



Asia - Pacific Centre for Environmental Law

12TH WORKSHOP

on

**URBAN AND INDUSTRIAL ENVIRONMENTAL MANAGEMENT
(CUM FIELD TRIPS): THE SINGAPORE MODEL**

**Seminar Room 4-3
Blk B, Level 4
Faculty of Law
National University of Singapore**

5-9 December 2011

Organised by

ASIA-PACIFIC CENTRE FOR ENVIRONMENTAL LAW (APCEL)

PROGRAMME

**Emeritus Prof KOH Kheng Lian: Workshop Director
Director, Asia-Pacific Centre for Environmental Law
Email: [lawkohkl@nus.edu.g](mailto:lawkohkl@nus.edu.sg)**

**The programme is accurate at the time of printing, but APCEL reserves the right to amend
the programme as it deems fit**

Theme: Urban and Industrial Environmental Management (Cum Field Trips): The Singapore Model

Purpose

To build capacity in urban and industrial environmental management

Objectives

- To enable administrators and managers of urban and industrial environmental management to learn and exchange experiences and techniques in urban and industrial management with participants from various developing countries in the world
- To promote awareness and understanding of the issues in urban-industrial environmental management and to initiate a policy dialogue and formulate strategies on urban industrial environmental management, including issues in compliance and enforcement
- To enhance the capacity of participants to meet the challenges of continued growth and environment pressures, taking the experience of Singapore as a model in some areas such as land use planning, nature conservation, air pollution, waste management, wastewater, sewage and pollution management, and control of freshwater quality in an urban setting
- To develop networks and partnerships among participants
- To examine the ASEAN strategies and plans of action relating to urban and industrial environmental management as an example of sub-regional efforts

Participants

- The workshop is targeted at a defined group of participants with a proven need for such training
- Participants should be in a position to pass on their knowledge formally or informally after the course. In other words, there should be a multiplier effect to the course
- Participants are expected to actively contribute to the workshop. They are also required to make a 10-minute presentation on **ONE** of the topics included in the programme
- Participants should bring with them a copy of the environmental laws in their country that relate to pollution.

Day 1, Monday, 5 December 2011

0815 hrs – 0830 hrs **Registration**

0830 hrs – 0915 hrs **Opening Ceremony**

Welcome: E/Prof KOH Kheng Lian (Director, APCEL)
Group Photo-taking session

0915 hrs – 0930 hrs Tea Break

0930 hrs – 1245 hrs **Session 1: The Idea of Green Singapore : Challenges and
Prospects for Sustainability**

The small city-state of Singapore, with a land area of 710 sq km and 5.18 million people (1.8 m are foreigners), remains an economically vibrant and socially robust society. Its growth rate for 2010 was 14.3 per cent. In many ways Singapore's economic success story has become the model for many other developing countries. Given that few countries globally seem able to continue their success stories, the question amongst Singaporeans and outside critics is whether Singapore's success is sustainable. The sustainability of Singapore lies in four major areas: economic, political, social and environmental. Environmentally, Singapore's cityscape underscores Green ideas. This talk will touch on four of them: a) An environmental ideology based on both environmental deterministic and possibilistic human-nature ideas which undergirds Singapore's leadership thinking for the last 40 years; b) its socialistic belief in long term planning based on the pragmatic implementation of national plans, land use planning, public transport and future changes; c) the government's focus on intra-urban 'Brown issues' (sewerage; clean water; garbage disposal; pollution control) though public housing; d) the concerns with financial bottom-lines in an eco-developmental pathway. The talk will highlight why the city-state of Singapore can never become fully sustainable because of its reliance on imported food, resources, labour and tourists and the global footprints it leaves behind.

Resource Person: Assoc Prof Victor SAVAGE,
Department of Geography, Faculty of Arts &
Social Sciences, NUS

