ADB

Urban Development Series

Competitive Cities in the 21st Century

Cluster-Based Local Economic Development

Australian Government

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Competitive Cities in the 21st Century

Cluster-Based Local Economic Development

by
KyeongAe Choe and Brian Roberts

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ISBN 978-92-9092-431-9
Publication Stock No. BKK113970

Cataloging-In-Publication Data

Choe, K., and B. Roberts.
Competitive cities in the 21st century: Cluster-based local economic development.
Mandaluyong City, Philippines: Asian Development Bank, 2011.

1. Cities. 2. Competitiveness. 3. Local industry. 4. Economic development.
5. Development policy. 6. Small and medium-sized enterprises. I. Asian Development Bank.

This report was prepared based on the results of the technical assistance project, City Cluster Economic Development: Innovative Interventions in South Asia, funded by the Asian Development Bank (ADB).

Note:
In this publication, “$” refers to US dollars, unless otherwise specified.

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Printed on recycled paper

This work is dedicated to the memory of
KyeongAe Choe, lead economist (infrastructure)
and the chief ADB author of this publication.

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Abbreviations

ADB	–	Asian Development Bank
BPO	–	business process outsourcing
CCED	–	cluster-based city economic development
CMR	–	Colombo Metropolitan Region
CNCR	–	Central National Capital Region (India)
DCR	–	Dhaka Capital Region
F&BI	–	food and beverage industry
FDI	–	foreign direct investment
FY	–	fiscal year
GDP	–	gross domestic product
GIS	–	geographic information system
ICT	–	information and communication technology
IMF	–	International Monetary Fund
I/O	–	input/output
ISIC	–	International Standard Industrial Classification of All Economic Activities
km^2	–	square kilometer
Lao PDR	–	Lao People's Democratic Republic
LED	–	local economic development
LGU	–	local government unit
LQ	–	location quotient
MCA	–	multi-criteria analysis
MSIA	–	multi-sector industry analysis
mSMEs	–	micro-, small, and medium-sized enterprises
NCR	–	National Capital Region (India)
NCT	–	National Capital Territory (of Delhi, India)
ODA	–	official development assistance
OECD	–	Organisation for Economic Co-operation and Development
PRC	–	People's Republic of China
R&D	–	research and development
RMG	–	ready-made garments
SEZ	–	special economic zone
SIC	–	standard industrial classification
SMEs	–	small and medium-sized enterprises
WTO	–	World Trade Organization

Foreword

At no previous time in history has there been an acceleration of change as rapid as what we have witnessed in the recent past. The rapid succession of advances in science and technology has been unprecedented. The pace of change has been following a course approximating an exponential curve, based on changes of economies growing out of the Industrial Revolution. But the rate of urban development has been less remarkable.

Most Asian developing countries gained their independence around the middle of the 20th century. The majority of them have been struggling to catch up their economic growth as quickly as possible, shifting from agrarian society to industrialized economy. In the postindustrial era, an influx of advanced knowledge and technology has put tremendous pressure on the developing Asian countries to absorb both the secondary manufacturing and the tertiary service industries all at once in a period of half a century, when it had taken the industrialized countries the past 2 centuries to achieve. With climate change and the recent international financial crisis, resource issues have swiftly reached the top of the political agenda: infrastructure provision for the fast-growing urban population in the Asian region, globalizing economy, energy conservation, water resource management, people's quality of living and their environment, to name a few.

Change of this sort bespeaks a great many adjustments of all kinds ahead; adjustments in the field of urban development are no exception than in others. This means that urban planning and development methods such as those introduced in this book must emphasize an innovative approach and depend upon readers' inventiveness and ingenuity to take the transformation of cities from approach to practice.

How can Asian cities become more sustainable and more competitive? Asian cities are the epicenters of rapid economic growth, yet little has been known about the competitiveness of key drivers of urban economic growth—the factors that make their urban industries competitive, or how governments or development agencies could strategically invest to boost competitiveness and sustainability simultaneously—until now. An innovative new development approach has been created to allow all types of cities, city-regions, and industry—small and medium-sized enterprises, development banks, and national and city governments—to be analyzed systematically. The Cluster-Based City Economic Development (CCED) Approach provides a systematic methodology to understand the major

drivers of local economic development, and to assess strengths and deficiency gaps in advancing the competitiveness of industrial clusters and city-regions. This approach connects knowledge with practice, provides strategic entry points of public–private partnership, and can be a good decision-making tool for policy makers (or private sector investors) to have better-informed decisions on investments. Importantly, understanding the anatomy of key competitiveness drivers of urban economies can frame the most effective ways of reducing poverty through the creation of sustainable jobs, best utilizing and building on the skill sets available in the city.

This work is dedicated to the memory of KyeongAe Choe, lead economist (infrastructure) and the chief ADB author of this publication. She was taken from us on 17 October 2011.

Ursula Schaefer-Preuss
Vice-President for Knowledge Management
and Sustainable Development
Asian Development Bank

Manila, Philippines
October, 2011

Preface

Many theories and ideas have shaped the development of cities (Hall 1998, Mumford 1961, Howard 1946), yet no one can claim that the ideal design, economic size, or development pattern exists for any single city. The characteristics of cities are shaped by complex sets of historical, geographic, economic, social, physical, governance, technological, and chance factors. The economies of cities also differ depending on their history and functions. Cities change, often in short periods of time, while others develop into mega cities. Cities are complex systems (Alexander 1965, Allen 1997), which makes it difficult to study them and understand how they function. Nevertheless, the hope is that exploring the factors that shape city development will lead to a better understanding of how to design and develop cities that are more livable and sustainable.

Cities play a crucial role in national economic growth, especially in Asia, where they have urbanized quickly over the last 30 years, beginning with manufacturing and now with the booming service sectors. However, Asian cities struggle with the impacts of fast growth. Overcrowding, environmental degradation, high land costs, and worsening mobility of people and goods are some conditions reducing the productivity as well as inhibiting industrial or business activities. The creation of almost 1 billion new jobs per year poses enormous challenges for Asian governments. Governments and entrepreneurs in Asian cities need to find new ways to improve their competitiveness, if they are to create and maintain sustainable development and inclusive economic growth in a world where cities—no longer countries—compete for trade and investment.

Asia's urbanization shows agglomerated patterns. Conventional urban development theories are not necessarily applicable in the Asian context. *Agglomeration:* In cities such as Bangalore, Shenzhen, or Singapore, the focus of economic development has shifted from investing in physical infrastructure to promoting competitiveness of industry clusters, high-level skills, and reducing business transaction costs. *Industry Clusters:* With the internationalization of economies, Asian cities have leaned toward industry agglomeration. An enabling environment—one that has favorable capital markets, environmental management, governance, human capital development, infrastructure, land-use planning, livability, research and development, and skills—will fuel high levels of industry agglomeration and city competitiveness. However, what is necessary to create enabling environments and strategic infrastructure to help cities more competitive, sustainable, and inclusive?

The historic focus on competitiveness was initially based on comparative (resources) advantage and, later, competitive (efficiency) advantage (Porter 1990). The rapid development of national and subnational economies, globalization, the open sharing of knowledge and information between countries, limits on renewable resources, and environmental and social issues are challenging many of the traditional ideas on competitiveness. For sustainable development to become a reality, the basis on which cities and regions compete for trade, investment, and development will need to change to one based more on mutual cooperation and collaboration.

There has been a growing interest, therefore, among academics and business in ideas and factors that contribute to making local economies more competitive under open-market economic systems, and how to link these ideas to generate more suitable economic development outcomes especially for Asian cities, where much of the world's future economic growth and development will occur. Many Asian governments—such as those in the People's Republic of China, India, and Japan—have shown a strong interest in clustering as a way to support sustainable local economic development. Sustainable local economic development calls for creating new ideas and forming of strategic architecture that will increase the competitiveness and sustainability of local economies and their inclusive development in the future.

Fostering clusters is seen as a way to enhance the competitiveness of cities and regions, stimulate innovation, find ways to conserve and share precious resources, reduce business transaction costs, address environmental and social problems, and create sustainable employment in cities. The theory and practice of cluster development is relatively new in Asia, but shows considerable promise in helping to make the development of cities and economies in the region more sustainable. However, tools appropriate to the governance structures and level of economic development found in Asian countries are needed to analyze properly and foster urban competitiveness and clusters in Asian cities.

Cluster-based city economic development (CCED) is an approach to develop a new path to achieve sustainable economic development in cities by fostering the development of industry clusters. The approach includes an analytical methodology, seven guiding steps to assess a city's economic policy environment and its drivers to competitiveness. Based on analytical results, the creation of an economic competitiveness profile for selected urban economies, an industry cluster, and the creation of a strategic foundation that aims to generate more jobs and income opportunities are suggested.

This book explores ways to foster the development of more competitive and sustainable urban economies in Asia. In particular, it explores ways of

fostering the development of industry clusters to increase the competitiveness of Asian cities through an analytical methodology and structured approach toward CCED. CCED has been developed and tested in three South Asian countries: Bangladesh, India, and Sri Lanka. It draws upon an extensive body of knowledge and experience of industry cluster development in Asia and elsewhere. Detailed studies of selected industry clusters have been undertaken to identify and understand what is necessary to make cities more competitive, and to formulate cluster development strategy for inclusive economic growth.

This book also seeks to address important questions concerning ways to make the economic development of Asian cities more sustainable. It is an important—and timely—investigation into the competitiveness of Asian cities in the context of a rapidly changing global economy and searching questions related to the environmental sustainability of these cities. The book seeks to identify significant risks that affect the sustainable development of urban economies, explain the nature of industry clusters in three Asian cities, and outline critical elements of enabling environments needed to support city clusters in these cities. The evidence uncovered by the investigations described in this book, and reinforced by other research, suggests that enhancing the competitiveness of cities can lead to increased productivity and efficiency gains, especially if the governance and strategic architecture that shapes the economic development of cities is improved.

Chapter 1 discusses the role and importance of cities in the economic development of nations in Asia, the need for cities to develop a deeper understanding of competitiveness, and the changing nature of competitiveness. Many countries are showing increasing interest in benchmarking the competitiveness of their cities, and the chapter discusses about the needs for a new development paradigm for new emerging patterns of agglomerated Asian cities.

Chapter 2 reviews the factors shaping the development of agglomeration economies in Asian cities. It examines general trends, drivers, and approaches that have given rise to the emerging pattern of spatial clustering or agglomeration of urban development in Asian cities. The chapter commences with a discussion of changes taking place in the urban and economic patterns of Asian cities, and this is followed by an analysis of push–pull factors that are driving economic development in these cities. It then discusses economic theories and strategies that have shaped the spatial economic development of the region's cities. The understanding of how to support demand-side economic development, especially endogenous growth, is poor.

Chapter 3 looks at how much local economic development in Asian countries and cities has been driven by supply-side thinking, which focuses

on the development of infrastructure, special economic or enterprise zones, growth centers, and growth corridors and triangles, coupled with generous incentives to attract businesses and investment to these areas. The chapter examines economic development factors in relation to the future development of local economies in Asia, especially how to improve competitiveness, innovation, strategic infrastructure, and enabling environments in cities from demand-side thinking.

Chapter 4 describes the theory and analytical tools used in cluster analysis. Different experiences to foster the development of clusters in Asian cities are described; such as, Information Technology Cluster in Bangalore, India; Education Cluster in Sleman, Indonesia; Multi-Industry Cluster Development in Chiang Mai, Thailand; and Knitwear Industry Cluster in Tirupur, India. The chapter includes a discussion on some of the reasons why industry cluster development processes in Asian countries are important.

Chapter 5 outlines a seven-step procedure for the CCED Approach. The approach provides a holistic and deductive approach to analyzing and understanding competitiveness contributing to the development of local economies. The chapter is intended to assess, identify, and explore ways to building up strategic urban infrastructure and services for supporting the development of industry clusters, and improve enabling environments to deliver better local economic conditions. It also shows how to develop innovative intervention strategies and actions for improving development planning, governance arrangements, and financing schemes to promote public–private partnership projects that can support sustainable urban economic development in cities.

Chapters 6–8 describe the application of the CCED Approach to analyze cities' competitiveness and industry clusters in Bangladesh, India, and Sri Lanka. Each chapter is a separate country case study. The development, testing, and replication of this CCED was undertaken as a joint development project by the study team in partnerships with industry cluster associations and networks and other industry stakeholders. The action plans developed undergo further pre-feasibility analysis to prepare a range of bankable investment projects that can be implemented under partnership arrangements.

Chapter 9 presents the lessons gained from the experience of conducting three CCED studies in Bangladesh, India and Sri Lanka, as well as studies conducted on clusters in other cities in Asia.

Chapter 10 outlines the ways of making CCED operational which were being tested at the time of preparing the book. It provides a broad framework for how governments and international development agencies

could become engaged in the CCED Approach. The chapter explores possible avenues for further development of CCED, recognizing that it is an approach containing analytical tools that can be a replicable development strategy for cities in Asia and elsewhere.

This CCED Approach is not just simply intended for academic bookshelves. The book is intended for use by government agencies, business, and communities of interest involved in supporting the development of inclusive local economies in Asia. The approach is to help practitioners take the extra step in creating action plans for industry clusters and to determine steps to implement CCED. Also, the findings of the CCED analysis methodology are to support policy makers to make informed decisions on prioritizing infrastructure investments that will have the most impact. Resources are limited but the needs for development are very great, and thus the CCED Approach aims to match industry (or small and medium-sized) clusters with required infrastructure to jump-start growth in a given city-region.

The findings of the book provide important insights for planners and policy makers responsible for the economic development of cities, sub-national regions as well as subregions on critical factors they need to take into consideration in shaping future economic development plans. The authors hope readers will find the book useful in applying CCED and other analytical tools, strategies, and examples to local and regional economic development practice.

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Acknowledgments

The book, *Competitive Cities in the 21st Century: Cluster-Based Local Economic Development*, is the culmination of more than a year of research inputs from three local partner institutions in Bangladesh, India, and Sri Lanka. This activity is the seventh subproject under the Asian Development Bank's (ADB) Regional Technical Assistance: 6337 Development Partnership Program for South Asia (financed by the Australia–ADB South Asia Development Partnership Facility). We do express our appreciation to ADB and the Australian Agency for International Development (AusAID) for financing this study project.

While countless people were involved in developing the country case studies, we wish to express our special appreciation to our partner research institutions—Centre for Urban Studies (CUS) in Bangladesh, National Institute of Urban Affairs (NIUA) in India, and SEVANATHA Urban Resource Centre in Sri Lanka, who developed each of the three country case studies; and many reviewers who provided valuable time and efforts for the case studies. The following people are also acknowledged for their contribution: Nazrul Islam, Nurul Islam Nazem, Amirul Islam Chowdhury, Aqm Mahbub, and Salma A. Shafi, from CUS, Dhaka, Bangladesh; Chetan Vaidya, Mukesh Mathur, V.K. Dhar, Debjani Ghosh, Paramita Datta Dey, Poornima Singh, and Sandeep Thakur from NIUA, Delhi, India; Champika Malalgoda from the Board of Investment in Sri Lanka; L.H. Indrasiri from the Urban Development Authority, Colombo; H.M.U. Chularatne, K.A. Jayratne, and K.S.S. Shanaka of the SEVANATHA Urban Resource Centre, Colombo; and Rod Brown of APD, Australia, for his inputs in Chapter 4 on clusters.

Special mention also goes to Shri Rajveer Singh of the APEX Cluster Development Services Pvt. Ltd, India, and Nihal Samarappuli and L.D. Dickman from the Board of Investment in Sri Lanka, for putting in extra effort to make the project a success. We also wish to thank the many people who attended workshops, roundtables, and other fora and provided inputs into the process used to test and evaluate the value of the CCED approach.

At ADB, we are particularly grateful to Xianbin Yao, director general, Regional Sustainable Development, and Gil-Hong Kim, director, Sustainable Infrastructure Division, for promoting and encouraging innovative thinking in ADB. Invaluable support, insights, and comments were received from numerous colleagues and reviewers from ADB's Urban Community of Practice as well as others from the government officials from Bangladesh, India, and Sri Lanka, and AusAID, particularly those who were representing

the field offices of AusAID in Colombo, Delhi, and Dhaka. To the Department of External Relations in ADB, we would also like to thank the following people: Muriel Ordonez, Robert Hugh Davis, Priscila del Rosario, Anna Maria Juico, Victor Angeles, Miguel Paulino, and Anthony Victoria for publication coordination and production; Mary Ann Asico for manuscript editing; Celeste Saniel-Gois for technical and administrative support; and Amelia Esteban, Pamela Puspus, and Araceli Knaik for data and research assistance.

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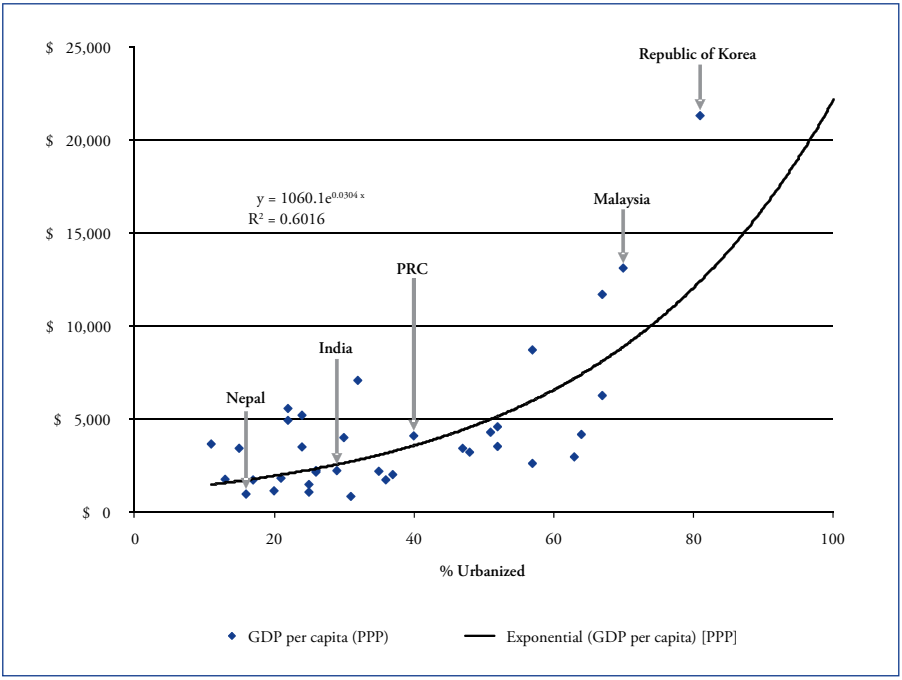
Chapter 1
City Competitiveness and Cluster-Based Economic Development

As economies globalize, those in developing Asia tend to transform in structure from primary (agriculture) to manufacturing and tertiary (service) industry. The secondary and tertiary sectors usually evolve in urban areas, because these areas are perceived to provide better infrastructure and proximity to other relevant companies, thereby helping to reduce business transaction costs. Urbanization is positively correlated with national gross domestic product (GDP), as shown in Figure 1.1. Empirical data show that productivity in many Asian countries is at least 1.5 times higher in the urban economy than in the nonurban. Asia is urbanizing rapidly, and the urban economy has become the engine of growth.

If cities are the engines of growth, then countries should take full advantage of urbanization and not hold back the opportunities it can provide for economic growth and poverty reduction. By 2030, more than 55% of the population of Asia will be urban. Towns and cities are growing outward, engulfing peri-urban rural areas and forming new business and entrepreneurial agglomerations. Urban and industrial agglomerations have several advantages. Economies of scale (i) make it more efficient and effective to share market information, knowledge, new technology, product design and service innovations, and common research and development (R&D) facilities or centers; and (ii) lower the costs of doing business. This is the key phenomenon behind the concept of *cluster-based city economic development (CCED)*.

As countries industrialize, cities take on a progressively greater role in their economic development. Urbanization usually accompanies industrialization. In most developed economies, the urban sector contributes more than 85% of GDP. Some cities are much better economic performers than others, as competitiveness studies of different countries show (OECD 2006). Large cities do not necessarily do better than smaller cities. GDP per capita and per square kilometer (km^2) also varies appreciably between cities of similar size within the same country and in different countries. These findings raise

Figure 1.1 Urbanization and GDP Per Capita of Asian DMCs



DMC = developing member country, GDP = gross domestic product, PPP = purchasing price parity, PRC = People's Republic of China.

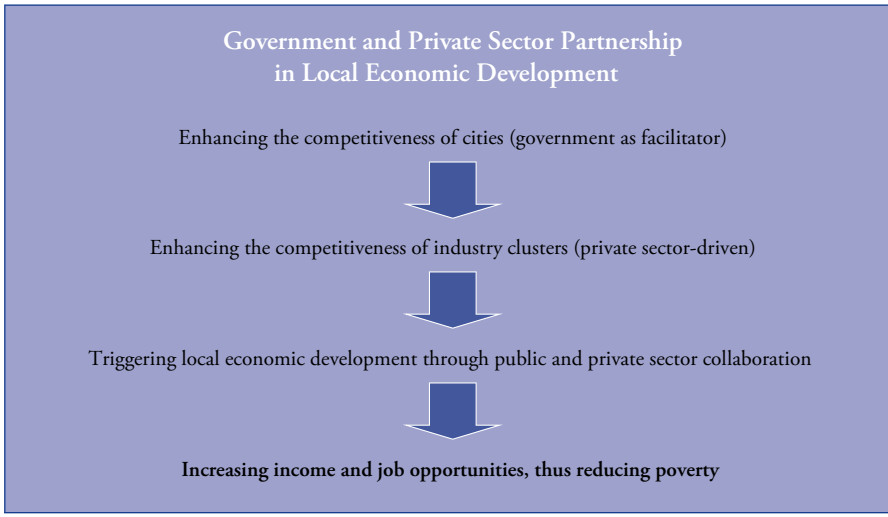
Source: World Bank (2007).

important questions about why some cities do better than others, and how cities that are lagging far behind can improve their performance to catch up with rivals.

Cities become competitive through shared services and infrastructure, or "commons" (Frost and Morner 2005): urban infrastructure, communications, and public services; business rivalry and cooperation; access to natural resources and skills; location relative to markets; risk management; social capital; quality of life. These factors are not all present, and not to the same degree, in all cities, especially in the developing world. Governments and private businesses alike must understand better the importance of these factors to economic development to compete in the globalizing economy, grow sustainably, and reap other benefits.

CCED is a new approach to local economic development, rooted in rigorous analytical research and aimed at building competitive urban economies and industry clusters. A concept introduced by ADB in 2008, CCED offers a new way of developing cities into engines of economic growth. It provides a strategy for inducing industry cluster development to unlock

Figure 1.2 Conceptual Approach and Goals of Cluster-Based City Economic Development



the potentials of micro-, small, and medium-sized enterprises (mSMEs) agglomerating in and around Asian cities. The seven-step analysis fully investigates the comparative advantages and drivers of competitiveness in cities, identifies industry clusters, helps in the preparation of long-term development plans, and supports the prioritization of action plans to improve the competitiveness of cities. The goals of CCED (Figure 1.2) are to create an enabling business environment in urban regions and stimulate industrial growth, and thus ultimately increase job and income opportunities for poverty reduction. The CCED approach seeks to capitalize on the benefits of economic agglomeration in an Asia that is rapidly urbanizing and increasingly integrated into global production systems.

This book looks into how the economies of Asian cities can grow in the future, and particularly into how these cities can become more sustainable by making their economies more competitive.

1.1 The Competitiveness of Asian Cities

According to a study by Webster and Muller (2000),

> Urban competitiveness refers to the ability of an urban region to produce and market a set of products (goods and services) that represent good value (not necessarily lowest price) in relation to comparable products of other urban regions. Non-tradeables, e.g., local services, are part of the

competitiveness equation. An urban economy that produces goods and services for local people of high value relative to price, supports the export economy of the city, making it more competitive, as well as directly raising the quality of life and standard of living for people living in the urban region.

The role of Asian cities in national economic development is not well understood. Cities contribute more than 90% of GDP in Malaysia and Thailand, and close to 100% in Singapore and Hong Kong, China, with their strong, highly competitive, and resilient economies (World Bank 2009). Even in countries with low urbanization rates like Sri Lanka and Bangladesh, more than 65% of GDP is produced in the urban areas.

Moreover, a higher proportion of GDP is being produced in megacities. These cities are becoming more efficient and have high degrees of industry agglomeration and specialization. Megacities like Kolkata and Dhaka, on the other hand, struggle in the competitiveness rankings and perform poorly. The fact that few Asian cities were ranked high in the Global Urban Competitiveness Report 2007–2008 (Ni and Kresl 2009) indicates that (i) labor productivity is generally low in Asian cities, (ii) patent development and innovation is also low, (iii) multinational corporations are thinly distributed, and (iv) governance systems are weak. There is high inefficiency as well in the management of Asian cities (ADB 2008b). Weak utility and other support services for business, except in the developed economies of Asia, further undermine the economic growth potential of many Asian cities.

In the 1990s, however, the converging forces of globalization, national economic reforms, and climate change began to shape the growth of cities and regions in Asia. Globalization has led to specialization and concentrated development in regions where investors can derive a business advantage. Cities and city regions have replaced the nation state as the principal drivers of economic development in many Asian countries. The forces of globalization, particularly since the 1997 Asian financial crisis, have produced major structural changes in urban economies and in approaches to local economic development.

In pursuit of competitive advantage, local and regional companies strive to minimize transaction costs and thereby gain access to markets, and governments to provide better supporting infrastructure through economies of scale. Transaction costs are affected by many factors, some of which are not directly related to economics, for example, government efficiency, strategic infrastructure, human capital, community attitudes, and amenities and culture. These factors differ between Asian cities, making it difficult to compare competitiveness between cities.

Various studies have tried to measure the competitiveness of cities in Asia (OECD 2006; Ni and Kresl 2009; Dollar et al. 2004; Kapoor 2009; Magdaluyo et al. 2001). International comparisons of competitiveness

confront methodological problems, because data collection varies in Asian countries. But the studies arrive at many common elements of competitiveness. The study by Dollar et al. (2004) on the competitiveness of 23 Chinese cities gives strong evidence of the importance of public investment in technical skills and R&D. As data from other Asian countries suggest, investment in skills and technology is probably more critical to competitiveness than investment in infrastructure, although it is impossible to have one without the other.

Historically, national governments have protected local economies from a wide range of economic and development risks through tariffs, regional development incentives, and subsidies. Globalization and national economic reforms have exposed urban economies to more exogenous risk than in the past, such as exchange rate movements; global commodity price changes, especially for petroleum; and competition in local markets resulting from imports and takeovers or the privatization of local businesses and government services. Asian cities must understand how risks affect the competitiveness of business, trade, and investment. For many cities, environmental and social risks have become a major concern, leading to a loss of competitiveness. International investors are starting to move to locations with cleaner environments and good social infrastructure and transportation networks.

To become more competitive, many Asian cities have encouraged more concentrated, specialized, and integrated production and capital investment in regions that offer the greatest competitive advantage to investors, buyers, transnational corporations, and other producers. Seoul, Singapore, Hyderabad, Kuala Lumpur, and many other Asian megacities recognize that, as labor and environmental costs rise, they need to develop more specialized industries by taking advantage of urban agglomeration.

1.2 Shaping Local Economies with Competitive Advantage

The opening up of economies to competition and the growing dominance of cities as drivers of economic development have significantly changed ideas of how cities can gain competitive advantage. Yet national governments cling to the notion that the economic development of cities and regions rests largely on supply-driven physical infrastructure. This old way of thinking has thwarted attempts to improve overall economic performance.

Three advantageous approaches to competitiveness can change much of the thinking of governments on economic development. These three—comparative, competitive, and collaborative advantage (see Table 1)—give

Table 1.1 Elements of Competitiveness: Comparative, Competitive, and Collaborative Advantage

Comparative Advantage	Competitive Advantage	Collaborative Advantage
Land costs	Research and development	Networks
Infrastructure	Technology	Industry clusters
Taxation	Regulation	Strategic alliances
Labor costs	Labor productivity	Public–private partnerships
Proximity to raw materials	Skills base	Inter-modalities
Transport	Core competencies	Trust and empowerment
Cost of capital	Quality of life	Open governance
Location of markets	Social capital	Smart systems
Economies of scale	Economies of scope	

Source: Study team.

rise to a wide range of policy tools and changes in strategies and plans for economic development, education, public–private partnerships, and urban infrastructure development.

1.2.1 Comparative Advantage

The principle of *comparative advantage*, developed out of trade theory, assumes that individuals and regions will produce those goods or services for which they have a relative advantage, usually because of infrastructure, natural resources, labor, or capital. Comparative advantage tends to induce specialization. After World War II, most countries built up national industries in their regions to export specialized goods and services to international markets. Economic planning sought to achieve comparative advantage by keeping production costs (labor, materials, energy, taxes, and infrastructure) low relative to those of competitors. The full costs of production were often not accounted for, but tariffs, incentives, and infrastructure subsidies were lowered to increase comparative advantage.

Asian governments rely extensively on comparative advantage policies to draw industries to regions they want to develop. Many tout the comparative advantage offered by new towns and growth centers, and the benefits of low-cost labor, cheap land, and subsidized infrastructure. Countries like the People's Republic of China (PRC) and Viet Nam promote a socialist market economy through the capitalist method of encouraging foreign and domestic investment in special industrial or economic enterprise zones (Peters and Fisher 2002). By mass-producing to minimize production costs, some urban areas, especially Shenzhen and Shanghai, have gained significant comparative advantage.

1.2.2 Competitive Advantage

In the 1980s, competitiveness shifted its focus toward *competitive advantage* (Porter 1985), which emphasizes efficiencies in the means of production, particularly in so-called value factors that have to do with performance and quality. Value factors pertain to resource, capital, and labor efficiencies and the use of advanced technologies to increase productivity. Recent thinking views quality of life, human capital, and social capital as also important to workforce productivity, innovation, and competencies. In many respects, such as technology and human capital, competitive advantage relates to endogenous growth theory as developed by Romer (1990) and others (Chapter 3).

Developing economies in Asia began opening up their national economies to foreign direct investment (FDI) in the 1980s to stimulate national development. Some grew in the 1990s by using competitive advantage as a policy for economic development. Foreign manufacturers, seeing their margins fall in comparison, turned to quality assurance to become more productive. Many private companies in the region also began to make improvements in the workplace and in skills, in the process shaping local economies and transforming urban areas.

In some countries, especially the PRC and the Republic of Korea, the steep rise in wage costs compelled a move from labor-intensive to more technology-based production to maintain competitive advantage. Governments also saw the importance of adding value to production supply chains and investing in R&D in new products and markets to withstand mounting international competition.

1.2.3 Collaborative Advantage

For companies that crave success in business or governments that hope to entice investors, especially from abroad, to invest in local economies, comparative or competitive advantage is no longer enough. Their profit margins squeezed by global competition, companies are forced to change the way they do business. Former rivals are seeking to collaborate through alliances, partnerships, and other forms of cooperation to win and expand their business. The new theory of *collaborative advantage* has thus emerged.

Collaboration in the context of competitiveness is centered on strategy and on the factor costs of production, such as the improvements to be gained in resource efficiency and organizational effectiveness. A feature of collaborative advantage in the service industries is mass collaboration (Tapscott and Williams 2006). Companies openly share or make information

and data public, or invite individuals or other companies to find solutions to problems, or to peer-review or test products. The mapping of the human genome, the development of Linux software, and the building of the online encyclopedia Wikipedia are examples of mass collaboration. Smart economies like Singapore are encouraging more open knowledge sharing to capitalize on the potential benefits of collaborative advantage.

Many Asian economies and businesses still view collaborative advantage as threatening. The approach cuts through the information secrecy that traditional business culture and practices hold dear. Yet keeping information secret is seen to hinder R&D and thus the growth of the producer services sectors in cities across the region (Tapscott and Williams 2006). With the development of the internet, which has internationalized data and information sharing, governments that try to curb the spread of knowledge and information risk suppressing learning, creativity, and innovation and keeping new products and services from being developed and commercialized.

The studies done for this book assume that greater collaboration between government, business, and local communities will mean more competitive business and enabling environments, and hence more sustainable economic growth, in Asian cities.

1.3 Agglomeration and Transformation of Asian Cities

McGee (1995) discusses how the built-up areas in many Asian megacities have swallowed up surrounding villages and small towns, and linked with other cities to become city clusters or city regions.

City clusters can offer shared access to common infrastructure, geo-spatial proximity for supply chains and networks, and concentrations of human resources and skills, and thus help to lower production and transaction costs. Industry clusters are significant drivers of local economic development. Much of the thinking about industry clusters has grown out of the concept of agglomeration and endogenous growth theory, where knowledge drives innovation. Cities like Bangalore, Seoul, Singapore, and Hong Kong, China have turned away from conventional infrastructure, low labor costs, and low taxes, and toward highly competitive industry clusters, specialized industries, high-level skills, and innovation, to develop their economies.

In transforming to become more market driven and integrated into global trade systems, cities in Asia have developed somewhat differently from those in the industrialized countries. Asian cities that have been better integrated

into the global economy have invested in maintaining and improving infrastructure services and the environment, and have supported more open information sharing and transparent governance. Those cities are becoming increasingly competitive, leaving less competitive subnational towns and cities to play catch-up. Many laggard cities are unlikely to catch up and be sustainable economies unless they stop resisting change and learn to create competitive advantage and to leverage resources much more effectively.

1.3.1 Agglomeration of Cities and Towns

The propensity of similar types of activities to cluster in cities was first recognized by Marshall (1890) and later explored by Weber (1929). The spatial agglomeration of business activities creates economies of scale, and competitive businesses and markets. Co-located businesses can also take advantage of externalities and shared infrastructure to reduce transaction costs (Batten 1994; Karlsson 2007). Many countries have tried to develop agglomeration economies with a range of spatial tools such as the base economy and industry attraction models (Giersch 1995; Richardson 1973; Geenhuizen and Nijkamp 1995).

Cities have shown evidence of the clustering and specialization of competitive businesses in and around markets and artisan districts. The earliest cities were planned, and infrastructure, housing, and public utilities built, to serve the needs of expanding local populations. These first "city states" were widely involved in local area commerce and trade. Later, as roads and shipping improved, cities began to trade with others, and economic activities in urban areas became more specialized and spatially concentrated. Increased specialization in production and in the functions of cities led to a growing trade, which fueled the economic development of most cities before the Industrial Revolution.

Congestion, problems with logistics, and restricted access to the skills that kept companies competitive made it more difficult to achieve economies of scale and lower transaction costs as cities grew (Harry 2008; Miceli and Sirmans 2004). Government policies to ease congestion and to decentralize investment and employment (Vermeulen and Rouwendal 2008) pushed people and industries to edge or linear cities along major highways. New urban growth poles, new towns, or economic enterprise industrial zones were created on city fringes or in peri-urban areas. Clusters of cities thus became metropolitan areas (or city regions), some with spatial concentrations of manufacturing and service industry activities (OECD 2006).

With industrialization came the massive expansion of cities and the first appearance of metropolises, or agglomerations of smaller cities and towns.

Growth spilled over into surrounding areas and satellite towns sprang up as production systems in larger cities became more organized and transport systems expanded. This growth sustained the manufacturing supply chain and consumer demand. Eventually, adjacent towns were absorbed into the larger cities, giving rise to metropolises and polycentric patterns of urban form and economic activity. In some parts of the world, especially in Asia, metropolitan cities have become megacities, or clusters of interlinked cities and economies. Some of these have developed along the major roads connecting cities and towns.

Choe and Laquian (2008) discuss the typology of urban agglomeration patterns at length, including the institutional and governance constraints on development, and measures that would move city cluster development (CCD) forward in Asia. They draw attention to the roots of the CCD concept in the emergence of several urban centers within a metropolitan area. Although city clusters around development corridors and megacities are prominent in Asia, many more city clusters in the region are made up of cities with populations of less than one million. To appreciate the development potential of city clusters, it is important to go beyond the size of cities (as measured by population) and consider their relative economic function, power, and influence in national urban and provincial development.

1.3.2 Agglomeration of Businesses and Industries

Economic activities in the modern city have become much more globally integrated (Sassen 1994; Scott 2001; Kanter 1995). In many rapidly developing export-oriented cities in Asia and elsewhere, large and powerful urban industry agglomeration economies have become established, peopled by national and international companies and multinational corporations in search of competitive advantage through access to resources, infrastructure, skills, and a strong enabling environment for business (ADB 2008b). The rise of these agglomeration economies has sparked interest in the role of industry clusters in the economies of cities (Enright 2003; Wu 2005), a role that, for Karlsson (2007) and Assmo (2005), is a critical one.

The phenomenon of industry clusters has been extensively researched, with the work of Michael Porter (2000) being of seminal importance. Industry clusters—like-minded businesses (competitors) and talents in a specific geographic location or area—have existed for centuries in cities, which became known for their specializations. But the industry clusters of today, unlike those of the past, are global, highly specialized, and integrated with multinational corporations and dominated by them (Korten 1995). For example, cities like Hyderabad and Mumbai have become important global centers of information and communication technology (ICT), finance, and

multimedia, while Delhi and Dhaka are among the world's largest ready-made garment production centers.

More recently, the importance of industry clusters has inspired new ideas on economic growth theory. Cooke and Morgan (1998), Porter (1990), and Swan, Prevezer, and Stout (1998) underscore the usefulness of knowledge networks, innovation, and technology transfer and adaptation in creating jobs, adding value to production, and bringing in investment. New economic growth theory (Romer 1986, 1990) rests on encouraging the geographic clustering of economic activities and their supply chains in urban areas, giving rise to a whole new area of knowledge on the development of industry clusters (Anderson 1994; Bergman and Feser 1999; Doeringer and Terkla 1995).

There has been increasing interest in industry clusters among central and subnational governments intent on making local economies more competitive but not succeeding despite various reforms. Other factors, many of them related to industry agglomeration, have been seen to come into play (Ng and Tuan 2006; Huang and Bocchi 2009). But what makes for the successful development of industry clusters, especially in Asia, is not well understood. Given the many challenges facing the development of Asian cities, learning more about the processes and drivers of agglomeration economies and industry clusters might help governments in the region find more sustainable pathways to urban economic growth.

1.3.3 Clusters as Drivers of Urban Economic Development

Agglomeration economies have enabled Japanese industries to play the role of "lead goose" in Asia (Hamaguchi 2009), blazing new trails in finding locations in the region that offer a competitive advantage to companies setting up manufacturing facilities offshore. Many of the cities that have been highly successful in attracting companies from Japan, and later from the Republic of Korea and Taipei,China, especially cities in the coastal regions of the PRC, have strong spatial and economic agglomeration characteristics. This suggests that foreign and local businesses co-locate in those cities to gain advantage from (i) sharing the costs of infrastructure and utilities, (ii) collaborating with competitors in purchasing and transport, and (iii) networking with competitors to share information and acquire knowledge. This phenomenon has not been widely observed in Asian city economies, however.

Most businesses in the region recognize the benefits of agglomeration but tend to think of themselves as competitors rather than collaborators. Since industry clusters and agglomerated cities offer opportunities for competitive advantage to competitor companies in the same geographic

area, a deeper look into how they function would provide important clues as to how businesses and governments in Asia could become more competitive, productive, and sustainable in support of economic development.

1.3.4 Fostering Clusters to Make Asian Cities More Competitive

Centering their research on typology of city cluster development (CCD) as a tool for improving the spatial development of Asian cities, Choe and Laquian (2008) assess the strengths and weaknesses in (i) integrated development planning, (ii) institutional and legal structures, (iii) governance systems, (iv) innovative financing, and (v) special economic development zones and land for industrial development. The authors point to a need for cities to develop strong enabling environments to support the growing numbers of cluster cities, in particular by carrying out sector reviews and by defining strategies, identifying priority intervention areas, and establishing guidelines for developing human capital and mobilizing financial resources.

The CCD study provides valuable insights into the emerging patterns of urbanization and the sustainability of agglomerated urbanization in Asia. The study deals at length with the broader framework of intergovernmental jurisdiction management but only marginally with the economic drivers behind the development of cities. How Asian cities develop their economies will depend more and more on how well they can meet the national and global demand from businesses and investors for human capital and for access to technology and business services, and provide a good quality of life as well. These factors significantly affect the ability of cities to attract investment and development.

Pursuing the investigation of the economic aspects, the Asian Development Bank (ADB) initiated the second stage of the study, on *Cluster-Based City Economic Development (CCED)*, in 2008. This book is the key output of that second stage. To avoid confusion, the abbreviation “CCD” is used in this book when referring to the physical geography and patterns of agglomerated urban growth, and “CCED” when referring to industrial agglomeration and clustering in the context of urban economic development.

Two important concepts regarding the planning and transformation of Asian cities through clusters have emerged. The first has to do with *developing infrastructure, land, and government services and utilities* to stimulate economic development (*supply-side development*). The second concept, a recent one that has gained prevalence because of the effects of globalization and integration of economies, is concerned with *creating an enabling business environment* in which businesses and governments can

stimulate, create, and respond to opportunities and changes in consumer markets and purchaser needs (*demand-side development*). Supply-side development tries to create comparative advantage for cities and towns by filling the gaps in basic urban infrastructure and services. Demand-side development, in contrast, recognizes that the means of production and demand for goods and services are dynamic and change very rapidly, so local economies and businesses must respond quickly and manage risks. The second concept is based on keeping the factor costs of production, basic services, taxes, and materials lower than those of competitors.

Both approaches are linked to local economic development (LED) and to cluster development in cities and city regions as a mechanism for economic sustainability and urban development. Supply-side development views spatial planning and infrastructure as the primary drivers of development. For demand-side development, on the other hand, the economic factors of competitiveness and governance are the primary drivers. Making Asian cities more sustainable in response to globalization and climate change issues requires a balanced effort that combines both supply- and demand-side development.

1.4 Cluster-Based City Economic Development

CCED works toward sustainable economic growth and development in cities by fostering agglomeration, innovation, integration, and clustering of productive economic activity and land-use activities. Intrinsic to CCED is a seven-step *structured approach* to strengthening a city's economic policy environment and its drivers of competitiveness (discussed in Chapter 5). The ultimate aim is to create more jobs and income opportunities in cluster cities or city regions. The analysis uses a framework based largely on the body of theory and practice initiated by Porter (1990, 1996, 1998) to improve understanding of the factors associated with localized, concentrated patterns of employment and economic activities in Asian cities. Sub-metropolitan concentrations of companies in those cities engage in similar types of activities and are often linked by networks of economic activities into larger urban clusters (Felbinger and Robey 2001; Porter 2000).

1.4.1 Demand-Oriented Local Economic Development

Asian cities continue to devote much of their economic planning and development to supply-side economic development, with governments in a leading role. Development led by public sector investment has succeeded in many ways, but not all of it has been sustainable, especially when

environmental costs are considered. As more Asian economies join the World Trade Organization (WTO), development led by the public sector alone will not have the same impact it had in the past. Economies will be controlled less by government and more by market forces. Many Asian countries are therefore seeking ways to engage the private sector in driving economic development in the future (ADB 2007, 2008c).

While several studies have measured the competitiveness of Asian cities (Dollar et al. 2004; Magdaluyo et al. 2001; Neo Advisory 2006), relatively few have explored the changes in industry structure or the nature of the primary drivers of competitiveness, such as the role of industry catalysts or of innovation, or the quality of human capital. In future, Asian cities must be able to respond better to factors that can strengthen enabling business environments (WHO 2007; Batterbury and Forsyth 1997; Brinkerhoff 2004). Strong enabling environments are essential for long-term core-business development, prioritized investment, and a competitive business environment in an urban region. Hong Kong, China used such an approach to develop a long-term economic plan for maintaining its competitive advantage in an expected environment of dynamic change and competition (Enright, Scott, and Dodwell 1997). Cities that do not understand the demand side of developing longer-term core productive activities face with high risks being left behind and having to play catch-up (Stimson et al. 2006, 193).

This lack of knowledge about the demand-side economic factors behind the development of Asian cities hinders Asian cities from becoming more integrated into the global economy; decision makers in local government are increasingly uncertain about what investment in strategic infrastructure and human capital development is required to foster demand-side investment, especially in services. Better knowledge about the drivers of economic development in Asian cities will allow long-term planning and development of sustainable cities.

1.4.2 The CCED Concept

Given the apparent importance of agglomeration economies and industry clusters to the economic performance and sustainability of Asian cities, what critical elements of strategic foundation, including the hard and soft infrastructure building blocks (Roberts and Stimson 1998; Prahalad 1996), do Asian cities need to create competitive economies? And how are these critical elements, essential to building clusters, to be identified and built?

The concept of CCED derives from regional agglomeration theory (Richardson 1973; Marshall 1919), which seeks to understand how related industries congregate in a geographic area, drawn by externalities such as

access to a pool of skilled labor and opportunities to capitalize on economies of scale, value addition to supply chains, planning by local authorities, and fortuitous events.

The agglomeration or clustering of land use and other economic activities in cities is a response to both supply- and demand-side factors. CCED aims to capture and capitalize on both supply- and demand-side approaches to economic development. On the supply side, governments introduce policies, provide specialized infrastructure, and offer financial incentives to companies that locate in a city or region. This approach to economic development has succeeded in the past. On the demand side, specialized skills, technologies, networks, and markets catalyze investment and development by giving a competitive advantage to businesses. It is concerned not with trying to establish or identify markets, but with responding to market demands as these arise.

1.5 Changing the Development Paradigm for Asian Cities

Old urban and regional development models have generally not succeeded in achieving environmentally sustainable development for Asian cities. They have led companies and communities to externalize and discount the real costs of production and consumption by not addressing problems of waste and pollution. These problems are adding significantly to the costs of managing Asian cities and undermining the competitiveness of their economies. Cities in Asia must learn to operate in more open and competitive environments, where the WTO, the International Monetary Fund (IMF), and global business, rather than national governments, set the rules of trade, development, and investment.

New models for sustainable local economic development are needed. They must not only take into account these external factors but also focus more explicitly on internal business environment, weak governance and enabling environments, and pro-poor development governance. If the goal of sustainability is to promote urban economies that generate value-added outcomes and distribute these efficiently and equitably, Asia requires a new road map to help create sustainable economies. A simple focus on competitiveness or livability alone does not capture the complexity and dynamics of urban economies.

CCED, as developed in this book, offers a pathway to increasing, rather than diminishing, returns. This is an important principle of sustainable economic development.

Chapter 2
Factors Shaping the Spatial Agglomeration of Asian Cities

The cities are growing at record rates and to an unprecedented extent. Their form, function, and structure, and especially their economic geography, are being vastly transformed. Not all the changes have been positive, however. Many urban environments have been devastated by urbanization: some Asian cities are now among the world's most congested and polluted. As urbanization accelerates across the region, governments must find ways to manage urban development better and bring about growth that is more sustainable. To do this, they must understand better the factors that are defining the spatial agglomeration of urban economies. These factors are explored in this chapter.

2.1 The Changing Economic Geography of Asian Cities

Industrialization has been the major driver of urbanization and economic development in most Asian economies. But industrialization in Asia has not followed the example of Europe during the Industrial Revolution. Industrialization in European countries took more than 200 years to peak. During that time the economic structure of most countries changed slowly, first from primary to secondary industry, and then to services. In Asia, however, most of the industrialization started only after World War II, and the change from agrarian society has been accelerating recently, at a much greater scale and intensity. Also, the secondary and service sectors are developing almost in parallel. The structure of Asian cities is changing fast; by far the greatest impact on urban growth in the future will come from services. Many large cities in Asia, including Beijing, Seoul, Singapore, Kuala Lumpur, and even Bangkok, are already moving into a postindustrial phase of development (Yusuf and Nabeshima 2006), with industries moving offshore or to lower-cost locations.

Powerful economic, social, political, and environmental forces are converging and marking out dynamic new physical and economic geographies in Asian cities. More and more, cities are dominating national economic development as people leave the rural areas in search of employment and a better life. But if their physical, economic, and social development is not well planned, cities in the developing economies of Asia could become dysfunctional and be far less likely to attract investment, create wealth, and reduce poverty.

2.1.1 Rapidly Urbanizing Asia

Asia is vast and rapidly urbanizing. In 1950, some 232 million people, or 17% of the population of Asia, lived in the urban areas. By 2030, about 2.66 billion, or almost 55%, will be urban. The economic, social, and environmental impact of so many people living in cities in the region will be enormous.

Urbanization in Asia varies in both speed and degree between countries. As Table 2.1 shows, Bangladesh, Cambodia, Lao PDR, and Sri Lanka are the least urbanized (2005 data), while in countries like Malaysia and the Philippines the population is more than 60% urban. Two decades from now, about 40% of the population of most developing countries in Asia will be living in the urban areas. In comparison, developed countries like Japan and the Republic of Korea are more than 85% urbanized, proving that urbanization is not incompatible with high living standards.

Growth in Asia is most rapid in its megacities, but these hold only 10% of the urban population of Asia and their rate of growth in most cases is declining (Roberts and Kanaley 2006). More than half of the urban population of Asia lives in cities with fewer than one million people. These smaller cities are urbanizing the fastest and have the highest informal sector employment. But, unless they are located close to large sources of raw materials, many of these secondary and tertiary cities find it extremely difficult to attract investment, especially in new industries. They tend to have weak governance systems and to pay less attention than larger cities to local tax collection. Infrastructure maintenance and utility services are also generally poor, as is the development of human capital. Many small cities like Naga in the Philippines have nonetheless succeeded in developing and maintaining human capital and attracting investment in new industries (Ishii, Hossain, and Rees 2007).

Urbanization rates are high in secondary and tertiary cities either because rural development policies fail or the cities extend their administrative boundaries to include adjacent rural and peri-urban areas. People increasingly migrate to the cities from the countryside to escape

Table 2.1 Urbanization Trends, Selected Asian Countries and the World, 1950–2030

Region or Country	GDP Per Capita (PPP, $) 2003	Population (million), 2005	Urban Population (million), 2005	% of Population Living in Urban Areas			Estimated Increase in Urban Population, 2005–2030	
				1950	2005	2030	No. (million)	%
World	…	6,453.6	3,172.0	29	49	61	1,772.7	56
Asia	…	3,917.5	1,562.1	17	40	55	1,102.2	71
Bangladesh	1,770	152.6	38.1	4	25	39	48.4	127
Cambodia	2,078	14.8	2.9	10	20	37	5.8	197
PRC	5,003	1,322.3	536.0	13	41	61	341.6	64
India	2,892	1,096.9	315.3	17	29	41	270.8	86
Indonesia	3,361	225.3	107.9	12	48	68	80.0	74
Lao PDR	1,759	5.9	1.3	7	22	38	2.3	177
Malaysia	9,512	25.3	16.5	20	65	78	10.8	66
Pakistan	2,097	161.2	56.1	18	35	50	79.3	141
Philippines	4,321	82.8	51.8	27	63	76	34.8	67
Sri Lanka	3,778	19.4	4.1	14	21	30	2.4	59
Thailand	7,595	64.1	20.8	17	33	47	14.6	70
Viet Nam	2,490	83.6	22.3	12	27	43	24.5	110

… = not applicable, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity, PRC = People's Republic of China.

Sources: UN (2002, 2003); UNDP (2005).

poverty and limited prospects. Thus, many secondary and tertiary cities develop from a consumption base with high employment in the informal sector. The urbanization rate increases once countries become more than 30% urbanized. At that rate of urbanization, countries begin to industrialize, the generally low-skilled rural poor transfer to low-level industrialized cities, and the urban informal sector thrives. Relatively poverty is more apparent in the cities than in the rural areas.

2.1.2 Size and Growth of Cities

The rate of population growth differs greatly between cities, even within the same country (Table 2.2). It is often relatively modest in the largest cities, and more rapid in cities that are smaller or of intermediate size. Even within cities, growth is not uniform. It occurs most often on the urban periphery, spilling over into neighboring areas or into spontaneous settlements.

Table 2.2 City Size and Population Growth, the PRC, India, and Indonesia, 2006–2015

City Size (no. of people)	PRC			India			Indonesia		
	No. of Cities	Avg. Annual Growth (%)		No. of Cities	Avg. Annual Growth (%)		No. of Cities	Avg. Annual Growth (%)	
		2005–2010	2010–2015		2005–2010	2010–2015		2005–2010	2010–2015
0.0–0.5 million	126	1.80	1.91	157	2.04	2.18	14	2.38	2.47
0.5–1.0 million	127	2.03	2.08	45	2.45	2.36	10	2.78	2.54
1.0–5.0 million	93	1.25	1.45	33	2.79	2.52	5	2.78	2.45
More than 5.0 million	4	0.77	1.04	7	2.30	2.12	1	3.19	2.46

PRC = People's Republic of China.

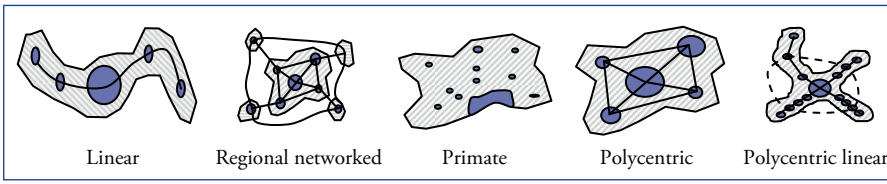
Source: UN (2002, 2003), UNDP (2005).

The table suggests that growth in the future will be fastest among medium-sized cities with populations of 0.5 million to 1.0 million people, and is likely to slow down in larger cities as they become less able to accommodate more people and as development costs increase. Urban growth will then spill over or leapfrog into peri-urban areas and small towns, where land for development is cheaper and more accessible. The result will be a starburst effect as villages and towns expand into urban areas, clustered around a parent or primate city.

2.1.3 Spatial Patterns Shaping City Clusters in Asia

Geographers and planners have studied the spatial patterns of urban development for centuries. But the extent to which form and structure determine the efficiency and economy of cities is not well understood. Scholars have conceived several types of city forms—linear, networked, concentric or primate, and polycentric (Figure 2.1)—to explain a wide range of phenomena associated with cities. These groupings, while theoretical, have been used in modeling transport services, land use, and employment distribution in larger cities, and in planning cities that are more efficient and livable.

Figure 2.1 Urban Regions: Typology



Source: Study team.

Asian urban agglomerations, as McGee (1995) describes their urban–rural mix of characteristics,

> …produce an amorphous and amoeba-like spatial form with no set boundaries or geographic extent…their radii sometimes stretching 75 to 100 km from the urban core. The entire territory—comprising the central city, the developments within the transportation corridors, the satellite towns and other projects in the peri-urban fringe—is emerging as a single, economically integrated "mega-urban region" or "extended metropolitan area."

Some authors (among them, Brochie et al. 1995; Newton 2000; Verhoef and Nijkamp 2002) contend that a polycentric urban form would shorten trips, increase the efficiency of fuel use, and reduce air pollution. Other studies cited in Carey (2006) (and in Simmonds and Coombe 2000; Friedmann and Millar 1965; and Friedmann and Douglas 1975) advocate a compact urban form of traditional suburban design. More recently, Bertolini (2005) introduced the concept of multimodal cities based on a primate city with networked regional cities.

Market functions in urban settlements, some strongly argue, influence how people behave: larger settlements offer a greater variety of higher-order goods and services, while goods of a lower order mark smaller villages and towns, which tend to cluster closely together. Though various other factors may be at work, the emergence of central hubs induces cities to cluster, especially around larger settlements (Choe and Laquian 2008). City clustering follows five basic patterns: primate cities (Bangkok); polycentric cities (Manila); linear cities (Tokyo–Kyoto); growth centers (poles; Guangdong and Hong Kong, China); and regional networked cities (the Singapore–Johor Bahru–Bintan growth triangle). Some cities like Singapore combine elements of more than one of these forms. A common feature of all the metropolitan forms is the existence of economic activity clusters that share infrastructure, logistics, planning, or other services. These clusters, especially those in production supply chains, are interdependent (for trade, knowledge, and commercial and social services). Much of the interdependence now extends beyond metropolitan boundaries to the entire country or to the region or subregions.

The examination of types of urban regions raises important policy questions about the urban forms that would be most conducive to the future development of Asian cities. Will development interventions that are geared to the needs of concentric compact cities, for example, support the economic growth of rapidly urbanizing Asian countries? Clustered cities can theoretically be developed or redeveloped, but physical geography, transport services, governance systems, and planning policies and politics will always dictate the urban development model. To have better cities and city regions the development approach must fundamentally change.

2.2 Dynamics of Urban Economies

Over the past two decades, Asian cities have become the primary drivers of economic development worldwide (ADB 2008b). The contributory factors are many: trade, finance, and information and communication systems have been globalized; national economies have been deregulated, structurally reformed, and opened up; infrastructure has improved; and cultural and visitor exchange between countries and their subregions has become more frequent. Several distinct types of urban economies of varying size and importance are emerging in Asia:

- The *large metropolitan regional cities*, *the primate cities*, which are the leading cities in a particular country or region and are very much larger than the others in the urban hierarchy (Goodall 1987). Cities like Bangkok, Mumbai, and Shanghai capture a disproportionately greater share of national investment and foreign direct investment (FDI) per capita than other large population centers.
- A range of *rapidly growing and highly specialized cities in ICT, tourism, advanced manufacturing, trade, or transport logistics*, like Bangalore, Cyber Jaya, Shenzhen, Singapore, and Hong Kong, China. Old port and trading cities like Chittagong, Hai Phong, and Malacca are also included here.
- *Emerging and rapidly growing regional towns and cities driven by growth in consumption and migration.* Many of these lack the basic infrastructure, good-quality services, and human capital resources needed for economic development, and are struggling to attract investment.
- *Regional towns and cities driven by resource-based industry development,* such as Jayapura in Indonesia.

These patterns of economic functions have brought enormous wealth and prosperity to some cities, but increasing poverty and environmental degradation to others. Without an industry sector, many cities have been unable to increase their wealth base and provide the basic services, infrastructure, and skills that would allow their economies to be more competitive and productive. Poor urban planning, governance, and environmental and financial management have also brought about pernicious forms of urban development that are making Asian cities even less productive and competitive (Marcotullio 2001).

There is a growing realization among governments and in the literature that cities must be more responsive to market demand and integrate more fully into global production systems to compete successfully for investment and new business development (Jain 2009). There is also a

realization that governments in most Asian countries have been increasingly disempowered by changes in global production, distribution, information, and communication systems and cannot influence the flows and types of investment in cities. Nevertheless, governments in Asia still try to secure domestic and foreign investment by supporting a range of economic growth models and ideas (Ito and Krueger 1995).

2.2.1 Urbanization as a Driver of Wealth Creation

Rapid urbanization has been the key driver of Asia's dynamic growth and a major contributor to poverty reduction (ADB 2008b). The region has depended for its success on large amounts of capital investment in world-class factories, on rising productivity, and on openness to foreign trade. WTO agreements, especially those with the PRC, India, Indonesia, and Thailand, have progressively drawn Asia's urban economies and workforce into the world economy, thereby accelerating urbanization.

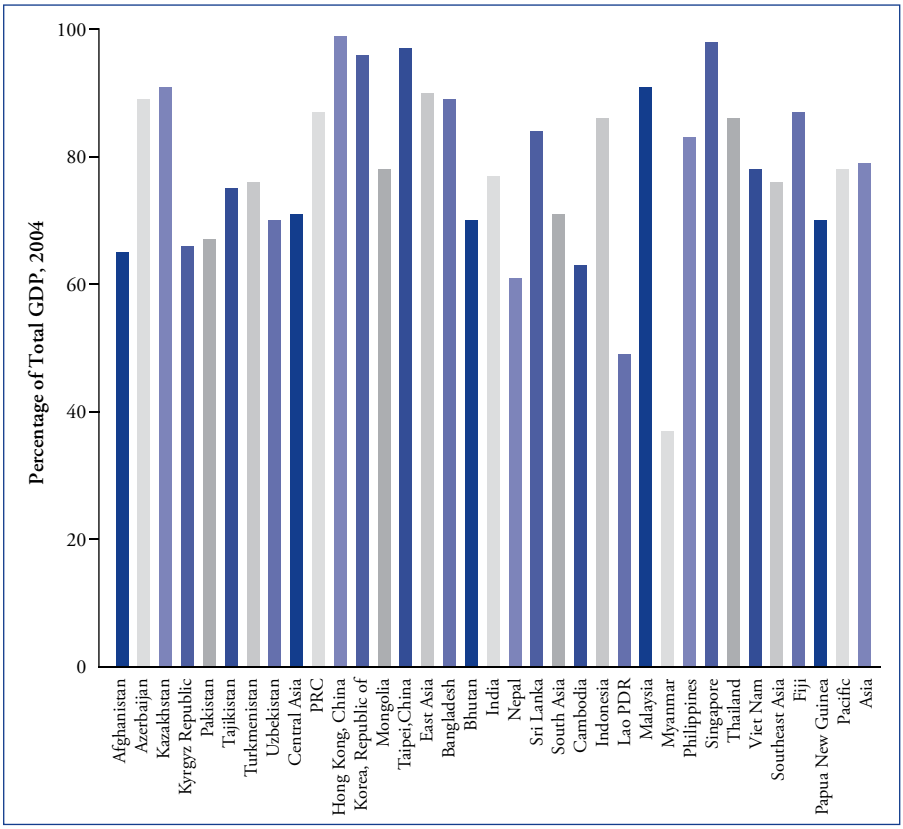
Studies on the relationship between urbanization and economic development generally show a high positive correlation between degree of urbanization and per capita incomes (Bloom, Canning, and Fink 2008; Jones and Koné 1996). Figure 1.1 in Chapter 1 clearly demonstrates this relationship for Asia: the Republic of Korea and Malaysia, whose populations are the region's most urbanized, also have the highest per capita incomes. Workers in urban areas are individually more productive and earn more than rural workers (Dutt and Noble 2004; Bloom, Canning, and Fink 2008; OECD 2006).

In all Asian countries, cities now drive economic development. They are the production houses of wealth and the centers of innovation, trade, and productivity growth. In most Asian countries, the urban economies (involving secondary manufacturing and the tertiary sector) account for 50%–90% of total GDP (Figure 2.2). Many of the larger metropolitan cities are major export manufacturing centers, with large industrial enterprise zones where goods are manufactured for multinational corporations. The per capita output of the capital cities (gross city product) generally far exceeds their countries' average per capita gross national product. For example, Bangkok's and Jakarta's GDP per capita is more than triple the average for their respective countries. GDP for capital city regions is also often more than six times higher than that for poorer rural regions.

2.2.2 Agglomeration and Increasing Economic Specialization of Urban Regions

Since the early 1980s, urban regional economies in Asia have taken on a more dominant role in national economic development. The nation state or

Figure 2.2 GDP Share of Urban Economies, Asian Countries and Regions, 2004



GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Sources: Cited in ADB (2008b, 26); computations based on figures from the 2005 database of the United Nations Centre for Human Settlements (UNCHS).

the national economy is no longer the primary driver, authors like Ohmae (1996) argue. Selected urban regions, especially those in which industries are organized in transaction-intensive networks, can have powerful push effects on the economic development of the country (Fan and Scott 2003). The trend toward greater specialization in subnational regions and integration with global production systems partly explains the shift. Global production systems are more and more being dominated by agglomeration economies and by industry activity clusters in key cities (Fujita and Thisse 2002). Globalization, economic deregulation and freer trade, better infrastructure, and increased cultural and visitor exchange are contributory factors, as mentioned earlier.

The cities or city regions in which there has been progressive concentration, specialization, and integration of production and capital

are those where investors, buyers, transnational companies, and other producers of wealth can gain competitive advantage (Korten 1995; Enright 1995). Megacities like Shanghai, Singapore, Tokyo, and Hong Kong, China dominate Asia's regional transport hubs for logistics and finance. Other cities like Bangkok rule the gem and jewelry industry, while Bangalore and Kuala Lumpur are global centers of ICT research and development. Powerful industry agglomerations, often large interdependent industries and supplier networks, are emerging (Busser and Sadoi 2003; Fan and Scott 2003).

This industrial agglomeration and specialization has attracted considerable investment, especially in the PRC. Urban economic policy is important in promoting industry investment, but access to FDI and national capital, competitive, strategic infrastructure, and an enabling business environment make some Asian countries and cities more favorable for investment and development locations than others.

2.2.3 Economic Structural Transformation from Secondary to Tertiary Sector Industries in Larger Asian Cities

While industrialization has had a major impact on the economic structure of cities in many Asian countries, many of the larger cities are deindustrializing and becoming more involved in services (Wu and Ma 2005, 271). In addition, both the manufacturing and service economies are changing much more rapidly. This means that economic and employment structures provide less guidance regarding future competitive advantage than in the past (Webster and Muller 2000). Manila, once dominated by shoe and textile manufacturing, has been transforming into a major business service center, especially ICT–outsourcing services. Other cities like Hong Kong, China have also been progressively shifting toward the service industries from manufacturing (Yip and Grange 2006).

Table 2.3 gives estimates of GDP by industry sector. In the more developed urban economies of Asia, the service sector contributes more than 65% of regional GDP. Endogenous growth is replacing export growth in many of these cities as they develop a wide range of producer services. The transition to more service-driven economies began in the late 1960s, when high labor and production costs pushed Japanese companies to produce goods and services offshore. Other Asian cities began their transition to manufacturing about this time. Although the economic structure of Asian cities has been substantially transformed, few available data provide reliable time-series estimates of sector GDP for Asian cities.

Table 2.4 shows how the economic structure of Beijing and Shanghai has changed since 1978. The GDP estimates for 1990 provide a useful

Table 2.3 Contributions to GDP by Sector, Selected Asian Cities and Years

City	Country	% Contribution to City GDP			Year
		Primary Sector	Secondary Sector	Tertiary Sector	
Beijing	PRC	2.6	35.8	61.6	2003
Ho Chi Minh City	Viet Nam	2.7	32.7	64.6	1997
Hong Kong, China	PRC	0.0	10.0	90.0	2004
Jakarta	Indonesia	1.3	22.1	76.6	1990
Osaka	Japan	1.3	25.3	73.5	2005
Seoul	Republic of Korea	3.3	40.3	56.3	2004
Singapore	Singapore	0.0	35.0	65.0	2004
Shandong	PRC	11.9	53.5	34.6	2003
Shanghai	PRC	1.5	50.1	48.4	2003

GDP = gross domestic product, PRC = People's Republic of China.

Source: Various statistical databases of the Organisation for Economic Co-operation and Development (OECD), the United Nations, and the World Bank.

baseline for monitoring the shift from manufacturing to services in these urban economies, two of the PRC's largest. Industries in the larger cities, particularly those in the south, began to be internationalized about that time. For Shanghai, the growth in services was extremely rapid between 1995 and 2000 as the city began to take greater control of financial services previously dominated by Hong Kong, China.

Table 2.4 Change in Industry Sector Contribution to GDP, Beijing and Shanghai, PRC, Selected Years

Sector	1978	1990	1995	2000	2003
Beijing					
Primary	5.2	8.7	5.8	3.6	2.6
Secondary	71.1	52.4	44.0	38.0	35.8
Tertiary	23.7	38.9	50.2	58.3	61.6
Shanghai					
Primary	4.0	4.3	2.5	1.8	1.5
Secondary	77.4	63.8	57.3	47.6	50.1
Tertiary	18.6	31.9	40.2	50.6	48.4

GDP = gross domestic product, PRC = People's Republic of China.

Source: Data drawn from the websites of Beijing Municipal Bureau of Statistics and the Shanghai Municipal Statistics Bureau.

As the economic structure of many Asian cities changes, many manufacturing industries are relocating to the peripheries of major urban conurbations or to smaller regional towns and cities. In the PRC, for example, the increase in labor and operating costs in the southeast has led companies to expand their business activities in the industrial north or to relocate in provinces away from the coast where labor costs are much lower (Wen 2004). During the transformation of Singapore's economy, many industries moved to Indonesia and Malaysia to capitalize on lower operating and labor costs. In India, the service sector is growing rapidly in the larger cities, with industrial manufacturing moving from the major metropolitan regions to state capitals and other smaller cities that offer competitive advantage, especially in labor costs (Dougherty et al. 2008). The ability of urban areas to continue to improve productivity for economic growth therefore holds the key to more job opportunities, better incomes, and improved living standards.

2.2.4 Subnational Variations in Cities' Economic Performance

The economic performance of cities within larger areas like provinces and states also varies significantly. Table 2.5 shows differences in the economic development of Guangdong province in the PRC. The GDP per capita of Shenzhen is almost four times that of Zhaoging, a city of similar size. The differences relate to the nature and competitiveness of the enabling business environment, strategic infrastructure, and economic geography. Factors such as the ability to attract FDI, industry structure, and leadership are also important. Similar variations can be observed in other Asian countries (Sachs, Bajpai, and Ramiah 2002; Shankar and Shah 2003). Generally, GDP is higher in more internationalized city regions, but economies of scale are also important.

Cities now dominate the economic geography of production and employment in Asia. As they develop, many of the more well-established and larger cities, such as Tokyo and Hong Kong, China, are becoming postindustrial cities, with a dominant tertiary sector. However, many of the resources that cities need to function properly come from their symbiotic relations with the hinterlands (Lo and Marcotullio 2001). To be competitive and functional, therefore, cities rely on sound urban regional management and support for sustainable development.

2.2.5 Spatial Concentration of Foreign Direct Investment

Along with specialization and agglomeration, FDI has been a strong driver of economic development in cities that enjoy competitive advantage. The history of economic development in Asia has seen five waves of

Table 2.5 Economic Indicators, Selected Cities in Guangdong Province, PRC, 2004

City	GDP Growth (%)	Per Capita GDP ($)	Gross Industrial Output* ($ billion)	Retail Sales ($ billion)	Exports ($ billion)
Dongguan	19.6	8,999	32.3	4.9	35.2
Foshan	16.3	5,957	41.6	6.8	2.5
Guangzhou	15.0	7,034	63.0	20.9	21.5
Huizhou	15.1	2,955	14.0	2.7	8.7
Jiangmen	12.2	2,706	16.5	3.9	5.1
Shenzhen	17.3	7,409	81.4	11.4	77.8
Zhaoqing	13.2	1,743	67.3	2.4	1.2
Zhongshan	18.7	5,501	21.2	2.2	10.0
Zhuhai	13.8	5,231	15.8	2.3	9.0

GDP = gross domestic product, PRC = People's Republic of China.

Note: Exchange rate used is $1 = CNY8.1.

* For all state-owned and other enterprises with annual sales of more than $500,000.

Source: Government of the PRC (2005).

spatially concentrated regional investment. The *first wave* began with the reconstruction of Japan in the 1950s. Japan used its substantial injection of Marshall Plan funds to rebuild its industrial and economic base, directing much of the money to the development of specialized, regional manufacturing industries, particularly in the Tokyo and Yokohama regions.

Over a period of 20 years, Japan rebuilt its economy and established itself in manufacturing for export, but by the early 1970s, labor and material production costs were escalating and Japanese manufacturers started to relocate. The *second wave* of investment in the late 1970s that followed was Japanese led and took place in offshore sites in the Republic of Korea and Singapore, and in Hong Kong, China and Taipei,China. These economies welcomed the capital infusion, employment, and technological uplift that accompanied the investment (Lo and Marcotullio 2001).

The *third wave* of FDI-led economic development occurred in the 1980s, when member countries of the Association of Southeast Asian Nations began to attract Japanese investment, and Indonesia, Malaysia, the Philippines, and Thailand industrialized. Factor endowments and comparative advantage determined the location of industrial investment. Bangkok, Bintan, Jakarta, and Manila became target growth centers for Japanese investment. This industrialization pattern became the catalyst for the so-called flying-geese or cargo-plane pattern of development (Yamazawa 1990).

The *fourth wave* of FDI and development, which started in the late 1980s and early 1990s, centered on the PRC. Four economic development zones in Fujian and Guangdong provinces in southern PRC received special privileges to encourage FDI. The policy was expanded to 14 other economic zone cities along the coast in 1984, and later to the Pudong area near Shanghai. The coastal cities where FDI was concentrated produced more than 53% of the country's GDP (Lo and Marcotullio 2001).

The *fifth wave* of investment began in the late 1990s with the opening of India to FDI, especially in IT and communications. Much of this was Indian expatriate investment. Newly industrialized economies like the Republic of Korea, Malaysia, Singapore, and Taipei,China also began to invest in Bangladesh, the PRC, Pakistan, and Viet Nam, taking advantage of favorable labor costs and lenient environmental standards for industries. A new wave of investment is taking shape as Chinese businesses experiencing higher production costs seek to invest in locations that offer comparative advantage or the prospect of growth.

The first five waves of investment concentrated industrial development in national capital regions (Laquian 2005), major cities with good transportation and communications systems, and resource-rich regions that supplied raw materials mainly to North Asian countries. A massive imbalance in FDI and subnational investment since then (Brooks, Fan, and Sumulong 2003) has severely distorted spatial patterns of investment and development, especially in the PRC (Zhang and Kristensen 1998). Growth in the export industry has enriched some parts of the country, but left other parts behind.

2.2.6 Political Ideology and Economic Development Planning

Both socialist and market-oriented governments in Asia, regardless of whether they have a federalist system like Malaysia's or a unitary system like that of the Philippines, tend to follow strong centralist models of regional planning and economic development. Centralist planning emphasizes national and regional self-sufficiency; its aim is equitable regional development. Centralist planning extensively uses 5-year periodic plans to set production targets and define major projects for national and regional development. In many cases, central agencies continue to manage large projects for urban regions that, despite devolution, cannot manage the projects themselves.

The economic development models put forward in the 1960s mostly had to do with achieving *comparative* advantage. Countries developed industrial growth poles and manufacturing zones, and offered cheap land, low-cost

infrastructure and labor, and well-developed transport facilities, among other incentives, to multinational companies. By the 1980s, the focus of economic development had moved to *competitive* advantage (Porter 1985), where the emphasis was on the efficiency and effectiveness of the factor costs of production and distribution. Then, in the early 1980s, most of the world's advanced capitalist economies experienced a major economic downturn. Asian governments began to realize that, to develop their economies, they had to encourage competition, regional exports, and investment, especially FDI. The economic structure of many countries underwent fundamental change hastened by accelerating globalization. Manufacturing industries that could not compete well in developed countries turned to developing countries, where production costs were much lower.

After World War II and until well into the last decades of the 20th century, most Asian economies stuck to the central planning model with relatively laissez-faire private sectors. But by the mid-1990s, reform, albeit slow, had begun in most centrally planned economies, like the PRC and Viet Nam. The lack of competitive infrastructure and innovation, bureaucratic inefficiency and the fiscal burden imposed by state-owned enterprises, and the inability to capitalize on private and state assets forced many Asian countries into economic reform programs that would have far-reaching impact on their economy and society. These challenges, along with the push for deregulation and reforms in national competition policy in the advanced capitalist economies, caused nations to adopt more liberal, but still controlled, approaches to provincial (or subnational) development.

2.3 Push–Pull Factors Influencing the Agglomerated Economies of Asian Cities

Rural–urban migration exerts considerable influence on Asian cities (UNFPA 2008), as extensive research into its causes (UNFPA 2008; Khun 2004) has shown. The cities have become magnets for people from the rural areas and other countries by virtue of their economic advantages. Push–pull factors, or drivers between rural and urban areas, greatly affect spatial form, land use, and economic development patterns in Asian cities. While these factors are associated with migration to cities (Jaffee 1998), they are also related to demand- and supply-side factors that affect the economic development of cities and city regions (Blair and Reese 1999). This subsection discusses some of the more consequential push–pull factors affecting the spatial and economic agglomeration of cities.

Push factors propel people to leave the rural areas (Jaffee 1998). Contributing to the push for rural–urban migration are the limited opportunities

for suitable gainful employment in the countryside, the fragmentation of farmland and ownership, overcrowding, poverty, civil war and unrest, soil erosion, poor-quality housing, and the lack of basic services and community facilities, especially in countries like Pakistan, the Philippines, and Sri Lanka.

Pull factors, on the other hand, encourage people to settle in urban areas (Jaffee 1998). Features of the urban environment relative to rural areas, such as income opportunities, higher wages, industrial jobs, a better standard of living, and kinship ties, are pull factors. These are also related to demand-driven factors, as well as to government policies and initiatives that are meant to generate demand and attract investment.

Many governments have implemented a range of rural development policies to slow the movement of people to the cities. Others have adopted strong anti-urbanization policies; for example, would-be migrants to cities in the PRC, India (Mishra 2007), and Viet Nam must have migration permits. Despite some successes, however, the policies for the most part fail because central governments do not address fundamental issues associated with agrarian reform, land administration and management, community and infrastructure services, and access to markets and good education facilities. Until governments deal with those issues, people will continue to migrate to the cities to find work and live better lives.

One outcome of the push factor is high informal employment in Asian cities, often in excess of 50% in many cities, although the rate tends to be much lower in primate cities (Dutt, Costa, and Aggarwal 1994). Many rural migrants end up selling small consumer items on the streets or doing dangerous or dirty work that puts their own safety at risk. The development of secondary and tertiary cities has become trading and consumer driven because these cities have had to absorb more rural migrants than the primate cities. At the same time, businesses tend to invest less capital and engage in less development in these cities than in the primate cities, thereby adding to informal sector employment.

2.3.1 Push Factors

Push factors arise when people are pushed or forced by external circumstances to migrate to cities from rural areas or other countries. Those circumstances could be natural disasters, such as famine or floods, which neither individuals nor governments can control. On the economic side, government policies and initiatives that are disadvantageous to rural economies or exclude them could leave the rural population unable to continue farming, find other work, and improve their standard of living. Some

key push factors that contribute in particular to the spatial and economic agglomeration of Asian cities are summarized below.

Land shortages. Land shortages are a major push factor forcing peasant farmers and small landholders off rural and peri-urban lands. Population growth has put pressure on dwindling land resources, leading to widespread deforestation, land degradation, and landlessness (Burns 2007, 19). Governments across Asia have attempted various land reforms, with limited success. Fragmentation of land is reducing production and marginalizing land. Research done in the Philippines shows that in 1985–2004 the size of the average farm fell from 1.8 to 1.1 hectares (Otsuka and Sonobe 2009). In Bangladesh, some 75% of the rural population is made up of landless laborers and marginal farmers with less than 0.2 hectare of land (FAO 2008). More than 4.48 million people, or 16.62% of the population, are landless (Hossain 2009), and this figure is rising. Under such circumstances, family members have little choice but to migrate in search of employment to support their families.

Disparity between urban and rural incomes. While rural incomes have risen across Asia in recent years, thereby reducing absolute poverty, the disparity between urban and rural incomes is widening (UNESCAP 2001, 15). Cities thus become attractive locations, especially for the younger generation looking for employment that will bring higher incomes. Addressing the income disparities is extremely difficult. Labor unions in larger cities secure better wages and conditions for workers in factories. In the rural sector, however, farmers and farm workers are not in a position to unite for higher wages or better prices for the goods they produce. Hence, the rural sector is much more vulnerable to labor market forces, which hold down real incomes.

