

“Environmental Law, Governance, and Management – Innovative Approaches from Singapore”

For University of Santa Clara students, May 2018

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AN OVERVIEW

For University of Santa Clara students
23 May 2018

Lye Lin-Heng

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What is Environmental Law?

- Defining the 'environment'?
- What are the major concerns re: environment?
- How can these be addressed?
- What is the role of law here?
- How effective is environmental law?
- Examination of Env. Law from 3 levels:
 - International
 - National
 - Regional eg. ASEAN
- Challenges / new perspectives

Water pollution – Citarum River, West Java, Indonesia



Air pollution



The decimation of species

“



Courtesy of the Burton Historical Collection, Detroit Public Library



Tiger Hunt, 1928, Singapore

Pangolins – on the verge of extinction in SEAsia

Singapore Zoo



106 rescued in Vietnam in 2011, worth US\$50,000



What is Environmental Law?

- **Pollution laws** – tort / statutory laws
 - land (wastes/garbage; toxic substances/electrical & electronic waste)
 - air (vehicles, factories, cigarettes etc)
 - water -rivers, lakes
 - marine pollution – oceans (plastics, garbage)
 - noise
- **Nature Conservation** – eco-systems and species
 - trade in endangered species (local/ international)
- Environmental Health & Safety (EHS) laws?
Workplace safety laws?
- New challenges – **Climate Change**

International Environmental Law – History & Evolution of Principles

- National health concerns – 1960s
 - Rachel Carson's "Silent Spring" (DDT & pesticides)
- Major accidents eg. Bhopal, Three Mile Island, Love Canal, Exxon-Valdez
- Four major UN Conferences:
 1. 1972 Stockholm Conference on the Human Environment
 - **Stockholm Declaration on the Human Environment, 1972**
 2. 1992 Rio Conference on Environment and Development "Earth Summit"
 - **Rio Declaration on Environment & Development, 1992**
 3. 2002 – Rio +10 Johannesburg - World Summit on Sustainable Development
 - "Improve lives while preserving Earth's resources"
 4. 2012 – Rio + 20 – UN Conference on Sustainable Development
 - "The Future We Want"

NB. Year 2000 - **8 Millennium Development Goals** – eradication of poverty and environmental protection by 2015

The 8 Millennium Development Goals, 2000 Replaced by SDGs in 2016



SUSTAINABLE DEVELOPMENT GOALS, 2016

SUSTAINABLE DEVELOPMENT GOALS



Sustainable Development

Brundtland Commission Report (1987)

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Q – Inter-generational equity & Intra-generational equity (Principle 3, Rio Declaration)

Principle 4, Rio Declaration 1992

*In order to achieve sustainable development, **environmental protection** shall constitute an integral part of the development process and cannot be considered in isolation from it.*

Common but Differentiated Responsibilities

Principle 7, Rio (1992)

- *States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem.*
- *In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities.*
- *The **developed countries** acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.*



The Precautionary Principle

Principle 15, Rio

- *In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities.*
- *Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*
- *Origin – 1982 World Charter for Nature*

The Polluter Pays Principle

Principle 16, Rio

National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that

the polluter should, in principle, bear the cost of pollution,

with due regard to the public interest and without distorting international trade and investment.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) LAWS

- Rio Declaration, 1992

PRINCIPLE 17

- “Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”

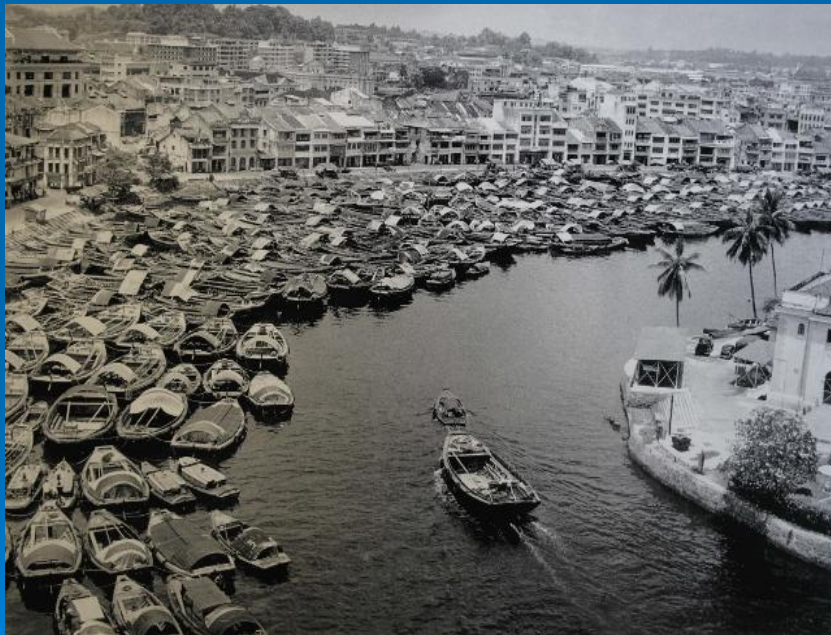
Singapore – 716 sq km

Ranked Asia's No. 1 city to live, work and play



Singapore today

- From 3rd world to 1st – in 35 years (1965-2000)
- GDP per capita – 1965 (US\$516); 2009 (US\$36,537)
- 2016 (IMF) - US\$55,700



On a little street in (old) Singapore 1965 - independence



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Tiger Hunt, 1928, Singapore



Communal riots, 1964
SINGAPORE



Supply of drinking water to rural areas by water wagon during dry season, c1959
SINGAPORE



