9. Malaysia

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INTRODUCTION

During the past 15 years, Malaysia has experienced rapid urbanization and its economy has undergone major changes. These changes have led to a significant influx of rural people and migrants to urban centers, bringing about pressure on local and state governments to provide land for development and infrastructure and housing for growing urban populations. The latest national statistics are shown in Table 9.1.

Table 9.1: Country Development Profile, Malaysia

Human Development Index rank of 177 countries (2003)^	61
GDP growth (annual %, 2004)	7.06
GNI per capita, Atlas method (current $, 2004)	4,650
GNI, Atlas method (current $ billion, 2004)	117.1
GDP per capita PPP ($, 2003) ^	9,512
GDP PPP ($ billion, 2003) ^	235.7
Population growth (annual 2005–2010, %) #	1.66
Population, total (million, 2005) #	25.33
Urban population, total (million, 2005) #	16.48
Urban population percent of total population (2005) #	65
Population largest city: Kuala Lumpur (2005, million)	1.39
Population growth: 16 capital cities or agglomerations > 750,000 inhabitants 2000#	
- Est. average growth of capital cities or urban agglomerations 2005–2015 (%)	28
- Number of capital cities or urban agglomerations with growth > 50%, 2005–2015	1
- Number of capital cities or urban agglomerations with growth over 30%, 2005–2015	4
Sanitation, % of urban population with access to improved sanitation (2002)**	96
Water, % of urban population with access to improved water sources (2002)**	96
Slum population, % of urban population (2001)**	2
Slum population in urban areas (2001, million)**	0.26
Poverty, % of urban population below national poverty line (2001)**	n.a.
Aid (Net ODA received, $ million, 2003)^	109.1
Aid as a share of Country Income (Net ODA/GNI, 2003 %)*	0.1
Aid per capita (current $, 2003)^	4.4

GDP = gross domestic product, GNI = gross national income, ODA = official development assistance, PPP = purchasing power parity.
Sources: See Footnote Table 3.1; World Bank (2005); OECD (2003); United Nations (2004, 2005).

This chapter examines trends and issues concerned with urbanization in Malaysia. It presents three case studies demonstrating sustainable aspects of urban region development: Planning of Petaling Jaya satellite new town; Putrajaya Wetland Lake development; and innovation and change involving the Cyberjaya Multimedia Super Corridor. The chapter then discusses lessons learned and sustainable urban strategies for the future.

COUNTRY CONTEXT

Political Structure

Malaysia consists of two distinct land regions: Peninsula Malaysia, which shares common land borders with Thailand and Singapore; and the eastern states of Sabah and Sarawak in northwestern Borneo, where it shares a common land boundary with Brunei Darussalam and Indonesia. There are 11 states in Peninsula Malaysia—Perlis, Kedah, Penang, Perak, Selangor, Negri Sembilan, Melaka, Johor, Pahang, Trengganu, and Kelantan.

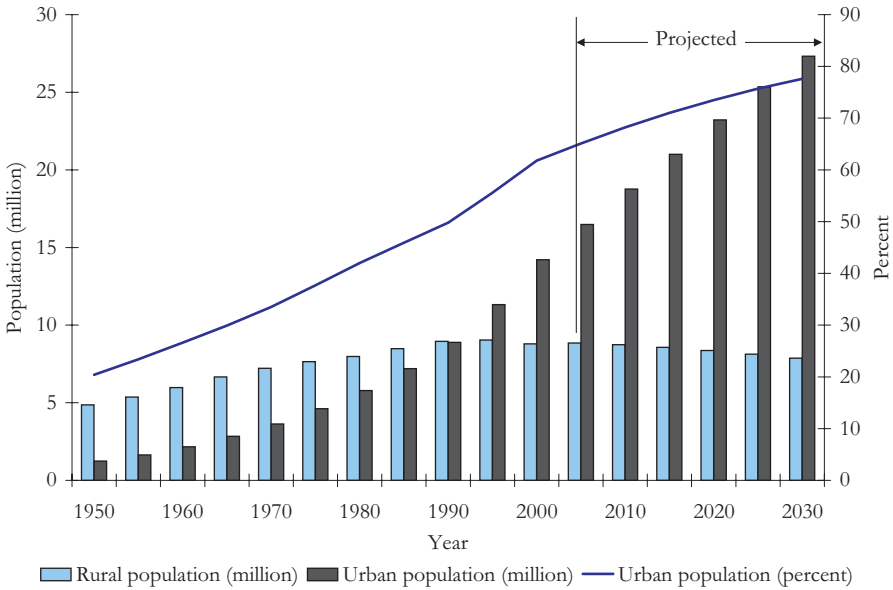
Population and Urbanization

Malaysia is a multicultural and multiracial society of about 25 million people where ethnic Malays, Chinese, and Indians live together in relative harmony. According to Agus (2002, p. 130), the tempo of urbanization for all ethnic groups in Malaysia during 1970–1980 was faster than in 1957–1970, but the Malays had the fastest rate of urbanization. The increasing relocation of *bumiputras* (bumiputra means the "sons of the soil" and it refers to the indigenous people of Malaysia) to cities resulted in a reduced Chinese majority in the urban areas.[1] During 1980–1990, urban population increased by 3.1.million. Of this increase, 10.3% was due to net migration, 52.3% from natural increase, and 37.4% from net urban boundary adjustments. As Figure 9.1 illustrates, the trend is that the rural population is on the decline and will enter negative growth after 2010. The rural population by 2030 is projected to decline to 7.9 million compared with 27.3 million people in urban areas.