Natural disasters and climate change. Increased flooding is not the only outcome of climate change that forces migration. Climate change may heighten or increase the frequency of heat waves, tropical cyclones, droughts, intense rainfall, tornadoes, avalanches, thunderstorms, and dust storms, all of which will also force migration, mostly to cities (UNCCD 2009). The effects of climate change as a push factor may well be more profound than those of poverty. With few chances to relocate to other rural areas, most of the rural people displaced by climate change will have to be absorbed by the cities. Asian cities may have to take in many more people each year than they now do. Cities in the region's developing countries are unlikely to have the capacity to accommodate any further increase in population, let alone generate sufficient employment opportunities for eco-migrants with limited skills, who can contribute little to value-added production or increased productivity. What is likely to occur is the expansion of the informal sector in cities, with a corresponding increase in demand for services and

infrastructure, and decrease in livability. Learning to live with and adapt to climate change will have a major impact on the future economic performance and competitiveness of cities in the region.

2.3.2 Pull Factors

Access to better income, more jobs, a higher quality of life, and markets is the most compelling pull factor that draws people to the cities. Urban markets take many forms: financial, land and property, labor, and buyers and sellers of commodities, services, or goods. Efficient and effective markets are essential to the development of competitive cities and national economies. Markets in Asian cities cover a wide range of development and performance. The following discussion describes some of the key market types that are shaping demand-side development and acting as major pull factors on local economic development and investment.

Financial markets and fiscal decentralization. Countries and cities vary greatly in the capability of their banks and financial institutions, especially if state owned, to lend capital and manage their own affairs. Some of these institutions have improved competition, giving city governments and local developers easier access to local and international capital markets, and drawing in capital for development projects that have given the cities a sharper competitive edge. Financial deregulation and fiscal decentralization are also important for the creation of subnational, city, and community banks and capital markets. Observers suggest that fiscal decentralization failures explain the difference in the performance and development of cities and regions in the PRC compared with those in India (Martinez-Vazquez and Rider 2006). Elsewhere, slow reform and decentralization of the banking sector, especially of state banking systems, has led to the concentration of banks, a pull factor in major cities (Claessens and Glaessner 1997); for example, some 38% of banks in the Philippines are in Metro Manila. Smaller provincial cities thus cannot create and retain capital for local development projects. Many towns and cities are incapable of creating the capital they need to develop local capital markets and encourage demand-driven local and external investment. But cities like Bangalore and Hyderabad have succeeded in strengthening their local capital base and becoming important venture capital markets that are a major pull factor for the ICT sector (Grondeau 2007).

Land and property markets. Land markets are among the most important pull factors in the development of urban economies. Governments, corporations, and individuals can develop, sell, or lease land for profit. Land-use zoning provides a basis for balancing the supply of land and the demand for it. Without zoning or some other system that regulates the land

and property markets, land is of uncertain use and value. Because urban land is a limited resource, there are long-term opportunities for capital gains in the land markets. In seeking to develop land markets, governments often control the supply of land, induce demand, and stimulate economic development in the housing construction sector. As land becomes more valuable, especially in inner-city areas, its value rises, as does the interest of potential investors in property development for higher-intensity uses.

Labor markets and human resources. Modern economies depend on well-developed labor markets and human resources. Many countries and cities in Asia do well even with limited natural resources, but they cannot do without suitable human capital. Human capital development is not just an education issue; it is also related to health, demography, gender, and social tolerance and other social issues. Access to skilled labor and knowledge workers is vital to the development of the service sector of urban economies. Cities that produce greater numbers of qualified and skilled people, like Bangalore and Shanghai, attract more investment. Unfortunately, skills are deficient in most cities in Asia's developing economies other than the capital cities (ADB 2008a). This deficiency is a major constraint on the economic development of regional cities and towns in South and Southeast Asia.

Consumer markets. Cities in Asia, as elsewhere, are major markets for consumer goods and services. Most Asian cities have service economies, that is, they mostly provide low-value-added trading, domestic, transport, and construction services. The growth of manufacturing has helped to diversify the economies, and has had a resultant pull effect on the urban population and a multiplier effect on demand for service sector employment. Local consumption has increased and the approach to urban economic development has changed. Regional shopping centers and malls are replacing older, small-scale commercial trading centers; new residential estate developments are rising in peri-urban areas; and large leisure facilities are being built in response to rising personal incomes. Many of these new developments are taking place at the periphery of primate cities or in new spillover cities, where local governments have attracted private developers into speculative development projects to improve their own revenue streams. The consumption-driven development models aggressively pushed by governments have spawned urban clusters. Cities like Shanghai, Singapore, and Hong Kong, China are now placing greater emphasis on sustainable growth by adding value through supply chains and expanding opportunities for import substitution (Rock et al. 2008).

Supplier markets. Suppliers provide goods and services to industries and consumers. They often agglomerate in markets to deal more effectively with competition or to share access to common infrastructure and services and thus reduce costs. Markets provide a central place where prices, goods,

and services can be compared or new goods and services launched. Cities are home to most suppliers of manufactured products and services. Organized into supply chains, they are vertically or horizontally linked to industries like automobile and aircraft manufacturing, shipbuilding, and electronics. Suppliers in most cities comprise hundreds of small and medium-sized enterprises (SMEs). In Asian cities, they also include a large number of informal traders, who provide products mainly for consumption. Suppliers have a sizable pull effect by virtue of their types, numbers, and specializations.

2.4 Spatial Planning Approaches to Fostering the Economic Development of Urban Regions: Issues

Governments throughout Asia retain a strong focus on physical development plans, infrastructure, and public programs of assistance. The following describes some common spatial approaches of governments and economic development issues.

2.4.1 Master Planning and Economic Planning

Governments have tried to use a wide range of national, regional, and local master or strategic plans to push urban and economic development. Many of these physical plans, for example, those in Bangladesh and Viet Nam, are linked to master plans. Governments have historically favored supply-side approaches to economic development; demand-side economic development is poorly understood and generally not incorporated into plans. Cities need to respond more to drivers of demand and not just to drivers of supply to gain competitive advantage. The failure of master planning in Asian cities is mainly due to the following reasons:

- Most plans are unrealistic or overly optimistic. They assume that the resources needed to implement the plans will be available.
- Planning is not backed by solid economic and financial analyses.
- Most master plans lack mechanisms for implementing projects for financing or through public–private partnership.
- Urban master planning has worked in countries like Singapore because the government understands the relationship between planning and the economics of development.

Singapore and Hong Kong, China use their well-developed planning systems effectively and enforce building and land-use regulations to create competitive advantage for business investment. Japan, the Republic of Korea, and Malaysia also have robust planning systems and city development plans that ensure efficient and effective property markets, reduce the risks associated with property rights, clearly define zoning requirements and uses, and reduce the risks from environmental hazards. The strength of the centralized planning systems in these countries is a major factor behind the success of their urban economies. More recently, stricter planning and development controls in the PRC have made property markets much more stable and created a favorable climate for demand-side development in cities throughout the country. But, weak planning in many other Asian countries has destabilized the property markets and made them less transparent, exposing investors and developers to higher risk.

2.4.2 Provision of Infrastructure

Keynesian economics provided a demand-side approach to economic development that most governments in Asia could use. The competitiveness of companies involved in production and the logistics systems in modern, high-performance urban economies both demand well-developed infrastructure. Regional economic development has succeeded in the PRC, Malaysia, Singapore, and some North Asian countries largely because major infrastructure projects support the growth of new towns, industrial areas, major transport hubs, and ICT services. Keeping up with the demand for infrastructure to support economic development is a significant problem for Asian countries. According to an ADB report (Nataraj 2007), Southeast Asian countries will need to spend $412 billion per year between 2007 and 2012, or about 6% of regional GDP, on roads, railways, airports, ports, and electricity. Most of the projects will be in cities or close to them. For India the infrastructure investment needed during the 5-year period is estimated to be $410 billion.

Investment in infrastructure spans a wide range across the region. More developed Asian countries invest mostly in health, education, and telecommunications infrastructure, while countries that are less developed give priority to investment in roads, water supply, and basic sanitation. Countries in the second group tend to invest heavily in special economic zones (SEZs), industrial estates, and business parks to encourage multinational corporations to invest in local economic development. Cities with well-developed transport and logistics systems and high-level business services have been successful, while others, especially regional cities, have been less so. In most cases, their distance from transportation hubs and markets and their limited pool of skilled labor undermined any competitive advantage regional cities might have in

other areas. Subsequently, many provincial governments and municipalities in the region have been saddled with high levels of debt service for "white elephant" infrastructure and industrial park complexes that are little used.

Private sector investment in urban infrastructure and service provision is intended to help fill the investment gap and reduce the financial pressures on city governments while improving the financial, and on occasion technical, performance of projects. The private sector accounts for about 20% of total annual infrastructure investment in developing countries, primarily in the telecommunications and energy sectors (World Bank 2005). In the region, private sector investment in infrastructure has not been particularly strong outside the capitals or large cities. Most public–private partnership projects tend to involve transport, energy, and utility services in large cities. Such arrangements are proving increasingly popular, as they can make investment funds more accessible and distance governments from fiscal discipline issues, and sometimes the political problems inherent in cost recovery and operation and maintenance. Nevertheless, their success still depends on the technical and financial expertise of governments to negotiate and monitor appropriate contractual arrangements. Most local governments in Asia, however, tend to be weak and to lack the expertise necessary to negotiate complex public–private partnership projects.

2.4.3 New Satellite Towns

Most primate cities in Asia and some larger metropolitan cities have adopted policies to develop new satellite towns as part of a polycentric strategy to decentralize employment and create more specialized economic activities. Most of the metropolitan plans for Asian cities provide for satellite towns, many of which develop around major industrial or commercial areas. Pudong, on the east side of the Huangpu River in Shanghai, is a major administrative and commercial center. Malaysia has developed Cyber Jaya, a new town south of Kuala Lumpur, chiefly for ICT industries. Clark in the Philippines has become a major electronics and logistics center for assembly manufacturing and logistics, taking advantage of the high-quality air and the nearby port facilities at Subic Bay. Bekasi, southeast of Jakarta, is a new town where heavy manufacturing industries are being developed.

Asian cities will expand mostly into new towns. But some of these have developed around a single, large, integrated industry, such as automobile or steel manufacturing. The economic base of such economies does not promote more diverse employment or provide many opportunities to add value along supply chains. As a result, these new towns are vulnerable to economic cycles like the 1997 Asian financial crisis. Cities that are engaged primarily in export growth industries are particularly vulnerable.

2.4.4 Economic Enterprise Zones, Industrial Estates, and Business Parks

Economic policies promoting exports are important to the development of urban economies. National governments have extensively used economic enterprise zones to encourage FDI through tax incentives, infrastructure subsidies, and reduced land costs. The development of these zones has been an important factor in the push to attract investors to Asia, especially in the PRC, India, the Philippines, Thailand, and Viet Nam. The advantage of these zones is that they usually provide adequate services and infrastructure to support a wide range of manufacturing-related enterprises.

However, some economic enterprise zones, especially those built in remote locations, have had development and financial viability problems. Many were not well planned, were built hurriedly, and lacked important infrastructure and business support services. Some developers ignored construction standards or environmental and safety regulations. Traffic congestion and pollution and a lack of affordable housing added to the numerous development problems of the zones, which have been extensively documented (Ramos 1993; Dennis 1987). The lack of support services for these zones affects their economic viability and attractiveness to investors, and is one reason some have been financially disastrous. Chen (1994) also points to noticeable differences in the performance of economic enterprise zones in socialist and more open economies.

Companies in economic enterprise zones in Asian cities tend not to innovate, often because they are part of larger multinational companies that do their R&D elsewhere. Neither do many companies seek to join clusters that could add value to their supply and distribution chains. Instead, many simply operate as factories for accessories and component manufacturing, seeking to achieve efficiencies and competitiveness within their internal supply chains. They fail to see the benefits of sharing common services with competitors to bring down local transaction costs.

Nevertheless, some cities have recognized the problem and have begun to work with businesses to put in place smart economic policies that will help reduce local transaction costs, encourage innovation, and develop exports. These measures involve streamlining business approvals and regulations, as is being done in Taguig, Metro Manila (Philippines–Taguig City 2007); providing R&D tax incentives for innovation (Das and Pant 2006); and identifying long-term priorities for sector industry development (Enright, Scott, and Dodwell 1997). Hong Kong, China's strategy defines nine core business sectors that the city will continue to support and develop over the next 50 years (Enright, Scott, and Dodwell 1997).

2.4.5 Growth Poles

Growth poles (Perroux 1955) are regional industrial cities established to stimulate the development of lagging regions and prevent further industrial decline. Growth pole theory is geared strongly toward spatially focused incentives and is very much influenced by thinking and practice related to industrial development in the 1960s. It is an extension of economic base theory, which many countries used in developing their steel, chemical, and textile industries (Hanson 1996). Cambodia is promoting the development of a growth pole at Kratie in the northeast to stimulate decentralized regional economic development (Khemero 2006), as is Lao PDR at Savannakhet in the south (Mabbitt 2006) and Chu Lai in Quang Nam Province, Viet Nam. To promote regional growth poles (Flynn 1995) countries commonly

- develop industrial estates and economic enterprise zones;
- recruit companies from other regions and countries;
- support new start-up, technology-based companies;
- revitalize businesses;
- support import substitution;
- support new businesses; and
- develop self-reliance.

Many countries combine growth pole theory with industry attraction theory. Indonesia's national development policy for 2005 emphasizes growth poles. Most growth poles are based on a supply-side premise that involves building infrastructure to attract investment using a range of incentives. Substantial public investment and support is often required to hedge against the initial risks associated with the development of the growth poles. Many growth poles suffer in their early development from a failure to respond to market needs. For example, Batam Island in Indonesia near Singapore, lacks critical strategic infrastructure (knowledge, R&D facilities) needed for the growth of industry clusters.

2.4.6 Technopoles

The concept of technopoles is Japanese (Castells and Hall 1994), and it has been applied in many countries. Science parks in the United Kingdom, the Brain Park in Rotterdam, and Research Triangle Institutes in the United States are examples. Drawing on growth pole concepts and endogenous growth theory, countries started technopoles to develop concentrations of high-tech activities (usually ICT, engineering, and biotechnology) in selected centers

that would catalyze the growth of high-tech industries and foster frontier and manufacturing-oriented R&D. Technopoles have strong associations with research institutions and universities. In the early 1980s, technopoles in turn brought about science and technology parks and incubator systems associated with universities in many member countries of the Organisation for Economic Co-operation and Development (OECD).

Technopoles have been developed in North and East Asian economies, such as the PRC, Japan, Republic of Korea, and Taipei,China (Biswas 2004; Shuguang Wang 1998; Castells and Hall 1994a, 1994b), and more recently in India (Biswas 2004). Malaysia has attempted to develop a multimedia super-corridor economy based on the technopole concept south of Kuala Lumpur (Ramasamy, Chakrabartya, and Cheahb 2004). The Multifunction Polis, a technology community development project in Adelaide, was a failed attempt to develop a technopole in Australia. Indeed, many technopoles have had limited success because the aim was to import new technologies rather than to develop local technologies that could build on existing core competencies and skills in a region. As with growth poles, much of the thinking about technopoles focused on manufacturing and processing industries because countries believed that manufacturing would generate higher value-added and employment multipliers. Comparatively little effort has been devoted to developing service industry technopoles, which can generate higher value-added and employment multipliers.

2.5 Old Models of Urban Growth Must Change

The conventional models of physical development that have helped Asian cities and regions to grow worked very well for half a century of reconstruction after World War II. But now the relevance of these old models is in dispute, as some cities in Asia move into a post-industrialization era, where services are replacing manufacturing as the primary driver of economic growth. This move is taking place in cities like Kuala Lumpur, Manila, Shanghai, and Hong Kong, China.

Urban economies in Asia are facing many new challenges. The role and dominance of governments in economic development is changing. Democratization has overturned the authoritarian model of national and local government, especially in countries like India, Indonesia, the Philippines, and Thailand. Production costs are escalating. Governments and businesses alike must cope with choking pollution and traffic, and comply with international quality standards and conventions. Poor conditions at work are draining competitiveness. A better-educated labor force is demanding higher wages and improved conditions. Meanwhile, outmoded systems of

property tax valuation and revenue collection, and rampant tax evasion, are starving local governments of revenue they need to build infrastructure and provide community services for the growing numbers moving to and living in the cities. All these issues—plus climate change, and shortages of water and land for food production near cities—will affect the development of urban economies in Asia and other parts of the world.

These challenges, some of which are discussed in detail in the next chapter, will force national, metropolitan, and city governments in Asia to adopt new models of economic growth and development that are both more economically responsible and sustainable. If they do not, the cost of doing business will continue to rise and the competitive advantage that some cities now enjoy will be lost.

Chapter 3
Emerging Factors Accelerating Urban Economic Growth

Governments tend to favor supply-side economic development, but demand-side approaches, while still in their infancy, are gaining interest. This chapter reviews some emerging ideas and approaches that governments use when developing local economies.

3.1 Demand-Driven Economic Development: Strategies and Approaches

Asian countries have adopted various policies, concepts, and models of development for their national, subnational, and urban economies. Most have adopted a supply-side approach—build the infrastructure and industry estates, keep production and labor costs low, and investment will come. Some have recognized the need for change and have moved toward the adoption of demand-driven strategies and approaches with considerable success.

3.1.1 Endogenous Growth Approach

Endogenous growth (or new growth) economic theory was developed in the 1980s as a response to criticism of the neoclassical growth model. Unlike the neoclassical growth model, which considers technological progress exogenous to economic progress, endogenous growth theory says that growth is governed by factors within, and not outside, the national economy.

The Government of Australia (1994, 11), for instance, traces the cause of growth to

> …deliberate, rational, optimizing decisions by investors, producers and consumers in [urban or subnational] regions. Subsequently, growth is endogenous to the model and investment behaviors in cities, and is influenced by three types of capital: physical, human, and intellectual capital related to research and innovation.

In Asian cities like Bangalore, Mumbai, Kuala Lumpur, Seoul, Toyko, Shanghai, and Hong Kong, China, endogenous growth theory has stirred interest in (i) increasing value capture in supply chains for local manufacturing and service sector businesses, and (ii) expanding domestic consumption. Since many of these cities are significantly transforming their economic structure and becoming more service oriented, their knowledge base can be tapped to innovate and create new services that will stimulate greater local demand. These new services might be in science and technology, recreation, health, education, training, information, and knowledge.

Higher domestic demand will stimulate economic growth and allow many manufacturing cities in Asia to depend less on export-based manufacturing to sustain the local economy. It can also help ease the environmental consequences of overreliance on manufacturing by encouraging innovations in resource efficiency and clean production. Asian cities under increasing pressure to reduce greenhouse gas emissions and waste can make their economies more sustainable through the endogenous growth approach, as cities like Rizhao in the PRC have done (Bai 2007). The approach also offers great opportunities to create new jobs and SME activities to absorb the growing numbers employed in the informal sector.

3.1.2 Industry Attraction Approach

Asian governments, including the governments of transforming Asian economies, have developed their urban and rural economies through industry attraction. They offer incentives and subsidies to major corporations and investors that choose to locate in a particular city or region and thereby attract other companies (Kotval and Mullin 2006, 82). The approach assumes that employment, taxes, and benefits will increase enough through a local multiplier effect, to offset the public outlays and subsidies. Historically, this approach has generated significant benefits (Stimson, Stough, and Roberts 2006) and has been used extensively as an economic tool in Malaysia and Thailand. However, footloose industries drawn to regions often depend on incentives and tax relief to be competitive. When the incentives no longer give them location advantage, the industries tend to move to some other city or country with more favorable incentives. Thus, this policy could lead to regional disinvestment.

3.1.3 Science and Technology, and Innovation Policy: Increasing Knowledge Capital and Innovation

Romer (1990) was one of the first to try to link increased investment in knowledge to higher productivity and output. He suggested that the decision to create knowledge is a rational one: the creators of knowledge

stand to benefit commercially from its proprietary components. Increasing returns to the general economy, in the form of knowledge spillovers, are also evident. Singapore and Japan have dominated science and technology development in Asia for more than 3 decades, and hold supremacy in attracting international investment in R&D capacity. Other economies, particularly the Republic of Korea, Malaysia, Taipei,China, and Viet Nam, recognize the value of investing in science and technology and increasing its share of GDP. But many other countries in Asia, like Bangladesh, Indonesia, the Philippines, Sri Lanka, and Thailand, have limited resources for R&D and innovation. These countries and their cities tend to be less attractive to investors and lose large numbers of highly qualified people to other markets where there is a demand for their skills.

The United Nations Educational, Scientific and Cultural Organization estimates that Asia's share of the world's gross expenditure on R&D increased from 27.9% in 1997 to 31.5% in 2002 (UNESCO 2005, 14). A further indicator of Asia's growing scientific importance is the growth in its share of world scientific publications, from 16.2% in 1995 to 22.5% in 2005. The share of the PRC nearly tripled during this period, from 1.4% to 4.1%. That country has now overtaken India in the number of publications registered in the Science Citation Index of the Institute for Scientific Information.

The following subsections provide a snapshot of the strong science performers in Asia, with data from UNESCO (2005).

The People's Republic of China. The PRC's endeavors in science and technology have long been noteworthy, but further stimulus has come from its formidable economic performance in the last 10 years. The country now spends 1.5% of GDP on R&D (India crossed the 1% threshold in 2004 and expects to reach 2% soon). In 2002, the PRC had 811,000 researchers; Japan had 647,000. Its sights set on breakthroughs in ICT, biotechnology, new materials technology, advanced manufacturing technology, aerospace, and aeronautics, the PRC has granted a large number of patents in recent years, fortifying technology innovation and development. High-tech exports are growing strongly, particularly in computers and telecommunications, optical electronics, life sciences and biotechnology, aeronautics and aerospace engineering, nuclear technology, weaponry, computer-integrated manufacturing, and materials design. The PRC now also imports more scientific instruments, electronics and telecommunications products, and electrical machinery than Japan does.

India. The science and technology infrastructure in India grew very slowly until the economic reforms of the 1990s. Since then, the government has given high priority to R&D in electronics, aerospace and defense, environmental management, agriculture, and the nuclear, biomolecular, and

medical sciences. Compared with most other Asian countries, India devotes considerable attention to its research laboratories, higher education, and human resources, leveraging its science and technology infrastructure with its plentiful workforce to establish one of the most extensive bilateral ICT collaboration programs in the world. In a series of resolutions and policy announcements, the government has shown that it is committed to making science and technology an integral part of socioeconomic development. In mid-2008, it announced unprecedented funding for science education and research. It has also made supporting improvements in intellectual property rights and negotiated numerous free trade agreements and technology cooperation programs.

Singapore. In 2008, Singapore allocated S$5.4 billion ($3.0 billion) to its Agency for Science, Technology and Research, whose aim is to groom the brightest Singaporeans for careers in research, attract global talent to the country, and create a vibrant research community. The government also allocated S$2.1 billion ($1.5 billion) to its Economic Development Board. In addition, the Biomedical Research Council is continuing to deepen its capabilities in basic research for the growing biomedical sciences industry. Committed to spending 3% of GDP on R&D by 2010, the government is using clustering concepts and judicious investment incentives to improve the environment for R&D and multinational investment. Singapore is already one of the world's most dynamic smaller countries, home to some 7,000 multinational enterprises and 22,000 researchers from more than 50 countries. It is steering the commercialization of its research efforts by deliberately fashioning itself into a regional and global hub. The country sees its membership in the WTO and its compliance with the Agreement on Trade-Related Intellectual Property Rights as a competitive advantage over other Asian countries like the PRC. Recent scientific advances achieved by the country with the government's support include the development of a miniaturized avian flu test kit by the Agency for Science, Technology and Research in 2007.

3.1.4 Growth Triangles: Creating a Focal Hub for the Economic Growth of Urban Regions

Hubs for the business, social, and government activities of urban regions within a country have been developed in provincial capitals equipped with strategic infrastructure for that purpose. The cities mentor personnel in surrounding municipalities and local governments to build up regional governance, business, and infrastructure. Metropolitan Naga in the Philippines provides a good example of such a focal hub approach to the development of urban regions (Kumssa and McGee 2001).

The Research Triangle Park, a pioneering science and technology park in the state of North Carolina in the United States, is another example of the focal growth hub. It took advantage of intellectual capital in three universities within 80 kilometers of one another (Duke University, North Carolina State University, and University of North Carolina at Chapel Hill) located in a triangle. High-tech industries started to agglomerate within the triangle in the early 1980s, greatly contributing to the economic development of the urban region composed of Raleigh, Durham, and Chapel Hill in North Carolina State (Thant et al. 1994).

Subregional zones of economic cooperation that transcend national borders form growth triangles. They were conceived and developed to maximize the efficiency of factors of production beyond what a single country could accomplish (Thant, Tang, and Kakazu 1994). The most well-documented growth triangle in Asia is the Singapore–Johor Bahru (Malaysia)–Riau Islands (Indonesia) (SIJORI) Growth Triangle. Singapore supplies capital, technology, and entrepreneurship, while Johor Bahru and the Riau Islands provide relatively low-cost land and labor (Forbes and Lindfield 1997). The Southern PRC growth triangle is made up of Guangzhou, Shenzhen, and Hong Kong, China. Besides economic complementarities, these two growth triangles have an abundance of universities and cultural and linguistic affinities that can further facilitate cooperative growth. A variation on the concept, the so-called Golden Quadrangle, links Yunnan Province in the PRC, the Lao People's Democratic Republic (Lao PDR), Myanmar, and Thailand. The particular benefit of this type of economic cooperation for countries in the Asian region is the impetus it provides to free trade and open regionalism.

3.2 Factors behind Demand-Driven Economic Development

As their economies transform and progress toward more market-based growth, Asian countries are obliged to take new approaches to developing their cities. Although strong anti-urbanization sentiments remain in some countries, there is a general realization that globalization has rendered urban growth unavoidable, and that urban areas now drive national economic development.

Cities in Asia, like their counterparts elsewhere in the world, must respond quickly to changes that will affect their economic development if they do not wish to lose out on investment opportunities and underperform. Not every city will be a high achiever or will engage in global business. But all cities, regardless of size or importance, must be aware of emerging trends in urbanization and respond by improving their economies.

3.2.1 Knowledge-Based Economies

Investigators have studied the role of knowledge in the development of local and urban economies for many years. Hirschman (1958) distinguishes between directly productive activities and what he refers to as "social overhead capital" (Goldstein 2005)—basic services that cannot function without primary, secondary, and tertiary productive activities. The terms "knowledge infrastructure" and "knowledge-based capital" are relatively recent, and mostly derive from Hirschman's work (Florida 2005; Landry 2000; Hall 1990; Castells 1989).

Anderson (1995) argues that cities and subnational regions must develop a learning infrastructure that enables mass participation by employees in regional knowledge development. This learning infrastructure, say Tapscott and Williams (2006), must place progressively greater emphasis on mass collaboration. Knowledge development and management will gain in importance as cities come to depend more on services to drive their economies.

According to Florida (2005), certain cities attract members of the "creative class" of people who work in information-age economic sectors and in industries where innovation and talent rule. The publisher's synopsis to Florida's book *Cities and the Creative Class* (2005) contends that

> …cities that succeed are those that are able to attract and retain creative class members. They don't do this through the traditional strategies of tax incentives, suburban housing developments, and loose regulation, but by concentration on the development and dissemination of knowledge.

Knowledge comes in two primary forms: *tacit and explicit*.

- *The concept of tacit knowledge* was first made prominent by Nonaka and Takeuchi (1995), who brought it into the realm of corporate innovation. People gain *tacit knowledge* from experience or informal conversations, and carry it in their minds. Access to this knowledge is therefore difficult. Personal contact and trust are generally required for its transfer.
- *Explicit knowledge* has been or can be articulated, codified, and stored in certain media (Strassoldo 1980) and readily transmitted to others through social interaction. It is thus is a key element in the creation of social capital (Coleman 1988; Putman 2001). Explicit knowledge is most commonly found in manuals, documents, and procedures, but it can also be audiovisual or passed on through works of art and product design. In the words of Radcliffe-Martin, Coakes, and Sugden (2000, 15),

> …explicit knowledge is increasingly being emphasized in both practice and literature, as a management tool to be exploited for the

> manipulation of organizational knowledge. Groupware, intranets, list servers, knowledge repositories, database management and knowledge action networks allow the sharing of organizational knowledge.

Cities and urban regions that have high explicit and tacit knowledge tend to lead in ICT and innovation. Their industries tend to be built around culture and the arts, and to exercise a high degree of creativity and imagination in developing new products, gaining competitive advantage in the process. Cities and regions that have low levels of tacit knowledge, on the other hand, are often politically conservative, and their industries tend to be followers or users of technology and services, rather than leaders and creators.

Knowledge-based economies rely on knowledge networks and learning communities. Knowledge management comprises a variety of ways—multimedia systems and publications, networks, education, and training—through which organizations, associations, and professions identify, create, represent, and distribute knowledge to encourage learning and innovation. Knowledge management programs are typically tied to learning objectives and outcomes, such as shared intelligence, improved performance, or competitive advantage.

3.2.2 Catalysts for Collaboration

Few local governments and business organizations have the resources or expertise to fully develop and implement larger development projects and programs. Most depend increasingly on networks, partnerships, strategic alliances, and catalysts (Doeringer and Terkla 1995; Liyanage 1995; Yves and Hamel 1998). Collaboration has become a strategy for doing business and developing local economies (Segal-Horn 1998). Many industrial countries now strive to develop collaborative advantage in addition to competitive advantage as a development strategy.

Collaboration improves efficiency, conserves resources, and pushes back the frontiers of innovation by introducing opportunities to stretch and leverage resources, technology, and infrastructure in ways not previously conceived. Businesses, governments, and communities can take advantage of those opportunities for economic development, emboldened to face risks that single or pioneering organizations would never attempt to confront. For collaboration to work as a local development strategy, catalysts must transform assets, resources, and the benefits of networks, alliances, and partnerships into projects and development activities.

Catalysts can be highly specialized and skilled entrepreneurs who take risks as they help to translate ideas, proposals, and plans into projects and

programs. Catalysts can also be companies that lead, develop, intermediate, broker, facilitate, innovate in, and provide venture capital for network building. Private utility providers, such as water and energy companies, can be catalysts. Such companies have enabled Asian countries and cities to carry out a wide range of public infrastructure development projects at considerable cost savings to their governments. A catalyst can therefore be a person or a group of people, companies, or initiatives that links businesses, governments, and communities to

- identify potential investment contracts and infrastructure;
- create networks and clusters of core competencies attractive to businesses;
- bring together people, resources, and technology; and
- facilitate investment through a range of finance, land, technology, and business development packages.

Catalysts can come up with novel ways of developing important projects for regional governments, often without increasing public debt. They therefore have a critical role in new investments and infrastructure, management services, community development organizations, and projects and programs that governments cannot create with traditional methods. Catalysts are also vital to the development of industry clusters, a best-practice approach to the development of urban regions that has been responsible for clusters like Silicon Valley and Bangalore.

3.2.3 New Economic Governance

Decentralization has renewed interest in the development of urban regions in Asia. It has taken three basic forms: deconcentration (physically relocating central government functions to the subnational regions without transferring authority), delegation (transferring specified central government responsibilities to lower tiers of government to be administered on behalf of the central government), and devolution (transferring full responsibility to local governments and agencies).

Decentralization and deconcentration both involve changing governance structures to empower local communities so that demand can be a major driver of development. But while most governments in Asia recognize that decentralizing government would improve local infrastructure and services (Roberts and Kanaley 2006), relatively few local governments appear to understand decentralization policy or adopt it. Many local governments tend to be uncertain about their responsibilities and the expectations of the national government, and unable to develop and finance appropriate policies and programs.

Differences in degree of decentralization and in the structure and functions of government complicate cross-country comparisons of the impact of decentralization on regional economic development. However, in some Asian countries, notably Indonesia and the Philippines, decentralization is fragmenting government and creating new provinces and cities. Less central government grant funds are allocated to these cities, which therefore have less funds available for development.

When preparing legislation, it is important to remember that decentralization should mean more local autonomy in policy development, and less dependence on central government resources and advice. The responsibilities of the various levels of government are often unclearly defined in the legislation. When Indonesia first decentralized, for example, it gave much the same powers to the provincial and local governments. Subnational development policy can also be ambiguous, with central governments wishing to decentralize and at the same time retain control. The central government must have some involvement in strategic planning, coordination, resource mobilization, and the setting of minimum service standards for major infrastructure projects, but more to facilitate than to substitute for local development efforts. Local skills and experience in policy development and analysis should be strengthened, and better information and data should be provided to stimulate demand-driven economies.

3.2.4 Strategic Infrastructure

Perhaps the most challenging problem for Asian cities is meeting the demand for urban infrastructure that will make good-quality, affordable, and reliable services more accessible. Demand for basic urban infrastructure now far outstrips supply in most of the cities, as Asia urbanizes rapidly. Governments are investing far too little in infrastructure, to the detriment of economic growth, private sector development, and the achievement of social and poverty reduction goals.

The World Bank and ADB have published many reports detailing shortfalls in infrastructure in Asian cities. The World Bank estimates that developing countries should invest about 5.5% of GDP each year to keep up with projected growth, but their public sector, which provides about 75% of all infrastructure investments on average, invests only 2%–4%.

However, it is not just hard infrastructure (roads, public utilities, and facilities) that the Asian cities find it difficult to provide. Most pay little attention to soft infrastructure—higher education and research facilities, ICT services, logistics management, efficient government decision-making systems, and strong capital markets.

The critical mix of hard and soft infrastructure that cities need to develop and become competitive places for trade and investment is referred to as *strategic infrastructure*. Strategic infrastructure is directed at the export growth sectors of the economy, such as manufacturing, tourism, business services, and logistics. Weak strategic infrastructure in most Asian cities hampers their ability to compete in the advanced manufacturing and knowledge-based industries that add value to local economies.

3.2.5 Living Standards

Livability is an important factor in the economic development of cities. It relates to such factors as security; amenities; access to high-quality education, shopping, cultural, and social services; quality and affordability of housing; employment opportunities; low exposure to natural disasters; and minimal social divisions. Highly livable cities are generally strong economically and are havens for investment in real estate, especially residential and commercial property.

Measures of livability provide useful indicators of the quality of life in cities. The Economist Intelligence Unit carries out an annual survey that ranks some 215 of the world's most livable cities according to 39 criteria ranging from personal safety to public transportation. Table 3.1 presents a livability index for selected cities in Asia. More livable cities have higher index scores and rank higher on the index. Japan, the Republic of Korea, Singapore, Taipei,China, and Hong Kong, China all offer a good standard of living, according to the index. Cities in the PRC have become more livable in recent years, thanks to the massive investment inflows and more readily available consumer goods that accompanied the country's entry into the WTO. The livability index for emerging business centers like Bangkok, Kuala Lumpur, and Taipei,China has increased since the 1997 Asian financial crisis. Less developed cities, especially those where unrest or environmental conditions are an issue, rank lower, with Karachi, Vientiane, and Yangon all in the least livable category (Mercer 2007).

3.2.6 Good Governance as the Foundation of Enabling Business Environments

Good urban governance is the foundation of enabling environments and well-functioning, well-managed infrastructure and services. A study of Kuala Lumpur (Jusoh, Malek, and Rashid 2009) singled out the impact of governance on the business culture and business friendliness of cities, and therefore on their competitiveness. At one end of the spectrum, an enabling business environment can promote the development of performance-

Table 3.1 Livability Index of Selected Asian Cities, 2007

Rank	City	Economy	Index Score	Rank	City	Economy	Index Score
34	Singapore	Singapore	102.5	131	Guangzhou	PRC	70.3
35	Tokyo	Japan	102.3	132	Rayong	Thailand	69.3
38	Yokohama	Japan	101.7	136	Colombo	Sri Lanka	66.3
40	Kobe	Japan	101.0	142	Jakarta	Indonesia	63.7
42	Osaka	Japan	100.5	145	Shenyang	PRC	63.0
54	Nagoya	Japan	99.5	148	New Delhi	India	62.4
55	Tsukuba	Japan	98.3	150	Ho Chi Minh City	Viet Nam	62.0
63	Yokkaichi	Japan	96.2	151	Mumbai	India	61.7
69	Omuta	Japan	94.9	153	Bangalore	India	61.3
70	Hong Kong	Hong Kong, China	94.3	157	Ha Noi	Viet Nam	60.1
73	Katsuyama	Japan	91.4	158	Islamabad	Pakistan	59.8
75	Kuala Lumpur	Malaysia	88.9	159	Chennai	India	59.3
83	Taipei	Taipei,China	86.5	161	Jilin	PRC	57.9
100	Shanghai	PRC	81.6	163	Lahore	Pakistan	56.5
101	Johor Baharu	Malaysia	81.2	164	Riyadh	Saudi Arabia	56.4
103	Kaohsiung	Taipei,China	80.7	169	Vientiane	Lao PDR	55.0
109	Bangkok	Thailand	76.8	175	Karachi	Pakistan	52.9
110	Yeochun (Yosu)	Korea, Rep. of	76.3	184	Almaty	Kazakhstan	49.4
113	Ulsan	Korea, Rep. of	75.0	185	Yangon	Myanmar	49.3

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Source: EIU (2007).

based cities that are competitively located, use results-based performance benchmarks and incentives for achievement, and provide efficient services. At the other extreme, without an enabling environment, cities can have their productivity stifled by a crushing bureaucracy and inefficient service delivery.

Good urban governance is characterized by the interdependent principles of sustainability, equity, efficiency, transparency and accountability, security, and civic engagement (UN-HABITAT 2008). National, subnational, and local governments and special-purpose authorities are often involved in policy formulation and program coordination. National governments set the framework in which local governments operate, but central government controls are increasingly being balanced by greater local autonomy that

permits genuine local decision making. Even with decentralization, national governments will continue to take an active role in urban governance, selectively intervening in areas of national interest or priority, setting national standards for service delivery, providing technical assistance in institutional strengthening and capacity building, monitoring the performance of local authorities, intervening when the national governments deem local governments to have failed, and providing incentives for effective coordination, improved service delivery, and satisfactory financial–economic performance.

While there is no ideal system of city governance, the arrangements in each country should always evolve to reflect the country's history, politics, culture, and stage of development. The features of the governance system are the responsibility of national governments, which set the enabling environment for city governance. They provide a useful yardstick for assessing governance systems and a starting point for efforts to improve the efficiency of urban governance. Some universal features of effective and proactive city governance are as follows:

- *Government functions.* Central, regional, and local governments and special-purpose authorities have clearly defined functions that minimize overlap in responsibilities.
- *Geographic boundaries.* Regional and local governments and special-purpose authorities have boundaries that effectively balance the need for efficient service delivery with appropriate functions, roles, and responsibilities. Too much government can be as big a problem as too little.
- *Governance of city regions.* "Whole city" and "urban region" issues can be analyzed and dealt with across administrative boundaries in areas such as economic development, land use, transportation planning, rural–urban linkages, development of peri-urban areas, and infrastructure and service provision.
- *Coordination and consultation arrangements.* Formal coordination and consultation arrangements, supplemented by extensive informal consultations, are widely understood and effectively used throughout government.
- *Financial relations.* Intergovernmental financial relations support the financial sustainability of cities and local governments by broadly aligning the tax bases and revenue-raising capabilities of governments and local authorities (including intergovernmental revenue sharing and general and specific-purpose transfers from higher government) with their functional responsibilities. Appropriate use of tax bases and of user charges and cost recovery is rewarded.

- *Capital requirements.* The central government facilitates access to loan funds and capital markets by local authorities at market terms and conditions within the constraints of prudent financial management by local authorities and the requirements of overall macroeconomic management. Local authorities are thus encouraged to operate as market entities, balancing capital requirements with risk and capacity or ability to pay, and prudent financial management is rewarded with increased access to capital.
- *Performance-based management.* Management and financial structures emphasize results and performance against benchmarks, including the use of incentives.
- *Accountability.* Decision-making processes and audit and reporting systems emphasize transparency, clear accountability for performance, and community consultation and involvement.

The various arrangements for decentralized governance in Asian countries can be assessed against these features. While much information on urban development and local government is available, relatively little attention seems to have been paid to the enabling environment derived from good city governance and its impact on the performance of cities. Central governments and international development agencies tend to focus more on the institutional and administrative capacity problems of local government. Local governments do have significant capacity constraints, but fixing these without also attending to the enabling environment is not a sustainable course of action. Periodic reviews of local governance are an essential part of developing a culture of proactive city governance and improved performance.

Understanding how cities can develop enabling environments for more efficient and sustainable cities is a key aspect of the CCED study. CCED provides a systematic approach that international development agencies like ADB can use in packaging assistance programs to improve governance.

3.3 Creating New Pathways for Sustainable Urban Economic Development in Asia

More and more, Asian cities are being shaped by the powerful forces of globalization and structural, social, political, and market changes. As many cities, especially larger metropolitan cities, restructure their economies from manufacturing to services, employment and other economic activities gather in outer urban areas, and in some cases relocate to other cities where it costs less to do business. At the same time, there is increasing spatial specialization or clustering of economic activities in the cities.

Governments and businesses are forced to find ways to become more competitive. They realize that the economic development plans and strategies of cities must define the core business activities and industry specializations on which they can base their long-term economic growth, and that local and national governments must create the enabling environment. For more sustainable cities, Asia needs a new paradigm of economic and physical development, and the means to carry it out.

Government economic policy must pay more attention in the future to building a strong enabling environment in national and local government, ensuring the presence of catalysts, and developing industry clusters to drive economic activity in the cities. The next chapter deals with the phenomenon of clusters in the context of new local economies, and their potential as urban engines of economic growth.

Chapter 4
The Cluster: Theory, Analysis, and Experience in Agglomerated Asian Cities

In the 1960s, only 20% of Asia's population lived in cities. This share has doubled in decades as more cities and towns have become agglomerated, and the United Nations (2002) projects Asia's urban population to reach 55% by 2030. The patterns of urbanization in Asia in the new millennium are different from the conventional model (the mono-centric city) of the late 19th and early 20th century Europe, swept by industrialization at a time when modes of transportation were limited. ICT and much wider transport options have spread out economic activities beyond the boundaries of a single city, and the urban–rural dichotomy deeply ingrained in planning systems no longer adequately explains Asian urbanization. Since the urban regions are hubs of economic growth for surrounding urban areas as well as the countryside, and almost all infrastructure lies within them or is linked elsewhere, their inclusive development and sustainable environmental management will be a major challenge in years to come. Urbanizing Asia in the 21st century requires a fresh look at urban development approach.

Globalization has bred more industry specialization and urban agglomeration as industries seek out locations that offer global competitive advantage to producers of goods and services. Interest in industry clusters and what makes them develop has thus grown among theorists like Porter (1985, 1990). Competitiveness depends largely on efficiency of production and the extent to which externalities that bestow competitive advantage are generated by an enabling environment. The way cities develop that enabling environment ultimately affects their competitiveness and industry agglomeration and specialization.

Traditionally integrated production has given way to networks of global suppliers and distributors. New types of businesses that produce components, accessories, and services for global markets have sprung up

in locations where they derive competitive advantage. In many of these locations, industry clusters linked to suppliers and distributors and to economic infrastructure turn out highly specialized goods and services in response to market and production changes. Industry clusters employ more than 50% of the workforce, and contribute a higher proportion to GDP, in post-industrial countries like the United Kingdom and the United States (US-HUD 1996). Most large cities in these countries have four or five significant industry clusters. London, for example, has global banking and finance, insurance, logistics, education, and arts industry clusters. Faced with international competition, many older manufacturing clusters in Europe, the United States, and Japan massively transformed to become more efficient and competitive in the last 2 decades. Companies and factories were forced to restructure; those that could not later closed down their operations or moved them offshore—mainly to Asia and other industrializing countries.

Globalization has also sparked tremendous growth, particularly in the last decade, among micro-, small, and medium-sized enterprises (mSMEs) in the industry supply chain. It is estimated that mSMEs now make up more than 90% of all businesses in Asia, and employ up to 60% of its workforce (Choe, forthcoming). These enterprises are increasingly recognized as major forces of economic growth in developing Asia. Their role in creating jobs and income, and therefore in reducing poverty, is extremely important.

Industry and business clusters have drawn much interest from governments, multinational corporations, and local businesses in Asian countries as a means of strengthening and diversifying the urban and regional economic base. This approach to economic development generates significant benefits by enabling cities and regions to gain comparative advantage from the increasing *economies of scale* of businesses that co-locate and collaborate in knowledge transfer, investment opportunities, and industry development.

This chapter explores the theory and analytical tools for investigating industry clusters, and reviews successful examples of industry clusters in agglomerated Asian cities. Clustering underpins the approach to CCED discussed in this and the next chapters.

4.1 Porter's Theory of the Competitive Advantage of Clusters

Porter (1990) makes the case for thinking about economic development differently than public policy makers have done in the past. He argues that economic vitality is a direct product of the competitiveness of local firms

and industries. He suggests that international competitiveness is profoundly affected by local conditions, but that these conditions are not always simply cost-related factors or availability of local natural resources.

Porter (1980) began by exploring techniques to analyze industries and competitors and to develop strategies for achieving competitive advantage. The strategies were based on an understanding of the four forces driving industrial competitiveness—potential entrants, buyers, suppliers, and industry competitors—resulting in the concept of internal and external environmental analysis. The environment in Porter's model was the economic and business environment, given his realization that the study of companies and industries alone was insufficient to explain competitive advantage. Further research on the competitiveness of global industries (Porter 1985) and of nations (Porter 1990) followed.

Porter (1990) introduces his *diamond model of competitiveness*. In the model (Figure 4.1) the following are the four broad determinants of the competitive environment for business:

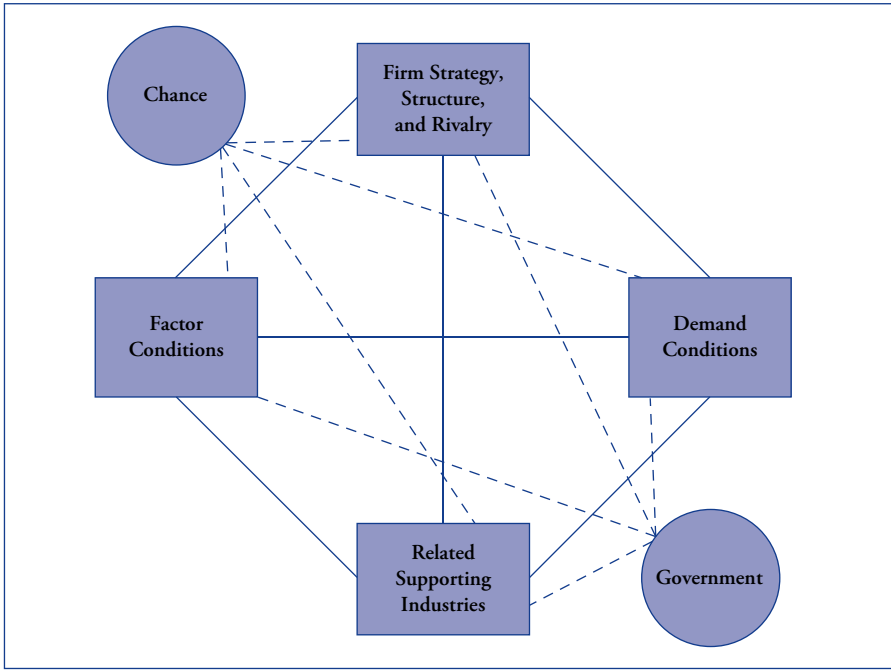
- *factor conditions*—skilled labor, resources, technology, and infrastructure;
- *demand conditions*—local and overseas demand for products and services;
- *related supporting industries*—suppliers and distributors in support of the industry sectors or clusters; and
- *firm strategy, structure, and rivalry*—conditions that govern how companies are created, organized, and managed, and the nature of domestic rivalry.

These four elements, according to Porter (1990, 321), are part of a system that shapes the competitive elements of the strategy for gaining competitive advantage:

> These determinants individually, and as a system, create the context in which a nation's firms are born and compete: the availability of resources and skills necessary for competitive advantage in an industry; the information that shapes where opportunities are perceived and the directions in which resources and skills are deployed; the goals of the owners, managers and employees that are involved in and carry out competition; and most importantly the pressures on firms to invest and innovate. The determinants in the 'diamond' and interaction amongst them create the forces that shape the likelihood, direction and speed of improvement and innovation by a nation's firms in an industry.

Two other factors identified in the model affect competitive advantage: chance and government. Chance relates to events or occurrences that have little to do with the country's circumstances, but may be influenced

Figure 4.1 Porter's Diamond Model of National Competitiveness



Source: Porter (1990).

by individuals, such as Microsoft's location in Seattle. Governments may aid competitive advantage through public policies that are favorable to investment and profit performance. Clustering competitive industries, for example, is important in creating rivalry and stimulating innovation.

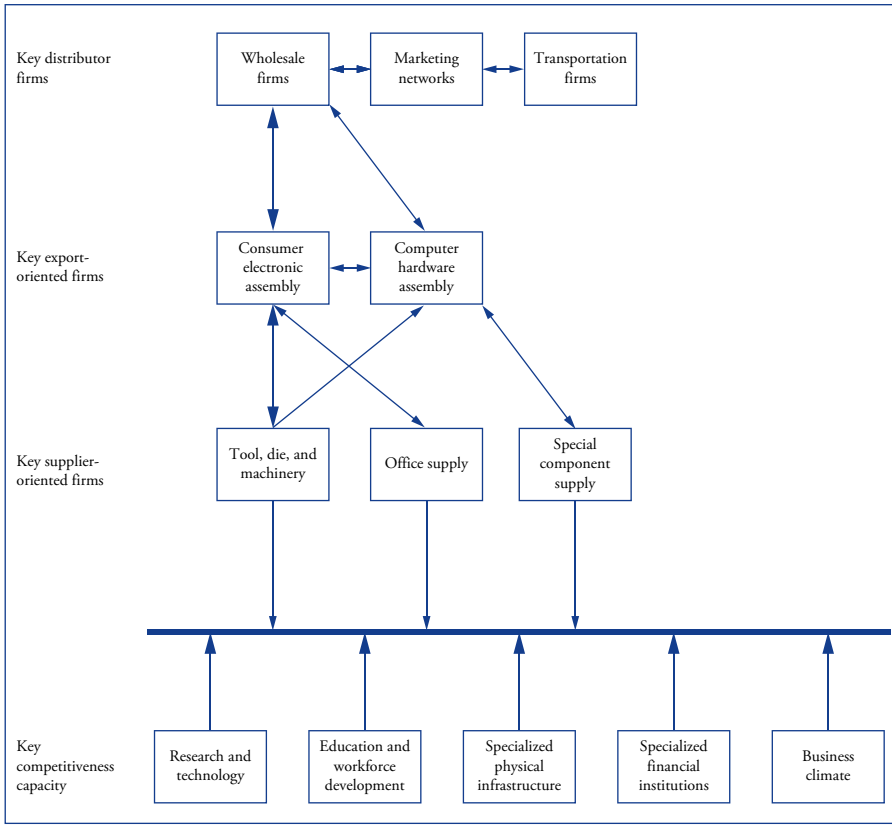
Porter (1990) has had an important influence on strategic thinking and analysis for business and economic development. While his early work was extensively concerned with the competitiveness of nations, many of the case studies provide insights into local and subnational competitiveness. Other researchers have used Porter's model to analyze the competitive advantage of regions for manufacturing (O'Malley and Egeraat 2000), trade services (Daly and Roberts 1998), film (Assmo 2005), food (Neven and Dröge 2001), and education (Curran 2001). The diamond model is a useful framework for strategic thinking about local economic development and has been widely applied in many countries to analyze clusters. The model can be used to identify the factors that underlie local competitiveness, analyze their interaction, and formulate strategies for regional economic and industry cluster development based on the identified elements of competitive advantage.

4.2 The Concept of Clusters

The definition of the term *cluster* has been the subject of much intellectual debate. As described in Chapter 1, a cluster is a grouping of like-minded companies (competitors) and talents in a specific geographic area. A feature of clusters is their statistically significant concentrations of companies and employment in relevant business activities that share common supply and distribution chains. Clusters generate considerable employment and are an important means of soaking up informal labor in cities (Kumral and Deger 2008). They also have an established reputation for specialization and excellence.

Figure 4.2 shows a typical electronics industry cluster, with the types of linked industries and the relevant markets and factors involved. At the core of the industry cluster are export-oriented companies. The key suppliers

Figure 4.2 A Typical Electronics Industry Cluster



Source: Study team.

are *horizontally integrated* industries and companies, receiving strategic infrastructure support from financial, education, and R&D service providers. Wholesale and transportation logistics companies form part of the *vertically integrated* supply chain.

Clusters can either form spontaneously or be induced or developed. Analysis indicates that spontaneous clusters are formed as a result of investment in a piece of infrastructure, a government decision, a new technology, the existence of R&D centers and universities, or a chance happening. Early commercial success leads to the entry of other players keen to be part of the successful actions. The effects snowball: the size of the cluster keeps increasing, and the revenue streams finance more commercial activity and infrastructure (a characteristic of Silicon Valley and most of the clusters in Italy).

- Functional clusters, that is, clusters that are induced or developed in partnership with government, represent an impressive body of knowledge that can be used very effectively to stimulate and support local economic development. Cluster initiatives are generally aimed at nurturing collaborative instincts and trust, and building a critical mass of relevant companies to achieve better outcomes than would otherwise be possible. The following six-step process developed by the European Commission (2002, 15) characterizes the emergence and evolution of functional clusters. The birth of a cluster can often be traced to historical circumstances, such as the availability of raw materials, specific knowledge in R&D organizations, or traditional know-how; the specific or sophisticated needs of a group of geographically concentrated customers or companies; or the location of companies or entrepreneurs carrying out some important new technological innovations. The first stage in cluster development involves new company spin-offs, leading to a geographic concentration of other competitor companies at a similar stage of development.
- Once a critical agglomeration of firms has been established, external economies are created in a cumulative process. The first indication of emerging external economies is the creation of a set of specialized suppliers and service companies. These frequently originate from the vertical disintegration of firms and the creation of a specialized labor market.
- The growth of the cluster creates a demand for nonmarket services and the formation of new organizations that serve several companies in the growing cluster. These include R&D development organizations, specialized education establishments, and business associations and networks.

- The development of external economies increases the visibility, prestige, and attractiveness of the cluster. More companies and skilled employees may move into the cluster as a result, producing a fertile breeding ground for new local and external companies (multiplier effects, generating more jobs that spin off from the first stage of cluster formation).
- The creation of nonmarket, relational assets that foster and accelerate the circulation of information and knowledge through, for example, social capital development and informal collaboration, help with the coordination of economic activity and innovation. The cluster begins to mature and may contain ensembles of specific, differentiated, and localized relations between persons and organizations coordinated by routines or conventions that work in the context of geophysical proximity.
- Some clusters eventually reach a stage when decline sets in or events cause core industries to shut down or relocate. Cluster decline is often seen to reflect technological, institutional, social, or cultural "lock-in" in business behaviors. Some clusters can be remarkably resilient as long as businesses and governments cooperate to rejuvenate and transform the cluster.

4.3 Review of the Literature on Clusters

The study of the role and importance of clusters in supporting local economic development has undergone considerable research and development since Porter (1985, 1990) first wrote about them. Most developed countries, and an increasing number of developing countries, have embraced the concept of clusters as a matter of new economic policy. The policy emphasis on clusters appears to be replacing the traditional supply-driven sector plans of governments, as these have failed to achieve sustainable economic outcomes for cities and regions. One success story using the demand-driven cluster approach in the Asian context is the ICT industry cluster in Bangalore, India, which has transformed the city's economy to global competitiveness.

There is growing support for clustering as the major driving force behind the competitiveness of local economies (Abramson 1998; Anderson 1994; Audretsch and Feldman 1996; Davidson 1992; Doeringer and Terkla 1996; Harrison et al. 1996a; Harrison, Kelley, and Gant 1996b; Klein, Gee, and Jones 1998; European Commission 2002). The OECD has been a major proponent of clusters (Guinet 1999), together with the Inter-American Development Bank (IADB), the World Bank, the United Nations Industrial Development Organization, the United Nations Conference on Trade and Development, and the World Economic Forum (World Bank 2009; World Economic Forum 1999). This support has helped to move the debate from the academic sphere into the realm of policy and business.

4.3.1 Growing Support for Clusters

Asia's contribution to industrial output will continue to rise, with Chinese and Indian cities becoming dominant global manufacturing centers. However, the potential of many Asian countries and cities is being stifled by government control and policy related to sector industry development. The OECD argues that national governments must shift away from top–down sectoral strategies for local economic development toward more bottom–up local development (Feld et al. 2001). Because industry policy agendas cut across issues and levels of government, the responsibilities must be shared by the various levels of government and the private sector, more actors must be involved, and there must be closer coordination. Cities are the focal points for competitiveness and growth; hence, giving them greater authority to unlock their creativity and development potential is the key to the sustainable growth of urban economies.

The decentralization (discussed in Chapter 3) and localization of economic development (Amin 2004, 52) in Europe and other OECD countries is in line with the concept of *subsidiarity*. According to this organizing principle, which has been gaining influence over the last 20 years, matters ought to be handled by the smallest, lowest, or least centralized (but) competent authority. Decentralization in the European Community was a central factor in European economic development, and a similar trend is now evident in Asia (Kimble 2002; Turner et al. 2003), with new local institutional networks and cluster initiatives realizing investment and research outcomes (Chaminade and Vang 2008).

The OECD contends that clusters can be a vital part of industry, innovation, and trade policy, but cluster analysis and cluster policy practice must be linked (Benneworth and Charles 2001) for greater coherence and transparency in cluster identification, cluster selection, and cluster action planning. The emphasis on evaluation and monitoring in the new generation of cluster policies has produced more credible policies.

4.3.2 Approaches to Facilitating Clusters

Clusters have been developed in many different ways (Clar, Sautter, and Hafner-Zimmermann 2008). Four main schools of thought have emerged in this regard (European Commission 2002, 17) (Table 4.1). The Californian and Nordic schools of thought are tied to economic systems; the two others are more generic. The OECD countries have engaged in a good deal of experimentation with respect to the various approaches. This book is one of the first combining economic geography and urban economic growth with the concept of business competitiveness.

Table 4.1 Four Schools of Thought on Clustering

School of Thought	Characteristics
Industrial districts	External economies, mutual trust, and a positive atmosphere of cooperation between companies, leading to incremental innovations
Californian school	Vertical disintegration, reduced transaction costs, and a specialized local labor market, plus conventions, informal rules, and habits, leading to greater collaboration between companies
Nordic school	Innovation as learning, and learning as a localized process, because of the importance of tacit or non-codified knowledge developed between workers of different companies
Porter's industrial cluster	External economies strengthened by proximity and better access to input factors, local rivalry, and local customers; collective improvement of the competitiveness of companies and creation of opportunities for the establishment of new niche companies to support the expansion of local supply chains and add more value to the cluster

Source: Adapted from European Commission (2002).

Many attempts to promote clusters have failed because they made no adjustments for local circumstances and production factors (Rianto et al. 2009). Developed economies emphasize technology and labor efficiency in local competitiveness. In many developing countries, where labor costs are low and new technologies are not always affordable, the approach to cluster building for efficiency gains will have to be different. The objectives will, however, be sufficiently similar to indicate the usefulness of collaborating with clusters in other parts of the world.

The experience of developing industry clusters is a relatively new trend in Asia. However, different approaches are coming into use in the PRC, India, Indonesia, and Singapore (*Business Asia* 1993; Chaminade and Vang 2008; Grondeau 2007; Saxenian 2000b; Yusuf and Nabeshima 2006; Zhang, Chester, and Ning 2004), and many hybrid models exist across the region.

4.3.3 Benefits of Enhancing Competitiveness through Cluster Development

Clusters enhance the competitiveness of economies in many ways. The important benefits of cluster development are discussed in the following subsections.

4.3.3.1 Development of Networks

Brown and Duguid (2000) see clusters as ecologies of knowledge formed through networks that permit knowledge to spread out and quickly find

complementarities. Networks are about connectivity, but they are frequently too shallow to add significant value. If the networks are tightly connected by the regular movement of individuals between companies, then the rate of interorganizational learning will be even faster. Networks, however, tend to be focused narrowly on exploiting sales opportunities and less on actively developing *collaborative competency*, that is, encouraging teams of skilled researchers and experts to work together on new ideas and innovations that can reduce their costs and risks, instead of competing against one another. Also, cluster networks can work out collaborative diversity and capitalize on their differences in skills and technologies to fill gaps in skills or develop new products.

Clusters provide pathways to innovation, because they provide connectivity between

- otherwise individualized researchers;
- researchers and the "right" companies, that is, those that will take the research to the market;
- entrepreneurs and collaborative competency and diversity; and
- local and foreign companies, to forge global supply chains.

A high-performing cluster connects people in the cluster with the skills and funds to create an innovative milieu and to share tacit knowledge that will help develop local economic competitiveness.

4.3.3.2 Development of Innovation Systems

The impact of technological change on the competitiveness of geographic centers of production has been known for centuries (Burke 1978). Technological change propels continuous innovation and adaptation in the production systems of industry clusters and in economies. However, technological change differs in rate and effects between industries and product types because of their differing cycles of innovation, growth, and standardization (Stimson, Stough, and Roberts 2006). Many countries in Asia have chosen to shorten the cycle by taking and adapting, rather than creating, new technologies and inventions. The early development of the Japanese car and electronics industries, for example, relied on R&D in the US and Europe.

Innovation requires the assembly of a diverse set of knowledge and networks for both production and consumption. Clusters, Benneworth and Charles (2001) say, incubate innovations. With the tacit and explicit knowledge stored in them, companies in the clusters can be creative and respond rapidly to business opportunities. In so doing, the companies

spark new cycles of innovation that enable them to maintain competitive advantage.

4.3.3.3 Development of Innovative Milieus

The concept of innovative milieus explains the how, when, and why of new technology (Castells 2000; Lecoq 2002; Camagni 1991). Some theorists have suggested that not just economic but also cultural factors, including social capital, are important to the rise of technology agglomerations, as seen in Silicon Valley. SMEs collaborating through networks, alliances, and links with universities have also forged a powerful R&D and entrepreneurial climate. Asian cities are showing increasing interest in creating innovative milieus to achieve competitive advantage (Ku, Liau, and Hsing 2005; H. Wen 2003; M. Wen 2004). High industry agglomeration has powered innovation and advances in technology in cities like Bangalore, Mumbai, Singapore, Shanghai, and Hong Kong, China (van Dijk 2007).

Other features of innovative milieus, besides the economic and cultural dynamics, are (i) a high quality of life; (ii) a pool of skills and knowledge that provides unique sets of core competencies; (iii) vibrant and innovative people with positive business attitudes; (iv) responsive and engaged governments and communities; (v) companies, managers, and employees willing to accept change; and (iv) the ability to respond collectively to threats. The mix of ingredients needs to be right. Those whose job is to finance infrastructure must understand this. Clusters need such nurturing milieus via progressively layered strategic infrastructure to become more competitive.

4.3.3.4 Investment Spin-Offs from Research and Development Outcomes

Asia is awash with activities aimed at establishing development corridors, free trade zones, economic development zones, industry precincts, and the like. These activities show up in the literature as “near examples” of clustering. But, as this book makes plain, economic corridors and special export zones or precincts are very different from well-performing clusters. This point must be understood by policy makers. A Brookings Institution report (Mills et al. 2008) cites examples of cluster activities that involve spin-offs from innovation and related activities, rather than simple spatial agglomerations. The benefits of these cluster activities include

- facilitating joint market assessments, marketing, and brand building;
- encouraging relationship building within the cluster, within the region, and in other locations;

- promoting collaboration in research activities, product and process development, and the like;
- aiding the spread of innovation and the adoption of innovative products, processes, and practices;
- supporting cluster expansion by attracting companies and supporting new business development; and
- sponsoring education and training.

4.4 Tools for Cluster Analysis

Many techniques have been developed for studying and analyzing clusters. Three primary quantitative tools for studying industry clusters and agglomeration are shift-share analysis, location quotient analysis, and input/output (I/O) analysis. Regional science has used these analytical tools extensively. In the 1980s, researchers developed new qualitative and quantitative methods for exploring clustering in cities and regions. Among these tools were multi-sector analysis and cluster competitiveness analysis. Indeed, the study of industry clusters itself has become a discipline.

4.4.1 Shift-Share Analysis

Investigators use *shift-share analysis* to analyze trends or changes in economic activities over time. It is a simple technique that involves measuring differences in the proportional change of sector economic activities, occurring over time in industry, GDP, or employment. Sectors that are growing proportionally faster over time than other sectors in the same economy may be experiencing a broadening or deepening of economic activities, suggesting greater specialization and agglomeration. Shift-share analysis is also widely used to develop I/O tables (discussed below) for analyzing changes in economic structure and determining subnational coefficients that measure the flow of expenditure between sectors. Shift-share analysis is used as well to model scenarios for subnational economic development.

Shift-share analysis does not explain the reasons for the growth or decline of a sector. It simply describes changes in economic activities over time. These changes provide evidence of competitive forces operating in an economy. The technique can be used to estimate the strength of actions, for example, a change in subnational economic policy, by estimating the shift-share parameters of a province with the policy change and without.

4.4.2 Location Quotient Analysis

Location quotient (LQ) analysis is a tool for measuring the relative or proportional strength of sector activities in a city or at the provincial level compared with their strength in the national economy, or the extent to which a particular economic activity is over- or under-represented in a subnational economy relative to its presence in the country as a whole. LQ ratios cover a wide range of economic activities, such as employment, industrial production, investment, gross regional product, wages, R&D, skills, and education. Ratios greater than one indicate that economic activity in the local economy is much higher than the national average. Ratios greater than two suggest the presence of industry specialization and clusters in the study area. Standard industry classification (SIC) data in national or regional statistical offices are normally used to estimate LQs; however, these data are not readily available for all cities, especially in Asia.

LQ analysis has been used to a great extent by researchers to determine elements of comparative advantage. Porter (1990) used the technique to identify competitive industry clusters in countries. The United States Department of Housing used an advanced application of LQ analysis to analyze the strength of industry clusters in more than 100 US cities (US-HUD 1996). The study assessed the competitiveness of 18 industry clusters using SIC groups. It analyzed the employment structure of each cluster by location and used LQ analysis to identify the geographic location of the most competitive industry clusters.

The greatest value of LQ analysis is in gauging the strength of regional industries, especially in the primary and manufacturing sectors. However, LQ analysis is less suitable for comparative analyses of economic activities in the services sector, as the SIC data available are often not as detailed as those in manufacturing. Moreover, globalization has increased the spatial disaggregation of many services and the agglomeration of higher-order producer services in some cities (Sassen 1991, 1994). The progressively more aspatial employment in services (Tapscott 1996, 1998; Tapscott and Williams 2006), especially with the emergence of telecommuting, telemarketing, and telemedicine, suggests that LQ analysis is not so applicable to the services sector. LQ comparisons between cities in different countries are also difficult, because some countries have their own industry classification standards.

4.4.3 Input/Output Analysis

I/O analysis, a technique developed by Leontief (1953) from the ideas of the 17th century French economist François Quesnay, is widely used for modeling and analyzing the structure, operation, and performance of national,

subnational, and local economies in a closed system. I/O tables represent an important set of social accounts of an economy in terms of the value of goods, services, imports, and other production input. This input is consumed, exported, or retained for use at some future date. Several pioneers in regional (subnational) science have worked extensively on regional I/O tables (Isard 1960; Richardson 1972; Tiebout 1962).

Regional I/O tables have the following uses:

- They are often the sole source of regional accounts, allowing estimates of gross regional product and of each sector's contribution to regional microeconomic indicators.
- They provide a picture of the local economy, indicating significant and insignificant categories of transactions and the economy's structural characteristics.
- They provide an indicator of sector purchasing and sales patterns within a region.
- They can be used to evaluate the impact of change in an economy that may result from an event, such as the loss of a major industry or the development of a new industry in a region.

I/O tables describe production and consumption flows in a region and show sector contributions within a closed economy to value addition, employment, imports, and exports, and thus identify clusters or strategically linked industries that are important for regional development (Feser and Bergman 2000). The data from I/O tables can be used to map and model industry supply chains and estimate the value addition that may result from investment in local industry enterprises. Care must, however, be taken in analyzing regional industry clusters. Many service components of clusters are becoming aspatial or open-economy because of globalization and greatly improved telecommunications, and are not recorded as imports or exports in regional I/O tables. Like the other analytical tools described earlier, I/O analysis provides little information about nonquantifiable factors that affect regional competitiveness, such as competencies, entrepreneurship, and asset performance. For this reason, other more qualitative analytical tools and methods need to be considered.

4.4.4 Multi-Criteria Analysis

Multi-criteria analysis (MCA) is a structured approach to determining overall preferences among options for accomplishing several objectives (Hinloopen et al. 1983; Nijkamp et al. 1990). MCA offers policy makers an alternative when progress toward multiple objectives cannot be measured by a single

criterion (Munasinghe 1992, 15). It allows the development of environmental, economic, and social indicators for assessing monetary and nonmonetary objectives that may influence policy decisions. Different outcomes or measures of impact can be ranked and compared, regardless of the indicators used.

MCA can be used to evaluate the optimal outcomes of a project. For instance, Nijkamp et al. (1990) used MCA to evaluate planning scenarios for major infrastructure projects. MCA is also used extensively in environmental decision making (Munasinghe 1992; Van Pelt et al. 1990), where often-conflicting criteria are considered. Munasinghe (1994) contends that MCA clarifies the most important attributes or goals, eliminating many irrelevant options, and makes the final trade-off more transparent, while also giving decision makers more flexibility of choice. He cites the value of MCA to the World Bank, which evaluates more than 60 projects each year.

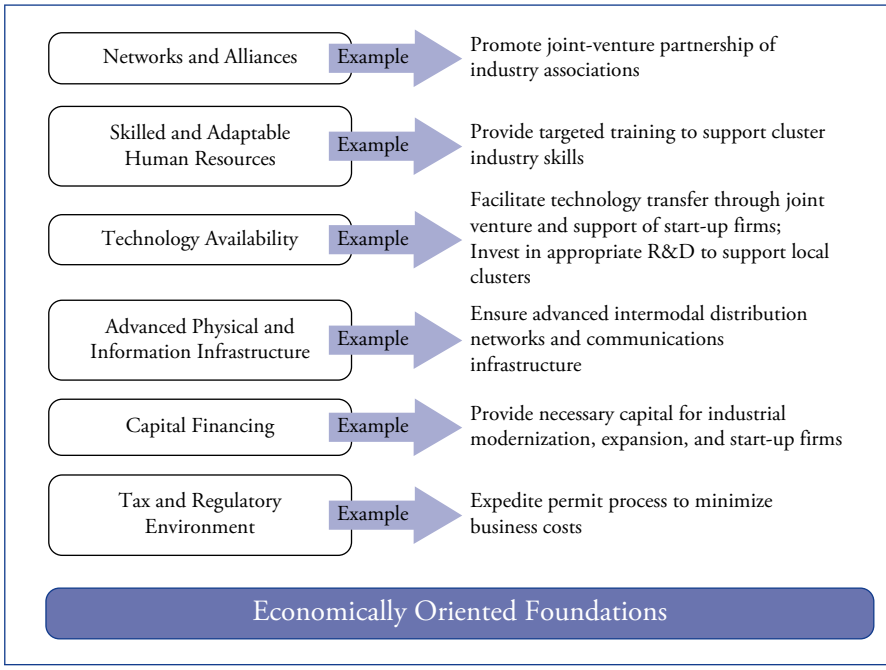
Many countries have used MCA techniques to assess the competitiveness of their cities and regions. The World Economic Forum produces an annual report on the competitiveness of countries (WEF 2009). The Global Competitiveness Report is based on 12 pillars of competitiveness and uses survey data from more than 30,000 companies worldwide. The 12 pillars of competitiveness are institutions, infrastructure, macroeconomic stability, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market sophistication, technological readiness, market size, business sophistication, and innovation. However, as authors such as Krugman and others argue (Krugman 1997; Ohmae 1996), it is no longer countries that compete, but cities. Yet while many countries have developed indicators to measure the competitiveness of cities, these indicators may differ significantly from country to country, making intercountry comparisons of competitiveness difficult.

Investigators have developed a variety of models to measure the competitiveness of cities in Asian countries, including cities in the PRC, India, the Philippines, and Viet Nam. The city competitiveness model for the Philippines, which is based on the World Economic Forum framework, evaluates the competitiveness of 30 cities using 6 primary drivers of competitiveness, 49 indicators, and both qualitative (from interviews with experts) and quantitative data (Macaranas 2008). The model then ranks cities on the basis of their competitiveness indicators.

4.4.5 Multi-Sector Industry Analysis

Multi-sector industry analysis (MSIA) is a semi-qualitative technique for assessing the attributes of competitiveness in different sectors of a local economy (Roberts and Stimson 1998). MSIA is a variation of MCA that can

Figure 4.3 Economic Foundation of Clusters



R&D = research and development.

Source: ICF Kaiser (1997).

provide valuable information about the relative strengths and weaknesses of the attributes of competitiveness of industry sectors and clusters. The results of the analysis can show how economic development can be fostered in sectors that have competitive advantage. The sector industry framework is the same as that used in I/O and shift-share analysis. Thus, comparisons between the competitiveness of different sectors of an economy and production can be examined.

MSIA uses a basic matrix and a nominal scoring system (1–3, 1–5, or 1–10) to record quantitative and qualitative measurements of the strengths or weaknesses of competitiveness attributes for selected industry or employment sectors of a local economy. The scores in the matrix are based on data and information from surveys, expert group meetings, and other assessment forums. The competitive attributes of the industry sectors to be measured (C_1, ... , C_n), related to technology, finance, environment, policies, etc., are listed in the first column, and the industry sectors fill the top row across the matrix. The competitiveness values are scored and entered into each cell in the matrix. The sum of the values of the cells across the table indicates the strength of different competitiveness attributes. The sum of

column scores indicates the most competitive industries. Thus, the matrix provides a picture of the relationship between competitiveness attributes and industries. Weights are often applied to the raw scores of industry sectors in the matrix to reflect the relative importance of the sectors to the development of the economy.

Six key elements form the economic foundation that supports the development of industry clusters.

These are:

- *Networks and alliances* are formal and informal associations and mechanisms that facilitate the exchange of knowledge, information, ideas, and trade between companies and businesses involved in specific types of economic activity within an area. (These networks and alliances may expand between areas and subregions, and some are global.)
- *Skilled and adaptable human resources*, for example, multiskilled, multilingual, and contract labor, must be available.
- *Technology availability* is important in improving production efficiency. The wide use of CAD, CAM, and GIS systems to assist manufacturing and analytical processes is important in improving the efficiency of production and the delivery of value-added producer services.
- *Advanced physical and information infrastructure*, for example, fiber-optic cable systems, data processing centers, efficient transportation systems, waste management services, and education, training, and community facilities have a significant impact on equipment and human performance in supporting the development of industry clusters and attracting new industries to regions.
- *Access to financial capital*, such as equity, venture capital, or debt financing, is an important economic foundation supporting investment in industry clusters.
- *Taxation and regulatory environment* has a significant impact on the cost of business and economic performance. Regions that offer taxation incentives for R&D, flexible building codes, sound policies on environmental performance, and support for cleaner production provide the kind of economic foundation that foster industry cluster development.

The main constraints on the use of MSIA in Asian developing countries have generally pertained to data availability and reliability. Choe and Pradhan (2010) used a simplified MSIA to prioritize investment areas in a given urban economic region in Nepal that would increase the potential for subnational economic growth. MSIA can also be used to assess risk factors in individual sectors (Roberts and Tabart 2005; Roberts 2006).

The MSIA of risk—economic, social, environmental, political, or technology risk—is important in understanding the factors that will maintain sector competitiveness and in putting risk management measures in place. MSIA is used in CCED assessment to measure the sector competitiveness of local economies. The results of this technique are presented in the case studies in Chapters 6, 7, and 8.

4.5 Competitive Cluster Development Initiatives

While the experience of developing industry clusters in Asian countries is still relatively recent, several cities have developed cluster-driven initiatives to support long-term economic development. Case studies of significant cluster-driven initiatives are presented in the following subsections. Some are concerned mostly with developing individual clusters; others, with creating networks of linked clusters.

4.5.1 Information and Communication Technology Cluster, Bangalore, India

Bangalore is known as Asia's Silicon Valley (Saxenian 2000a). It is Asia's leading ICT region, capturing a significant share of the global market in software and ICT services. Thirty years ago the region was experiencing a massive brain drain of professional expertise, most of which headed for Europe and North America. Bangalore has since managed to develop global competitiveness in the ICT sector despite its relatively poor regional infrastructure, governance systems, quality of life, stewardship of capital, and planning. Its success can be attributed to the responsiveness of economic policies, enabling mechanisms, and networks that have developed through the Indian diaspora. The following paragraphs describe important initiatives that have enabled Bangalore to develop a regional economy that is strongly linked to the global economy.

The structure of competition in the ICT sector has changed dramatically in the last 2 decades, with greater outsourcing of software development and information call centers. The traditional vertically integrated corporate structure has given way to vertical fragmentation and increasing company specialization (Saxenian 2000b). As a result, producers are no longer involved in all stages of production, from design to distribution. They now confine their efforts to niches in the value chain in which they can excel, relying on separate specialists to provide different components and final system integration. The number of actors in the industry has thus increased dramatically, and competition between layers has intensified. This is also true of most other industries in India.

Bangalore originally developed as a center of electrical engineering expertise as a result of government policies designed to develop India's electrical engineering industry. Its universities produced well-educated engineers, but rapid growth in the ICT sector in the 1980s led to a significant migration of electronics engineers from Bangalore and other areas in India to Silicon Valley, Massachusetts Route 66 (Saxenian 1996b), and other emerging ICT regions in Europe and the United States. By the early 1990s, with a global recession looming, leading ICT companies in the United States began to outsource more ICT development. Engineers who had trained in Bangalore started to move back home to take advantage of cheap labor costs and the large pool of English-speaking graduates. The demand for high-level English skills in the industry has made Bangalore a magnet for well-educated people—a boon for the call centers set up by large corporations like American Express.

At about the same time, the Indian Department of Electronics began to support the country's software industry by setting up software technology parks, which are export processing or special economic development zones designated for the production of software and computer products. Software Technology Parks of India was registered in 1991 as an autonomous agency to facilitate the development of software technology parks, reflecting the desire of the Department of Electronics to avoid direct government involvement in the business side of the industry. The department selected Bangalore as the site of one of its first software technology parks. India now has some 30 software technology parks, but Bangalore dominates the country's ICT industry.