WWW.YIPCHEONGFUN.COM



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Singapore – Some Facts 2017

- Land area – 716 sq km
- Population – 5.8 million 8,100 persons per sq km)
- Literacy rate – 97% (age 15 and above)
- 3 main racial groups :- Chinese (75%), Malay (14%), Indian (7%), Eurasians & the rest
- 4 main religions – Buddhism/Taoism; Christianity (including Catholicism), Hinduism, Islam
- 92% home ownership
- 82% live in public housing built by Housing and Development Board (HDB)– high rise apartments purchased on 99 year leases, very few on short leases
- Home ownership – nation-building with HDB and Central Provident Fund (CPF)



Vision and Political Will

“We have built, we have progressed. But there is no hallmark of success more distinctive and more meaningful than achieving our position as the **cleanest and greenest city in Southeast Asia**”

Lee Kuan Yew, 1st Prime Minister of Singapore,
Launch of month-long Keep Singapore Clean campaign, 1968



From “Garden City” to “City in a Garden”



See Lee Kuan Yew's autobiography, “From Third World to First – The Singapore Story:1965 – 2000”

- Transformation of poor Crown colony to a centre for international trade & technology
- High living standards, safety
- Well educated, diligent and reliable labor force
- Equal rights for women, respect for all religions and racial groups
- Meritocracy
- Tight control over civil protests – sensitivities of race and religion
- Environment and public health - Clean air and water, waste collected daily, strict anti-litter laws, EMS in place
- Greenery – from “Garden City” to “City in a Garden” – to woo investors!



Governance and the Environment

Environmental Management System (EMS)

1. Institutions
2. Laws
3. Land use planning
4. Building the environmental Infrastructure
5. People – education, public participation
6. Government – vision and political will, “clean” government



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EMS in Singapore – Innovative approaches

- Building strong administrative & legal institutions
- Land acquisition & comprehensive land use planning
- Building the environmental infrastructure – sewage & drainage systems, air & water emissions control for factories, green energy
- Environmental laws, implementation and enforcement
- Regulating industries, controlling and managing pollution
- Bold solutions – public housing, cleanup of rivers, off-shore land-fill site; new water technologies and strategies, new deep tunnel sewerage system
- Transportation – Road Pricing (ERP), Certificate of Entitlement (COE), Mass Rapid Transit (MRT)
- Greening Singapore – from “Garden City” to “City in a Garden”
- Development of human capital
- Political will – “top down” government, “clean” government



Investing in the environmental infrastructure

- Sewerage & drainage systems
- Air pollution monitoring stations
- Laboratories for testing effluent etc
- Incinerators, sanitary landfills,
- Hazardous waste management
- Securing clean water – closing the loop
- Investments in new technology, solar



Governance and the Environment

- “You can tell how polluted a city is by its greenery...Other cities had clean and green suburbs that gave their residents respite from city centres. Singapore’s size forced us to work, play, and reside in the same small place, and this made it necessary to preserve a clean and gracious environment for rich and poor alike”

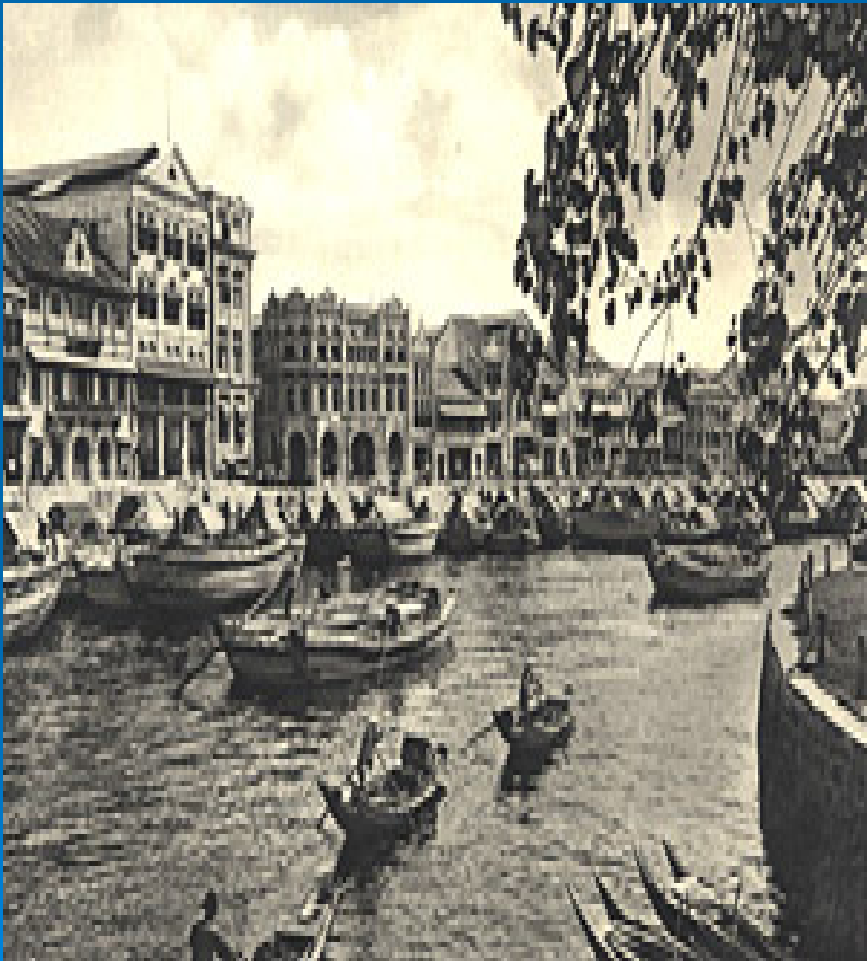
Lee Kuan Yew

Chapter 13, “*Greening Singapore*”,

From Third World to First – The Singapore Story, 1965 –2000, p. 181



Singapore River - yesterday & today



Old shop-houses : pre-conservation



Preserving the Built Environment - Conservation houses, Singapore



Land-use planning (contd)