GOOD PRACTICE CASE STUDIES

The chosen good practice study cases are Petaling Jaya, Putrajaya, and Cyberjaya. All three are located in Kelang Valley in the state of Selangor, which is

Figure 9.1: Trends in Urban and Rural Population, Malaysia



the fastest- growing region in Malaysia. They are pioneer model projects and represent milestones in the country's sustainable urban development.

Petaling Jaya is the earliest satellite new town, planned in the 1950s to alleviate the increasing congestion of the capital city, Kuala Lumpur. It has a total area of 51.4 square kilometers ($km^{2)}$ and gained the status of a municipality in 1977. It has developed into an important city in the urban conurbation of Kuala Lumpur with a population of about half a million people governed by Petaling Jaya Municipality. Local Agenda 21 was successfully implemented there in 2000.

Putrajaya is the new administrative seat of the Malaysian Government, following the Government's decision in June 1993 to relocate the federal administrative capital from Kuala Lumpur to the district of Sepang in Selangor. The relocation is part of the decentralization effort as well as a means to alleviate traffic congestion in Kuala Lumpur and ensure its continued development as Malaysia's premier business hub. Putrajaya is a model city planned with "great respect for the environment" (Putrajaya Malaysia tourist information pamphlet). The city plans to embrace two main themes: city in a garden and "intelligent city."

The construction of Putrajaya commenced in October 1996. By 2005, it had about 80,000 inhabitants, with modern and "smart" public amenities and infrastructure. Putrajaya is equipped with a good inter- and intra-city transport system, including monorail and water taxis, a broadband global

Figure 9.2: Map Showing Location of the Case Studies

multimedia communication platform, and a common utility tunnel for services, hospitals, and schools. About 38% of the land is being developed into parkland. Putrajaya has the largest man-made wetland in Malaysia with a total area of about 160 hectares (ha), which is used for recreational activities as well as scientific and biological research.

Cyberjaya is the multimedia super corridor (MSC) city dedicated to multimedia companies. It is the national information technology (IT) hub of Malaysia. It is adjacent to Putrajaya and is surrounded by other MSC clusters such as "telesuburbs," a high-tech park, and cyber-village and airport city. The development started in 1996 with seven flagship applications and 50 world-class companies. Cyberjaya exemplifies a planned city open to innovation and change and seems ready to take advantage of the opportunity of global IT development.

Petaling Jaya: Local Agenda 21 Implementation

Background

GOOD PRACTICE	
Good Governance	✓
Urban Management	
Infrastructure/Service Provision	✓
Financing and Cost Recovery	
Sustainability	✓
Innovation and Change	✓
Leveraging ODA	

Along with many other countries in the world, Malaysia has implemented Local Agenda 21. Agenda 21 is a comprehensive plan of action developed at the Rio Earth Summit in 1992 to be taken globally, nationally, and locally by organizations of the United Nations System, governments, and major groups in every area in which humans impact on the environment. Local Agenda 21 has been used as a program for cooperation between local authorities, communities, and the private sector to plan and manage their built and natural environments toward sustainable development.

It can be described as a local action plan aiming at sustainable development in the 21st century. Petaling Jaya Municipal Council carried out a Local Agenda 21 Pilot Project for 2 years starting in early 2000 (Lee 2001).[2] It was selected due to its commitment, geographical location, capacity, and existence as a community-based organization in promoting community development.

Petaling Jaya is a satellite town of the federal capital, Kuala Lumpur. It is located in the district of Petaling, State of Selangor. It was established in 1952 with an area of 19.9 km^2 and was originally planned to accommodate 70,000 people to help relieve the problem of congestion in Kuala Lumpur and provide new homes and job opportunities. Petaling Jaya experienced rapid urbanization as more people from rural areas migrated to the town, leading to the development of Sungai Way and Subang districts and more than 50 other

Table 9.2: Land Use, Petaling Jaya

Land Use	Proportion (%)
Housing	52.1
Industry	14.3
Commerce	6.4
Public facilities	4.5
Open space and recreation	8.8
Institutions	0.3
Infrastructure	9.2
Others	4.4
Total	100

Source: Petaling Jaya Municipal Council.

new areas within the jurisdiction of the municipality.[3] With the growth of the town, the Petaling Jaya Town Authority was upgraded to the Petaling Jaya Municipal Council in 1977. Petaling Jaya has since expanded to about five times its original size, covering an area of about 97.2 km^2, with a population of 486,040 (2005).

The Petaling Jaya Municipality is Malaysia's first and largest industrial area. It acts as one of the center hubs of Klang Valley (comprising Kuala Lumpur, Petaling Jaya, Shah Alam, Subang Jaya, and surrounding areas) for industry. Table 9.2 shows the major land use of the municipality. Housing and industry are the two major land uses, constituting about two thirds of the municipality's total land area.

