SUSTAINABLE CITIES PROGRAMME- LOCAL AGENDA 21-
ASIA REGIONAL MEETING:

Strengthening City and National Partner Capacities to Mitigate and Adapt to Climate Change Impacts

Organized by:

UN-HABITAT REGIONAL OFFICE FOR ASIA AND THE PACIFIC (ROAP) FUKUOKA,
in cooperation with UN-HABITAT HEADQUARTERS, NAIROBI

Manila, Philippines: 25th - 28th August 2008

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SECTION I: General overview

1. Background

Through out the last 10 years the Sustainable Cities Programme and the Local Agenda 21 Programme in Asia has promoted environmentally sustainable local development, and supported cities to more fully realise the vital contributions that urban areas make to over-all social and economic development.

The SCP-Asia Expert Group meeting in Manila reviewed SCP-LA21 country supporting activities, synthesised "Factors of Success" from 10 years of operational support in the region, and analysed how to utilise Environmental Planning and Management (EPM) experiences and good practices at local, national and global levels to support cities address Climate Change Impacts through UN-Habitat's Global Sustainable Urban Development Network (SUD-Net) and its "Cities in Climate Change Initiative" (CCCI). SUD-Net is an innovative approach to re-invent networking by exchanging specific knowledge and best practices among and beyond networks, international and national organizations and institutions, local governments, universities and other research and training institutes, the private sector and the public. SUD-Net is starting with an initiative on "Cities in Climate Change" (CCCI), which will contribute to strengthen the ability of local governments to mitigate and adapt to climate change, which will in turn introduce the urban dimension into the Asian Regional and global discussions on climate change.

The 2008 SCP/LA21 Asia Regional Meeting "Cities Addressing Climate Change Impacts" was held in Manila, from 25th to 28th August where a total of 60 participants came from China, India, Indonesia, Philippines, Sri Lanka, South Korea, and Thailand representing urban practitioners, national anchor institutions, city/central/federal governments, and international support programmes. This workshop was organized by the Regional Office for Asia and the Pacific (UN-HABITAT ROAP, Fukuoka) in close coordination with its headquarters in Nairobi. (See Annex 1. Aide Memoire).

1.1 preparations for the workshop

In preparation for the meeting all participants received (1) Background information on Manila city, (2) the Aide Memoire of the workshop, (3) A background paper on Climate change and cities in Asia and (4) UN-HABITAT brochures on Climate Change. In addition to the above mentioned documents the anchor institutions received a copy of the following; (1) SCP Anchor strategy October 2003, (2) Minutes of the Bangkok Anchor Institution Strategy Oct 2004 and (3) The IHS curriculum. (See Annexes)

Responding to the requirements of the workshop SCP partners prepared a synthesis of the factors of success of the SCP implementation; and an overview of the national climate change related policy and strategies and good practice examples of city level intervention and actions. Asia's leading Regional Climate Support Programmes such as; Clean Air Initiative, ADB `s Energy Efficiency Initiative/ Carbon Market, UNEP`s Green Buildings Programme, UNESCAP`s Clean Development Programme, UCLG-ASPAC and CityNet, as well as the exemplar Asian cities addressing climate change impacts prepared presentations which give an over view of ongoing activities and partnering opportunities.

1.2 Objectives of the workshop:

- To review, consolidate and validate SCP-Asia's partners' collective ability to ***upscale*** the innovations and demonstrations promoted through application of EPM processes into significant physical improvements to the lives of the urban poor, strengthened application of management ***tools*** (such as Environment Management Information Systems), supported by appropriate ***policy and legislative changes*** at the local, national and global levels, and ***institutionally anchored*** nationally and in UN-Habitat's Regional Office for Asia and the Pacific (ROAP). In the process to synthesise **"Factors of Success"** resulting from the past 10 years of programme implementation in the region.
- To link SCP-Asia EPM achievements and lessons of experience to current discussions and experiences on climate change mitigation and adaptation, support SCP-Asia and other Regional partner networks to apply these good practices to address the challenges of Climate Change Impacts by and on Cities within the framework of UN-Habitat's recently launched Cities and Climate Change strategy, SUD-Net and its supporting "Cities in Climate Change Initiative" (CCCI). Encourage regional partners to join the UN-Habitat SUD-Net/CCCI, and start to build an "**Asian Knowledge Sharing Platform"** for policy dialogue and collective action in support of Cities addressing Climate Change Impacts, particularly by ***raising awareness*** on likely climate change impacts globally, regionally and nationally; ***mapping*** national policy and city mitigation/adaptation responses and regional climate change support programmes;
- To develop a SCP/CCCI-Asia **"Transition Strategy"** to support Cities addressing Climate Change Impacts by ***reviewing*** how SCP-Asia could be strengthened/re-tooled to better respond to the new challenges, and ***discussing*** the next steps for a UN-HABITAT supported CCCI-Asia