The introduction of the parks coincided with economic reforms to liberalize and increase the competitiveness of India's potential export industries. The government recognized the importance of developing strategic infrastructure to encourage the growth of export industries, as the private sector's capacity to do so was extremely weak. The Department of Electronics has provided direct support for software technology parks by assisting with the development of high-quality strategic infrastructure and supplying administrative help. It also makes basic infrastructure available, including reliable power; fully furnished office space; and communications facilities, including high-speed data lines and internet access. Export-oriented software firms in the parks have been granted tax exemptions for 5 years.

The software technology parks provide a decentralized, one-stop shop for applications from potential investors. The local directors of individual parks have wide-ranging powers and are intended to serve as friend, philosopher, and guide to the industry while also functioning as the eyes and ears of the Department of Electronics (Saxenian 2000a). An important incentive provided by the department was to allow 100% foreign ownership

in return for meeting export quotas. Companies that locate in the parks are also allowed to freely repatriate capital investment, royalties, and dividends after paying the necessary taxes (Saxenian 2000a). The Indian software industry in Bangalore thus has a significant competitive advantage over other Asian countries that impose controls on foreign companies investing in the ICT sector.

The clustering process in Bangalore has worked at a number of different levels: job creation; inward investment; innovation; skill formation; and development of physical, digital, and social infrastructure. The clustering process has had some difficulties in that the whole-of-government approach linking local industry development opportunities to national education, science and technology, and innovation architecture has not advanced as hoped. Nevertheless, evidence indicates that some businesses have learned to collaborate with rival firms to fill new export orders and develop new products.

Bangalore has, however, become a victim of its own success. The rapid growth of the city has created significant development and transportation problems and put additional pressure on the city's congested roads. Software companies are also now fierce critics of the city's energy grid, as power cuts take a toll on their businesses. The quality of Bangalore's infrastructure has improved little over the last decade. Bangalore is also short of managers with strong marketing skills, although this should correct itself, as significant numbers of Indian ICT workers acquire these skills by taking postings in Australia, Europe, North America, and Singapore.

The Bangalore Metropolitan Regional Development Authority and the Bangalore Development Authority have responded to the development and transportation problems by working with the Cities Alliance to improve living conditions for the urban poor. The city development strategy, prepared with the participation of local stakeholders in the economic development of the city, defines a vision for the city, analyzing its economic prospects and establishing clear priorities for action and investment.

Despite the problems, Bangalore provides an example of a city within a developing country that has been able to mobilize its resources successfully to make the most of the opportunities provided by connecting with the global economy. Despite weak regional governance, it has successfully capitalized on links with the Indian ICT diaspora, especially in places like Silicon Valley, and has taken advantage of its English-literate and articulate population and Department of Electronics policies to develop strategic infrastructure for ICT in selected regions. Bangalore now has a highly creative innovative milieu of skills and competencies that is enabling the development of cross-industry links into the multimedia, education, and R&D sectors.

4.5.2 Education Cluster, Sleman, Indonesia

Sleman is one of five local governments or regencies that make up the Yogyakarta Special Territory and forms the northern part of the city of Yogyakarta. The regency is one of the most progressive in Indonesia in terms of institutional reforms. The regency also has some of the richest historical, cultural, and tourism sites in Indonesia. It is internationally famous for the Prambanan and Kalasan Hindu temples built in the 8th century, which attract a large number of visitors every year.

Sleman has won a number of awards in recognition of its achievements in governance, economic development, tourism, and financial management (Sorosa 2006). The local government has adopted several urban development good practices that have significantly contributed to sustainability.

Three sectors—trade, hotel and restaurant services, manufacturing, and agriculture—dominate the Sleman economy, contributing to more than 50% of gross regional product. The structure of Sleman's economy has changed in recent years largely because of initiatives by the regency's government to attract national-class education facilities to the region (Sorosa 2006). After a period of negative economic growth in 1998 and 1999, Sleman experienced positive economic growth averaging about 4.4% per year and up in 2000–2006. This is slightly above the growth rate for the national economy, reflecting Sleman's improved competitiveness.

Sleman has undertaken several initiatives that have significantly enhanced its capacity to support a more diversified economy and clusters. Among the more important initiatives is the development of the education cluster. Sleman is unique in that it not only houses one of the largest and finest universities in Indonesia, Gajah Mada University, but is also home to 35 other large and small public and private universities, giving Sleman the title of Indonesia's City of Education. Sleman has become an education cluster, enabling it to develop a degree of competitiveness and specialization in knowledge and learning not found elsewhere in Indonesia.

The university campuses and their activities naturally attract economic development through the multiplier effects of education and R&D activities on the region's agriculture, tourism, and cultural sectors. The universities have also drawn international interest and led to exports of education services. The level of education of Sleman residents is relatively high compared with that in other areas of Indonesia. Challenged by a citizenry that tends to be more rationally critical than others, the regency's government has provided the impetus for the introduction of good governance measures.

To support the development of the education cluster and two emerging agribusiness and tourism clusters, the regency has taken important steps to improve the enabling environment for business development. These include the following:

- *Performance-based management.* Sleman prepared an annual financial report and presented it to the public. An independent professional audit of the report ensured that it complied with national accountancy standards. The audited financial report was published as a demonstration of public accountability.
- *Local policies and initiatives.* These were implemented to support regional development and have included
  - undertaking good governance planning to show how regional autonomy improves services to society based on transparency, accountability, and public service principles;
  - improving the social welfare of the community labor- rather than capital-intensive economic development projects;
  - improving the conditions in society by providing education and health facilities; and
  - bringing about a more democratic society by introducing a community education program to familiarize residents with the concept and responsibilities of citizenship.
- *Economic planning and analysis.* Sleman invested heavily in data collection and in skilled research and analysis staff to support its corporate and development planning. While the application of these tools was not sophisticated, the region gained a better understanding of its competitiveness.
- *Resource mapping.* Sleman undertook extensive mapping of its social, environmental, and economic resources. This mapping project involved assistance from the Swiss government in establishing a geographic information system linked to the cadastral index maps for the region. The regency has used the information to plan, monitor, and evaluate the environmental impact of development. It has also shared information and collaborated on projects with other regencies in the province.
- *Investment in human capital.* Sleman has invested heavily in human capital development and has one of the most well-trained and competent staff of any local government in Indonesia. Through strong leadership, the regency has encouraged the development of new and innovative ideas to improve the efficiency and effectiveness of public service delivery.

4.5.3 Multi-Industry Cluster Development, Chiang Mai, Thailand

The Thai government has implemented cluster development strategies to improve national economic performance and technological capabilities.[1] The National Science and Technology Development Agency, a major research organization, is responsible for fostering the development of industrial clusters based on the national system of support for innovation (Wonglimpiyarat 2006). The agency has supported a cluster-based economic development model to meet the challenges of a knowledge-based economy. A small but significant network of industry clusters has developed in Chiang Mai.

Chiang Mai is a major cultural center, and much of its industrial activity originates from a history of local crafts. The key industries are tourism and handicrafts. However, Chiang Mai is unique because it hosts the only center in Thailand dedicated to private sector innovation. The Research and Development, and Innovation Service Center of the Federation of Thai Industries is actively involved in collaboration and the facilitation of innovation among local industry members. The emphasis is on innovation, both technological and non-technological. The center portrays itself as the main driver and facilitator of the innovation system, which is intended to support the development of new and improved export products and services from Chiang Mai.

Most industries in Chiang Mai fall into one of eight key clusters. Rating these clusters without additional information and analysis is not possible, but Chiang Mai's international tourism cluster would no doubt rate highly. The scope and activities of the seven clusters are as follows:

- *Food and agri-industry.* This cluster develops exports of local fresh, preserved, and processed food and of beverages. R&D activity has led to the development of new products and quality improvements in existing products, especially a greater variety of cut-flower exports. The attention paid to innovation has resulted in a new ice cream product using new machinery.
- *Handicrafts.* The handicrafts cluster has fostered the skill-intensive production of handmade products like lacquerware and wooden and silver items. R&D activities have produced machine tools that have greatly increased productivity and the quality of local handicrafts. Innovation has led to the use of clean technology to improve productivity and reduce costs, to process innovation to come up with new product lines, and to the use of workplace learning to improve productivity.

[1] Sutham Vanichseni of SVI Initiatives, Bangkok, and Pun-Arj Chairatana of the Public Policy Development Office in Thailand provided background material for this case study.

- *Construction and decorative materials.* This cluster lacked the necessary focus on intensive production of construction materials, such as roofing and other kinds of tiles, bricks, window frames and precast concrete products, and decorative materials including furniture and fittings. R&D activities have involved experimentation to find an optimal firing temperature for brick and tile production and pilot production of roof tiles using molding extruders. Innovation has led to the development of new brick and tile materials, the use of a new heat recovery system for process improvement, and trend setting in knock-down products.
- *Fashion.* The fashion cluster has directed its efforts at developing textiles, garments, leather products, and jewelry. Innovation in this cluster has led to new blends of cotton, linen, wool, and silk to generate new products; new preventive maintenance, line balancing, and inventory control systems; new dyeing processes; and the application of local knowledge to new styles.
- *Health.* This cluster has concerned itself with health services, for instance, spas, massage, relaxation, rehabilitation, and hospitals, and with health products, such as festival food, natural pharmaceuticals, and cosmetics. R&D activities have included sensory analysis to improve bee pollination and honey products, and clinical research into the use of natural dietary supplements for diabetes patients.
- *Tourism.* Chiang Mai is well known as a tourist destination. It has many cultural attractions, restaurants, and hotels and is a center for tour operators and ticketing agents who organize trips to many other parts of Thailand and to neighboring countries. The industry has become more innovative in applying ICT to improve service quality, and in packaging new tours and services based on local culture, for such things as traditional weddings and religious ceremonies.
- *Knowledge-intensive services.* The internationalization of Chiang Mai's economy has opened up new opportunities in education, consulting services, technical testing, product design, and R&D. To capitalize on these opportunities the city has been particularly innovative in introducing English courses so that local firms can participate in international markets.

4.5.4 Knitwear Industry Cluster, Tirupur, India

Tirupur, in Tamil Nadu Province, is an industrial city with a population of more than 400,000. It has been an important textile manufacturing center since 1870. Tirupur's knitwear industry cluster is one of the important garment industry clusters in India, providing direct and indirect employment to more than 30,000 people. It accounts for more than 50% of India's cotton knitwear exports, and has become a major foreign exchange earner.

Tirupur was a cotton-ginning cluster before it was transformed into a hosiery cluster and finally into a knitwear cluster. Over time, the Tirupur cotton market and ginning factories lost their competitive edge to similar centers that developed elsewhere in the country, and many of Tirupur's entrepreneurs switched to knitwear, which was exported to the United States through Mumbai merchants. However, knitwear production was not sustained, so most manufacturers continued filling small orders for merchant exporters in Mumbai. The turning point for the industry occurred when an entrepreneur from Italy came to Tirupur in 1978 to examine the prospects of investing in the garment industry. On becoming aware of the quality of the garments, the skill base, and the opportunities in Europe, a major retail chain from Italy came to Tirupur to buy garments in 1981. Securing a major exporter was enough to rejuvenate the area's textile industry.

The formation of the Tirupur Exporters' Association in 1990 provided the foundation for the development of the cluster. The association undertook a number of initiatives to address business development issues without waiting for the government to take the lead. These initiatives included establishing the Internal Container Depot in 1995 to deal with logistics problems; setting up the India Knit Fair Complex in 1997 to provide a location for garment exhibitions; setting up the Tirupur Area Development Company to address the town's infrastructure; and developing the Netaji Apparel Park in 2006. The association has provided a role model for other cluster development initiatives in India.

The Tirupur knitwear industry cluster has grown rapidly since 1990. This growth is partly due to India's economic reforms, which have enabled businesses to compete for export markets and benefit from the competitiveness of India's low wage and salary structure. In addition to low wages, other factors that have been advantageous for the cluster's development include the following:

- *Access to export markets.* For the larger companies in the cluster, access to export markets has been the driving force for improving their competitiveness (Cawthorne 1995). The key organizational learning generated and the managerial and production capacities built have helped companies adapt quickly to more demanding markets as these have developed (Tewari 1999).
- *Reorganization of the labor force.* Government and business have taken steps to work with the labor force (especially women, who own many of the micro-enterprises) for the reorganization of the production structure and labor process, leading to greater efficiencies and productivity gains (Neetha 2002).

- *Learning relationship.* The exchange of information and ideas has created a learning experience between first-time exporters and their foreign buyers, resulting in a more customized fit between producers and buyers as well as feedback to intermediaries (Tewari 1999).
- *Organizational change.* Better-performing companies have paid greater attention to making organizational changes in their work practices, thereby increasing productivity.
- *Embedded nature of production networks.* Knowledge embedded by the Tirupur Exporters' Association and the government's assistance programs has assisted local companies in creating a dynamic middle tier of local exporters that are leading the cluster's transformation and modernization (Tewari 1999).

4.6 Applying the Lessons from Industry Development to Cluster-Based Economic Development

Facilitating cluster development is a relatively new concept in most Asian countries, although naturally developing clusters have existed in some cities in Asia for hundreds of years. National and local governments in Asia are showing a growing interest in facilitating industry cluster development, but uncertainty about the process and whether it provides the best model for achieving more sustainable development outcomes persists. The experience in facilitating the development of clusters in advanced economies suggests that it is good practice, but that there can be no guarantee of success (DGCIS 2009).

Clusters can be encouraged to establish and develop in two ways. The first approach is to build on existing or established core competencies and other factors of competitive advantage in established local companies and industries. These clusters tend to evolve from historic industries, and as a city's or city region's population grows the cluster creates new opportunities for the development and expansion of local businesses and supply chains, thereby creating a critical mass of companies that feed off one another. The expanding cluster leads to the creation of centers of innovation and networks that are recognized by new business entrants for their excellence, creativity, and attractiveness.

The second approach involves developing new clusters from scratch, usually in industrial parks. The ability to catalyze the expansion and integration of supply chains is critical to the development of greenfield clusters. As these clusters expand, opportunities for import substitution

arise, and the expanded network of local competitive suppliers and distributors forms the nucleus of companies in the cluster and provides the means for cluster growth.

A feature of many Asian cities is consumption- and population-driven economic growth. The sustainability of these city economies is weak. Consumption-driven growth only creates demand for goods and services, most of which are imported and paid for by rural exports and remittances to families. Some governments have sought to address this problem through supply-side initiatives that foster regional development, including the construction of industrial estates and SEZs, rural development, and urban redevelopment projects. While many of the government initiatives to stimulate economic development, investment, and employment have been successful, most attempts to decentralize and stimulate new industry development away from larger cities to regional towns and districts have met with limited success in attracting investors. National and local governments have had to shoulder the financial costs of maintaining large industrial estates with no factories.

Much of the new investment in industrial development in Asia has occurred and will continue to occur in a few cities. Many secondary cities and regions will continue to struggle to attract development unless they can build the enabling environments and strategic infrastructure that will allow them to gain some kind of local competitive advantage. The current dependence on supply-driven approaches to stimulating the development of secondary cities is not working well in many Asian countries. Fresh approaches to stimulating more sustainable urban economic development are necessary. These will require greater emphasis on policies and programs that stimulate endogenous and exogenous (from exports) growth.

To deal with this problem, local governments in regional towns and cities must find ways to create enabling environments, set priorities for economic development and strategic infrastructure investment, establish and attract growth catalysts, and build human capital to create the strategic architecture that will attract investors and developers to less advantaged cities. The development of clusters, which shows promise in India, the PRC, and Malaysia, offers a way to reinvigorate underperforming industries and to stimulate the development of new ones.

The CCED framework described in the next chapter offers one way for cities in Asia to work out how they can create the strategic architecture that will make their economies more competitive, creative, and sustainable.

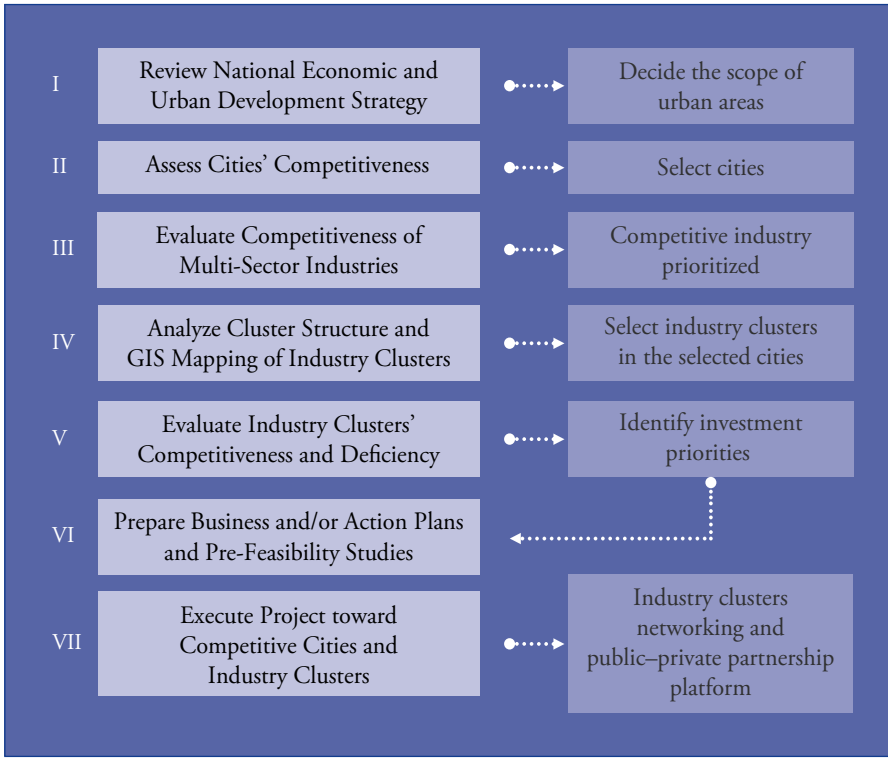
Chapter 5
Building Competitive Local Economies: Approach and Analytical Steps

Though industry clusters and records of relevant experiences proliferate, there has been no systematic or structured research into (i) the key drivers of city competitiveness, (ii) the indicators of industry cluster strengthening, and (iii) the conditions that cities and industries should work together to develop in their local or subnational economies. What makes the local economy competitive must be better understood to attract investment and create employment opportunities. To maximize the benefits from the enabling business environment, it is also important to prioritize the target intervention areas for government and business.

At this point, it is important to distinguish between (i) the ultimate goal of CCED (the first figure in Chapter 1), and (ii) the pragmatic steps toward achieving a competitive local or subnational economies (Figure 5.1). The ultimate goal is more job and income opportunities for local residents. Meanwhile the pragmatic steps guide those responsible for making decisions so that targeted interventions can be prioritized by governments and business, and adequate incentives can be provided to attract investment for a city's economic development potential. The CCED approach involves seven steps of systematic analysis, as shown in Figure 5.1.

The CCED approach uses a wide range of analytical tools and techniques, as well as consultative, dynamic, and action-oriented learning processes, in formulating strategies and plans of action that support the development of industry clusters and other productive economic activities in cities (or subnational regions). CCED is seen to be particularly useful in mapping out priority investment areas to arm decision makers with the information needed to achieve the greatest development impact. This chapter explains the seven steps in the CCED analytical process in detail. But the three underlying principles of competitiveness in new urban economies must first be considered.

Figure 5.1 Seven-Step CCED Analysis



CCED = cluster-based city economic development, GIS = geographic information system.

Source: Authors.

5.1 The Three Principles of Competitiveness in New Urban Economies

Spatial agglomeration, as it intensifies, tends to increase specialization in geographic localities by opening up niche opportunities for mSMEs to develop and capture, or fill import gaps. These niche industries heighten the synergy among companies and industries, offering the locality some form of competitive advantage and helping to lower local transaction costs. A small, but often powerful, critical mass of industry clusters thus develops. How these agglomerated economies can be made more competitive clusters is a challenge for governments and businesses, as many factors relate to the competitiveness of cities. The variables also differ considerably between cities and countries.

Krugman (1997) contends that countries do not compete against each other in any real sense. Companies and cities do. Therefore, those

responsible for the economic development of cities must understand how enterprises can be supported in competing successfully for trade and influence. Among the many factors that dictate how cities are positioned and function within global and national economies are the size, scale, and level of economic development; the geography and history of the cities; the level of their endowed resources and human capital; and the nature of their governance systems.

Under the new model of economic development, competitive advantage results from the capacity of cities, businesses, and governments to be flexible and to improve on technologies, methodologies, products, market segments, operating strategies, and policies. The city becomes a platform for a global strategy, a place where the activities of most companies will take place. Economic development planners must therefore identify the activities that will give their city an advantageous niche, no matter how small, in the future.

The globalization of communications and information systems means that companies, regardless of size or location, have the same access to new knowledge and ideas. To stay ahead of competitors, it is no longer enough for business enterprises to invest in new technologies, human capital, innovation, and new product development, as many will have the same access to new information and innovation. A new phenomenon related to the competitiveness of cities—collaborative advantage—has emerged in recent years. The concept of mass collaboration (Tapscott and Williams 2006), which is linked to collaborative advantage, has turned many an idea about how cities and companies strengthen competitive advantage on its head.

Competitiveness in local economies and business development is now directed toward a new objective: reducing total supply chain transaction costs. Governments and businesses must adopt strategies that will both increase internal efficiencies and reduce the total transaction costs of externalities. How well national and city governments succeed in reducing those transaction costs, especially for businesses, will determine the competitiveness of cities and the extent to which the local economies develop.

Finding ways for cities, public agencies, and business enterprises to collaborate and share knowledge to reduce the transaction costs of externalities is the wave of the future. Demonstrating how collaborative advantage can be achieved to make urban economies more competitive and sustainable is a central goal of CCED. As the review of the literature in previous chapters showed, *three principles* are of particular consequence in meeting the CCED objectives.

5.1.1 Principle 1: A Long-Term, Strategic Vision for Urban Economic Development

To sustain the growth of local economies, those responsible for the economic development of cities must find ways to continuously increase productivity. They can do so by focusing on a narrow set of criteria related to the factors of production. The most important of these criteria is an economic vision for the development of the local economy, a vision that civil society generally agrees to and that can inspire collective effort and confidence to outcompete rivals. Hamel and Prahalad (1994) name the key factors in the development of the vision and describe them in terms of their strategic intent: the realization of a dream that provides a sense of direction, a sense of discovery, and a sense of destiny. It involves setting goals by identifying future opportunities that are based not only on the resources owned by companies and cities, but also on better leverage of those resources. It often means unlearning the past.

Realizing the vision requires the key decision makers to reach a collective understanding of how competing for the future will be different from the way things were done in the past, and an accepted point of view about where the opportunities lie. This collective understanding can energize cities and clusters to achieve the goals. Moreover, the goals must be in harmony. Having several competing goals is almost as bad as having no goals at all. The collective goals for local economic development will guide business and government policy, investment, and development decisions.

Cities and regions must therefore identify the areas in which they should specialize if they are to be competitive. But identifying those specializations, Porter (1990) says, often matters less than being clear about how they are to be developed. The structure of regional leadership is therefore critical. Businesses and governments must determine the major capabilities to be built, and have a detailed plan for doing this.

5.1.2 Principle 2: Endogenous Growth and Industry Cluster Development

Cities become more self-sufficient by creating enabling environments that induce supply chains to converge and specialize. Encouraging similar businesses and competitor firms to co-locate and collaborate is one effective way of doing this.

Agglomeration is spontaneous because of the presence of unique competitiveness factors, economies of scale; however, localities can speed up the process toward competitiveness with the right strategic

architecture, which can help reduce local transaction costs and attract new investment and business activities. Governments must consider carefully how they can support both demand- and supply-side initiatives for local economic development by creating the right kind of enabling environment and strategic infrastructure. In an increasingly global and interconnected world, the soft infrastructure elements of strategic architecture associated with social capital and skills development, governance, and technology orientation spell the difference.

In the CCED framework, industry clusters catalyze and drive economic activities in cities and local communities by helping to create some form of localized competitive advantage. Industry cluster development runs parallel with and complements consumption-driven growth, still the primary driving force behind economic development in most Asian cities. Industry clusters add diversity and depth to the development of local economies by adding value to and expanding supply chains. By stimulating expanded and new forms of investment, innovation, and development in cities, they also have important multiplier or spin-off effects.

5.1.3 Principle 3: Collaboration and Partnerships for Local Economic Development

Until recently, efforts by governments and businesses to boost the competitiveness of cities emphasized improvements in competitive advantage. But changes in the way goods and services are produced, natural resource limitations worldwide, the growing dependence of businesses and governments on knowledge, innovation, and technology, and rapidly changing markets have pushed businesses, and more latterly governments, to look for ways of creating collaborative advantage in local economies to stay competitive.

Collaborative advantage (Huxham 1996) is achieved through the sharing of knowledge, information, assets, resources, risk, waste management, and materials recovery between governments, businesses, and communities of interest. For centuries, companies and centers of economic activity strove for dominance over capital, information, technology, and resources. This old model of economic development no longer holds. The CCED approach rests on the concept of collaborative advantage. A key feature is the focus on building partnerships between the private and public sectors, nongovernment organizations, and civil society for economic development. The partnerships may be formal or informal, or a combination of the two.

Informal partnerships may include communities of interest groups or knowledge networks that share information or ideas. Much of this

information is tacit knowledge (Ninan 2005; Sureephong et al. 2006) needed for social capital development and innovation. Formal partnerships may include industry or cluster associations or legally binding agreements between government agencies, businesses, and communities. All such partnerships for economic development, formal or informal, establish a variety of mechanisms that foster collaboration and collective support for local business development, employment, and investment. Partnerships are necessary for greater integration of spatial and economic policies, planning, information systems, and management practices.

Collaboration and shared vision translate into many operational benefits, such as shared market entry costs and market intelligence, collective negotiation for trading, shared research and learning experiences, and coordinated visits overseas. Two types of efficiencies emerge: *static efficiencies*, which are external efficiencies derived from the much larger scale of operations of a cluster compared with the operations of a company; and *dynamic efficiencies*, which lead to innovation. As a unique critical mass of similar types of companies becomes established in a particular location, new businesses are formed and the process becomes self-reinforcing.

5.2 Step 1: Review the National and Local Economic Policy Environment

Policies, laws, and government regulations have an important impact in shaping the growth and development of local economies. In many cases these shape the flow of funds from national to local government and taxation sharing arrangements, set priority sectors and geographic areas for directing budget expenditures and investment, setting out industrial relations and wages, and urban planning and development requirements. Subnational governments also have different powers and responsibilities that can significantly affect levels of economic performance. It is important that these policy arrangements between the different levels of government are analyzed carefully, as they shape the way strategies and projects are developed to support local economic development.

International trade and development agreements, together with national economic development and spatial planning policies, greatly affect the way strategic infrastructure for local economic development is created. An overview of the national policy environment for economic development is therefore a good place to begin. Much of the necessary information can be obtained from public reports and studies.

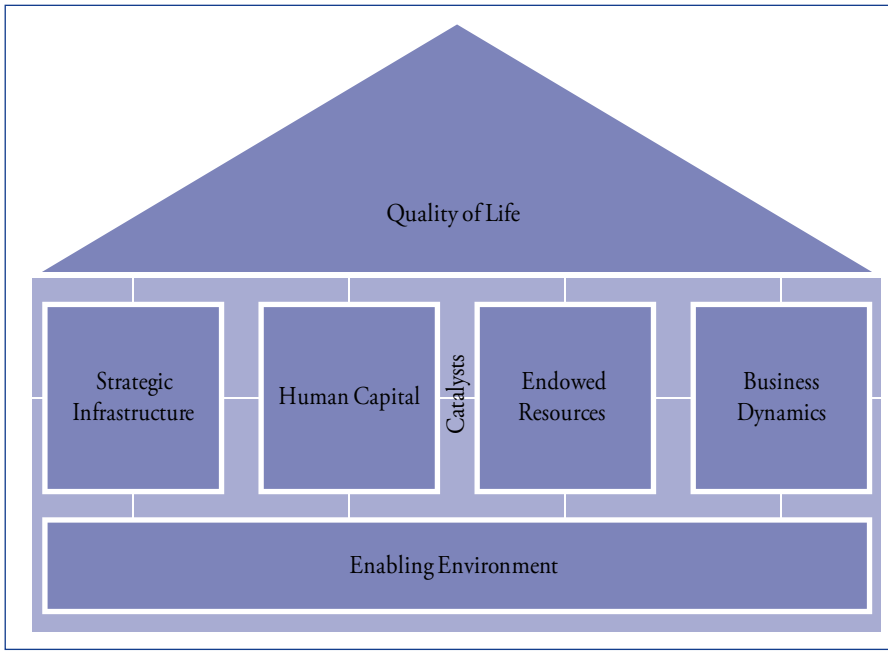
Such a review should yield information about the following urban development matters:

- the national urban system and the way it functions, including national, state, and local responsibilities for economic governance;
- the economic geography and contribution of major cities to the national economy;
- national and state economic policies for the economic development of cities;
- national and state spatial planning policies and strategies for the development of cities, especially metropolitan regions;
- major industrial projects and programs designed to catalyze local economic development;
- national, state, and local policies to stimulate investment in R&D, innovation, technology, and human capital for commerce and industry, including the development of special economic zones and industrial parks;
- policies and initiatives for specific sector industries and industry clusters; and
- funding mechanisms for national and local infrastructure development in cities, including bonds, loans, and public–private sector partnerships.

For local economies, reviewing strategic architecture can provide an overview contrast to the national economic policy. Strategic architecture is like a framework or plan describing the blue print for various building blocks which support or hold together the development and operations of a local economy. Cities need to work on developing their competitive advantage based on exploiting strengths and capitalizing on difference of these building blocks. Often the point of difference in the economic success of one city against another is according to the nature and quality of a city's strategic architecture.

By necessity, the design and development of strategic architecture must ensure investor confidence and, as much as possible, offer certainty to businesses, investors, and the wider community about the future direction of and support for local economic development. Strategic architecture thus provides a map for guiding the public and private sectors working together. It identifies the opportunities (i) to collaborate; (ii) to leverage infrastructure, endowed resources, human capital, and technologies; and (iii) to share information and knowledge to create strong and dynamic enabling environments for business and investment.

Figure 5.2 Building Blocks of Strategic Architecture Supporting the Development of Local Economies and Clusters



Source: Study team.

The strategic architecture of urban economies has basic building block, as shown in Figure 5.2. These, in combination, forge their competitiveness for a city economy to grow and develop. These elements perform a range of functions that are generally responsible for driving or propelling the development and continuing the operations of city's economy. While productivity leaps may be enhanced by the judicious application of technologies and methodologies brought in from elsewhere, trade and investment between cities and nations are powerful sources of productivity growth. The CCED model views the strategic architecture as the founding block for a longer-term development of a city's economy.

5.3 Step 2: Analyze the Six Drivers of City Competitiveness

The second step of analysis is to look into the factors that drive the economic competitiveness of cities in a country. As discussed in Chapter 1, many Asian countries, including the PRC, India, the Philippines, and Viet Nam, have begun to measure the competitiveness of their cities. The Philippine Index

Table 5.1 Drivers of City Competitiveness

Drivers of City Competitiveness (Philippines)	City Competitiveness Index (India)	Urban Competitiveness Index (Global)
• Cost of doing business • Dynamics of local economies • Human resources and endowed resources • Infrastructure • Responsiveness of LGUs to business needs • Quality of Life	• Factor conditions • Demand conditions • Strategy and rivalry • Supporting and related industries	• Economic scale • Economic growth • Development level • Production efficiency • Employment • Economic aggregation • Technological innovation • Decision-making ability

LGU = local government unit.

Source: Study team.

of City Competitiveness (AIM 2007), which is based on the competitiveness index of the World Economic Forum (1999). It measures six drivers of competitiveness using a mix of qualitative and quantitative indicators. The Competitiveness Index for Indian Cities uses a set of drivers, based on the four competitiveness factors of the Porter (1991) diamond model. The Global Urban Competitiveness Index (Ni, 2009) uses another made up of a set of eight driver indicators. Table 5.1 shows the different drivers used by these three indexes, using a mix of qualitative and quantitative data from statistical and survey assessments.

The Philippine model is one of the better models used by different countries in evaluating city competitiveness. It is relatively easy to use. It has been run several times. It is more broad-based, incorporating quality of life indicators, and it has been used to measures small and medium-sized cities. However, in the context of the operations of modern economies and the CCED approach, we need a tool for assessing the competitiveness of cities that proved a basis for developing projects and other initiatives to develop an overall new "strategic architecture" for cities.

The detailed contents of each economic driver for competitiveness cannot be replicated easily somewhere else, as the scope, scale, mix, and features of attributes composing economic drivers differ from city to city. Nevertheless, the six main key drivers are common to many cities, especially within the same county; for example, national regulations, wages, and labor conditions offer little differences in the way of competitive advantage within a country, but do affect the competitiveness of cities when comparisons are made between countries. Cities, therefore, must work out ways to develop and strengthen the competitive attributes of local economic drivers to create the foundation upon which to build and develop the local economy.

The *six drivers* of competitiveness must be able to respond quickly to changes in the means of production, in export or domestic market demand,

in technologies, or even in climate change. The composition of each driver may vary between cities and regions. The degree of strengthening and fine-tuning these six drivers will be critical to the economic performance of cities or city regions.

In this regard, catalysts transform and link systems, as discussed in Chapter 3. In the economic development context, catalysts are people, organizations, and devices that can stimulate interest, actions, and events, and provide or facilitate shared access to pools of resources, capital, and assets. They are the connecting or link mechanisms which cement or combine different driver attributes together to support the functioning of a wide range of economic activities. They take different forms and perform a wide range of functions. They are an integral feature of all six economic drivers and not easily separated into a single set of identifiable factors. Economic catalysts may include major infrastructure development projects which create spin-offs or spillover effects generating further investment. Tax incentives and industry support policies are important catalysts for investment and help to reduce business transaction costs.

The involvement of catalysts encourages creativity by making available resources otherwise inaccessible to individual business enterprises because of high cost, scale of operations, or other reasons, or by giving those enterprises collective negotiating power. Catalysts in the form of civic entrepreneurs can devise innovative ways for local governments to develop major projects, often without increasing public debt. They have a decisive role in new investments and infrastructure, management services, community development organizations, and projects and programs that governments are unable to put up through traditional means. Catalysts also facilitate and glue together for the development of industry clusters and are responsible for the success of Bangalore, like the ICT industry.

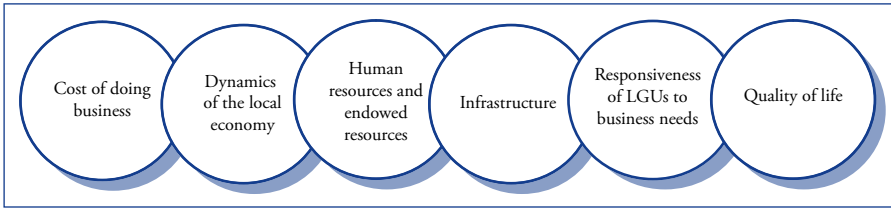
5.3.1 The Six Drivers of City Competitiveness

In the Philippine model, weights ranging from 15% to 25% are applied to each driver, and distributed among 43 attributes of competiveness to reflect their relative importance to the overall competiveness of city economies. Qualitative information from experts is used, together with some quantitative data. The experts represent local chambers of commerce, business leaders, local government officials, and academics. Qualitative survey data is collected by means of telephone interviews or survey forms. The assessment of qualitative indicators uses a scale of relative competiveness ranging from 1 to 10. The CCED approach adopts the six drivers from the Philippine city competitiveness study, with some modifications in the associated attributes.

5.3.1.1 Responsiveness of Local Government Units to Business Needs

Local government plays a critical role in developing urban areas and enabling business environments. Private sector enterprises first assess the ability of the local government to respond to short-lived as well as systemic issues before deciding to invest in a business in the locality. The enabling environment comprises the governance structures and organizational arrangements that define the rules of engagement for business and economic development in specific jurisdictions. Enabling environments are shaped by public policies, rules, regulations, plans, standards, and other operating requirements set by governments, but especially by politics and leadership. Each requirement has some influence on local production systems and markets and on decisions made by businesses and investors. All local enabling environments are unique creations, but some will have a greater impact on stimulating economic development than others.

Figure 5.3 Six Drivers of City Competitiveness, Philippines



LGU = local government unit.

Sources: AIM (2007); Macaranas (2008).

In cities that have a reputation of corruption, slow bureaucratic processes, lack of transparency and accountability, and conservatism, the enabling environment is considered weak and a major barrier to economic development (Bannock, Gamser, and Juhlin 2005). A weak response by the local government units (LGUs) to the needs of private sector investors adds significant burdens to business development and operating costs by delaying decisions and fostering rent seeking by public officials. Strong enabling environments provide clear and transparent rules (i.e., a good governance system) for businesses seeking to engage with government. Strong enabling environments exact unequivocal commitment from local governments to maintain and enforce these rules, and provide guidance or rulings where these are not documented, to maintain fairness and equity in business and community dealings.

Leadership. Successful economic development demands strong and effective local leadership. Leadership is about doing, and making a major commitment to performance. It is not about the charismatic characteristics of a few

notable people. The leaders required to support local economic development include entrepreneurs, innovators, community heads, captains of industry, academics, and social commentators, who use the media and other forms of communication to convey ideas and information. The importance of grassroots leadership in local economic development (Henton, Melville, and Walsh 1997), especially in changing community attitudes, reducing xenophobia, overcoming environmental concerns, and developing community and lifelong learning support systems, should not be underestimated.

5.3.1.2 Business Dynamics of Local Economies

A vibrant local economy draws inward investments, generates income, and makes a city more attractive. The dynamics of doing business in a local economy are affected by the flow of information, openness to business and new ideas, aversion to risk, taxation, the costs of doing business, awareness of new technology and its use, the structure of the sector industry and of employment, and the preferences and behavior of consumers. Collectively these attributes create a business milieu that differs from place to place, with some cities and industries being much more dynamic or volatile than others.

Business dynamics encompass many of the domestic rivalry factors included in Porter's (1990) (industry) competitiveness model. Local companies compete vigorously, thereby creating a competitive environment that stimulates the rapid development of skilled human resources, related technologies, market-specific knowledge, and specialized infrastructure. Domestic rivalry also triggers the establishment of special programs and local schools and universities, government-supported technical institutes and training centers, and other specialized activities designed to provide information and knowledge for a wide range of economic activities. A highly regulated or controlled market significantly reduces business dynamics, therefore discouraging competitiveness of urban areas. Business dynamics also have a significant effect in stimulating the development of clusters. Rival and integrated companies tend to locate in one city or region as the business dynamics create opportunities to gather information, identify advances in technology and innovation, and gain access to capital and the high-quality skills needed for advanced manufacturing and producer service industries.

5.3.1.3 Human Resources and Endowed Resources

Resources are assets or qualities that are derived from natural capital (or endowed resources) and human capital. They come in many forms or types.

Natural resources. Endowed natural resources include such things as soil, water, vegetation, the coastline, forests, and minerals and other extracted

resources. In cities, natural features such as rivers, hills, foreshore areas, and natural wildlife habitats provide natural amenities for residents and visitors. They also have valuable ecological functions. Cities with rich regional hinterlands capable of producing food, raw materials, and relatively cheap energy sometimes enjoy a significant competitive advantage over cities with limited natural resources. But cities that have no access to rich natural resources and hinterlands are not necessarily disadvantaged. They can make up for this lack by being more specialized and efficient with respect to natural resources, built forms, and energy savings. The exploitation and destruction of natural resources greatly depletes the natural capital of cities and regions (Hawken, Lovins, and Lovins 1999), and even undermines the sustainability of GDP growth. In many cases, problems associated with soil instability, flooding, and groundwater are compounded, such that businesses and governments must shoulder heavy environmental costs (Douglas 2002) and cities are forced to undertake expensive mitigation and rehabilitation measures to protect communities and vital economic activities from further damage.

Human resources. Access to diverse pools of highly developed human capital is probably one of the most salient attributes of a competitive position for individual companies and businesses in open-market economies. Some industries are facing a growing global shortage of human capital, leading to greater competition and to incentives being offered to skilled personnel to move from one place to another. Incentives pull people to places like Hyderabad, India, which has a high demand for skilled ICT personnel, and the Arabian Gulf states, where demand for construction workers is high. On the other hand, there has been a substantial loss of skills in towns and cities in Bangladesh, the Philippines, Sri Lanka, and many other Asian countries. The alignment of the skills base with the production base is therefore a key aspect of increasing the competitiveness of cities. Public and private sector education and vocational training programs aligned with the demand for skills from local industries and public enterprises are an essential attribute of such competitiveness. Not all learning has to be formal; tacit learning or vocational skills training through networks, informal partnerships, and associations, often more cost-effective than formal education, is no less vital to the development of social capital. The spillover effects of knowledge, both tacit and formal, create new opportunities for business development, especially in the services sector.

5.3.1.4 Infrastructure

Infrastructure comprises the hard and soft infrastructure needed to develop the key exogenous or endogenous growth of industry sectors that will drive the development of local economies. It includes strategic assets such as urban infrastructure, buildings, and structures for the production of goods

and services, rather than their consumption. Strategic infrastructure may include specially developed assets, such as supercomputer, scientific, or testing facilities. Action plans for the provision of strategic infrastructure to facilitate the development of clusters and an enabling business environment should be linked to public investment plans that describe the corresponding costs and responsibilities (Stimson, Stough, and Roberts 2006).

Demand-Driven Infrastructure: Cities with poor basic infrastructure are greatly disadvantaged when it comes to being competitive. Many governments tend to think that hard infrastructure, especially transport facilities, will inevitably bring investment and development. This supply-side approach to economic development accounts for the major infrastructure projects built without demand for them. To be competitive, cities and city regions must learn to take a more demand-driven approach to regional economic development. In developing key hard infrastructure projects to support the development of city regions, governments must also plan, budget, and provide funds for the necessary supporting services.

Logistics. Integrated infrastructure, multimodal transport, logistics, and information and research facilities build competitive advantage for city regions. Smart infrastructure, smart buildings, and smart transport, including intermodal facilities that transfer goods and commodities seamlessly between transport systems, are part of a new portfolio of strategic assets and infrastructure that are reducing the transaction costs of business. Businesses will need such facilities, and the associated systems, to stay competitive as energy costs rise. Many regions tend to think that hard infrastructure, especially transport facilities, will inevitably bring investment and development. This supply-driven approach to economic development accounts for the major infrastructure projects built without demand for them. To be competitive, cities and city regions must learn to take a more demand-driven approach to regional economic development. In developing key hard infrastructure projects to support the development of city regions, governments must also plan, budget, and provide funds for the necessary supporting services. In this regard, they must take a longer-term perspective on the expected fields of specialization, and the degree and direction of growth.

5.3.1.5 Cost of Doing Business

Doing business entails costs—registration fees, taxes, personnel costs, transportation costs, utility charges, etc. How expensive it is to operate a business in the city compared with other cities is an important factor that companies must consider in deciding whether or not to do business in the city. Business taxes, business regulations and procedures, construction permits, informal fees, and costs of utilities, as well as tax incentives and industry support policies, all affect how the business performs.

5.3.1.6 Quality of Life

Livability, or the quality of the built environment. The productivity of companies is directly affected by their workers' well-being. Livability is concerned with the well-being of city residents, such as the quality of the built environment and the services available to residents for their recreational, social, educational, health, and security needs. Cities with high levels of pollution, crime, corrupt business practices, and poor-quality buildings and amenities rank low on the livability index. To improve livability, many cities have used public programs to clean up river systems; housing, industrial, and recreational areas; and parklands. With the increasing global shortage of skills in some industries, managers of companies and public agencies now recognize that, to attract senior executives and management personnel, cities must offer potential employees a high quality of life.

5.3.2 City Competitiveness: Analysis Technique

Table 5.2 shows a sample matrix used in the CCED assessment of cities. In the assessment, the six drivers carry different weights depending on relative importance.[1] The weights were assigned by a team of experts from government, business, and the academe with sound knowledge of

Table 5.2 Sample CCED Report on City Competitiveness

Driver	Maximum Score	City Score	National Average Score	City's Comparative Advantage against National Average (%)
Dynamics of the local economy	2.50	1.85	1.50	+14
Endowed natural and human resources	1.50	1.08	0.90	+12
Infrastructure	1.50	1.05	0.90	+10
Responsiveness of LGUs to business needs	1.50	1.08	0.90	+12
Cost of doing business	1.50	1.14	0.90	+16
Quality of life	1.50	1.08	0.90	+12
Total	10.00	7.28	6.00	+13

CCED = cluster-based city economic development, LGU = local government unit.

Source: Study team.

[1] The Philippine model uses weights ranging from 15% to 25%, and 5–10 attributes of competitiveness, for each driver.

local urban economics and development. In the CCED case studies (in Bangladesh, India, and Sri Lanka), the city competitiveness analysis was carried out by each country with its own data, but was based on the 43 common attributes, with variations to allow for each country context. The data collected for each attribute were compiled and processed in Excel, and the results for all the cities were presented in one table.

The selected attributes for each driver are scored as follows. Each of the 43 attributes is assigned a score on a scale of 0–5 (or, for more refined analysis, a scale of 0–10). A score of 0 indicates an irrelevant or inapplicable indicator. A score of 5 (or 10), which might be given to business dynamics in financial management in Singapore, for example, indicates international standing. The data come from quantitative and qualitative sources. For many Asian cities, however, quantitative data are often of poor quality or outdated. For that reason, the analytical technique is designed for simple scoring but can be easily adapted for use with more rigorous quantitative data. At any rate, the six drivers and 43 attributes are scored and analyzed through multi-criteria analysis (MCA), a technique explained in Chapter 4.

A comparative analysis of different cities in the same country in terms of the relative strengths and weaknesses of the six drivers would identify nationwide competitiveness trends and, if needed, allow comparisons with the country average and international levels of competiveness. With this analytical tool, policy analysts can spot major structural weaknesses in competitiveness factors, arrive at key measures that would strengthen the economic performance of the cities, and determine what the individual cities must do to become more competitive.

This analytical tool for assessing the competiveness of cities is a significant improvement on the traditional techniques for analyzing strengths, weaknesses, opportunities, and threats (SWOT). SWOT analysis does not readily permit comparisons of drivers and indicators of competitiveness. The CCED technique, on the other hand, is able to demonstrate key weaknesses and strengths in the competitiveness of cities within a country, provided the same building blocks are measured for comparison. When the weighted scores for the six drivers are aggregated for each city, sorting the resulting values (competitiveness index scores) enables the ranking of cities in a country according to their degree of competitiveness. For example, in the Sri Lanka case study, 14 cities (shown in Table 8.3, Chapter 8) were evaluated and ranked according to the scores for the same six drivers (and 43 indicators) used in the Philippine competitiveness study.

5.4 Step 3: Explore National and Local Multi-Sector Industry to Understand the Industry Structure

The next step in the CCED process involves *multi-sector industry analysis (MSIA)* to understand the national industrial structure. The results of this step of the analysis will be used again later as base reference data when the intensity of presence of a specific industry sector at the city level is assessed. The national MSIA does not need to be repeated every time. The structure of the national economic and industrial sectors changes gradually, and the changes can be captured every 3–5 years. After the macro-level country analysis, the sector industry analysis in a given locality can be done. The results of the MSIA of local industries, when compared with national data, give a better understanding of the changing patterns and structure of local industry and local economic potential.

Further, as explained in Chapter 4, location quotient (LQ) and shift-share analyses should be applied to figure out how industry sectors in the selected locality have been changing over time, and the contribution of local industries to employment opportunities and national GDP growth. LQ analysis identifies the concentration or intensity of business activities. The results can identify the industries that are contributing most or least to the local economies.

This section briefly discusses the MSIA, LQ, and shift-share techniques adopted in the CCED analysis and the use of the results.

5.4.1 Step 3.1: Conduct Multi-Sector Industry Analysis

5.4.1.1 At the National Level

MSIA uses the MCA techniques described in Chapter 4. Various indicators defining the competitiveness of different industry sectors are reconstructed in a matrix table (Table 5.3), assigned nominal scoring values, and assessed. The competitive indicators of the industry sectors (C_1, ..., C_n), such as the environment and human resources catalysts, are listed in the first column, and the various industry sectors, such as mining, energy, and financial services, run across the top of the matrix. The industry sectors usually follow the standard industrial classification (SIC).[2] See Table 6.4 (in Chapter 6), for example, for the competitiveness indicators for various industry sectors. Figure 4.3 in Chapter 4 explained the potential indicators for MSIA.

[2] An industry sector is a group of establishments that are strongly vertically integrated and produce a similar range of products or services. Industry sectors are normally classified under the standard industrial classification (SIC) system, although many countries have their own industry classification standards, for example, the North American Industry Classification System.

Table 5.3 Sample MSIA Matrix

Industry Sector / Competitive Indicator	Mining	Forestry	Fishing	Tourism and Leisure	Manufacturing	Energy	Financial Services	Food Processing	Agriculture	Public Utilities	Retail Services	Communications	Transport	Public Administration	Community Services	Domestic Services	Industry Indicators Competitiveness Index
Access to financial resources																	
Access to networks or associations																	
Natural resource endowment																	
Human resources																	
Cost of utility services																	
Tax and regulatory environment																	
…more indicators can be added…																	
Industry competitiveness index																	

MSIA = multi-sector industry analysis.

Note: Standard industrial classification (SIC) data are sometimes not available, especially in the smaller cities of Asia. It then becomes necessary to use surveys and consultation to gather qualitative information for scoring the attributes.

Source: Roberts and Stimson (1998).

A nominal scoring system (1–3, 1–5, or 1–10) is used in assessing the value of the competiveness indicators for each industry sector. The perceived strengths or weaknesses of the different indicators of competitiveness for all the industry sectors in an economy should be recorded, as shown in Table 5.3. The scores in the matrix are based on data and information from surveys, expert group meetings, and assessments. Weights are applied to the raw scores of industry sectors in the matrix in recognition of the fact that some attributes carry more weight in the development of an economy than others. The competitiveness values are scored and entered into each cell in

the matrix. The sum of the values of the cells across the table (the horizontal shaded area in the table) indicates the strength of the different competitive indicators supporting all of the industry sectors in an economy. The sum of the column scores (the vertical shaded area in the table) indicates the competitiveness of an industry sector in the economy.

MSIA provides valuable information for understanding the national industry structure, and the relative competitive strengths and weaknesses of the industry sectors. The results of the analysis give important clues to the size of the industry sectors and their contribution to GDP. The results can be used in assessing risk factors by sector (Roberts and Tabart 2005; Roberts 2006) or by type of risk (economic, social, environmental, political, or technological). Such an analysis helps in understanding the factors that must be present to keep the industry sectors competitive and the measures that need to be taken to manage risk.

5.4.1.2 At the City or City Region Level

The central objective of developing competitive cities is to provide a better enabling business environment where companies and industries can be more productive so that the economy can grow, more jobs and income opportunities can be created for the residents of cities or city regions, and poverty incidence can be reduced. The second part of CCED analytical step 3 is concerned with establishing the identity of the industry sectors in a selected city (or city region) that can best help increase local GDP. A similar MSIA matrix is prepared for the major industry sectors in the city or city region. The total scores for the various industry sectors can generate a competitiveness ranking index for comparing the competitiveness of the industries. See Figure 6.5 in Chapter 6, for example. Toward the end of step 3, decision makers or investors should have a better idea of the city (or city region) that will be the focus of development.

5.4.2 Step 3.2: Examine the Structural Changes in Industry Sector Clusters over Time, at the Selected Local Level

Once the local areas of intervention are decided, those areas can be subjected to sector industry analysis. Shift-share, LQ, and input/output (I/O) analyses are used to examine the structural changes that occur in the industry sectors over time and the relative degrees of specialization in the sectors. These techniques were explained in Chapter 4. Shift-share analysis, using data such as employment, number of enterprises, percentage share of the industry sector, and capital markets over specific periods, can bring out

the changes in sector industry structure over those periods and show trends, for comparison with national data. The more extensive the sector industry data available, the more refined the results of the analysis.

LQ analysis can make apparent the relative concentration of economic activities and changes in employment in a given city, compared with the country as a whole. It also yields worthwhile clues about the industry sectors that have a bigger share of economic activities in the city. City region or subnational LQ analysis can provide information about business clusters or concentrations in extended territories, such as states or provincial governments. This information is useful in planning the strategic infrastructure and economic governance requirements of companies in the territories.

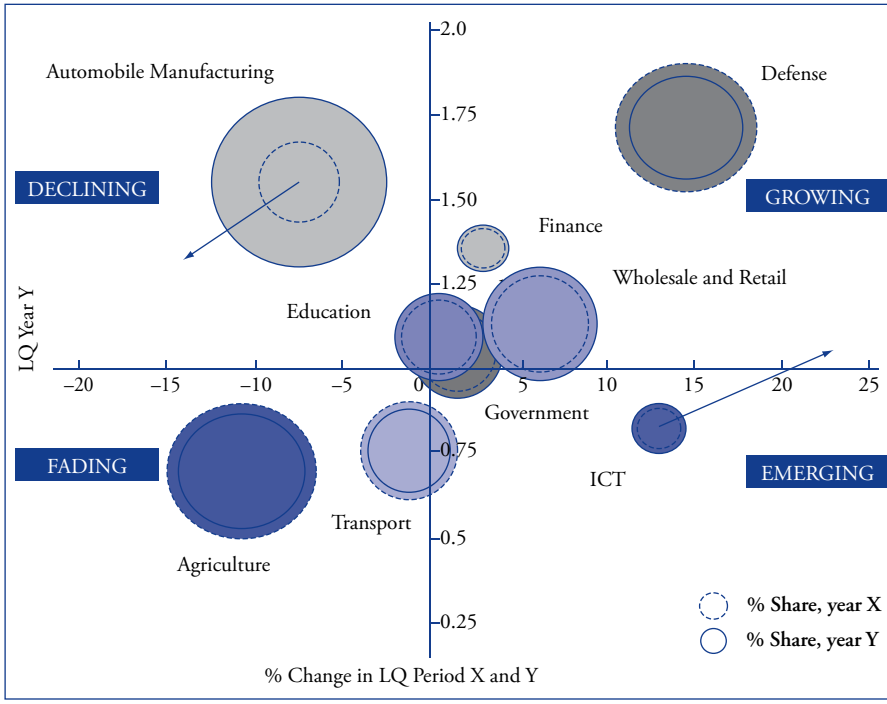
Sector GDP analysis involves creating an I/O table of a region's economy to determine total and sector industry contributions to GDP. The table can also have value in mapping supply chains of local clusters. Time-series I/O analysis (e.g., comparing tables for different time periods) reveals in-depth structural changes in imports, exports, gross regional product, and balance of payments, among other things. The analysis can point out industry sectors where significant value addition has occurred over different periods, possibly indicating the presence of emerging clusters or strong business networks.

Shift-share and LQ analyses can be combined to demonstrate graphically the changes in the structure of industry clusters over time in a specific area (city) of a country's economy. Figure 5.4 shows how the two techniques might be combined in an analysis of six industry sectors in a hypothetical local area.

The bubbles or circles symbolize industry sector intensity and changes over time. The two concentric circles for each industry sector show the change in the proportion of industry clusters in the study area over the time period measured. Automobile manufacturing accounts for the largest share of the economy (it is represented by the largest circles), with an LQ of 1.6, signifying a higher level of activity than the national average in year Y. However, the shift share of the sector has declined over time. The smaller size of the bubble for year Y than for year X suggests waning economic importance and competitiveness. Agriculture, another significant sector, is similarly losing vitality. However, ICT, despite an LQ of close to 1.0 in the locality, is growing (with a shift share over time of about 12% on the positive side of the x-axis) and is a possible micro cluster.

This analytical technique is very useful in presenting changes in industry sectors and clusters. Generally, industry sectors with LQs greater than 1 and a positive shift-share percentage over a given time period (those data points in the upper-right quadrant of Figure 5.4) are emerging and growing industry

Figure 5.4 Location Quotient and Shift-Share Change in the Economy of a Sample Metropolitan Region, 1997–2006



ICT = information and communication technology, LQ = location quotient.

Source: Study team.

sectors and clusters. A negative percentage change in shift share and an LQ of less than 1.0 (those data points in the lower-left quadrant of Figure 5.4) are indications of a fading cluster. In LQ and shift-share analysis, it is important to assess if a decline or a sharp rise in LQ for an industry sector is due to a change in local or national conditions. A more rapid fall in the proportional share of a local economic activity relative to the national economy would suggest a drop in local competitiveness; a more rapid rise would suggest an increase in competitiveness.

5.5 Step 4: Investigate Clusters by Industry Sector at the Selected City Level

In step 4, potential industry clusters that deserve further support and development in the selected city or urban region are explored. A threefold

analysis of local (or city region) industry sector clusters, using (i) *spatial mapping* and (ii) *structural mapping of forward–backward linkages of the selected industry*, is required. The intent of the analyses in this step is to understand how local companies and industry clusters are strategically positioned in their localities. For local economic development to succeed, the cities and industry clusters must understand the anatomy of the forward–backward linkages in the supply chain and then determine how best to develop the core business sectors, clusters, partnerships, and networking and other arrangements that will lead to robust and sustainable industry clusters. To begin the process:

- First, spatial mapping of the distribution of potential industry clusters is carried out, to allow the clusters to take advantage of economies of scale in the city or city region. This mapping is often done with the aid of a geographic information system (GIS). The spatial mapping of industry clusters in a city will be useful in planning and locating key strategic infrastructure and development projects.
- Second, forward–backward linkages in the value-adding supply chain are mapped for potential (or to be selected) industry clusters. This analysis will reveal the deficiencies along the value-added supply chain and indicate how these can be dealt with efficiently, to promote the full growth of the selected industry clusters.

5.5.1 Step 4.1: Conduct Geographic Mapping of Industry Clusters in Cities or City Regions

The geographic mapping of industry clusters involves (i) collecting data on businesses and employment types, classified under the SIC code, together with postal codes or other geographic delineations; and (ii) mapping the geographic concentrations. Several data sets provide useful information on the spatial characteristics of economic activities. These include business telephone directories, licenses and permits, tax records, and utility accounts, all of which can be geo-coded (activities codified into SIC groupings by geographic location) with minimal effort. Geo-coding of land use or businesses activities using Google Earth, or data collection using the global positioning system (GPS), enables very high accuracy in the mapping of industry clusters in developing countries, as will be shown in the research done in Bangladesh and Sri Lanka presented in the next chapters.

Analysts can also use local-area LQ analysis or other statistical measures of concentration to identify the spatial significance of the concentration of businesses or government enterprises. Table 5.4 shows LQs indicating concentrations of core industries in a cluster. Spatial concentrations of businesses and government enterprises can be analyzed with the use of

Table 5.4 Sample Location Quotient Analysis, Pennsylvania Wood Cluster, 2000

Industry Classification	Location Quotient
Prefabricated wood buildings and components	59.76
Wood television, radio, and phonograph cabinets	29.33
Wood kitchen cabinets	14.78
Hardwood flooring mills	10.45
Wood office furniture	6.45
Wood pallets and skids	4.67
Wood household furniture, except upholstered	4.06

Note: Based on 4-digit standard industrial classification codes.

Source: Smith (2003, 19).

postal codes at the district, ward, or local government level. The level of spatial analysis will depend on the quality of the geographic data available.

The geographic cluster maps can be used in spatial plans to optimize supporting infrastructure and logistics facilities, and to encourage their co-location within the cities or city regions where the clusters are poly-centered (not confined to one district). The geographic mapping facilitates detailed investigation and analysis of the functions of the clusters and the competitiveness of the different factors that support their operation and development. After the clusters are mapped, the forward–backward (or value-chain) linkages of the selected industry clusters should be analyzed.

5.5.2 Step 4.2: Conduct Structural Mapping of the Value-Adding Supply Chain of Industry Clusters in Cities or City Regions

Mapping in this case means tracing the paths connecting relevant forward–backward linkages along the value-added supply chain of a selected industry sector. The objective is to identify missing linkages or bottlenecks between the sources of raw materials and the markets for trading.

In this value-chain mapping, certain types of companies make up the core industries in a cluster. These core industries might include, for example, several food processing factories in a food cluster, or a steel mill in a metals cluster. Other companies locate close to and serve the cluster's core industries. In Porter's (1990) model, these other companies belong to supplier or supporting industries. Table 5.5 shows the types of core industries in a wood industry cluster in Central Pennsylvania (Smith 2003, 19). From the analysis, a simple flowchart showing the structure of supply-chain links between the forward–backward industries along the supply chain in the

Table 5.5 Possible Structure of a Wood Industry Cluster, Central Pennsylvania

Core Industries	Related but Noncore Industries
Papermaking	Kitchen outfitters
Prefabricated buildings and components	Upholsterers
Household furniture	Arts and crafts
Hardwood flooring mills	Designers
Sawmills and planning mills	Furniture warehouses
Kitchen cabinets	Forest nurseries
Manufactured, plywood, and wood products	Forestry research and development
Office furniture	Forest management agencies
Pallets and skids	Mobile homes
Millwork	Boat fittings

Source: Smith (2003, 19).

cluster can be prepared. Relatively high LQs for noncore industries (greater than 5) could indicate a relatively mature and large cluster.

Once the spatial mapping and forward–backward linkage mapping is done, the next step is to analyze the conditions of the competitiveness elements of the industry cluster using Porter's diamond model (to be explained later in this chapter).

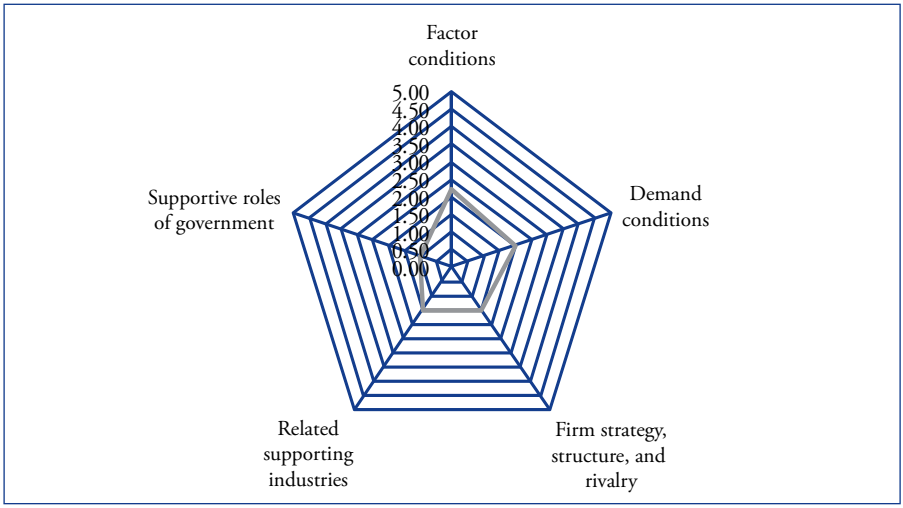
5.6 Step 5: Evaluate Gaps in Competitiveness of the Selected Industry Clusters

A twofold analysis is carried out in step 5. First, in accordance with Porter's (1990) diamond model, one of the techniques most widely used in industrial cluster analysis, analysts work with industry focus groups to score the relative competitive strengths of the selected industry cluster(s) within a city or city region. Second, the results of the diamond model will show the gaps in competitiveness in the industry clusters concerned.

5.6.1 Step 5.1: Analyze Industry Clusters in Cities or City Regions Using Porter's Diamond Model

CCED adopts Porter's diamond model (see Figure 4.1, Chapter 4) for the evaluation of relative competitiveness. Analysts use a cardinal or alphabetic scale or symbols ("+" or "-") to score or rank the strength of five conditions: (i) input factor condition, (ii) demand condition; (iii) firm strategy, structure,

Figure 5.5 Sample Result of Diamond Analysis, General Engineering Cluster, Faridabad, Delhi, India



Note: The maximum score for each condition is 5.0.

Source: Study team.

and rivalry condition; (iv) related supporting industries; and (v) government. The sixth condition, chance, is a random occurrence, and so is not included in this analysis. A total of 32–47 elements under the five conditions are analyzed for each cluster using a semi-qualitative scoring method. (See the India case study in Chapter 7 for a sample analysis.)[3] Depending on the strength of these five factors, this step of analysis will further reveal the gaps in competitiveness of the selected industry clusters.

The relative competitiveness of each condition is measured on a numeric scale of 0–5. A Delphi technique is used in scoring (Bordecki 1984). A focus group of core and noncore business leaders and other knowledgeable experts score the current and future competitive position requirement for each indicator. The scores recorded by the assessors are averaged, then discussed and, if necessary, adjusted to arrive at the final score for the industry cluster. The scores for all the elements are averaged to arrive at composite competiveness scores for the industry cluster, by condition. An average competitiveness score greater than 4 suggests a strong, well-developed, internationally competitive cluster; a score between 3 and 4, a strong, nationally competitive cluster; and a score of 2–3, a small, emerging, subnational-strength cluster.

[3] It is not always possible to assess every indicator, and other indicators can be added or replaced, depending on the country's system or local business conditions.

Figure 5.5 shows a sample result of the diamond analysis of the general light-engineering cluster in Faridabad, Delhi. This result can be used in the next stage of gap analysis and action planning to improve the competitiveness of the selected industry cluster. The details of the elements of the competitiveness of industry clusters are demonstrated in Table 9.3, Chapter 9.

5.6.2 Step 5.2: Analyze Cluster Competitiveness Deficiencies (Gaps)

The next step of the analysis involves what are the gaps in the competitiveness conditions and elements of a cluster. Where there are significant differences, the need for action to strengthen the weak elements and improve a cluster's overall competitiveness and economic performance is indicated. For example, a growing cluster seeking to compete in international markets might score 2.75 on current competitiveness, but it will need to lift its overall index to 3.25 to succeed nationally, and 4 to compete successfully in world markets—that is, the cluster must improve its competitiveness index by 0.5, or 18%, to become a successful national cluster. Table 5.6 shows a simple example of how one competitive element of the cluster might be assessed. Actions that could be taken to improve competitiveness are shown in the final column.

The analysis of competitiveness deficiency gaps provides an indication of the strengths and weaknesses of the five factors affecting the competitiveness of industry clusters, as well as the potential threats and opportunities facing the development of an industry cluster. Projects and programs that should be considered in an action plan to strengthen the industry cluster and promote industry cluster development can thus be identified.

Table 5.6 Sample Analysis of Competitive Elements of Clusters Using Porter's Diamond Model

Competitive Element	Current Status	Requirements for Future Competitiveness	Gap	Actions
Markets				
Expanding domestic and local markets	3	1	+2	Market intelligence
Expanding export markets	2	4	–2	Collaborative marketing
New products				
Demand expansion capacity for new products	2	4	–2	New technologies
Responsiveness to change and innovativeness	2	3	–1	Change management

Source: Study team.

5.7 Step 6: Prepare a Strategic Plan for Industry Cluster Development in a City or City Region

How to work out what needs to be done to support the development of a cluster is the toughest part of the CCED process. This is because many different players are involved in a cluster, and they will have different ideas and interests in participating in the development of the cluster. Reaching consensus in a group with such diverse interests will be difficult. *Before moving on to the next step, it is essential to confirm the commitment of the selected industry cluster(s) to their longer-term engagement.*

After the commitment is confirmed, three critical steps must be taken to arrive at a consensus on how to develop a cluster. These matters must be discussed and consensus arrived at before action planning begins. The three steps are to define clearly (i) what they should intend to achieve collectively (*strategic intent*); (ii) what it is that the potential participants stand to gain from participating in the development of a cluster (*business plan*); and (iii) what things need to be done to facilitate the development of the cluster, especially the building or strengthening (by governments) of the overall competiveness of the city region as well as the selected industry cluster in the locality. In this sense, matching the six drivers of competitiveness of the city and the five conditions for the competitiveness of the industry cluster would add value to *action plan* preparation for the cluster.

5.7.1 Step 6.1: Prepare a Statement of Strategic Intent for the Industry Cluster

Setting a vision for the cluster is important, so there is a clear understanding of what those engaged in its development want to achieve in the long term. The vision statement defines the outcome of the planning and development process. Some organizations and corporations are moving to replace vision statements with statements of strategic intent (Hamel and Prahalad 1994). *Strategic intent* is a term that goes beyond the basic vision and mission statement to introduce an element of flexibility in setting objectives and strategies in circumstances of continuous change. The strategic intent describes future strategic directions for the development of a cluster. It conveys a sense of destiny about the long-term markets and eventual competitive position of a cluster. It also offers possibilities by providing a sense of opening up opportunities for discovery to explore new competitive territories. Opportunities to make different choices along the selected economic pathways are made available as well.

Table 5.7 Sample Format for a Statement of Strategic Intent for an ICT Cluster

Statement of Strategic Intent for the Industry Cluster / Six Key Drivers of City Competitiveness	To develop an internationally competitive IT industry cluster in [*location*] to support the development of technologies in computer graphics and simulation for the education and multimedia industries
	Policy Initiatives
Enabling environment (institutional governance)	• Program for attracting skilled immigrants • Program for attracting and providing incentives to international ICT multimedia businesses • ICT knowledge information systems
Business dynamics	• ICT business cluster network association and network development • Collaborative marketing initiatives
Strategic infrastructure	• High-speed fiber optics network systems for all business centers in metropolitan areas by 2012 • Three regional ICT multimedia business headquarters by 2015 • Development of high-quality, mixed-use business parks
Endowed resources and human capital	• Lifelong learning, education and training, and R&D focusing on ICT industry development programs • Language and international business skills development • Community learning programs
Quality of life	• Basic urban services and infrastructure • Clean and green spaces • Good transportation system • Proximity to market, schools, government offices

ICT = information and communication technology, R&D = research and development.

Source: Study team.

The major problem with many vision statements supporting organization plans and other types of plans is that they can be unrealistic and the outcomes not easily measured. Circumstances, markets, production systems, technologies change, so that vision and mission statements can become obsolete even before the plans are implemented. However, the statement of strategic intent for a cluster, like a vision statement, must be realistic in terms of what can be achieved in 20 years or so, given the resource limitations facing all organizations. Therefore, the stakeholders engaged in planning for the development of a cluster must be realistic about what they can and cannot do, given the resources and the time available. Table 5.7 presents an example of a simple framework for the development of a statement of strategic intent for an ICT cluster.

5.7.2 Step 6.2: Prepare a Business Plan for the Industry Cluster

Business corporate planning, however, has a key role in the organizational management arrangements for cluster development under CCED. Corporate planning relates to high-level planning in an organization and involves the continued analysis of corporate environmental matters that affect business, the setting and reevaluation of objectives for the organization, the formulation of strategies and tactics, implementation, and evaluation. A key element of corporate planning for clusters is the cluster business plan. The corporate business plan for the development of a cluster should be prepared by a working group or board representing the interests of the cluster.

These may include producers, service providers, R&D units, public utilities, government, and professional interests. The business plan should outline a clear vision for the cluster, the core business functions, and operational arrangements. The business plan should include an annual, medium-term, and long-term plan, incorporating the initiatives found in the action plan. The business plan should identify the operating arrangements and organizational mechanisms proposed to ensure the most efficient and effective delivery of services and development projects that will be supported or implemented under the management of the cluster. These may involve developing an information network, strategic alliances, and partnerships, and outsourcing and franchising the management of various cluster activities and initiatives. Corporate plans also provide the basis for financial models to support the development of projects, including funding and risk-sharing arrangements.

Along with the institutional support mechanisms used for the implementation of a business plan, the following overall management functions need to be considered carefully:

- operations;
- organization (or network or membership) setup of the industry cluster;
- marketing of cluster activities;
- R&D;
- financial management;
- general management and administration;
- human resource management; and
- legal and tax matters.

5.7.3 Step 6.3: Prepare Action Plans for Cluster Development

Many action plans incorporate wish lists of projects, most of which will never be funded. Thus, in preparing action plans, there must be a link between the planning, budgeting, and financing processes and the action plan to ensure that projects and programs have a reasonable chance of being implemented. During planning, agencies and departments often make commitments to programs and projects, but when it comes to executing the actions, they tend to make excuses about not having the resources. If business networks and champions have not been actively engaged in leading the cluster planning process, they are unlikely to commit to whatever action plan for developing a cluster is produced. This is why few plans are fully implemented and why delays in project implementation are a regular occurrence.

The following should be included in an action plan for a city cluster economic development, based on the corporate business plan for the selected industry clusters:

- list of proposals, projects, and programs;
- actions prioritized on the basis of immediate needs;
- assignment of responsibilities;
- timelines;
- allocation of resources;
- description of performance indicators;
- projected business expansion or improvement based on planned investment, and expected increase in revenue returns; and
- description of risks, contingencies, and alternative actions.

For cluster development to succeed, the different attributes of the six drivers, which were defined by the attributes of the five conditions of industry cluster competiveness, must match and support the growth of the cluster. Linking the six drivers to the five conditions is not easy, as it requires consensus building among the participants. To aid in visualization, a matrix listing the six key drivers and the five conditions is prepared. Table 5.8 gives examples of how this linking process can take place, and identifies specific types of actions that could be supported to help develop the cluster and enhance its competiveness. Some competitiveness attributes will overlap; however, the matrix template is sufficiently robust to enable the development of different strategic initiatives that align with important competitiveness conditions specified in Porter's diamond model. The competitiveness conditions and associated elements identified through the gap analysis should be given priority in planning interventions.

Table 5.8 Linking the Six Key Drivers of City Competitiveness and the Five Conditions of Industry Cluster Competitiveness in Porter's Diamond Model

Driver of City Competitiveness	Industry Cluster Competitiveness Conditions				
	Input Factor Conditions	Demand Conditions	Firm Strategy, Structure, and Rivalry	Related Supporting Industries	Supportive Roles of Government
Responsiveness of LGUs to business needs	Capital	Markets • Expanding domestic and local markets • Expanding export markets	Capacity • Expansion capacity to meet demand for new products	Supply chains • Strength of local business support services • Responsiveness of local support services • Quality of local support services	Governance • Streamlined business approval systems • Enforcement of business regulations
Dynamics of local economy	• Scale and extent of foreign and joint-venture companies • Flexibility of production systems	Products • Quality and reliability of product or service • Potential to add value to supply chains	New products • Responsiveness to change and innovativeness	Value addition • Businesses' awareness of value-adding potential • Product sustainability	Standards • Quality of local support services • Government support for cluster development
Endowed natural and human resources	Resources • Proximity to raw materials • Cost of local raw materials compared with cost of imports	Environment • Quality of raw materials			Management • Support for sustainable industry
	Labor pool • Availability of skilled labor	Skills • Efficiency and productivity of labor • Strong business ethics	Networks • Management skills • Strong social capital and business networks	Capacity • Education and training facilities • Strong firm collaboration • Shared industry knowledge capital development	Facilitation • Support for R&D • Workplace health and safety conditions
Infrastructure	Infrastructure • Quality of infrastructure services (logistics) • Cost of services	Infrastructure • Quality of infrastructure services (utilities)	Intelligence	Business mix • High level of technology application in firms • Quality of tele-communications services	Utilities
Quality of life	Environment • Living environment • Quality of life of the workforce	Markets • Proximity of markets and other services (utilities)	Entrepreneurs	Networks • Civic entrepreneurship and community partnerships	Projects • Public development projects • National or international leadership

R&D = research and development.

Source: Study team.

The mapping of strategic architecture provides the basic information for cluster stakeholders to identify specific actions needed to design, develop, assess, implement, and operationalize projects and programs to support the development of the cluster. Action plans fill in the details and priorities for concrete actions to be undertaken by stakeholders and the government. Actions may include improving urban infrastructure and services to enhance the business environment within which the industry clusters are spatially agglomerated. A *project* is a stand-alone, one-time intervention completed in less than 3–5 years, something that normally involves building or improving something. A *program* is a series of projects related to and under the umbrella of strategic directions, which take longer periods (10–15 years) to implement in order to achieve the strategic goal by the end of the period.

5.8 Step 7: Operationalize the Cluster Development Plans in a City or City Region

The action plan will identify key projects and programs the clusters propose to initiate and develop in the short to long term. Some of these projects may be complex and require substantial investment and management. For larger projects and programs, there will be need to scope the study and undertake some form of project assessment to determine investment attractiveness and viability before proceeding to the next stage of development. This normally involves the preparation of a pre-feasibility study.

The purpose of a pre-feasibility study is to define the scope and scale of a proposed project, the component activities associated with the project, the assumptions behind the development of the project, the robustness of the approach proposed for delivering the project output, value for money and project costs and benefits, and risks associated with the project. Pre-feasibility studies should determine if a project is bankable, that is, capable of attracting private investors and funding support from international development agencies. A pre-feasibility study document is a little like an investment prospectus. A pre-feasibility study will incorporate the following matters:

- background of the project, including the justification for it;
- description of the proposed project, including its objectives, components, and activities;
- project implementation plan;
- contribution to sustainable development;
- financial analysis of the project;

- economic analyses;
- stakeholders' comments;
- key factors affecting the project, including a risk matrix; and
- conclusions and recommendations.

Various financial techniques can be used in evaluating the feasibility of projects, but best practice requires consideration of more than just the financial dimensions of a project. Its contribution to sustainable development must also be considered.

Clusters tend to develop successfully if an organization is established to represent their interests and support cluster development activities. Best-practice approaches to the organizational management of CCED are centered on improving the productivity, quality, and reliability of services; the longevity and performance of assets; and organizational management, strategic leadership, and monitoring and evaluation systems. No single model of institutional support is the best one for managing the implementation of a cluster development plan. A number of important organizational matters need to be considered carefully in the development of a cluster organization.

5.8.1 Formalizing Industry Clusters

The most appropriate organizational model for the development of a cluster depends on many factors. In most market economies, governments have become more involved in helping to set up cluster network organizations, collaborative partnerships, or cluster-owned companies. Most clusters start with an informal local network of companies and industry leaders meeting to share information and ideas. The evolutionary process that follows leads to more formalized partnerships arrangements and cluster-owned spearhead companies engaged in collective R&D, marketing, commercialization, education and training, and joint-venture projects, some of which will involve public–private sector partnerships to provide key strategic infrastructure. The two most common organizational models used to facilitate the development of clusters are described briefly below.

5.8.1.1 Developing a Network Model

Network models provide a flexible way to begin the development of clusters. These can start as informal networks and develop into more formal structures and ultimately into corporate businesses undertaking a wide range of activities on behalf of the cluster network members. One of the most successful network models for cluster development was set up by the

Joint Venture Silicon Valley Network, established in Silicon Valley in 1993 (JVSVN 1995). The network is an incorporated nonprofit organization whose council represents more than 400 member organizations. The network was developed by businesses associated with ICT to provide the flexibility, efficiency, and diversity needed to create an organization to represent their interests in a rapidly changing industry at the time. The core network organization established to run the network supports the implementation of the initiatives and serves as a catalyst for new issues requiring collaboration. Today the organization has six core functions that provide

- reliable economic information;
- neutral forums for addressing regional issues;
- coaching and administrative support to the initiatives;
- networking among innovators;
- communications; and
- benchmarking.