Implementation of Local Agenda 21

The state of Selangor, one of the most developed states in Peninsular Malaysia, was the first to draft a sustainable development strategy toward a more developed state by 2005. The Petaling Jaya Municipal Council (MPPJ) adopted the Selangor Sustainable Development Strategies and Selangor Agenda 21 as a guide in formulating its action plans, publicity program, courses, and training for the Local Agenda 21 Petaling Jaya program.

The broad Local Agenda 21 initiatives, national policies, Selangor Agenda 21, and the local authority's policies were all compiled and presented to the community at large for their feedback and consideration. The Local Agenda 21 Petaling Jaya pilot project (2000–2002) planning process, following the United Nations Development Program (UNDP), aims to (Ministry of Housing et al. 2002, 28):

(i) balance economic, community, and environmental interests and considerations into projects, processes, and strategies;

(ii) fully engage a wide local stakeholders' group to get a range of views and interests, particularly those who will benefit from or be affected by the outcome of the planning process; and
(iii) create mechanisms and strategies that can be maintained over the long term to address various issues in an in-depth and sustained manner.

There are six main stages in the Local Agenda 21 Petaling Jaya planning process:

(i) formulation of a community vision and the aspirations of stakeholders;
(ii) formation of partnership (local authority, community, and businesses);
(iii) community input (community-based issues, local knowledge);
(iv) drafting of action plan (formalized agreed objectives, targets, commitments);
(v) implementation and monitoring (stakeholders monitor activities); and
(vi) evaluation and feedback (medium- and long-term review).

A total of 150 participants representing 80 organizations participated in the formulation of the community vision during a 2-day workshop in 2000. They included representatives from nongovernment organizations (NGOs), resident associations, schools, the private sector, and government agencies. The adopted community vision states:

> *The MPPJ, communities, and other agencies in Petaling Jaya give our commitment to solve the identified issues through greater participation, consultation, and awareness-raising process in building a comfortable, harmonious and healthy city within the sustainable environment. (MPPJ, 2000, p. 4)*

Following the establishment of the community vision as a common direction and mandate, a Local Agenda 21 Petaling Jaya Committee was set up with the mayor of MPPJ as the chairperson.[4] The Local Agenda 21 Committee consists of 37 members, comprising representatives from NGOs, community-building organizations, religious institutions, the private sector, government agencies, and the MPPJ. A especially formulated Local Agenda 21 Petaling Jaya logo and slogan "Petaling Jaya: Toward Sustainable Development" was used to create public awareness shared identity and enhance ownership.

A second workshop was organized to disseminate the common vision to a large number of residents and stakeholders to obtain their feedback and reach a consensus. In the second workshop, the participants identified three

neighborhood areas—SS 21, SS 22, and PJS 2—in Petaling Jaya to be the Local Agenda 21 PJ pilot project sites. Since 2000, six working committees[5] have been set up. Three of them were formed according to major themes of the common vision, i.e., safety, social integration, and environment. The other three working committees were established according to the geographical locations of the selected neighborhoods (SS 21, SS 22, and PJS 2). The working committees then formed three action plan committees:

- Social Integration Working Committee (SS 21) – strengthening the relationship of the neighborhood;
- Environment Working Committee (SS 22) – domestic waste management; and
- Safety Working Committee (PJS 2) – petty crime prevention and vandalism action plan.

Discussions were held to improve participation in the Local Agenda 21 action plan formulation, using such techniques as logical framework analysis, SWOT analysis, and card systems. The aim was to ensure that all action plans had been formulated through effective roundtable and multi-stakeholder discussions. Table 9.3 gives an illustration of the detailed activities and programs implemented under the respective action plans.

From the pilot program implementation, shown above, residents were found to be more concerned with daily pressing problems such as recycling, safety, vandalism, and service quality, rather than global environmental issues such as global warming and biodiversity. The working committee for the action plans showed a tendency to emphasize local rather than global matters. This emphasis continued into the current phases of Local Agenda 21 PJ implementation.[6] Another interesting finding was that a heightened neighborhood spirit can be fostered through innovative initiatives and community-based activities, such as neighborhood competitions, recycling campaigns, and ecological projects.[7]

Lessons Learned

The experience from the pilot projects as shared by MPPJ Petaling Jaya Local Agenda 21 Officer, Lee Lih Shyan, demonstrates several key learning elements in Local Agenda 21 implementation. These concern capacity building, institutional and mechanism arrangements, leadership, and information accessibility.