1.3 Structure of the workshop

The Regional meeting was structured into plenary sessions, targeted presentations and round table discussions where partners shared their SCP-EPM experiences of the past 5-10 years at local, national and international levels; and strategise on how to maximize the benefits from these experiences and lessons learned by linking with other Asia Regional Support Programmes to support Cities addressing Climate Change Impacts through SUD-Net/CCCI. The workshop was organised in three day sessions.

SECTION II: THE WORSHOP- DAY 1

Day 1 –(Tuesday 26th August):
Consolidating SCP-Asia's Achievements and Identifying "Factors of Success"

Over the past ten years, the UN-HABITAT Urban Environment Section through the Sustainable Cities Programme-(SCP)/Local Agenda 21 has supported initiatives for sustainable urbanisation through a strategy designed to increase the impact of SCP/LA21 at the local, national and global levels. As part of this strategy, support was increasingly decentralized from the Programmes' international core teams to regional and national urban partners' institutions. In most countries where SCP-Asia has been active, urban institutions have been identified and are progressively assuming the role of providing technical support to local authorities and national government. This has significantly increased the capacity of Programme response to requests from local and national governments for EPM support, and strengthened the partner institutions towards becoming EPM anchoring facilities.

The day one of the 2008 SCP-Asia Regional Expert Group Meeting offered the opportunity for the SCP-Asia partners to share their experiences and reflections on how the strategy has worked; to what extent SCP-Asia has effectively contributed to improve urban governance, urban planning, environmental management, poverty reduction and especially the lives of urban poor communities.

Whilst morning sessions were structured around individual country presentations on achievements and lessons learned from the SCP implementation in Asia, afternoon sessions were organized on round table discussions and focused on how SCP- process, toolkits, expert group, network for City2City exchanges, others (political support, demo-project funds,

etc) could be used to support Cities Address Climate Change Impacts. The results of the discussions were shared in plenary and further developed through out the workshop as detailed below.

2.1 The Programme Day 1:

Day 0 (Monday 25th August): Arrival and Welcome:

19.0 **Welcome Cocktails:** Registration Angela Pinzon, SCP Regional Advisor UN-HABITAT ROAP, introduction of participants and welcome remarks by Chris Radford, Senior Human Settlements Officer (SHSO) UN-HABITAT ROAP.

Day 1 (Tuesday 26th August): Consolidating SCP-Asia's Achievements and Identifying "Factors of Success"

08.30 **Introduction** to the workshop by Chris Radford SHSO: SCP-Dutch programme objectives and expectations

09.00 **Achievements and Lessons Learnt** - Country presentations summarising their experiences, challenges and good practices that demonstrate:

- the ***up-scaling*** of demonstration projects citywide;
- application of management ***tools***
- ***documentation*** of these experiences for city and national ***policy learning, legislative reform and national replication***; and
- how EPM has been ***anchored*** by national capacity-building and research institutions and other partners.

09.00 The **India-SCP** experiences by Dr Sneha Palnitkar
09.20 The **Sri Lanka-SCP** experiences by Dr Fahmy Ismael
09.40 The **Philippines-SCP** experiences by Noel Duhaylungsod
10.00 Coffee Break
10.20 The **China-SCP** experiences by Dr Pan Xiaodong
10.40 The **Thailand-SCP** experiences by Dr Paul Chamniern
11.00 The **Korea-SCP** experiences by Professor Kwi-Gon Kim
12.00 **Discussion** on presentations facilitated by Bernhard Barth
13.00 **Lunch**
14.00 Facilitated **Roundtable Discussions**:

- Urban **EPM practitioners** will summarise "Success Factors" based on the following core elements: EPM process, toolkits, expert group, network for City2City exchanges, others (political support, demo-project funds, etc). Facilitated by Cecilia Njenga, HSO, UN-HABITAT.
- A separate **"Anchoring Institutions"** group (AIILSG, SLILG/UM, UP-SERD/DILG-LGA, TEI, BU, Korea Eco-City Network) will review implementation of the regional anchoring

strategy, including feedback on the first draft curriculum modules by IHS. Facilitated by Bernard Barth, Human Settlements Officer. UN-HABITAT.