- 55 Development Guide Plans
- 5% nature areas
 - 2 national parks, 4 nature areas but all terrestrial, no marine parks
- Parks & Water Bodies Plan
- Conservation of Built Heritage
- Parks, green corridors, trees & plants throughout the island “Garden City”

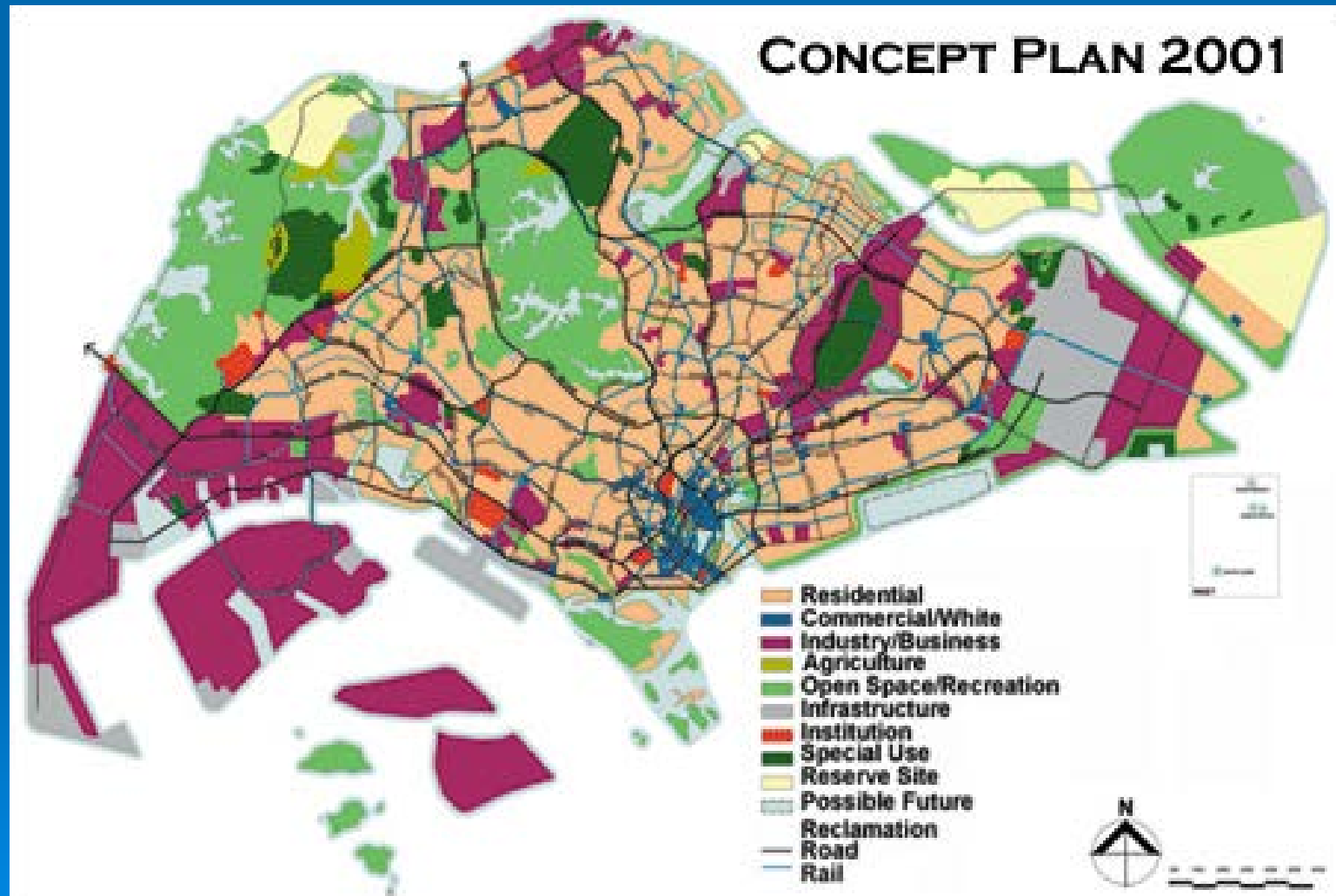
Note – (1) Master Plan Committee chaired by Chief Planner URA, with senior officers from other govt departments, public participation minimal but public dialogue is sought once plans are in place

(2) Development Control Committee for all major development projects with reps from MND, MEWR PWD, SIA, SIP

(2) No EIA/EIS laws, but pollution laws do require pollution impact studies, risk assessment studies



SINGAPORE



Siting of pollutive industries

- Jurong Island, Singapore – amalgamation of 7 small islands (Petro-chemical industries)
“Industrial Ecology”