The core organization that runs the network collaborates with the network partners and public agencies in developing and implementing initiatives to build elements of strategic architecture elements and leverage community, business, and government resources. A number of subnetwork organizations have been set up to implement these initiatives. Some key initiatives of the Joint Venture Silicon Valley Network (JVSVN 2003) are:

- Silicon Valley Alliance for Teaching;
- climate change;
- disaster preparedness;
- Silicon Valley Economic Development Alliance;
- wireless communication; and
- workforce development.

The network's board of directors and heads of initiatives develop and approve memorandums of understanding annually as the basis for their working relationship. This ensures two-way accountability for support and results. The major interest of the network is that the initiatives establish and make progress on measurable objectives while looking for opportunities to achieve other results. Memorandums of understanding define the relationship between the joint venture's initiatives and the network organization set up to implement these.

5.8.1.2 Establishing a Formal Partnership Model

A second model for facilitating industry cluster development is based on public–private sector partnership. Formal institutions and joint-venture organizations are established to support the development of the cluster. One of the most successful clusters using a formal organization model has been the Australian wine industry cluster, which began as a partnership between federal government and the wine industry. The partnerships have led to several spin-off organizations that provide elements of strategic architecture to support the development of the Australian wine industry (Marsh and Shaw 2000). These organizations include the Winemakers' Federation of Australia, the Australian Wine Export Council, the Wine Industry Information Service, the Cooperative Research Centre for Viticulture, the Grape and Wine Research and Development Corporation, and the Wine Industry National Education and Training Advisory Council. The Australian wine industry produces about 2% of the world's wine and is one of the most successful and innovative industries of its type in the world.

The Australian wine industry is a formalized national cluster, with several independently run but integrated support organizations. The model is applied widely at the local or regional level, where a cluster organization is established to provide a range of services to cluster members. These services may include collaborative marketing, lobbying, resource sharing, R&D, human resource development, and community relations. The advantage of a formal cluster organization is that it substantially reduces business costs and risk. It can also help small companies to achieve economies of scale as a group when competing against larger corporations for business and contracts.

5.8.2 Organizing for Cluster-Based City Economic Development

CCED proposes a new way for governments and cities to support sustainable local economic development. There is growing interest in clusters among governments and businesses in Asian countries, especially in India and the PRC. However, the process of engaging industry groups and government in cluster development and using CCED takes time. Much effort is required to get business competitors and public agencies to work together and trust each other. There are many altercations between rival partners along the way. However, attitudes are changing and many cities and businesses in them have realized the benefits of fostering the development of clusters. There are several important arrangements that organizations seeking to support city cluster development need to follow to ensure success in applying CCED.

5.8.2.1 Mobilizing Support for CCED

The process of testing and developing CCED in South Asia has taken 2 years. The experience has shown that considerable effort and time must be given to education programs before industry groups and government agencies understand the value of the CCED process and what it can achieve. The first task, therefore, after initial consultations to build awareness of the CCED concept, is to explore whether CCED is applicable to fostering local economic development, and whether the motivation and leadership to make it happen are present. Enhancing awareness of CCED among key industry leaders and gauging their level of interest is critical. This can be achieved in a number of ways. One way is to hold a series of discussions with key people to educate them and gain commitment to the concept. Another is to work closely with existing industry associations.

The general thrust in creating interest in CCED has been to emphasize the need for companies and governments in cities to capitalize on the comparative advantages by taking stock of skills and potential and developing collaborative actions to seize specific opportunities. Such a strategy is particularly crucial for areas affected by increasing competition in their major industries. By focusing on and understanding specific industries and clusters, governments can learn how to improve competitiveness and be better equipped to make effective decisions in areas such as resourcing, regional marketing, education and training, science and technology, and urban infrastructure investment, all of which are crucial to local economic development.

5.8.2.2 Selecting the Cluster Leadership Group

The leadership of the cluster development process must come from business, in partnership with government. Government should be involved, but the whole process should be seen as owned by business. However, business needs to appreciate that clusters will embrace a wide range of interests, including the community. Thus, a small group of business leaders or civic entrepreneurs must be identified as the point of contact and the drivers of the process. They will steer the process and will remain a critical element in the six building blocks of the cluster over time. The leadership group will change; opportunities for different people to lead should be encouraged to generate fresh ideas that will keep the cluster dynamic.

5.8.2.3 Identifying the Cluster Membership

The major task is to ensure that the membership of a cluster organization represents the industry. Potential cluster members are likely to be leaders

of private companies within the target geographic industry. They will be knowledgeable about the industry and its institutional resources. The cluster network should have the following characteristics:

- *Inclusiveness.* A demographic cross-section of the industry should be sought.
- *Knowledge of the industry.* Cluster members should be familiar with the unique features of the industry's history, culture, and economy.
- *Knowledge of major resources.* Cluster members should be able to identify the major business, industrial, governmental, academic, and nongovernment organizations involved in the industry.
- *Appropriate size.* Knowledge is more important than the number of people involved. The number should be large enough to be inclusive of collective knowledge, but not so large as to present management challenges or to inhibit individual participation. The group should have from 10 to 30 people.

5.8.2.4 Facilitating Cluster Development

Most clusters will need an experienced facilitator to help the steering committee through the cluster development process. The facilitator will help the industry identify specific opportunities and develop a cluster action plan and business plan to guide the operations of the cluster organization. The process should identify barriers to the industry's development, as well as opportunities that draw on the collective strength of businesses within the industry cluster to enhance business opportunities for the industry as a whole or for networks within the cluster. Specifically, this stage should help the industry cluster

- identify and document the key strengths, capabilities, comparative advantages, markets, and opportunities within the industry cluster;
- identify and document the key threats to the industry and the constraints within each market segment;
- develop action and implementation plans for target markets, set a timetable, and identify potential funding sources for tackling each threat, constraint, and opportunity identified;
- decide on the message the industry wants to convey and the tactic to be used to convey that message to potential markets; and
- share the workload involved in implementing the agreed actions by means of a committee process, with each committee developing its own work plan, funding, and actions, all of which should be consistent with the vision and agreed activities of the group as a whole.

5.9 Replicate the Cluster-Based City Economic Development Approach

The network and partnership approaches to cluster facilitation and development have been applied successfully in many parts of the world, including Asia. In Asia, cluster-building management models fully supported by the government are in operation in the PRC and Thailand. These have enjoyed some success, but the level of business ownership and engagement is still low. The most successful cluster development models for Asia are likely to be the partnership models; however, businesses must take on a key role in their development.

Establishing a business cluster is a bit like a railway journey. At some point in time the train needs to leave the station and start traveling toward its destination. The reality is that the clustering approach cannot wait for everybody to board the cluster train before it leaves. That is why the process needs to be designed to have further stations down the track where others can get on board. A train also has different carriages, and companies with like-minded interests can board the carriage of their interest. The final job is to minimize the derailments that will occur from time to time as quickly as possible to ensure that the industry starts moving again.

If the research into the development of a particular cluster has been thorough and the cluster's objectives are clear and can be implemented efficiently and effectively, a city's economic development effort will have been strengthened and the business community will have been expanded. Those involved must remember that this is not an overnight process but a long-term one and that the results will not always be easy to measure. More jobs and increased income opportunities may result from the clustering efforts, but attempts should be made to assess other benefits as well.

The CCED process involves assessing the competitiveness of cities to identify sectors and clusters in the local economy with the potential to propel its development; and identifying and implementing projects and programs to build strategic architecture to enable the potential to be realized. Operationalizing CCED and industry cluster development is still a new concept in Asia. Therefore, to ascertain how to make CCED successful, the approach and application of the concept need to be tested through field studies. ADB selected three countries in South Asia (Bangladesh, India, and Sri Lanka) to develop and test the application of CCED so as to derive important lessons about the practicality of the approach and how to improve on it.

The next three chapters present the experience of developing and testing CCED in the three countries.

Chapter 6
Cluster-Based City Economic Development in Bangladesh

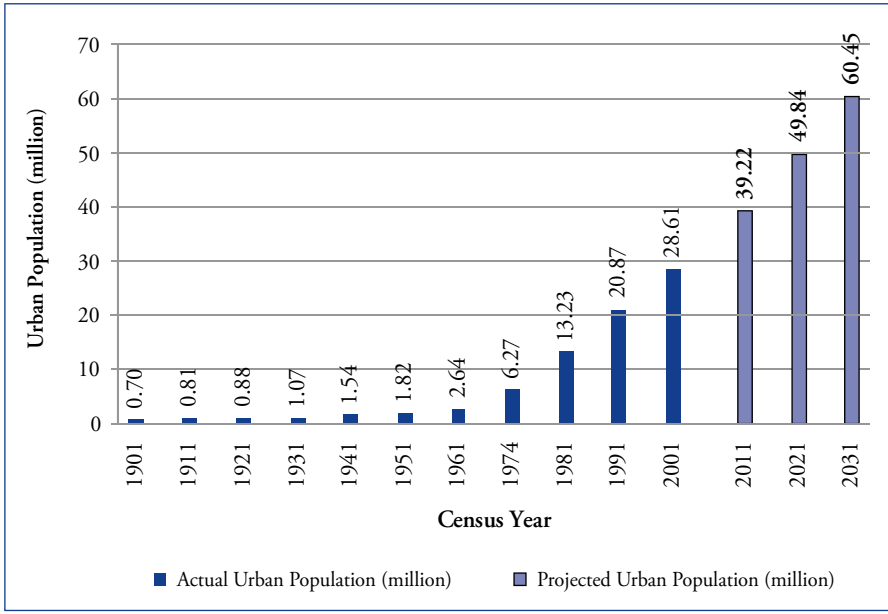
Bangladesh[1] is one of the most densely populated and least urbanized countries in Asia: only 27% of its people live in cities and towns (CIA 2009). Yet, in less than 2 decades, the cities have become the country's engines of economic growth and development (Figure 6.1). Estimates indicate that urban areas account for 60% of national GDP. While rural development should not, for this reason, have low priority, by 2025 rural employment will be in sharp decline, and almost all new jobs will be in the urban areas. The cities must therefore become more competitive and more receptive to investment if Bangladesh is to address the acute poverty and raise the standard of living. The CCED approach offers one option for achieving more sustainable development and employment outcomes for towns and cities in Bangladesh.

Urbanization is proceeding fastest in the capital city, Dhaka, but other large urban centers are also growing rapidly. More than half of the country's urban population lives in the four largest cities—Chittagong, Dhaka, Khulna, and Rajshahi. Dhaka's population of more than 14 million is more than a third of the country's urban population. Severe environmental, housing, health, and social problems can be traced to poorly managed urbanization. Surely, therefore, better managed urbanization will be economically beneficial for Bangladesh, as it has been elsewhere in Asia.

This chapter describes the experience of applying CCED to a study of city competitiveness and industry clusters in Bangladesh. The chapter begins with a brief overview of cities and urbanization in Bangladesh,

[1] Under ADB RETA-6337 (Subproject 7): City Cluster Economic Development, the CCED study applied its analytical methodology in the capital regions of Bangladesh (Dhaka), India (Delhi), and Sri Lanka (Colombo). This chapter summarizes the Bangladesh case study report (February 2011). Further details of the discussion in this chapter may be found in the report.

Figure 6.1 Urban Population, Bangladesh, 1901–2031



Note: Figures for 2011, 2021, and 2031 are projections.

Sources: BBS (2003); study team.

outlining their role in economic development. This is followed by an analysis of the competitiveness of 13 cities in Bangladesh, and of the economic structure, changes in economic structure, and sector competitiveness in the Dhaka Capital Region (DCR). Then the structure and competitiveness of the ready-made garments (RMG), leather, and food and beverage industry clusters in the DCR are analyzed.

6.1 Urban Growth and Economic Development

The transformation of the economy and rapid urbanization present many challenges to the government at all levels. The economy is integrating into the global economy, especially through export-oriented manufacturing and human resource exports. Cities are becoming more and more important in development, especially in diversifying the economy, creating jobs, and attracting FDI. But productivity and competitiveness are low by international standards. For Bangladesh to thrive and prosper, businesses and government must perform better. They must learn how to become more competitive. First, the factors that can make the individual cities and industry sectors more competitive must be identified.

6.1.1 Urbanization

Bangladesh has 522 urban centers (BBS 2003). The Census Commission has classified the urban centers into four categories: megacities (more than 5 million people), statistical metropolitan areas (1–5 million people), municipal towns (more than 100,000 but less than 1 million people), and other urban areas (up to 100,000 people).

Dhaka, which had an estimated population of 14 million in 2008, is the primate city and the only megacity. Population sizes are significantly lower in the second-, third-, and fourth-largest cities: Chittagong (3.38 million), Khulna (1.34 million), and Rajshahi (0.7 million). The Ministry of Local Government, Rural Development, and Cooperatives has designated 11 cities as municipal towns, that is, formal urban areas with elected local governments. At the time of the 2001 census, Bangladesh had 223 municipal towns. By 2008, the number had risen to 308. The municipal towns had a total population of about 9 million, or 31% of the urban population of Bangladesh.

Three factors account for the country's rapid urbanization:

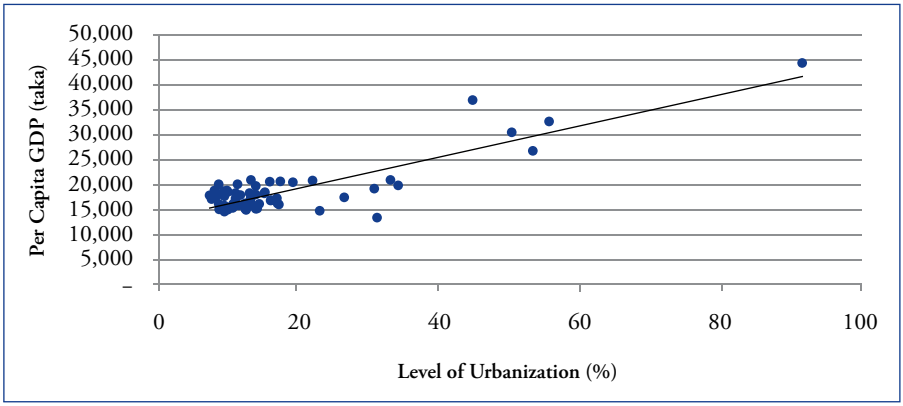
- the natural increase in the urban population;
- the territorial extension of urban areas and changes in the definition of urban areas; and
- the migration of people from rural to urban areas.

In addition to migration, Dhaka attracts 400,000–500,000 commuters daily from neighboring areas, contributing to congestion in the city. Over time, many of these commuters become migrants. While accurate statistical data are not available, Islam (2005) believes that Dhaka attracts more than 500,000 new migrants every year, mostly from the rural areas.

Urbanization in recent years has been marked by intensified urban pull exerted by the growth of industries and services (particularly export-oriented industries in the large cities), construction, and foreign remittances. In the mid-1970s, like many other developing countries, Bangladesh began to modernize its industrial production system, first through joint ventures with the Republic of Korea and Singapore, and then by itself, with Bangladeshi entrepreneurs. The garment industries congregated in Dhaka (74% of such industries) and Chittagong (22%). Accessibility to buyers, ability to communicate with overseas firms, financial and banking opportunities, and other location advantages drew industrial and other public sector investment to the urban areas, particularly the bigger cities.

The link between urbanization and economic development is well documented (see, for example, ADB 2008b; Friedmann 1973; Roberts and

Figure 6.2 Correlation between Per Capita GDP and Urbanization, by District, Bangladesh, 2005



Source: BBS (2007a, 2008a, 2008b).

Kanaley 2006; and UNFPA 2008). Figure 6.2 shows the relationship between urbanization and GDP in Bangladesh, by district. More urbanized districts have higher GDP. The country's sectoral approach to economic development has created a regional imbalance in employment and investment favoring the more urbanized regions.

The Greater Dhaka District[2] is the most urbanized and has the highest per capita GDP, followed by Chittagong. An economic corridor runs between Dhaka and Chittagong, although Comilla, between the two, has a much lower per capita GDP, possibly because of its poor infrastructure and poor governance. The third spatial concentration of economic development is the Jessore–Khulna–Mongla corridor. The Bangladesh economy has grown moderately over the past 2 decades (Table 6.1). Increased FDI and changes introduced by the central government to stimulate development account for much of the growth.

The structure of the economy continues to change. Many traditional sectors are in decline, but new industries are starting to make a noteworthy contribution to economic growth and development. The three broad sectors of the economy—agriculture, industry, and services—are still growing, but at markedly different rates. Table 6.2 shows the changes in economic structure between 1980 and 2007.

[2] A district in central Bangladesh. Dhaka city takes up a fifth of its area. Districts make up the second-highest tier of government in Bangladesh, below the divisions and above the subdistricts and the union parishads (local councils).

Table 6.1 Annual Average Population Growth Rate and GDP, Bangladesh, 1980–2007

Item	1981–1990	1991–1996	1997–2001	2002–2006	2007
Population	2.2	2.1	1.5	1.4	1.4
GDP	3.7	4.4	5.3	5.7	6.5
Per capita GDP	1.5	2.3	3.8	4.3	5.1

GDP = gross domestic product.

Source: BBS (2008a, 2008b).

Table 6.2 GDP Growth and Trends in Economic Structural Changes, Bangladesh, 1981–2007 (%, at constant 1995–1996 prices)

Item	1981–1990	1991–1996	1997–2006	2007
Agriculture	2.3	1.6	3.6	2.8
Industry	5.8	7.5	8.7	9.5
Services	3.7	4.1	6.2	6.6
GDP	3.8	4.4	5.5	6.5

GDP = gross domestic product.

Source: Mujeri (2004).

The GDP growth rate and the sectoral share of industry have been increasing, at the expense of agriculture, which has had a declining share of GDP (Table 6.3). The growth in industry has resulted from a sizable increase in export-oriented manufacturing and in construction. Services have had more or less the same share, although as Mahajan (2007) reports, the sector's contribution to GDP is the highest of all three sectors. The services sector is the largest source of employment, and might well be an even more significant contributor to GDP if data were available on the informal sector, which accounts for more than half of the labor force in many urban centers.

Table 6.3 Changes in Sectoral Contribution to GDP, Bangladesh, Selected Years (%, at constant 1995–1996 prices)

Item	1980	1990	1997	2006
Agriculture	33.2	29.5	25.9	21.8
Industry	17.1	20.8	25.0	29.0
Services	49.7	49.7	49.1	49.2
GDP	100.0	100.0	100.0	100.0

GDP = gross domestic product.

Source: Mujeri (2004).

6.1.2 Urban Planning and Economic Development Policies

Bangladesh has no explicit urbanization, urban development, or urban economic development policy. The 1976 report on human settlements (UNCHS 1976) was the country's first comprehensive statement on urbanization for the balanced growth of the rural and urban economies. However, the recommendations of the report have never been officially adopted as public policy. The current policy focus for economic development is still directed at supporting rural development, although this may change with the government that was elected in 2009. Economic development, both national and local, is still primarily concerned with rural development. A departure from this policy occurred in the Second Five-Year Plan (1908–1985). The plan envisaged the extension of infrastructure and service facilities from 100 urban centers to about 1,200 growth centers nationwide. The emphasis in urban development thus shifted from medium-sized towns to small rural market centers, particularly the development of agriculture-based industries in these centers to generate local employment. The strategic intent was to slow urbanization in the larger cities and create small rural market centers, but it hardly succeeded.

In 2005, the government, through its Local Government Engineering Department (LGED), began to prepare a national urban sector policy. The draft policy recognized the excessive dominance of a few cities like Chittagong and Dhaka in urbanization. There is overcrowding and a conspicuous lack of basic facilities and utilities in almost every sphere of life. Such unplanned development is adversely affecting urbanization, and a more sustainable process will require strengthening its beneficial aspects and dealing effectively with its negative consequences. Urban development should be grounded in a broad-based urbanization policy that encompasses the spatial, economic, social, cultural, and environmental aspects of urbanization. The aim should be to achieve an urban society free from hunger and poverty and provide access to health and education, shelter, and basic services, and a livable environment.

The economy then moved gradually toward a free market economy with polices for deregulation and liberalization being put in place. The policies promoted an open economy under private sector leadership, along with a liberal trade regime. The intent was to accelerate economic growth by expanding the domestic market, providing access to FDI, facilitating technology transfer, creating marketing networks, and strengthening technical and managerial skills. The importance of industrial development as an engine of economic growth gained recognition because of a growing realization that the development of agriculture, viewed as the mainstay of the economy, depended on backward and forward linkages with the industry sector. This awareness is reflected in the policy focus on agriculture-based industries in recent years. In 2007–2008, the government drew up its second

national strategy for accelerated policy reduction (2009–2011) in line with its Poverty Reduction Strategy Paper.[3] Macroeconomic stability will be maintained through prudent fiscal and monetary policies and supportive external sector policy. The current macroeconomic framework, however, is confronted with several challenges, including

- raising the investment–GDP ratio from its stagnant level of around 24%;
- sustaining revenue growth;
- reducing the high rate of inflation;
- deflecting the potential threat to past gains in poverty reduction;
- addressing the issues facing the export sector, led by the ready-made garment (textiles) industry, because of strong competition worldwide; and
- providing productive employment for the growing labor force, especially the poor.

The strategy views SMEs as one of the most promising areas for economic development. SMEs account for 99% of private sector industrial establishments and 70%–80% of the nonfarm labor force (Government of Bangladesh 2008). Their share in manufacturing value added to GDP varies between 28% and 30%. A large proportion of SMEs are in the rural areas, and roughly one-third are in Dhaka District. Despite government support, SMEs continue to suffer from a number of constraints, including poor access to finance, infrastructure bottlenecks (especially in power supply), low technology competence, difficult access to markets, and regulatory barriers. The development and future prospects of SMEs depend largely on urban sector development, particularly on improved rural–urban interaction.

6.2 Cities' Competitiveness and Ranking

The analytical framework used in measuring the competitiveness of cities in the Philippines (see Chapter 5), as well as cities in India and Sri Lanka (see Chapters 7 and 8) was applied to cities in Bangladesh. The analytical framework involved ranking the cities and assessing their attributes of competitiveness. The top 10 cities in population size—Dhaka, Chittagong, Khulna, Rajshahi, Sylhet, Barisal, Rangpur, Mymensingh, Bogra, and Comilla—were assessed. Sixty-two percent of the total urban population of Bangladesh is in these 10 cities (BBS 2003).

[3] Prepared in 2005 in consultation with the World Bank and the IMF.

Table 6.4 Weights Assigned to the Key Drivers of Competitiveness

Key Driver of Competitiveness	Number of Attributes	Maximum Score Possible Weight Scale	Weight (%)
Cost of doing business	6	1.5	15
Dynamics of the local economy	10	2.5	25
Human resources and training	4	1.5	15
Infrastructure	10	1.5	15
Government's responsiveness to business needs	9	1.5	15
Quality of life	10	1.5	15
Total	49	10.0	100

Note: The same weights were used in the Philippine city competitiveness ranking project (AIM 2008).

Source: Study team.

The six key drivers of competitiveness—the cost of doing business, the dynamics of the local economy, the availability of human resources and training, the availability of infrastructure, the government's responsiveness to business needs, and the quality of life—were used in the competiveness assessment (Table 6.4). Each driver had several attributes, and each attribute had a number of indicators. Each city was scored separately.

The assessment used the scoring and ranking method explained in Chapter 5 in analyzing the competitiveness of the selected cities. The method converts the raw scores for the attributes and building blocks into values on a 10-point scale to allow comparisons between the cities studied. A score of 1–5 is considered below average; a score above 5 but lower than 7.5, competitive in the domestic market; and a score of 7.5 or above, competitive in the South Asian and international markets. The strength of the scoring method is that it rates the performance of a city by using individual indicators in relation to national and global standards and identifies areas for improvement. Table 6.5 shows the total index scores for the 10 cities in the study.

The results show that Dhaka, with a total score of 7.31 out of 10, is the most competitive city in Bangladesh. This result is not unexpected, because of Dhaka's size and its predominant role in the country. Chittagong, Sylhet, and Comilla have the next-highest scores. Six of the 10 cities are not competitive nationally (their index scores are below 5). These cities produce mostly for local consumption. They import a wide range of goods and services, but trade only a small range and quantity of basic agricultural products with other regions. Chittagong, Sylhet, and Comilla are considered competitive nationally, but they have a long way to go before they can have more export-oriented, and internationally competitive, economies. None

Table 6.5 Competitiveness Index Scores, by City and by Competitiveness Driver, Bangladesh

Key Driver of Competitiveness	Dhaka	Chitta-gong	Sylhet	Comilla	Mymen-singh	Khulna	Bogra	Rajshahi	Barisal	Rangpur
Cost of doing business	0.93	0.84	0.93	0.90	0.81	0.75	0.71	0.75	0.72	0.54
Dynamics of local economy	2.06	1.88	1.65	1.33	1.21	1.20	1.39	0.73	0.65	0.70
Human resources and training	1.40	0.84	1.02	0.86	0.71	0.72	0.57	0.39	0.42	0.57
Infrastructure	1.02	1.26	0.96	0.83	0.78	0.87	0.75	0.81	0.75	0.72
Government's responsiveness to business needs	0.87	0.63	0.36	0. 42	0.36	0.39	0.33	0.30	0.27	0.21
Quality of life	1.04	0.87	0.86	0.78	0.96	0.84	0.75	0.72	0.81	0.69
Total score	**7.31**	**6.32**	**5.78**	**5.11**	**4.83**	**4.77**	**4.49**	**3.70**	**3.62**	**3.43**
Ranking	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Source: Study team.

of the cities studied are internationally competitive (index score of more than 7.5), although Dhaka is competitive internationally in some sectors, mainly in textiles and garments.

Population size appears as a major determinant of competitiveness. Large cities like Dhaka generate their own economies of scale. As the cities studied varied to a great extent both in population size and in competitiveness scores, the study looked at whether population size and competitiveness are correlated. The highest correlation was between population size and government's responsiveness to business needs. This does not mean that local governments in the larger cities are more responsive to the cities' development and economic growth, but that Dhaka appears to be the only city that understands what government must do to promote competitiveness. Similarly, larger cities tend to have an advantage over smaller cities in human resources and training, quality of life, and dynamics of the local economy. The total index score had a positive correlation as well with population size.

The location of cities with respect to transport, government services, and natural resources also appears to be important in relation to competitiveness: centrally located cities with good connectivity are more competitive than those located close to the country's borders. Chittagong and Dhaka, because of their location advantages as major transport hubs, have had higher concentrations and specializations of employment and economic activities, and have benefited greatly from access to migrant labor, public services, and markets associated with agglomeration. At the same time,

however, the agglomeration of employment and business in these two cities has increased congestion and pollution costs.

6.3 Multi-Sector Industry Analysis

Manufacturing establishments or businesses are categorized by the Bangladesh Bureau of Statistics into two main types: macro establishments, which include large, medium-sized, and small establishments; and micro establishments, which have fewer than 10 employees. In 2003, there were about 450,000 manufacturing industry establishments in Bangladesh, of which 74,825 (16.6%) were located in the DCR. Table 6.6 shows the size classification of manufacturing industries in the Dhaka Capital Region in 2003.

Large industries provided just over 62% of formal employment in the manufacturing sector. (The extent of informal sector manufacturing employment is impossible to guess, but may well exceed that in the formal sector.) Micro industries employed almost 22%, while small industries provided 12.5% of the formal jobs. In 2003 in the DCR, there were 10,639 macro establishments, of which nearly 79% were small, 5.5% medium, and 15.7% large. However, by 2005 macro-type establishments had increased to 14,371, a net increase of 35% over 2 years. Much of this increase occurred in the garment industry. In 2005 over 1.54 million people were employed in macro manufacturing enterprises (BBS 2009). The most dominant industry sectors were apparel and textiles, which represented about 55.4% of all manufacturing enterprises, and contributed more than 55% of all employment in the DCR.

Multi-sector industry analysis (MSIA) (Chapter 5) was used to evaluate the competitiveness attributes of the industry sectors. For convenience and

Table 6.6 Size Classification of Manufacturing Industries in the Dhaka Capital Region, 2003

Industry Type	Units or Establishments	%	Total Persons Engaged	%
Micro industry (fewer than 10 persons)	64,186	85.78	256,574	21.95
Small industry (10–49)	8,378	11.19	146,459	12.53
Medium industry (50–99)	589	0.78	40,576	3.47
Large industry (100 and above)	1,672	2.23	725,530	62.06
Total	**74,825**	**100.00**	**1,169,139**	**100.00**

Source: BBS (2007).

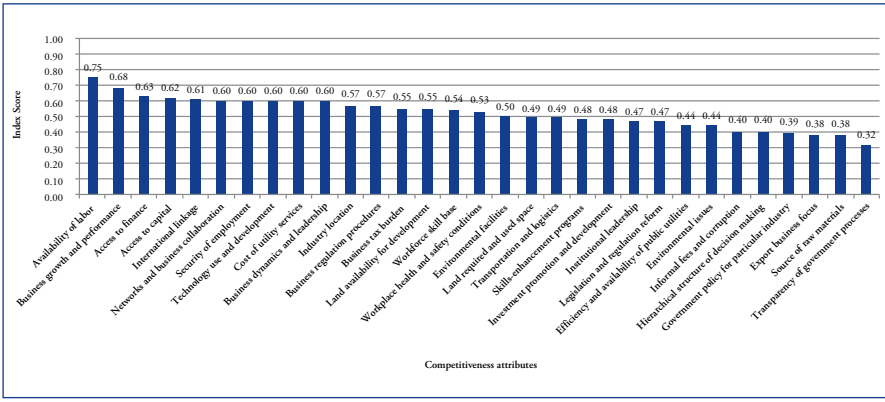
ease of data collection, all the manufacturing and service industry sectors were aggregated into 25 industry sectors following the general definitions used in the United Nations' International Standard Industrial Classification of All Economic Activities (ISIC). Thirty-one indicators of competitiveness were analyzed. The analysis was made by an expert assessment panel comprising government, academic, industry, and professional group interests (a consultation group).

6.3.1 Strength of Industry Competitiveness Attributes

Figure 6.3 shows the ranked index scores for the regional competitiveness attributes of the DCR economy. The strongest competitiveness attributes were availability of human resources, followed by business growth and performance, access to finance, and access to capital. These attributes had index scores of at least 0.6 (nationally, but not internationally, competitive). Other relatively strong competitiveness attributes (those with index scores greater than 0.5) were business dynamics and leadership, international linkages, cost of utility services, security of employment, technology use, business regulation procedures, networks and business collaboration, land availability for development, business tax burden, and workforce skill base.

The weakest attribute in the economy, according to the index scores, was transparency of government export processes. Other weak attributes were government policy for particular industries; hierarchical structure of decision making; and informal fees and corruption. The analysis provides important insights into the policy development and intervention priorities that the country must have for its economy to be more competitive overall.

Figure 6.3 Multi-Sector Industry Analysis: Scores of Competitiveness Indicators for All Industries, Dhaka Capital Region



ICT = information and communication technology.

Source: Study team.

The interventions must be strategic and must be directed at those sectors of the economy that have the greatest potential to generate employment and investment opportunities.

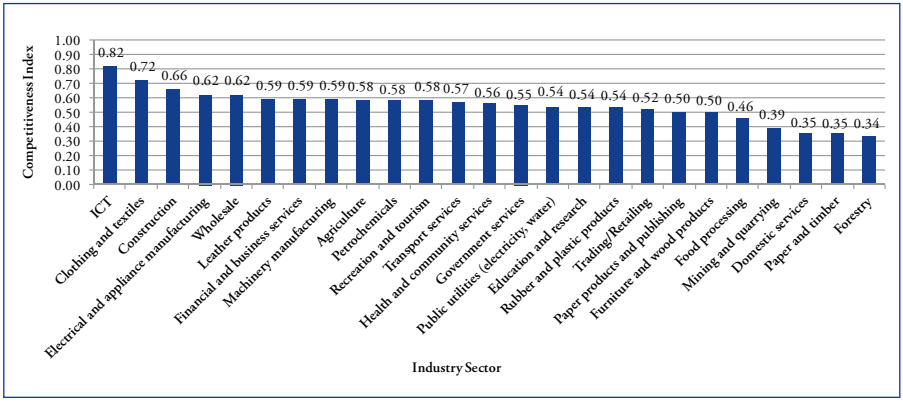
6.3.2 Competitiveness Scores of Industry Sectors

Figure 6.4 shows the index scores of competitiveness for 25 industry sectors in the DCR economy. The most competitive sector is ICT, followed by clothing and textiles, from which Bangladesh derives almost 75% of its export earnings. The competitiveness of the ICT sector is driven largely by international factors and by its role in supporting the operations of government and business. This sector tends to be the most competitive in all countries, as it is increasingly driven by demand created by globalization.

Other manufacturing sectors that are relatively strong are construction, electrical and appliance manufacturing, and wholesale. Their index scores (greater than 0.6) indicate that they are nationally competitive and have some export capability. Leather products, finance and business, machinery manufacturing, agriculture, petrochemicals, recreation and tourism, transport, health and community services, government services, public utilities, education and research, and trading, among other industry sectors, are only marginally competitive within the domestic economy, with index scores between 0.5 and 0.6.

Financial and business services have increased in recent years as the economy has grown, but access to capital for investment remains weak

Figure 6.4 Multi-Sector Industry Analysis: Competitiveness Scores of the Industry Sector, Dhaka Capital Region



ICT= information and communication technology.

Source: Study team.

because of the slowness of reforms in the sector, especially in banking. Weaknesses in supply chain management are a major factor behind the poor competitiveness of the food processing industry. Most industries in this sector supply food only to local markets; they are therefore not exposed to competition from international operators that would bring pressure on local companies to reduce costs by becoming more efficient, and to produce better-quality food and beverage products.

Further analysis of these sectors using MSIA and other statistical data would enable a clearer understanding of the competencies that are important to their development. The MSIA would bring out patterns of strength or weakness in attributes or factors that would guide national and local governments and businesses in setting strategic directions and overall priorities for resource allocation to develop the local economies.

6.4 Competitiveness of the Dhaka Capital Region

As Dhaka was identified as the most competitive city in Bangladesh, but still lacking in international competitiveness, a more in-depth study of its economy was made to find out how it can improve. The CCED approach to improving Dhaka's competitiveness might be used as a pilot case and applied to other cities and regions. The DCR is the largest and most developed industrial city in Bangladesh. It is also the administrative, commercial, and cultural center of the country. Although Dhaka has a dynamic and vibrant economy, it is one of the poorest megacities in the world. GDP per capita is low by international standards, but GDP per hectare is high because of the intensity of urban development and business activities. Poor planning and management of land use and utilities has led to high congestion and underperformance of assets and service delivery, reducing the returns to businesses and government from their capital investment. More and more business activities have migrated away from the central area to the periphery as a result. Identifying improvements that can be made in the functional and spatial productivity of industrial areas in Dhaka is important in attaining a more sustainable and prosperous economy for the megacity.

6.4.1 Growth Patterns and Economic Activities

The Dhaka Capital Region comprises six administrative districts (Figure 6.5). The DCR covers an area of 7,440 km^2, including the rural hinterlands of the six districts. The more rural among its municipalities are mainly agricultural land, wetlands, floodplains, and water bodies.

Figure 6.5 Administrative Districts in the Dhaka Capital Region

DCC = Dhaka Capital Corporation, HQ = headquarters.

Source: Study team.

The economy of the DCR is dynamic, but it is controlled by activities in and around the central business district. There is significant variation in economic output and activities in the DCR and the surrounding municipalities, and therefore also in the spatial distribution of poverty and the quality of infrastructure, utilities, and government services. These patterns and variations in the spatial geography of the economy are explained below.

In 2001, according to a census, the DCR had population of 17.3 million, 61.3% of which (10.6 million) was urban (BBS 2002). Table 6.7 shows how the population was distributed. There were 2,326 persons per km^2, although population density varied substantially between the six districts. Dhaka was the most densely populated, followed by Narayanganj and Narsingdi. The urban population of the DCR is expected to reach 15.9 million by 2011 and 23.6 million by 2021.

The DCR is relatively affluent compared with other areas of the country. The nonfarm sectors in particular are faring better in the DCR, possibly because of urbanization and the agglomeration of economic activities. Thus, economic growth is faster in the DCR than in other regions.

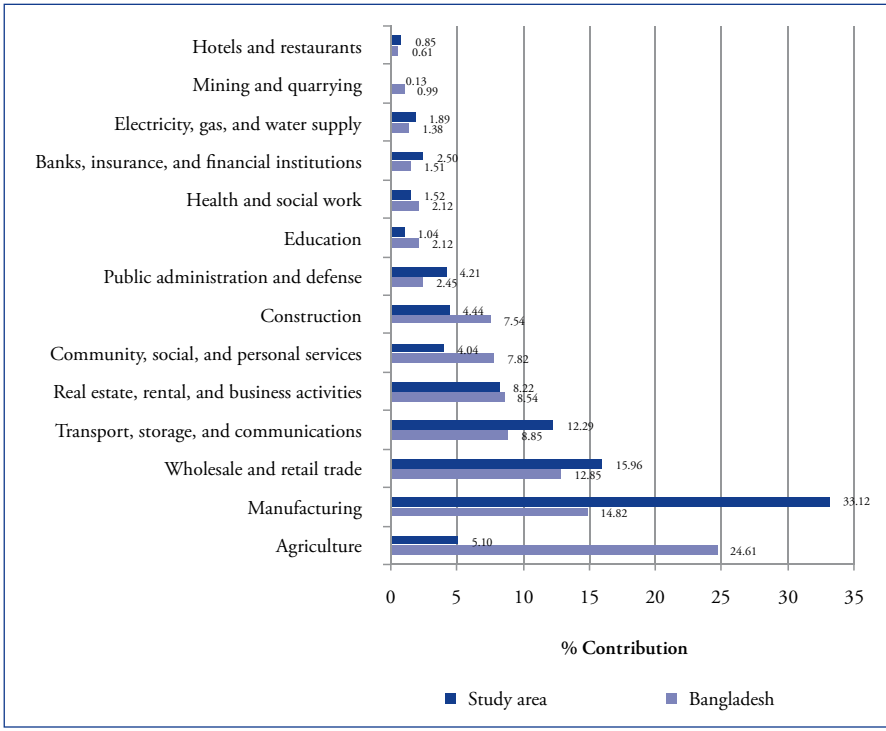
Table 6.7 Urban and Rural Population, Dhaka Capital Region, 2001

District	Population (million)			Degree of Urbanization (%)	Area (km^2)	Density (per km^2)
	Urban	Rural	Total			
Dhaka	7.902	0.717	8.618	91.7	1,161	5,887
Gazipur	0.904	1.119	2.023	44.7	1,800	1,124
Manikganj	0.097	1.205	1.302	7.5	1,379	946
Munshiganj	0.167	1.122	1.289	13.0	955	1,350
Narayanganj	1.206	0.965	2.171	55.6	701	3,097
Narsingdi	0.364	1.538	1.902	19.1	1,141	1,667
Dhaka Capital Region	10.639	6.666	17.305	68.5	7,440	2,326

km^2 = square kilometer.

Source: BBS (2002).

Figure 6.6 Industry Sector Contributions to Gross Regional Product, Dhaka Capital Region, and to Gross Domestic Product, FY1999/2000



Source: BBS (2007a).

Figure 6.6 compares the contribution of the various sectors to the DCR's gross regional product (GRP) in 2000 with their contribution to national GDP. Manufacturing contributed 33.1% to GRP; most of it can be credited to the garment and leather industries.

Construction, the second-largest industry sector, contributed only 4.4% to GRP, but its role in the DCR economy is important especially in providing informal sector employment and rapidly growing. Other rapidly growing sectors in the DCR are wholesale and retail trade; transport, storage, and communications; real estate, rental, and business activities; and public administration and defense. Agriculture contributed the least to the region's economy (about 5.1%) and is in decline.

6.4.2 Multi-Sector Industry Analysis of the Dhaka Capital Region

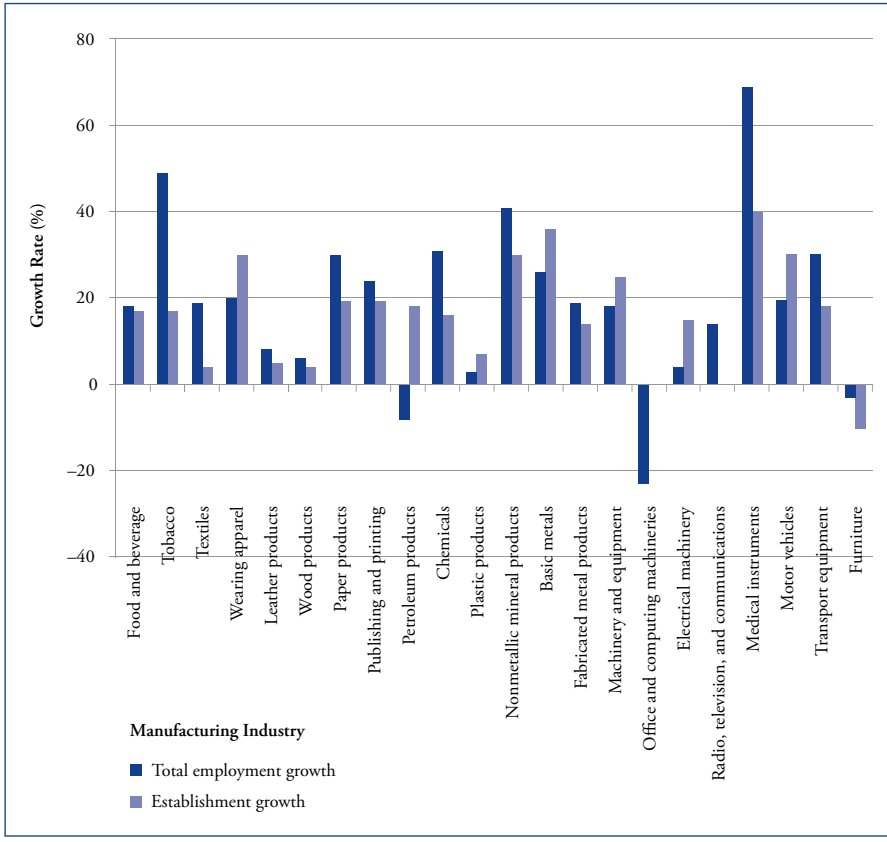
This section discusses and analyses aspects of the development of the industry sectors in the DCR in the past few years. Figure 6.7 shows the growth in employment and establishments in manufacturing between 2002 and 2005. Many industries developed rapidly, but from a very low base. Medical instrument manufacturing had the fastest growth, at 43.7%, followed by basic metals, at 36.3%. Both are emerging industries.

Employment also increased substantially in some industries—by 42% in non-metallic mineral products, 37% in tobacco, and 31.4% in chemicals. However, these sectors were not large, except for the non-metallic mineral products sector, which employed more than 57,000 people. The wearing apparel industry had 30.5% more employees in 2005 than it did in 2002. Among the 22 manufacturing industries for which data on employment are available, only three experienced a decline in employment during the period; these were furniture, petroleum products, and office and computing machinery.

6.4.2.1 Location Quotient Analysis

The country's nonfarm formal sector had 3.7 million establishments and employed 11.3 million people in 2003, according to that year's census count of economic activities (BBS 2007a). Table 6.8 breaks down the nonfarm employment in Bangladesh and the DCR. About 40% of nonfarm employment in the DCR in 2003 was in manufacturing. Nationwide, this sector accounted for 26% of all nonfarm employment in 2003. The second-largest nonfarm employer in the DCR was wholesale and retail trade, which absorbed 33% of workers, compared with 40% nationwide on average (benchmarking data).

Figure 6.7 Employment and Establishment Growth in Manufacturing, Dhaka Capital Region, 2002–2005



Source: Study team.

Location quotients (LQs) for 13 broad sectors of the DCR's economy (based on GDP) for 1995–1996 and 1999–2000 are shown in Table 6.7. Manufacturing had the highest number of workers, followed by wholesale and retail trade. LQ analysis indicates that the construction industry is more highly concentrated in the DCR than in the country as a whole (2.19). A sector with an LQ greater than 1 is likely to be more concentrated in the DCR than in the country as a whole, producing specialized materials, products, and services or distributing these within the domestic market. Construction had the highest LQ value (2.19), followed by public administration and defense (1.61) and manufacturing (1.5). Sectors with low LQs are mining and quarrying (0.38), education (0.47), and real estate, rental, and business activities (0.47), indicating a low level of self-sufficiency or specialization.

Figure 6.8 shows the relative size of industries in the DCR in relation to employment growth and LQ. Industries with an LQ greater than 1 (indicated

Table 6.8 Nonagricultural Sector Employment, 2003

Sector	Bangladesh		DCR		
	Number Employed	% of Total	Number Employed	% of Total	LQ
Construction	36,212	0.32	20,766	0.70	2.19
Public administration and defense	341,015	3.03	144,004	4.89	1.61
Manufacturing	2,975,580	26.40	1,169,089	39.67	1.50
Electricity, gas, and water supply	29,499	0.26	10,568	0.36	1.37
Transport, storage, and communications	240,672	2.14	68,178	2.31	1.08
Banks, insurance, and financial institutions	231,810	2.06	65,889	2.24	1.09
Health and social work	231,299	2.05	60,667	2.06	1.00
Wholesale and retail trade	4,510,325	40.02	979,303	33.23	0.83
Community, social, and personal services	983,711	8.73	180,649	6.13	0.70
Hotels and restaurants	694,865	6.17	126,586	4.29	0.70
Real estate, rental, and business activities	127,409	1.13	15,650	0.53	0.47
Education	853,326	7.57	104,604	3.55	0.47
Mining and quarrying	14,699	0.13	1,447	0.05	0.38
Total	11,270,422	100.00	2,947,400	100.00	—

DCR = Dhaka Capital Region, LQ = location quotient.

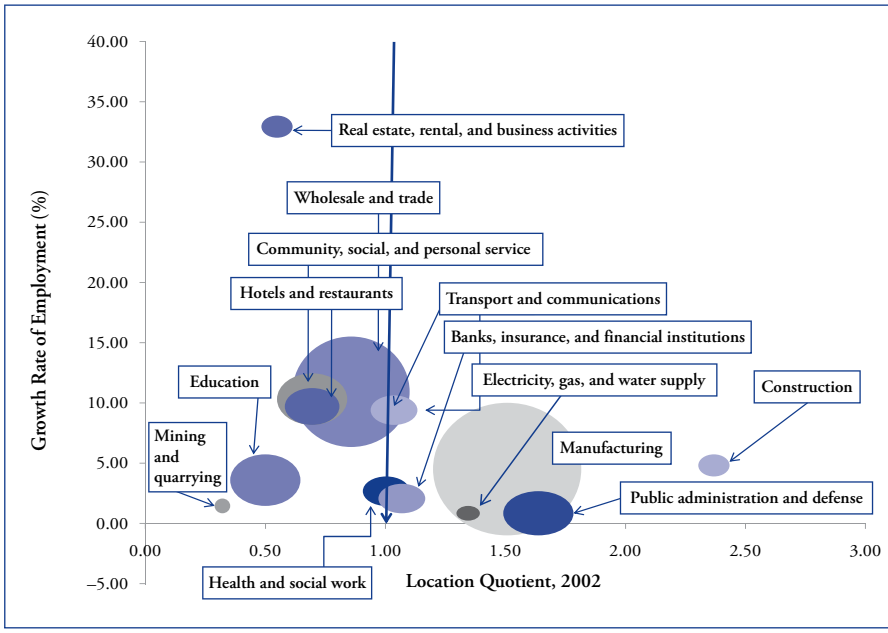
Source: BBS (2007a).

with a vertical line in red) show higher concentration and specialization in the DCR than nationwide. Industries with an LQ less than 1 have relatively lower concentration in the DCR than nationwide. The position of the bubbles along the y-axis shows whether the industries are growing (above 0.00) or declining (below 0.00). Currently, no industry is declining in the DCR. The arrows indicate the likely direction of growth and development for the industry sectors. The graph provides an important indication of the agglomeration (the size of the bubbles) and scale of emerging industry clusters (the growth rate of employment) in the DCR, some of which are investigated in more detail later in this book.

6.4.2.2 Industry Cluster Mapping

This section analyzes the spatial pattern of industry location and the major concentrations of employment within the DCR. LQ analysis was carried out

Figure 6.8 Size, Location Quotient, and Employment Growth, by Sector, Dhaka Capital Region, 2003



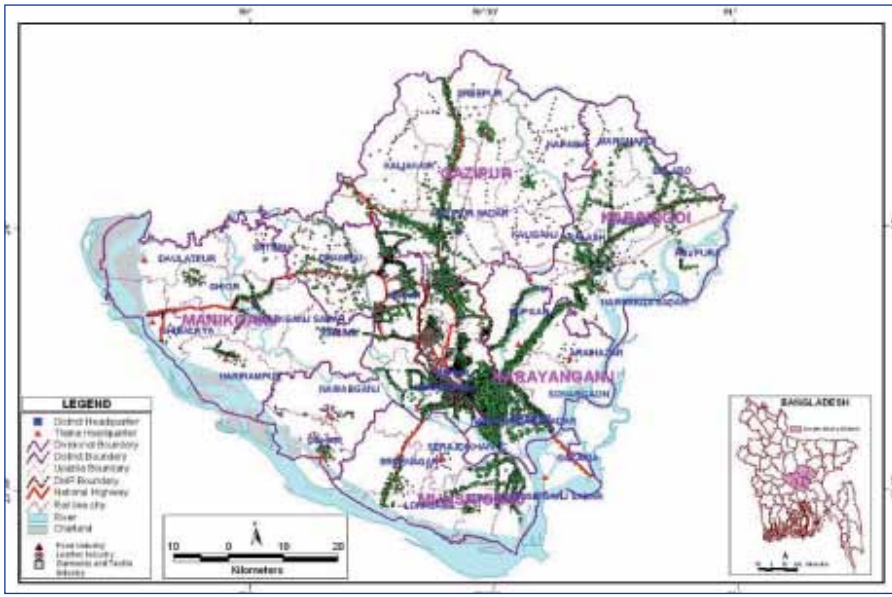
Source: Study team.

to identify the concentrations of industries in the DCR in relation to their national concentrations. The concentrations of seven key industries in the DCR were mapped with the help of a geographic information system (GIS).

Figure 6.9 shows the location of major industries in the DCR. In 2005, the DCR had more than 74,000 industry units, half of which were in the Dhaka metropolitan area. The next-largest concentrations of manufacturing units in the DCR are in Narayanganj, Narsingdi, and Gazipur. Manikgonj has the lowest concentration. Within Dhaka District (see footnote 2), there is a major concentration of industries in the central city area. Most of these are textile manufacturing units, located primarily in Mirpur and Savar, and along the Airport Road. One of the largest concentrations of micro industries is in Keranigonj Thana,[4] south of the Buriganga River. Most industry units function as feeder firms in the supply chain for a few large-scale industries.

[4] *Thanas* and *upazilas* (subdistricts) are the second-lowest tier of government in Bangladesh. They rank below the divisions and districts and above the union parishads (local councils). A thana occupies the area within a police precinct.

Figure 6.9 Concentration of Manufacturing Industries, Dhaka Capital Region, 2009



DMP = Dhaka metropolitan area.

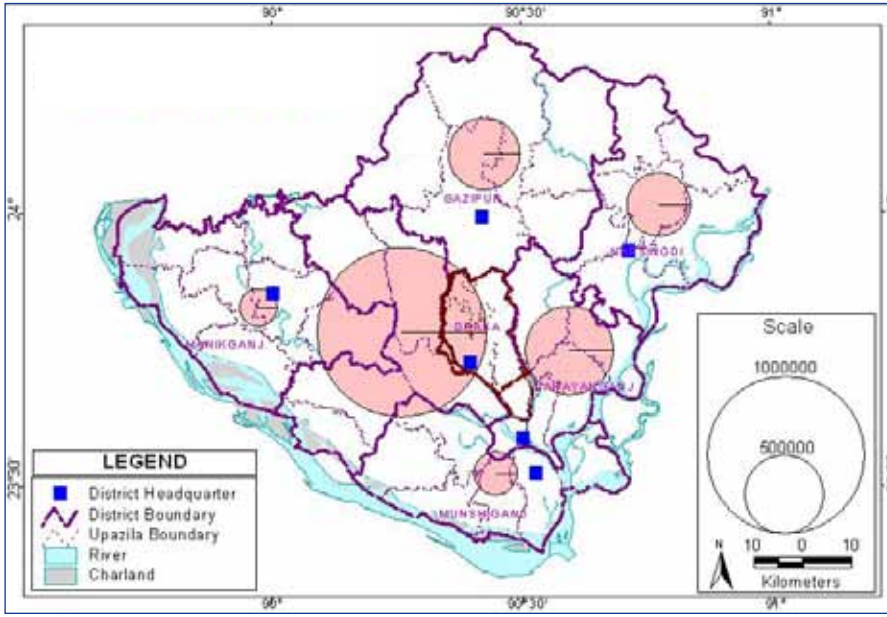
Note: Upazilas are subdistricts, the second-lowest tier of government in Bangladesh, below the divisions and districts and above the union parishads (local councils).

Source: Study team.

Two export processing zones in Savar, northwest of Dhaka city, contain many textile manufacturing units. Outside Dhaka District, the major concentrations of industries are in Narayanganj. Narayanganj was traditionally an industrial town engaged in jute processing and hosiery production. It is still an industrial town, although jute processing is no longer a major economic activity. Apparel, especially knitwear, industries are gradually moving to Narayanganj, and it now has more than 8,000 textile and garment factories.

Figure 6.10 shows the major concentrations of the manufacturing labor force in the DCR. The greatest concentration of labor is found in Dhaka District, Savar, and fringe areas; the next largest, in Narayanganj and then Gazipur. Gazipur is expanding because of its flat and generally flood-free land. Land is also available in Narsingdi for the expansion of industries, and many manufacturing industries are moving into this area. There is a small concentration of industries, mainly food processing and other agricultural business activities, in Munshiganj and Manikganj.

Figure 6.10 Concentration of Labor, Dhaka Capital Region, 2009



Note: Upazilas are subdistricts, the second-lowest tier of government in Bangladesh, below the divisions and districts and above the union parishads (local councils).

Source: Study team.

6.5 Analysis of Three Industry Clusters in the Dhaka Capital Region

An important step in the application of CCED is the analysis of industry clusters. The cluster approach to industry economic development and analysis focuses on the cluster actors that think and act together for their individual and collective benefit. Collective gains transcend the sum of the individual gains, because collective thinking, action, and unity, coupled with higher visibility and consequent attention by markets and institutions, lead to exponential returns (South Asia Enterprise Development Facility 2007). The study team selected these three industries in the DCR for the cluster analysis:

- *The textile and ready-made garments (RMG) industry.* This is the largest employer and the most vibrant industry in the DCR, but it must first overcome many problems before it can be more globally competitive.
- *The leather industry.* This industry has had serious environmental and quality problems and must be more competitive. Its potential for value addition and export development is high.

- *The food and beverage industry (F&BI).* This is an emerging industry in the DCR that must be made more efficient. It has an important role in food security and has significant value-adding and export potential.

A core industry location map showing the spatial agglomeration of the core businesses and companies in each cluster was prepared. The locations were identified through a primary survey in March–April 2009 using satellite images and a ground survey of the core industry locations. GIS techniques were applied in the map and database preparation. Associated, partner, and linked industries and support systems were also identified so that the industry cluster could be completely mapped. To analyze the efficiency of the core industry and to establish the nature of its forward and backward linkages, the industry supply chain was traced. Current and future industry competitiveness was analyzed on the basis of an adaptation of the Porter diamond model, and a deficiency gap measure was devised. With the deficiency gap measure, the shortfall in competitiveness of the various attributes needed for the development of the cluster could be determined and an action plan and strategies could be prepared for the development of the cluster.

The competitiveness of the three clusters was analyzed and action plans were drawn up for their development, according to the steps discussed in Chapter 5. A brief profile of each core industry, in terms of its growth and the extent of its development dynamics, is provided here.

6.6 Analysis of the Textile and Ready-Made Garments Industry Cluster in the Dhaka Capital Region

The textile and RMG industry has been the country's export leader for the last 10 years. The industry generates an estimated 1.2 billion jobs in the DCR and, in 2009, exported more than $3.6 billion worth of textiles and garments. This sector has gained comparative advantage because of (i) its large pool of low-cost labor; (ii) its low transportation costs, resulting from the co-location of industrial establishments; and (iii) policy support from the government, including the establishment of economic enterprise zones and other taxation, foreign ownership, and infrastructure inducements for exporters and investors. The sector was named one of the "thrust sectors" of the government in its 2006–2009 industrial and export development policies.

Successive governments in Bangladesh have encouraged and supported the development of the textile and RMG industry since the mid-1980s. Industry entrepreneurs set up factories anywhere they could secure land or buildings, including houses when these were available. Government did not seek to impose any restrictions on the location of factories. Supply industries

grew rapidly to meet the demand for raw materials and fabricated products. But high rents on properties close to the main producers scattered many in these lower-order supply chain industries around the DCR and created a widely dispersed supply chain distribution structure. Inefficiencies and high local transaction costs resulted as the city transport and utility sectors became increasingly congested.

6.6.1 Spatial Mapping of the Textile and Ready-Made Garments Industry Cluster

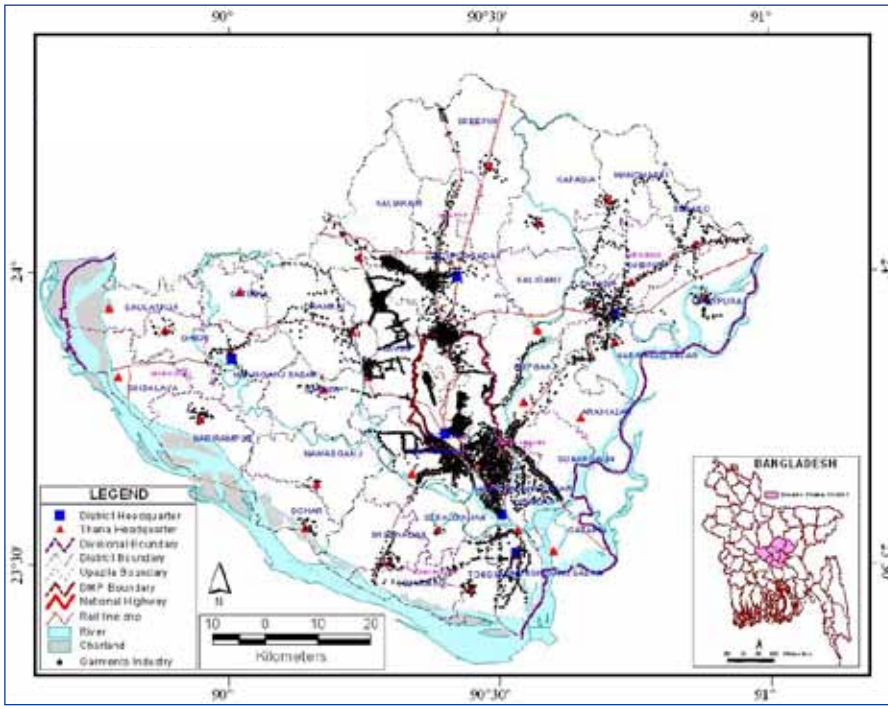
More than 8,000 factories and SMEs of varying sizes are involved in the production of textiles and ready-made garments in the DCR. More than 60% of these are in the Dhaka metropolitan area, with around 8% in Narayanganj and 17% in Gazipur (Figure 6.11). The factories are geographically concentrated in these districts because of the ready access to skilled labor, and the lower transportation and other business transaction costs. Most of the textile and RMG industry units are in central Dhaka, where factory buildings are multistory and not well designed for efficient production. For this reason, some factories that have expanded have relocated to areas where there is more land and vertical (same-level) production systems.

In central Dhaka, many of the supporting industries are close to the main production houses, but the intensity of the development in these areas has added to the traffic congestion and overtaxed the utility services. Despite these disadvantages, many well-established family businesses with expanded operations elsewhere in the DCR maintain premises in the inner city, partly because of the numbers of skilled people who live in this area and also because of the economies of scale resulting from the agglomeration.

A second agglomeration of textile and RMG industry units is in Narayanganj, adjacent to Dhaka. Before independence, Narayanganj, as mentioned earlier, was a major player in jute and hosiery manufacturing. After the jute industry declined, the city continued to produce hosiery items, mainly for the domestic market. A third textile and RMG agglomeration is in Gazipur and Tongi districts. The belt starts from Tongi and runs to Joydebpur within the Gazipur District jurisdiction. A fourth textile and RMG agglomeration is in Savar, one of the country's largest and fastest-growing industrial areas. Two export processing zones are in the area.

A linear pattern of textile and RMG factories is also developing along the major roads and highways leading out of Dhaka. The failure to contain these factories within properly developed industrial areas will only add to the DCR's environmental problems, as many of these enterprises lack waste treatment facilities.

Figure 6.11 Locations of the Textile and Ready-Made Garments Industry, Dhaka Capital Region



Notes: *Thanas* and *upazilas* (subdistricts) are the second-lowest tier of government in Bangladesh. They rank below the divisions and districts and above the union parishads (local councils). A thana occupies the area within a police precinct.

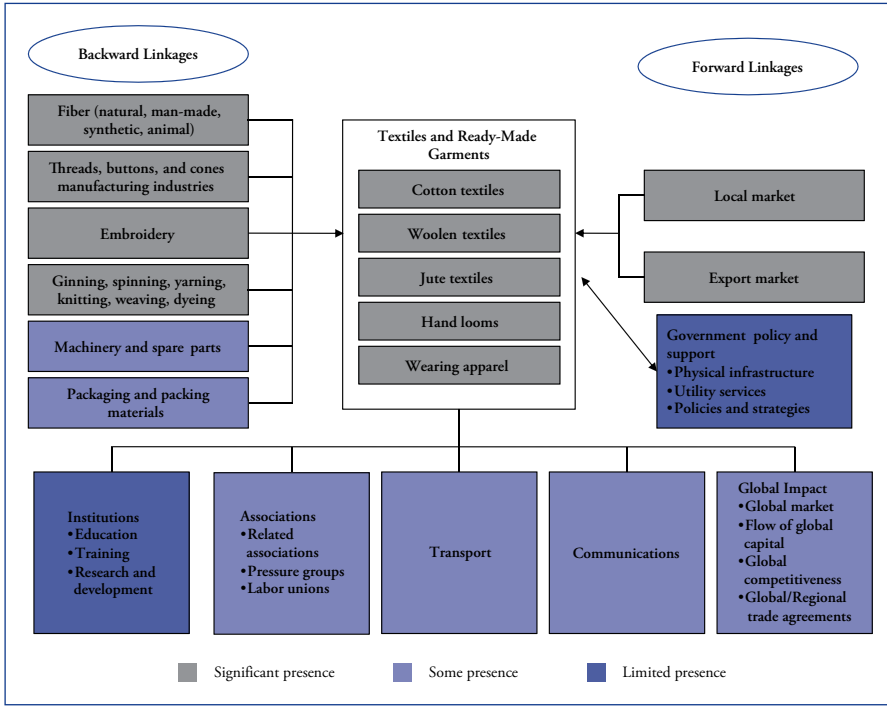
Source: Study team.

6.6.2 Structure Mapping of the Textile and Ready-Made Garments Industry Cluster

Figure 6.12 shows the structure of the textile and RMG industry cluster in the DCR. The five core industries in the cluster are cotton textiles, knitwear, woolen textiles, jute textiles, and hand looms. The backward and forward linkages supporting the industry cluster are government (in policy and strategy matters), utility services, industry associations and interest groups, educational establishments, labor unions, national and international markets, and R&D and design support services. Many components of the cluster are poorly developed, inefficient, or missing. As a result, the cluster is not functioning efficiently, undermining its competitiveness against other Asian textile and RMG centers, especially the PRC.

As noted above, many problems impede the proper functioning of the textile and RMG cluster. Most factories have had to set up their own utility

Figure 6.12 Structure of the Textile and Ready-Made Garments Industry Cluster, Dhaka Capital Region



Source: Study team.

systems (such as power generation, water supply, steam supply, and effluent treatment plants) to overcome constant disruptions in these services. In addition, the large labor force and mid-level technical and management staff are often not sufficiently skilled or technologically trained to run equipment that could strengthen the performance of the sector. There is a heavy reliance on foreign skills for management positions that Bangladeshis could easily fill if only there were facilities to train them. While telecommunications have improved, transport services, vehicular traffic, and logistics management are becoming worse, thereby adding to the transaction costs of business. Weak quality assurance in many factories is leading to high rates of rejection of exported textile and RMG products.

In general, integrating backward and forward supply chains will add value. The backward supply chain consists of eight stages: (i) cotton ginning or raw-fiber making, (ii) spinning, (iii) yarning, (iv) knitting or weaving, (v) dyeing, (vi) cloth making, (vii) the turning of cloth into ready-made garments, and finally (viii) the sale of the garments in the domestic or export markets. Each stage involves some form of value addition. Opportunities exist to add further value to products, especially if supporting industries—such as (i) lining and

the production of buttons, zippers, and other accessories; and (ii) integration of design and marketing services—were to join the value chain. Mapping the supply chain helps the industry to understand the production systems within the cluster, the value-adding elements, and the linkages to supporting industries and services. The supply chain for the textile and RMG industry shows that the industry cluster has a strong multiplier effect on employment and production.

6.6.3 Competitiveness and Gap Analyses of the Textile and Ready-Made Garments Industry in the Dhaka Capital Region

Table 6.9 gives a detailed breakdown of the current and desired future competitiveness of the industry with respect to the five conditions of competitiveness and 38 associated elements, and the gap in competitiveness. Demand conditions are the most favorable attributes of competitiveness in the cluster, as most of the garments produced are low-priced exports destined for discount or lower-income consumers in developed and developing countries. The cluster is weakest in government support. Much of this weakness has to do with the need for industry reforms and the removal of many unnecessary restrictions on the operations of businesses and enterprises in the cluster, and for the provision of essential infrastructure and services. Factor conditions, firm strategy and rivalry, and supporting industries are not internationally competitive. Overall, the competitiveness of the cluster is weak, scoring 2.09 out of a possible 5.00. For the cluster to become globally competitive, this score must improve to at least 3.89.

Table 6.9 Competitiveness Analysis of the Textile and Ready-Made Garments Industry Cluster, Dhaka Capital Region, Using the Porter Diamond Model Framework

Five Conditions and 38 Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
FACTOR CONDITIONS	2.10	3.82	–1.72
Labor	1.82	3.82	–2.00
Availability of skilled labor	2.10	4.00	–1.90
Management skills	1.80	3.90	–2.10
Efficiency and productivity of labor	2.40	3.80	–1.40
Education and training facilities	1.00	3.60	–2.60

continued on next page

Table 6.9 *Continued*

Five Conditions and 38 Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
Infrastructure	2.22	3.80	–1.58
Quality of infrastructure services (logistics)	2.20	4.10	–1.90
Quality of infrastructure services (utilities)	1.80	3.80	–2.00
Cost of services	2.20	3.40	–1.20
Quality of telecommunications services	2.70	3.90	–1.20
Endowed resources	2.57	4.03	–1.47
Proximity to raw materials	2.20	4.10	–1.90
Cost of local raw materials vis-à-vis imports	2.40	3.70	–1.30
Quality of raw materials	3.10	4.30	–1.20
Social environment	1.90	3.54	–1.64
Quality of life of workforce	1.10	3.10	–2.00
Workplace conditions	2.30	4.00	-1.70
DEMAND CONDITIONS	2.31	3.53	–1.21
Markets	2.10	3.60	–1.50
Expanding domestic and local markets	1.00	3.00	–2.00
Expanding export markets	3.20	4.20	–1.00
New products	2.00	3.50	–1.50
Demand expansion capacity for new products	2.00	3.60	–1.60
Responsiveness to change and innovativeness	2.00	3.40	–1.40
Business environment	2.67	3.50	–0.83
Quality and reliability of product or service	2.80	3.10	–0.30
Product sustains awareness and support	2.70	3.60	–0.90
Strong business ethics	2.50	3.80	–1.30
FIRM STRATEGY, STRUCTURE, AND RIVALRY	1.81	3.46	–1.65
Structure	1.75	3.40	–1.65
Presence of foreign and joint-venture companies	1.60	3.30	–1.70
Flexibility of production systems	1.90	3.50	–1.60

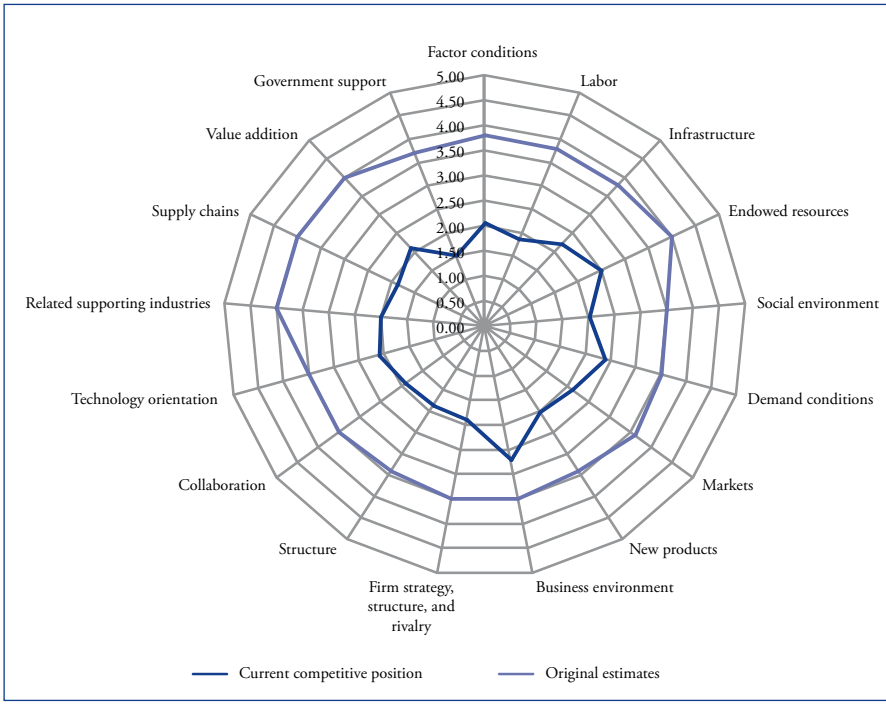
continued on next page

Table 6.9 *Continued*

Five Conditions and 38 Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
Collaboration	1.78	3.48	–1.70
Strong industry–firm collaboration	1.40	3.20	–1.80
Shared industry knowledge capital development	1.60	3.40	–1.80
Strong social capital and business networks	2.30	3.80	–1.50
National or international leadership	2.30	3.70	–1.40
Civic entrepreneurship and community engagement	1.30	3.30	–2.00
Technology orientation	2.10	3.50	–1.40
High level of technology application in companies	2.10	3.50	–1.40
RELATED SUPPORTING INDUSTRIES	1.98	3.98	–2.00
Supply chains	1.83	3.97	–2.13
Strength of local business support services	1.80	3.90	–2.10
Responsiveness of local support services	1.80	4.00	–2.20
Quality of local support services	1.90	4.00	–2.10
Value addition	2.20	4.00	–1.80
Potential to add value to supply chains	2.40	3.80	–1.40
Business awareness of value-adding potential	2.00	4.20	–2.20
GOVERNMENT SUPPORT	1.44	3.66	–2.22
Government support for cluster development	0.90	3.80	–2.90
Streamlined business approval systems	1.50	3.50	–2.00
Support for sustainable industry development	1.60	4.00	–2.40
Enforcement of business regulations	2.20	3.60	–1.40
Support for research and development	1.00	3.40	–2.40
Average for All Indicators	**2.09**	**3.89**	**–1.80**

Source: Study team.

Figure 6.13 Deficiency Gap Analysis of the Textile and Ready-Made Garments Cluster, Dhaka Capital Region



Source: Study team.

The following is a summary of some key issues concerning the competitiveness attributes of the textile and RMG cluster in the DCR. The results of the deficiency gap analysis of the industry cluster using the Porter diamond model are presented graphically in Figure 6.13.

6.6.3.1 Factor Conditions

Table 6.9 shows significant weakness in the competitiveness of labor factors in the cluster. Participants at the first CCED meeting for industry stakeholders in 2009 identified a number of labor problems. One is a lack of adequate education and training facilities and a scarcity of human resources with enough skills to make the sector more competitive. The only specialized educational institution serving the sector is the College of Textile Engineering and Technology. Some other educational institutions have degree courses in fashion technology, merchandising, and supply chain management, but very few offer skill enhancement programs. Floor quality assurance in the industry is deficient as a result, and rejection rates are high.

Utility services, according to the participants at the 2009 meeting, are also poor and unreliable. The local government units in the DCR will have to deliver more efficient utility services, especially in areas of high concentration of industrial establishments. Proximity and access to raw materials is another problem. Government and industry must make a greater effort to improve the quantity and quality of raw materials and delivery systems at the lower end of the supply chain.

Employees in the industry endure very poor conditions—low wages, high rent, overcrowded housing, and inadequate access to basic health and social services. Factories generally have minimal safety and health safeguards; in many cases, they are dangerous places to work in. Many of these costs are considered business externalities, but they significantly affect productivity. Employers in the cluster are only just starting to acknowledge the positive correlation between quality of life and workforce productivity.

6.6.3.2 Demand Conditions

Market conditions are highly competitive for exporting firms, but the domestic market is weak. Companies know that, with the international markets expected to become more difficult, they must expand into the domestic markets to grow. Given the scant disposable income of most of the people, markets for budget items and a few niche lines of apparel will have to be developed. Unfortunately, the capacity of the sector to respond to change, innovate, and develop new products is relatively weak. It must become more capable of developing new products and changing production line processes to maintain and develop its export market share and also develop opportunities in the domestic market.

Product quality and reliability is relatively high, compared with other competitive attributes, because firms have to compete for business in the international markets. Entrepreneurs in this sector are aware of the importance of post-sales and product support for quality assurance and product reputation with foreign buyers. The sector is capable of dealing with international business risks, but business ethics and risk management must improve.

Despite the global recession, the textile and RMG industry sector in Bangladesh shows moderate growth. This suggests that businesses are experienced enough to deal with the problems created for the industry by the crisis. Low elasticity of demand for cheap cloth makes the sector less vulnerable to international business risks associated with raw material prices. A demand factor that will have a considerable effect on the industry in the future will be the pressure placed on the industry to become more carbon neutral. Costs will be greatly affected, and wages are likely to feel downward pressure.

6.6.3.3 Firm Strategy, Structure, and Rivalry

The industry is dominated by many small companies and microenterprises. There are a few joint ventures with foreign companies, mostly from the Republic of Korea and Taipei,China. The industry has to engage more with foreign companies to accelerate technology transfer, modernize management practices, and gain access to new and expanded markets. Production must also be more flexible and integrated.

Many companies are entrepreneurial, but there is a rigidity to change and most do not have the capital to invest in new technologies or the wherewithal to respond to rapidly changing demand. Because investment in the textile and RMG sector could generate more wealth for the country, the government must take steps to reform its foreign investment policy and tariffs to attract foreign investment and modernize production systems in the sector.

The practice of knowledge sharing and collaboration between companies is new to most businesses in the sector in Bangladesh, and so is the diffusion of technology along the supply chain. The industry, as a whole, fails to appreciate, or is unwilling to accept, the necessity of collaborating to promote economies of scale and capital-intensive production, which are driving down production costs in other parts of Asia. Companies must learn to share their experiences, knowledge of market conditions, and new technologies to heighten competitiveness and innovation within the cluster. The introduction of initiatives to encourage knowledge sharing will be an important step toward more collaborative competition and production in the sector.

Finally, the uptake of modern technology in the textile and RMG sector is not high. Bangladesh has an abundance of unskilled labor, and many companies are prepared to force down labor costs to remain competitive, not realizing that doing so often also lowers productivity. Higher salaries, skills training for workers, and the use of more modern technologies will increase productivity and return on capital. Unfortunately, some labor laws and practices block the adoption of new technologies. The slow adoption of new technology is a major constraint on the development and competitiveness of the sector.

6.6.3.4 Related Supporting Industries

Related supporting industries in the cluster are only weakly competitive. The businesses surveyed voiced dissatisfaction with supporting services, especially with government services, which tend to be slow and prone to rent seeking. Modern industries depend increasingly on high-quality information,

regulation, financial, and legal services—all of which are weak or lacking in the textile and RMG sector. Although the sector has high value-adding potential, opportunities to expand and develop supply-chain industries are undermined by poor knowledge and by lack of government policy and support for R&D and innovation. Not knowing how to add value, most companies stick to traditional production systems and practices, which are rapidly becoming outdated. Education programs to encourage product innovation and risk management are necessary.

6.6.3.5 Government Support

Companies in the sector expect significant support from government. This is partly because industrialization in Bangladesh began under socialist policies, including nationalization, which protected companies from competition. There is no coherent government policy supporting the development of the textile and RMG cluster. R&D receives little government support, and negligible private sector investment. As mentioned above, the industry gets some tax benefits from government as a "thrust sector" of the economy. But it requires long-term business development policy, institutional reforms, tax breaks for R&D and venture capital formation, and low-interest loans. Government must also take a leading role in the development of strategic public infrastructure such as industrial estates, through land banking and other means, for the sustainable growth and development of the industry.

6.6.4 Action Plan for the Textile and Ready-Made Garments Industry in the Dhaka Capital Region

The textile and RMG industry has been the leading export industry in Bangladesh for the last 10 years and will continue to be one of the main drivers of economic development in the DCR. This sector has gained comparative advantage because of its large pool of low-cost labor, the low transportation costs made possible by the co-location of industrial establishments, and some government support.

However, despite being one of the country's few globally competitive industries, the textile and RMG industry is problem ridden. All attribute scores are below 3 (Table 6.8), the level considered necessary for an internationally competitive and sustainable industry cluster. Except in a few specialized product lines, the sector is competing at the bottom end of the global marketplace. The sector must raise its competitiveness by taking a more collaborative approach to development to reduce transaction costs, innovate, and add value to industry supply chains. To address competitiveness and development issues confronting the industry cluster,

an action plan was prepared with industry stakeholders in the CCED initiative. The plan identifies the following areas of strategic intervention to facilitate the development of the textile and RMG cluster in the DCR:

- traffic decongestion, through the provision of traffic controls and more feeder roads in the cluster areas;
- establishment of cluster associations to promote a cooperative business environment and eliminate supply constraints; and
- training for product diversification.