Chairperson: E/Prof KOH Kheng Lian

1245 hrs – 1345 hrs **Lunch**

1345 hrs – 1500 hrs

Session 2: The Road from UNFCCC, Copenhagen and Mexico

Currently there are over 200 international environmental agreements and an uncountable number of bilateral agreements on the subject of environment. However, the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol of 1997 provides the only multilateral framework to address climate change, the biggest environmental threat faced by mankind. This framework is not permanent as the Kyoto Protocol has a limited life span (2008-2012). Although the Bali Action Plan, a decision made at the UNFCCC meeting in 2007 was expected to provide the foundation to achieve a legally binding long term climate agreement acceptable to both developed and developing nations, the UNFCCC climate negotiations in Copenhagen in 2009 were fraught with disagreement. As a result, the participating countries failed to reach consensus on issues such as global initiatives for mitigation of climate change, international cooperation for adaptation to climate change, and making adequate funds available to support developing countries' efforts to reduce emissions and adapt to the impacts of climate change. A better outcome is expected when the next UNFCCC Conference of the Parties (COP 16) is held in Cancun, Mexico, from 29 November to 10th December 2011. Thus this session will provide an overview of the international climate change negotiations from the perspective of both developed countries and developing countries. The key reasons for the failure to reach consensus will be analyzed.

Resource Person: Asst Prof Asanga GUNAWANSA,
School of Design & Environment, NUS,
Associate Member, APCEL, NUS

Chairperson: E/Prof KOH Kheng Lian

1500 hrs – 1515 hrs

Tea Break

1515 hrs – 1615 hrs

Session 3: Addressing Environmental Issues through Land Use Planning

Urban Planning, as an activity of purposeful anticipation of and provision for the future, presents the best opportunity to address critical environmental concerns at the early stages of development programming. This presentation traces the principles and philosophies governing the key planning instruments in Singapore, namely, the strategic Concept Plan, and the statutory Master Plan, and considers how environmental concerns are addressed, in tandem with concerns such as economic growth and social development. Apart from examining spatial strategies, the presentation will include a discussion of major regulatory approaches to pre-empt incompatible, sub-optimal and environmentally harmful land uses, and as well as an exploration of supportive mechanisms that facilitate plan implementation in a market-driven economy.

Resource Person: Dr MALONE-LEE Lai Choo,
Director, Centre for Sustainable Asian Cities,
School of Design & Environment, NUS

Chairperson: E/Prof KOH Kheng Lian

1615hrs – 1730 hrs

Session 4: Sustainable Cities and Eco-Cities

ASEAN is committed to developing “A clean and green ASEAN...” AWGSC has developed the Framework on Environmentally Sustainable Cities in ASEAN. Singapore chairs AWGSC. Singapore is taking a leadership role in jointly developing the Tianjin Eco- City in China.

Resource Person: E/Prof KOH Kheng Lian

Chairperson: E/Prof KOH Kheng Lian

Day 2, Tuesday, 6 December 2011

0900 hrs – 1000 hrs

Session 5: Waste Management

- Integrated waste management planning
- Waste management infrastructure
- Waste management policy, institutional aspects, and regulations

This session provides an overview of the solid waste management system in Singapore. Principles of sustainable urban waste management planning are defined, including the waste management hierarchy, integration of institutional matters and infrastructure, costs, and the importance of systems that are appropriate to the unique local situations. The key waste management facilities and infrastructure in Singapore are presented, including collection systems, incinerators, landfills, and recycling facilities, including issues such as capacity and cost. The latter half of the presentation is devoted to the institutional issues that are essential for a workable, cost effective waste management system. These include methods of private sector participation, regulations and enforcement, tariffs and charging, arrangements between the regulator and operator, and other issues.

Resource Person: Mr Richard C. REIDINGER,
CEO (Acting), Eco Special Waste
Management

1000 hrs – 1045 hrs

Participants' Presentation

Resource/Chairperson: E/Prof KOH Kheng Lian

1045 hrs – 1115 hrs

Tea Break

1115 hrs – 1215 hrs

Session 6: Hazardous Waste Management

Hazardous waste is a by-product of industrial processes (solvents, wastewater sludge, etchants, etc), commercial activities (vehicle oil changes), institutions (medical waste, R&D waste), and even households. A comprehensive regulatory, institutional, and infrastructure framework is required to strictly manage these diverse and dangerous materials. Improper management of hazardous waste has resulted in serious environmental pollution, land contamination, and population health problems in many countries around Asia.

Singapore has one of the most advanced hazardous waste management systems in Asia. The government controls hazardous waste through a combination of regulation (Toxic Industrial Waste Regulations), administrative control, and strict enforcement.

The entire value chain, including generation, transport, treatment, and final disposal, is managed. All hazardous waste infrastructure in the country is privately owned and operated, and a private market for hazardous waste services prevails which ensures efficient prices and services. Hazardous waste methods used in Singapore include incineration, solvent recycling, stabilization, oil recycling, and physical-chemical treatment.