Legal institutions and the Law

- Environmental laws – pollution, nature conservation, land use planning
- Extending liability to directors and officers of corporations, enhanced penalties, mandatory jail
- Reversing onus of proof
- Enforcement of laws – self-monitoring, inspections, warnings, prosecutions, composition of offences,
- Attending to complaints – 24 hour “hotlines” for public, efficient administration, implementation and enforcement



A “Fine” City



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Reminder in a Bus



Innovative approaches - Supply of Utilities

- Until recently, waste disposal was linked to power generation (electricity) and water
- One bill for all 3 (Power Singapore) – ensures all 3 bills get paid
- Today – power generation no longer in govt hands, but privatised
- Water supply still linked to waste disposal, in one bill
 - flushing of toilets/amount of water used is controlled by Public Utilities Board (PUB)
 - PUB also monitors water quality standards
 - investments in new technology for water recovery
 - (a) desalination
 - (b) membranes – NeWater
 - (c) Deep Tunnel sewerage system
 - (d) New laws eg. New Drinking Water regulations specifying standards for drinking water, 2008; Energy Conservation Act 2012





Cleanup of Singapore's rivers

- PM Lee Kuan Yew, 1987:
- *"Ten years ago, our rivers were like sewers, smelly, dirty and devoid of fish or any aquatic life. This year marks the restoration of the Singapore, Rochor, Geylang and Kallang Rivers into clean watercourses."*
- *We now have pleasant landscapes. We can walk along the river sides and fish or boat, ski or swim, all unthinkable only a few years ago. It is an achievement many societies dream of, but few achieve."*
- The cleaning of the six rivers was completed in 1987 at a cost of S\$200 million.



Water Management

- Integrated water management by PUB
- 4 national 'taps'
- Water conservation as national policy
 - public education
 - mandatory installation of water saving devices
 - re-use and recycling of water
 - substitution of potable water with alternative sources
 - water audits for large consumers
 - Checks on excessive flow rates

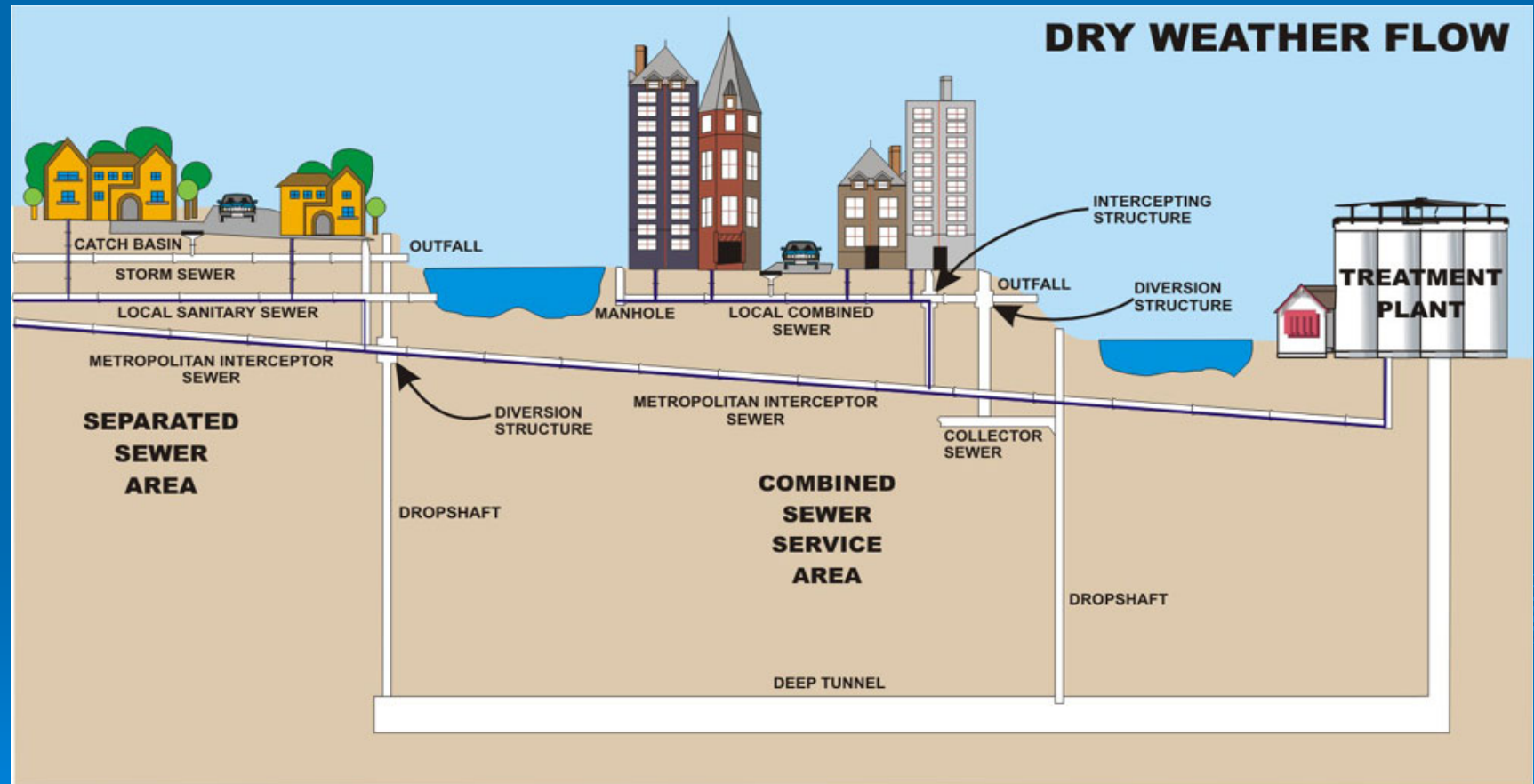


Innovation – the Marina Barrage

- A concrete and steel dam built across the 350m wide Marina channel. The Marina Bay and the Kallang Basin will become a big Marina Reservoir. It will improve the water supply as well as check flooding in Singapore. Completed - 2008
- A Botanic Garden will be built in the Marina South.
- Water sports such as canoeing, dragon boat racing, Formula 1 power boat racing and wakeboarding now in the Marina Reservoir.
- Integrated resorts just completed including 2 casinos