Capacity building of the stakeholders should be a continuous process to promote stakeholder understanding of sustainable development. As demonstrated by the Local Agenda 21 Petaling Jaya pilot project implementa-

Table 9.3: Programs Implemented under Working Committees

Working Committee	Programs
Environment	a) Briefing of recycling project in schools
	b) Demonstration of kitchen and garden waste composting
	c) Distribution of brochure on recycling
	d) Establishment of community recycling
	e) Awareness and training program
	f) Natural and organic food carnival with NGO
Social Integration	a) Family day
	b) Best neighborhood competition
	c) Consultation with disabled people
	d) Festive season celebration
Safety	a) Safety and security guidebook
	b) Neighborhood watch scheme
	c) Fire hydrant adoption scheme
	d) Exhibition on anti-vandalism
Other initiatives	a) Section 17 town center beautification and cleanliness activities
	b) Advertising and billboard to promote LA21
	c) Publication of publicity materials
	d) Website creation: www.mppj.gov.my/la21
	e) Stakeholder training
	f) Operation of community ICT center at section 17 through partnership with MPPJ, PIKOM, and PJCC
	g) Consultation process on planning and development projects (town park, traffic control, etc.)

ICT = information and communications technology, LA = Local Agenda, MPPJ = Petaling Jaya Municipal Council, NGO = nongovernment organization, PIKOM = Persatuan Industri Komputer dan Mutimedia Malaysia or Association of the Computer and Multimedia Industries of Malaysia.
Source: Petaling Jaya Municipal Council 2005.

tion, this is best achieved through awareness and education programs such as training, workshops, and group discussions or seminars. The participation of professionals and experts, academicians, NGOs, and local authorities help promote stakeholders' understanding of the problems faced by the authorities as well as the general public.

At the local authority level, institutional arrangements, such as the setting up of multidisciplinary departments, multi-stakeholders' groups, and multisectoral committees, are useful in leading to better understanding and consistency of policies about sustainable development. The participation of local leaders in Local Agenda 21 pilot projects is another critical success factor because they have the ability to influence, educate, and initiate ideas in the community to promote Local Agenda 21 implementation. To enhance participation and dissemination of information to a wide group, information and communications technology (ICT) is employed as an effective tool to

facilitate effective communication. A high penetration rate of ICT among the community members will further enhance participation, transparency, equity, responsiveness, and efficiency in the local delivery service system and planning process.

The successful implementation of Local Agenda Petaling Jaya 21 pilot projects has led to current key ecological projects, such as Kelana Jaya lake rehabilitation scheme, Stream Keepers Handbook project, and Sungei Penchala Rehabilitation program.

The implementation of these projects illustrates the confidence and strong partnership with various stakeholders as well as funding and support from local groups and international agencies, such as the Danish International Development Agency, Canadian International Development Agency, and UNDP-Global Environment Facility (UNDP-GEF). Specifically, these projects aim at improving the quality of water from the current standard IV to standard IIB that is suitable for recreational purposes. Strong partnership spirit and active participation can be seen from the involvement of the Section 19 Resident Association in monitoring water quality, launching the State Irrigation and Drainage project of "One State-One River Pilot Scheme," and launching environmental brigades by the Malaysian Department of Environment. They demonstrate the workability of community-based participation and development.

Putrajaya, Model City of Sustainable Development

Background

GOOD PRACTICE	
Good Governance	
Urban Management	
Infrastructure/Service Provision	
Financing and Cost Recovery	
Sustainability	✓
Innovation and Change	✓
Leveraging ODA	

Putrajaya is the country's largest urban development project on a greenfield site, set to be a model city of sustainable development. It is 25 km from Kuala Lumpur City and 20 km from Kuala Lumpur International Airport. It is situated within the southern growth corridor and MSC, 5 km from Cyberjaya. It has an area of 4,931 ha (about one third the size of Kuala Lumpur) with a target population of 330,000 (2010) and daytime population of 500,000 (Table 9.4). To accommodate this population, a total of 67,000 detached and row housing and condominiums are planned, with 3.8 million m^2 of government and 3.4 million m^2 of commercial land use in eight precincts.

In terms of land use distribution, as an administrative center, Putrajaya has a high percentage of government institutional (53%) and commercial land

use (29%), followed by a relatively high percentage of green area (38%). Government use; mixed development; and civic, cultural, commercial, sports, and recreational precincts are located in the core area, while the residential areas and diplomatic enclave are on the periphery. A large tract of greenery is important to ensure the implementation of the garden city concept where landscaping and water bodies are prominent components.

Table 9.4: Population and Area of Putrajaya

Area	4,931 hectares
Land use	
- Government	53.0%
- Commercial	29.0%
- Residential	25.8%
- Civic and cultural	0.2%
- Public facilities	10.1%
- Utility and infrastructure	18.2%
- Green area	37.5%
Planned population	330,000
Daytime population	500,000
Government	3.8 million m^2
Commercial	3.4 million m^2
Planned housing units	67,000 units

Source: Putrajaya Holding 2005.

The intention is to build a city that reflects the natural and cultural heritage of the country with the capacity and amenities to meet the challenges of the millennium (Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd 1999, p. 13). Its residents can look forward to a diverse range of entertainment, sports, leisure, and recreational activities, both indoor and outdoor. Businesses can locate or invest in a wide range of commercial products from an A grade office to business parks, hotel developments, or other leisure/entertainment/retail and waterfront projects. Approved businesses/industries will also receive and enjoy various incentives.