16.00 **Tea Break**

16.30 **Plenary Report-back** on "Success Factors"

17.30 **End of Day 1**

19.00 **Welcome Cocktails** Asia Regional Support Programme and exemplar city representatives.

2.2 Introduction to the day 1 workshop :

Chris Radford, Senior Human Settlements Officer opened the event setting the framework based on the SCP-Dutch programme objectives and expectations, with a brief summary of their achievements that demonstrated the opportunity to use the lessons learned and institutional anchoring framework to support cities addressing climate change impacts.

It was recommended visiting the updated UN-HABITAT ROAP Website (http://www.fukuoka.unhabitat.org/topics/SCP/scp_e/scp.main_e.html) which displays the achievements of the SCP programme in Asia cities.

2.3 Achievements and Lessons Learnt: The morning sessions were anchored around individual country presentations of SCP regional partners from India, Sri Lanka, Philippines, China, Thailand, Korea summarising their experiences, challenges and good practices. These experiences were reported around the three SCP-Dutch programme objectives as detailed below:

Objective 1: "up-scaling demo projects":

- City-wide application
- National Replication Strategies; Provincial/National Policy Dialogue
- New legal guidelines and application

Objective 2 : Institutionalising the EPM system through

- Regional anchoring from ROAP
- National anchoring and partnership outreach to cities
- Toolkit adaptation/customisation/application
- Integration into a Anchor Institution`s curricula for sustained impact

Objective 3: Internalising SCP`s Normative functions

- Routine documentation
- New toolkit development
- Website dissemination

Integration with UNEP & Institutionalisation within UN-HABITAT

Day1: The India-SCP experiences by Dr Sneha Palnitkar

Day 1
Factors of Success for SCP in India (Maharashtra) for Phase I and II

By
Dr. (Prof.) Sneha Palnitkar
25th August, 2008 Manila, Philippines

1

SCP introduced in Chennai (Madras) in India as a `Demo-City'

2

EXPERIENCE SHARING WITH CHENNAI

- Chennai-first city in India to implement SCP.
- Visit to Chennai on19th & 20th January 2004.
- Discussion with Chennai Metropolitan Development Authority (CMDA) and the Municipal Corporation.
- CMDA anchored the programme.
- Critical issues identified -
  - Management of inland water ways.
  - Traffic management.
  - Sanitation.
- Involvement of celebrities and government officials.
- Active support of the state government.

3

- Chennai as a Demo City for EPM Process Development.
- EPM Process Development & Adaption.
- City to State Upscaling of EPM
- Process Tailored to Indian Urban Situation – Cities.
- SCP Replicated in Maharashtra State in India.

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Virar and Panvel growing Cities in close vicinity of a mega city, Mumbai.

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SCP – 2 Cities in Maharashtra in Pilot Phase.

- Two Phases
- Phase I pilot- 2 Cities –Virar & Panvel in MMR.

Nature of SCP Maharashtra Project

- Two Phases –
  - Phase I pilot- 2 Cities –Virar & Panvel in MMR.
  - Phase II - Replication in 8 more cities covering all the regions.
- Focus on sustainable Solid Waste Management.
- Partners – UN Habitat, AIILSG, Government of Maharashtra, MMRDA, CIDCO, Municipal Councils of Virar and Panvel, NEERI, MVP, BARC, NPC, PKV, SMS

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Briefing the Government on the SCP

CURTAIN RAISER - INTERACTION MEETING WITH GOVERNMENT SECRETARIES ON 22ND FEBRUARY, 2004

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City Consultation in Virar 23rd & 24th February, 2004

Issues Discussed:

- Scientific Management of Municipal Solid Waste
- Develop Water Supply & Waste Water Management System
- Developing the infrastructure through implementation of DP
- Gender issues.
- Awareness creation and public participation

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City Consultation in Panvel 25th & 26th February, 2004

Issues Discussed :

- Involvement of NGOs for planning "ZERO" Waste Garbage
- Need for Master Plan for development of physical and social infrastructure
- Emphasis on cooperation of all government agencies & citizens
- Training and capacity building for EPM process at the city level.