Innovation – Deep Tunnel sewerage system



Innovative solutions - Pulau Semakau landfill site



Bird's-eye View of Semakau Landfill (Courtesy of ENV)

- 13 hectares of mangrove were replanted to replace those removed during construction of the bund. Wildlife continues to thrive on Pulau Semakau, and the air and water quality remains good.

On 16 Jul 05, Pulau Semakau was opened for nature-related recreational activities. Members of the public can now visit the island for birdwatching, sports fishing and intertidal walks.



Port of Singapore – World's Busiest Seaport in shipping tonnage



Port of Singapore



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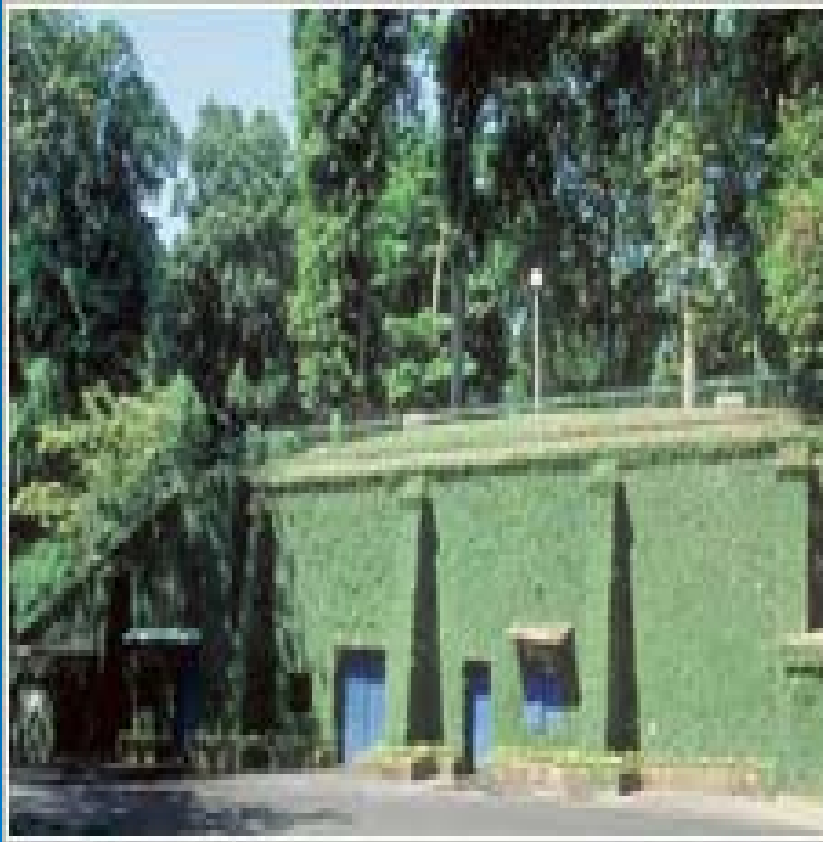
Nation-Building & the Garden City Concept – per Lee Kuan Yew, 1st Prime Minister,

- “To achieve First World standards in a Third World Region, we set out to transform Singapore into a tropical garden city...We planted millions of trees, palms and shrubs. Greening raised the morale of the people and gave them pride in their surroundings. We taught them to care for and not vandalize the trees. We did not differentiate between the middle-class and the working-class areas...to overcome the initial indifference of the public, we educated their children in schools by getting them to plant trees, to care for them and grow gardens. They brought home the message to their parents.

Lee Kuan Yew, *From Third World to First, 1965-2000*, chapter 13
“Greening Singapore”



From “Garden City” to “City in a Garden”



Preserving our “heritage roads” & “heritage trees”



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It was like a sick joke, says Mr Sivasothi about the sole surviving Hopea sangal specimen that was felled.

WONG MAY-E



NATURE SOCIETY
Over 150 years old, the tree was 35 m tall.

'Extinct' tree felled

By NEO HUI MIN

THE Hopea sangal tree had long been thought extinct here, until nature enthusiasts surveyed the Changi area and found one.

But on Wednesday, that survivor was felled, even though it was in a tree conservation area on state land.

"It was like a sick joke," said Mr N. Sivasothi, who saw the trunk being loaded on a lorry and taken away.

Estimated to be over 150 years old, this specimen had been 35 m tall, with a girth of 330 cm.

Only a stump was left.

Mr Sivasothi, a research officer with the Raffles Museum of Biodiversity Research, said: "I guess I was in disbelief. I didn't even ask the workers who it was who had the tree felled."

Responding to queries from The Straits Times yesterday, the National Parks

Board (NParks) said the tree was felled without its permission by DTZ-Debenham Tie Leung Property Management Services.