Resource Person: Mr Richard C. REIDINGER

1215 hrs – 1300 hrs

Participants' Presentation

Resource/Chairperson: E/Prof KOH Kheng Lian

1300 hrs – 1400 hrs

Lunch

1400 hrs – 1530 hrs

Session 7: Environmental Impact Assessment and Pollution Control

Any major new development, infrastructure, or facility has the potential to impact the surrounding environment and community. EIA is the planning tool that allows the identification, quantification, evaluation, and mitigation of impacts on the environment. EIA is a requirement in most Asian countries. However, EIA scope, methodology, and effectiveness varies dramatically across the region. Singapore, Malaysia, and Hong Kong are good examples of very different approaches to EIA. World Bank standard EIA is the most accepted approach internationally.

Once facilities are in operation, pollution control and enforcement is the key to ensuring sound environmental management and no impact to surrounding public or the environment. This session will

review good pollution control in terms of air quality, wastewater, energy, and other aspects.

Resource Person: Mr Richard C. REIDINGER

Chairperson: E/Prof KOH Kheng Lian

1530 hrs – 1600 hrs

Tea Break

1600 hrs – 1730 hrs

Session 8: Greening the Urban Environment: National Parks Board (NParks)

Guest Speaker: Mr Simon LONGMAN
Director/Streetscape, NParks

Q & A

Chairperson: E/Prof KOH Kheng Lian

Day 3, Wednesday, 7 December 2011

0900 hrs – 1000 hrs

Session 9: Air Pollution Management – The Singapore Experience

(a) Control of Air Pollution from Industrial Sources

This session discusses Singapore's management of air pollution – it gives an overview of the control of air pollution from industrial sources and the laws that apply.

Resource Person: Assoc Prof LYE Lin Heng,
Deputy Director, APCEL; Chair, MSc
(Env Mgt) program, NUS

Chairperson: E/Prof KOH Kheng Lian

1000 hrs – 1015 hrs

Tea Break

1015 hrs – 1115 hrs

Session 10: Transport-Based Air Pollution Management

(a) Singapore's Experience – The Control of Vehicular Traffic and Road Pricing

(b) Experience of other Countries
(Participants' Inputs)

This session elaborates on Singapore's management of air pollution control via controls on vehicular traffic. It looks at the implementation of the "polluter pays" principle in the system of control of car sales via the certificate of entitlement (COE); in the imposition of charges for entry into the central business area, and for use of certain expressways during peak hours; and the imposition of taxation for use of the roads.

Resource Person: Assoc Prof LYE Lin Heng

Chairperson: E/Prof KOH Kheng Lian

1115 hrs – 1200 hrs

Session 11: Basel Convention and Hazardous Waste in Asia

The Basel convention is the primary Multilateral Environmental Agreement governing the transboundary movement of hazardous waste. This session will explore the origins and need for the Basel convention, as well as its implementation in Singapore, effectiveness, and issues.

This session will also review the hazardous waste management situation in various countries in Asia. Aspects of the regional regulatory regimes as well as facilities available for hazardous waste treatment will be explored.

Resource Person: Mr Richard C. REIDINGER

Chairperson: E/Prof KOH Kheng Lian

1200 hrs – 1245 hrs

Session 12: Adaptation to Climate Change in Cities: What Role Can ASEAN Play?

This session focuses on the role of ASEAN as well as a case study of Singapore (a member of ASEAN) on adaptation to climate change.

Resource / Chairperson: E/Prof KOH Kheng Lian

1245 hrs – 1330 hrs

Lunch

1330 hrs – 1410 hrs

Session 13: Singapore's Sustainable Energy Strategy

Guest Speaker: Mr Edwin Khew, Chairman, Sustainable Energy Association of Singapore (SEAS)

1410 hrs – 1500 hrs

Participants' Presentation

Resource/ Chairperson: E/Prof KOH Kheng Lian

1500 hrs – 1515 hrs

Tea break

1515 hrs – 1600 hrs

Session 14: Compliance and Enforcement

This session discusses the challenges relating to compliance and enforcement, and how these may be resolved.