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Key Areas Identified in CCs

- Solid Waste Management
- Water Supply- augmentation schemes.
- Waste Water Management
- Infrastructure Development, Resource Mobilization and Development Planning
- Role Of ULB in Gender Specific issues.
- Community Participation and Awareness Building

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Recommendations of the Working Groups

- Solid Waste Management
  - Emphasis on source segregation, processing & recycling of waste at the generation point
  - Decentralized Waste Management plans.
  - Involvement of Poverty Groups.
  - Composting and BARC model of Bio Gas.
- Water Supply
  - Completion of augmentation schemes.
  - Meterization & water audit
  - Pricing to recover all costs.
  - GIS application.

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Recommendations of the Working Groups (Contd.)

- Waste Water Management
  - Adopting low-cost sustainable Liquid Waste Management – e.g. Phytorid Technology.
- Development Planning & Resource Mobilisation
  - Review the process of development planning for enhancing ULBs' ability in infrasturcture development
  - Strengthening resources of the ULBs.
- Gender Specific issues- needs of working women.
- Awareness and Capacity Building of the community.

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ACTION PLAN – FOR ZERO WASTE

- Both Virar and Panvel prepared micro plan for zero waste.
- Inventory of all the properties for each electoral ward
- Replicable models of zero waste of ALMs shown to Working Group members in Mumbai which helped in preparing elaborate SWM plans

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Experience Sharing About SCP – EPM Process

- Comprehensive Preliminary Work at Anchor Institution Level – i.e. AIILSG.
- Initial discussions with State Government i.e. Maharashtra State.
- Pilot Phase Concentrated on two cities in Vicinity of Mega City, Mumbai. (e.g. Virar and Panvel).
- Effective City Consultation Process & Road Map Preparation.

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CRITICAL ISSUES IDENTIFIED SCP IN PHASE I

- Solid Waste Management
- Water Supply
- Waste Water Management
- Infrastructure Needs and Resources
- Development Planning and Controls
- Awareness, Training and Capacity Building Needs for Establishing and Sustaining EPM Process.

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- Active Stakeholders' Consultations & Road Map Preparation.
- Focused Group Discussions (FGDs) & Road Map Preparation.
- Special Consultations with Political Leadership at each City Level.
- Focused discussions with State Government, Metropolitan Development Authority for Policy Advocacy.

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- Problem Solving Through Intersectoral Coordination.
- Targeted Interventions at City Level.
- Documentation & Dissemination.
- Convergence, Sustainability, Institutionalisation in selected ULBS.
- Significant State Support for the Success and Institutionalisation of the EPM Process.
- Experience Sharing Cross Learning with other Cities on Participatory Planning and Good Governance Practices through Seminars and Site Visits.

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OUTCOME OF SCP PHASE I

- Decentralized Solid Waste Management Strategy
- Consensus on Water Audit and Meterisation
- Awareness to Improve Waste Water Management
- Poverty Linked Solid Waste Management.
- Experience Sharing with other Cities – Best Practices Documentation and City Visits
- Need to Review Development Planning Process
- Significance of State Support for the Success of the EPM Process

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DEMO PROJECTS OF WASTE PROCESSING

Bio Gas Technology

NEERI's Waste Water Technology

- Wetland specifically constructed for pollution control and waste management
- Involves : preliminary filtration, removal of suspended solids and further treatment in hypodermic plant (emergent and floating leaved plants) (total treatment - 18 Hrs.)
- Effluent reduction efficiency of 85-95%
- Can be used in combination with septic tanks
- Treated water can be used for non-potable purposes
- Low-cost & less space requirements

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SCP – Furthering Up-scaling in India.

- Experience Gained from Two Cities - Virar & Panvel.
- Cross Learning.
- SCP Further Upscaled in India – in Maharashtra State.

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SCP Cities in Maharashtra State.