NParks is now investigating the case. Under the Parks and Trees Act, anyone who fells or cuts a tree within a tree conservation area can be fined up to \$10,000.

DTZ said its officials had recently inspected the tree and found it was termite infested and had been struck by lightning. It was also leaning towards some of DTZ's tenanted houses.

"Due to the rainy season and thunderstorms, it posed great danger and DTZ was concerned about the safety of the public," it said.

Asked why it had not asked for a permit, Mr Heng Hua Thong, DTZ's executive director for property and facility management, said: "The public's safety was most important to us, so we had to carry

this out urgently. It was most unfortunate that it happened to be this tree."

It is believed that this tree gave Changi its name, as the common name of the tree is Chengal Pasir or Chengal Mata Kuching.

Nature Society (Singapore) vice-president Shawn Lum said the tree had been struck by lightning but was still healthy.

"In fact, it had flowered recently. This type of tree does not flower regularly. It could be every three to 10 years.

"Having been struck by lightning, it was not in the best of shape, but it would have lived for many more years if left alone," he said.

The only silver lining to this cloud is that when the tree flowered, Dr Lum collected the seeds and gave them to NParks.

Twenty germinating seeds are now being nurtured in NParks' nursery.

APCEL

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Improving our streetscapes

- From URA website



Orchard Road, Singapore's "Fifth Avenue"



“Takings”

Land Acquisition / Compulsory Purchase

- Removal of constitutional protection for Property.
- Most constitutions provide for the payment of just compensation for land acquisition by the government.
- US – 5th Amendment “No person shall...be deprived of life or property without due process of law; nor shall private property be taken for public use without just compensation”
- Malaysia – Constitution Article 13
 - (1) No person shall be deprived of property save in accordance with law.
 - (2) No law shall provide for the compulsory acquisition or use of property without adequate compensation.
- The Malaysian Constitution applied to Singapore when S’pore was part of Malaysia in 1963-65.



Land Acquisition in Singapore

- In 1965, in moving the Second reading of the Constitution (Amendment) Bill, PM Lee Kuan Yew said:

“**Clause 13 - we have specifically set out to exclude.** The reason is quite simple. This Constitution was drawn up by five eminent jurists from five of the major Commonwealth countries for the old Federation of Malaya. It is, in form, modelled upon a similar provision in the Constitution of the Republic of India. Since the passage of that section in the Indian Constitution, amendments have had to be introduced because **land reforms were not possible, if the strict tenor of the words were to be complied with.** In other words, in clause 2, once we spell out that no law shall provide for the compulsory **acquisition** or use of property without adequate compensation, we open the door for litigation and ultimately for adjudication by the Court on what is or is not adequate compensation.



Land Acquisition Act, 1966, amended at various times re: compensation, use of “whichever is lower”

- To ensure that increases in land value as a result of public development should not benefit landowner but the community at large
- 1973 Amendment – compensation pegged to market value as at 30 November 1973 or the date of the Gazette Notification, whichever is the lower. But land values fell below 1973 value; govt made ex gratia payment up to market value at acquisition date or \$600,000, whichever is less wef 1 January 1981.
- 1988 – land values changed substantially since 1973. 1988 Amendment pegged compensation to value of acquired land as at 1 Jan 1986 or the date of acquisition, whichever is lower. Ex gratia payment continued, although not part of the law.
- 1993 Amendment – market value as at 1 Jan 1992 or date of notification, whichever is lower
- 1995 Amendment – for land acquired after 1 Jan 1995, compensation was at market value or date of notification whichever is lower.
- **2007 – restoration of full market value: compensation will be based on market value as at the date of acquisition of the land**



Public Housing by the HDB –

housing 82% of population, on 99 year leases, purchased by citizens with compulsory savings funds (CPF)

See <http://www.pinnacleduxton.com.sg/>



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Innovations in Public Housing

- Emphasis on home Ownership
- Financial grant for 1st time homebuyers
- Government designed & built - initial years
- Social engineering – priority if children live near parents, racial quotas
- Satellite towns, full facilities, good transportation links, schools, markets, shops, places of worship, clean industries
- No trusts recognised, owner must seek consent of spouse if flat is sold, but flat is protected from bankruptcy



Innovations in Road Transportation – reducing vehicular pollution

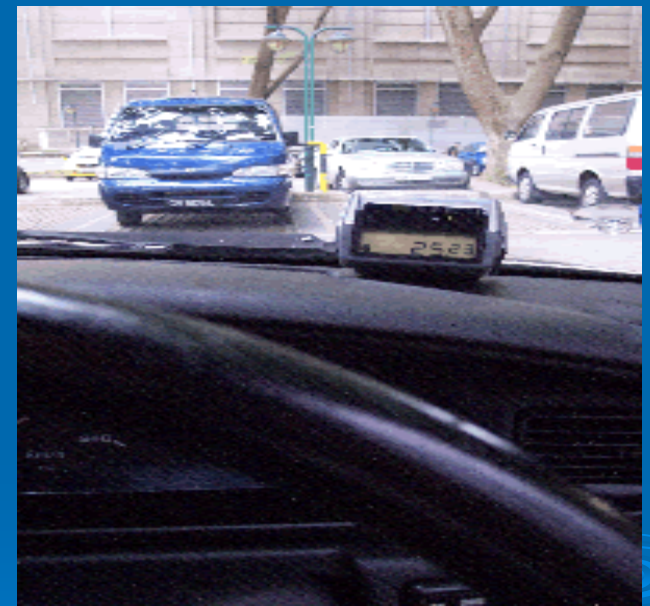
- Improving public transport by building the MRT and LRT, improving bus and taxi services
- Discouraging use of private cars by increasing costs through various vehicular taxes including (a) the COE (**Certificate of Entitlement – to use a motor vehicle**), (b) taxing according to vehicular capacity & age (c) Road pricing – Electronic Road Pricing (d) use of technology to expedite traffic flow – sensors at busy road junctions
- Mandatory inspections for vehicles 3 years old & above
- Higher parking charges in busy places