6.7 Analysis of the Leather Industry Cluster in the Dhaka Capital Region

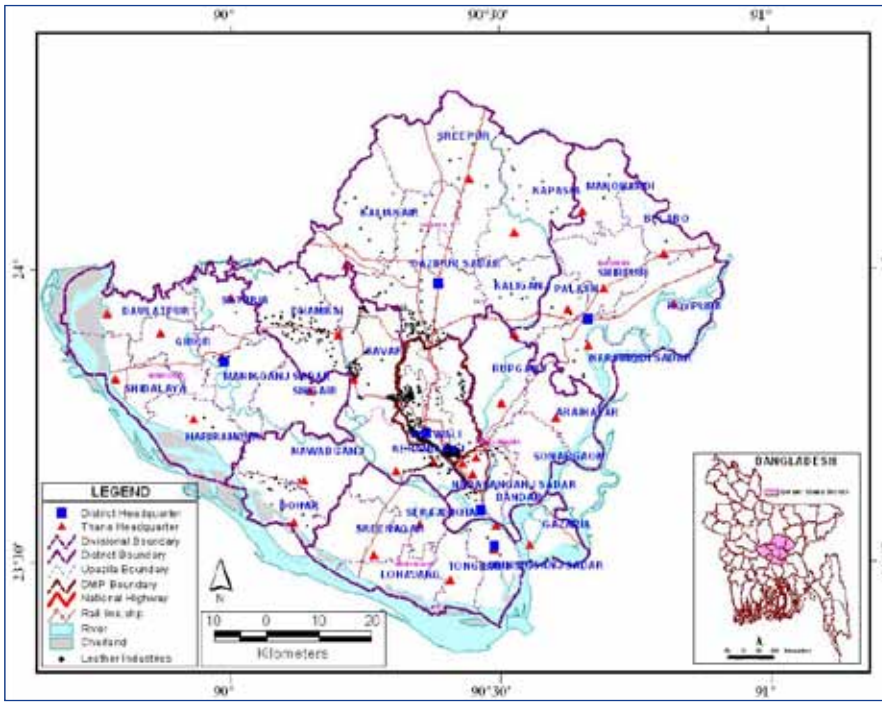
The manufacture of leather plays a small but noteworthy role in the export economy of Bangladesh. The country produces some of the world's finest goatskin for smooth-grain leather products. In recent years the industry has diversified its products by combining the latest advances in leather technology with an increasing supply of fine-quality local hides and skins. Bangladesh has also entered the field of leather fashion garments with distinction and prestige. Leather and leather products represent about 11% of the export earnings of Bangladesh. Leather and leather products are currently exported to 53 countries including Brazil, the PRC, France, Germany, Italy, Japan, the Netherlands, the Russian Federation, Spain, Singapore, and Taipei,China. Exports in 2007–2008 totaled Tk32 billion ($463 million) (EPB 2008).

6.7.1 Spatial Mapping of the Leather Industry Cluster

Unlike the textile and RMG industry, the leather goods industry is highly concentrated in the DCR, specifically near the center of Dhaka. According to the Bangladesh Bureau of Statistics (BBS) economic census data for 2003, the DCR accounted for nearly 72% of all leather industry establishments in the country (3,520 out of 4,914), and 80% of all leather industry employees nationwide (34,846 out of 43,633).

Unpublished BBS data gathered between 2002 and 2005 show that leather industry establishments grew by 4.62% per year, and employment by 7.25%. An overwhelming majority of leather industry companies or businesses within the DCR were microenterprises with fewer than 10 employees, other unpublished BBS data on the size of companies indicate. But microenterprises employed only 42% of the industry total in the DCR in 2003. Figure 6.14 shows the concentration of tanneries in the DCR. There are more than 200 tanneries in Bangladesh (Sharif and Mainuddin 2003),

Figure 6.14 Leather Industry Locations, Dhaka Capital Region



Notes: *Thanas* and *upazilas* (subdistricts) are the second-lowest tier of government in Bangladesh. They rank below the divisions and districts and above the union parishads (local councils). A thana occupies the area within a police precinct.

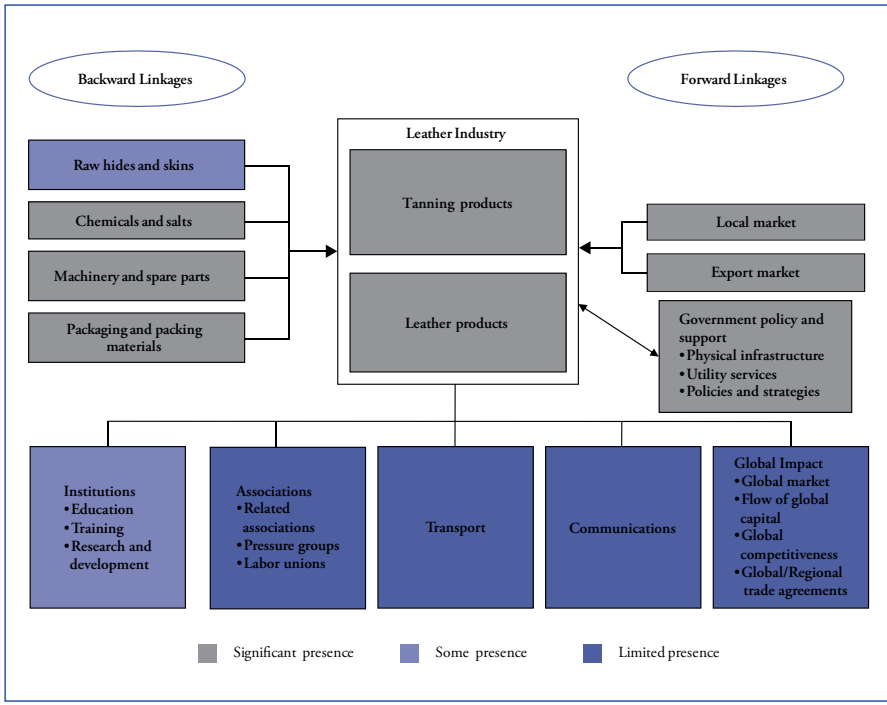
Source: Study team.

90% of these in the Hazaribagh area of Dhaka. The rest are moderately concentrated in Gazipur, and a few are in Narsingdi and Manikganj.

6.7.2 Structure Mapping of the Leather Industry Cluster

Figure 6.15 shows the structure of activities in the leather industry cluster and how they are interrelated. Tanning and the manufacture of leather products are the core business activities. The backward linkages are raw hides and skins, chemicals and salts, machinery and spare parts, and packaging and packing materials. The forward linkages are purchasers and distributors that sell and transport products to international and domestic markets. The cluster also has horizontal linkages with educational, training, and R&D institutions. The government provides the physical infrastructure and utility services like electricity, water, and gas to the industry, and it supports opportunities for new business development. Associations, labor unions, and other pressure groups are part of the cluster as well.

Figure 6.15 Structure of the Leather Industry Cluster in the Dhaka Capital Region



Source: Study team.

There are six steps in the supply chain. Raw hides and skins are predominantly sourced from within Bangladesh, although as the industry has expanded the import of live cattle and raw hides has increased. About 40% of the supply of raw hides and skins is produced during the Muslim festival Eid ul-Azha. The rest is produced throughout the year. In 2008, about 20.45 million square meters in local raw hides and skins were supplied. Because animals are slaughtered irregularly, the industry has substantial underused capacity. The import of live cattle could take this up.

After slaughter, animal hides are prepared for tanning. The preparatory stages[5] may include preservation, soaking, liming, fleshing, splitting, liming, bathing, degreasing, bleaching, and pickling. The leather then passes through four other processes before being used to produce a range of leather products including shoes, handbags, gloves, and leather jackets. Most of the country's leather products are exported. Exports reached $203 million in 2008–2009.

[5] See leather production process at http://en.wikipedia.org/wiki/Leather.

6.7.3 Competitiveness and Gap Analyses of the Leather Industry in the Dhaka Capital Region

The current and desired future competitiveness of the industry, as well as the competitiveness gap, is analyzed in detail in Table 6.10 according to the five key conditions of competitiveness and 38 associated competitive elements in the Porter diamond model. All five factors score less than 3.0, well short of what is necessary to develop an internationally competitive and sustainable leather industry cluster.

Table 6.10 Competitive Analysis of the Leather Industry Cluster, Dhaka Capital Region, Using the Porter Diamond Model Framework

Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
FACTOR CONDITIONS	2.58	4.42	–1.85
Labor	2.25	4.30	–2.05
Availability of skilled labor	2.50	4.30	–1.80
Management skills	1.80	4.30	–2.50
Efficiency and productivity of labor	3.00	4.30	–1.30
Education and training facilities	1.70	4.30	–2.60
Infrastructure	2.55	4.25	–1.70
Quality of infrastructure services (logistics)	2.50	4.30	–1.80
Quality of infrastructure services (utilities)	2.50	4.00	–1.50
Cost of services	2.50	4.00	–1.50
Quality of telecommunications services	2.70	4.70	–2.00
Endowed resources	3.43	4.90	–1.47
Proximity to raw materials	3.30	5.00	–1.70
Cost of local raw materials vis-à-vis imports	3.70	5.00	–1.30
Quality of raw materials	3.30	4.70	–1.40
Social environment	2.24	4.36	–2.12
Quality of life of the workforce	2.00	4.30	–2.30
Workplace conditions	2.00	4.30	–2.30

continued on next page

Table 6.10 *Continued*

Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
DEMAND CONDITIONS	2.71	4.49	–1.77
Markets	2.60	4.15	–1.55
Expanding domestic and local markets	2.50	4.00	–1.50
Expanding export markets	2.70	4.30	–1.60
New products	3.00	4.50	–1.50
Demand expansion capacity for new products	2.80	4.00	–1.20
Responsiveness to change and innovativeness	3.20	5.00	–1.80
Business environment	2.60	4.70	–2.10
Quality and reliability of product or service	3.00	4.70	–1.70
Product sustains awareness and support	2.80	4.70	–1.90
Strong business ethics	2.00	4.70	–2.70
FIRM STRATEGY, STRUCTURE, AND RIVALRY	1.88	4.00	–2.13
Structure	1.75	3.55	–1.80
Presence of foreign and joint-venture companies	1.30	3.80	–2.50
Flexibility of production systems	2.20	3.30	–1.10
Collaboration	1.86	4.18	–2.32
Strong industry–firm collaboration	1.70	3.70	–2.00
Shared development of industry knowledge capital	1.30	4.30	–3.00
Strong social capital and business networks	2.00	4.30	–2.30
National or international leadership	2.30	4.30	–2.00
Civic entrepreneurship and community engagement	2.00	4.30	–2.30
Technology orientation	2.20	4.00	–1.80
High level of technology application in companies	2.20	4.00	–1.80

continued on next page

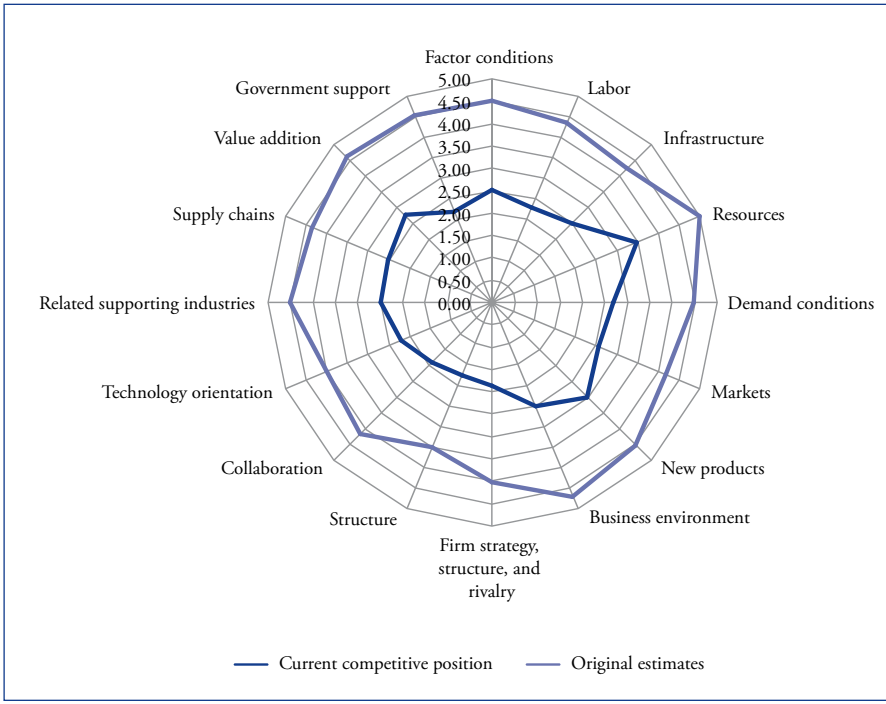
Table 6.10 *Continued*

Competitiveness Elements of Cluster	Current Competitive Position of the Industry	Future Desired Competitive Position of the Industry	Competitiveness Gap
RELATED SUPPORTING INDUSTRIES	2.52	4.44	–1.92
Supply chains	2.37	4.30	–1.93
Strength of local business support services	2.30	4.30	–2.00
Responsiveness of local support services	2.30	4.30	–2.00
Quality of local support services	2.50	4.30	–1.80
Value addition	2.75	4.65	–1.90
Potential to add value to supply chains	3.00	5.00	–2.00
Business awareness of value-adding potential	2.50	4.30	–1.80
GOVERNMENT SUPPORT	2.16	4.42	–2.26
Government support for cluster development	2.00	5.00	–3.00
Streamlined business approval systems	2.00	3.80	–1.80
Support for sustainable industry development	2.30	4.30	–2.00
Enforcement of business regulations	2.20	4.30	–2.10
Support for research and development	2.30	4.70	–2.40
Average for All Indicators	**2.52**	**4.57**	**–2.06**

Source: Study team.

The strongest driver attributes are those associated with demand and factor conditions. The weakest are those associated with firm strategy, structure, and rivalry and government support. The attributes for related supporting industries have average scores. The overall competitiveness gap of –2.06 is significant. This means that the industry cluster must do better in every aspect for its competitive position to improve. Overall, the perceived level of competitiveness of the cluster attributes is weak, scoring 2.52 out of 5.00. The score must be at least 3.75 for the leather industry cluster to become truly globally competitive. The results of the deficiency gap analysis of the leather industry cluster using the Porter diamond model are shown in Figure 6.16.

Figure 6.16 Deficiency Gap Analysis of the Leather Industry Cluster, Dhaka Capital Region



Source: Study team.

6.7.3.1 Factor Conditions

Human resource development and management in the cluster is generally weak. The industry focus groups singled out substantial improvements that beg to be made in management skills and the provision of higher-quality education and training facilities and services. The Bangladesh College of Leather Technology in Dhaka is the only specialized technical institution providing education and training services to the leather industry. Its few graduates are not enough to support the development of the sector. There are no training facilities for the workers, who use outdated production processes and technology. The demand for skilled labor is low.

Infrastructure is poor in Hazaribagh, where most of the tanneries are. Roads in the area are narrow and congested. The drainage capacity cannot accommodate the liquid waste from the sector. The tanneries in Hazaribagh discharge some 21,600 cubic meters of liquid waste every day. Industrial waste undergoes little or no treatment, and solid waste collection is deficient. The local environment and factory conditions directly affect the working and

living conditions in the DCR. Industry workers, particularly those employed in tanning, are among the poorest and least healthy in the DCR. The experts suggest that a central effluent treatment plant be set up in the area to save the Buriganga River and the locality from pollution.

According to a report prepared by the Bangladesh Society for Environment and Human Development, about half a million residents of the capital, Dhaka, are at risk of serious illness due to chemical pollution from tanneries near their homes. The report estimates that 8,000–12,000 workers at the tanneries suffer from gastrointestinal, dermatological, and other diseases. Over 90% of them can expect to die before the age of 50. About a quarter of these workers are not yet 11 years old.

In short, while the growth of the leather sector has been important in the development of the DCR and the country, it has come at considerable cost to the people and the environment. There are proposals to relocate many of the tanneries at Hazaribagh to outer metropolitan areas as part of the Dhaka Tannery Estate Project. This action would help deal with many environmental problems associated with the industry, but it could take many years to achieve. The authorities must contend with problems of land acquisition, set up an effluent treatment plant, and repay the tannery owners, who are reluctant to move until these issues are addressed.

6.7.3.2 Demand Conditions

Overall, demand conditions are relatively good, but they could be better. Most of the crushed and finished leather products are exported; local demand is less than export demand. Because the industry is linked to a great extent with international markets, new product development is important. The capacity to increase production and delivery is, however, undermined by weak capacity to expand, and in particular by the slowness to innovate. The tardy response to production and market change could adversely affect export development.

Quality assurance in the sector is relatively high, mainly because the companies must stay competitive internationally. But industry competitiveness is reduced by problems related to risk management and business ethics. Businesses recognize that these competitiveness factors, especially business ethics, must be strengthened to meet international standards. Because it is targeted at the budget end of the market, rather than the high end, the DCR leather sector has been successful in developing export markets, mainly by keeping labor costs low and discounting environmental and social costs. Some companies have even succeeded in the high-end market. The industry may not enjoy this position of advantage much longer. In the developed world,

consumers and buyers are becoming more discerning and are demanding transparency of labor and environment costs. The leather industry is therefore compelled to address the competitiveness factors associated with business responsiveness to change and innovativeness, business risk, and other environmental factors.

6.7.3.3 Firm Strategy, Structure, and Rivalry

The high concentration of companies in Hazaribagh creates a strong market for the purchase of raw materials, but it has not had much effect on reducing transition costs or increasing the degree of information sharing, collaborative purchasing, and product marketing. This suggests that competition in the industry is individualistic, with very little collaboration between companies. The industry recognizes that competitiveness demands greater collaboration and sharing, and this can be achieved through an active association of these companies. The industry is currently not in a position to operate collectively in negotiating prices or access to international markets.

Leather processing technologies have changed over the past 2 decades. Before 1990, most tanneries processed up to what is called the wet blue level.[6] After the banning of the production and export of wet blue products, however, tanneries had to update their production processes and produce crushed and finished leather. This change in production technology was not easy for all companies, especially the small and cottage-type tanneries, which were largely unable to finance the purchase of new machinery. As a result, very few tanneries and producers of leather products use modern technology or machinery that would raise the level and quality of production.

6.7.3.4 Related Supporting Industries

Competitiveness in the supply chain and value-adding processes is weak. This is explained partly by the structure of the industry, as described above. Companies are generally unwilling to share information and to collaborate in purchasing and in product and market development. Supply-chain service providers, especially education and training, R&D, logistics, and servicing institutions, are poorly integrated. The industry realizes that services, especially utility services, must be more available and reliable. Without improvements in supporting services, the sector cannot respond adequately to changes in market demand, technology, and production systems. Of particular concern to the industry is the paucity of infrastructure and other utility services, especially reliable electricity and water supply. The industry

[6] In the raw state chrome-tanned skins are blue and are referred to as “wet blue.”

also ranks competitiveness in value addition among the factors that most demand attention.

6.7.3.5 Government Support

Like the textile and RMG industry, the leather industry expects a great deal of support from the government. Government has introduced policies to develop leather exports and boost local value addition. Overall, while manufactured products have increased, compared with raw leather exports, competitiveness is still low and still requires government support in taxation, administrative streamlining, regulatory enforcement, and R&D. The industry also receives very little support from the private sector for R&D. A particularly challenging area for government is environmental regulation, which the industry sector sees as adding to costs.

However, as various reports indicate, the costs of failing to act on the environmental and social problems could far exceed the value of the industry to the economy when health, productivity, and use of resources are considered. The planned relocation of the leather industry to Savar is of paramount importance for its survival. Only the government can handle the complex issues involved in transferring such a large and well-established industry, and provide stronger infrastructure support. The task would, however, be incomplete if government failed to set up a central effluent treatment plant in Savar.

6.7.4 Action Plan for the Development of the Leather Industry in the Dhaka Capital Region

Many problems beset the leather industry in the DCR. Like the textile industry it is competing at the bottom end of the global market except for a few specialized product lines. Environmental issues, which affect the health and well-being not only of those engaged in the industry but of the population of the region as a whole, are perhaps the most important challenge. The industry must also become more competitive by taking a more collaborative approach to reducing transaction costs, developing innovative products and processes, and adding value to industry supply chains. The following improvement measures are proposed for the leather industry cluster:

- support from the government for the construction of wastewater treatment facilities in the most concentrated areas in the leather industry cluster;
- establishment of a cluster association to promote knowledge sharing among the industries in the cluster;

- establishment of a cluster association to promote a cooperative business environment, increase awareness of the importance of business ethics, and foster an attitude of prudent risk taking to take advantage of the opportunities for growth presented by business risks; and
- training in management skills.

6.8 Analysis of the Food and Beverage Industry Cluster in the Dhaka Capital Region

Rice is a staple food crop in Bangladesh. Rice production accounts for more than 70% of the value-added production in the country's food and beverage industry (F&BI). However, Bangladesh is not self-sufficient in food and imports 2 million metric tons of grain each year. It spends some 2.5% of its annual budget to manage the food deficit (BBS 2009). Food security is an extremely complex issue, and the development of the F&BI has top priority.

The industry sector extends over a wide range of business activities including the production of baked goods, candy, fresh and processed fruits and vegetables, cereals, dairy products, and carbonated and non-carbonated fruit juices and other beverages. Tobacco products are also part of the sector. Bangladesh has a huge domestic market and growing demand for fresh and processed foods. Producing more and better-quality food and storing it properly will increase food self-sufficiency and security for the country's growing population. The F&BI's potential to develop as a major export industry is significant because of the country's proximity to northeastern India, where the food culture is similar to that in Bangladesh.

In recent years, notable developments have occurred in the production and variety of other foods processed in Bangladesh (Yu 2002). The drive to develop the export markets for processed and fresh food is partly responsible, as are changes in the people's diet and the growth of the middle class, which is interested in nontraditional foods. The F&BI has therefore experimented with, and gained a keener understanding of, new product development and improved production methods. It has modernized machinery and technology; improved food quality, safety, and packaging; and marketed processed foods more effectively. In 2006, the F&BI grew 39.7% over the previous year (BBS 2007b). The F&BI encompasses a wide range of businesses activities including bakeries; confectioneries; fresh and processed fruits and vegetables; cereals; dairy products; carbonated and non-carbonated fruit juices, drinks, and other beverages; various other food items; and tobacco products. The core industries in the F&BI cluster can be classified into two major groups as shown in Table 6.11.

Table 6.11 Core Industries in the Food and Beverage Industry Sector, Dhaka Capital Region

Food	Beverage
Processed fish and meat Edible oil Dairy products Agro-processed foods	Alcoholic beverages Nonalcoholic beverages Soft drinks and sterilized bottled water

This sector has significant potential to expand, add value, and create many more jobs, especially in the DCR. The industry in the DCR is also much more diversified and heterogeneous than it was 10 years ago. There is now greater use of technology in the sector, which has seen distinct upgrades in product processing and preservation, marketing, and distribution. But the sector is still underperforming, lacks competitiveness, and needs reform.

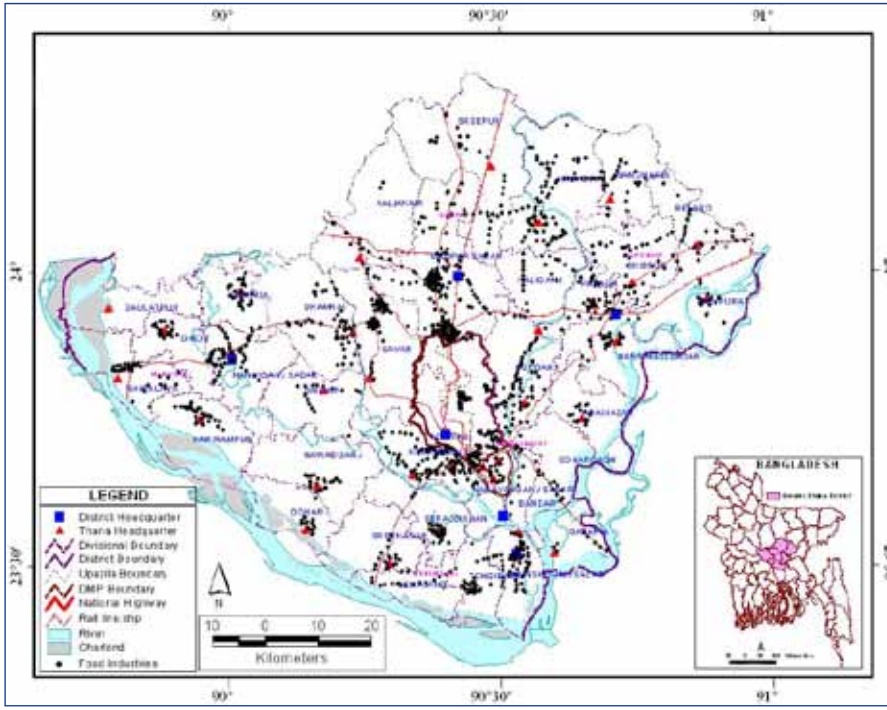
The industry is being held back from expanding by structural problems; intransigence in the adoption of new types of crops; poor supply chain management and logistics; lack of education, training, and workplace skills development; and the need for capital for new technologies and equipment. Until the industry is more mechanized, it will struggle to achieve the production efficiencies that will allow it to compete successfully in export markets. While the sector can grow successfully by serving and developing the domestic market, production systems must improve so that food prices stay affordable for the poorest members of society.

6.8.1 Spatial Mapping of the Food and Beverage Industry Cluster

The agglomeration of establishments in the F&BI is not as intensive or as large as in the textile and RMG and leather industry sectors (Figure 6.17). The industry units are dispersed; in contrast, the two other sectors are much more concentrated in a few districts. Most of the smaller concentrations of food industries serve local farming districts. Only a few are large-scale companies that draw on regional and national supply sources. A sizable number of smaller enterprises are scattered along the major regional road system.

The larger factories in the food cluster are concentrated mainly in the older parts of Dhaka, Tongi, Gazipur, and Narayanganj. There are also moderate concentrations of predominantly local food processing companies in Savar, Ghorasal, Narsingdi, Manikganj, and Munshiganj. The geographic dispersal of the food processing companies in the DCR suggests that transaction costs in the sector are high, and that economies of scale and scope have not been achieved to the same degree as they have been in the

Figure 6.17 Food and Beverage Industry Locations, Dhaka Capital Region



DMP = Dhaka metropolitan area.

Notes: *Thanas* and *upazilas* (subdistricts) are the second-lowest tier of government in Bangladesh. They rank below the divisions and districts and above the union parishads (local councils). A thana occupies the area within a police precinct.

Source: Study team.

maturing textile and RMG and leather industry clusters. As noted above, the F&BI cluster is highly dispersed, except for beverage production, which is located in inner Dhaka and is at a very early stage of development. It will, however, take many years of planning and development by industry owners and government to increase food industry concentration and specialization and expand the export capacity of the cluster in the DCR.

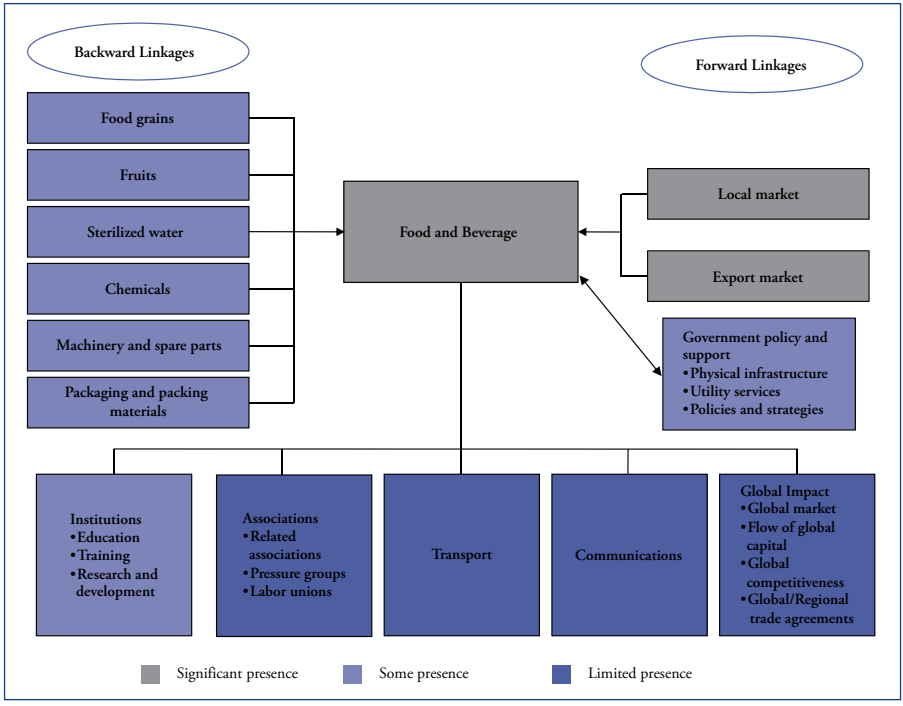
The most important backward linkages in the F&BI cluster include a range of chemical, machine and spare parts, and packaging material companies. The cluster is supported horizontally by micro credit, marketing, and education, training, and R&D institutions. Government provides much of the physical infrastructure and utility services, especially communications and transportation, to support logistics in the cluster, but these support facilities and services are weak, especially in the satellite towns in the DCR. Industry associations, pressure groups, and labor unions are important elements of social capital in the cluster.

6.8.2 Structure Mapping of the Food and Beverage Industry Cluster

Figure 6.18 is a structure map of the F&BI cluster in the DCR. The cluster almost exclusively produces for the DCR and surrounding economies. Many of the supply-chain links are weak and require development, especially regional transportation, warehousing, and cool-storage facilities. Quality assurance and the rapid perishability of produce and products are problems. In addition, food processing enterprises are small, making it difficult to achieve economies of scale.

Most food products are purchased from the local market. There are hundreds of small farm producers, but only a few large-scale operations. Except for potatoes, most products are purchased seasonally and stored in factory warehouses. Food production occurs throughout the year; however, there is a high level of slaughter during Eid ul-Azha to mark the end of Ramadan. After processing, the food products are sold fresh in the local market or stored for export. Cool-storage capacity is limited, especially during Eid ul-Azha.

Figure 6.18 Structure of the Food and Beverage Industry Cluster, Dhaka Capital Region



Source: Study team.

The main products used in the first stage of the beverage production process are treated water (most of it from the supply mains); fruits, either juiced or pulped; locally grown sugar; chemicals; energy; and transport services to move the raw materials. Some factories draw water from groundwater sources and produce their own electricity because of the unreliability of supply. Most of the chemicals and machinery used to process food are imported. Many chemicals and pulped products are stored for some time before processing because of the schedules for the shipment of chemicals and other commodities used in production.

During processing, a number of quality control checks are required to ensure food quality and safety. These checks are mandatory for companies that export food. Packaging and branding also take place during processing. After processing, the beverage products are stored and sold to local and export markets as demand dictates. A number of intermediate and parallel processes occur along different stages of the supply chain, such as forward sales, purchasing, contracting, marketing, and promotion of products and services.

6.8.3 Analysis of the Food and Beverage Industry

The Porter diamond analysis model, which was used to measure indicators of competitiveness in the textile and RMG and leather clusters, was also used to evaluate the F&BI cluster. The potential to develop the food processing industry in Bangladesh has been recognized for a long time (Chowdhury 2009; Yu 2002). However, the F&BI sector lacks the organizational structure and proper technical support to perform more capably. The sector has weak attributes, which rate less than what is necessary to achieve a national competitiveness rating. Table 6.12 gives a detailed breakdown of the current and desired future competitiveness, and the gap in competitiveness, for 38 elements of competitiveness linked to the five drivers. All the key five conditions scored less than 2.50, well short of what is necessary to develop a nationally competitive cluster.

Figure 6.19 is a graphic representation of the current and desired future competitiveness of the F&BI according to the five competitiveness attributes. The following provides more detailed insight into the factors that affect the competitiveness of the F&BI cluster and its development in the DCR.

6.8.3.1 Factor Conditions

Human resource issues were identified as one of the most significant weaknesses in the factor conditions in the F&BI cluster. The industry suffers from a lack of adequately trained human resources at the mid-technical

Table 6.12 Competitive Analysis of the Food and Beverage Industry Cluster, Dhaka Capital Region, Using the Porter Diamond Model Framework

Competitiveness Elements of Cluster	Current Competitive Position of Industry Cluster	Future Desired Competitive Position of Industry Cluster	Competitiveness Gap
FACTOR CONDITIONS	2.48	4.05	–1.57
Labor	2.32	4.10	–1.78
Availability of skilled labor	2.40	4.10	–1.70
Management skills	2.70	4.30	–1.60
Efficiency and productivity of labor	2.50	4.30	–1.80
Education and training facilities	1.70	3.70	–2.00
Infrastructure	2.62	4.02	–1.40
Quality of infrastructure services (logistics)	2.60	3.90	–1.30
Quality of infrastructure services (utilities)	2.40	4.00	–1.60
Cost of services	2.30	3.70	–1.40
Quality of telecommunications services	3.20	4.50	–1.30
Endowed resources	2.63	4.03	–1.40
Proximity to raw materials	2.50	4.00	–1.50
Cost of local raw materials vis-à-vis imports	2.60	3.80	–1.20
Quality of raw materials	2.80	4.30	–1.50
Social environment	2.32	4.00	–1.68
Quality of life of the workforce	2.00	4.10	–2.10
Workplace conditions	2.60	4.00	–1.40
DEMAND CONDITIONS	2.36	3.90	–1.54
Markets	2.10	4.10	–2.00
Expanding domestic and local markets	2.60	4.20	–1.60
Expanding export markets	1.60	4.00	–2.40
New products	2.15	3.50	–1.35
Demand expansion capacity for new products	2.30	3.80	–1.50
Responsiveness to change and innovativeness	2.00	3.20	–1.20

continued on next page

Table 6.12 *Continued*

Competitiveness Elements of Cluster	Current Competitive Position of Industry Cluster	Future Desired Competitive Position of Industry Cluster	Competitiveness Gap
Business environment	2.67	4.03	–1.37
Quality and reliability of product or service	2.80	4.10	–1.30
Product sustains awareness and support	2.40	4.00	–1.60
Strong business ethics	2.80	4.00	–1.20
FIRM STRATEGY, STRUCTURE, AND RIVALRY	1.98	3.55	–1.58
Structure	1.70	3.25	–1.55
Presence of foreign and joint-venture companies	1.40	3.00	–1.60
Flexibility of production systems	2.00	3.50	–1.50
Collaboration	2.02	3.60	–1.58
Strong industry–firm collaboration	1.70	3.20	–1.50
Shared development of industry knowledge capital	1.90	3.50	–1.60
Strong social capital and business networks	2.30	3.90	–1.60
National or international leadership	2.00	3.70	–1.70
Civic entrepreneurship and community engagement	2.20	3.70	–1.50
Technology orientation	2.30	3.90	–1.60
High level of technology application in companies	2.30	3.90	–1.60
RELATED SUPPORTING INDUSTRIES	2.30	4.16	–1.86
Supply chains	2.23	4.20	–1.97
Strength of local business support services	2.30	4.20	–1.90
Responsiveness of local support services	2.20	4.20	–2.00
Quality of local support services	2.20	4.20	–2.00
Value addition	2.40	4.10	–1.70
Potential to add value to supply chains	2.50	4.20	–1.70
Business awareness of value-adding potential	2.30	4.00	–1.70

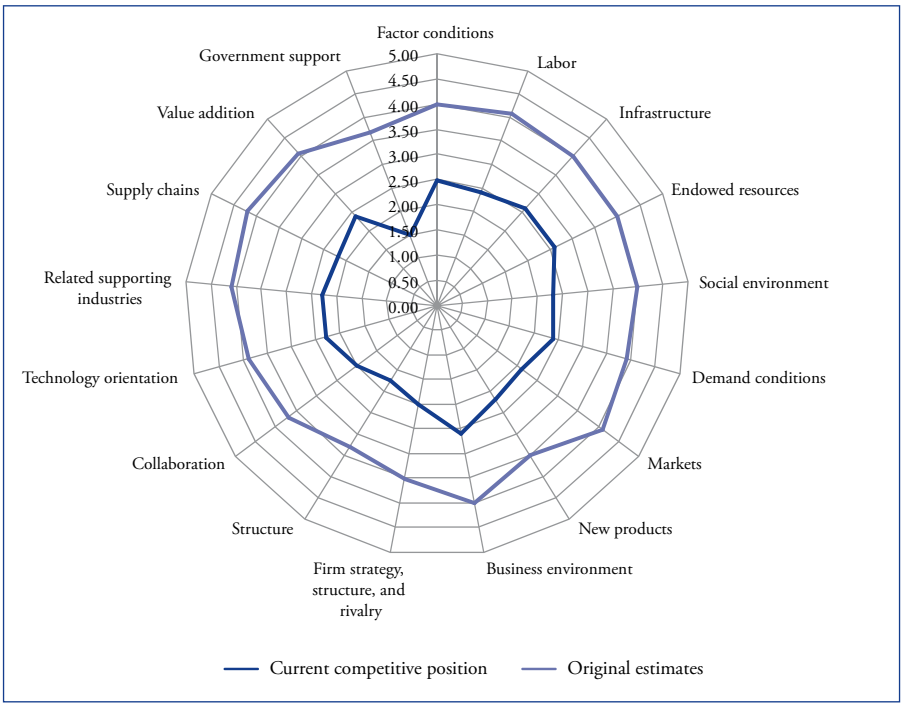
continued on next page

Table 6.12 *Continued*

Competitiveness Elements of Cluster	Current Competitive Position of Industry Cluster	Future Desired Competitive Position of Industry Cluster	Competitiveness Gap
GOVERNMENT SUPPORT	1.44	3.76	–2.32
Government support for cluster development	1.20	3.80	–2.60
Streamlined business approval systems	1.60	3.70	–2.10
Support for sustainable industry development	1.50	3.70	–2.20
Enforcement of business regulations	1.90	3.90	–2.00
Support for research and development	1.00	3.70	–2.70
Average for All Indicators	**2.31**	**4.11**	**–1.79**

Source: Study team.

Figure 6.19 Deficiency Gap Analysis of the Food and Beverage Industry Cluster, Dhaka Capital Region, Bangladesh



Source: Study team.

and management level, as well as from a lack of internationally recognized or credible testing institutes. The only specialized education institution for this sector is the Institute of Nutrition and Food Science in the University of Dhaka, but very few graduates undertake studies that will help support the development of this sector. Other educational institutions like the College of Home Economics produce some graduates, but nothing like the hundreds that the industry must have to grow. These institutions provide only managerial and technical human resources for this sector. There are very few skills enhancement programs or training for the semiskilled and unskilled workforce. Globally, food production is becoming a skill-dependent industry. How to develop the capacity of such a large workforce is a challenge.

The quality of infrastructure and utility services supporting the F&BI is not satisfactory and below what is necessary for sector competitiveness. Food production is a continuous process, and any disruptions in water and electricity services can be very costly to business. Services are also not price competitive, partly because of loss and theft during the distribution process. The overall unit cost to industry also increases. Many industries have had to develop dual electricity systems for on-site backup in case of electricity load shedding. The government is trying to provide more efficient services in areas where the concentration of industrial firms is high. With regard to information and telecommunications services, these are nationally competitive, but better broadband and wireless services must be provided to make the industry internationally competitive in the future.

Although Bangladesh is an agro-based country, the supply of farm produce to factories is problematic. Production establishments are very small, and the lack of quality control in the farms results in contamination of produce and materials. The F&BI focus groups identified necessary improvements in quality along the supply chain as an important issue in boosting the competitiveness of the resources that go into food and beverage production. Companies in the F&BI realize that the workers work and live in very poor conditions. In addition, wages are low and accident rates involving the use of agricultural machinery are high (Mukherjee and Ping 2008). These factors are affecting productivity and investment in the sector.

6.8.3. Demand Conditions

The F&BI in Bangladesh is predominantly oriented to the domestic market. It meets more than 90% of local demand. Exports from the sector make up only about 1% of the country's total exports. The sector is aware that it is not sufficiently competitive to expand into the export sector, except in niche markets. The focus will therefore remain on developing domestic markets where rising demand is assured. This also means that companies in the DCR

can continue to use appropriate technologies. But attention must be paid to raising productivity; if not, demand will have to be met from imports, thereby putting pressure on the trade balance.

The sector in the DCR is responding to demand for new and improved food products. Dhaka is a much more sophisticated and diverse market for agricultural products than other cities in the country. Food and diets are changing (Alauddin and Tisdell 1991). Of particular note is the shift to more wheat and potato starch foods in urban centers (Scott and Bouis 1996). The sector is, however, not responding fast enough to these changes in demand to meet market needs. Price elasticity is clearly a significant factor behind the changes in food choice and consumption. The growth of the F&BI will have to be driven by increasing local market demand, but with protein and fruit intake declining among the poor (Hossain, Naher, and Shahabuddin 2005), ways must be found to reduce the high current costs of production and the transaction costs associated with distribution and marketing to expand domestic demand.

Entrepreneurs in the sector appear skilled and experienced enough to have good control over the business environment. Research shows that the sector is more conscious of quality control and appears better equipped to deal with business risks than other sectors in the DCR. This is partly because the sector is less exposed to international risk than the textile and RMG or leather sector, for example.

6.8.3.3 Firm Strategy, Structure, and Rivalry

The F&BI is dominated by hundreds of small and medium enterprises and factories that have strong links to local agricultural production systems and regional town centers. Almost 80% of farm holdings in Bangladesh are less than 0.2 hectares; only 2.5% are larger than 3 hectares (BBS 2002). The pattern of production unit holdings varies little in the DCR. The small size of farms and the large number of producers make it difficult for the industry to achieve economies of scale and become more efficient in tillage (Roy et al. 2004), and for small operators to have much bargaining power.

Competition and prices also tend to be driven by seasonality of production and farmers accepting prices for their produce with little or no profit margin. Quality assurance on the production supply side is the main barrier keeping international food processing companies out of Bangladesh. This is reflected clearly in the low score for the presence of foreign and joint-venture companies, a future competitiveness attribute in the Porter diamond model (Table 6.12). Foreign investors often opt for joint ventures in the telecommunications sector, where they have greater control over the market and network.

The practice of cooperative farming is not widespread in Bangladesh (Sarker and Itohara 2008). This is partly because of the traditional nature of landholdings in the country, and also because of the absence of job alternatives and the reluctance to change established agricultural practices. In the beverage industry there are a few joint-venture or foreign companies—e.g., Nestlé Bangladesh and Fu-Wang Bread—but this sector is dominated by many localized firms. The beverage industry holds potential for foreign investors as the market is expanding and problems of supply are not as great as in the processed food industry.

Moderate collaboration exists in the cluster; however, the practice of knowledge and information sharing, networking, and cooperation with competitive firms is a new concept in Bangladesh. Companies are only starting to recognize that they must work together to develop networks and business associations and undertake collaborative research and marketing if the sector is to develop export markets. Part of the problem with greater collaboration, however, is the dispersed nature of industry development. Developing networks and business associations could help overcome this problem. The F&BI is beginning to share experiences and knowledge as an outcome of the industry association's leadership, but this sharing is still very much at a developmental stage.

Technology orientation in the F&BI is not high, and this explains the rating of less than the 2.5 required for national competitiveness. Production and markets in the F&BI sector in the DCR, as in other regions, tend to be localized with a high demand for unskilled labor. This must change if output is to increase, quality control strengthen, and waste decrease during production and distribution. In recent years some larger companies have begun to modernize machinery and use new technology, but smaller factories lack the capital to do so. In the future, entrepreneurs will depend on modern technology to compete, and there may therefore be more amalgamations and consolidation in the sector, especially in beverages. Many smaller business operations serving local farming district markets will be forced to close as larger operators, with better technology, establish and concentrate around the region.

6.8.3.4 Related Supporting Industries

Entrepreneurs in this sector are quite satisfied with the performance of the supporting industries, but the operation of supply-chain systems is below what is considered nationally competitive. It is recognized that supply chain management in the sector is poor and must be upgraded (Chowdhury 2009) but a world-class packaging industry is yet to be developed. Also the entrepreneurs are unable to depend on the testing report of the Bangladesh Standard Testing Institute (BSTI) and the Bangladesh Council for Scientific

and Industrial Research (BCSIR) because of the lack of staff and the low level of technology. Entrepreneurs and exporters have been requesting government support for the establishment of an internationally recognized testing institution and facility in Bangladesh.

Research indicates that the F&BI is aware of opportunities to add value to production systems and acknowledges that it must become more competitive to take advantage of these opportunities. The problems standing in the way of greater value addition in the F&BI pertain to complex structural adjustments; rural land tenure and management reforms; technology improvements; the required capital investment, which far exceeds the requirement in labor-intensive production; and business management and human resource improvements. It will be difficult for the F&BI to deal with all this by itself. Government must take the lead. Reforming the industry to create more value-adding opportunities will be very difficult as the reforms will run up against social, cultural, and established production practices that are centuries old. However, without reform it is highly unlikely that the industry will be able to increase production to meet the growing demand for food in particular.

6.8.3.5 Government Support

The lack of government support for the F&BI sector is seen as a significant factor undermining the competitiveness of the cluster. According to the government's export policy, the F&BI is the highest-priority sector because food security must be ensured. But, as the study findings show, this priority is not reflected in government support for tax benefits and subsidies, a long-term plan for the industry at the regional level, and support for R&D. Among the three industry sectors studied, the R&BI has the largest deficiency gap in R&D. The research clearly indicates that the government must exercise stronger leadership, especially in dealing with some of the problems outlined here.

6.8.4 Action Plan for the Development of the Food and Beverage Industry in the Dhaka Capital Region

The F&BI is an industry that must be made more productive and competitive if it is to meet future demand for food and contribute to national food security. The industry is made up of a very large number of small producers, all producing similar types of products. The problems associated with supplying unprocessed food also make it difficult to achieve economies of scale and better quality in the industry, and complicate the development of the export side of the sector.

The reform of the F&BI sector will be far from easy. Some problems appear intractable, but are not insurmountable if there is greater commitment and support for the sector in the DCR. The sector must improve its competitiveness by fostering a more collaborative approach to development. It can thus reduce transaction costs, innovate, and add value to industry supply chains. Knowledge and information sharing must increase to strengthen the social capital, and build trust and confidence among investors. An action plan prepared in conjunction with industry stakeholders for the CCED initiative identified several areas for strategic intervention to facilitate the development of the F&BI in the Dhaka Capital Region:

- Very little background information on this sector is available. An action plan for R&D must be developed. A major component of the industry sector and also the possibility of expansion in the area of exports should be included. The establishment of pilot industries in existing Bangladesh Small and Cottage Industries Corporation (BSCIC) and EPZ areas is recommended for the F&BI.
- It is also recommended that relevant bodies provide policy and investment support to the industry. Incentives must be provided to encourage domestic entrepreneurs to develop those industries that have good linkages and are also attractive to investors.
- Establishing a food processing industry cluster in small, medium, and large towns is a necessary step as well. The government should provide land and infrastructure services in all cities and towns for the F&BI clusters.
- Forward- and backward-linking industries, depending on the locality and type of industry, must be incorporated into these clusters.
- Quality control improvements are essential in all steps of production. The government created Bangladesh Standards and Testing Institution (BSTI) with this in mind and offered its services in testing food industry products before marketing.
- The foremost priority is the provision of basic infrastructure services and logistics in the DCR.

6.9 Cluster-Based City Economic Development in the Dhaka Capital Region: A Summary

Bangladesh will continue to urbanize very rapidly. By 2030, the rural population is expected to be in decline, but urban population growth rates are still likely to exceed 3% per year for the next 2–3 decades. The challenges for the development of Bangladesh and its cities are enormous

not the least of them being where and how the expected 40 million increase in urban population by 2030 will be accommodated. How will the country create more than 20 million urban jobs to avoid massive unemployment and underemployment? More importantly, how will this larger urban population be fed, housed, and educated? These are thorny issues for a country that has a population density of 1,126 people per km^2, is prone to natural disasters, and has limited natural resources. Much of the economy's transformation to services is due to urbanization and the development of the cities. While the cities will drive the future economic development of the country, the government is not any less responsible for supporting and reforming the urban or agriculture sector to make the country more sustainably growing and self-sufficient in food production.

The CCED study of Bangladesh cities identified many issues related to macroeconomic and urban policy that have led to growing disparities between regions, between rural and urban areas, and within cities throughout the country. The cities in western Bangladesh, for example, are much less competitive than those in the east. The availability of energy and the comparatively better infrastructure in Dhaka, Chittagong, and Sylhet are significant contributors to the east–west disparities. These disparities will take many decades to address. In the absence of viable spatial policies (physical or spatial planning), most major investments will continue to favor the large cities of Dhaka and Chittagong and possibly a few other cities. This situation is neither sustainable nor in the interest of the development of the country.

Chapter 7
Cluster-Based City Economic Development in India

India[1] has undergone massive economic transformation in recent years. Its economy is now the world's 12th largest, and Asia's 4th largest after those of the PRC, Japan, and the Republic of Korea. Globalization and economic policy reforms introduced by the government in the early 1990s have had a major impact. Industrial agglomeration and economic specialization have increased, and business service industries have developed. In the larger cities, services are starting to dominate. Cities like Hyderabad and Mumbai are now important international centers of ICT, finance, and multimedia. National and international companies and multinationals are seeking to locate and invest in places in India with the access to resources, infrastructure, skills, and enabling environments that will give them competitive advantage. Urban business and industry agglomerations are growing larger, and industry clusters are forming in the major cities.

India is one of the few countries in Asia that have studied the competitiveness of their cities. It has also embraced the cluster concept as a tool for local economic development. This CCED study of the Central National Capital Region (CNCR) presents a clear picture of industry cluster development and suggests strategies that should be useful in the development of other subnational cities in India.

7.1 Urban Growth and Economic Development

In 2008, India had 1.1 billion people, 29% of whom lived in the urban areas (CIA 2009). By 2030, the population is expected to be 50% urban. In 1991,

[1] Under ADB RETA 6337 (Subproject 7): City Cluster Economic Development, the CCED study applied its analytical methodology in the capital regions of Bangladesh (Dhaka), India (Delhi), and Sri Lanka (Colombo). This chapter summarizes the India case study report (February 2010). Further details of the discussion in this chapter may be found in the report.

only 23 Indian cities had a population of at least 1 million; there were 35 such cities a mere 10 years later, and the number is projected to reach 70 by 2021. Six of the world's largest metropolitan areas are in India. While yearly growth in population is expected to slow down from the present 1.9% to about 1.2% in 2011–2021, the urban population will continue to increase by about 3% yearly, mainly because of rural–urban migration. Urban systems are under enormous pressure, and there are grave problems in urban planning, management, and governance, particularly in the large cities.

The cities contributed 60% of India's GDP in 2001 (compared with 29% in 1951 and 55% in 1991). But, despite the wealth created by urbanization, India still struggles to meet the infrastructure and service needs of its urban citizens. Its economic growth potential has not been fully manifested.

Urbanization is inevitable. Urban infrastructure and governance must therefore improve to raise productivity and create jobs for the poor, and more investment must find its way to the urban areas. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM), which provides financial assistance for basic infrastructure that is linked to reforms, is the most significant national initiative in this regard.

7.1.1 New Urban Planning and Development Initiatives

The Constitution (74th Amendment) Act (1992) sought to change the functions of local government through a bottom–up process. Community participation was seen to be vital, and strong local government, an effective third tier of government. The Twelfth Schedule of the act listed 18 functions that the state legislature could entrust to urban local bodies. These local bodies are now mainly responsible for providing civic services. The extent and quality of civic services, citizen participation in governance, and transparency and accountability are expected to improve as decentralization proceeds.

Most cities have metropolitan region plans or city development plans for the next 20–25 years. These plans contain land use, social and physical infrastructure, and zoning provisions, but tend to be rigid and static and not sufficiently responsive to rapid change. They are often inadequate for sustainable development because they do not provide for growth in the number of stakeholders, or incorporate conservation and environmental issues in development.

In 2005, the central government launched the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) (Government of India 2006a) to

- improve and augment the economic and social infrastructure in cities;

- provide basic services to the urban poor, including security of tenure, at affordable prices;
- initiate wide-ranging urban reforms; and
- strengthen the municipal governments.

The 7-year program covers 65 cities. A prerequisite for assistance under the program is a city development plan with details of priority programs. But the program has limitations where the comprehensive development of city regions is concerned. All master plans, as well as zoning codes, housing standards, and land use regulations, are confined to formal city boundaries despite the unplanned and uncontrolled urban growth beyond such boundaries. Infrastructure facilities and services lag far behind the pace of urbanization.

7.1.2 City Infrastructure

Government efforts to cope with urban problems have included an integrated development program for small and medium towns, an accelerated urban water supply program, and the establishment of growth centers and growth poles. Under the Integrated Development of Small and Medium Towns Program, the government contributed 36%–48% of the cost of infrastructure development in towns with populations of less than 500,000. For large cities with populations of 4 million or more, the government contributed 25% of infrastructure development costs, with the state providing 25% and the city 50%.

Recognizing the infrastructure deficit (Table 7.1) and its impact on sustainable economic growth and on poverty reduction, the government has made the development of social and economic infrastructure one of its highest priorities. The government understands that, with improved infrastructure, India's economy can grow faster and more people can benefit. It has thus increased allocations for infrastructure development through such national programs as the National Highways Development Program, the Provision of Urban Amenities in Rural Areas Program, and the JNNURM.

7.1.3 Issues on Public–Private Partnerships for Urban Infrastructure

Several public–private partnership options for urban service provision and financing have emerged. These include service contracts, performance-based service contracts, joint ventures for project implementation and financing, management contracts for operation and maintenance, and build–operate–transfer arrangements. The government has drawn up policy and procedural guidelines for the use of state governments and urban local bodies entering into public–private partnerships.

Table 7.1 Funding Requirements for Urban Infrastructure, 2007–2012

Infrastructure	Required Funding	
	Rs. (in Crores)	$ Equivalent (million)
Water supply	53,666	11,915
Sewer systems and sewage treatment	53,168	11,815
Drainage	20,173	4,483
Solid waste management	2,212	503
Management information systems	8	2
R&D and training	10	2
Total	129,237	28,720

R&D = research and development.

Rs 1.0 crore = Rs 10,000,000.

Source: Study team's estimates, based on Government of India (2006b).

Public–private partnerships in infrastructure development abound in India. In urban infrastructure, they started out mostly in water supply projects. Build–operate–transfer projects often did not address water supply and sanitation system problems, such as the high amounts of unaccounted-for water, the large expenditures on energy, and insufficient cost recovery due to low tariffs. These partnerships are therefore slowly shifting their focus to improving the management of existing systems. Base data for existing water supply systems are not available, however, and most public–private partnership projects in the water supply sector are still in the pilot stage and do not cover entire cities.

7.1.4 Issues Facing the Economic Development of Indian Cities

The Indian economy grew at a modest 3.5% per year in the first 3 decades after independence. The growth rate improved to an average of 5.6% in the 1980s, but the country faced severe macroeconomic imbalances like high fiscal deficits, large foreign debt, high inflation, and an acute shortage of foreign exchange. Growth in the present decade has achieved record levels, reaching 9% in the last 2 years. The service sector has been the main contributor to the growth of GDP since the 1980s, when manufacturing suffered a decline in growth. Only in recent years has the manufacturing sector resumed positive growth. The sluggish growth of the economy in general and the slow growth of manufacturing in particular, and its subsequent deceleration over the last decade and a half of the last century, may be an important factor behind the exceptionally slow pace of urbanization in India. Further, the structure of employment has not kept pace with the

GDP structure. Despite its fast-declining contribution to GDP, agriculture continues to absorb a very large proportion of the country's workers. The pull factor exerted by industrial job opportunities in the cities has also been weak over the past few decades.

Urban poverty in India was reported to be over 25% in 2004–2005, mostly concentrated in small and medium towns. The "self-employed" category, with the lowest earning and least secure workers, increased from 39.68% in 1983 to 45.40% in 2004–2005, while "regular employees" decreased from 42% to 39.5%. Even wage-paid casual work opportunities dwindled from 18.11% to 15.1% in urban India, according to the 61st round of the National Service Scheme. The restructuring and dismantling of large industrial units in cities has fostered the "casualization" of work in the cities, and so have the modernization drives launched in large cities in a bid to transform them into global cities. The slowdown in industrial employment has pushed regular employees in the organized sector into casual jobs or into the informal sector as self-employed workers.

The pressures of urbanization have, over the years, increasingly fragmented municipal functions and eroded municipal authority. Local governments have lost control over the provision and maintenance of key municipal services of water supply and sewerage, electricity, land acquisition and development, urban planning and zoning regulations, and slum clearance and improvement. The tenets of "governance" and "management" must blend to ensure good local economic development and growth.

Thus, there is a need to develop a strategy that includes (i) concentrating infrastructure investments in a few selected urban areas to achieve economies of scale and agglomeration; (ii) providing infrastructure investments in area-wide initiatives encompassing city clusters; (iii) picking cities whose governments have a proven track record of managing projects efficiently, effectively, and in an accountable and transparent manner; (iv) making private-sector participation a key component of projects; (v) building capacity in each project, especially in the areas of comprehensive planning, resource mobilization, and project management; and (vi) focusing on inclusive development approaches that improve the living conditions of poor people and disadvantaged groups.

7.2 Competitiveness of Cities

The progressive move in Asia toward economies that are more market, knowledge, and service based is fundamentally changing the way governments are developing cities. A strong anti-urbanization sentiment

persists in some countries, but most Asian countries realize that cities are the key drivers of national economic development. As has happened elsewhere, a new model of development is enabling cities to respond more quickly to changes in their economic environment so as not to risk losing investment opportunities and underperforming. Not every city in Asia will be a high achiever or will engage in global business development, but all cities, regardless of size or importance, must be aware of and respond to these changes if they are to improve services, investment, and development opportunities for their citizens.

The business environment in India varies not only across states but also within states because of differences in policy and administration between local urban institutions. This chapter analyzes the competitiveness of Indian cities and underscores the growing importance of the concept of urban competitiveness. It makes use of many observations reported in Ernst and Young (2007)[2] about the profile and competitiveness of Indian cities in relation to such parameters as urban governance and reforms, infrastructure, economic base, and workforce skills.

7.2.1 Ranking the Cities

The primary purpose of classifying and ranking cities across India is to provide an objective decision-making framework for investors, and information for policy makers and realtors. The analysis, however, presents aggregated information about the viewpoints and expectations of investors and does not reflect the actual performance of cities.

The ranking of cities shown in Table 7.2 is based on two earlier analyses carried out by neoIT and by Ernst and Young (Ernst and Young 2007). The Ernst and Young paper was released at the International Real Estate Summit of the Federation of Indian Chambers of Commerce and Industry (FICCI) in Mumbai. The composite ranking of the 30 cities is based on each city's indices of

- prosperity;
- urban governance;
- business environment;
- infrastructure; and
- quality of life.

[2] www.inrnews.com/realestateproperty/india/smaller_cities_to_fuel_real_es.html

Table 7.2 Five Key Drivers and 16 Domains Used in Ranking the Competitiveness of Cities in India

Key Drivers of City Competitiveness	Domains
1. City Prosperity	
City prosperity indicates the general affluence of the population, the depth of the consumer market, and income and expenditure characteristics. Together, these parameters affect the need and demand for residential, retail, and hospitality etc. Further, the size of the population is directly related to demand for housing.	**Demographics.** Indicators like population growth and projected population are important in assessing the demographic potential of the city, which would affect the residential sector.
	Income. Growth trends in household income, savings, and credit are reliable indicators of disposable income and consumerism that would affect retail development in the city.
	Consumer Market. Market size and ownership of major household assets, such as cars and two-wheelers, are considered measures of the general patterns of spending in the city.
2. Urban Governance	
The ease of doing business depends on government regulations and reforms. It forms the basis for policy making and implementation and the quality of administration in the city.	**Municipal Reforms.** The governance and PPP initiatives of urban local bodies indicate their propensity to contribute to economic growth and their interest in creating investment opportunities. State reforms, such as rent control and the imposition of a ceiling on urban land development, are important for organized real estate development.
	Public Finance. Public spending per capita and annual budget are considered indicators of the development activities that can be undertaken by the municipal body.
3. Business Environment	
A favorable business environment is a key factor that attracts investment into the city, directly affecting its commercial and industrial development. Economic growth further attracts enterprises, a skilled workforce, and ancillary business activities. The economic base and the presence of financial institutions also affect the business environment.	**Investment Climate.** The assessment of the current and potential investment patterns is based on the expected number of special economic zones, industrial estates, and ICT parks. The presence of financial institutions is also a key element.
	General Labor Availability. Human capital is a key indicator of the economic capability of a city. The number of students turned out by various institutions is a gauge of the human resource skills available.
	Workforce Composition. This important indicator of the economic profile of a city has several categories, such as employment in manufacturing, hospitality, trade, financial services, and government.

continued on next page

Table 7.2 *Continued*

Key Drivers of City Competitiveness	Domains
4. Infrastructure	
High-quality infrastructure is vital for economic and social development in the city. Basic urban services, a robust social infrastructure, and a healthy logistics and transport network are needed for economic growth. Several parameters of physical, technological, and social infrastructure constitute this index. Massive infrastructure projects and investment expected in the near future are also considered.	**Basic Infrastructure.** This includes, among others, water, road, rail, and air facilities, and indicates the extent to which the supply chain is streamlined and cost effective.
	Technological Infrastructure. The growth of ICT and the ICT-enabled sector and supporting sectors such as telecommunications makes communication options more affordable and accessible.
	Social Infrastructure. Economic growth and human development are directly related. The number of hospitals and associated services indicate the status of health-care infrastructure.
	Proposed Investment in Infrastructure. This domain is likely to provide insight into the future state of infrastructure in a city and its path of economic growth.
5. Quality of Life	
Quality of life is an important indicator of material well-being, which cannot be measured solely by monetary indicators. Intangible factors, such as environmental pollution, crime and safety, and recreation and leisure options, also widely affect socioeconomic well-being.	**Environment.** Environmental indicators, such as quality of air and living conditions, are critical to measuring the quality of life in a city.
	Public Transport. Public transport provides convenience to daily commuters and hence enhances their quality of life. The number of auto rickshaws, taxis, and buses per unit of population is also an indicator of intra-city accessibility.
	Socio-demographic Characteristics. Perceptions of crime and safety are important indicators of the quality of life. Indicators in this category are ranked in reverse: scores decrease as the number of crimes increases.
	Hospitality and Leisure. This parameter indicates the options for leisure and hospitality in a city, with direct impact on real estate development.

ICT = information and communication technology, PPP = public–private partnership.

Source: Ernst and Young (2007), modified by the study team.

These five drivers cover 16 key domains (Table 7.2), each one with several attributes. Weights were then assigned to each domain to determine the ultimate competitiveness score for each city. Multiple attributes of the 16 domains in the five drivers were individually scored on a scale of 1–5. The sum of these individual attributes determined the total rating for each driver.

Table 7.3 Summary Ranking of the Top 15 Indian Cities

Rank	Five Key Drivers of City Competitiveness					Overall
	Prosperity	Urban Governance	Business Environment	Infrastructure	Quality of Life	
1	Delhi	Greater Mumbai	Delhi	Delhi	Greater Mumbai	Delhi
2	Greater Mumbai	Delhi	Greater Mumbai	Chennai	Delhi	Greater Mumbai
3	Bangalore	Bangalore	Hyderabad	Hyderabad	Chennai	Chennai
4	Kolkata	Ahmedabad	Bangalore	Greater Mumbai	Hyderabad	Bangalore
5	Pune	Surat	Chennai	Kolkata	Bangalore	Hyderabad
6	Chandigarh	Pune	Pune	Bangalore	Kolkata	Kolkata
7	Hyderabad	Vadodara	Kolkata	Visakhapatnam	Panaji	Pune
8	Chennai	Chennai	Ahmedabad	Ahmedabad	Chandigarh	Ahmedabad
9	Thiruvananthapuram	Rajkot	Panaji	Pune	Pune	Surat
10	Surat	Hyderabad	Visakhapatnam	Nagpur	Ahmedabad	Chandigarh
11	Shimla	Nasik	Nagpur	Kochi	Thiruvananthapuram	Nagpur
12	Jaipur	Nagpur	Jaipur	Jaipur	Agra	Visakhapatnam
13	Ahmedabad	Chandigarh	Indore	Thiruvananthapuram	Surat	Vadodara
14	Kochi	Indore	Surat	Srinagar	Jaipur	Jaipur
15	Asansol	Ludhiana	Vadodara	Agra	Vadodara	Thiruvananthapuram

Source: Ernst and Young (2007).

Table 7.3 gives the overall ranking of the top 15 cities, as well as their ranking by competitiveness driver. High quality of life, of transportation infrastructure, and of the overall contribution of its labor force have pushed Delhi[3] to the top of the overall rankings. It is only the second Asian city, after Kuala Lumpur in 1998, to host the Commonwealth Games, which took place in 2010. Major infrastructure initiatives, such as a new international airport and an underground rail system, are among the key improvements in basic services and urban transport projects were scheduled to be completed by 2010. Furthermore, the city is connected to well-developed suburban cities along its periphery, such as Faridabad, Gurgaon, and Noida (the city name is derived from the acronym for "New Okhla Industrial Development Authority"), making it India's largest economic hub.

[3] See Table 7.4 for the definition of Delhi (the National Capital Territory of Delhi).

7.2.2 Improving Cities' Competitiveness and Economic Development

Figure 7.1 graphically compares the competitiveness of 30 Indian cities by key driver. The chart at the lower right corner shows the summary ranking. These radar charts quickly show the weaknesses in each city's competitiveness. However, all the 30 top-ranked Indian cities scored hardly more than 3.0 out of the maximum score of 5.0. These cities must score over 4.0 to be internationally competitive.

By referring to the radar charts in Figure 7.1, decision makers in each city can easily recognize which of the five key drivers need strengthening for the cities to become domestically and internationally competitive.

Greater Mumbai is unchallenged as India's commercial capital, but its infrastructure lags far behind economic growth. The Mumbai Urban Transport Project, the Bandra–Worli Sea Link, and other large infrastructure projects, once completed, should boost Mumbai's ability to compete with Delhi in the near future.

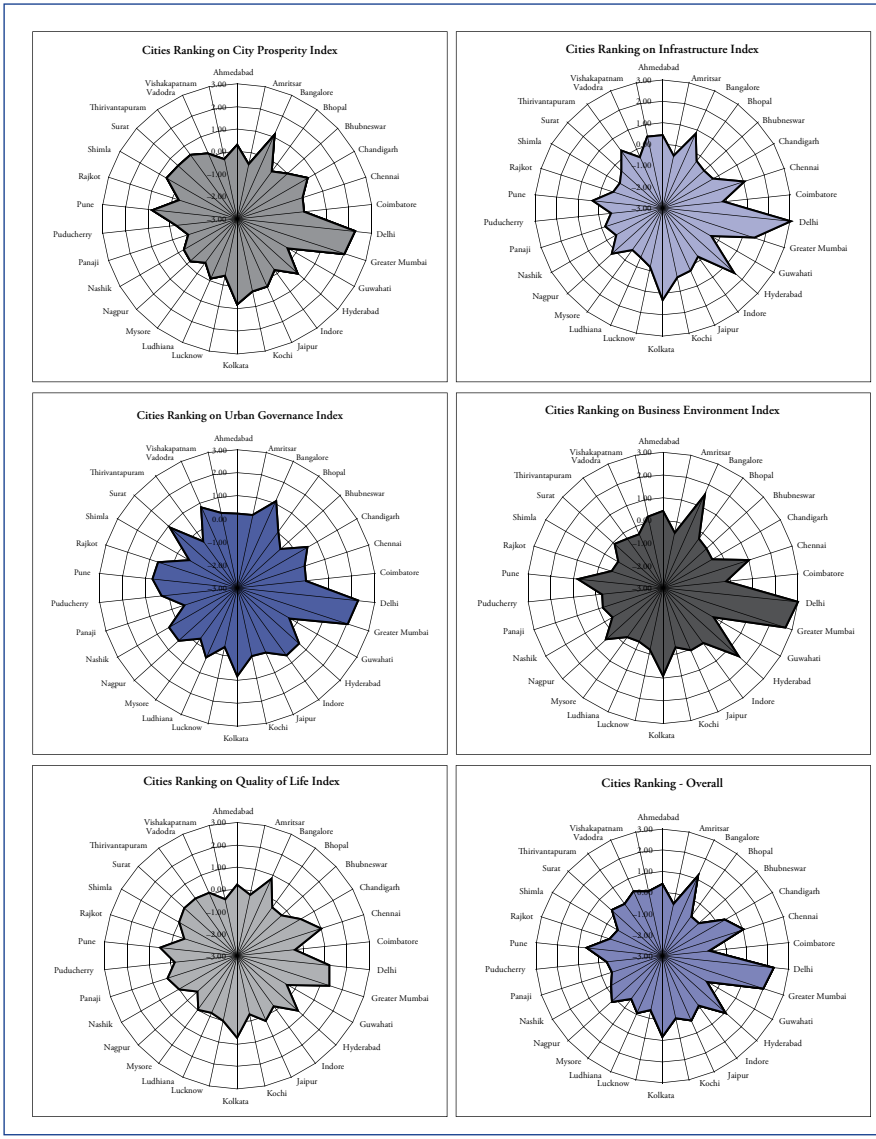
Chennai is the country's major seaport and is known for its manufacturing industries. It has become one of India's major ICT destinations. Chennai is anticipating an exceptionally high investment of more than Rs34,000 crore ($7.55 billion) for improvements in its urban infrastructure, such as the extension of the local rail service to the surrounding peri-urban areas.

Bangalore, while also a major economic hub, has a diversified economic base, with several major ICT, biotechnology, and fast-moving consumer goods companies based outside the city. The city is a major manufacturing center for apparel and is close to one of India's largest automotive and ancillary clusters in Hosur. However, the city's infrastructure has been unable to keep pace with recent economic growth.

Driven by ICT advances and capitalizing on its highly educated workforce and several world-class technology companies, **Hyderabad** is now challenging Bangalore for the fourth spot in the rankings. Its growth is unprecedented, and the city is poised to become the fourth-largest urban agglomeration in India by 2011. Hyderabad's formally approved ICT SEZs are the highest in number in the country, indicating high investor confidence. The development of urban infrastructure has kept pace with economic growth, making the city a strong competitor to Bangalore.

Kolkata is a major economic hub in eastern India and has traditionally been an important trading center. It is attracting significant investment, particularly from the ICT industry because of proactive government policies

Figure 7.1 Ranking of the Top 30 Indian Cities, by Competitiveness Driver



and the availability of a large pool of skilled labor. **Ahmedabad** and **Pune** are expected to experience similarly high growth over the next decade and have the components, including infrastructure, to support such growth.

Surat and **Chandigarh**'s strong urban governance and reforms supported by the state government of Gujarat make both of these cities attractive investment destinations. Surat, in the Delhi–Mumbai industrial

corridor, is a major manufacturing center in the state. Chandigarh is one of India's most prosperous cities. In recent years it has emerged as a major ICT destination because of its proximity to major industrial clusters in north India and Delhi. Chandigarh has the potential to become a major knowledge hub. It is an attractive business destination and a strong competitor to Surat, but its poor national and international connectivity is a major deterrent to its growth.

The global economic crisis is putting pressure on the country to become more economically competitive to compete better for global trade and investment. The states and cities must also become more competitive. At the same time, India is presented with opportunities to speed up reforms that might otherwise have taken longer to achieve. To ease the pressure on the cities, India must increase its public investment, smooth the progress of public investment, and induce private investment in urban development. The country must also fast-track large infrastructure projects that are already in the pipeline. The current infrastructure deficit is making Indian cities less competitive globally and adding to transaction costs and delays. Inflows of foreign direct investment (FDI) have been robust but cannot be taken for granted in the current recession. Investor confidence is low and must improve to maintain the flow.

To develop the economy of Indian cities and increase their competitiveness, the following, among other things, must improve:

- the enabling environment, including public sector management, legislation, and the finance sector, to attract investment;
- decentralization and government support for business improvements;
- the efficiency and logistics of transportation and ICT systems, particularly in the major cities;
- the capacity of education and R&D facilities; and
- the focus on industry agglomeration and specialization.

7.3 Multi-Sector Industry Analysis of the Central National Capital Region

A substantial part of India's National Capital Region (NCR) is made up of the Central National Capital Region (CNCR) (Figure 7.2). The CNCR comprises the National Capital Territory (NCT) of Delhi (the colored area in Figure 7.2), and some parts of the states of Uttar Pradesh, Haryana, and Rajasthan. The NCT of Delhi (often referred to collectively as "Delhi")

Figure 7.2 Study Area: The Central National Capital Region

Source: Study team.

has 9 districts, 59 census towns, 27 *tehsils*,[4] and 165 villages over a total area of 1,484 square kilometers. The NCR had a population of 17 million in 2008, mostly concentrated in the CNCR. Because the CNCR provides ample evidence of industrial value chains, economic clusters, and industrial agglomerations, it was selected for the testing and evaluation of the CCED approach in this study. Table 7.4 summarizes the differences between the NCR, the CNCR, and the NCT of Delhi.

[4] Generally, a tehsil consists of more than one towns and villages, for which a tehsil functions as an entity of local government.

Table 7.4 Differences between the NCR, the CNCR, and the NCT of Delhi

Region or Territory	States Covered	Districts Covered	Total Area (km^2)	Date Created
National Capital Region	National Capital Territory of Delhi	New Delhi, Central, North, Northeast, East, South, Southwest, West, and Northwest	33,578	1962 (notified)
	Haryana	Faridabad, Gurgaon, Mewat, Palwal, Rewari, Jhajjar, Rohtak, Sonipat, Panipat, Dharuhera		
	Rajasthan Uttar Pradesh	Alwar, Bhiwadi Industrial Town, Meerut, Baghpat, Ghaziabad, Gautam Buddha Nagar, Bulandshahr		
Central National Capital Region	National Capital Territory of Delhi	New Delhi, Central, North, Northeast, East, South, Southwest, West, and Northwest	2,000 (approx.)	2007 (redesignated in the NCR Plan 2021)
	Haryana	Faridabad, Gurgaon, Sonipat, and Bahadurgarh		
	Uttar Pradesh	Ghaziabad, including Noida		
National Capital Territory of Delhi		New Delhi, Central, North, Northeast, East, South, Southwest, West, and Northwest	1,484	1991 (Constitution [Sixty-ninth Amendment] Act)

7.3.1 Economic Structure and Growth Patterns of the Industry Sector, National Capital Territory of Delhi

Industry clusters have been recognized as important contributors to the long-term, sustained economic growth of the NCT of Delhi. The high-growth industries with the potential to drive Delhi's economy onto a high-growth trajectory must therefore be identified. According to the fifth economic census in 2005, the top four industries in the NCT of Delhi in terms of number of establishments were (i) retail trade; (ii) manufacturing; (iii) community, social, personal, and other services; and (iv) finance, insurance, real estate, and business services (Table 7.5). In 1998–2005, the communication sector grew the fastest among the industries. It was followed by finance, insurance, real estate, and business services, and retail trade.

The top three employment-generating industries in the NCT of Delhi in 2005 were manufacturing (31% of the total); retail trade (25%); and

Table 7.5 Number of Enterprises by Sector Industry, National Capital Territory of Delhi, 1998 and 2005

Industry	Fourth Economic Census, 1998		Fifth Economic Census, 2005		% Growth or Decline
	Number of Enterprises	% of All Enterprises	Number of Enterprises	% of All Enterprises	
Manufacturing	129,363	19.1	**111,855**	14.8	–13.5
Maintenance and repair	…	…	26,011	3.5	…
Electricity, gas, and water	1,036	0.2	1,227	0.2	18.4
Construction	8,277	1.3	5,266	0.7	–36.3
Wholesale trade	36,958	5.6	20,654	2.7	–44.1
Retail trade	231,133	34.2	**370,232**	49.0	**60.1**
Restaurants and hotels	30,247	4.6	36,099	4.8	19.3
Transport	53,886	7.1	27,479	3.7	–49.0
Communications	11,091	1.7	26,999	3.6	***143.4***
Finance, insurance, real estate, and business services	29,153	4.4	**52,973**	7.0	**81.7**
Community, social, personal, and other services	147,575	21.8	**75,658**	10.0	–48.7
Total	**678,719**	**100.0**	**755,453**	**100.0**	**11.1**

… = No data available.

Source: Fourth and Fifth Economic Censuses, Government of National Capital Territory of Delhi.

community, social, personal, and other services (16%) (Table 7.6).[5] However, between 1998 and 2005, there was a drop in employment in the following industries: electricity, gas, and water (by –75%); transport and storage (by –33%); construction (by –28%); and manufacturing (by –24%). Employment generation increased sharply between 1998 and 2005 in retail trade (68%); finance, insurance, real estate, and business services (43%); and restaurants and hotels (36%). Though manufacturing generated the highest employment as a whole, employment in the sector dwindled by about 24%, perhaps

[5] Table 7.5 shows data on the number of enterprises, while Table 7.6 contains data on the numbers employed. The employment data and the enterprise categories, by census date, are not necessarily the same for the two data sets. Directly comparable categories are not available.

Table 7.6 Change in Employment by Industry Sector, National Capital Territory of Delhi and India, 1998 and 2005

Industry in the National Capital Territory of Delhi	Fourth Economic Census, 1998		Fifth Economic Census, 2005		% Growth or Decline
	Number	%	Number	%	
Manufacturing	1,440,076	41.4	**1,098,821**	**30.9**	–23.7
Maintenance and repair	…	…	113,333	3.2	…
Electricity, gas, and water	115,477	3.3	29,427	0.8	–74.5
Construction	22,289	0.6	15,980	0.5	–28.3
Wholesale and retail trade	694,034	20.0	1,052,234	29.6	51.6
• Wholesale trade	158,147	4.6	151,423	4.3	–4.3
• Retail trade	535,887	15.4	**900,811**	**25.3**	68.1
Restaurants and hotels	115,470	3.3	156,979	4.4	36.0
Transport, storage, and communications	261,273	6.9	198,984	5.6	–23.8
• Transport and storage	163,775	3.9	108,956	3.1	–33.5
• Communications	97,498	3.0	90,028	2.5	–7.7
Finance, insurance, real estate, and business services	207,465	6.0	**296,954**	8.4	43.1
Community, social, personal, and other services	622,454	17.9	**581,413**	**16.4**	–6.6
Total	**3,478,538**	**100.0**	**3,544,125**	**100.0**	**1.9**
Industry in India	Fourth Economic Census, 1998		Fifth Economic Census, 2005		% Growth or Decline
	Number	%	Number	%	
Manufacturing	6,849,000	26.5	5,619,000	23.5	–18.0
Maintenance and repair	…		…		…
Electricity, gas, and water	996,000	3.9	909,000	3.8	–8.7
Construction	1,283,000	5.0	960,000	4.0	–25.2
Wholesale and retail trade	485,000	1.9	559,000	2.3	15.3
Retail trade	…		…		…
Restaurants and hotels	…		…		…
Transport and storage	3,149,000	12.2	2,836,000	11.9	–9.9
Communications	…		…		…
Finance, insurance, real estate, and business services	1,629,000	6.3	1,931,000	8.1	18.5
Community, social, personal, and other services	11,414,000	44.2	11,072,000	46.4	–3.0
Total	**25,805,000**		**23,886,000**		**–7.4**

… = No data available.