The city development is in two phases over a period of 15 years. Phase 1 (1996–2000) and Phase 2 (2000–2010). Putrajaya Holdings Sdn Bhd, the developer of the township, was incorporated in 1995; Perbadanan Putrajaya was incorporated (1996) as the body to administer and manage Putrajaya.

Table 9.5 shows the development position of Putrajaya in 2003, with a population of about 40,000 people, which was to double to 80,000 by end 2005 with an additional 9,700 housing units. Population growth depends greatly on the speed of construction of the government buildings, which is the main source of employment in the city's initial stage of development.

In 2003, more than 2 million m^2 or half of the government buildings were completed/under construction. In addition, about 20,000 houses were completed/under construction. The housing was built largely for public servants and their families.

Table 9.5: Existing Putrajaya Population and Status (2003)

Planning Information	Size (Status)
Resident population	40,000
Government office worker	13,200
Government offices	802,319 m^2 (completed)
	1,203,694.3 m^2 (under construction)
Commercial spaces	28,110 m^2 (completed)
	148,645 m^2 (under construction)
Housing units	9,711 units (completed)
	10,991 units (under construction)

Source: Putrajaya Holding 2005.

An already completed development is the Putrajaya Lake and Wetlands, which is in the heart of the city and is a critical component of the project. Built to demonstrate the benefits of incorporating the wetlands ecosystem into an urban area, Putrajaya Wetlands is next discussed as a good practice case in sustainability. The key environment-friendly solution of constructing the wetlands is to treat catchment water before it enters the Putrajaya Lake, thus ensuring that the water in Putrajaya Lake remains clean and unpolluted. The 197 ha Putrajaya Wetlands is one of the largest freshwater wetlands in the tropics (Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd 1999). It is Malaysia's first such project and represents a milestone in its urban development.

Implementation of Putrajaya Wetlands

Central to the development objective of Putrajaya as a model city of sustainable development is the concept of a "city in a garden." The planners incorporated nature through greening programs and creating Putrajaya Lake as an integral part of the urban development concept. The 400 ha Putrajaya Lake, created by damming the two rivers, River Chuau and River Bisa, forms the centerpiece and distinctive identity of the new city.

Studies of the Putrajaya catchment revealed the presence of increased pollutant levels in the lake's water from upstream sources and outside the city's development boundary. Sustaining the long-term urban development of the wetlands is proposed with the aim "to create a self-sustaining and balanced ecosystem in Putrajaya" (Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd 1999, p. 37). Wetlands are defined as "land inundated with tempo-

rary or permanent water that is usually slow moving or stationary, shallow, either fresh, brackish or saline, where the inundation determines the types and productivity of soils and the plant and animal communities" (Ramsar Convention 1971, cited in Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd 1999, p. 21).

Putrajaya Lake is a constructed wetland with human-made systems that involve altering the existing terrain to simulate natural wetland conditions. This is primarily designed to replicate observations that wetlands purify water by removing organic compounds and oxidizing ammonia, reducing nitrates, and removing phosphorous. The mechanisms are complex and involve bacteria oxidation, filtration, sedimentation, and chemical precipitation.

Among the goals of the wetland development are to construct a self-sustaining, balanced lake and tropical wetland ecosystem to guarantee the high quality of the lake water, and to develop a natural habitat of public conservation of indigenous wetland flora and fauna. Research and knowledge of the role of natural wetlands in water resource management, especially controlling water pollution have helped construct this man-made wetland that replicates an environment-friendly ecosystem. Even so, given its size, the fast-track nature of the project, catchment management, and the presence of numerous inlets, several key challenges in its development confront even its innovative lake design.[8]

The Putrajaya Wetlands has been constructed to remove pollutants from the catchment before it enters the lake. A series of wetlands is to be constructed to filter and cleanse the water that enters the lake. As with many other development projects, the Putrajaya Wetlands showcase predominantly Malaysian resources. They are a product of a dedicated team of Malaysian scientists in various disciplines working together to combine international

Table 9.6: Principal Features of Putrajaya Lake and Putrajaya Wetlands

A. Putrajaya Lake

Catchment area	Water level	Surface area	Storage volume	Average depth	Average catchment inflow	Average retention time
50.9 km^2	RL 21 m	400 hectares	26.5 million m^3	6.6 m	200 million liters/day	132 days

B. Putrajaya Wetlands (Area in ha)

Total area	Planted area	Open water	Weirs and islands	Zone of intermittent inundation	Maintenance tracks
197.2	77.7	76.8	9.6	23.7	9.4

ha = hectare, m = meter, m^3 = cubic meter.
Source: Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd, 1999, 16 and 34.

and local research to provide an acceptable solution to meet system design criteria, including minimum lake design standards for phosphorus, nitrogen, suspended solids, and bacteria. It is an innovative design, especially the multicell and multi-stage approach layout. This design strategy ensures the better distribution of flow across wetlands and maximizes shallow areas required for successful growth of aquatic plants in the filtration and cleansing function. This approach also permits cost-effective maintenance of the lake.