Mass Rapid Transit (MRT) Trains



Electronic road pricing



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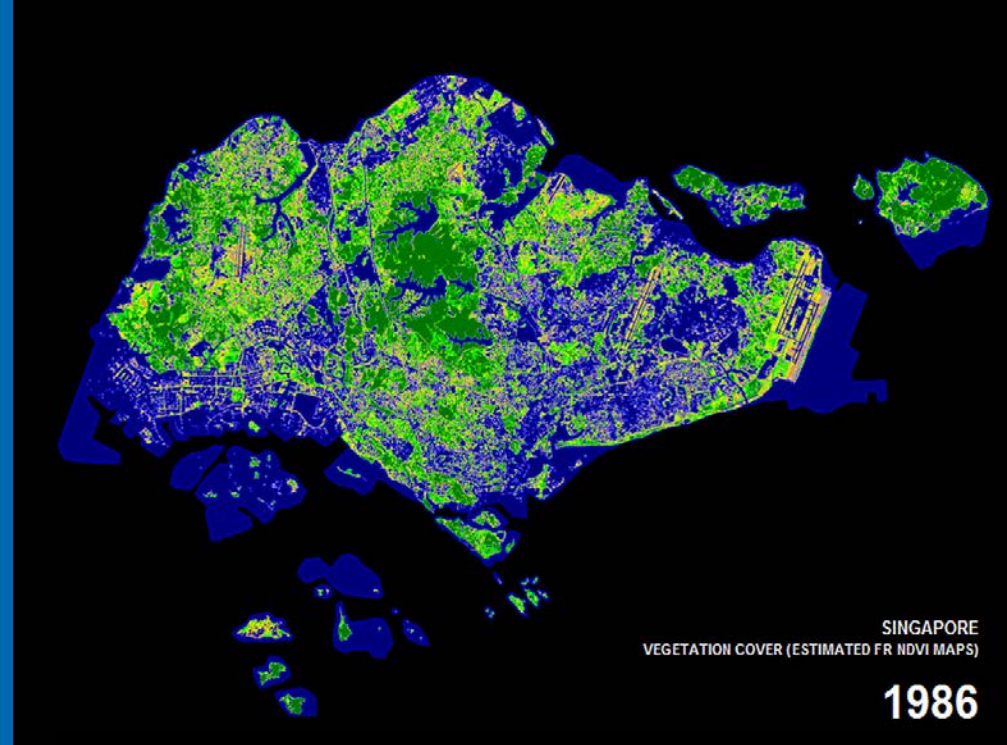
Nature Conservation

- 4 nature reserves
 - Bukit Timah Nature Reserve
 - Central Catchment NR
 - Labrador NR
 - Sungei Buloh Wetlands Reserve
- 2 national parks
 - Botanic Gardens
 - Fort Canning Park



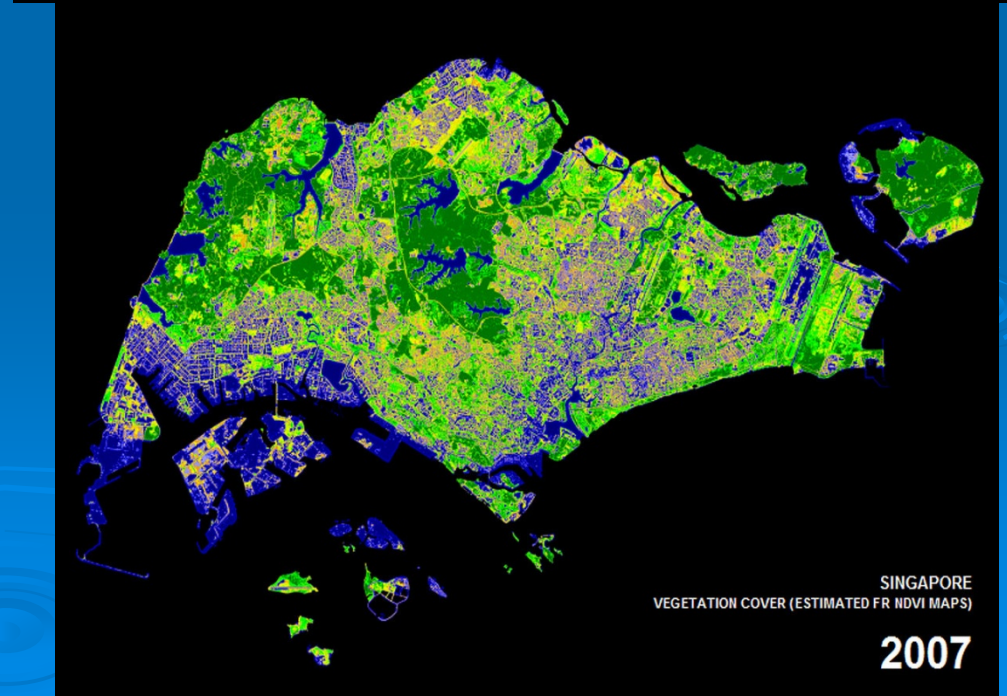
1986

- Population 2.7 million
- Greenery 36%



2007

- Population 4.6 million
- Greenery 47%



Oriental Pied Hornbill returns to Singapore after 50 years

<http://www.nparks.gov.sg/biodivercity/>



Singapore's Cities Biodiversity Index

- Prepared by NParks, Singapore for Bonn 2008 meeting of Convention on Biological Diversity (CBD)
- To assist cities in benchmarking their conservation efforts, endorsed by CBD COP-10, Nagoya