- **Focus on Small & Medium Sized Cities.**
- **22 large and 227 medium and small cities in Maharashtra.**
- **8 Cities selected in Maharashtra for SCP Upscaling in Phase – II**

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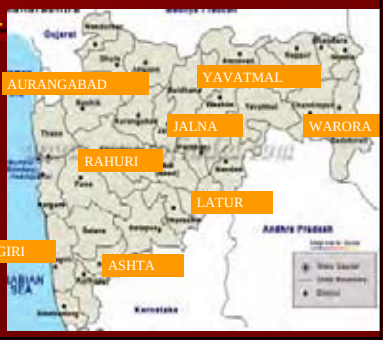
SCP – 8 Cities in Maharashtra in Pilot Phase.

- **Phase II - Replication in 8 more cities**



Localizing the EPM Process

- Commitment of the cities to SCP – City pacts
- Focus on local capacity, SCP committee, SCP Cell and Coordinators, Identifying LPIs for consistent support
- Comprehensive EPs to address all the critical civic issues
- capacity building for CDP
- Environment Poverty intersection

Environment – Poverty Intersection

- Identifying Urban Poor
- Involving them in Service Delivery
- Organizing Micro enterprises and capacity building
- Legal contract framework
- Unit system for Solid Waste Mgt. and other services
- Planning support for informal sector
- Basic Urban Services in low income settlements

Impediments in compliance

- Low priority and capacity
- Public apathy
- Land availability for centralized and decentralized treatment and SLF
- Financial constraints
- Labour law constraints
- Absence of effective framework for outsourcing
- Viability of MSW projects

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Govt. Resolution by Government of Maharashtra; GOM Directives in GR of Oct 2006 To Implement the MSW Rules on Priority

- Bulk generators waste collection And collection of Debris and green Waste
- Two bin system for all generators and handing over of two bins
- Doorstep Collection of waste from two bins separately
- Enforcement to stop littering
- Decentralized waste mgt., Recycling Centre
- Providing litterbins and clearance
- Decentralized Processing Facilities
- SLF Provision
- BMW management – Rules Compliant

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EMIS and ESR

- Government notification to digitize the City Survey maps of all the maps Municipal Corporations and Municipal Councils – SCP Cities taken on priority basis
- MRSAC appointed the nodal agency – to coordinate with ULBs, Town Planning Department, Settlement Commissioner, and DMA
- Guidelines for preparing Annual Environment Status Report
- ESR to include guidelines on EMP

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Approach Of SCP Phase-II

- State Level Committee for selection of cities
- Convergence with State and National campaigns – Sant Gadge Baba Abhiyan and JNNURM
- Commitment of the cities to SCP – City pacts
- Focus on local capacity, SCP committee, SCP Cell and Coordinators
- Identifying LPIs for consistent support
- Comprehensive EPs to address all the critical civic issues

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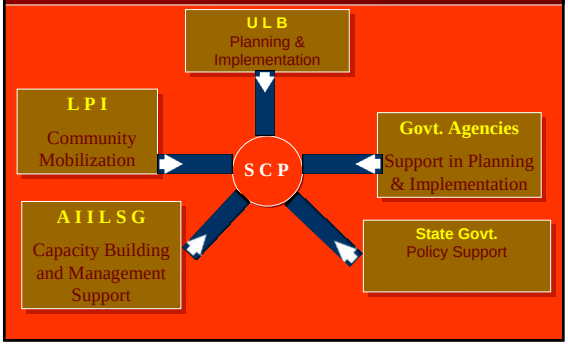
Stakeholders



Role Of The ULBs

- Urban Pact
- Setting up SCP Cell, Nodal Officer, Coordinator and Associate
- Environment Profile with the support of the AIILSG
- List issues and stakeholders
- Establish Working Groups
- City Consultation to evolve CDS, CDP, Projects and monitoring the progress of implementation

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Local Partner Institutions

- Support in preparation of City Profile
- Supporting the ULB in consultation process and in evolving CDS and CDP
- Awareness creation and civic engagement in the Environmental Planning and implementation Process
- Sustaining the participatory process

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State Support and Role Of Govt. Agencies

State Government

- Policy decisions on civic issues emerging in consultations
- Facilitate coordination with other departments and field agencies
- Project development
- Financial support for execution of plans.
- Legal framework to establish participatory process like EPM