Resource Person: Assoc Prof LYE Lin Heng

Chairperson: E/Prof KOH Kheng Lian

1600 hrs – 1730 hrs

Participants' Presentation

Resource/ Chairperson: E/Prof KOH Kheng Lian

Day 4, Thursday, 8 December 2011

0900 hrs – 0945 hrs

Session 15: Integrated Water Resources Management in Singapore and the Deep Tunnel Sewerage System

Singapore has come a long way in terms of water management and since the turn of the century PUB, the national water agency has implemented a new strategy in managing water resources in an integrated manner. With this integrated approach, Singapore is able to source, purify and supply water to meet its need for the future in a more sustainable manner. The Deep Tunnel Sewerage System is a major initiative by Singapore in this integrated approach to also meet the nation's need for treatment, disposal and reclamation of its used water.

Guest Speaker: Mr YONG Wei Hin,
Asst Director, Water Reclamation Department
Public Utilities Board (PUB)

Chairperson: E/Prof KOH Kheng Lian

0945 hrs – 1045 hrs

Session 16: Raw Water Quality Management - A Case Study in Singapore

The quality of runoff in any water resources project is largely influenced by the activities within the catchment areas and the direct pollution load the reservoir is being subjected to. As catchment areas tend to get progressively more urbanized in terms of industrialisation, the runoff quality tends to deteriorate. When such raw water is treated, there will be additional costs incurred for infrastructure development for anti-pollution measures to be taken within the catchment area and the reservoir and also for treatment of water. These additional expenditures will lead to an increase in the production cost of treated water. The main objectives of this paper are to define the impact of urbanization and industrialization on water catchments leading to poorer runoff quality and higher treatment costs. These concepts are illustrated in a real-life case study in Singapore where the sources of pollution in an urbanizing catchment were identified and quantified.

The pollution problem was analysed thoroughly and well-defined anti pollution measures were taken over a period of time and the results monitored. It has thus been shown that it is possible to accommodate industrialisation and urbanization in large tracts of land provided an appropriate infra structure is set up to identify the pollution problems and carry out extensive analysis. Anti-

pollution measures should be recommended on the sound basis of analyses of field data clubbed with appropriate administrative support from all the relevant contributing sectors. Legislation should be promulgated or amended, if necessary and, most important of all, there should be the right political will to back the technical decision makers.

Resource Person: Dr A APPAN, Technical Adviser,
LBW Consultants, Singapore; R J Crocker,
Singapore

Chairperson: E/Prof KOH Kheng Lian

1045 hrs – 1100 hrs

Tea Break

1100 hrs – 1200 hrs

Participants' Presentation

Resource/Chairperson: E/Prof KOH Kheng Lian

1200 hrs – 1330 hrs

Lunch

1330 hrs – 1415 hrs

Departure for NEWater Visitor Centre

1415 hrs – 1515 hrs

NEWater Visitor Centre

Name of Person-in-charge (to be advised)

1515 hrs – 1600 hrs

Departure for Housing Development Board

1600 hrs – 1730 hrs

Visit to Housing Development Board

Name of Person-in-charge (to be advised)

Day 5, Friday, 9 December 2011

0830 hrs – 1000 hrs

**Session 17: Legal and Policy Aspects of Green Construction:
Lessons from Singapore**

The construction industry is considered to be one of the major causes for air, water, and noise pollution. Further, it is said that the emission of GHG by the construction sectors is one of the main human-induced causes of climate change. Thus, with the ever increasing focus at all levels of policy and planning on climate change mitigation and adaptation, the construction sector has been identified as one of the key industries that should be pro-active in sustainable development. This presentation will provide an overview of the legislative and policy initiatives in Singapore to promote a sustainable construction industry.

Resource Person: Asst Prof Asanga GUNAWANSA, School of
Design & Environment, NUS, Associate
Member, APCEL, NUS

Chairperson: E/Prof KOH Kheng Lian

1000 hrs – 1015 hrs

Tea Break

1015 hrs – 1115 hrs

Session 18: Urban Metabolism and Industrial Ecology

Even as our cities evolve into greater complexity and density, there are ways to understand the sustainability of their development, centering around their material and energy sourcing, use, disposal and recycling. Urban metabolism and the more general concept of industrial ecology are some ways of doing so. Several developments around the world are applying these concepts to help promote sustainability in their operations. These concepts and case studies will be shared with participants of the lecture and workshop.

Resource Person: Dr KUA Harn Wei

Chairperson: E/Prof KOH Kheng Lian

~End of Workshop~

E/Prof KOH Kheng Lian
Director, APCEL Workshop on Urban and Industrial Environmental Management