Source: Fourth and Fifth Economic Censuses, Government of National Capital Territory of Delhi.

Table 7.7 Percentage Change in Location Quotient, 1998–2005

Industry	% of Employment by Industry Sector, Fourth Census, 1998			% of Employment by Industry Sector, Fifth Census, 2005			% Change of LQ, 1998–2005 (c)a
	NCT of Delhi	India	LQ (a)	NCT of Delhi	India	LQ (b)	
Manufacturing	41.4	26.5	1.61	30.9	23.5	1.43	–11.2
Electricity, gas, and water	3.3	3.9	0.89	0.8	3.8	0.24	–73.0
Construction	0.6	5.0	0.13	0.5	4.0	0.12	–7.7
Wholesale and retail trade	20.0	1.9	10.98	29.6	2.3	13.73	**25.1**
Transport, storage, and communications	6.9	12.2	0.64	5.6	11.9	0.51	–20.3
Finance, insurance, real estate, and business services	6.0	6.3	0.98	8.4	8.1	1.12	**14.3**
Community, social, personal, and other services	17.9	44.2	0.42	16.4	46.4	0.38	–9.5
Miscellaneous	4.2	3.0	…	7.8	0.0	…	
	100.0	100.0	…	100.0	100.0	…	

[a] c = (b – a) / a.

LQ = location quotient, NCT = National Capital Territory.

Note: Cells with thick red border lines are reference values for Figure 7.3.

Source: Fourth and Fifth Economic Censuses, Government of National Capital Territory of Delhi.

because of the down cycle in 1999–2003. Many industries employed fewer people in 2005 than in 1998, but GDP increased overall.

Table 7.6 has been reformatted in Table 7.7 to show how the location quotient has changed over time. The percentage change in the location quotient for the NCT of Delhi over 1998–2005 was divided by the percentage change in the location quotient for India over the same period, for each industry sector. The result reveals an employment growth pattern that is highly skewed in favor of (i) wholesale and retail trade, and (ii) finance, insurance, real estate, and business services in the NCT of Delhi. Employment in the remaining sectors has shrunk heavily (over 20%–70%) except in construction and community, social, and personal services. The location quotient in 2005 was less than 1 in the case of electricity, gas, and water; construction; transport, storage, and communications; and community, social, and personal services. Such sectors had a lower share or concentration of industrial employment vis-à-vis national employment.

Table 7.8 Change in GDP Contribution of Sector Industry, at Current Prices, National Capital Territory of Delhi, 1998 and 2005

	1998		2005		
Industry	Rs million	$ million	Rs million	$ million	% Change
Manufacturing	5,268	114.5	12,147	264.1	131
Electricity, gas, and water	121	2.6	1,014	22.0	738
Construction	3,508	76.3	10,188	221.5	190
Restaurants and hotels	9,700	210.9	23,285	506.2	140
Transport, storage, and communications	4,863	105.7	10,189	221.5	110
Finance, insurance, real estate, and business services	15,456	336.0	32,646	709.7	111
Community, social, personal, and other services	7,800	169.6	15,040	327.0	93
Public administration and defense	2,680	58.3	4,886	106.2	82
Other services	5,120	111.3	10,153	220.7	98

GDP = gross domestic product.

Source: Study team.

The location quotient was also less than 1 in the case of manufacturing, wholesale and retail trade, and finance, insurance, real estate, and business services. There was a higher share the wholesale and retail trade segment in the NCT (29.6% in 2005) was about 14 times (2.3% in India in 2005) higher than the national average.

The economy of the NCT Delhi has undergone a wide range of structural changes, as indicated in Table 7.8. The gross state domestic product (GSDP) in 2005 was $23.38 billion. GSDP data from the Fourth and Fifth censuses show that growth in the industrial sector as a whole was high during the period between the two surveys. The spurt in construction and the closure of polluting industries also led to various structural changes in the economy of the NCT of Delhi in 1998–2005. The leading growth sectors have been electricity, gas, and water, which had astounding growth of 738% in the 7-year period. Construction, a rapidly growing (190%) sector in terms of population and industrial and business setup, is in second place, and it is

followed by restaurants and hotels, manufacturing, and transport, storage, and communications. The rapid increase in population and the large amounts of energy and water resources required by industry explain the high-growth pattern. Despite the overall decline in employment in the NCT in 1998–2005 (Table 7.6), there was a significant increase in GDP for construction, restaurants and hotels, manufacturing, and finance, insurance, real estate, and business services (Table 7.8). The finance, insurance, real estate, and business services sector in particular contributed most to GDP, signifying a shift in the economic structure toward services. Overall, the GDP of the NCT of Delhi also increased as a result.

7.3.2 Location Quotient and Shift-Share Analyses of Industry Clusters in the Central National Capital Region

Increasing specialization in the NCT of Delhi (such as in Faridabad, Gurgaon, and Sonipat) is leading to the development of strong industry clusters with well-developed, integrated supply chains. The following analyses of the economic structural changes in the sector industries are three-dimensional, and require another technique for clear interpretation of trends. The three-dimensional bubble graphs[6] in Figures 7.3–7.7 show the concentration, growth, and size of employment in five districts in the CNCR—NCT of Delhi, Faridabad, Ghaziabad, Gurgaon, and Sonipat. The same analyses done previously for the NCT of Delhi have been carried out for each of the other satellite cities in the CNCR.

7.3.2.1 NCT of Delhi

According to the Fifth Economic Census, the main manufacturing lines in the NCT of Delhi are apparel; publishing, printing, and reproduction of recorded media; rubber and plastic products; and basic metals and fabricated metal products and equipment (Table 7.9). Polluting industries, such as chemicals and rubber, plastic, petroleum, and coal products, will be closed and are likely to move to other parts of the CNCR.

In the NCT of Delhi the retail trade has developed considerably with the opening of shopping centers (Figure 7.3). The finance sector has continued to grow, signifying the important role of the city in this industry. Manufacturing,

[6] The growth or decline in employment concentration (change in the location quotient over time) in various industries from 1991 to 2001 (from 1998 to 2005 in the case of NCT Delhi) is plotted on the x-axis. The y-axis shows the employment concentration for an industry in a given year in a particular district relative to the national average value for the industry. The size of a circle indicates the percentage share of employment of the industry within the district.

Table 7.9 Share of Employment in Manufacturing Sector Industries, National Capital Territory of Delhi, 2005

Manufacturing Sector Industry	No. of Workers	Percentage Share (%)
Food products	14,748	4.3
Beverages, tobacco, and tobacco products	2,108	0.6
Textile products	124,341	36.2
Wood products, furniture, and fixtures	7,548	2.2
Paper and paper products, printing, publishing, and allied industries	23,823	6.9
Leather and leather furniture products	10,783	3.1
Rubber, plastic, petroleum, and coal products	10,050	2.9
Chemicals and chemical products	10,508	3.1
Nonmetallic and mineral products	1,125	0.3
Basic metals and alloys	8,910	2.6
Metal products and parts, machinery, and transport equipment	64,517	18.8
Electricity, gas, and water	4,499	1.3
Wholesale trade	160	0.1
Public administration and defense services	46	0.0
Sanitary services	78	0.0
Repair of goods and services	25,028	7.3
Miscellaneous unspecified group	35,032	10.2

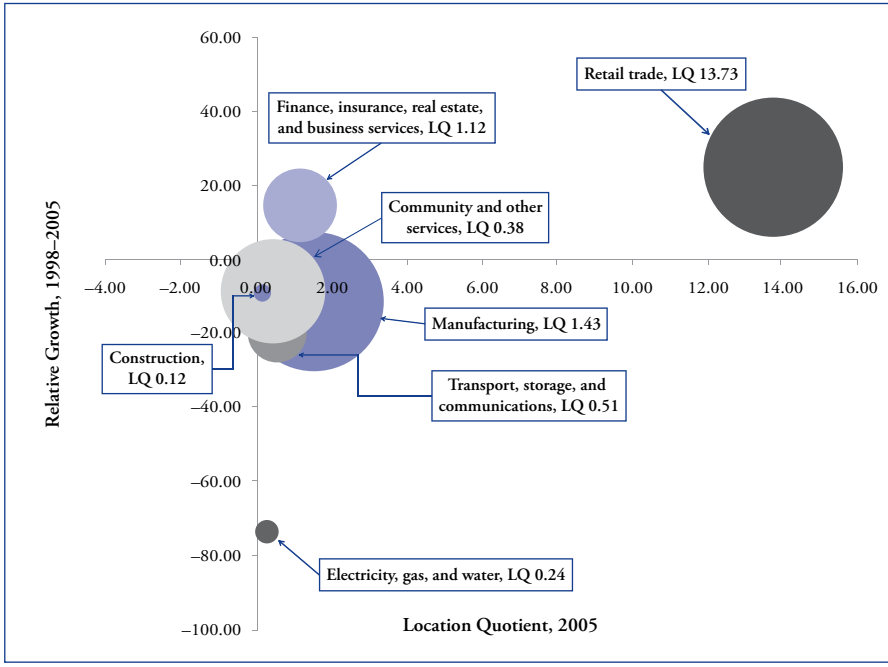
Source: Economic Survey of Delhi, 2005–2006.

transport, and construction are large and important industries, but are in decline as employment in these industries has become more decentralized. The NCT of Delhi is likely to become more important in the services sector, while most manufacturing industry development takes place outside the NCT but within the CNCR and in adjacent states.

7.3.2.2 Faridabad

Faridabad, one of the main industrial cities of Haryana, is surrounded by the river Yamuna in the east and the Aravalli hills in the south and west. It is a preferred destination for industries, corporations, and government departments because of the numerous economic activities in and around the city. Faridabad has over 6,000 light engineering companies (mostly in the automotive components business), hundreds of polyethylene and paper packaging units, home appliance makers (fan making is a household industry),

Figure 7.3 Location Quotient Analysis of Employment Concentration, National Capital Territory of Delhi, 1998–2005



LQ = location quotient.

Note: The size of the circle indicates the comparative size of the industry.

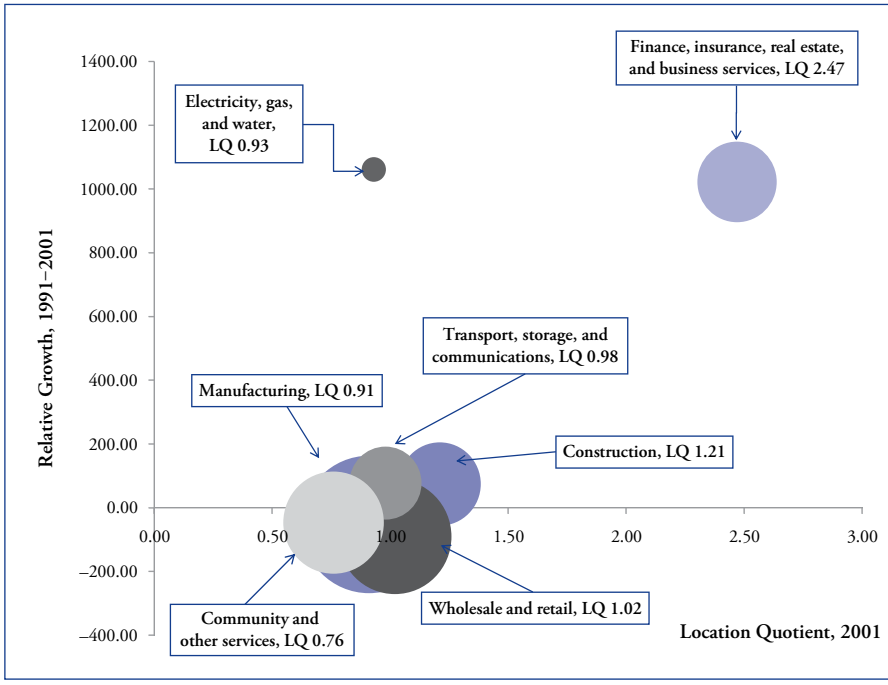
Source: Study team.

manufacturers of melamine crockery and machine tools, and businesses engaged in textile dyeing, printing, and allied industries. The engineering sector generates a significant portion of employment opportunities in Faridabad and is intricately linked with general manufacturing, consumer goods, and automotive and relevant component processing industries. Automotive manufacturing factories are agglomerated in Faridabad.

The other noteworthy industry in the district that has shown growth of more than 50% is wholesale and retail trade, though the sector more or less serves the local needs of Faridabad (LQ almost equal to 1) (Figure 7.4).

The transport, storage, and communications sector has a location quotient of less than 1, indicating slightly a lower employment concentration than the national average. Both the electricity, gas, and water sector and finance, insurance, real estate, and business services have location quotients that are almost double the national average. Electricity, gas, and water experienced the highest relative growth of 153% in 1991–2001,

Figure 7.4 Location Quotient Analysis, Employment Concentration, Faridabad, 1991–2001



LQ = location quotient.

Note: The size of the circle indicates the comparative size of the industry.

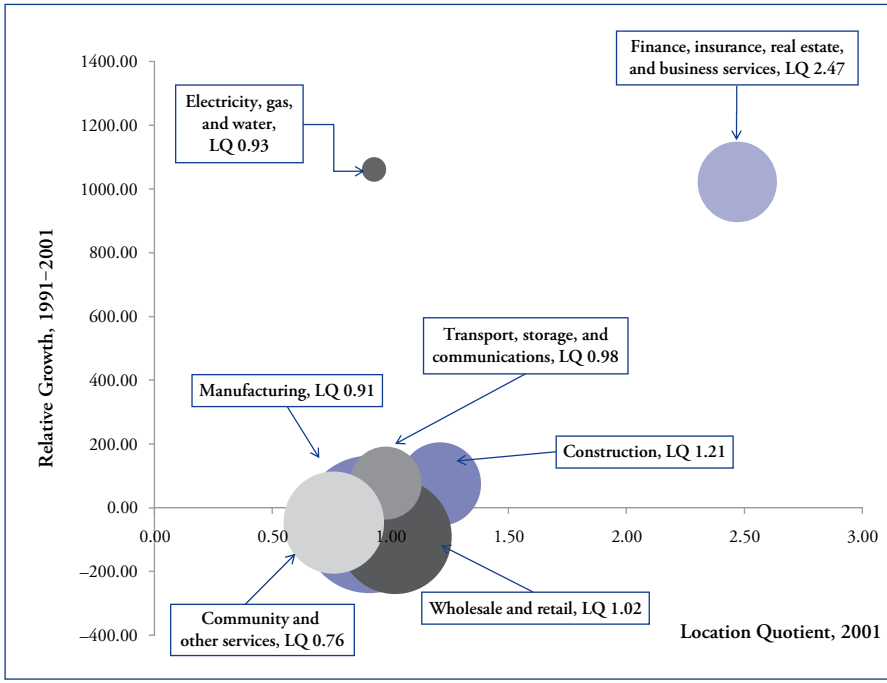
Source: Study team.

while finance, insurance, real estate, and business services had negative growth during the same period. The location quotients for construction and manufacturing indicate that the relative concentration of employment in these sectors is almost the same as the national average. In Faridabad, employment is highest in manufacturing, as the bubble size suggests, followed by wholesale and retail trade and community, social, and personal services. Transport, storage, and communications has the lowest location quotient, 0.81, indicating a lower concentration of employment than the national average; however, relative growth in 1991–2001 was positive, at about 25%. Five of seven sectors have grown substantially in Faridabad.

7.3.2.3 Ghaziabad

Ghaziabad has an important place in industrial development in Uttar Pradesh. Manufacturing industry represents almost eight times the combined income of other industries, with the most important industry being steel. The manufacturing

Figure 7.5 Location Quotient Analysis, Employment Concentration, Ghaziabad, 1991–2001



LQ = location quotient.

Note: The size of the circle indicates the comparative size of the industry.

Source: Study team.

sector also includes apparel, transportation equipment, dairy products, tobacco products, ceramics, pottery, industrial machinery and equipment, and a range of electrical and electronic goods. Ghaziabad has 14,160 small-scale industries, employing about 73,130 workers. It also has 145 medium and heavy industries with a capital investment of Rs2,930.86 million ($65.3 million), employing about 31,200 workers.

Noida was created under the Uttar Pradesh Industrial Act and came into existence on 19 April 1976. The city is now the administrative headquarters of Gautam Budh Nagar district, with headquarters at Suraj Pur. There are around 1,800 registered garment units with an outlay of around Rs36,000 million ($8.0 billion) and numerous general engineering establishments in the cluster with an outlay of Rs1,520 million ($338 million). There is also a large number of unregistered units in both sectors. Garment and general engineering industries are the top two sectors in the cluster in terms of number of units and investment outlay.

The wholesale and retail trade had a location quotient of 10.33 in 1991, but it has since fallen by 90% to barely above 1.0. Finance, insurance, real estate, and business services have a relative employment concentration of more than twice that of the national economy and had relative growth of more than 100% in 1991–2001 (Figure 7.5). The relative growth trend in electricity, gas, and water is similar, but the location quotient of 0.93 indicates a share below the national average. None of the other sectors had significant relative growth. The size of the bubble for the manufacturing sector suggests that this sector is the largest employer in Ghaziabad, followed by wholesale and retail trade. Four sectors have a location quotient hovering around 1.0, signifying a similar or lower concentration of employment than the national average. Although manufacturing is an important part of the basic economy in any region, it is not prominent in Ghaziabad (location quotient of 0.91 and negative growth of 51%).

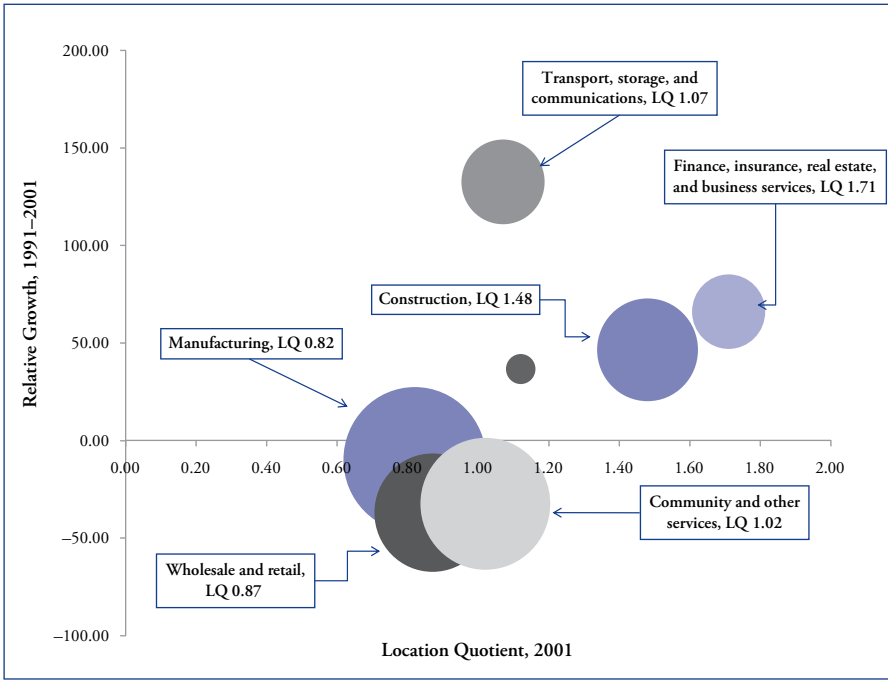
7.3.2.4 Gurgaon

Gurgaon district is in the southwest corner of the CNCR, in close proximity to the Indira Gandhi International Airport. Gurgaon is famous for its outsourcing and offshore services, which contribute the most to its economy. ICT, automobile manufacturing, and pharmaceuticals are the major industries. There are many prestigious international companies engaged in the manufacture of cars, motorcycles, automobile parts, telecommunications equipment, electrical goods, computer hardware (as well as software development), sports goods, rubber products, ready-made garments, light engineering goods, pharmaceuticals, terry towels, food items, air conditioners, shoes, pesticides, and insecticides, among others. The industries in Gurgaon employ more than 200,000 workers.

Finance, insurance, real estate, and business services have emerged as the driving force of the Gurgaon economy, with growth of 66% and the highest level of industrial employment compared with the national average (LQ of 1.71). The construction industry is coming up with diverse new projects, in response to rising demand for property. New residential and commercial properties have been developed in the past few years. The SEZs will give further impetus to Gurgaon industrial estate development, turning the city into a competitive ICT center. Gurgaon has also experienced tremendous growth in recent years as a business process outsourcing destination within India. On the other hand, wholesale and retail trade is on the decline, with the location quotient dropping by 37%.

During 2000–2010, the major growth industry in the district was transport, storage, and communications, which grew at an astonishing 133%. With its exceptional infrastructure and telecommunications conveniences, Gurgaon

Figure 7.6 Location Quotient Analysis, Employment Concentration, Gurgaon, 1998–2005



LQ = location quotient.

Note: The size of the circle indicates the comparative size of the industry.

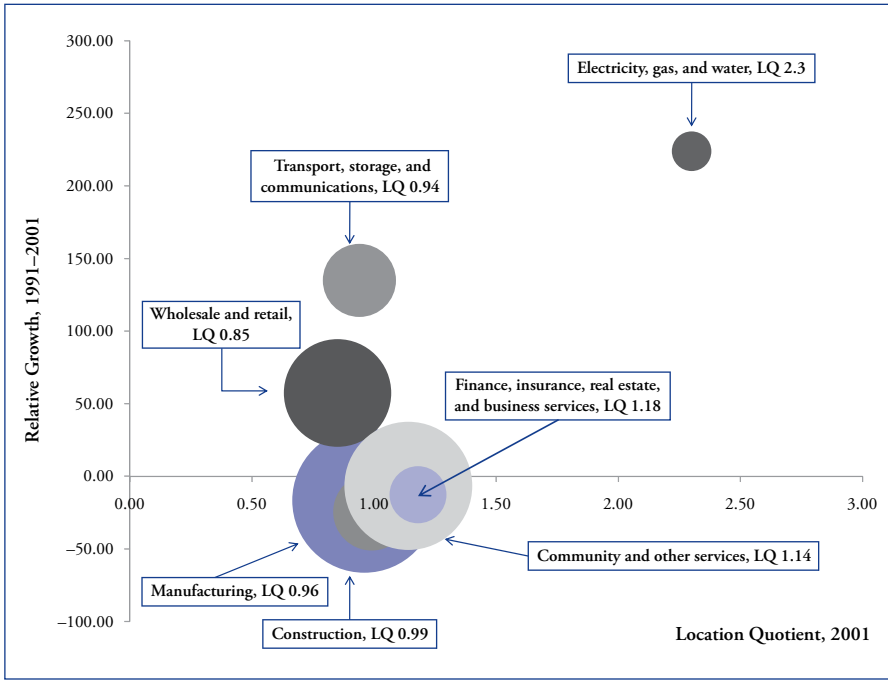
Source: Study team.

is becoming a hub for news channels and media organizations. Information broadcasting is now a major business, and the city provides a top-notch environment for this. Manufacturing and wholesale and retail trade have location quotients of less than 1 but still offer a substantial number of jobs, together with community, social, and personal services. Four of the seven sectors shown in Figure 7.6 have location quotients greater than 1, indicating a high level of concentration of employment in these sectors and growth trends, compared with the national economy.

7.3.2.5 Sonipat

Sonipat has an area of 2,130 km^2 and lies in the southeast part of the state of Haryana. The district produces a large variety of products, such as rubber, plastic, and chemical products; paints and varnishes; drugs and pharmaceuticals; dyes; polyvinyl chloride (PVC) shoes; weighing scales; machine tools; agricultural implements; hydraulic presses and other light

Figure 7.7 Location Quotient Analysis, Employment Concentration, Sonipat, 1991–2001



LQ = location quotient.

Note: The size of the circle indicates the comparative size of the industry.

Source: Study team.

engineering products; leather goods; textiles; and bulletproof helmets. Sonipat has an effective industrial infrastructure. The transport, storage, and communications industry has done well, growing by 135% in 1991–2001. A well-established surface transport system linking Sonipat with other marketing centers will promote industrialization.

As Figure 7.7 shows, the largest employers in Sonipat are the manufacturing and construction industries, followed by community, social, and personal services. The location quotient of the manufacturing sector, at 0.96, indicates that the relative concentration of manufacturing activity in Sonipat is almost the same as the national average. Electricity, gas, and water and transport, storage, and communications had relatively high growth of more than 100% in 1991–2001. The relative growth rate was 224% for electricity, gas, and water, also the only sector in Sonipat with a location quotient greater than 2, signifying a relative concentration more than double the national average.

7.4 Emerging Patterns of Industry Clusters in the Central National Capital Region

The regional economy of CNCR has historically been based on apparel, textiles, and general engineering, as reflected in the strong concentrations of these industries in the satellite cities in the CNCR. Faridabad, Noida, and other small cities in Ghaziabad are the oldest centers of general engineering, and Gurgaon has many small and large enterprises in the automotive components industry. Key observations from the section "Multi-sector Industry Analysis of the Central National Capital Region" are summarized below:

- Communications, wholesale and retail trade, and finance, insurance, real estate, and business services are not only growing very fast in the NCT, but are also the second-largest employers after manufacturing.
- Although the manufacturing sector has declined over time, it is still the top employment generator (over 30% of employment) in the CNCR economy.
- Faridabad has had substantial growth in manufacturing.
- Construction and finance, insurance, real estate, and business services have grown very fast in Gurgaon. Also, there is a high concentration and significant share of manufacturing, which provides overall employment and value-adding supply-chain activities in support of the CNCR economy.
- Noida is primarily in manufacturing.
- Sonipat does not show any specialization and is still a greenfield destination for most economic activities.

Table 7.10 shows that most secondary manufacturing is taking place outside the NCT of Delhi but within the CNCR and in adjacent states. (The NCT of Delhi, on the other hand, is likely to become more important in the services sector.) Gurgaon, Faridabad, Ghaziabad, and other CNCR towns are increasingly becoming centers of high growth for finance, insurance, real estate, and business services like ICT. But, as Table 7.10 clearly shows, two manufacturing sector industries—machinery and equipment (general engineering) and transport equipment and parts (automotive components)—are very important throughout the CNCR. In the NCT, textiles (mainly ready-made garments) provide substantial employment.

The location quotient analyses identified four industry clusters that could drive the development of the CNCR economy. The four industry clusters are (i) textiles and ready-made garments (RMGs), (ii) light engineering, (iii) automotive components, and (iv) ICT and ICT-enabled services. The development of these clusters will lead to regional development, reduced

Table 7.10 Concentration of Manufacturing Activities in the Central National Capital Region, 2009

Manufacturing Activity	NCT of Delhi	Guragon	Faridabad	Sonipat	Ghaziabad
Food products, beverages, and tobacco	Low	Low	Low	Low	Low
Textiles	High	Low	Low	Low	Low
Leather and leather products	Low	Low	Medium	Low	Low
Basic chemicals and chemical products	Low	Low	Low	Medium	High
Rubber, plastic, and chemical products	Low	High	High	Low	Medium
Other nonmetallic products	Low	High	Low	High	Low
Basic metals and metal products	Medium	Low	High	Low	High
Machinery and equipment	High	High	High	High	High
Transport equipment and parts	High	High	High	High	High
Other manufacturing industries	Low	Medium	High	High	Medium

NCT = National Capital Territory.

Source: Study team.

poverty, and improved living standards. The further growth of these industry clusters will be affected by the availability of (i) an inexpensive and highly skilled workforce, (ii) a growing domestic market, (iii) high-quality ICT capabilities, and (iv) a regulatory regime conducive to foreign direct investment, among other factors. With these factors in mind, three industry clusters were finally chosen: (i) textiles, (ii) light engineering, and (iii) automotive components.

7.5 Diamond Model Analysis of Three Industry Clusters in the Central National Capital Region

This section analyzes the structure and operations of the textile cluster in Okhla, Ghaziabad; the light engineering cluster in Faridabad; and the automotive components cluster in Gurgaon. The study of the selected clusters is based on interactions with key actors and representatives of industrial associations and local and national institutions. Limitations in

detailed statistical data and time meant that extensive use had to be made of focus group discussions and roundtables to identify the current and desired status of the clusters, and current constraints on their growth and development. The analysis was supported by input from working groups where officials of companies from the industry clusters were represented.

The analysis followed the CCED process, as described in Chapter 5, beginning with the industry structural mapping of core industries and relevant supply chains for each industry cluster. This was followed by a detailed analysis of industry competitiveness, involving an assessment of five conditions and 39 elements, based on Porter's diamond model, and a deficiency gap analysis. The results of the analysis were used in developing an action plan for strengthening each cluster.

7.5.1 Ready-Made Garments Industry Cluster, Noida in Okhla, Ghaziabad

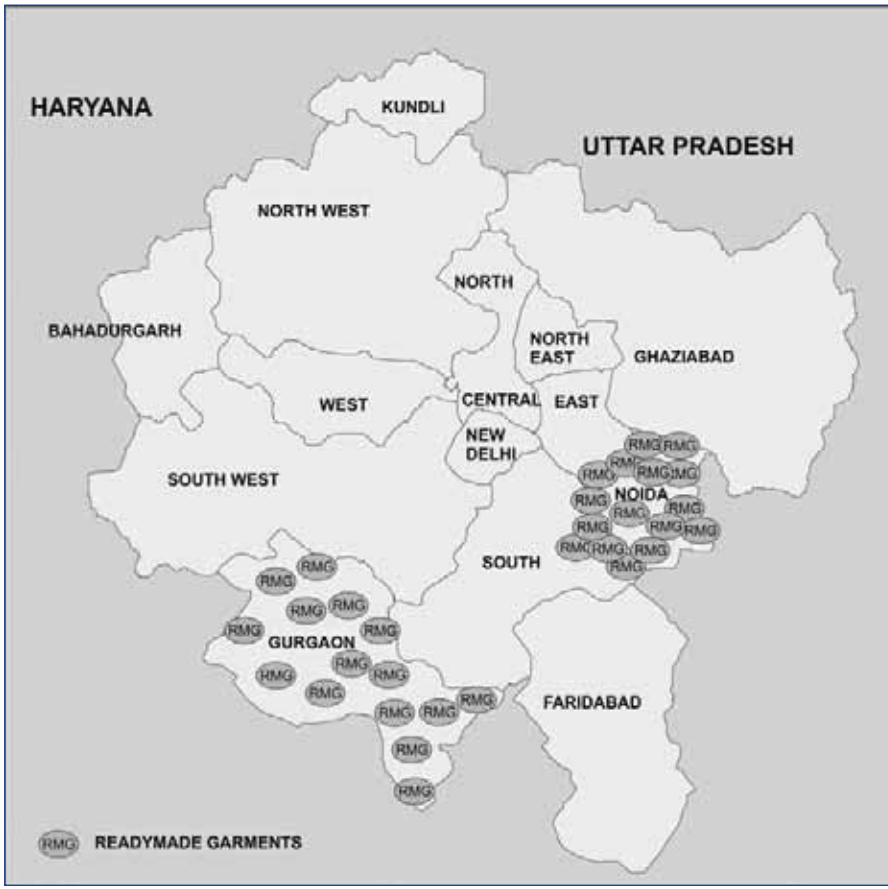
The CNCR is the leading RMG center in the country. It produces 40% of India's ready-made garments, and exports them. Most of its garment companies are in Noida, Okhla industrial area, in the southeast part of the CNCR. The other major production center in the CNCR is in its southwest, in Guragon. This is one of the largest industrial areas in the country, with more than 4,000 factories. The Indian textile industry contributes about 17% to India's export earnings. The export basket consists of a wide range of items—cotton yarn and fabrics, man-made yarn and fabrics, wool and silk fabrics, made-ups, and a variety of garments. India exports its textile products, including handloom and handicrafts, to more than a hundred countries. Okhla produces roughly 19% of the total output of the registered sector and 16% of the output of the unregistered sector. Despite their substantial contribution to the country's GDP, nearly 98% of the textile enterprises in Okhla are not organized and are mostly micro-, small, and medium-sized enterprises (mSMEs) in the informal sector.

The results of the analysis of the drivers of competiveness for the textile cluster in Okhla, using Porter's diamond model, are described briefly below, followed by gap analysis and action plans for strengthening the Okhla RMG industry cluster.

7.5.1.1 Factor Conditions

The backward linkages of the RMG core industry are raw materials suppliers, machinery tools suppliers, fabric processors, and packing materials suppliers. Suppliers in the cluster are close to their markets, and the mSMEs in the

Figure 7.8 Ready-Made Garments Industry Agglomeration in the Central National Capital Region



Source: Study team.

cluster have easy and cost-effective access to a wide range of services. Critical to the growth of the cluster is the availability of cheap labor provided by the migrant population from Bihar and Uttar Pradesh. These workers gain entry to the trade by working in factories with little formal training. The CNCR does, however, have a number of established education and ICT institutes that act as catalysts to enrich the human capital base of the cluster.

The technology used in the cluster for manufacturing RMGs is changing according to international standards. Almost all manufacturers and exporters have adopted improved manufacturing processes and are maintaining the desired quality standards. They are helped in this regard by various testing labs, which test raw materials against the finished-product requirements.

But those in the unorganized informal sector have largely not benefited from advanced technology. The cluster has access to railways, roads, and airports, including depots to the international market in the Okhla industrial area, but roads and connectivity are in poor condition and so are internal public transport facilities in the Okhla industrial area. Sewerage infrastructure is also not well developed. Electricity supply has improved somewhat, but further improvement is needed to ensure uninterrupted power supply to the cluster.

7.5.1.2 Demand Conditions

The RMG cluster is very dependent on export orders for its development. The cluster accounts for 16% of total apparel exports from India. There are about 50 large export houses in Okhla, which are responsible for most of the cluster's exports. The exports, which include international brands, go primarily to the European Union countries, Canada, and the United States. The garments are not high priced and are mainly for clothing and discount-chain markets.

7.5.1.3 Related and Supporting Industries

There are eight categories of supplementary industries *and activities that support the RMG core cluster*: (i) merchants, traders, and manufacturers of fabric, threads, buttons, fittings, etc.; (ii) processing units for cloth and fabric, which do bleaching, dyeing, enzyme work, etc.; (iii) buyers that procure direct export orders and then distribute them within the cluster for manufacturing; (iv) a group of exporters of RMGs that directly export to various countries; (v) garment fabricators that stitch the garments and send them back to the main units for further processing; (vi) machine embroiderers that add value to the main products; (vii) contractors taking garments from the main manufacturers and then distributing them in the nearby localities for embellishment; and (viii) suppliers of machines and tools, machinery repairers, and manufacturers and suppliers of packaging materials. The industry has a problem of high rejection rates, indicating a quality assurance problem within the supply chain network. Few of the competitiveness attributes in the RMG cluster are good or excellent.

7.5.1.4 Firm Strategy, Structure, and Rivalry

Most garment manufacturing units in the cluster are small and family owned, with the owner and family members acting as manager, purchaser, marketer, negotiator, quality controller, and finance controller. Few professionally qualified people are hired for those roles, except for a few people with merchandising diplomas. Large companies and export houses do, however,

recruit technically and commercially qualified employees for production, inventory control, and design work. The companies are mostly integrated horizontally. Because of the small scale of their operations and subcontracting relationships, only a few companies are vertically integrated. There are many companies in the industry, but product differentiation is minimal. Most producers have been supplying a fixed clientele abroad for the last 20–30 years.

With globalization opening up the economy, the growth potential is tremendous, provided the industry has access to the latest technology, economies of scale and marketing consortia. Encouraging non-price competition and product differentiation, notional or real (maybe with diversification), would reduce rivalry among firms. Already, rivalry is moderated by the fact that exit barriers are low.

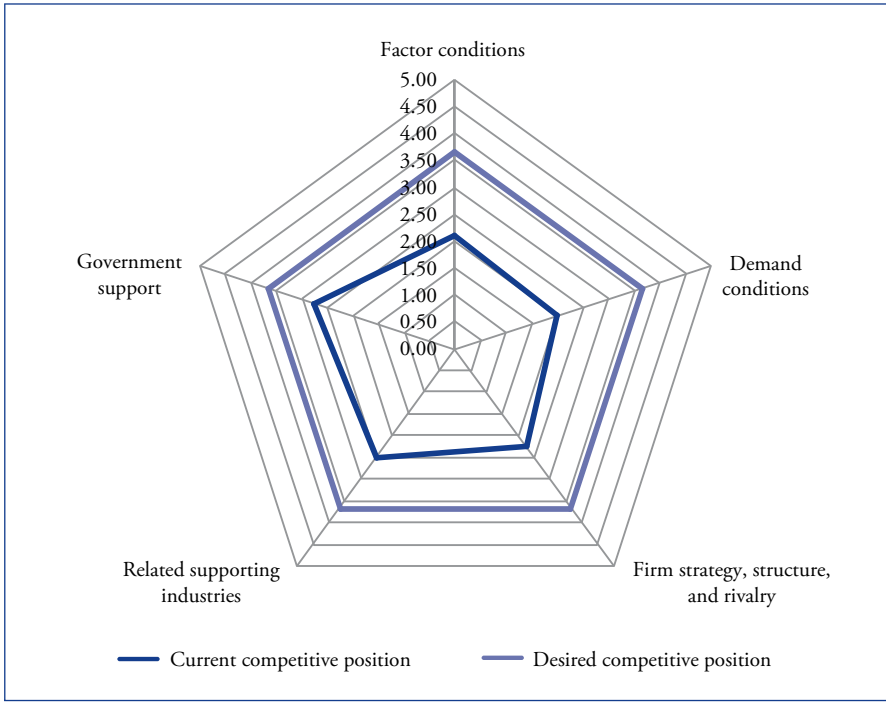
7.5.1.5 Government Support

In 1956–1957, the government developed the Okhla industrial area in four phases. As far as public policy is concerned, there is direct or indirect impact on the cluster from institutions like the Development Commissioner, Small Scale Industries; the Central Board of Excise and Customs; the Sales Tax Department; the Department of Factories; the Central Pollution Control Board–Delhi; and the Textiles Committee, Ministry of Textiles. The excise duty on fabric, the sales tax on local sales, and the higher rate of interest on loans are among the issues that require government action for the healthy growth of the trade. Government support for the cluster is generally poor. There are weaknesses in business approval systems and in the enforcement of business regulations, education and training, and R&D. Government support for capacity building and measures to improve quality assurance are urgently needed.

7.5.1.6 Competitiveness and Gap Analysis of the Cluster

The key features of the cluster that emerged from the evaluation are as follows: (i) companies find it difficult to gain access to supplier services, education and training facilities, and product improvement services, and to build brands; (ii) stakeholders have low awareness of policy matters, the role of government, and export procedures; and (iii) companies tend to use traditional, outdated practices, have low social capital, and lack the expertise that would be useful in solving production-related problems. Though they are geographically agglomerated, the companies are not yet organized for collaborative group actions, as small stakeholders are not aware of the benefits of economies of scale.

Figure 7.9 Analysis of the Competitiveness of the Okhla Garments Industry Cluster



Source: Study team.

Figure 7.9 shows the level of competitiveness of the Okhla RMGs cluster, using the five factors in the Porter model. As mentioned, none of the competitiveness factors in the cluster are good or excellent. Conditions are poor and the competitiveness scores are less than 3.66 (out of a possible score of 5.00), the threshold value for international competitiveness. The average score for 72% of the 39 competitiveness indicators is below 2.50. To compete internationally, the RMG cluster must score higher than 3.75 in all the competitiveness elements. The cluster's strength lies in its production flexibility, the scale of the domestic market, and the capacity to expand into new products. To open up markets, the cluster must have easy and cost-effective access to a wide range of services, abundant availability of raw materials, and easy availability of cheap labor for all groups in the cluster.

7.5.1.7 Action Plan

The following should be part of the action plan for improving the competitiveness of the RMG cluster:

- *Short-term activities.* These soft interventions should create awareness of policy matters, the role of government, and export procedures such as deadline setting. The activities should include the following:
  - online stores for accessories and trims;
  - adopting a consortium approach to procurement and marketing;
  - training employees;
  - improving the quality of management;
  - managing quality;
  - training fabricators and subcontractors;
  - holding an annual international convention on apparel and textiles; and
  - adopting advanced technology to improve production process and quality.
- *Long-term activities.* These hard interventions should improve the business environment of the cluster to increase productivity and environmental sustainability, and develop infrastructure. The activities should include the following:
  - modernizing the cloth and fabric processing groups, which are engaged in bleaching, dyeing, and enzyme work;
  - developing textile and apparel knowledge parks to create economies of scale and become hubs for domestic and international retailers, sourcing offices for stakeholders involved in forward and backward linkage, and sharers of knowledge of state-of-the-art production facilities that conform to global quality and consistency standards;
  - improving solid waste management and wastewater treatment; and
  - rehabilitating roads and improving connections.
  - establishing lean manufacturing, including plans for efficient cutting-room layout and work flow;
  - improving workers' health care;

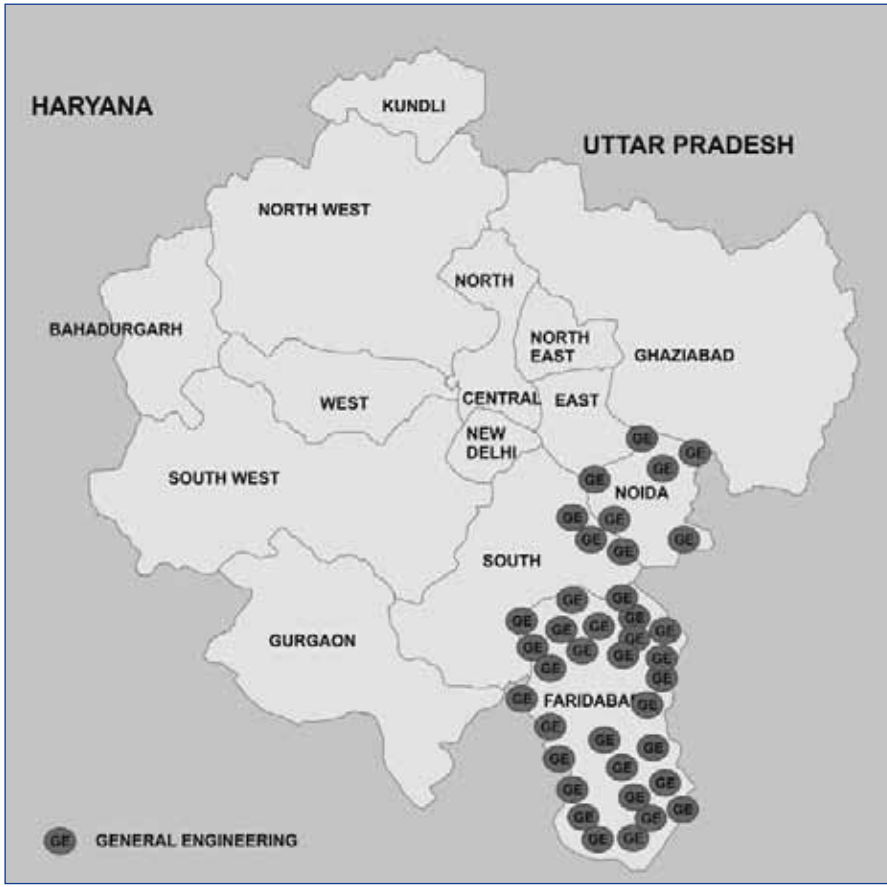
7.5.2 Light Engineering Cluster, Faridabad

The engineering industry in the CNCR encompasses a wide range of engineering products and can be primarily categorized into heavy engineering and light engineering segments. Faridabad and Noida are the two main areas where the majority of the light and heavy industry units are situated. Faridabad city is virtually a suburb of the NCT of Delhi. It is about

11–32 km away from New Delhi. The industrial base of Faridabad is part of the overall economy of the NCT of Delhi, implying the interdependence of the economies. This industrial estate in Faridabad is spread over an area of about 6,948 hectares.

Over the years Faridabad has emerged as an important cluster particularly for industries in the heavy engineering sector such as automobiles, earth-moving machinery, and various engineering products. Smaller enterprises supply the larger ones with ancillary products like castings, forgings, fasteners, bearings, and steel pipes and tubes. Faridabad has over 6,000 general engineering companies (mostly in the automotive component business).

Figure 7.10 General Engineering Industry Agglomeration in the Central National Capital Region



Source: Study team.

The major industrial production in the district, city itself, includes tractors, mainly represented by Faridabad steel re-rolling, scientific instruments, power looms, cranes, fan making, and machine tools. The industrial base of Faridabad (according to estimates) is very wide, with more than 15 multinational companies (MNCs), and 300 medium and large-scale industries. However, there is also a large number of small industrial units functioning from various locations including residential areas in the city. On the whole, there are about 15,000 small, medium, and large establishments in the Faridabad–Ballabgarh Complex. The complex provides direct and indirect employment to nearly half a million people and ranks as the ninth-largest industrial estate in Asia. Its combined turnover is estimated to be about Rs2,000 billion ($44.5 billion).

7.5.2.1 Factor Conditions

The raw materials used by manufacturers in this cluster include metal sheets, bar angles, channels, and ingots, which are all sourced locally. The raw materials are generally basic and semifinished metal products that are expensive and have high inventory and stock management costs. While Faridabad has branches of all the major banks, none of them has introduced any special financing schemes for the light engineering industry. A major issue in this cluster is the technology gap between local manufacturers and modern trends. Modern machinery and equipment is too expensive for the average entrepreneur. The light engineering industry is facing severe shortages of skilled and technically qualified labor. Most workers do not have certificates or diplomas from technical training institutions and therefore are not well informed about the latest production techniques. The synergy between industry demand and educational curricula is minimal.

7.5.2.2 Demand Conditions

The cluster caters to three markets: (i) manufacturers of original equipment and vehicles (25% of total demand); (ii) the replacement market (65%); and (iii) the export market (10%), primarily for exports to international tier 1 suppliers (original equipment manufacturers).

The manufactured goods are sold to traders, both within the city and across the country. Each manufacturing concern has its own relationship with dealers. Local automotive manufacturing plants account for a number of the engineering products. In addition, given the rapidly growing investment in infrastructure, demand for cranes is high. The cluster also produces agricultural implements for the local and international markets. The products manufactured by the light engineering mSMEs are used

largely in the capital goods and heavy engineering industry. Therefore, that industry determines to a considerable extent the demand for the products. The infrastructure, manufacturing, and process industries are expected to be the key demand drivers of the light engineering sector in the future.

7.5.2.3 Related and Supporting Industries

The light engineering industry generally derives significant support from the country's well-established ICT sector and higher-education institutions. A well-developed technical and tertiary education infrastructure consisting of numerous universities, research institutions, and other higher-education centers supports the engineering sector not only with a steady stream of qualified staff, but also with R&D. Nevertheless, the cluster suffers from serious technological deficiencies. The lack of education among entrepreneurs, the limited financial resources, and a change-resisting culture have resulted in production facilities with primitive process techniques and obsolete machinery and equipment. The quality of manufactured products has suffered as a result. The provision of essential services, such as power, water, and energy, is poor. The power supply has not kept pace with the increasing population and the growth of economic activities. The entire CNCR is short of water, and the inequitable distribution of water across various parts of the CNCR has worsened the shortage.

7.5.2.4 Firm Strategy, Structure, and Rivalry

Most companies in the cluster are mSMEs, managed by first-generation owners. In most of these companies, the delegation of work is limited and ineffective. The owner is the only manager who decides on all aspects of operations and has no effective backup. Companies dealing in similar goods and situated close to each other share little information. Moreover, subcontracting arrangements are absent despite the presence of many small units, implying limited flexibility in production.

In most companies, the time spent on strategic marketing is severely curtailed by competing demands. In any case, the focus is always on redressing immediate issues and not on analysis-based corrective action. Thus, there is no plan or record of activity where specific days are periodically set aside for building customer relationships (e.g., meeting customers or visiting exhibitions).

There are four main industry associations in the cluster. Their basic objectives are to promote, develop, and encourage trade and industry, and to provide various services to their members. Besides providing a platform for small-scale units to convey their views and problems to the state or central

governments, the associations take up individual problems of their member units with the departments concerned. The associations also endeavor to create awareness of the latest technological developments, marketing strategies, quality improvements, etc., among their members.

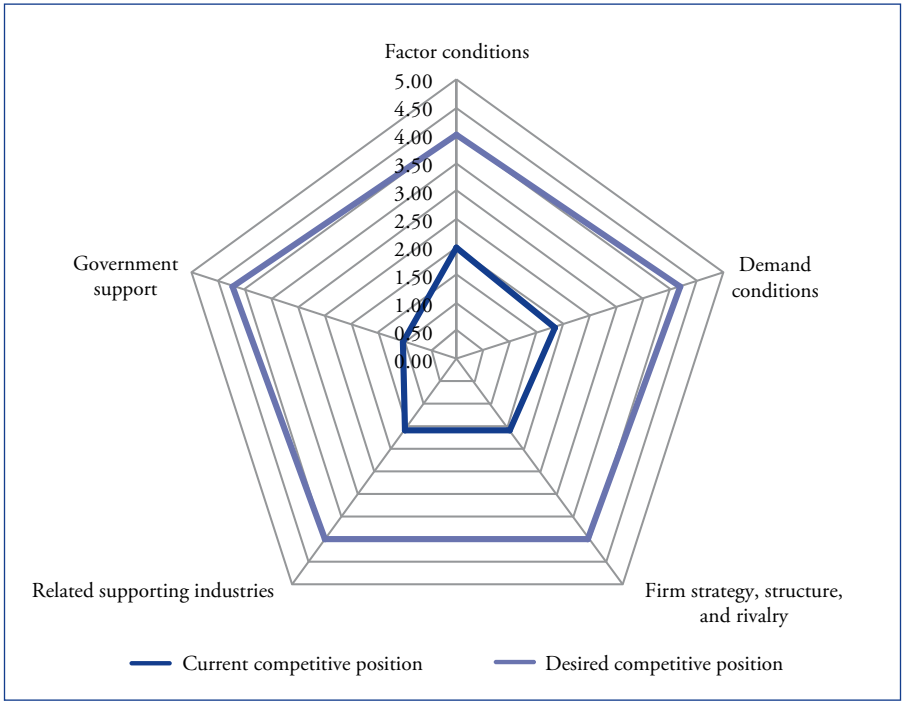
7.5.2.5 Government Support

The role of government in the cluster is marginal. Government does not provide support in securing tax exemptions, or in lowering the rate of interest on loans. These are some issues that require actions from the government for the healthy growth of the light engineering cluster.

7.5.2.6 Competitiveness and Gap Analysis of the Cluster

The study team analyzed the competitiveness of the Faridabad cluster using Porter's diamond model (Figure 7.11). The key features that emerged from the analysis were: (i) the lack of managerial skills among entrepreneurs,

Figure 7.11 Analysis of the Competitiveness of the Faridabad Light Engineering Cluster



Source: Study team.

(ii) the limited links between research institutes and industry, (iii) the minimal international collaboration, (iv) the limited financial resources, (v) the change-resistant culture, and (vi) the lack of education in science and training in technical skills. All these factors have resulted in production facilities with primitive process techniques and obsolete machinery and equipment.

7.5.2.7 Action Plan

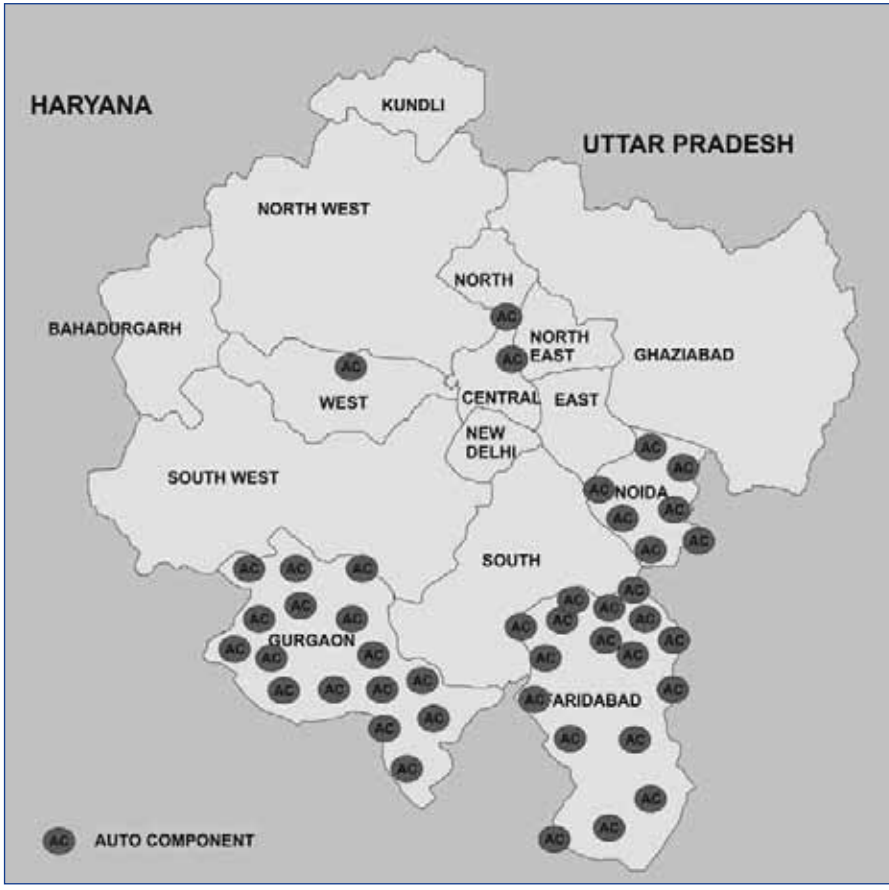
An action plan for improving the competitiveness of the light engineering cluster should comprise the following:

- *Short-term projects.* These soft interventions should be included in the plan:
  - improving quality and standards;
  - enhancing productivity;
  - making extensive use of ICT;
  - expanding markets and increasing market penetration;
  - establishing good practices in supply chain management;
  - supporting workers' health and safety programs;
  - arranging better access to financing; and
  - undertaking joint purchases of raw materials.
- *Long-term projects.* These should involve improving the business environment of the cluster to increase productivity and environmental sustainability, and developing basic urban infrastructure, such as
  - improved toolroom facilities;
  - stronger reverse engineering through the establishment of a design center based on computerized design software;
  - upgraded testing centers, for better quality monitoring and control; and
  - more reliable water supply.

7.5.3 Automotive Components Cluster, Gurgaon

A surge in the automobile industry in India since the 1990s has led to the robust growth of the automotive components industry, which has made great advances in recent years in growth, spread, adoption of new technologies, and flexibility despite the multiplicity of technology platforms and low

Figure 7.12 Automotive Components Industry Agglomeration in the Central National Capital Region



Source: Study team.

volumes. The industry now has more than 400 companies in the formal sector and more than 10,000 small companies in the informal sector. The CNCR accounts for almost 40% of India's automotive components industry.

Gurgaon is one of the three key manufacturing hubs of the $7-billion-per-year (in 2009) automotive components industry. The Gurgaon cluster is an induced cluster that started with Maruti in 1980s. More than 60% of the companies now in the cluster began operations in the 1980s. Brand consciousness has yet to catch up; however, the situation is improving and about 30% of the companies manufacture and market branded products. Almost half of the companies in the cluster are engaged in manufacturing for original equipment manufacturers.

7.5.3.1 Factor Conditions

The automotive components industry produces more than 20,000 components, each of which performs a different function. The formal sector units are quality conscious and have good quality control systems. Most of these units sell their output to local assemblers that have to maintain the quality of their products. A considerable number of these units are ISO 9002 certified.

The informal sector units do not use any specific quality standards. Their main concern is reducing costs to be able to cater to the price-conscious replacement market. Physical appearance and good fit are the criteria for quality inspection in this market. Parts are manufactured in small industrial units using outdated production processes. While the economic and social infrastructure in Gurgaon is inadequate, it is expected to improve with the proposed extension of the urban rail system to Gurgaon. The road connections have improved with the recent construction of several overpasses. Some expressways have also been proposed. The power supply, however, is inadequate and has not kept pace with the increasing population and with economic growth.

7.5.3.2 Demand Conditions

The automotive components industry produces a highly diversified range of products. The distribution channel varies depending on the dynamics of the manufacturing units. The industry is not well organized and technological know-how and expertise are limited to a few large companies. Almost three-quarters of demand for automotive components is from the suppliers of original equipment manufacturers, and the competitiveness of the automotive parts manufacturers is based largely on the quality of the automotive components and their timely delivery to those suppliers. The replacement market for automotive parts is highly price conscious, and suppliers with products of the right quality and low prices penetrate the market quickly.

7.5.3.3 Firm Strategy, Structure, and Rivalry

Most of the automotive components units in Gurgaon are family-owned businesses, with only a few being professionally managed. The owners of companies in the formal sector are mostly qualified and possess a formal technical education, but those in the informal sector are less qualified and yet are remarkably knowledgeable about materials, machinery, and products. The industry generally produces items of relatively moderate to low technology. Precision parts and dies for automotive components,

plastic molded items, and gears should be, in many cases, designed with sophisticated software programs. The stringent quality norms imposed by the original equipment manufacturers have forced companies to upgrade their facilities. However, a lack of financial resources means that companies cannot always respond adequately to product safety and other technical requirements. In most cases, companies are unable to raise enough capital to carry out required adjustments in their production processes to meet ever-changing standards and requirements. While not sharing output markets, companies in Gurgaon often share certain input factor markets, primarily those for labor. In output markets, mSMEs, acting as suppliers to either an original equipment manufacturer or to an assembler, remain under competitive pressure.

7.5.3.4 Related and Supporting Industries

The Indian automotive components industry is well served by two industry associations, the Society of Indian Automobile Manufacturers, which represents original equipment manufacturers, and the Automotive Component Manufacturers' Association of India, which represents the components industry. Both associations actively interact with the industry, the government, and other stakeholders to promote the interests of the industry and improve its competitiveness.

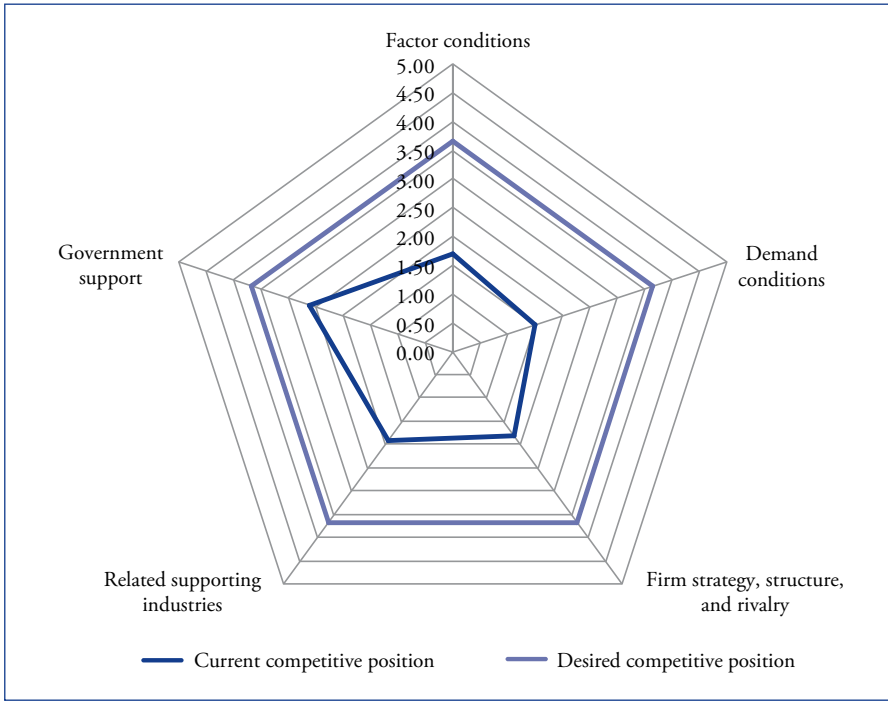
7.5.3.5 Government Support

Government support for the automotive components cluster is generally robust. The development of the industry receives strong policy backing from the Government of India. There are still weaknesses in business approval systems and in the enforcement of business regulations and R&D; however, the government gives much stronger support to the automotive components industry than to either the textile industry or the light engineering industry.

7.5.3.6 Competitiveness and Gap Analysis of the Cluster

According to the focus group participants, none of the competitiveness attributes are good or excellent; most are average or poor. The study team analyzed the competitiveness of the Gurgaon automotive components cluster using the Porter diamond model (Figure 7.13). To be competitive in the future, the cluster must improve its scores for all of the five factors to at least 3.56. More than 70% of the companies are operating with an average annual turnover of less than Rs250 million ($5.6 million). This figure would drop to less than half if recalculated for only the bottom 70%

Figure 7.13 Analysis of the Competitiveness of the Gurgaon Automotive Components Cluster



Source: Study team.

of the companies—informal sector mSMEs, which are the key driving force of economic activities in Gurgaon. Raising operating efficiency and competitiveness and catering to a wider customer base would require investment in production, R&D, and managerial know-how.

7.5.3.7 Action Plan

To become globally competitive, Gurgaon's automotive components companies have to learn the best manufacturing practices and adopt them, be quality conscious, and follow strict delivery schedules. The gap between Gurgaon's automotive components industry and global standards is still significant; to survive and grow, the industry must upgrade its capabilities. Upgrading both vendors to large industries and companies that cater to the replacement market, directly linking some of the more progressive units to domestic and export markets, and facilitating technology improvements are priorities.

An action plan for enhancing the competitiveness of the automotive components cluster should include the following:

- *Short-term projects.* The following soft activities should be part of the plan:
  - upgrading technology;
  - making financing more accessible to companies in the cluster;
  - promoting international marketing and branding;
  - managing and sharing knowledge and information; and
  - adopting ICT.
- *Long-term projects.* These hard interventions should also be included:
  - upgrading skills;
  - setting up an R&D center;
  - establishing a quality assurance and standardization center for the industry; and
  - establishing a subcontracting exchange.

7.6 Conclusions

The CNCR continues to be the country's leader in consumer market expansion. It is the largest market in India in size, socioeconomic profile, and steadily increasing quality of life. Thus, the region has an environment that will allow industrial clusters to take advantage of the positive spread effects of a CCED project. Moreover, the CNCR is ranked highest in India in almost all parameters, including prosperity, urban governance, business environment, and infrastructure. The region is developing at breathtaking speed, and the insatiable demand for urban infrastructure is outpacing supply.

Over time the CNCR has experienced major challenges with respect to sustainable development. It attracts a number of migrants, largely because of its better employment opportunities, better infrastructure and services, and, above all, better governance than elsewhere. Rapid and sustainable growth in the manufacturing and services sectors is needed to absorb this extra labor. To optimize growth and income generation, this study recommends a systematic investment and development plan for the three industrial clusters reviewed—the textile industry in Okhla, the light engineering industry in Faridabad, and the automotive components industry in Gurgaon.

To achieve the critical success factors for sustainable development in the CNCR, holistic support for the three clusters is necessary. According to the focus groups, strategies that would help with the implementation of the CCED project are a focus on an enabling environment, institutional and legal reforms, industry agglomeration and specialization, private sector participation, and inclusive development approaches that improve the living conditions of the poor and other disadvantaged groups. In addition to industry clusters staying abreast of the latest information in their fields, exhibition facilities and export facilities need to be significantly enhanced. Systematic capacity-building programs are urgently required, particularly for mSMEs.

Chapter 8
Cluster-Based City Economic Development in Sri Lanka

Sri Lanka[1] is one of the least populated countries in South Asia and its economy is one of the region's smallest. Yet GDP per capita is among the highest in the region ($4,825 purchasing power parity in 2008) and the country has shown its ability to compete very successfully in developing trade and attracting investment, despite the long civil unrest (World Bank 2009). Sri Lanka has enormous development potential: the population is generally well educated and natural resources abound. Thirty years of civil war and other setbacks, like the 2004 tsunami that devastated many coastal regions, hindered development. Now Sri Lanka is emerging as a newly industrializing country with a strong and well-developed manufacturing base and services sector.

Two powerful forces—globalization and structural reforms introduced by the government—are transforming the economy. FDI has increased; new industries have come up; and improvements are being made in government and business competitiveness, efficiency, and productivity, and in employment. Other reforms have sought to decentralize government, promote investment, and develop areas outside the Colombo Metropolitan Region (CMR).[2] Some of these policies have worked better than others because of the problems of recent years.

Globalization has cast Sri Lankan cities in an increasingly dominant role in national and local economic development. The CMR generates more than 48% of the country's GDP, and dominates the political and economic agenda. Other, smaller, cities have been disadvantaged as a result. Over the next 2 decades, if international trends are any guide, more than 80% of

[1] Under ADB's RETA 6337 (Subproject 7): City Cluster Economic Development, the CCED study applied its analytical methodology in the capital regions of Bangladesh (Dhaka), India (Delhi) and Sri Lanka (Colombo). This chapter summarizes the Sri Lanka case study (February 2010). Further details of the discussion in this chapter can be found in the report.

[2] Colombo, Gampaha, and Kalutara in the Western Province make up the Colombo Metropolitan Region (CMR). In 2006, the CMR had a population of 5,648,000.

Sri Lanka's GDP will come from the urban sector economies. The investment climate in other cities and areas must therefore improve to restore geographic balance in development. This means that all levels of government must work much more closely together on new strategies for making regional urban economies more competitive and attractive places for investment. The CMR will be a catalyst for economic decentralization of the country.

With the economy becoming more internationalized, industry agglomeration and specialization is likely to increase in Colombo and other urban centers. But companies will invest in locations where secure access to natural resources, good and reliable infrastructure and logistics, a strong enabling environment, and labor skills give them competitive advantage. Encouraging companies to agglomerate or cluster in cities offers them a way to minimize their transaction and development costs. It is also a response to the globalization of production and assembly systems and local competitiveness factors. Industry clusters are already forming in the CMR. The CCED project seeks to foster sustainable economic development in Sri Lankan cities to answer some of these challenges.

8.1 Urban Growth and Economic Development

In 2004, about 48% of the population of Sri Lanka, or just over 9 million people, lived in the urban areas (Indrasiri 2006). At that time Sri Lanka had about 300 urban centers occupying 5,008 km^2, or roughly 7.8% of the country's land area. Urban populations are growing at around 0.5% per year, a moderate rate in comparison with the growth in the rest of Asia. But with the peace settlement concluded with the Tamil Tiger rebels, urban trends could change quickly. Urban management practices have to improve greatly to avoid the problems associated with urbanization elsewhere in South Asia.

Many Sri Lankan cities host combinations of activities that are important in local and national economic development. Table 8.1 gives the broad economic functions of 51 cities. The majority of cities, including CMR, are located around the south-western region of Sri Lanka. At the northern tip of the country several cities are agglomerated around emerging town Jaffna, taking advantages of proximity to India.

8.1.1 Urban Planning and Economic Development

Sri Lanka's economic development policy integrates the positive attributes of a free-market economy with domestic aspirations for development. Since 2005, the country's GDP has grown by more than 6% per year (ADB 2009a).

Table 8.1 Population, Area, Population Density, and Economic Base of 51 Cities in Sri Lanka, 2004

City	Population Size	Area (hectare)	Density (people per hectare)	Economic Base
Colombo	642,163	4,020	160	Commercial, services, and tourism
Kadawatha	271,490	9,613	28	Services
Kandy	219,230	2,853	77	Administrative and tourism
Dehiwala Mt. Lavinia	209,787	2,163	97	Industry and tourism
Ja-Ela	185,562	7,920	23	Industry and tourism
Maharagama	180,112	2,213	81	Services
Moratuwa	177,190	1,990	89	Industry and tourism
Piliyandala	174,264	6,230	28	Industry and services
Battaramulla	166,157	2,139	78	Administrative
Panadura	162,979	5,450	30	Services and tourism
Wattala Mabole	161,644	4,620	35	Industry
Kolonnawa	160,417	3,213	50	Industry and services
Seeduwa Katunayaka	146,040	2,504	58	Industry
Negombo	144,551	4,878	30	Tourism, fisheries, and services
Peliyagoda	134,588	2,221	61	Industry
Homagama	133,887	1,814	74	Industry and agriculture
Kotte	115,826	1,673	69	Administrative
Beruwela	114,251	7,300	16	Fisheries and tourism
Kalutara	105,873	5,328	20	Administrative and education
Galle	104,015	6,560	16	Administrative, heritage, and tourism
Vavuniya	99,441	7,762	13	Commercial and services
Dodanduwa	98,012	2,795	35	Fisheries and tourism
Kalmunai	94,457	6,095	15	Agro-industry and services
Trincomalee	93,748	7,817	12	Administrative and tourism
Matara	84,533	2,908	29	Administrative, tourism, and commercial
Batticaloa	78,400	3,311	24	Administrative and fisheries
Eravur	76,670	6,291	12	Fisheries and tourism

continued on next page

Table 8.1 *Continued*

City	Population Size	Area (hectare)	Density (people per hectare)	Economic Base
Kilinochchi Paranthan	75,300	14,931	5	Services
Ratnapura	73,072	2,020	36	Administrative and trade
Veyangoda	71,701	3,733	19	Services and education
Ambalangoda	70,999	1,396	51	Education, tourism, and fisheries
Wennappuwa	70,555	4,093	17	Services and tourism
Gampaha	68,855	3,426	20	Administrative and education
Anuradhapura	66,357	6,698	10	Administrative, agriculture, and heritage
Balapitiya	65,335	1,233	53	Fisheries and tourism
Akurana	64,358	2713	24	Commercial
Digana Kundasale	63,828	1750	36	Agriculture and services
Weligama	62,042	2,917	21	Fisheries and tourism
Matale	61,861	3,463	18	Administrative and commercial services
Kurunegala	60,938	4,569	13	Administrative and commercial services
Ahangama	59,806	5,213	11	Fisheries and tourism
Gampola (Udapalatha)	59,707	3,006	20	Commercial
Puttalam	56,621	7,328	8	Fisheries and tourism
Kinniya	55,628	3,302	17	Services
Mawanella	54,916	4,753	12	Services
Chilaw	54,351	3,673	15	Tourism, fisheries, and services
Minuwangoda	52,746	3,450	15	Commercial and agriculture
Mutur	52,656	3,843	14	Fisheries and tourism
Tangalle	51,515	1,867	28	Fisheries and tourism
Samanturai	51,142	9,282	6	Agro-industry and services
Dickwella	50,952	1157	44	Fisheries and tourism
Total	**5,746,170**	**218,186**		

Source: Indrasiri (2006).

The policy tries to ensure a balanced and contemporary approach to national development that both supports domestic enterprises and encourages FDI. The aim is to lessen regional disparities in physical and social infrastructure. Those disparities persist because urbanization has been largely unplanned.

The government has announced a 10-year infrastructure program to promote investment, create jobs, and develop the economy (ADB 2009b). Ongoing projects include the coal-fired power plants in Norochcholai and Trincomalee, the expansion of the Colombo and Galle ports, new ports in Hambantota and Oluvil, and a new international airport in Weerawila. The Urban Development Authority also plans to develop Hambantota in the Southern Province, Trincomalee in the Eastern Province, and Dambulla in the Central Province into commercial and economic centers to reduce unemployment and poverty in those areas. In the once-prosperous Uva Wellassa region, now one of the country's most undeveloped and poverty-stricken areas, irrigation, to improve farmers' livelihoods, is a government priority.

8.1.2 Urban Economic Development Issues

To become more efficient and competitive, Sri Lankan cities must deal with a number of urban economic development issues. Some of these challenges are:

Classification of Urban Areas. Urbanization data and demographic changes in Sri Lanka have been erratic because urban areas have been classified, reclassified, and declassified since 1977. The definition of urban areas is unclear. The boundaries of urban areas have not been updated to reflect urban growth, resulting in considerable underestimation of actual urban trends. The administrative boundaries of local authorities have also not been defined in the last 35 years.

Linkages between Urban Physical Planning and Economic Development Planning. The government's economic liberalization policies, introduced in 1977, have encouraged FDI in industries, but have had only a small impact on urban development. The policy package of 1977 and subsequent supporting policy initiatives through 1987 did not address the role of the urban sector in development. In response to the changing social and economic conditions of the late 1980s, the government decided to devolve powers to the provinces and divisions. A micro-spatial approach to physical development has therefore been used to effect changes in the provinces. Economic and basic urban infrastructure and services, which require lumpy investments of capital, could not be delivered efficiently at the fragmented local level. In addition, physical plans prepared by the Urban Development Authority have not been fully implemented either because of a lack of funds from the central government or because of insufficient private sector participation.

Focus on Decentralization Rather Than on Broader Economic Development. Sri Lanka's economic policies have changed several times in the last 2–3 decades, with the focus shifting from agriculture to industrial development. With economic liberalization, successive governments have offered more incentives to export-oriented industries. State intervention has been minimized and an open trade policy has been allowed to dictate industrial development. FDI has had a vital role; in 2008, FDI amounted to $850 million. The current government has launched a new industrial development program to decentralize industry and spread the benefits of industrialization more evenly across the country. The goal is to establish 12 investment zones and transform 12 small townships close to these zones. To promote comparatively underdeveloped provinces, the Board of Investment in 2006 offered incentives to industries locating in backward areas. More than 316 industrial ventures were approved by the board and the Ministry of Industrial Development as a result. The decentralized industry spread the benefits of industrialization, diversifying and increasing economic activities in rural and underdeveloped areas.

High Informal Sector Employment. About 84% of the workforce in agriculture is employed in the informal sector, and the rest, in the formal sector on tea and rubber estates. Nearly half of the city population lives in underserved settlements and works in the informal sector. Many informal sector workers are engaged in various economic activities in the CMR. In Sri Lanka as a whole, more than 63% of the labor force is in the informal sector.

8.2 Competitiveness of Cities

The challenge for Sri Lanka lies in making its cities more attractive to investors and developers, decentralizing and sustaining economic development and growth, and taking the pressure off the rapid development in the CMR. The CMR will still be the country's main driver of economic development for many decades to come by continuing to generate much of the capital, human resources, technology, and advanced services needed for economic rebuilding after the lengthy hostilities and the tsunami. However, the CMR's economy, despite its obvious success, is underperforming and must improve its overall competitiveness and productivity. One of the main obstacles to meeting these challenges is the limited understanding in government and the private sector about how Sri Lankan cities can become more competitive.

To improve understanding of the competitiveness of cities, 14 cities, each with 50,000 to 1 million inhabitants, were surveyed and their competitiveness was assessed. The cities were Ampara, Anuradhapura, Colombo, Dambulla, Galle, Gampaha, Hambantota, Kalutara, Kandy, Kurunegala, Matara, Nuwara Eliya, Ratnapura, and Trincomalee.

Data on six primary drivers of economic development were collected: (i) the cost of doing business, (ii) the dynamics of the local economy, (iii) human resources and training, (iv) infrastructure, (v) government responsiveness to business needs, and (vi) quality of life. For each driver the study team collected data on a range of attributes of competitiveness. The assessment was primarily qualitative and was based on secondary information and interviews with informed experts, selected randomly. The team used a scoring system ranging from 0 to 10 to assess the relative competitiveness of each of the 34 attributes of competitiveness and to rank the attributes. Scores obtained from those interviewed were averaged for each attribute. A score of 10 was the strongest measure of competitiveness, indicating high international standing. Where possible, the qualitative assessment scores were evaluated against available data.

8.2.1 Assessing the Competitiveness and Economic Development of Cities

Table 8.2 summarizes the competitive strengths and weaknesses of the 14 selected cities. The most common issues were corruption and poor capacity of local government to govern. Poor infrastructure, understaffing,

Table 8.2 Competitive Strengths and Weaknesses of Cities in Sri Lanka

City		Competitive Strengths	Competitive Weaknesses
CMR	Colombo	• Already developed as a commercial city with adequate infrastructure facilities • Better business dynamism and HR skills with a higher quality of life	• Corruption, poor local government administration • Environmental pollution
	Gampaha	• Better than Colombo in some respects such as corruption • Access to banking facilities similar to Colombo's and human resources availability is quite strong • Adequate road infrastructure and environmental facilities	• Poor responsiveness of LGUs to business needs
	Kalutara	• Generally good in all aspects • Better access to rural banks • Strong availability of human resources	• Poor LGU administration
Galle		• Good business growth and dynamism • Strong human resources availability • Port should be developed to required commercial standard	• Poor LGU administration

continued on next page

Table 8.2 *Continued*

City	Competitive Strengths	Competitive Weaknesses
Dambulla	• Developed as an economic center • Less corruption • Good business growth and human resources availability	• LGU management needing improvement • Poor water services • Long distance from Colombo
Nuwara Eliya	• Local government unit appears quite efficient and acts responsibly • Local government ranked most responsive to business needs • City mayor appears to have very strong commitment	• Long distance from Colombo • Poor access to banks • Difficulties retaining skilled human resources
Ratnapura	• Average performance on almost all drivers • Availability of human resources	• Poor city administration
Ampara	• Comparatively good performance despite distance from the capital city • Businesses are developing and doing well in paddy cultivation • Good access to finance from rural banks	• Dearth of human resources • Very poor transport facilities and road network • Lack of infrastructure is a key issue
Kurunegala	• Good access to finance from rural banks	• Below-average performance on most of the key drivers • Poor HR and management skills
Matara	• Average performance on almost all drivers	• Poor business performance and HR
Anuradhapura	• Rich in archeological sites and well known as a tourist destination • Adequate human resources	• Poor local government administration; takes no interest in improving the city into a tourist destination • Lack of infrastructure
Hambantota	• Fast-developing city, with new infrastructure projects coming up • Adequate human resources • Good local government administration	• Distance from Colombo • Poor infrastructure
Trincomalee	• Has a natural harbor and is a well-known tourist destination • Could be easily developed as tourism or fisheries hub	• Extremely poor performance on all key drivers • Lack of infrastructure • Dearth of skills • Distance from Colombo
Kandy	• Well known as a World Heritage city • A tourist destination	• Traffic congestion • Corruption and poor local government administration • Below-average performance on almost all key drivers

CMR = Colombo Metropolitan Region, HR = human resources, LGU = local government unit.

Source: Study team.

and environmental pollution were the issues that were next most frequently mentioned. For some cities, distance from the capital city, Colombo, where businesses fared much better, was an issue. Cities in the Eastern, Southern, Northern, and Central provinces should therefore be developed more quickly to serve as economic growth centers for the provinces.