Three components for the Index:

1. Native biodiversity in the city
 2. Ecosystem services provided by native biodiversity in the city
 3. Governance and management of native biodiversity in the city
- <https://www.nparks.gov.sg/biodiversity/urban-biodiversity/the-singapore-index-on-cities-biodiversity>

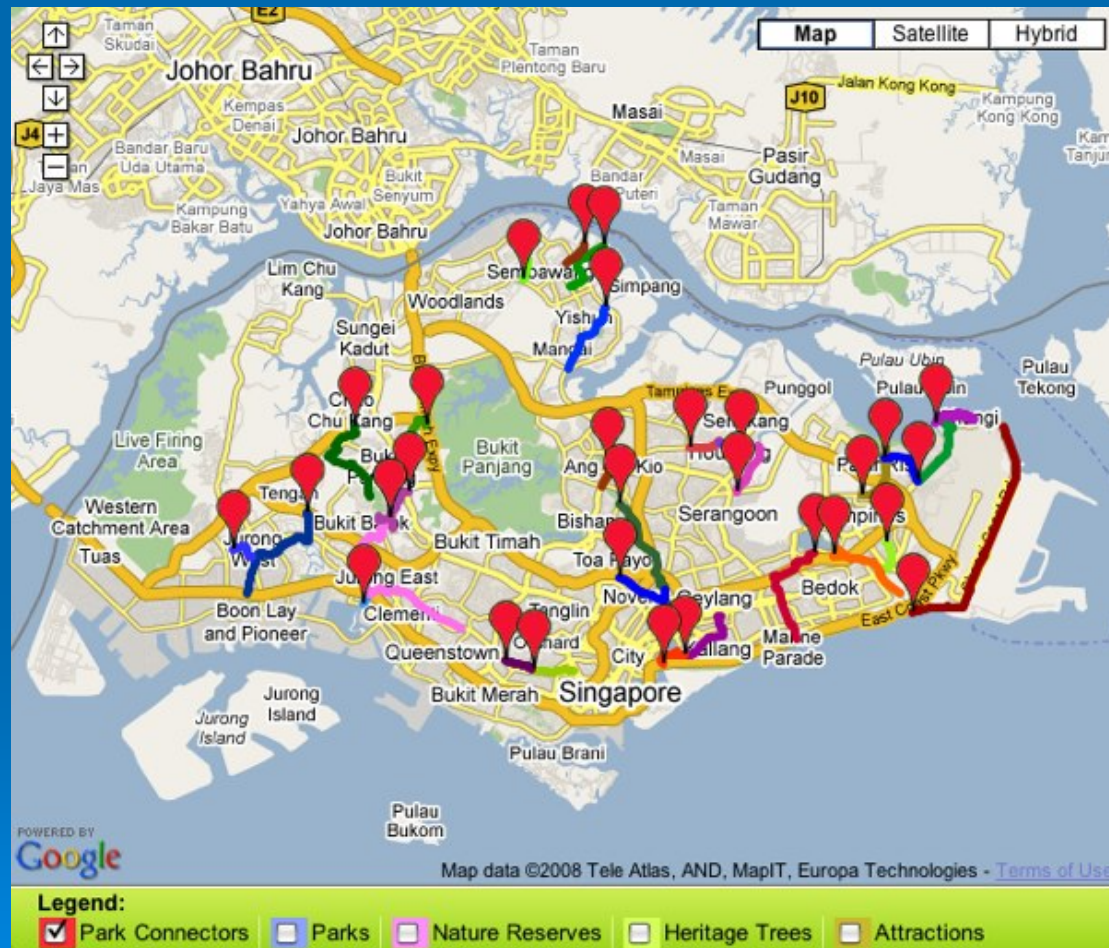


Types of Parks in Singapore

1. City and Heritage Parks – 11
2. Horticultural Parks – 1
3. Hill ridges parks – 4
4. Riverine parks – 8
5. Community parks – 11
6. Nature parks – 6
7. Botanic gardens – 2 including Orchid Gardens
8. Coastal parks – 6
9. Offshore island – Ubin
10. Marine park – Sisters Island

http://www.nparks.gov.sg/cms/index.php?option=com_visit&task=parks&Itemid=73

SINGAPORE – PARK CONNECTORS



Tree Top walk, Telok Blangah



Ecolink at BKE

<https://www.nparks.gov.sg/news/2015/11/factsheet-eco-link-at-bke>



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Heritage Roads, Singapore

Arcadia Road and The Arcadia



Roof top gardens and vertical greenery



Singapore – Climate Change?

Flash floods 2010, 2013



Flooding at the junction of Scotts Road and Orchard Road. The area was the worst-hit, but flooding was also reported in Bukit Timah Road, Veerasamy Road in Little India and Thomson Road. ST PHOTO: STOMP READER SANGSARA

➤ THE END

➤ THANK YOU –



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