A total of 24 wetlands cells are being created based on the height of the water level and classified as upper, central, and lower cells. Within each cell, the water depth varies from 0.5 meters (m) to 3 m to allow downstream flow direction. Each wetland cell is designed to create zones of wetland and intermittent inundation. Aquatic plants are established in the wetland zones where the primary role is filtration by intercepting pollutants. The wetland zones are permanently flooded. The zone of intermittent inundation on the lower slope of the inundated area is flooded only during high flows.

Putrajaya Wetland Lake is composed of three control levels, namely, normal water level, weir overflow level, and major flood level. The detention storage level is between normal water level and weir overflow level only. Orifice control is used to increase the wetland retention time and control the release of floodwater during flooding.[9] Beyond design and construction, the quality of the water is continuously monitored and managed by the wetlands management department.

The Putrajaya wetlands management has also implemented an extensive public education program to foster greater community awareness and participation in environmental conservation. With the wetlands construction, Putrajaya Lake and its environs have "altered from a terrestrial plantation [of oil palm and rubber] into a marsh of aquatic plants (in the wetlands itself) and banks of riparian and littoral vegetation" (Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd, 1999, p. 107). It has become an important part of the green corridor linking Putrajaya to the surrounding forest reserves.

Lessons Learned

The Putrajaya Wetlands project illustrates the benefits of incorporating wetland ecosystems into urban development. It demonstrates how a country with vision, determination, and planning may draw inspiration from nature to solve an urban problem, which is not just of local but also of global significance. As the former Malaysian prime minister said: "We call upon the global community to target at least 30% of the earth's terrestrial area to be greened by the year 2000…The greening of the world will hopefully inspire a new spirit of international cooperation and partnership in which global resources are fairly

shared. If successful, we would have solved, at least partially, an important environmental problem" (Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd 1999, p. 11).

Wetlands, whether natural or man-made, can be planned as an integral part of a city's urban greening and further harnessed as an environmental-friendly solution to improve water quality and urban aesthetics, with a wider role for ecotourism, public education, and scientific research. This, as the Malaysian case demonstrates, clearly requires careful planning at the design, construction, and management phases, and engagement of the entire community. Herein lies the challenge as well as opportunity for harmonious coexistence of humans and the environment. The Malaysian case of wetlands in urban planning holds relevance for other cities in other countries seeking to improve the quality of life and water resource management in urban areas.

Cyberjaya Multimedia Super Corridor, Innovation and Change

Background

GOOD PRACTICE	
Good Governance	✓
Urban Management	
Infrastructure/Service Provision	
Financing and Cost Recovery	
Sustainability	✓
Innovation and Change	✓
Leveraging ODA	

The Cyberjaya intelligent city is located at the center of a rapidly expanding technology region, the MSC. This technology region is Malaysia's first development initiative to move the economy from traditional manufacturing to a knowledge economy. The MSC, to be developed in three phases during 1996–2020, is located to the south of the Kuala Lumpur Metropolitan Area. Covering an area of 15 km by 50 km, the corridor stretches from Kuala Lumpur City Center in the north to the Kuala Lumpur International Airport in the south, with Cyberjaya and Putrajaya, the new administrative capital, in the middle. By 2020, there will be 12 intelligent cities. The Multimedia Development Corporation (MDC) is especially set up and empowered by an act of Parliament to spearhead MSC development. The MSC is set to offer an attractive physical, legal, and financial environment for both indigenous and foreign ICT companies to create products and services for the global market. In addition to good infrastructure, the MSC provides cyber laws to protect the intellectual property of ICT firms. Both local and foreign firms are eligible to apply and receive MSC status,[10] special incentives that include tax-free status for up to 10 years, duty-free imports of equipment, and unrestricted employment of foreign ICT workers (MDC 2004).

Implementation of Cyberjaya

Cyberjaya, at the center of MSC, acts as the main catalyst for the region's economic and ICT growth. It is the first intelligent garden city planned and developed by Malaysian planners. The development of the 2,894 ha site started in 1997 and was officially launched on 8 July 1999. Due for completion in 2011, total project cost is expected to be in the region of $5.3 billion.

The township is planned with easy access to the nearby cities of Kuala Lumpur and Shah Alam. The Express Rail Link, for example, connects Cyberjaya to the center of Kuala Lumpur. Several planning zones facilitate phased development.[11] The central area of Cyberjaya, called the flagship zones and covering almost half of the total land area, is made up of enterprise, commercial, and residential zones. The rest of the technology township is allocated for public facilities, green areas, and recreational areas. Unlike many other technology-based townships, Cyberjaya is a self-contained area with emphasis on eco-friendly, low-density development that preserves nature and maintains a good landscape for an excellent quality of life.[12]

The development of MSC is supported by a high-capacity, digital telecommunications infrastructure designed to meet international standards in aspects of capacity, reliability, and pricing.[13] As a technology township, Cyberjaya is to be provided with a broad range of the latest technology infrastructure, including

- international and national fiber-optic backbone with multiple internet service providers;
- broadband connectivity to all buildings;
- wireless WiFi hot-spot service at most public areas;
- equal availability of cheap, dark-fiber fiber-optic connectivity to all internet service providers, telcos and other service providers regardless of size;
- local online e-commerce portal; and,
- "smart" homes and schools.