8.2.2 Ranking the Cities

Table 8.3 shows the competitive index scores computed for the selected 14 cities and the scores for the six key drivers. The study suggests that the cities vary greatly in competitiveness and that economic activity tends to concentrate where integration into the global economy is easiest, such as in the cities of Colombo and Gampaha.

Table 8.3 Competitiveness Index Scores, by City and by Competitiveness Driver, Sri Lanka

Key Driver of City Competitiveness / City, Sri Lanka	Cost of Doing Business	Dynamism of Local Economy	Human Resources and Training	Infrastructure	Responsiveness of Local Government Units to Business Needs	Quality of Life	Competitive Index Score	City Rank
Colombo	0.92	2.30	1.10	1.06	0.98	1.15	7.51	1
Gampaha	0.99	2.10	1.20	1.07	0.57	0.86	6.79	2
Kalutara	0.95	2.02	0.98	0.91	0.62	0.94	6.42	3
Galle	0.83	1.75	1.02	0.75	0.41	0.85	5.61	4
Dambulla	1.03	1.42	0.90	0.85	0.52	0.88	5.60	5
Nuwara Eliya	0.88	1.02	0.90	0.94	1.00	0.84	5.58	6
Ratnapura	0.84	1.23	1.04	0.91	0.61	0.92	5.55	7
Ampara	0.87	1.70	0.72	0.65	0.70	0.80	5.44	8
Kurunegala	0.66	1.80	0.78	0.87	0.45	0.76	5.32	9
Matara	0.88	1.15	0.86	0.86	0.67	0.87	5.29	10
Anuradhapura	0.81	1.20	1.02	0.84	0.39	0.98	5.24	11
Hambantota	0.93	1.55	0.94	0.74	0.40	0.65	5.21	12
Trincomalee	0.92	0.90	0.70	0.74	0.24	0.58	4.08	13
Kandy	0.65	1.38	0.84	0.88	0.32	0.89	4.96	14
Driver Score	**0.87**	**1.54**	**0.93**	**0.86**	**0.56**	**0.86**	**5.61**	
Maximum Score	**1.50**	**2.50**	**1.50**	**1.50**	**1.50**	**1.50**	**10.00**	

Source: Study team.

The cities in the Western Province—Colombo, Gampaha, and Kalutara—were the highest ranked, indicating that these cities are more attractive to investors than the cities in the Eastern and Southern provinces. The study also revealed that even the best-performing cities are deficient in some aspects of competitiveness; for example, corruption is high and local government administration poor, and pollution is rife. Inadequate road networks, water supply facilities, and other infrastructure are major impediments to the competitiveness of most Sri Lankan cities. Competitiveness scores for the 11 cities outside the Western Province (i.e., the CMR) are lower than the 5.61 average for the 14 cities. This implies that the engines of economic growth in Sri Lanka are dominated by the CMR, and that increasing the competitiveness of other provincial cities will lead to balanced and more inclusive national economic development.

8.2.3 Competitiveness of the Colombo Metropolitan Region

The CMR is linked with other regions by road and railway networks. While the CMR holds many nationally important functions, many aspects of its economy need to be addressed to make it more competitive. Given the importance of improving the competitiveness of the CMR to national and regional development, the contribution of various industries to the CMR's economy must be understood.

The three administrative districts of the CMR—Colombo, Gampaha, and Kalutara—are made up of 34 urban centers. The land is used mainly for agriculture, but these centers form a contiguous urban belt stretched over 180 kilometers along the west coast, as well as clustering around the city of Colombo. The agricultural land scattered in between these urban centers is gradually being converted into residential and mixed-use areas. In 2008, the CMR accounted for over 48% of the country's GDP and average annual per capital income was $2,022 (ADB 2009a). The major industrial locations in the CMR are Avissawella, Biyagama, Katunayake, Ingiriya, Malwatte, Mirigama, Panadura, Peliyagoda, and Wathupitiwala.

The CMR has a population of 5.2 million people. The high population concentration in the CMR results in a relatively high population density of 1,456 people per km^2, compared with a national average of 342 people per km^2. Population density within the CMR varies significantly from 165 people per km^2 to 12,673 in the center of Colombo city. The following are the key emerging issues related to the unplanned urbanization of the CMR:

- continuous migration from rural to urban areas in expectation of a better quality of life;
- income disparities;

- deteriorating quality of the environment as a result of the pollution of water bodies, the increased frequency and intensity of flooding, ad hoc waste disposal, and the like;
- inadequate conservation of natural resources, resulting in depletion and land-use conflicts;
- rapid increase of the informal sector and of underserved settlements, creating social problems;
- employment structure inappropriate for, and insufficiently responsive to globalization;
- inadequate sanitation facilities, transport, and housing;
- weak governance, including poor law enforcement and management of infrastructure facilities;
- increasing land values, giving rise to such issues as a backlog of housing needs;
- lack of overall infrastructure facilities for rapid urbanization;
- lack of political commitment to significant change and to the implementation of physical plans;
- high concentration of industrial activities; and
- dispersed urban centers without proper integration of transport and land use.

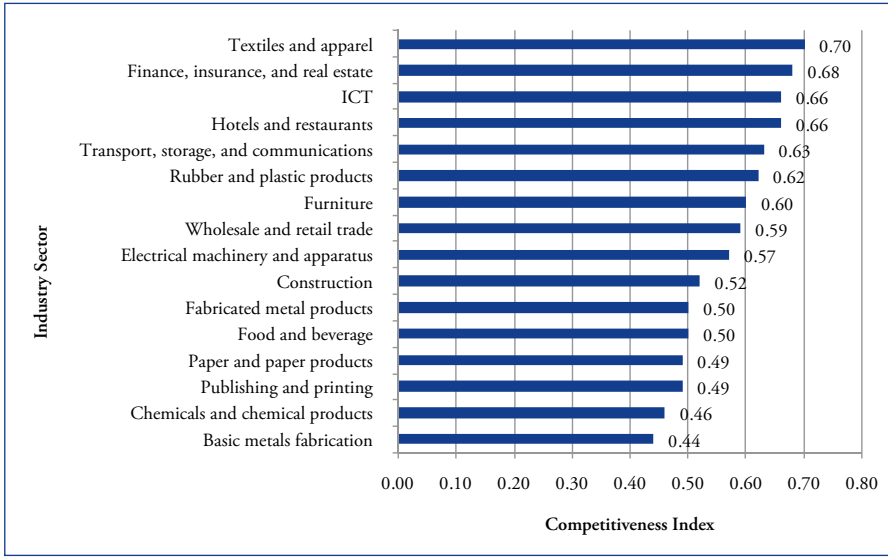
8.3 National and Local Multi-Sector Industry Analysis of the Colombo Metropolitan Region

The MSIA was done to (i) assess the structural changes that had occurred in the CMR's economy over the last decade and thereby identify the key industries driving the CMR economy, and (ii) investigate the competitiveness ranking of sector industries in the CMR with a view to identifying the industry strengths and weaknesses relative to the different competitiveness indicators.

8.3.1 Multi-Sector Industry Analysis of the Colombo Metropolitan Region

The MSIA covered the CMR's economy, composed of 25 competitiveness indicators for 16 selected industry sectors. The study team used a qualitative scaled assessment system when scoring the competitiveness attributes for each industry sector. The team developed two sets of score sheets—one

Figure 8.1 Multi-Sector Industry Analysis: Scores of Competitiveness Indicators by Industry Sector, Colombo Metropolitan Region



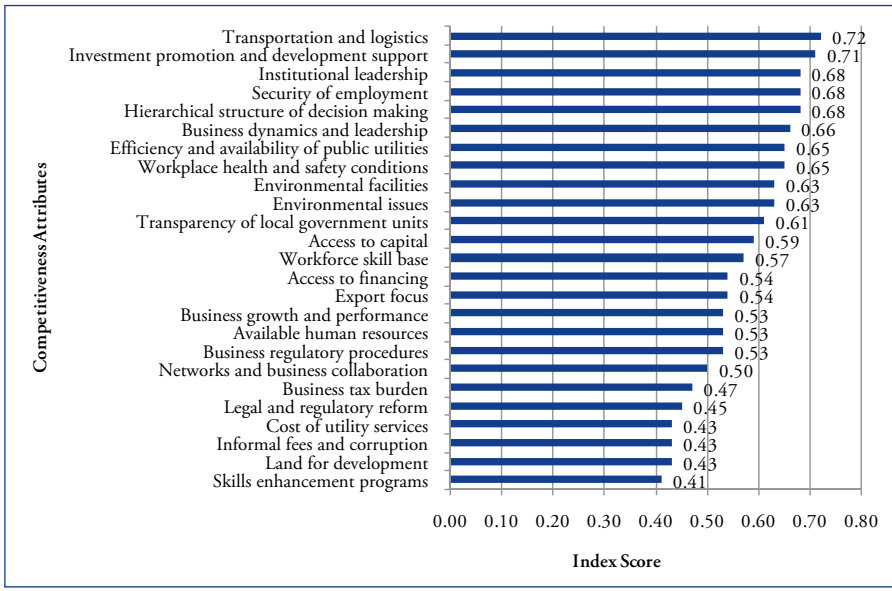
Source: Study team.

with the raw scores, showing the weights, and a second score sheet with a weighted score matrix, identifying the strongest and weakest attributes Possible scores on the index ranged from 0 to 1, with 1 being the highest level of competitiveness.

Figure 8.1 shows the 16 industry sectors according to degree of competitiveness. The most competitive industry sectors in the CMR, with index values of more than 0.60, are textiles and apparel (0.70); finance, insurance, and real estate (0.68); ICT and IT-enabled services (0.66); hotels and restaurants (0.66); transport, storage, and communications (0.63); and rubber and plastic products (0.62).

Figure 8.2 shows the relative strengths of the 25 competitiveness indicators. Among the most competitive indicators in the CMR, with index values of more than 0.65, are transportation and logistics (0.72), investment promotion and development support (0.71), security of employment (0.68), institutional leadership (0.68), business dynamics and leadership (0.66), efficiency and availability of public utilities (0.65), and workplace health and safety conditions (0.65). Among the least competitive attributes, with index values equal to or less than 0.53, are available human resources (0.53), business regulation procedures (0.53), business tax burden (0.47), legislation and regulation reforms (0.45), cost of utility services (0.43), informal fees

Figure 8.2 Multi-Sector Industry Analysis: Strength of Competitiveness Indicators for All Industry Sectors, Colombo Metropolitan Region



Source: Study team.

and corruption (0.43), land for development (0.43), and skills enhancement programs (0.41). These are major weaknesses that warrant attention. Policy reform initiatives are needed to improve these rankings and make the CMR's economy more competitive.

8.3.2 Location Quotient and Shift-Share Analyses of Industry Clusters in the Colombo Metropolitan Region

The spatial and sectoral concentration of companies and employment in the CMR was analyzed to derive an indication of the economic competitiveness of industry. The analysis brought out important structural changes that had occurred in the CMR's economy over the last decade and thereby identified the key drivers of the CMR economy. The analysis of the growth patterns of sector industry used three tools; (i) location quotient (LQ) analysis, (ii) shift-share analysis, and (iii) estimates of sector GDP. Each tool revealed different aspects of the performance of the industries analyzed and provided some basis for industry cluster evaluation.

The study examined how the industry profiles had changed over a decade, by comparing the years 1997 and 2006, and the CMR with Sri Lanka

as a whole. The study showed, for example, that total employment in the country had increased from 5.6 million to 7.1 million (27% increase), while employment in the CMR had increased from 1.7 million to 2.3 million (35% increase).

LQ analysis was also used to measure the concentration of an industry in the CMR compared with its concentration in the national economy. The proportion of local employment, by SIC type, was compared with total employment by the same type in the national economy. In 2006, the concentration of employment in several industry sectors in the CMR was higher than the national average. Export industries with high LQs (above 1.5) and high employment (above 17,000) included textiles and apparel; financial, insurance, and real estate services; chemicals and chemical products; base metals; and publishing and printing. Table 8.4 shows the total employment and the LQ for each industry sector in the CMR in 1997 and 2006.

Table 8.4 Employment and Location Quotient, by Industry Sector, Colombo Metropolitan Region, 1997 and 2006

Sector	1997		2006		Change in Employment, 1997–2006
	Number of Employees	LQ	Number of Employees	LQ	
Agriculture, forestry, and fisheries	183,230	0.29	184,603	0.25	–0.04
Food and beverages	36,889	0.57	65,006	0.58	–0.01
Tobacco products	1,941	1.15	3,306	1.38	+0.23
Textiles and apparel	278,555	2.20	282,881	1.77	–0.43
Leather tanning and dressing, luggage, and handbags	5,232	1.71	9,197	2.25	+0.54
Wood and wood products and cork except furniture	4,964	0.99	11,036	1.14	+0.15
Paper and paper products	9,117	2.52	14,720	3.04	+0.52
Publishing, printing, and reproduction of recorded media	11,144	1.91	26,107	2.81	+0.90
Coke-refined petroleum products and nuclear fuel	1,000	2.70	1,846	3.09	+0.39
Chemicals and chemical products	23,990	1.79	36,454	2.16	+0.37
Rubber and plastic products	18,306	1.26	29,116	1.68	+0.42
Nonmetallic mineral products	21,510	1.13	35,539	1.27	+0.14
Basic metals	17,446	2.77	24,452	2.92	+0.15

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Table 8.4 *Continued*

Sector	1997		2006		Change in Employment, 1997–2006
	Number of Employees	LQ	Number of Employees	LQ	
Fabricated metal products except machinery and equipment	7,476	2.04	11,101	2.31	+0.27
Machinery and equipment	1,000	1.16	1,600	0.78	–0.38
Office, accounting, and computing machinery	785	2.05	1,255	1.21	–0.83
Electrical machinery and apparatus	8,270	2.84	13,231	3.03	+0.19
Radio, television, and communication equipment and apparatus	404	2.08	647	1.63	–0.45
Medical, precision, and optical instruments and watches	1,354	1.94	2,166	1.81	–0.13
Motor vehicles and (semi) trailers	453	0.44	797	0.66	+0.22
Transportation-related components engineering	386	2.31	675	3.04	+0.73
Furniture	7,446	1.29	30,170	1.45	+0.16
Construction	135,338	1.40	156,457	1.21	–0.19
Mining and quarrying	23,510	0.83	676	0.02	–0.81
Electricity, gas, and water supply	17,501	1.82	4,261	0.51	–1.31
Wholesale and retail trade	244,896	1.29	437,603	1.44	+0.15
Hotels and restaurants	35,900	1.39	55,416	1.35	–0.04
Transport, storage, and communications (excluding ICT)	125,899	1.53	177,980	1.40	–0.13
ICT-enabled services	2,500	2.69	27,934	2.83	+0.14
Financial, insurance, and real estate services	63,228	2.16	143,193	2.03	–0.13
Public administration, defense and social security	151,208	1.26	158,117	1.24	–0.02
Education	86,848	1.03	90,202	1.02	–0.01
Heath and social work	65,136	1.55	53,186	1.52	–0.03
Other community, social, and personal service activities	50,403	1.68	65,072	1.65	–0.03
Unclassified	31,796	0.53	55,825	0.87	+0.34

ICT = information and communication technology, LQ = location quotient.

Source: Various surveys and data from the Department of Census and Statistics, Sri Lanka.

Figure 8.3 plots the change in industry concentration from 1997 to 2006 (x-axis) against industry concentration in 1997 (y-axis). The size of the bubbles indicates the size of employment in the various industry sectors in the CMR. The LQ bubble graph clearly separates industry sectors into four quadrants.

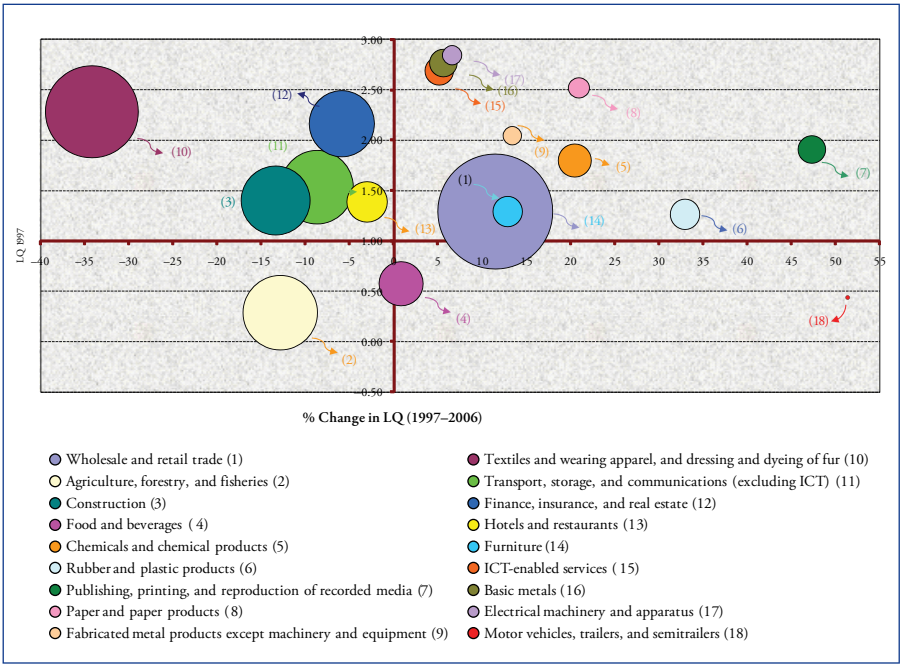
The industries in the upper-right quadrant are standouts in the CMR's economy that have been growing significantly over time (x-axis values are on the positive side), and those with a higher concentration in the CMR than at the national level (y-axis values above 1.0). Ten industrial sectors are in this quadrant, which is dominated by the wholesale and retail trade, chemicals and chemical products, rubber and plastic products, publishing and printing, ICT and ICT-enabled services, basic metals, and furniture industries. Industries represented by large bubbles in this quadrant have a high concentration of employment relative to total employment in the CMR; this means that those industries will have a major influence on workforce demand. Industries represented by small bubbles, such as ICT, where the concentration of employment is small relative to the CMR total, are emerging industries with high potential that need support for further development.

The lower-right quadrant contains industries that are not as concentrated in the CMR as they are at the national level (negative y-axis values), but are expected to become more concentrated over time (positive x-axis values), for example, food and beverages, and motor vehicles, trailers, and semitrailers (see Table 8.4). These industries could be viewed as preemergent, with the potential to contribute more to the CMR's economic base.

The upper-left quadrant contains industries that are more concentrated in the CMR than at the national level (y-axis values on the positive side), but whose concentration is declining (negative x-axis values), for example, textiles and apparel and finance, insurance, and real estate. The contraction of these industries is an important warning indicator that the CMR is losing part of its export base and should develop planning and investment development strategies to keep these industries from contracting further. If the CMR does not bolster these industries or replace them with other export industries, it could experience difficulties absorbing labor from the declining industries in the future.

Industries in the lower-left quadrant are less important in the CMR than they are nationally and are also declining, for example, agriculture, forestry, and fisheries. This serves as a warning that the CMR needs to attract more businesses in such industries to maintain an economy that is sufficiently balanced and diversified in comparison with the national economy.

Figure 8.3 Change in Employment Concentration and in Location Quotient, by Selected Key Industry Sector, Colombo Metropolitan Region, 1997



ICT = information and communication technology.

Note: Selected industries only, using data from Table 8.4.

Source: Study team.

8.3.3 Identification of Key Industry Sectors

The various analyses helped identify the most competitive industries, that is, those that have the most potential to support export development (both domestically and internationally), employment generation, and the overall economic development of the CMR. The factors considered in the identification of competitive industry sectors were employment (size, growth, and concentration); number of companies; spatial concentration of companies; contribution of the sector to GDP; ability to compete and cooperate; product homogeneity and sustainability; and promotion potential.

The findings indicate that the CMR could focus on becoming a knowledge (ICT and ICT-enabled), logistics (shipping and aviation), tourism (travel and leisure), financial (banking and insurance), textiles and apparel (RMGs), or rubber industry hub (rubber products). The choice of industry for further development is not necessarily limited to those with growth

potential. The textiles and apparel cluster generates a significant proportion of employment, and for the government to let the industry collapse is simply not justified. Therefore, declining industries like the textiles and apparel industry in the CMR require substantial support, from an economic policy perspective.

Table 8.5 summarizes the criteria used in selecting the industry sectors in the CMR with the greatest potential. The tools discussed in Chapters 4 and 5, and information about GDP share, made it possible to identify the key industry sectors that operate as a cluster (concentrated) using one or more of the following criteria:

- LQ greater than 1.25, indicating that the concentration of the industry in the CMR is higher than the national average;
- growth in concentration (positive growth in LQ in the last decade, as indicated in Figure 8.4), indicating that particular industries are gaining or at least sustaining competitive advantage;
- relatively larger contribution to GDP than other industries;
- growth in share of GDP;
- high competitiveness of industry sector (index score of more than 0.60, derived from multi-sector analysis);
- high employment; and
- other contributory factors, such as a country's natural beauty and tourism sector.

The following sectors with an LQ greater than 1.5 and an MSIA index score above 6.5 can be regarded as the key drivers for the economic development of the CMR: finance, insurance, and real estate; transport (mainly shipping, aviation, and logistics), storage, and communications; hotel and restaurant; ICT and ICT-enabled services; textiles and apparel; and rubber and plastic products.

As the cluster development process is a constant effort with public and private sector as partner, the CCED approach has built-in consultation procedures for the selection of the final list of industry sectors to be further developed. The procedures assume the following: (i) positive government views and policy support for a selected industry sector, and (ii) willingness and commitment of industry sector leaders or representatives to pursue further development.

Table 8.5 Criteria Used in Selecting Key Industry Sectors, Colombo Metropolitan Region

Industry Sector	LQ in 2006[a]	Trends in Local Representation of Industry Sector, 1997–2006b			Net Job Growth,[a] 1997–2006	Share of GDP, 2006 (%)	Growth in Share of GDP, 1997–2006 (%)	No. of Employees in 2006[a]	Industry Competitiveness (MSIA): Index Score[c]
		Gain (%)	Neutral (%)	Loss (%)					
Wholesale and retail	1.4	11			192,707	13.7	77	437,603 (19%)	0.59
Construction	1.2			13	21,119	2.0	–42	156,457 (7%)	0.52
Rubber and plastic products	1.7	33			10,810	0.5	–26	29,116 (1%)	0.62
Finance, insurance, and real estate	2.0			–6	79,965	5.0	316	143,193 (6%)	0.68
Hotels and restaurants	1.4		–3		19,516	0.2	–80	55,416 (2%)	0.66
Transport, storage, and communications	1.4			–9	52,081	7.4	121	177,980 (8%)	0.63
ICT and ICT-enabled services	2.8	5			25,534	0.2	509	27,934 (1%)	0.66
Education	…		–1		3,354	1.2	–66	90,202 (4%)	…
Textiles and apparel	1.8			–29	4,326	5.7	30	282,881 (13%)	0.70
Other sectors	…	…	…	…	115,698 (22%)	…	…	862,586 (39%)	…
Total in CMR					**525,110 (100%)**	**51.0**	**12.6**	**2,263,368 (100%)**	**…**

… = data not available, CMR = Colombo Metropolitan Region, ICT = information and communication technology, MSIA = multi-sector industry analysis.

[a] See LQ values, 2006, Table 8.4.

[b] [(LQ value 2006 – LQ value 1997) / LQ value 1997] x 100

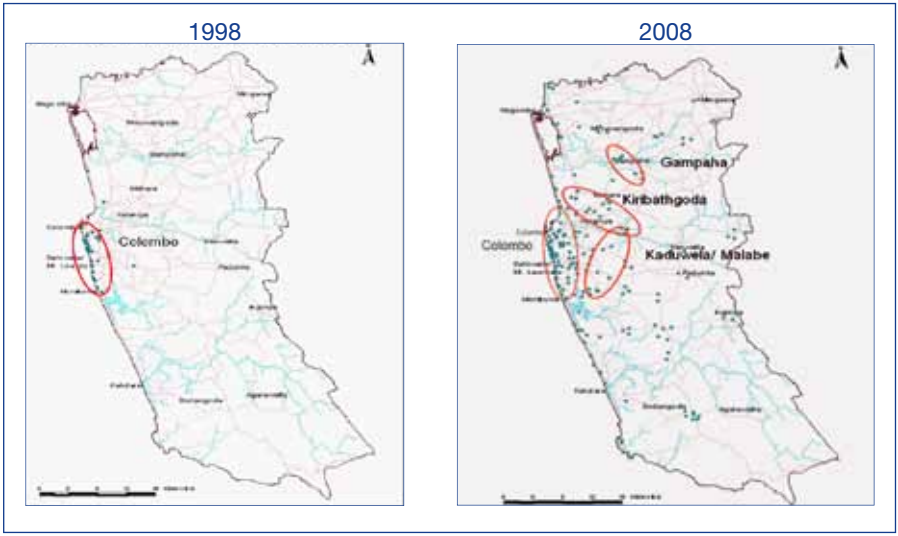
[c] See Figure 8.3.

Source: Study team.

8.4 Geographic Mapping of Three Industry Clusters in the Colombo Metropolitan Region

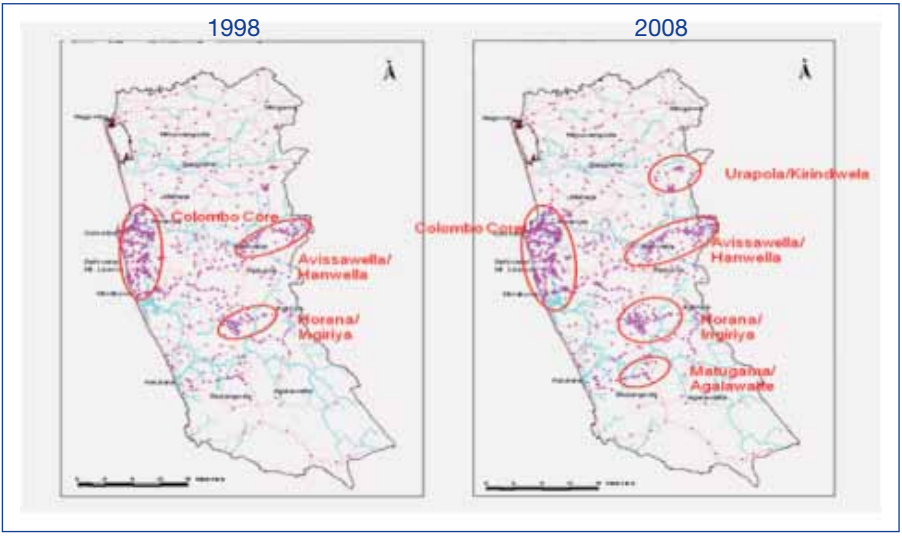
Before exploring the three industry clusters, it is equally important to appreciate the geographic concentration of companies in the selected industries. The location of the selected industry sectors and their degree of geographic concentration are essential information in deciding where and what infrastructure support the government should provide.

Figure 8.4 Changes in Industry Concentration and Locations in the Colombo Metropolitan Region: Information and Communication Technology Industry Cluster



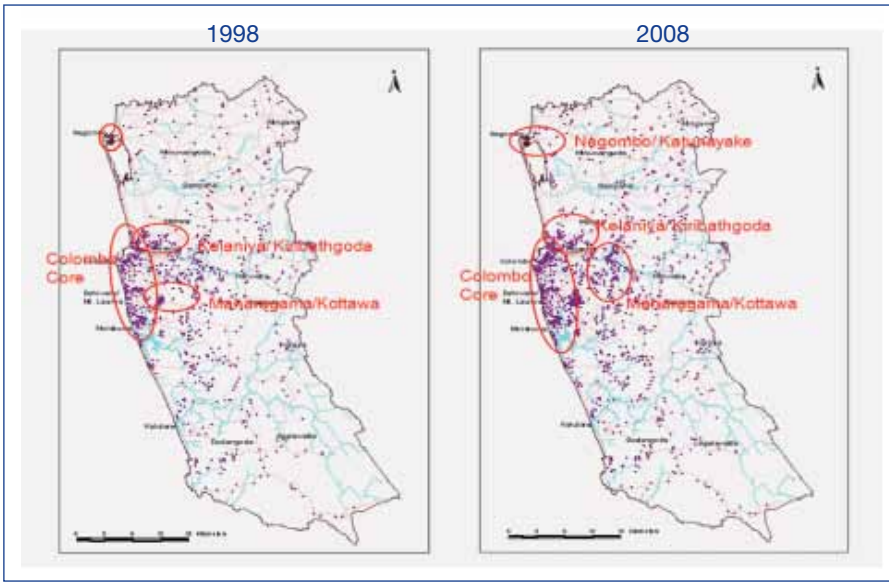
Source: Study team.

Figure 8.5 Changes in Industry Concentration and Locations in the Colombo Metropolitan Region: Rubber and Plastic Industry Cluster



Source: Study team.

Figure 8.6 Changes in Industry Concentration and Locations in the Colombo Metropolitan Region: Textiles and Apparel Industry Cluster



Source: Study team.

In Sri Lanka, the geographic information system (GIS) is also used in plotting the location of industries. For cost-effective delivery of infrastructure services to enhance competitiveness, industry clusters must agglomerate geographically. To understand the concentration pattern of industry agglomeration within the CMR, various data were collected from many sources, such as detailed land-use maps prepared by the Urban Development Authority, statistical information compiled by the Board of Investment of Sri Lanka, information prepared by the Ministry of Industries, and business directories. Figures 8.4–8.6 show the changes in the spatial locations of three industries in 1998–2008. ICT and ICT-enabled industry has shown clustering patterns around the city of Colombo. Although the LQ analysis indicated that the textiles and apparel industry has been in decline, the industry's high concentration in the CMR is evident because of the sheer numbers employed.

8.5 Analysis of Three Industry Clusters in the Colombo Metropolitan Region

Both qualitative and quantitative analyses were used to explore in detail the nature of the industry supply chains within each cluster, the economic importance of the selected clusters, the governance structure, and the competitive strengths and weaknesses of the industry clusters.

The study team held a series of discussions with key stakeholders from each selected cluster to better understand (i) the forward–backward linkages of the industry sector, (ii) the structure of the core industries (key producers and exporters) that make up the cluster, and (ii) the structure of supporting industries along the supply chains (forward and backward linkage industries). Each selected industry cluster was analyzed for competitiveness and participatory action plans were prepared by using the five conditions and the associated 39 elements of Porter's diamond model.

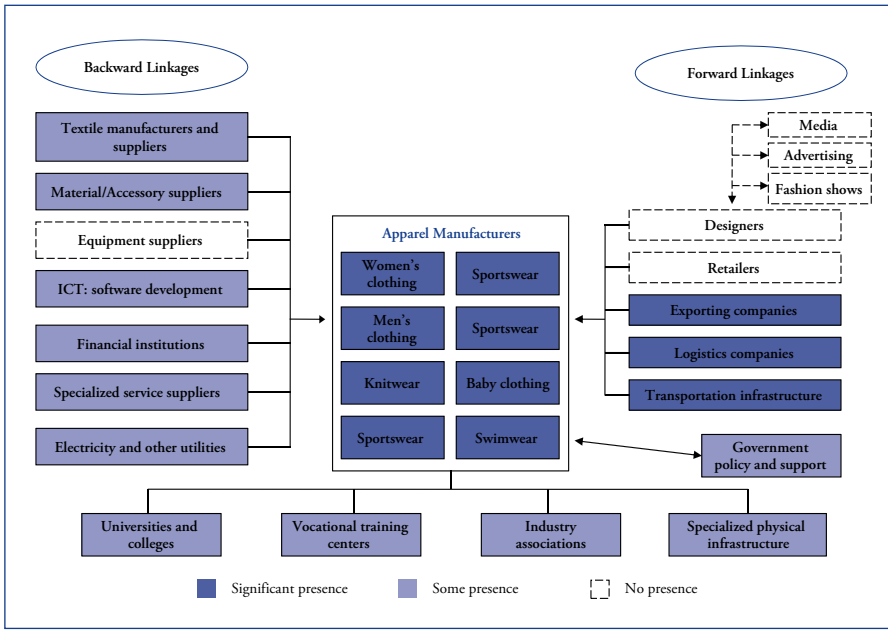
The strength of each element was assessed on a scale of 0–5. A score of 4–5 indicates that the competitiveness of an element is high and suggests a strong globally competitive position for the cluster. The difference between current conditions and future competitiveness requirements gives some indication of deficiency gaps in competitiveness factors.

8.6 The Textiles and Apparel Industry Cluster

The CMR has a world-class apparel manufacturing base exporting mainly to the European Union and the United States. In 2007 the textiles and apparel industry in the country (i) was Sri Lanka's largest earner of foreign exchange, earning $3.2 billion, 46% of the country's export earnings; (ii) directly employed more than 300,000 people (33% of manufacturing sector employment) and indirectly employed more than 1 million; (iii) had realized investment of more than $700 million (as of the end of 2007), $280 million of which was in enterprises within the CMR; and (iv) accounted for around 5.7% of national GDP.

Manufacturing units engaged in core industries have a significant presence in the CMR's apparel cluster. They are backed by a proactive industry association, the Joint Apparel Association Forum, which represents all key stakeholders. The cluster also has a good network of transportation infrastructure supported by export and logistics companies. Other associated industries producing textiles and apparel accessories such as buttons, elastic, labels, and packaging materials are clustered in the CMR. But design and retail marketing have only a limited presence. The core of the cluster has more than 500 apparel manufacturers producing a variety of products; however, the highest-value-added components, including equipment suppliers, designers, and retailers, are largely absent. Figure 8.7 presents the forward–backward linkages in the supply value chain of the CMR textiles and apparel cluster.

Figure 8.7 Structural Map of the Textiles and Apparel Industry Cluster, Colombo Metropolitan Region



ICT = information and communication technology and information and communication technology–enabled industry.

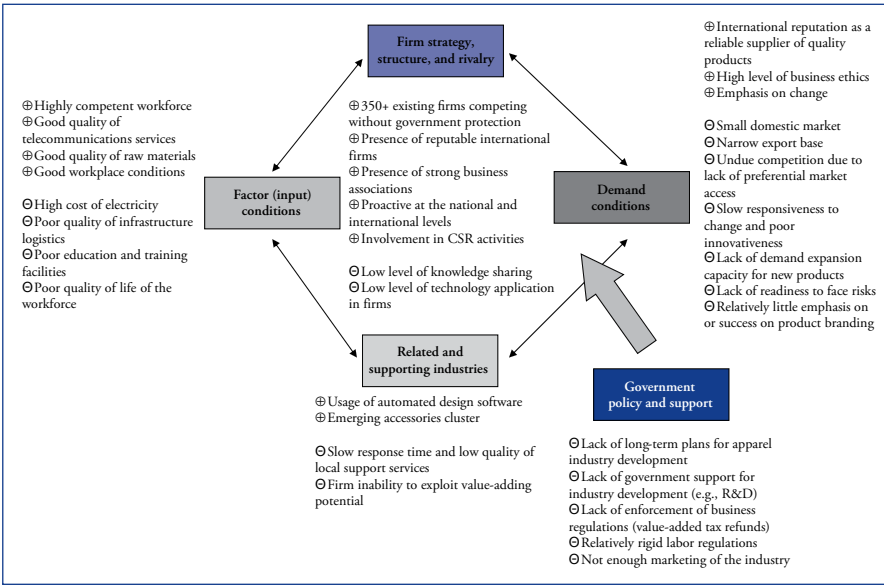
Source: Study team.

8.6.1 Competitiveness of the Textiles and Apparel Industry Cluster, Colombo Metropolitan Region

Figure 8.8 shows the analysis of the competitiveness conditions in the textiles and apparel industry cluster in the CMR using the Porter diamond model.

The apparel manufacturers require input from the textile manufacturers, an extremely small group in Sri Lanka, and from other suppliers of trims, buttons, and other accessories, which have some presence in Sri Lanka. The emerging ICT cluster enables improved supply chain management, and local financial institutions provide credit. The sophisticated equipment necessary for producing garments is imported mostly from Germany and Italy. A few exporting and logistics companies support the manufacturers along with transportation and utility companies and other supporting infrastructure. Universities and vocational schools with design and production curricula are available, but Sri Lanka has few designers and retailers as foreign retailers design most products and more than 85% of output is exported. As a result, the cluster has little involvement in media and advertising,

Figure 8.8 Analysis of the Five Conditions of Competitiveness of the Textiles and Apparel Industry Cluster, Colombo Metropolitan Region



CSR = corporate social responsibility, R&D = research and development.

Source: Study team.

including fashion shows. This has a significant negative impact on the cluster's ability to move toward higher-value-added activities.

Table 8.6 gives details of the competitiveness conditions and 39 elements in the textile and apparel industry cluster using Porter's diamond model analysis. The cluster is positioned in the right market (high-end products) but in the wrong activities (low-value-adding activities such as cut-and-make). Thus, it participates in only 10% of the value chain. The challenge is to shift into high-value-adding activities such as design (20%) and marketing and sales (50%).

Cluster strengths include a trained workforce, good supporting clusters, and preferential access to the European Union market. Weaknesses include the low amount of branding and marketing. Significant entrepreneurial activity is apparent in this small but rapidly growing sector, but strengthening the whole cluster's entrepreneurial direction will require greater coordination between educational institutions, companies, and the government.

The analysis of the CMR's textiles and apparel industry cluster shows an industry in decline and now at a critical stage unless the producers focus on innovation, quality improvement, and value addition (Figure 8.3 and Table 8.6).

Table 8.6 Competitiveness Analysis of the Textiles and Apparel Industry Cluster, Colombo Metropolitan Region, Using the Porter Diamond Model Framework

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FACTOR CONDITIONS	**3.02**	**4.71**		**–1.69**
Labor	3.05	4.90		–1.85
Availability of skilled labor	3.20	4.80	–1.60	
Management skills	3.20	5.00	–1.80	
Efficiency and productivity of labor	3.00	4.80	–1.80	
Education and training facilities	2.80	5.00	–2.20	
Infrastructure	3.20	4.65		–1.45
Quality of infrastructure services (logistics)	2.80	4.80	–2.00	
Quality of infrastructure services (utilities)	3.00	4.40	–1.40	
Cost of services	3.20	4.80	–1.60	
Quality of telecommunications services	3.80	4.60	–0.80	
Endowed resources	2.67	4.60		–1.93
Proximity to raw materials	2.20	4.20	–2.00	
Cost of local raw materials vis-à-vis imports	2.40	5.00	–2.60	
Quality of raw materials	3.40	4.60	–1.20	
Social Environment	2.97	4.50		–1.52
Quality of life of workforce	2.40	4.40	–2.00	
Workplace conditions	3.80	4.80	–1.00	
DEMAND CONDITIONS	**2.71**	**4.29**		**–1.57**
Markets	1.80	3.80		–2.00
Expanding domestic and local markets	1.40	3.20	–1.80	
Expanding export markets	2.20	4.40	–2.20	
New Products	2.40	4.30		–1.90
Demand expansion capacity for new products	2.00	3.80	–1.80	
Responsiveness to change and innovativeness	2.80	4.80	–2.00	
Business Environment	3.53	4.60		–1.07
Quality and reliability of product or service	3.60	4.80	–1.20	
Product sustains awareness and support	3.20	4.40	–1.20	
Strong business ethics	3.80	4.60	–0.80	
Readiness to face risk	2.60	4.60	–2.00	

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Table 8.6 *Continued*

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FIRM STRATEGY, STRUCTURE, AND RIVALRY	**3.00**	**4.58**		**–1.58**
Structure	2.70	4.10		–1.40
Presence of foreign and joint-venture companies	2.80	3.80	–1.00	
Flexibility of production systems	2.60	4.40	–1.80	
Collaboration	3.16	4.68		–1.52
Strong industry–firm collaboration	2.80	4.20	–1.40	
Shared development of industry knowledge capital	2.40	5.00	–2.60	
Strong social capital and business networks	3.60	5.00	–1.40	
National or international leadership	3.40	4.80	–1.40	
Civic entrepreneurship and community engagement	3.60	4.40	–0.80	
Technology Orientation	2.80	5.00		–2.20
High level of technology application in firms	2.80	5.00	–2.20	
RELATED SUPPORTING INDUSTRIES	**2.60**	**4.92**		**–2.32**
Supply Chains	2.60	4.93		–2.33
Strength of local business support services	1.8	4.8	–3.00	
Responsiveness of local support services	2.8	5	–2.20	
Quality of local support services	3.2	5	–1.80	
Value Addition	2.60	4.90		–2.30
Potential to add value to supply chains	2.8	5	–2.20	
Business awareness of value-adding potential	2.4	4.8	–2.40	
GOVERNMENT SUPPORT	**1.72**	**4.64**		**–2.92**
Government support for cluster development	2.2	5	–2.80	
Streamlined business approval systems	1.4	4.4	–3.00	
Support for sustainable industry development	1.8	4.6	–2.80	
Enforcement of business regulations	2	4.8	–2.80	
Support for research and development	1.2	4.4	–3.20	
Average for All Indicators	**2.75**	**4.53**		**–1.77**

Source: Study team.

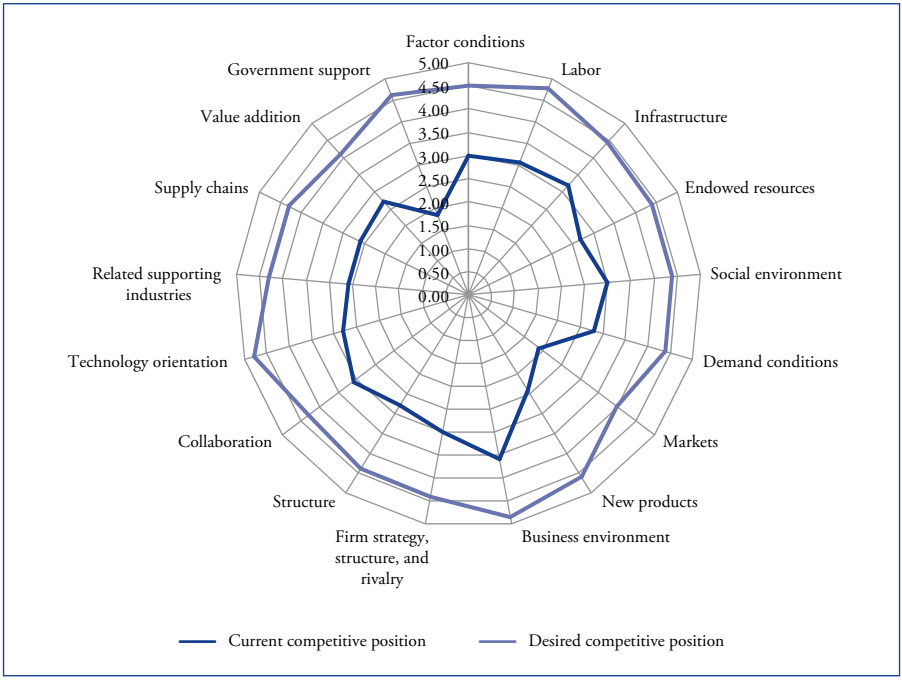
Weaknesses in any of the five conditions in the diamond model (Figure 8.8) can erode the cluster's competitiveness. The deficiencies are (i) undue competition because of insufficient access to preferential markets (demand conditions); (ii) the high cost and poor status of infrastructure logistics (factor conditions); (iii) the low level of technology application (firm structure, strategy, and rivalry); and (iv) the low level of local value addition (related and supporting industries).

8.6.2 Deficiency Gap Analysis

The radar chart in Figure 8.9 summarizes the deficiency gap conditions in the textiles and apparel industry cluster in the CMR, covering the 39 elements under the 13 key domains that make up the five conditions in the Porter diamond model.

The overall deficiency gap for the cluster is –1.77, suggesting a need to improve by around 50% the overall competitiveness of the cluster in relation to the five competitiveness conditions and the 13 key domains. The cluster is now at a critical point where it could lose global competitiveness unless the producers direct their efforts at innovation, quality improvement,

Figure 8.9 Deficiency Gap Conditions in the Textiles and Apparel Industry Cluster, Colombo Metropolitan Region



Source: Study team.

and value addition. The deficiencies are most apparent in drivers related to the development of new markets and products, and also in government support for the development of the cluster. Business approval systems must be streamlined.

8.6.3 Priority Actions

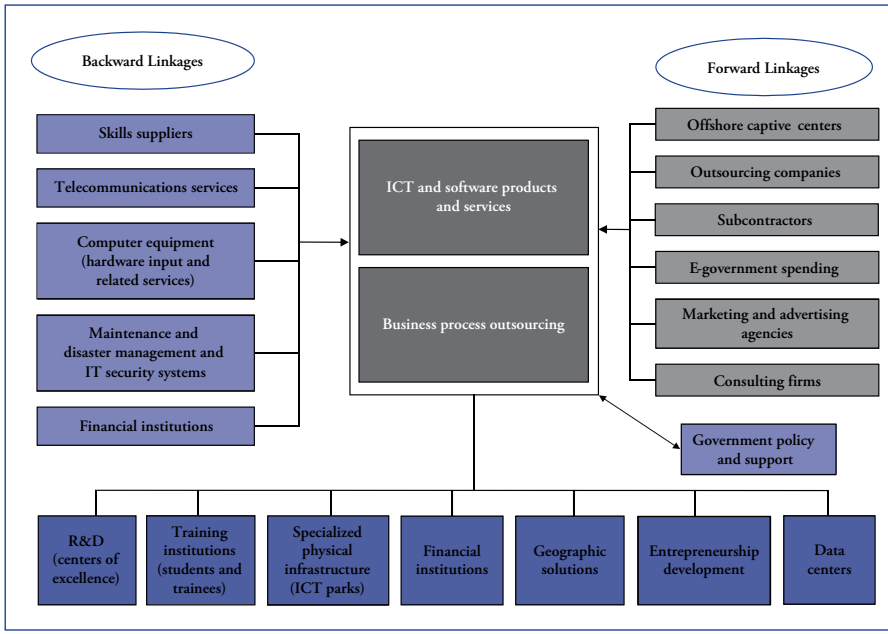
The competitiveness and deficiency gap analyses led to the identification of important interventions that must be carried out to promote the development of the cluster. These initiatives are as follows:

- *Improve the business environment.* The government should act immediately to ease the costs of doing business. This is an area in which progress can be achieved more easily, as significant improvements do not require a long period of time; however, political will is necessary.
- *Improve infrastructure.* Significant progress can be made by reducing electricity costs and stimulating investments in telecommunications. Specifically, the government should deregulate the electricity sector and provide incentives to investors in the telecom industry. Effluent disposal facilities must also be improved.
- *Broaden access to preferential markets, such as the European Union, India, and the United States.* The government should try to obtain better market access so that Sri Lanka can compete with neighboring countries.
- *Shift production to higher-value-added services.* Companies need to shift from cut-and-make production to higher-value-added services, such as full-package orders, where manufacturers are responsible for everything from material sourcing to packaging. A Sri Lankan design house and product branding will be important in this regard.
- *Develop an "apparel research park."* In line with the foregoing improvements, the development of an apparel city with the following features is recommended: design and pattern manufacturers, fabric suppliers, accessory and material suppliers, garment manufacturers, equipment and spare parts suppliers, specialized service suppliers, fashion shows, exhibitions, conferences, and business meetings.

8.7 Information and Communication Technology and ICT-Enabled Industry Cluster

The ICT and ICT-enabled industry, including ICT business process outsourcing (BPO) companies is rapidly growing in most modern economies. Sri Lanka enjoys a competitive advantage in the sector because of the

Figure 8.10 Information and Communication Technology Industry Cluster Map, Colombo Metropolitan Region



ICT = information and communication technology, e-government = electronic government, R&D = research and development.

Source: Study team.

high quality of the graduates from its education and training institutions, the sector's interconnectedness with global business, and the network of expatriate Sri Lankans who have succeeded in developing ICT and ICT-enabled services.

From 1996 to 2006, the ICT industry sector had the highest location quotient (2.8) of the sectors analyzed and a positive 5% change in location quotient. The CMR was ranked as one of the top 50 global outsourcing destinations on A. T. Kearney's Global Services Location Index, and among the top 20 emerging cities by *Global Services* magazine. The sector has a high-quality pool of skilled workers for establishing high-demand niche competency centers. There are more than 300 ICT and BPO companies, but these are mostly small and medium companies and only a few are large global players. The export earnings of the sector rose steadily during the past decade to an estimated $275 million in 2006, and the country looks forward to earning $1 billion from its ICT exports by 2012.

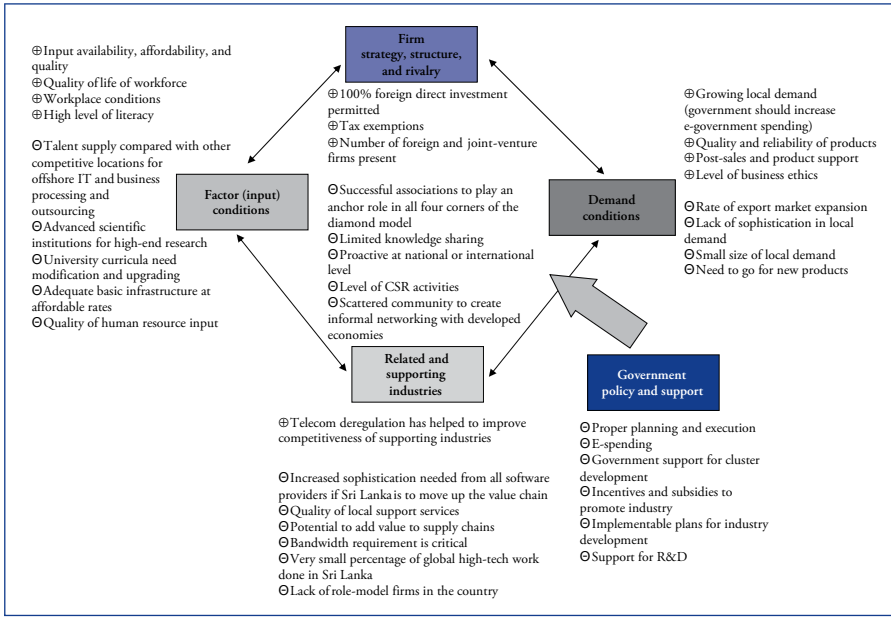
The structure of the ICT cluster in the CMR is shown in Figure 8.10. The international market for the ICT industry is expanding and domestic

users of applications and programs are increasing. New investors, mostly from abroad, are capitalizing on the opportunities. Educational institutions are adapting their courses and programs to the industry's needs and the government has undertaken several initiatives favorable to the industry. Nonetheless, the cluster is still thin in some areas, and it requires training providers, specialized packaging firms, marketing specialists, and better coordination between companies, associations, and government agencies to move from infancy to the next stage.

8.7.1 Competitiveness of the Information and Communication Technology Industry Cluster

Figure 8.11 shows an analysis of the ICT cluster using the Porter diamond model. The analysis indicates competitive strength in human resources and in firm structure, strategy, and rivalry. But it also shows competitive weaknesses in the international market in demand conditions and related supporting industries.

Figure 8.11 Analysis of the Five Conditions of Competitiveness of the Information and Communication Technology Industry Cluster, Colombo Metropolitan Region



CSR = corporate social responsibility, e-government = electronic government, IT = information technology, R&D = research and development.

Source: Study team.

Table 8.7 shows the results of an analysis of the competitiveness conditions and elements of the ICT cluster in the CMR using the Porter diamond model framework described in Chapter 5. The overall competitiveness score of 2.49, suggests national competitiveness, with some internationally competitive drivers and attributes.

Factor conditions in the cluster are relatively weak (2.58). The cluster has a well-trained workforce, but lacks the human resources to meet the growing demand for services. Infrastructure supporting the cluster is poor—especially high-quality broadband telecommunications facilities. Many of the larger apparel firms are in government industrial estates. Workplace conditions are good. Demand conditions (2.77) are below international competitiveness requirements. As in the textiles and apparel cluster, the attributes of the business dynamics are very competitive, especially quality assurance, business ethics, and risk taking; however, expansion into new markets and products is problematic. The industry is small, and achieving the economies of scope and scale needed to develop the mid- to higher-value end of the ICT and BPO markets is extremely difficult. While specialized products, such as aviation and accounting software and insurance BPO services, have been successfully developed, product development in general has not been easy. There are significant weaknesses in both branding and marketing, which relate to problems in firm strategy, structure, and rivalry discussed below.

Overall firm strategy, structure, and rivalry (2.53), especially the willingness to collaborate, is weak. Technology orientation is high (3.60), as technology is the core business of most companies in the cluster. Related supporting industries are very weak (2.22) and not nationally competitive. Supply chain support services are weak, along with the quality and capacity of local support services. These conditions are not unusual for fledgling ICT industry sectors in developing countries. Government support (1.56) is low, especially in streamlining official procedures and documentation, and in R&D support for the industry. The cluster needs R&D support to grow.

8.7.2 Deficiency Gap Analysis

The ICT and BPO industries that make up the ICT cluster are highly human resources–driven industries. If Sri Lanka is to be innovative, it must ensure that its human resources practices are world class. On the demand conditions side, Sri Lanka must diversify its output and look for lucrative export markets. The deficiency in firm structure, strategy, and rivalry is due mainly to limited knowledge sharing. With respect to related and supporting industries, the key defect is not identifying the potential to add value to the supply chain. The cluster depends for its development on government support in providing strategic infrastructure and streamlining business

Table 8.7 Competitive Analysis of the ICT Industry Cluster, Colombo Metropolitan Region, Using the Porter Diamond Model Framework

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FACTOR CONDITIONS	**2.58**	**4.48**		**–1.90**
Labor	*2.20*	*4.75*		*–2.55*
Availability of skilled labor	2.00	4.80	–2.80	
Management skills	2.50	5.00	–2.50	
Efficiency and productivity of labor	3.00	4.70	–1.70	
Education and training facilities	1.30	4.50	–3.20	
Infrastructure	2.25	4.35		–2.10
Quality of infrastructure services (logistics)	2.20	4.00	–1.80	
Quality of infrastructure services (utilities)	2.50	4.00	–1.50	
Cost of services	1.30	4.70	–3.40	
Quality of telecommunications services	3.00	4.70	–1.70	
Endowed resources	*3.00*	*4.47*		*–1.47*
Proximity to raw materials	3.00	4.00	–1.00	
Cost of local raw materials vis-à-vis imports	3.00	4.40	–1.40	
Quality of raw materials	3.00	5.00	–2.00	
Social Environment	*3.19*	*4.33*		*–1.14*
Quality of life of workforce	3.00	4.20	–1.20	
Workplace conditions	3.80	4.30	–0.50	
DEMAND CONDITIONS	**2.77**	**4.49**		**–1.71**
Markets	*1.70*	*4.00*		*–2.30*
Expanding domestic and local markets	1.60	3.00	–1.40	
Expanding export markets	1.80	5.00	–3.20	
New Products	*2.50*	*4.50*		*–2.00*
Demand expansion capacity for new products	2.40	4.60	–2.20	
Responsiveness to change and innovativeness	2.60	4.40	–1.80	
Business Environment	*3.67*	*4.80*		*–1.13*
Quality and reliability of product or service	3.80	4.80	–1.00	
Product sustains awareness and support	3.20	4.80	–1.60	
Strong business ethics	4.00	4.80	–0.80	
Readiness to face risk	3.50	4.50	–1.00	

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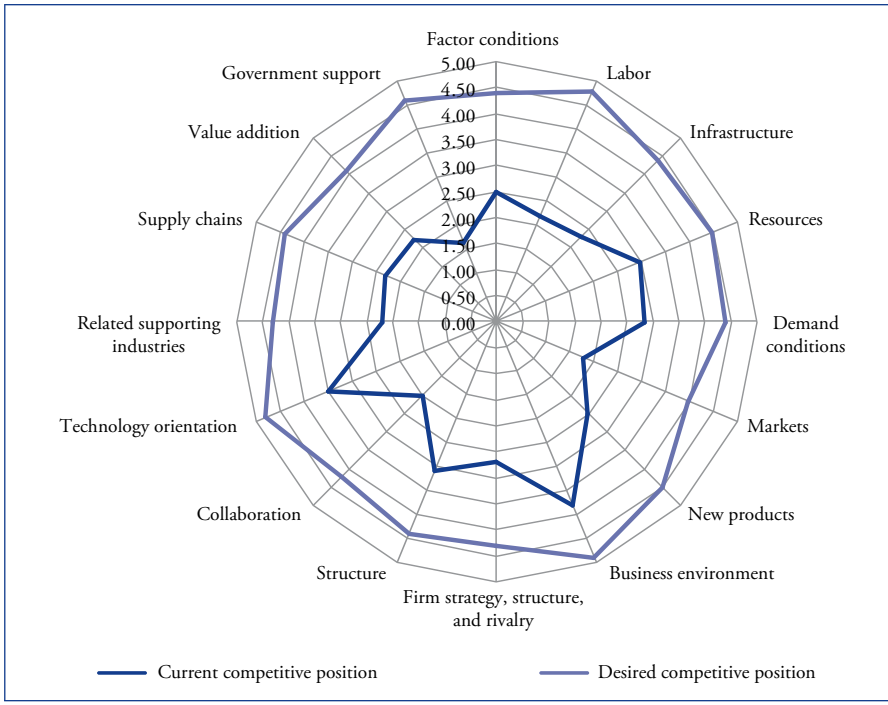
Table 8.7 *Continued*

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FIRM STRATEGY, STRUCTURE, AND RIVALRY	**2.53**	**4.35**		**–1.83**
Structure	3.20	4.40		–1.20
Presence of foreign and joint-venture companies	2.80	4.40	–1.60	
Flexibility of production systems	3.60	4.40	–0.80	
Collaboration	*2.04*	*4.24*		*–2.20*
Strong industry–firm collaboration	2.20	4.00	–1.80	
Shared development of industry knowledge capital	1.60	4.20	–2.60	
Strong social capital and business networks	2.60	4.60	–2.00	
National or international leadership	1.80	4.40	–2.60	
Civic entrepreneurship and community engagement	2.00	4.00	–2.00	
Technology Orientation	*3.60*	*4.80*		*–1.20*
High level of technology application in firms	3.60	4.80	–1.20	
RELATED SUPPORTING INDUSTRIES	**2.22**	**4.30**		**–2.08**
Supply Chains	2.20	4.40		–2.20
Strength of local business support services	1.60	4.20	–2.60	
Responsiveness of local support services	2.60	4.60	–2.00	
Quality of local support services	2.40	4.40	–2.00	
Value Addition	2.25	4.15		–1.90
Potential to add value to supply chains	2.00	4.30	–2.30	
Business awareness of value-adding potential	2.50	4.00	–1.50	
GOVERNMENT SUPPORT	**1.56**	**4.64**		**–3.08**
Government support for cluster development	2.20	5.00	–2.80	
Streamlined business approval systems	1.20	4.40	–3.20	
Support for sustainable industry development	1.60	4.60	–3.00	
Enforcement of business regulations	1.60	4.80	–3.20	
Support for research and development	1.20	4.40	–3.20	
Average for All Indicators	**2.49**	**4.45**		**–1.97**

Source: Study team.

Figure 8.12 Deficiency Gap Conditions in the Information and Communication Technology Industry Cluster, Colombo Metropolitan Region



Source: Study team.

processes. Figure 8.12 shows the competitiveness deficiency analysis of the ICT cluster using a radar chart. The overall deficiency gap of –1.97 suggests that, to become globally competitive, the cluster must improve its overall competitiveness by 80%.

8.7.3 Priority Actions

The competitiveness and deficiency gap analyses led to the identification of major interventions that will support the development of the cluster. These are as follows:

- *Increase the supply and quality of cluster-specific human resources.* The government and the private sector need to work together to further enrich and expand ICT education programs and to develop technical capabilities.
- *Provide affordable infrastructure services.* Internet bandwidth and telecommunications costs are critical for the cluster. The government's

monopoly on some key areas of the telecommunications industry remains a source of frustration that translates into higher costs, inefficient services, and less competition.

- *Create an efficient development and project implementation mechanism.* All ICT cluster development programs should be integrated under one umbrella organization. A culture of ICT technology adoption needs to take off.
- *Establish strong business linkages.* The ICT sector remains too fragmented into various specializations with no clear pattern emerging. Formal and informal networks, including informal links with the Sri Lankan diaspora community in industrial economies, are needed.
- *Develop an ICT park.* With the foregoing improvements in mind, the development of an ICT park with the following features is recommended: public, private, and donor funding; links with universities and R&D institutions; good physical infrastructure; a focus on products and services in which Sri Lanka has a competitive edge; and the participation of the government as a coinvestor in addition to its traditional role of regulator and facilitator.

8.8 Rubber Industry Cluster

The production of rubber and the manufacture of rubber products have been a solid part of Sri Lanka's economy since the 1870s, when the first rubber trees were planted. Sri Lanka is now the sixth-largest exporter and the eighth-largest natural rubber–producing country. The range of rubber products is varied and includes ribbed smoked sheet, pale crepe, sole crepe, brown crepe, technically specified rubber, centrifuged latex, and specialty types of rubber. Sri Lanka is one of the world's largest producers and suppliers of crepe rubber.

The production of manufactured rubber products, such as hoses, tubes, conveyor belts, automobile parts and solid tires, and latex-based products, has expanded considerably in recent years. Latex-based products include industrial, household, medical, and surgical gloves; rubber thread; doormats; rubber bands; sports goods; and footwear and footwear components. The industry is generally well equipped with testing, quality control, and R&D facilities.

The cluster is important to the CMR for the following reasons:

- More than 100 rubber product manufacturing units, or more than 90% of all rubber product manufacturing units in Sri Lanka, are in the

CMR. Of these 100, 39 units operate under the purview of the Board of Investment (Ministry of Enterprise Development and Investment Promotion) and accounted for nearly $500 million (more than 85%) of Sri Lanka's rubber product exports in 2007.

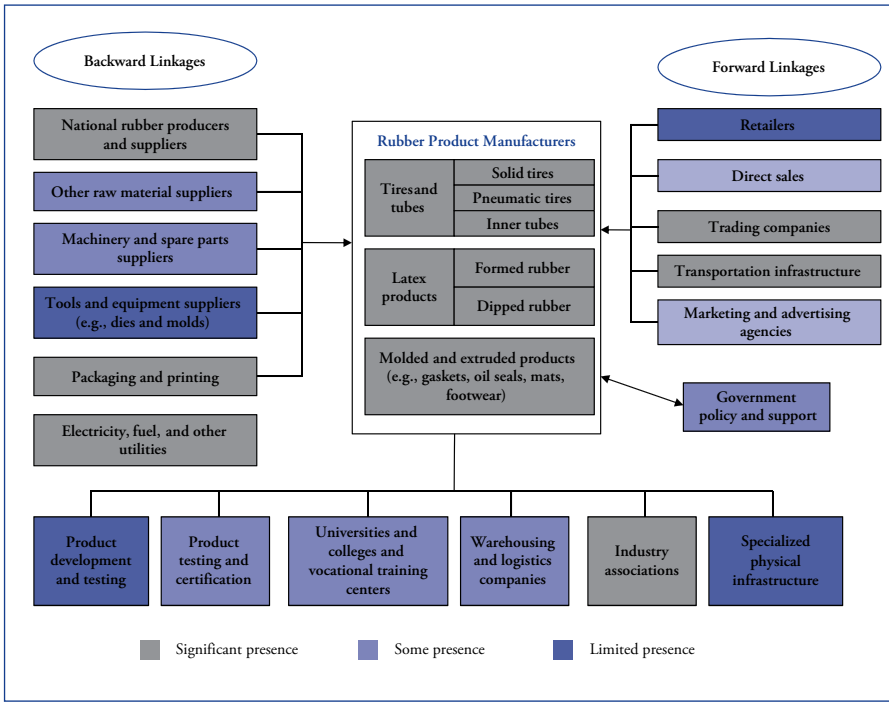
- In 2007, Sri Lanka's rubber exports amounted to $693 million, including nearly $600 million in manufactured rubber product exports. Sri Lanka is the world's top exporter of solid tires to the international market, with a market share of 25% in 2007. Loadstar is the global market leader in solid tires and enjoys more than 20% of the world market. Dipped Products is the world's fourth-largest industrial glove manufacturer. Multinational corporations like Ansell (latex-based products) and Trelleborg (tires) have their regional manufacturing base in Sri Lanka.
- Sri Lanka has ready access to the basic raw material and is a net exporter of natural rubber. In 2007, Sri Lanka produced 120,000 million tons of natural rubber, of which only 60% was converted into value-added rubber products, mainly for export. The country has embarked on a major project to expand its rubber plantations by 40,000 hectares in 2010–2015. The rubber product manufacturing sector directly employs about 30,000 people who live in the CMR, and indirectly employs nearly 50,000.

Figure 8.13 shows the structure of the rubber industry cluster in the CMR, and identifies the core and support industries. The Sri Lankan rubber industry is served by various organizations and agencies. The Ministry of Plantation Industries looks after the needs of rubber growers. The Department of Rubber Development and the Rubber Research Institute come under the purview of the Ministry of Plantation Industries. The Department of Rubber Development manages smallholder support programs, including subsidy schemes, and oversees the activities of the rubber trade. The Rubber Research Institute provides technology-related services to both the plantation sector and the product manufacturing sector. The Sri Lanka Society of Rubber Industry and the Colombo Rubber Traders' Association represent the private sector.

Extensive studies of the rubber industry have been undertaken to examine its competitiveness and potential to add value to export development (J. E. Austin Associates and SRI International 1998; Dunbar and Bolnick 2006). However, these studies have been concerned with the primary production of raw materials and first-stage manufacturing (Coir Council International 2009). The competitiveness of the more advanced manufacturing side of the industry has not been studied, but this element of the industry has significant potential for value addition and export development.

The manufacturing process involves product development, inbound and outbound logistics, product manufacturing, marketing, and sales. The key product development activities are market research, R&D, and testing. Inbound logistics are mostly confined to dealing with the supply of

Figure 8.13 Rubber Industry Cluster Map, Colombo Metropolitan Region



Source: Study team.

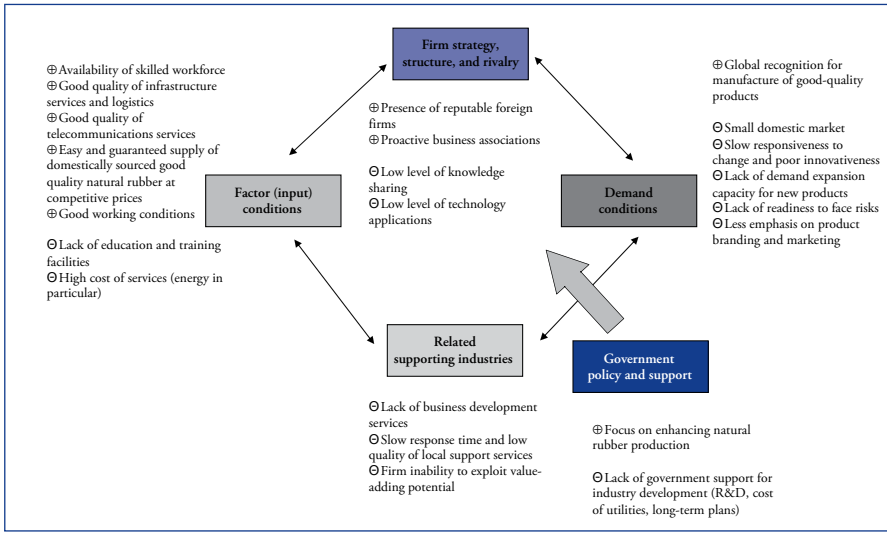
natural rubber, synthetic rubber, processing aids, fillers, chemicals, fabric, steel wire, and molds. The production process consists of compounding, manufacturing, finishing, testing, and packaging. Outbound logistics include the support necessary for the domestic or international marketing of products. Marketing and sales take place directly or via retailers.

Sri Lanka has a significant presence in the value chain of raw materials, manufacture of solid tires and latex products, and logistics for the export of finished products to international markets. It has some presence in domestic marketing.

8.8.1 Competitiveness of the Rubber Industry Cluster

Figure 8.14 shows an analysis of the rubber industry cluster in the CMR using the Porter diamond model. Given the strongly established industry base, relevant skills, and good-quality raw materials, the industry is fairly competitive in producing high-quality rubber products for the export market. The demand for rubber-based products is increasing, and some well-established, world-class product manufacturers that cater to leading

Figure 8.14 Analysis of the Five Conditions of Competitiveness of the Rubber Industry Cluster, Colombo Metropolitan Region



R&D = research and development.

Source: Study team.

companies in the industry are collaborating with one another and taking responsibility for new product development.

At the same time, Table 8.8 shows the results of an analysis of the competitiveness factors in the rubber industry cluster using the Porter diamond model. The overall competitiveness of the cluster, at 2.94, supports the view that the industry is a competitive producer of high-quality rubber products for the export market. Factor conditions in the cluster are relatively strong (3.54), and internationally competitive. The workforce is well trained, and the infrastructure is good but aging. Many of the larger rubber product companies are in government industrial estates. As Sri Lanka is a producer of rubber, endowed resources are a country strength; however, the supply of latex cannot keep up with demand, so increasing volumes of raw rubber are being imported. Workplace conditions and worker access to affordable housing are good. Many rubber factories and businesses in the supply chain are in the outskirts of Colombo, where housing is much cheaper than in the inner-city area.

Demand conditions (2.71) are below international competitiveness requirements. The attributes of the business dynamics that are most competitive are quality assurance and business ethics. As in most other export sectors of the economy, expansion into new markets and products

Table 8.8 Competitive Analysis of the Rubber Industry Cluster, Colombo Metropolitan Region, Using the Porter Diamond Model Framework

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FACTOR CONDITIONS	**3.54**	**4.92**		**–1.38**
Labor	*3.00*	4.75		–1.75
Availability of skilled labor	4.00	4.50	–0.50	
Management skills	2.50	4.50	–2.00	
Efficiency and productivity of labor	3.00	5.00	–2.00	
Education and training facilities	2.50	5.00	–2.50	
Infrastructure	3.50	5.00		–1.50
Quality of infrastructure services (logistics)	4.00	5.00	–1.00	
Quality of infrastructure services (utilities)	4.00	5.00	–1.00	
Cost of Services	2.00	5.00	–3.00	
Quality of telecommunications services	4.00	5.00	–1.00	
Endowed resources	*4.00*	*5.00*		*–1.00*
Proximity to raw materials	4.00	5.00	–1.00	
Cost of local raw materials vis-à-vis imports	4.00	5.00	–1.00	
Quality of raw materials	4.00	5.00	–1.00	
Social Environment	*3.57*	*5.00*		*–1.43*
Quality of life of workforce	4.00	5.00	–1.00	
Workplace conditions	4.00	5.00	–1.00	
DEMAND CONDITIONS	2.71	5.00		–2.29
Markets	*2.50*	*5.00*		*–2.50*
Expanding domestic and local markets	3.00	5.00	–2.00	
Expanding export markets	2.00	5.00	–3.00	
New Products	*1.50*	*5.00*		*–3.50*
Demand expansion capacity for new products	2.00	5.00	–3.00	
Responsiveness to change and innovativeness	1.00	5.00	–4.00	
Business Environment	*3.67*	*5.00*		*–1.33*
Quality and reliability of product or service	4.00	5.00	–1.00	
Product sustains awareness and support	4.00	5.00	–1.00	
Strong business ethics	3.00	5.00	–2.00	
Readiness to face risk	2.70	4.30	–1.60	

continued on next page

Table 8.8 *Continued*

Five Conditions in the Porter Diamond Model and Associated Elements to Assess Industry Cluster Competitiveness	Competitive Position		Competitiveness Gap	
	Current	Desired	In the Elements	In the 5 Conditions
FIRM STRATEGY, STRUCTURE, AND RIVALRY	**3.38**	**4.88**		**–1.50**
Structure	4.25	5.00		–0.75
Presence of foreign and joint-venture companies	5.00	5.00	0.00	
Flexibility of production systems	3.50	5.00	–1.50	
Collaboration	*3.10*	*4.80*		*–1.70*
Strong industry–firm collaboration	3.00	4.00	–1.00	
Shared development of industry knowledge capital	2.00	5.00	–3.00	
Strong social capital and business networks	4.00	5.00	–1.00	
National or international leadership	3.00	5.00	–2.00	
Civic entrepreneurship and community engagement	3.50	5.00	–1.50	
Technology Orientation	*3.00*	*5.00*		*–2.00*
High level of technology application in firms	3.00	5.00	–2.00	
RELATED SUPPORTING INDUSTRIES	**2.20**	**5.00**		**–2.80**
Supply Chains	*2.33*	*5.00*		*–2.67*
Strength of local business support services	2.00	5.00	–3.00	
Responsiveness of local support services	3.00	5.00	–2.00	
Quality of local support services	2.00	5.00	–3.00	
Value Addition	*2.00*	*5.00*		*–3.00*
Potential to add value to supply chains	2.00	5.00	–3.00	
Business awareness of value-adding potential	2.00	5.00	–3.00	
GOVERNMENT SUPPORT	**1.80**	**5.00**		**–3.20**
Government support for cluster development	2.00	5.00	–3.00	
Streamlined business approval systems	1.00	5.00	–4.00	
Support for sustainable industry development	1.50	5.00	–3.50	
Enforcement of business regulations	3.50	5.00	–1.50	
Support for research and development	1.00	5.00	–4.00	
Average for All Indicators	**2.94**	**4.93**		**–1.99**

Source: Study team.

is problematic. The industry is under pressure to increase the production of raw material, and to focus on higher-value end products, but is finding it difficult to do so because of the already large scope and scale of production. The cluster is facing strong competition from other Asian producers and has been affected significantly by the global financial crisis. Like the textile and apparel clusters, it has low risk tolerance, and this is affecting product innovation and development.

Overall firm structure, strategy, and rivalry (3.38) is internationally competitive. Much of the competitiveness is due to historical factors, such as foreign ownership and investment in rubber production and manufacturing in Sri Lanka in and around the CMR for more than 100 years. Collaboration, especially in knowledge sharing and technology orientation, is weak. Related supporting industries are very weak (2.2). Supply chains have become increasingly inefficient and there is no sustained interest in finding ways of adding value to the rubber supply chain. Production could substantially increase if the capacity and efficiency of the rubber supply chain, from the farm to the distribution of rubber products, were improved. Government support (1.80) is low, especially in streamlining official procedures and documentation, and in R&D support for the industry. This situation is similar to that in which the other export clusters described above find themselves.

8.8.2 Deficiency Gap Analysis

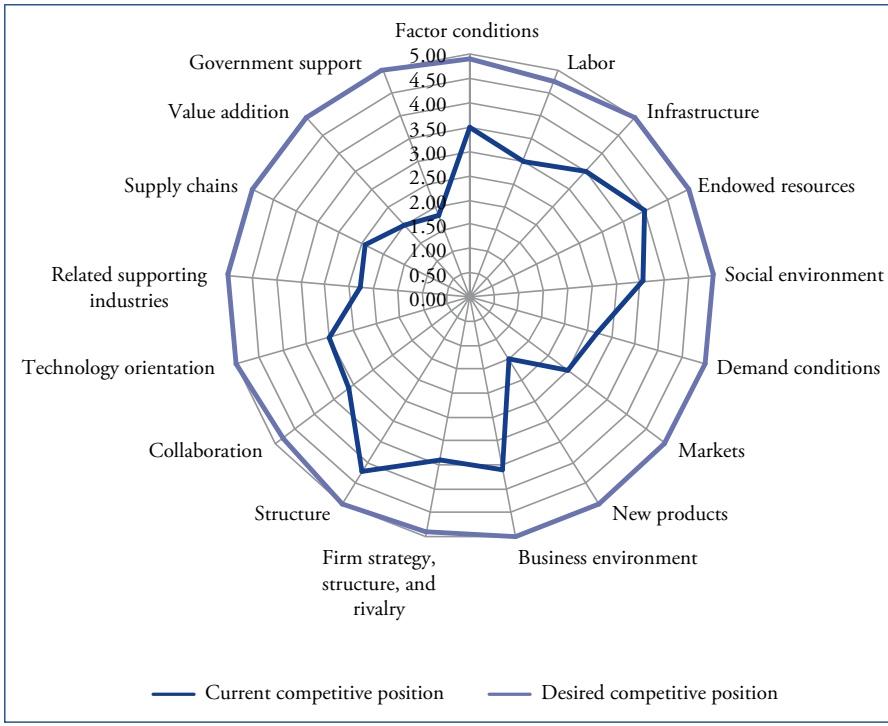
Lack of innovation, branding, and marketing is a weakness where demand conditions are concerned. Regarding factor conditions, the high cost of services, mainly electricity, is the biggest impediment. In relation to firm strategy, structure, and rivalry, the low level of technology use is a serious hindrance. The inability of companies to explore ways of adding value is the key deficiency with respect to related supporting industries (see Figure 8.15).

8.8.3 Priority Actions

The competitiveness and deficiency gap analyses led to the identification of key areas of intervention that the cluster needs to grow. These key initiatives include the following:

- *Develop a culture of innovation among SMEs in the cluster.* Innovativeness would have a serious impact on products, processes, and services. Awareness programs aimed at sharing knowledge and developing new technology should be introduced. Development activities designed to expand and modernize the rubber industry are also needed.

Figure 8.15 Deficiency Gap Analysis of the Rubber Industry Cluster, Colombo Metropolitan Region



Source: Study team.

- *Develop infrastructure.* Encouraging the use of alternative energy and coordinated sharing of resources would be a good answer to the problem of poor infrastructure, including high energy costs and the lack of warehousing facilities and effluent treatment facilities.
- *Strengthen R&D and the education and training system.* The government must attract investment to encourage R&D. Emphasis should be placed on investing in an educational institution specializing in rubber technology and a staff training center with adequate facilities for prototype testing.
- *Improve the business environment.* Besides global competition, the industry is stymied by outdated government policies, high tax rates, and inadequate government support. Immediate remedial measures include simplifying the government's business rules and regulations and thereby improving the business environment for the industry.
- *Develop a "rubber industry park."* With the foregoing improvements in mind, the development of a rubber city with the following features is recommended: (i) a few manufacturing units; (ii) a product development

and testing center; (iii) a computer-aided design, manufacturing, and engineering center; (iv) a procurement center; (v) a dry rubber compounding center; (vi) a latex compounding center; (vii) warehouses for both raw materials and finished goods; (viii) central workshops; (ix) an effluent treatment plant; (x) a gamma eradication plant; (xi) power generation and water supply units; and (xii) a rubber technology campus, including a staff training center; an information center and library; and an international communications center.

8.9 Conclusion

While previous studies examined the application of the cluster-driven approach to the development of eight industry sectors in Sri Lanka (Austin and International 1998), the CCED approach has enabled a much more detailed analysis of industry clusters. The city competitiveness study revealed that the CMR is the most competitive of the 14 cities studied and has the right kinds of industries to be able to take advantage of the positive spread effects of a city cluster development program. The textiles and apparel, ICT, and rubber industry clusters are the most competitive industry sectors and have the highest potential to drive the development of the CMR economy.

The action plans for the three industries show the importance of catalysts for the development of industry clusters. The major catalysts mentioned in the action plans are, among others, industry parks, an improved business environment, stronger education and training and R&D, and a culture of innovation.

A more efficient and effective enabling environment, especially good public governance, will improve the overall competitiveness of all industry sectors. Cluster development will also require support from business and industry networks and partnerships, well-coordinated information sharing and R&D, and a smart workforce. Weaknesses in these competitive factors, both in the CMR and in other cities in Sri Lanka, must be addressed to allow the country to become more competitive, attract investment, and fast-track its economic development after the long years of civil unrest.

Chapter 9
Insights Gained from the Three Country Case Studies

The city competitiveness study done in 2008–2009 as part of the CCED approach provided useful insights into the strengths and weaknesses of key economic drivers in the three South Asian countries studied. It also yielded important information about the elements of strategic architecture in the cities that must be improved to make the cities more competitive. The comparison of competitiveness drivers of cities in the three countries revealed noteworthy differences in competiveness that may not be entirely due to the degree of development of the country.

9.1 City Competitiveness Index Scores

As explained in Chapter 5, the city competitiveness index derives from an analysis of six key drivers: the cost of doing business, the dynamism of the local economy, the quantity and quality of human resources and training, the availability of infrastructure, the responsiveness of local government units to business needs, and the quality of life.

The city competitiveness study identified the attributes of competitiveness in 39 cities—10 cities in Bangladesh, 15 in India, and 14 in Sri Lanka—and ranked them according to the strengths and weaknesses of these attributes (Table 9.1). Competitiveness indicators, ranging in number from 34 to 49, were allocated among the six drivers, and were scored to develop the index. The score for each city, out of a maximum of 10.00,[1] was the sum of the scores for its indicators. The median score was 5.96. Cities with competitiveness scores of more than 7.00 are considered internationally competitive because they export extensively, mostly manufactured products. Cities with scores of more than 5.50 and up to 7.00 are considered nationally competitive.

[1] The India case study used the maximum score of 5.00. For ease of comparison, the scores assigned to the attributes were doubled to bring them up to the maximum of 10.00.

Table 9.1 City Competitiveness Ranking, 39 South Asian Cities

City	Country	Population (2007–2008)	Index Score	Inter-country Rank	Intra-country Rank	Level of Competitiveness
Dhaka	Bangladesh	12,797,394	7.32	6	1	International
Chittagong	Bangladesh	3,858,093	6.32	14	2	National
Khulna	Bangladesh	1,388,425	4.77	34	6	Regional
Rajshahi	Bangladesh	775,495	3.75	37	8	Regional
Sylhet	Bangladesh	463,198	5.78	21	3	National
Rangpur	Bangladesh	463,198	3.43	39	10	Regional
Barisal	Bangladesh	210,374	3.62	38	9	Regional
Mymensingh	Bangladesh	225,811	4.83	33	5	Regional
Bogra	Bangladesh	106,779	4.50	35	7	Regional
Comilla	Bangladesh	419,623	5.11	31	4	Regional
Mumbai	India	13,922,125	7.47	2	1	International
Bangalore	India	5,310,318	7.40	3	2	International
New Delhi	India	12,259,230	7.34	4	3	International
Chennai	India	4,590,267	7.33	5	4	International
Hyderabad	India	4,025,335	7.18	7	5	International
Kolkata	India	5,080,519	6.89	8	6	National
Ahmedabad	India	3,913,793	6.76	10	7	National
Pune	India	3,337,481	6.70	11	8	National
Surat	India	3,233,988	6.48	12	9	National
Kanpur	India	3,144,267	6.31	15	10	National
Jaipur	India	3,102,808	6.30	16	11	National
Lucknow	India	2,685,528	6.20	17	12	National
Nagpur	India	2,403,239	6.17	18	13	National
Indore	India	1,811,513	5.99	19	14	National
Bhubaneshwar	India	1,814,012	5.96	20	15	National
Colombo	Sri Lanka	800,000	7.51	1	1	International
Gampaha	Sri Lanka	52,657	6.79	9	2	National
Kalutara	Sri Lanka	69,000	6.42	13	3	National
Galle	Sri Lanka	123,027	5.61	22	4	National
Dambulla	Sri Lanka	37,539	5.60	23	5	National
Nuwara Eliya	Sri Lanka	48,412	5.58	24	6	National
Ratnapura	Sri Lanka	59,339	5.55	25	7	National
Ampara	Sri Lanka	21,713	5.44	26	8	Regional
Kurunegala	Sri Lanka	30,324	5.32	27	9	Regional
Matara	Sri Lanka	73,541	5.29	28	10	Regional
Anuradhapura	Sri Lanka	65,000	5.24	29	11	Regional
Hambantota	Sri Lanka	15,000	5.21	30	12	Regional
Trincomalee	Sri Lanka	74,000	4.08	36	14	Regional
Kandy	Sri Lanka	157,213	4.96	32	13	Regional
Median		775,495	5.96			

Source: Study team.

They trade with other cities and engage in minor exporting. Cities with index scores of more than 4.50 and up to 5.50 are considered competitive within their subnational regions. They mainly serve the local economy but also trade with other regional city economies. Cities with scores of up to 4.50 are mainly service economies that usually depend heavily on imports and produce few regional exports.

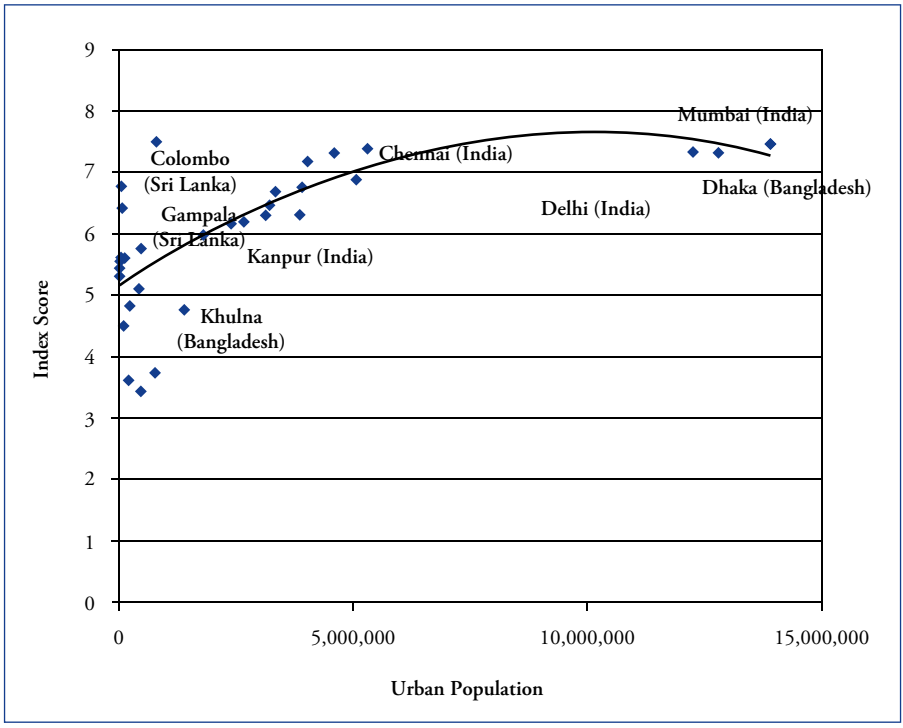
Overall, the competitiveness of the cities is weak. Most are only nationally or regionally competitive, and only seven are internationally competitive. Colombo ranked first in the overall assessment. Several factors explain Colombo's competitiveness: it is Sri Lanka's capital and its principal gateway city, it generates more than 50% of national GDP, it has well-developed municipal services and a strong enabling environment, and it has been an international trade hub for more than 500 years. The large number of cities that are only nationally and regionally competitive reflects the generally poor state of strategic architecture. National and subnational governments must identify the key weaknesses in the strategic architecture of those cities and take steps to improve the cities' competitiveness. The more competitive the city, the better it can attract investment and develop in a more sustainable way.

9.2 Relationship between City Size and Competitiveness

Few studies explore the relationship between city size and competitiveness, especially in Asia (Harris 2007; Dollar et al. 2004). The analysis of the competitiveness of 39 cities suggests that population size generates economies of scale that are not possible in smaller cities. Figure 9.1 shows the relationship between urban population size and competitiveness. It indicates that competitiveness flattens out at populations of more than 4 million. GDP per capita appears to be higher and to be rising faster in cities with populations of 2–5 million than in cities with more than 10 million people.

Caution is necessary in suggesting a causal relationship between city size and competitiveness, as the economic base and export orientation of cities can considerably affect their competitiveness. But competitiveness appears to be related to export performance. Cities with a large export sector, such as Colombo and Hyderabad, tend to rank much higher on the competitiveness index than cities that are primarily engaged in domestic economic activity.

Figure 9.1 City Competitiveness and Urban Population Size, 39 South Asian Cities



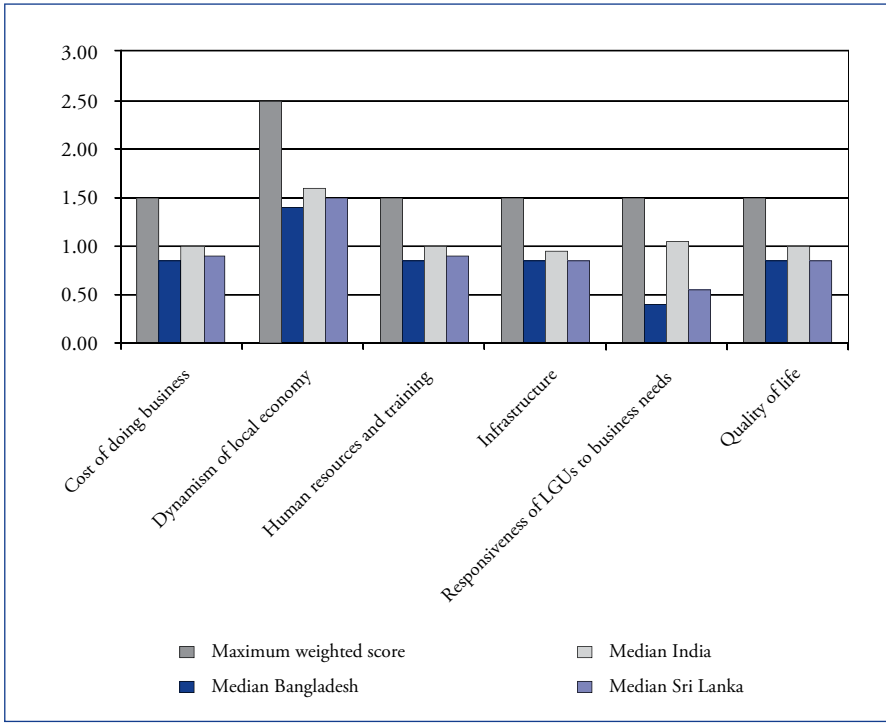
Source: Study team.

9.3 Analysis of the Six Key Drivers of City Competitiveness

Figure 9.2 compares Bangladesh, India, and Sri Lanka according to their ratings for the six key drivers of competiveness. The tallest bar stands for the maximum possible score for each building block, 1.50 in five of the six cases. A rating of at least 60% of this maximum score is needed to be nationally competitive. Most key drivers in the three countries rate below 60%. Again, these results should be interpreted with care because of the differences among the countries in degree of development and in economic governance. They nonetheless provide a useful comparison of weaknesses in competitiveness drivers. Cities in India are the most competitive for all six drivers, but in all three countries human resource development, infrastructure, and quality of life still need to improve considerably if South Asian cities are to become more competitive overall.

The cost of doing business in South Asian cities is high. Urban governance is deficient. Local governments invest too little in infrastructure.

Figure 9.2 The Six Drivers of Competiveness: Bangladesh, India, and Sri Lanka Compared



LGU = local government unit.

Source: Study team.

But congestion and poor quality of life are also adding greatly to the cost of business. Good quality of life means access to education and health services, affordable housing, safety and security, and clean air and environmental management services. These factors enable companies and local governments to attract skills to smaller cities, and induce managers to move their families out of the capital cities, where they have generally better access to education, health services, and spouse employment. Low infrastructure and labor cost are becoming less important in attracting investment and development in smaller (subnational) cities, according to the research. Access to human capital and quality-of-life factors are now the primary drivers of city competitiveness.

The dynamics of business are another major driver of competitiveness. Business activities across the region are vibrant and are dominated by SMEs and micro (mainly family) enterprises, but business dynamics are held back by weak collaboration between companies and local governments in dealing with the increasing cost of doing business. For example, most companies

in industrial areas maintain backup generators and water storage facilities to cope with supply problems. Collaborating with government to establish reliable facilities for electricity, water, and waste management in the local areas would solve many of these problems and reduce the need to invest in backup utilities.

In nearly all the cities studied, local governments that are insufficiently committed to local economic development greatly undermine the competitiveness of the urban economies. Local governments must undergo reform, engage more capably with the private sector, and be more responsible for planning and managing local economic projects. To this end, more attention must be paid to education and the development of skills in urban governance and management. If urban governance and local enabling environments do not improve, smaller cities in South Asia will struggle to attract investments that will sustain growth. The research on competitiveness drivers shows that local city governments have a poor understanding of how they can create competitive enabling environments to attract investors.

9.4 Multi-Criteria Analysis of City Competitiveness and Multi-Sector Industry Analysis of Capital City Regions

The competitiveness studies of cities in Bangladesh, India, and Sri Lanka provided useful information for developing national urban policy and monitoring the economic performance of the cities. Competitiveness can foster healthy rivalry between cities, as has occurred in other Asian countries. However, the economic development of cities requires a deeper understanding of the role of the various industry sectors in that development.

Urban economies develop through a combination of population and consumption growth, export and investment, and employment resulting from endogenous growth. Not every sector of an urban economy is in competitive trade or business. Many sectors deliver noncompetitive social, education, health, security, and community services. Until recent years, public agencies, not subject to competition, were responsible for these sectors. The export and endogenous growth sectors, where the investment and employer multipliers are largest, deserve closest attention from governments as they develop strategic architecture for economic development. Cities or urban regions must be competitive for local economies to grow. But better efficiency in the delivery of public sector, consumer, and other services is equally important. Multi-criteria analysis (MCA) provided ways of analyzing and understanding the key drivers of city competitiveness.

A similar technique but different indicators are used in multi-sector industry analysis (MSIA). MSIA studies evaluating the sector competitiveness of local economies in the capital region of the three countries revealed both differences and similarities in competitive attributes. Common competitive indicators were mostly associated with transport logistics, investment promotion, availability of workers, business dynamics and leadership, use of technology, and international linkages. Significant competitiveness weaknesses had to do with the perceived effects of government corruption on business, the narrow export base of the capital's economy, inefficiency in public utility services, weak skill development, problems in land development and administration, and the lack of legislative and regulatory reform, among other factors.

Figure 9.3 shows the results of the MSIA studies of the Dhaka and Colombo economies.[2] There are clear dissimilarities between Colombo, Dhaka, and New Delhi.[3] Workplace health and safety conditions are much poorer in Dhaka than in the two other cities, while transparency and accountability are a good deal better in Colombo. City size seems to affect the performance of government systems. Smaller cities appear to deliver more efficient public utility services. Services are significantly better in Colombo and the government provides stronger policy support for industry development than in Dhaka and New Delhi. A major drain on the competitiveness of the export sectors is unreliable utility services, especially electricity and water in Dhaka, where load shedding makes textile manufacture more costly and less productive.

Besides showing the strengths and weaknesses of individual sectors, the MSIA studies also brought out cross-sector weaknesses along supply chains, such as weaknesses in R&D, in access to microfinance for SMEs, in management training, and in quality assurance skills.

MSIA, a relatively quick technique for assessing the strengths and weaknesses of essential elements of strategic architecture, proved to be a handy analytical tool for CCED. Its insights into strategic planning in each of the cities studied will help steer policies and initiatives for a stronger strategic architecture for exports. While its qualitative assessments are a limitation, MSIA is still a useful assessment tool in the absence of reliable statistical data.

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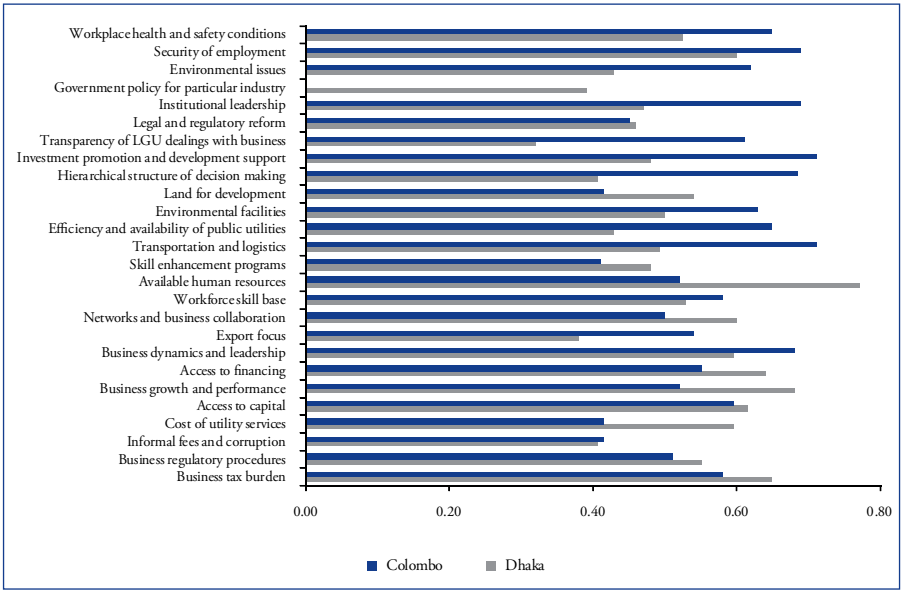
[2] Changes in the variables for New Delhi precluded direct comparisons with New Delhi data.

[3] Strictly speaking, the results of the three MSIAs from Bangladesh, India, and Sri Lanka are not comparable, as each country had its own evaluation team within its own country. However, the study team considers it is worthwhile to provide insights into cross-country comparisons of the competitiveness environment of multi-sector industry, for the applicability of CCED cross-country comparative analysis on other occasions.

Figure 9.3 Comparison of Index Scores Contributing to the Competitiveness Indicators, Multi-Sector Industry Analysis, Dhaka and Colombo



LGU = local government unit.

Source: Study team.

9.5 Structural Changes in the Economies of the Capital Cities

The availability of limited time-series data on production and employment in the three city economies enabled the study team to perform a location quotient and shift-share analysis of structural changes and specializations in industry. This was the first such analysis for the three capital regions in South Asia. The shift-share analysis has shown significant structural changes in the city economies since 1990. Manufacturing has grown rapidly and now accounts for more than 30% of GDP and up to 40% of employment in the three cities, including informal sector enterprises. Services account for more than 55% of employment, excluding the informal sector.

The growth of manufacturing in the three cities has occurred at the lower end of the value chain, that is, among producers of parts and accessories rather than assembly enterprises. A large quantity of input services is brought in from overseas, or from elsewhere within the country in the case of New Delhi and Dhaka. Emphasizing endogenous growth in R&D and producer services and developing import substitution markets would address gaps in the supply chain.

I/O tables, combined with the location quotient and shift-share analysis, provided a deeper understanding of the structural changes in the three economies. A time-series analysis of sector GDP was particularly useful in identifying the sectors in each economy that were undergoing major structural transformation.

Sub-metropolitan employment data revealed patterns of business migration within the Delhi metropolitan region. No such analysis was done for the sub-metropolitan economies of Colombo and Dhaka for lack of data. Further work in each city is needed to develop tools for assessing the impact of structural changes in the economy and the potential impact of policy interventions. This knowledge is important when planning infrastructure to support the subnational migration of manufacturing and the development of service sector industries.

9.6 Mapping Out Industry Clusters by Standard Industrial Classification

Two types of industry cluster maps were prepared for nine clusters in the three national capitals. The **first mapped the geographic location of industries by SIC industry type**. The **second mapped industry supply chain structures for each cluster**.

9.6.1 Geographic Location Mapping of Industries

The spatial mapping of companies or businesses using GDP fixing by SIC type was extremely useful. Before the CCED project no geospatial data on business type by location in the capital cities had been captured and made available. Such information, especially where time-series data were captured in Colombo, made it possible to identify the spatial migration and growth patterns of industry types. Global positioning system (GPS) SIC geo-coding of the garment, leather, and food and beverage industries in Dhaka enabled very detailed analysis of six spatial patterns of industry clustering.

Geo-spatial agglomeration is most intense in the inner-city industrial districts, which tend to be more highly integrated with service industry providers in the same locality than businesses showing evidence of more dispersed patterns of firm clustering. Clusters in industrial estates and linear clusters appear to have much lower industry linkages and synergies than inner-city clusters, and in many cases is the result of spillover development from inner-city clusters. Some businesses have completely relocated away from the inner-city industrial districts with their operating constraints and limited room for expansion.

9.6.2 Structural Mapping of Supply Chain of Industry Clusters

Mapping the supply chain structure of clusters is very difficult, even in industrial economies. The study team nonetheless identified vertical and horizontal supply chain linkages for each cluster, using SIC and I/O table data and industry focus groups. But, because of insufficient information, the team could not estimate quantitative flows and intensity of transactions between suppliers and distributors for each cluster. Many SMEs are informal or home-based operations that do not keep formal financial records of contract work, and their activities involve cash and personal credit arrangements.

The structural mapping of clusters revealed that, except for the rubber cluster in the Colombo metropolitan region, most are primarily in low-value-added manufacturing. Higher value addition takes place elsewhere. The depths of the clusters' supply chain therefore tend to be shallow. The extent of horizontal integration in each cluster is also low. Support for R&D and skill development, in particular, tends to be externalized or outsourced. Most of the clusters studied export many of their products, and have limited capacity to expand the range and design of their products for domestic markets to support more endogenous growth. Competitiveness and potential opportunities to stimulate endogenous growth are also hindered by the lack of access to microcredit and of critical mass in providers of education and training, product development and design, and marketing and commercialization services. These activities have a low presence in each cluster except for the rubber cluster in Colombo.

Because of the weaknesses in these key elements of strategic infrastructure, the clusters are less able to develop and support the local markets. Their current structure makes them vulnerable to changes in global market demand. This is true, above all, of the textile and apparel clusters in all three countries, given their export orientation. The failure of government economic agencies in particular to support the development of cluster-specific strategic infrastructure that could stimulate endogenous growth and domestic market demand is a significant oversight in national economic and industry development policy.

9.7 Deficiency Gap Analysis

The deficiency gap analysis of competitiveness attributes supporting industry clusters, based on a modified Porter diamond model, gave a better understanding of the actions that must be taken to develop strategic architecture for cluster development. Table 9.2 shows how the nine clusters scored on 39 attributes of competitiveness, according to the assessment

Table 9.2 Evaluation of Five Competitiveness Conditions and 39 Competitiveness Elements of Nine Industry Clusters in Colombo, Dhaka, and New Delhi

Five Conditions and 39 Competitiveness Elements of Industry Cluster	Apparel cluster, CMR	ICT cluster, CMR	Rubber cluster, CMR	Textile cluster, CNCR	Light engineering cluster, CNCR	Auto. components cluster, CNCR	Apparel and textiles cluster, Dhaka	Leather cluster, Dhaka	Food and beverage cluster, Dhaka	Average level of competitiveness	Level of competitiveness	Targeted level of competitiveness	Average competitiveness deficiency	Level of strengthening required
FACTOR CONDITIONS														
Labor														
Availability of skilled labor	3.2	2.0	4.0	2.1	1.5	1.9	2.1	2.5	2.4	2.4	Weak	4.3	1.9	Significant
Management skills	3.2	2.5	2.5	2.5	1.9	1.6	1.8	1.8	2.7	2.3	Weak	4.4	2.1	High
Efficiency and productivity of labor	3.0	3.0	3.0	2.2	1.9	1.6	2.4	3.0	2.5	2.5	Significant	4.4	1.9	Significant
Education and training facilities	2.8	1.3	2.5	3.1	3.2	2.2	1.0	1.7	1.7	2.2	Weak	4.3	2.2	High
Infrastructure														
Quality of infrastructure services (logistics)	2.8	2.2	4.0	2.1	2.6	1.6	2.2	2.5	2.6	2.5	Significant	4.3	1.8	Significant
Quality of infrastructure services (utilities)	3.0	2.5	4.0	2.3	3.0	1.8	1.8	2.5	2.4	2.6	Significant	4.2	1.6	Significant
Cost of services	3.2	1.3	2.0	1.5	2.4	1.3	2.2	2.5	2.3	2.1	Weak	4.2	2.1	High
Quality of telecommunications services	3.8	3.0	4.0	1.1	1.5	1.3	2.7	2.7	3.2	2.6	Significant	4.6	2.0	Significant
Resources														
Proximity to raw materials	2.2	3.0	4.0	2.1	1.8	1.3	2.2	3.3	2.5	2.5	Weak	4.4	1.9	Significant
Cost of local raw materials vis-à-vis imports	2.4	4.4	4.0	1.9	2.1	1.3	2.4	3.7	2.6	2.8	Significant	4.4	1.7	Significant
Quality of raw materials	3.4	3.0	4.0	2.5	1.7	1.6	3.1	3.3	2.8	2.8	Significant	4.6	1.8	Significant
Social Environment														
Quality of living environment for workforce	2.4	3.0	4.0	2.3	2.8	2.2	1.1	2.0	2.0	2.4	Weak	4.1	1.7	Significant
Workplace conditions	3.8	3.8	4.0	1.8	1.8	1.5	2.3	2.0	2.6	2.6	Significant	4.3	1.7	Significant
DEMAND CONDITIONS														
Markets														
Domestic and local market expansion	1.4	1.6	3.0	1.4	1.7	1.7	1.0	2.5	2.6	1.9	Low	3.9	2.0	High
Export market expansion	2.2	1.8	2.0	2.3	2.3	1.8	3.2	2.7	1.6	2.2	Weak	4.4	2.2	High
New Products														
Expansion capacity for new products	2.0	2.4	2.0	1.6	1.7	1.4	2.0	2.8	2.3	2.0	Weak	4.1	2.1	High
Responsiveness to change and innovativeness	2.8	2.6	1.0	1.9	1.8	1.5	2.0	3.2	2.0	2.1	Weak	4.2	2.1	High
Business Environment														
Quality and reliability of product or service	3.6	3.8	4.0	2.4	2.1	1.1	2.8	3.0	2.8	2.8	Significant	4.5	1.6	Moderate
Product sustainability awareness and support	3.2	3.2	4.0	2.4	2.1	1.4	2.7	2.8	2.4	2.7	Significant	4.4	1.7	Significant
Strength of business ethics	3.8	4.0	3.0	2.6	2.1	1.8	2.5	2.0	2.8	2.7	Significant	4.5	1.8	Significant
Readiness to face risk	2.6	3.5	2.7	2.3	2.3	2.5	2.7	2.4	2.2	2.6	Significant	4.2	1.6	Significant

continued on next page

Table 9.2 *Continued*

Five Conditions and 39 Competitiveness Elements of Industry Cluster	Apparel cluster, CMR	ICT cluster, CMR	Rubber cluster, CMR	Textile cluster, CNCR	Light engineering cluster, CNCR	Auto. components cluster, CNCR	Apparel and textiles cluster, Dhaka	Leather cluster, Dhaka	Food and beverage cluster, Dhaka	Average level of competitiveness	Level of competitiveness	Targeted level of competitiveness	Average competitiveness deficiency	Level of strengthening required
FIRM STRATEGY, STRUCTURE, AND RIVALRY														
Structure														
Presence of foreign and joint-venture companies	2.8	2.8	5.0	2.3	2.7	1.3	1.6	1.3	1.4	2.4	Weak	3.9	1.5	Significant
Flexibility of production systems	2.6	3.6	3.5	1.3	2.1	1.7	1.9	2.2	2.0	2.3	Weak	4.0	1.7	Significant
Collaboration														
Strength of industry–firm collaboration	2.8	2.2	3.0	2.6	2.5	1.2	1.4	1.7	1.7	2.1	Weak	3.8	1.7	Significant
Sharing of industry knowledge capital development	2.4	1.6	2.0	2.7	2.6	1.7	1.6	1.3	1.9	2.0	Low	4.2	2.2	High
Strength of social capital and business networks	3.6	2.6	4.0	2.5	2.3	1.7	2.3	2.0	2.3	2.6	Significant	4.3	1.8	Significant
National or international leadership	3.4	1.8	3.0	2.6	2.7	2.2	2.3	2.3	2.0	2.5	Weak	4.3	1.8	Significant
Civic entrepreneurship and community engagement	3.6	2.0	3.5	2.1	2.6	1.9	1.3	2.0	2.2	2.4	Weak	4.1	1.7	Significant
Technology Orientation														
Level of technology use in firms	2.8	3.6	3.0	2.2	2.1	2.0	2.1	2.2	2.3	2.5	Weak	4.3	1.8	Significant
RELATED SUPPORTING INDUSTRIES											Low			
Supply Chains														
Strength of local business support services	2.8	1.6	2.0	2.4	2.5	2.4	1.8	2.3	2.3	2.2	Weak	4.4	2.2	High
Responsiveness of local support services	2.8	2.6	3.0	2.2	2.4	1.9	1.8	2.3	2.2	2.4	Weak	4.4	2.1	High
Quality of local support services	3.2	2.4	2.0	2.6	2.9	1.8	1.9	2.5	2.2	2.4	Weak	4.4	2.0	High
Value Addition														
Potential to add value to supply chains	2.8	2.0	2.0	2.5	2.0	1.6	2.4	3.0	2.5	2.3	Weak	4.4	2.1	High
Business awareness of value-adding potential	2.4	2.5	2.0	2.4	2.4	1.7	2.0	2.5	2.3	2.2	Weak	4.3	2.1	High
GOVERNMENT														
Government support for cluster development	2.2	2.2	2.0	2.8	3.7	2.5	0.9	2.0	1.2	2.2	Weak	4.5	2.3	High
Streamlining of business approval systems	1.4	1.2	1.0	2.4	2.9	2.6	1.5	2.0	1.6	1.8	Low	4.3	2.4	High
Support for sustainable industry development	1.8	1.6	1.5	2.1	3.0	2.4	1.6	2.3	1.5	2.0	Low	4.4	2.4	High
Enforcement of business regulations	2.0	1.6	3.5	2.8	2.8	2.2	2.2	2.2	1.9	2.4	Weak	4.4	2.0	High
Support for R&D	1.2	1.2	1.0	3.4	3.1	3.1	1.0	2.3	1.0	1.9	Low	4.3	2.4	High
Average for All Indicators	2.8	2.5	2.9	2.2	2.3	1.8	2.0	2.4	2.2	2.4		4.3	1.9	

CMR = Colombo Metropolitan Region, CNCR = Central National Capital Region, ICT = information and communication technology, R&D = research and development.

Source: Study team.

made by a focus group using a numeric scale of 0.0–5.0. A score higher than 4.0 indicates that the cluster is competitive at or above international best practice; higher than 3.0 and up to 4.0, nationally competitive; higher than 2.0 and up to 3.0, competitive at the subnational level; and 2.0 and below, weakly competitive.

The last three columns in the table bring out the extent of the gaps in competitiveness conditions. On 19 of the 39 elements, the average deficiency score[4] is more than 2.0. This indicates the need for a high degree of support (infrastructure, technology transfer for capacity building, etc.) to achieve international competitiveness. For the 20 other attributes, where the average deficiency score is 1.5–2.0, less support is required to make the clusters internationally competitive.

The analysis of the nine clusters shows Colombo's rubber industry to be the most competitive, and New Delhi's automotive parts industry cluster to be the weakest. However, as different economic activities are evaluated for each cluster, these results should be interpreted with care. Some clusters can be less competitive and still grow as long as market demand is growing, although, like the Colombo RMG cluster, they will eventually lose export market share. The comparative analysis of the RMG clusters in Colombo, Dhaka, and New Delhi suggests that the Colombo cluster is the most competitive because it is more specialized and targets the higher-value end of the global consumer market. But the cluster is facing strong competition from Southeast Asian producers and in the future will not gain competitive advantage through economies of scale. To develop, it will have to find out how it can add value to its supply chain.

Several weaknesses in competitiveness attributes are common to most of the clusters. Except for the automotive components cluster in New Delhi, all the clusters are focused on the export market and foreign exchange earnings. While leading companies in the clusters are aware of the prospects in the domestic markets, inefficiencies in their production chains greatly reduce profit margins and the potential to add value and expand demand in the local markets. Companies are also reluctant to share information that could support innovation, although social capital in the clusters is high, especially in the RMG industries, because of the long history and close associations between local producers and suppliers in areas where similar types of businesses congregate. Opportunities for the clusters to support endogenous growth are therefore hampered.

Moreover, governments provide weak support for cluster development, especially for streamlined business approval and more sustainable industry

[4] The difference between targeted and actual average competitiveness.

development, and are generally disinclined to address the serious environmental problems. Most clusters located close to reliable sources of reasonably good-quality raw materials enjoy some strategic advantage. But quality is still a problem and rejection rates of products are high. Many firms turn to raw material imports, assured of their quality by international certification. Competition in global markets has raised awareness of the need to improve quality assurance, production sustainability, and business ethics. Without such improvements, international contracts can be difficult to secure.

All clusters show weaknesses in related supporting industries and government support. The first set of competitive attributes pertains to supply chains, especially the delivery and quality of local business support services, opportunities to add value to supply chains, and knowledge sharing with other businesses in the cluster. Improved competitiveness in this regard requires both formal and informal development of knowledge, the provision of better training facilities and curricula, and the development of networks, partnerships, and industry associations.

Until recently, government has provided inadequate support for cluster development in the three countries. Bureaucratic and corrupt business approval systems keep out investors and new entrants. Business and environmental regulations are oppressive and at the same time unwillingly enforced. The failure of governments to deal with environmental problems adversely affects public health and employee productivity. The clusters also cannot rely on government support for R&D to raise productivity and production along their supply chains.

The gaps in factor and market conditions and in firm strategy structure and rivalry are less than those in related supporting industries and government support, but are still below international best practice. The competitive elements for factor conditions occur mainly in human resource development. Unskilled labor is in abundant supply but is increasingly being lost through migration. The clusters cannot fill their need for skilled labor and management to improve overall productivity and performance. Education and training facilities are in short supply. Foreign enterprises in some clusters are recruiting international staff to make up for the shortage.

Another weakness in factor conditions common to all the industry clusters studied is the lack of infrastructure. The deficiency varies among the three cities studied, and is not as bad as some others. Many leading companies in the clusters are in planned industrial areas and districts where infrastructure and utility services are generally better. Elements of clusters in inner-city areas, such as the RMG industry in Dhaka, must contend with the high cost of services, especially water, electricity, and telecommunications, because of system losses and theft. As production costs escalate, competitiveness drops.

Poor telecommunications services, combined with low computer literacy, often means the loss of contracts, many to clusters in Southeast Asian countries where the services are much more reliable. Proximity to materials used in production is a competitive advantage, but delivery delays and damage caused by poor logistics affect just-in-time production and perishable food businesses in particular.

Many larger companies in the RMG clusters realize that they must provide appropriate residential accommodation to attract and keep skilled workers. Their workforces must also stay healthy and productive. Governments have failed to provide for workers' housing needs when planning and developing special enterprise zones and industrial estates.

Deficiencies noted in demand conditions were the lack of capacity to expand export markets and develop domestic markets, slow response to changes in market demand, and low product innovation. Inertia tends to reduce the overall dynamics of business in the clusters.

9.8 Action Planning for Cluster-Based City Economic Development

Action planning is the most difficult part of the CCED process, as it involves assigning priority to investment projects and activities that will have the largest multiplier effect and reduce transaction costs along cluster supply chains. Many projects listed in action plans are not implemented because insufficient resources have been set aside for them. In some cases, actions are not prioritized or clearly defined.

CCED action planning seeks to identify bankable projects, that is, projects that are attractive to investors and governments. Government support is important, because many infrastructure and capacity-building projects entail high risks at the start or the benefits do not appeal to individual investors. The economic returns to the community and businesses are high, but the returns on investment or equity are less than acceptable. In such cases, governments must share the risks or guarantee cash flow during the initial stages, as they commonly do in public–private partnership projects. Governments must actively support cluster development projects before the private sector partners come in.

The action plans for the clusters include a large number of investments that should increase government support and industry services. Most priority projects are expected to reduce the external transaction costs of cluster companies. Public sector investment is involved in many of these projects.

Governments are best placed to improve the support systems for logistics, R&D, and education and training, and to modernize business regulations, while considering stakeholder interests. Businesses can offer solutions and take part in the delivery of public services if it is profitable and expedient for them to do so.

Priority areas of support for the development of clusters in the three countries are:

- improving knowledge management and international marketing intelligence;
- using ICT technologies;
- providing training facilities and programs for the cluster workforces;
- improving the delivery of utilities, especially water supply, waste management, electricity, and telecommunications;
- increasing support for R&D, particularly for innovation and new product development;
- streamlining approval by providing one-stop shop facilities and e-governance systems;
- developing business networks and associations to spread knowledge and formal and informal (tacit) learning; and
- introducing special initiatives like the national garment institutes in Dhaka and New Delhi.

9.9 Pre-Feasibility Studies for CCED

The CCED project included pre-feasibility studies of integrated projects for India and Sri Lanka. The studies confirmed the viability and bankability of the projects. The CCED approach to pre-feasibility evaluation is different from the model traditionally used by international development banks. Industry cluster task forces work with government officials to design, develop, and cost integrated projects, each one with key components linked to

- policy reforms;
- investments in strategic infrastructure;
- capacity building for R&D, skills, marketing, and innovation;
- project financing, including public–private partnership; and
- operations.

9.10 Fostering Industry Clusters at Different Stages of Development

The cluster leadership group, normally the CCED steering committee, will identify cluster development activities and tasks to secure wider commitment from industry and government to the process and to network building, and, working through the appointed facilitator, will set the action planning and organizational development in motion. Since the industry clusters will be at different stages of development at a given time of intervention, the leadership group should consider using different approaches to encourage the full functioning of the clusters.

9.10.1 Incubation Stage

The first stage of the cluster development process after the steering committee and facilitator are appointed is running a series of activities that will progressively engage cluster stakeholders in the development process. An action learning approach will ensure that each stage of the process allows time to learn and reflect on the gains and losses from the process, especially the mistakes. There should be no preconceived ideas at the outset about what should be achieved. Part of the process is coming to a shared position about what is possible and realistically achievable. It is also important to establish a spirit of openness in the face of problems and issues besetting the sector industries, and to build trust between rivals to overcome these. The development of clusters is based on these two values of openness and trust, both of which are necessary for collaborative advantage (Chapter 1).

The facilitator will normally lead a series of industry meetings, roundtables, focus group discussions, and studies to gather information and win support for clustering. The intent during this incubation stage of cluster development is as follows:

- Coordinate and conduct the identification of industry-specific ingredients of relationships in each cluster, and draw the industry representatives to demonstrate that they are committed to working together. These ingredients can include issues such as trust, shared goals, strategic importance to parties, clear mutual benefits, interdependence, time, shared information, social bonding, similarities in organizational culture, expectations, perceived competencies, planning, and commitment.
- Coordinate and conduct an initial analysis of the cluster, starting with national policy and weaknesses in the drivers of competiveness. CCED steps 1 (analysis of the six building blocks) and 2 (national multi-sector analysis) were introduced as part of the national study, but steps 2 and 3

(city industry cluster analysis) can be combined if the process is specific to a city. Specific industry cluster opportunities should be identified, along with action-oriented implementation items and timetables, specific constraints on new economic opportunities, and realistic, well-researched proposals for overcoming the institutional barriers to the implementation of the action plans.

- Develop the initial industry cluster report, including a preliminary action plan and a summary of outcomes achieved so far. This report will serve as the blueprint for formalizing actions, setting overall goals, and gaining the commitment of each company to the ongoing cluster or alliance process. It can be useful at this stage to get the members to sign a document attesting to their commitment to the process.

9.10.2 Action Stage

Once the action plan is completed, the next stage of the process is formalizing the clusters and making the plan operational. This is normally a facilitated process. An organization (formal or informal) representing the interests of the cluster must first be formed and registered, and a management body appointed to oversee the business planning, pre-feasibility evaluation, and operations including finance. Putting the business plan in operation will involve carrying out the cluster action plans. Whole-of-government and whole-of-business approaches to the implementation of the CCED projects and programs, or public–private partnerships, can be used, but they must be flexible. New economic governance systems may be needed to support specific cluster initiatives, like those discussed in Chapter 5 for the Australian wine industry.

9.11 Other Insights Gained from the CCED Approach

The CCED project was a unique opportunity to test and develop an approach to LED that could benefit the economic development of South Asian cities. It provided a deeper understanding of urban competitiveness and industry agglomeration in sectors not previously investigated. This knowledge has helped governments in the three capital cities to work with selected industry groups in developing policies and projects in support of LED that can contribute significantly to the future development of industry clusters in these cities.

The previous sections outlined insights gained directly from the CCED project. Other lessons pertain more to policy and strategic planning. These

other contributions of the CCED project are summarized below to improve knowledge and understanding of sustainable economic development in urban economies, not only in South Asia but also in other Asian city economies.

- The research on city competitiveness shows that many secondary-city LGUs are ill prepared to take on the responsibilities that accompany decentralization. Outside the national capital cities, there is limited expertise in packaging public projects to make them attractive to private investors. Often, if LGUs cannot manage development projects, central agencies step in and take control. No transfer or building of knowledge, technology, and skills takes place.
- Weak local government is also compounded by skill losses to migration to the capital city and other countries. Without improved capacity, LGUs will be unable to work with local business to initiate and manage LED projects. Governments and official development assistance must give increasing emphasis to reinforcing the capacity of LGUs. If not, secondary and tertiary cities will become even less competitive, government decentralization policies will fail, and local economies will continue to lack strength.
- Identifying the strengths and weaknesses of the elements of the six key drivers of city competitiveness is an important part of the CCED process. The strategic architecture for the economic development of clusters—for example, the enabling and human resources development environments that must be considered in cluster design—spans many jurisdictions. In some cases, local, spatially concentrated, investment will have to be made in key infrastructure or industry capacity-building projects to support cluster development. In other cases, the investment may have to support more city-wide needs. Understanding which elements of strategic architecture are important for local economic and cluster development will put governments and businesses in a better position to identify the priority actions that will make the local economies more competitive and, hence, more attractive to investors.
- An important principle of sustainable CCED is maximizing the benefits of public and private investment in local economies to add value and enhance the employment multipliers associated with industry cluster development. Adding value to the total capital stock of cities will contribute to sustainable development in South Asian cities.[5] This is best achieved by capitalizing on opportunities to leverage and stretch public and private sector resources, particularly for the development of industry clusters and industrial ecology. The CCED studies identified major weaknesses in resource use, production management, logistics,

[5] Total capital stock includes assets, savings, and human and natural capital.

and quality assurance in the supply chain. Material waste or rejection rates among microenterprises in the South Asian garment industries exceed 50%. The efficiency and competitiveness of these industries is thereby greatly undermined and microenterprises lose a considerable amount of income. A more efficient supply chain can create employment and opportunities to expand the value chain of many sector industries in South Asian cities.

Chapter 10
A New Paradigm of Local Economic Development for Growing Asian Cities

With globalization, Asian economies are in transition from agriculture to industry and services. The changes in their economic structure are affecting the pace of urbanization as non-agriculture industries generally locate in urban contexts in search of better infrastructure for production. Asia is urbanizing differently from developed countries. Industrialized countries have transformed their economic structure over the last 2 centuries since the Industrial Revolution. Asian developing countries, in contrast, have been changing their economic structure only in the last 3–4 decades, forming urban agglomerations with escalating population growth. The urban infrastructure required for Asian cities therefore is not necessarily confined within administrative boundaries; more inclusiveness is demanded, discarding the fixation on rural–urban dichotomies and involving both software and hardware aspects.

Asian cities must become more competitive if they are to integrate with other globalizing economies, and reduce endemic poverty, underemployment, and economic disadvantage. Many challenges face them along the way. Without continuing reform, their chances of attracting investment or creating prosperous and sustainable local economies will be limited. For Asian cities to be competitive sustainably, the factors and industry sectors that drive their prosperity must be clearly recognized. What makes cities and industries in urban regions competitive? Which building blocks and industry sectors drive urban economies? With what measures should weaknesses in local economic drivers be addressed?

Cluster-based city economic development (CCED) offers a new paradigm for local economic development. The approach is aimed at helping cities take advantage of the agglomerations of mSMEs, companies, and industries in their extended urban regions and contribute more strongly to economic growth. The applicability and replicability of the CCED approach

were confirmed in selected cities in Bangladesh, India, and Sri Lanka. This chapter draws conclusions by highlighting (i) the contributions of the CCED approach; (ii) the anticipated outcomes of using the approach; (iii) the conceptual premises and pillars of cluster development; (iv) the benefits of the approach to countries and official development assistance (ODA) agencies; and (v) a pathway to the broader application of the approach in other Asian cities.

10.1 Salient Features of the CCED Approach

The CCED approach provides development professionals with a unique opportunity to understand better the impact of factors of competitiveness on local economies, and the catalytic role of industry clusters in economic growth. Governments will find this understanding exceedingly important as Asian cities become more globalized and their economies interlinked with one another through international trade. There is a good way to arrive at this understanding—through CCED.

In the economic development of Asian cities, the CCED approach can help achieve many firsts. It can

- measure and compare attributes of competitiveness, as it did in the three South Asian countries;
- identify, map, and analyze sector and spatial changes in industry and economic activities in cities and city regions;
- identify, measure, and analyze strengths and gaps in key factors that will drive the future development of city economies;
- identify the nature, strengths, and weaknesses of selected industry cluster supply chains to determine the critical elements of strategic infrastructure that will increase competitiveness; and
- develop a more collaborative approach to sector industry and local economic development planning beyond administrative boundaries of cities.

The approach also enables national and city governments and ODA agencies to

- better target investments in infrastructure and capacity building to support sustainable economic development and employment growth;
- map spatial concentrations of industries that have environmental problems, e.g., tanneries in Dhaka, for projects involving environmental improvement and waste management;

- analyze industry clusters and improve the quality of information available to government and business for planning and investments in support of LED; and
- improve the economic data on cities that will improve economic and financial modeling and the impact assessment of urban projects.

The CCED approach provides a tested mechanism for businesses and governments to

- collaborate in identifying critical strategic infrastructure projects that will improve the productivity and performance of businesses and the economies of cities in the region;
- build co-investment partnerships with governments to address weaknesses in supply chains and support services and to reduce business transaction costs;
- develop business cluster partnerships and networks that will strengthen collaborative innovation by competing businesses;
- share information and knowledge and achieve critical mass to enable companies in a cluster to compete for business in international and domestic markets;
- improve the capacity of businesses to address quality assurance issues, and risks associated with doing business in a more global economy; and
- provide a better model for businesses to work with governments in fostering local economic development.

10.1.1 A Systematic Way of Understanding the Competitiveness of Cities and Industry Clusters

The challenge for many Asian cities is to understand what they must do to become more competitive, attract investment, strengthen the business environment, and advance local economic development. Understanding what makes a city competitive is not easy. Many factors, besides economic considerations, are involved. Measuring the competitiveness of cities is even more difficult, since many local governments and businesses have poor data on local economies and do not know how best to use the data for their development. For many cities, improving competitiveness means a focus in government and business policy and strategy on efficiency gains at the enterprise or public agency level (Kumar and Chadee 2002). Local economic policy and taxation reforms can also increase the productivity and performance of individual business enterprises. However, poor access to commonly used services, such as transport systems, higher education facilities, telecommunications, and basic water supply and wastewater

management infrastructure, can diminish the productivity gains. Investing in such scattered locations adds little to competitive advantage.

Compounding the poor understanding of competitiveness among many local governments in Asia, and of how they can and should promote local economic growth, is the reluctance of governments to partner with businesses. A feeling of mutual distrust prevails, especially on the part of small-scale enterprises. As a result, governments have been hampered in creating strong enabling business environments for investment, development, and ongoing business operations.

In helping cities and economies achieve more sustainable and inclusive development, cluster-based economic development, despite being relatively new in Asia, shows considerable promise. Asian cities must have tools for understanding the level of economic development and governance needed for urban competitiveness and industry cluster development. CCED offers a seven-step guided approach and analytical techniques for a better understanding of such matters as the anatomy of complex urban economies, the key drivers of city competitiveness, and the competitiveness attributes that industry clusters should strengthen to improve their value chains. Table 10.1 summarizes CCED's seven-step approach to analyzing local economic competitiveness, for easy reference.

10.1.2 Continuous Strengthening of the Three Key Principles

Over the past 3 decades, powerful global and national forces have emerged and changed the fundamental principles on which many Asian economies, cities, governments, and businesses operate. The entry of many Asian countries into the WTO has brought about structural reforms and introduced competition, with severe impact on state-owned, corporate, and mSME businesses (Huang 2001). These changes have also made it even more necessary to improve efficiency in enterprise production systems and reduce external transaction costs to businesses and governments.

As explained in Chapter 1, empirical data show that urbanization is positively correlated with the GDP growth of a country. Urban economies are considered engines of economic growth; hence, the CCED approach strongly advocates sustainable urbanization. Economic opportunities are better in agglomerated geo-spatial formations (cities or industries) because the unit cost of providing urban infrastructure as well as the transaction costs of doing business are lower (through economies of scale) than in low-density or scattered human settlements. Economic geographers also theorize that agglomerated developments become centers of gravity, attracting similar and related economic activities. The multiplier effects bring out more opportunities

Table 10.1 Seven-Step Approach to Analyzing Local Competitiveness

Step	Analysis Area	Technique Used	Competitiveness Elements Analyzed	Use of Analysis Results	Action to Be Taken before Going on to the Next Step
0	3 principles	Continuous efforts to develop macro framework	Supporting institutional framework at macro level	Sustaining the principles throughout cluster-based economic development	Commit to long-term development; strengthen supporting institutional framework continuously
1	National economic policy environment	Review of relevant economic policy and urban development strategy	Industrial projects, national and spatial planning, funding mechanisms and availability	Preparing overview of strategic national contexts that may or may not have positive outcomes for local economic development	Recommend reform agenda at the national level to improve local economic performance
2	City competitiveness	MCA of 6 drivers of city competitiveness	43 attributes analyzed; maximum score of 10 when summed up total evaluation scores of the 6 drivers (max. score of 5 was used in India case)	Identifying weak attributes that affect city competitiveness; desirable score for international competitiveness greater than 7.5 (or 4 if maximum score is 5)	Select a city or an urban region for focused development; consult with local government for its interest in pursuing competitiveness of city
3.1	National multi-sector industry analysis	MSIA using 5 or 6 key factors	25–36 industry sector indicators, analyzed through MSIA and with the use of SIC code	Determining the size of the industry sector and its contribution to national GDP; max. score of 1.0	Prepare national baseline data; desirable score is compared with the national average score as benchmark
3.2	Local multi-sector industry analysis	Location quotient and shift-share analysis	National and local data on the number of enterprises established, numbers employed in industries	Identifying the industry sectors that account for substantial portions of local economies	Select several industry sectors in a given local area of concern for further analysis
4.1	Local mapping of industry clusters	Spatial mapping	Census data or SIC directory address, and GIS	Identifying the location of industry clusters spatially agglomerated in a given city (or city region)	Select 2–3 industry clusters willing to work in partnership with public sector and committed to such work

continued on next page

Table 10.1 *Continued*

Step	Analysis Area	Technique Used	Competitiveness Elements Analyzed	Use of Analysis Results	Action to Be Taken before Going on to the Next Step
4.2	Backward and forward linkage analysis of the selected industry cluster	Industry structure mapping	Economic value-adding supply chain mapping; presence or absence of forward–backward companies relevant to the core industry sector identified	Identifying the strengths and weaknesses along the value chain of the selected industry cluster; estimating value addition along the supply chain	Reflected in action plan to reduce transaction costs of doing business along the vertical and horizontal value-adding supply chain
5.1	Porter's diamond model of analysis	5 conditions	39 elements (number depends on the industry sector)	Assessing the relative competitiveness of the selected industry cluster	Use in action plan for investment and competitiveness development
5.2	Analysis of deficiency gap conditions using the results from step 4	Same as in step 5.1	39 elements (number depends on the industry sector)	Identifying deficiencies of industry clusters and strengthening their market competitiveness	Identify possible ways of improving deficiency gap conditions to reach desirable level of industry cluster competitiveness
6.1	Business plan	By industry cluster	Development of long-term vision and strategy for the industry cluster	Holding consultation meetings, building consensus, and reaching agreement among stakeholders on the business plan	Confirm the commitment of the selected industry clusters to their long-term engagement
6.2	Action plans	Based on business plan prepared in step 6.1	Preparation of short- and medium-term action plans, with both software and hardware aspects of infrastructure in balance	Preparing stand-alone projects (which can be completed in 5 years) or a series of projects under one investment program (lasting 10–15 years)	Select and prioritize most urgent investment areas
7	Execution of action plans	Formalization of industry cluster associations or networks	Preparation of investment projects and feasibility study	Searching for investors and preparing funding application	Form partnerships between government and private sector

GDP = gross domestic product, GIS = geographic information system, MCA = multi-criteria analysis, MSIA = multi-sector industry analysis, SIC = standard industrial classification.

Source: Study team.

to grow, as one core industry cluster can attract two or three other relevant noncore economic activities (depending on the type of industry). If urbanization is unavoidable as economic structures change, its challenges should be turned into opportunities for sustainable growth.

However, sustainable cluster economic development is not a given. Constant work is required to build toward sustainability and at the same time reinforce the underlying principles. The three underlying principles, explained in Chapter 5, are as follows:

- Providing *a long-term strategic vision for urban economic development* by creating goals and a collective sense of direction, and identifying future opportunities to pursue;
- Promoting *self-sufficient endogenous growth* and industry cluster development through both demand- and supply-side initiatives that foster the right kind of enabling environment and strategic infrastructure;
- Requiring *collaboration and partnerships* for collaborative advantage through the sharing of knowledge, information, assets, resources, risk, waste management, and materials recovery among the public and private sectors, nongovernment organizations, and civil society, for economic development.

These principles should be consistently incorporated into city economic development and spatial plans in national economic policy planning to encourage local economic development.

10.1.3 Promotion of Private Sector Development and Collaborative Advantage

The last decade has seen the rise of a huge number of mSME clusters in the region. It is estimated that mSMEs now account for more than 90% of all private sector businesses, and employ as much as 60% of Asia's workforce. These enterprises are increasingly recognized as major drivers of economic growth in developing Asia. They have a vital function in employment and income generation, and therefore in poverty reduction. Conventional financing tools such as private sector participation (PSP) or public–private partnership (PPP) in public infrastructure financing do not bring out the competitiveness that economies must have to grow. Private sector development (PSD) must be distinguished from and reach beyond the narrow focus of PSP, PPP, and capital markets by also supporting the development of mSMEs.

However, Asia's export industries, particularly in the wake of the global recession, have suffered a dramatic decline due to low demand in world markets, high credit risk, poor access to capital, and inadequate physical

infrastructure. Many mSMEs, at the frontline of value chains, are in direst straits. Despite their considerable potential for reducing poverty in the region, mSMEs lack systematic backing and knowledge to transform into more productive contributors to the local economy. Developing countries in Asia must link inclusive local economic growth with the sustainable development of mSMEs to compete in a globalizing world. Governments must devise effective strategies and practical investment programs to facilitate mSME cluster development, given the substantial, poverty-reducing opportunities for mSMEs in areas like manufacturing, services, and farm product processing.

Sectoral approaches to dealing with constraints on economic systems, which governments in most Asian countries tend to embrace, do improve the competitiveness of cities, but only partly. Most governments are not favorably disposed toward holistic systems or multi-sectoral approaches because they are complicated, open ended, and not easy to explain to the public, and they often require substantial upfront expenses before results are realized. Businesses are much more comfortable than governments in complex systems and quickly learn to respond to changes in their operating environments. Businesses can often devise solutions to complex problems, but governments must carry them out. For example, governments interested in PPP must first find land or pass enabling legislation to allow major industry clusters or infrastructure projects to proceed.

The future competitiveness of cities in Asia will therefore depend on how well local governments provide the infrastructure and services for private sector development that will help reduce transaction costs throughout the supply chain. In some cases, to keep their local economies competitive, cities will have to invest in initiatives that involve collaboration and alliance arrangements with mSMEs. Such arrangements can help strengthen links and partnerships between private sector businesses and government to compete with other cities.

To encourage PPP and PSD, integrated and sustainable mini–industrial cluster parks or smaller common facilities can be set up in local areas as part of priority-product value chains. Such parks and common facilities may be located in places where the factor conditions are relatively favorable. The specific locations are, however, best left to the discretion of the private sector stakeholders that are mainly responsible for conceiving, implementing, and operating the facilities. Local authorities should encourage the development and implementation of such industrial parks and common facilities in PPP rather than with government taking the lead. Governments (or donors) may contribute grants-in-aid toward capital expenditures. Private ownership, through long-term lease, and participation by actual users will ensure meaningful clusters and sustainable initiatives (Vinanchiarachi, forthcoming).

10.1.4 A Critical Planning Tool for Policy Decision Makers

There is a strong disconnect between national economic policy and urban development policy, as the case studies in South Asia show. Until recent years, economic development policy was centered on rural development although more than 60% of GDP is produced in the cities. Policy reforms for local economic development that strengthen the capacity and competitiveness of regional economies and stimulate export and endogenous growth are urgently needed, according to the CCED analysis. Policy and industry support programs must switch emphasis from supply-side to demand-side initiatives.

Asian cities will succeed in developing their economies only if all levels of government and businesses understand what will make them more competitive. Economic development strategies based on comparative advantage from cheap land and labor, utilities, and tax incentives give a development edge to cities in the region. However, the availability of human resources, the quality of skills, technology use, and logistics are increasingly determining business and investor decisions. In cities throughout the region, these factors are having a greater influence on the economic geography of trade and investment, the location of production centers, and the nature of business activities. The CCED approach, an analytical guide to planning strategies for the development of mSMEs and industry clusters unlimited by urban–rural dichotomies, provides information central to investment decisions.

An important merit of the CCED approach is its detailed insights into the strategic investments that build pathways to more sustainable LED through multi-sector, multitiered linkages. Local economies faced with more open competition are weighed down by governments and businesses disinclined to collaborate in responding to shocks and opportunities. The strategic architecture that allows local businesses to interact and respond to different environmental and governance domains is very difficult to create. But if businesses and governments can be made to understand that local systems must be more attuned to international systems, and to accept that open knowledge platforms and information sharing and collaboration are deciding factors, urban economies can create pathways to sustainable development. The CCED approach espouses visionary decision making in prioritizing where to invest and what to invest.

10.2 CCED Applications in Official Development Assistance

International development agencies provide substantial support for LED in Asian cities. Sector programs (in health, education, infrastructure, capacity building, etc.), administered primarily by a central government agency, are the dominant means of support, particularly in Asia, where the national finance ministry must guarantee repayment or accountability for foreign loans. In some Asian countries, however, governments now permit sub-sovereign lending to local governments and utility agencies.

A factor essential to the success of CCED is finding ways for multilateral agencies, governments, the private sector, and nongovernment organizations to become finance and resource partners in industry cluster development and LED. ODA agencies provide key financing for large projects and in many cases catalyze such projects. But project funding is still done mostly through government. New ways of delivering ODA directly to industry cluster projects are required. Governments and ODA agencies must be able to work with formal industry associations and networks in designing, developing, and funding components of integrated projects for LED and cluster development. The important factors to be considered in the design of CCED projects that involve ODA are discussed below.

10.2.1 Need for an Integrated Development Planning Framework

Integrated strategic development plans and projects underlie sustainable economic and urban development. However, most attempts to integrate plans and projects have been hard put to succeed because of silo mentality or the reluctance of public agencies to share information or collaborate on projects and programs. Central planning agencies used to engage in integrated regional development planning through the central budget process, but decentralization and devolution have limited their ability to do so, especially when several levels of government and ODA are involved. Also, the failure to train local government personnel to plan and manage integrated strategic development projects has greatly weakened the capacity to deliver key infrastructure projects that serve multi-sectoral interests.

CCED projects are likely to engage local and central governments, ODA agencies, and industry associations in implementing integrated packages of assistance through new forms of industry partnerships. Subprojects involving infrastructure development, capacity building of industry clusters of mSMEs, vocational training, policy reforms, etc., may be implemented in

sequence or in parallel under public–private sector governance and project management. Coordination with government (for cofinancing) and with an incorporated industry association (for project management) will be required. Governments and their ODA or bilateral agency partners must bear this in mind.

10.2.2 Need for a Development Assistance Model That Encourages Competitiveness

ODA agencies provide development assistance to regions that are often selected on the basis of poverty, population, and economic indicators. Fund distribution formulas also include factor weights related to these indicators. In addition, some ODA providers base their funding decisions on a proportional allocation of resources or economic wealth among specific regions. Such approaches to fund allocation do not necessarily reward regions for improving their competitiveness.

If regions are to become more competitive, ODA providers must make some changes in the mechanisms they use to allocate development funds. While changing national formulas for distributing income to regions is difficult, the access of regions to ODA can be made more competitive to reward regions that are able to improve their competitiveness. For this purpose, CCED assistance funds may have to be created to provide bridging and other forms of capital to regions where public sector investments generally do well. Many regional governments have no incentives to improve the performance of the assets they own or manage.

10.2.3 Project Bundling or Unbundling for Cofinancing

ODA agencies provide important assistance to regions in developing and implementing packages of assistance. Table 10.2 outlines a framework being developed by CCED to guide governments, ODA agencies, and other potential investment partners in providing packages of assistance for specific projects or programs for CCED industry cluster building. Under the framework, priority projects for development assistance are identified in cluster development plans. Some of these projects or activities are then bundled into larger, multi-sector projects, or unbundled into single, stand-alone projects. In much the same way, Clean Development Mechanism (CDM) projects (Ellis 2006) are grouped into programmatic activities carried out by different agencies.

Under the framework, ODA agencies assist CCED processes in different ways. Donor agencies, for example, may be involved in technical assistance

Table 10.2 Framework of Official Development Assistance for CCED Projects

Development Package	Organizational Funding Source					
	Private	Multilateral	Bilateral	Government	NGO, Other	Community
Institutional Governance						
Corporate governance reform			▲	▲		
Institutional capacity building		▲	▲	▲		
Development of SMEs	▲	▲	▲	▲	▲	
Government service delivery		▲		▲		
Government finance		▲		▲		
Management information systems			▲	▲		
Project development and packaging		▲	▲	▲		
Project delivery	▲			▲	▲	▲
Human Resource Development						
Skills development	▲	▲	▲	▲	▲	
Network and cluster development	▲	▲	▲	▲	▲	
Financial Capital						
Regional finance and capital markets	▲	▲	▲	▲		
Venture capital	▲	▲				
Strategic Infrastructure						
Regional infrastructure projects		▲				
Economic infrastructure (ports, highways)		▲	▲	▲	▲	
Social infrastructure (education and health)		▲	▲	▲		
Environmental infrastructure (solid waste disposal)	▲	▲	▲	▲	▲	▲
Logistics and one-stop shop facilities	▲	▲	▲	▲		
Marketing intelligence systems	▲		▲			
Catalysts						
Consultation and engagement	▲	▲	▲	▲	▲	▲
Networks, partnerships, and alliances	▲	▲	▲	▲	▲	
Facilities provided by the public sector		▲	▲	▲		
Microfinance for SMEs		▲	▲			
Corporate industry network organization	▲	▲	▲	▲		
Participatory budgeting			▲		▲	▲

NGO = nongovernment organization, SMEs = small and medium enterprises.

Source: Study team.

for capacity building and technology transfer. Others, including international development banks like ADB and the World Bank, would be more directly engaged in project finance. Some areas of assistance, such as institutional capacity building, will appeal more to bilateral agencies or nongovernment organizations and fall within their mandate. Strategic infrastructure projects are more likely to be within the domain of providers of ODA with government sovereign guarantee.

10.2.4 New Governance Mechanisms for a Private Sector–Driven Approach

CCED was initiated by ADB as a better way of assisting in the planning, development, and management of integrated multi-sector projects for industry cluster development and LED in cities. The approach is also intended to heighten collaboration between ODA and other investors. Industry cluster development projects, by their very nature, require multi-faceted programs of assistance, as they build and enhance industry supply chain capacity and add value to local production systems, and therefore take longer to complete than physical infrastructure projects. Traditional governance systems, coordinated through the public sector, are not particularly suited to these types of projects. Many of the current arrangements are far from satisfactory and do not deliver sustainable economic development outcomes for cluster development.

One governance model being developed by CCED calls for industry cluster task forces, with representatives from industry, government, and education and training institutions, to draw up cluster business plans and develop pre-feasibility packages into bankable projects that ODA and business partnerships can fund. The Sri Lankan rubber industry, registered as a corporate body, is taking the lead with government in developing a pre-feasibility package of technical, capacity, and infrastructure investment assistance to improve the value chain for the rubber cluster in the Colombo metropolitan region. A similar arrangement has been worked out for the Okhla garment industry cluster in New Delhi. Under these two governance structures, a series of co-investment projects involving the industry, government, ADB, and ODA is being prepared to develop the clusters.

Other governance models will have to be designed for CCED. In Bangladesh, these are likely to be more formalized, as local governments outside Dhaka have very little capacity to provide cluster development support. In India, the process will be assisted more by the state governments, as the central government is encouraging competition among the states and linking investments in strategic infrastructure to local governance reforms under the JNNURM. State government and city governments are

becoming more engaged in a range of governance models for infrastructure development in support of industry clusters and LED. Other Asian countries like the PRC, the Philippines, and Viet Nam are doing the same.

For governments as well as for ODA agencies and development banks, coming up with new and innovative ways of mobilizing resources, improving economic governance, and enhancing the competitiveness of urban systems is a challenge. However, new governance models must be developed and tried if industries and employment in Asian cities are to become more sustainable. It is hoped that CCED will break new ground in this field with the modular yet integrated assistance framework described above, and that strong clusters can be built and LED promoted not only in South Asia but also in other Asian cities, in collaboration with ODA agencies.

10.3 Aiming for Maximum Impact with Limited Resources

Poverty incidence in Asia and the Pacific is the highest in the world. The region is home to two thirds of the world's poor, particularly in agriculture. In Asia, more than 43% of those employed are in agriculture, yet the sector contributed only 11% to the GDP of the region in 2006. The economic slowdown that started in 2007 has curtailed progress toward the Millennium Development Goals and cut GDP growth in half in 2009, compared with achievements in the past decade. A strategic approach to inclusive growth that will allow the underemployed or unemployed to move from less to more productive economic activities must be found. The approach must take into account both the rural and the urban poor.

At the same time, the economic challenges in developing Asian countries have become more complex: urban populations are growing at great cost to the environment; climate change has increased the risk of natural disasters; and income gaps within and between developing countries are widening. These factors cause diminishing sustainable growth and development in the urban areas. Integrated, sustainable urbanization, which includes various dimensions of urban physical planning and pinpoints required actions, has not yet succeeded.

International development policies have paid scant attention to mSMEs, despite evidence that economic growth is significantly correlated with the abundance of these businesses in urban areas. Economic research is starting to pay attention to the links between mSMEs and industrial clusters, which offer advantages to regional development like higher multiplier effects for job creation, reduced business costs, efficient management of industrial

by-products, and reduced waste. Urban development projects have nonetheless been conventionally equated with basic urban infrastructure and services, such as water supply, sanitation, roads, and waste management. The development approach can be seen as reactive—simply filling the gaps in infrastructure services in rapidly urbanizing areas.

Is there an alternative approach that addresses the realities of urban development more proactively? Can that approach deal effectively with the complexities of the urban economy, environment, and society? Are there better ways of achieving maximum impact with limited resources? How can such information be prioritized and provided to policy makers to help them make better decisions for development?

As Asian economies become more market driven and Asian cities are integrated into global supply chains, the development of cities is becoming quite differentiated. Primary cities are magnets for investment and industrialization, while subnational towns and cities lack competitiveness and therefore struggle to develop. With the internationalization of economies, greater industrial agglomeration, and economic specialization, the structure of urban economies across the region is changing. Cities like Hyderabad and Mumbai are now important global centers of ICT, finance, and multimedia, while Dhaka and Delhi are among the largest production centers of ready-made garments in the world. National and international companies and multinationals seek to invest in places that offer competitive advantage in terms of access to resources, infrastructure, a healthy environment, and the skills required for the goods and services they produce. Business and industrial agglomerations are expanding spatially in cities, and taking the form of industry clusters.

CCED is a local economic development strategy initiated by ADB. The initiative (i) combines the business cluster concept (Porter 1985) with urban development, (ii) transforms the concept into practice in terms of geo-spatial and physical development, and (iii) attempts to stimulate the development of industry clusters by responding to their infrastructure needs, and promotes environmentally sustainable and inclusive development. Industry clusters grow in places where businesses have competitive advantage, based on the city's specialization. They offer shared access to common infrastructure, well-developed and closely linked supply chains and networks, and concentrations of human resources and skills, which help to reduce production and transaction costs. Industry clusters are recognized internationally as major drivers of local economic development.

The CCED approach requires implementers to identify, measure, and understand the drivers of competitiveness that are important to the development of urban economies. A better understanding of the attributes of

competitiveness enables policy makers and investors to target key investments by government and business that will strengthen the enabling environment for cluster-driven local economic development. The three principles behind the CCED approach (see under "Continuous Strengthening of the Three Key Principles" above) are continually strengthened in the process.

Overall, the literature has focused on evaluating and analyzing existing clusters, and reporting whether they are performing well or not and what factors are responsible for their success or lack of it. Researchers tend to assume that clusters are formed spontaneously. There is almost no policy development or understanding related to how competitive advantage can be created through demand-side responses in Asian contexts. This book presents an analytical approach to identifying competitive industry clusters and the comparative advantage or deficiencies of given urban regions, and tests the replicability of the framework in pilot cases in three countries (Bangladesh, India, and Sri Lanka). The CCED approach also aims to induce functional industry clusters by helping to provide their growth needs (for example, R&D, vocational skills training, electricity, transportation, or logistics). Clustering has many advantages: economies of scale allow market information, knowledge, new technology, and innovations in product design to be shared and lower the costs of doing business. Governments can increase their tax base as land values and corporate income taxes increase.

The analytical assessment indicates that this CCED approach will help cities, policy makers, and other stakeholders to (i) identify spatial clusters of industries that are competitive but dormant or that should improve their environmental infrastructure; (ii) target strategic investments in critical infrastructure and capacity building for sustainable economic development at the local level, taking environmental issues into account; and (iii) make informed decisions on where to invest first and what to invest to maximize economic impact with limited resources. But, ultimately, the intended longer term impact of CCED is to provide more job and income opportunities in both urban and rural areas for poverty reduction.

10.4 Key Observations: A Summary

The CCED study shows the sizable expansion of the service sector; the emergence of spatial industry clusters within metropolitan regions; and rising specialization at the sub-metropolitan level. Cities are increasingly important in the development of local regional economies because they create markets and new opportunities for rural-based industries. They are also havens for employment for the growing numbers of people who are forced to leave the land.

Changes in the political economy and economic policy. There is a strong disconnect between national economic policy and urban development policy in South Asia. Until recent years, the focus of economic development policy was on rural development, yet more than 60% of GDP is produced in the cities. The CCED analysis reveals an urgent need for policy reforms that support local economic development to strengthen the capacity and competitiveness of regional economies and stimulate export and endogenous growth. Policy and industry support programs must switch emphasis from supply-side to demand-side initiatives.

The need to enhance the competitiveness of cities. The studies in the three countries showed important structural weaknesses in urban economies and identified areas where governments must take action to stimulate new investment and development. Critical needs to be considered in efforts to improve the competitiveness of cities across the region include government support for industry and governance; the logistics of supply chains; and human capacity development to provide the skills that businesses and government must have to operate in a more competitive and open market environment.

Tools for the competitive analysis of urban economies. The application of location quotient, input/output, shift-share, multi-sector, and cluster analysis provided new, detailed insights into the structure and dynamics of three metropolitan economies. Few cities in Asia have the data required to monitor economic performance and to evaluate the impact of development proposals. Better economic models of urban economies for evaluating investment and project development, environmental, and social impact are required.

Analysis of the strategic intervention areas of industry clusters. The analysis of competitive attributes of industry clusters using Michael Porter's diamond model linked to the five factor conditions and the elements of a strategic approach to industry cluster competitiveness has proved to be a very useful analytical tool for CCED, especially in identifying critical weaknesses and deficiency gaps that must be strengthened to develop local economies and industry clusters. The process provides a sound foundation for action plans that will enable governments to make strategic interventions that will strengthen critical strategic infrastructure, services, and governance systems, and develop human capital to meet the needs of industry clusters. The analysis also enables priorities to be set for strategic investments, and partnerships for co-investment and development to be identified.

Improved pathways to sustainable development. An important learning outcome for CCED is that it provides detailed insights into strategic investments, setting up pathways that will result in more sustainable local

economic development through multi-sector, multi-tiered linkages. The difficulty in developing local economies in the face of more open competition is that governments and businesses must learn how to engage collaboratively in responding to shocks and opportunities. Local economies are no longer protected from external influences. Nevertheless, getting businesses and governments to understand that local systems must be more attuned to international systems, and to accept that open knowledge platforms and information sharing, competition and collaboration, is critical in creating a pathway to sustainable development in urban economies.

Action learning. The process of engaging with industry representatives, key public agencies, and knowledge industries through "action learning" has been the key success factor in the outcomes achieved through CCED. The process has enabled and motivated industry participants to guide the process and to transfer ownership to key stakeholders from the outset. The outcome has been a series of action plans defining the scope of pre-feasibility studies of investment projects to build key elements of competitiveness for industry clusters and other economic development projects. The action learning process has not been easy, and it has taken considerable effort to win industry backing for a process that offers no guarantee of success, but that creates opportunities to strengthen collaboration between key industry players.

Knowledge development in support of clusters. The CCED study has advanced both theoretical thinking and practical applications on ways to facilitate industry cluster development. Many Asian countries are just beginning to recognize the importance of industry cluster and knowledge development as the new drivers of economic activities. Creating more open and knowledgeable economies and communities has become critical to the building of local and virtual capital. The action-oriented research and development process of analyzing the competitiveness of the nine industry clusters has been an important knowledge development and learning process, with more than 400 people involved in focus group discussions, workshops, seminars, and forums at different stages. The action learning approach has led to noteworthy advances in the cluster analysis of this region. A program for the further dissemination of knowledge from the CCED experience will be developed to ensure the sustainability of the process in supporting local economic development.

10.5 Next Steps

The CCED approach is a concept that is relatively new to most Asian DMCs, except India. Several Asian DMCs have had projects of the cluster type, but

these are still far from generating the true values that come from pursuing the competitiveness of cities and linking along the value-adding supply chain of an industry cluster. ***Wider dissemination, promotion, and more thorough understanding of the CCED approach by governments and the private sector will be required as a next step.***

The CCED offers a new pathway toward competitive cities in the globalizing economy. The African Development Bank, the European Bank for Reconstruction and Development, the Inter-American Development Bank, the United Nations Industrial Development Organization, and the World Bank have all included similar approaches to competitiveness and cluster development in their operations for a decade. Rapidly urbanizing Asian DMCs, faced with global challenges, should turn their attention to this new pathway and consider how it can help them to (i) create more job opportunities and reduce the incidence of poverty, and (ii) respond to global challenges through urbanization. ***The private sector and government must collaborate to achieve competitiveness that benefits them both.***

The CCED analysis provides insightful information about which cities and industry sectors are competitive, and which others are deficient in the conditions necessary for optimal competitiveness. The process can be a powerful tool for the public and private sectors to make informed decisions about where to invest, and to prioritize investments. ***The results of the analysis for a country (or a subregion) can be used to set its policy directions.***

Three industry clusters out of the nine studied (three each from Bangladesh, India, and Sri Lanka) expressed their strong willingness and commitment to work further in coordination with their governments and with support from ADB. The next key action will be pilot CCED projects with strong environmental improvement features and income opportunities for the poor living around the industry cluster. An industry cluster in Sri Lanka has proposed such a pilot project. Sri Lanka's rubber industry, comprising its rubber plantations and rubber product manufacturers, has a total turnover of over $800 million per year and accounts for more than 6.5% of the country's manufacturing exports, besides serving a major part of local needs. The industry directly employs over 250,000 persons and indirectly provides work for over 50,000, through a cluster of related and supporting industries. The growth of the industry is helping to stimulate the economy and create more jobs for the urban population as well as for poor farmers working on the rubber plantations. ***An adequate industry wastewater treatment plant proposed by the rubber industry cluster in Sri Lanka awaits investors.***

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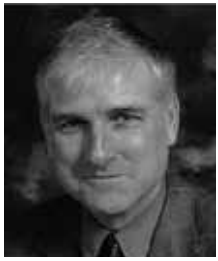

Brian Herbert Roberts, director, SPMS. During the past 30 years, as a professional planner, project manager, academic, and adviser, Brian Roberts has been involved in a wide range of urban and regional planning, urban management, institutional capacity building, land management and administration, and economic development projects in more than 25 countries. He has held senior positions with the United Nations Centre for Human Settlements, the Queensland (Australia) state government, two academic institutions, and the consulting industry. Many of these positions have involved responsibility for managing very large and complex multidisciplinary projects, overseeing national and regional institutional reform programs, developing national urban management policy, higher-level education and training, and briefing heads of state and ministers in several countries. Recently, Brian Roberts has been involved in teaching and research, and authoring or coauthoring 100 conference papers, journal articles, book chapters, and books, including a textbook on regional economic development.

Competitive Cities in the 21st Century
Cluster-Based Local Economic Development

Economic challenges in developing Asian countries have become more complex: urban populations are growing at great cost to the environment, climate change has increased risks of natural disasters, and income gaps within and between developing countries are widening. These factors threaten the sustainable growth and development of urban areas, the drivers of Asia's economy. A strategic approach for inclusive growth is needed. The City Cluster Economic Development approach provides a strategic framework and a set of analytical tools, which governments, businesses, and communities can use to support the inclusive and sustainable development of competitive urban economies in Asia. Said approach was developed and tested by the Asian Development Bank to improve the basis for integrated planning and development of urban regions in Asia and the Pacific. It also helps urban managers and other city stakeholders identify action plans and determine priority investment areas.

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Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org
ISBN 978-92-9092-431-9
Publication Stock No. BKK113970

Printed on recycled paper

ISBN 978-92-9092-431-9
9 789290 924319

Printed in the Philippines