Some provisions, for example, smart schools, will be benchmarked and tracked against international developments. As an intelligent city, one of the salient features of Cyberjaya development is the establishment of the city command center (CCC). The CCC acts as a central monitoring hub to monitor, manage, and implement key services. It is considered as the "brain" of the city, providing single management of traffic, utilities, community facilities, municipal services, and public amenities through integration of systems and services in three major areas: advanced traffic manage-

ment, integrated utility management, interactive community service, and municipal and public amenities.

The CCC can be accessed through a variety of means, including the customer service counter at the CCC building, telephone service, interactive voice response system, interactive television, personal computers at home and office, and mobile data terminals and kiosks in public areas. The development of Cyberjaya and MSC showcases how innovation and change in ICT are integrated with eco-friendly urban development to enhance the quality of life.[14]

To attract and encourage ICT development, the Malaysian Government through the MDC, backed by the Bill of Guarantees, offers the following commitments to companies:

- provide a world-class physical and information infrastructure;
- allow unrestricted employment of local and foreign ICT workers;
- ensure freedom of ownership by exempting companies with MSC status from local ownership requirements;
- give freedom to source capital globally for MSC infrastructure and right to borrow funds globally;
- provide competitive financial incentives, including Pioneer Status (100% tax exemption) for up to 10 years or an investment tax allowance for up to 5 years, and no duties on the importation of multimedia equipment;
- become a regional leader in intellectual property protection and cyber laws;
- ensure no censorship of the internet;
- provide globally competitive telecommunication tariffs;
- tender key MSC infrastructure contracts to leading companies willing to use the MSC as their regional hub; and
- provide a high-powered agency to act as an effective one-stop super shop.

Unlike many industrial development strategies elsewhere, the above constitutes probably one of the most innovative strategies put forward to promote the MSC as a center of ICT industries. The Bill of Guarantees and incentives are not only competitive in comparison with other technology regions but are lucrative as well to make this technology region a business attraction for local as well as global companies.[15]

Within 2 years of development, several facilities were completed, including the Multimedia University, Lim Kok Wing University College of Creative Technology, Century Square office blocks, the MDC headquarters, Cyberview Lodge Resort and Spa, several Enterprise Buildings, a smart school,

the transport terminal, Cyberpark, the central incubator, and the Street Mall. Several other facilities, including a sports complex, Tele-Medicine Centre, and an 18-hole golf course are expected to be completed in the near future.

The township currently houses about 10,000 people with an anticipated population of 120,000 (2010). Table 9.7 shows the current number of MSC companies by sectors. These include large technology companies such as NTT Japan and TMNet, both operating from their own premises. Other world-leading companies, such as DHL, HSBC, Shell, BMW, EDS, Motorola, Ericsson, and Nokia, have also established their companies within single tenancy buildings. As well, other smaller companies operate from office buildings for multiple tenancies, including the Century Square. Facilities to be owned or rented have been built to cater to the differing needs of ICT industries. The target is to locate about 500 IT companies in Cyberjaya by 2020.

Lessons Learned

Diversifying the economic base and promoting ICT growth is never an easy task. Focused start-up efforts are useful to catalyze development and enhance confidence, especially when such development is new and unfamiliar. The country and its population need time to build up the ICT and knowledge capacity. The Cyberjaya development manifests what might be achieved

Table 9.7: MSC Companies according to Sectors

Sectors	Number
Software Development/Business Application	339
Software Development, Engineering and Specialized Application	238
Internet Business-E-commerce services/Solution Providers	117
Content Development	113
Internet-based Business/Web hosting/Online publishing	110
Hardware/Electronics Design	109
Education and Training	85
Internet Based Business – Application Service Provider	71
Wireless/Mobile Technology	58
Shared Services/Outsourcing	55
Systems Integration	40
Telecommunications/Networking	45
Computer/Systems Security	30
Production/Post-production/Animation	26
Computer/Engineering Design	17
Incubator	17
Consultancy	16
Bio Informatics/Life Sciences	8

Source: MDC 2004.

by fusing technology, vision, and determination to make that leap. As a trailblazer and long-term investment, the technology township is carefully planned with a large budget from the start.

The importance of government commitment and support to every aspect of the city's development and success has to be underscored. Its implementation necessitates capacity in ICT infrastructure, including the promotion of ICT education and culture for young and old, at home, work, and play, which requires broad changes in workforce planning, resources channeling, and simultaneous updates on the impacts of ICT and other new innovations. With comprehensive and up-to-date technological innovations, infrastructure, laws, schools, and software, Cyberjaya is set to showcase how technology and development may improve the quality of life in a sustainable development model, and illuminate the development path for the remaining proposed intelligent cities in the years ahead.

STRATEGIES TO ENHANCE SUSTAINABLE URBAN DEVELOPMENT

The Malaysian Government has continuously given attention to avoiding environmental degradation from overdevelopment while seeking innovative ideas to build sustainable cities. The three case studies showcase some of those efforts: community participation in Local Agenda 21 PJ, innovative construction of Putrajaya wetlands, and the building of a new Cyberjaya intelligent garden city to achieve the broader goal of urban development and sustainability. They are primarily aimed at making cities work better for all who live, work, do business, and play in them. They provide examples of the public-led national processes and approaches that are being implemented at various levels—from local to metropolitan and regional—to meet existing concerns and challenges.

As with many other Asian countries, Malaysia is rapidly urbanizing. Beyond meeting the services that are required of all city governments, some key challenges facing Malaysian urban development concern the increased size of cities in terms of both their population and land consumption, which, if not properly managed, will have far-reaching negative environmental impact. Examples include the massive land conversion of oil palm plantations into mixed housing development (a form of unsustainable "greenfield development"), low-density urban suburbs, illegal hillside development, and encroachment of wetlands, especially in the form of waterfront or riverfront development.

There is a growing awareness that these will not remain isolated local issues. The Federal Town and Country Planning Department and respective

local authorities have initiated broad policy strategies and a legal framework in the form of development plans, development guidelines, and planning standards to arrest such undesirable development and their adverse environmental impact. However, these problems will prevail and continue unless stringent monitoring mechanisms by the local authorities and respective government authorities are adopted. In other words, while there is commitment to sustainable development as set out in the National Vision Policy, a more holistic approach to sustainable development planning is necessary in preparing development plans at the structure plan and local plan levels. Even though the sustainable development debate may be in full swing globally, the alternatives are at an initial stage in Malaysia. A wide dissemination and stocktaking of urban good practices in sustainable development will hopefully entrench their sharing and sharpen the practice.

What is most important is that there is no turning back in regard to sustainable development. Recent efforts of government agencies, especially by the Federal Town and Country Planning Department and local authorities to develop innovative models of city building—Putrajaya and Cyberjaya—have led the way in demonstrating the urban possibilities in utilizing ecological solutions and ICT. Partnership between the different levels of government and inclusion appear to be yet another immediate strategic area of policy action. Active and effective participation at the neighborhood level involving different stakeholders (as in the case of Petaling Jaya Local Agenda 21) offers new directions for consolidating community-based action. It presents relevant options for achieving not just economic sustainability but also social justice and equity, which are important in identifying urban solutions that are tailored as closely as possible to people's needs.

Notes

[1] The relocation is a part of the Government's New Economic Policy to promote greater growth and equality among the various ethnic groups in the country. See Economic Planning Unit (2004) and www.epu.jpm.my for further discussion of the policy and details of Malaysia's Vision Policy and 5-year development plans.

[2] Petaling Jaya, Miri, Kuantan, and Kubang Kerian are among the pioneer local authorities implementing Local Agenda 21.

[3] Following a boundary realignment exercise in early 1997, parts of Petaling Jaya, such as Subang Jaya, Sunway, Puchong, and USJ, have been placed under the jurisdiction of the newly formed Subang Jaya Municipal Council.

[4] The functions of the Local Agenda 21 Petaling Jaya Committee included facilitating the implementation of the Local Agenda 21 pilot project; steering the direction of the Local Agenda 21 pilot project; formulating an action plan and implementation strategies; coordinating, implementing, and monitoring the implementation of the

Local Agenda 21 pilot project; and reporting the project progress to the full council, and national, technical, and steering committees.

[5] The functions of the working committees include awareness-raising activities via dialogue, research and campaigning at the local level; formulating action plans and implementation strategies; coordinating, implementing and monitoring the progress of Local Agenda 21 Pilot Project, and reporting progress to Local Agenda 21 Petaling Jaya Committee.

[6] See www.mppj.gov.my/la21 for more details.

[7] The key ecological projects are the restoration of Kelana Jaya Lake, Sungei Penchala, and the production of a stream keeper's handbook. While the pilot projects were funded by MPPJ and the Malaysian Government, these later ecological projects enjoy international funding from Danish International Development Agency, Canadian International Development Agency, and United Nations Development Program - Global Environment Facility.

[8] See Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd (1999), Chapter 4, for further discussion of how a vision becomes reality.

[9] See Perbadanan Putrajaya and Putrajaya Holdings Sdn Bhd (1999), Chapter 6, for details of these innovations in the wetland design.

[10] Companies with strong value-added activities, which are providers or heavy users of multimedia products and services, are eligible for MSC status, which then entitle them to certain privileges and incentives offered under the Bill of Guarantees.

[11] There are two phases of development, with phase 1 comprising approximately 1,460 hectares.

[12] See Setia Haruman Sdn Berhad webpage (www.setiaharuman.com/msc/intro.htm, accessed on 11 Jan 2006) for more information. Setia Haruman Sdn Berhad is the master developer of the Cyberjaya Flagship Zone.

[13] The main features of the telecommunications infrastructure include, first, a fiber-optic backbone with 2.5–10 gigabits per second capacity; second, high-capacity links to international centers; third, open standards; fourth, high-speed switching and multiple protocols including ATM; fifth, best-in-class performance guarantees; sixth, competitive telecommunications pricing; and seventh, integration into new transportation projects.

[14] See MDC (2003) for more details.

[15] Especially the income tax allowance as sourcing of capital is fundamental to emerging indigenous companies in the ICT sector.