Government Agencies

- Provide Data and Technical Information
- Technical Support for Project Planning, Investment Plan and Implementation

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Role of AIILSG – Anchor Institution

- Anchoring the SCP at the State Level
- Technical Support to the ULBs
- Training and Capacity Building
- Inter- sectoral coordination
- Policy advocacy
- Institutionalization of the Process

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Outcomes in Phase II

- State level orientation meeting
- Study visit
- State level training
- State level review meeting and consultation
- Setting up of SCP Cells – and Preparation of EP.
- Preparatory meetings to list issues & stakeholders
- SCP Review Meeting and training Workshop
- Revamping SCP Cell & preliminary Consultation
- City Consultation
- Working Group exercise
- Demo projects
- Implementation of CDP
- Institutionalisation
- Evaluation

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Documentation Cross Learning and Dissemination.

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ACHIEVEMENTS IN THE PROCESS OF IMPLEMENTATION OF SCP

- **Capacity enhancement of the ULBs in identifying key issues of city development through participation of the stakeholders.**
- **Cross Sectoral coordination, effective interaction with Government agencies. Articulation of policy issues.**
- **Gender issues in focus.**
- **Poverty – Environment intersection.**
- **Demo project on SWM, on sewerage treatment in collaboration with NEERI - Phytorid technology**
- **Proposed establishment of cell for review of development planning process**
- **Problem solving in water supply schemes.**

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LESSONS LEARNED

- SCP- EPM is a scientific approach of participatory planning process.
- City priorities can be set only through bottom up process.
- Cross sectoral coordination helps problem solving.
- Government support crucial for sustaining the process.

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WAY AHEAD

- **Taking working group process ahead.**
- **Visit to Cities of Good Practices**
- **Demo Projects and its Implementation at City Level.**
- **Policy initiatives at State and City Level.**
- **Sharing the Phase I – II experiences at National Level/ State Level.**
- **Replication of SCP.**
- **Institutionalization of the EPM process.**

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Models & Tools Identified During the SCP Process in Maharashtra by AIILSG

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Day1: The India-SCP experiences by Dr Sneha Palnitkar

SCP Experience in Maharashtra - Models in Five Areas of MSWM

1. Awareness creation for storage and non littering - *participation of generators, RWA and NGOs*

3.Collection, transfer and transportation - *Private Companies*

2. Door to door collection of segregated waste and decentralized waste processing - NGOs and Organized Rag pickers and Self help groups of urban poor

5.Enforcement – ***involving ex servicemen and police officers***

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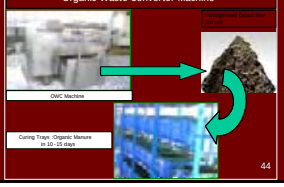
Models of decentralised processing through Urban Poor

Decentralized Processing – Do At Home Models Zero Garbage to Municipal Stream

Biogas plant

Processing with in the area in Compost Bins

Organic Waste Converter Machine



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SCP- Models in Bulk Transportation and Centralized Processing and Disposal – Maharashtra Experience

Bulk Carriers Proposed at Transfer Station

Compost Plant

Weigh Bridge at Landfill

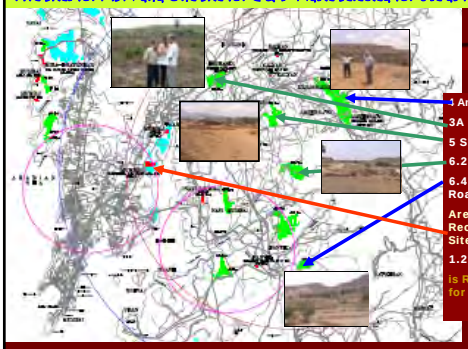
Auto Loading Device of the Compactor

Landfill Construction

Closure of Old Dump

Development of Regional Landfill for Mumbai Metropolitan Area

Five Sites for MSW and One Site for C & D Waste Selected for Use as RLF for MMR



1 Ambernath
3A Bhiwandi
5 Shil Phata
6.2 Near Taloja
6.4 Panvel- Pune Road
Are Recommended Sites for MSW
1.2 Airoli Site
is Recommended for C & D waste

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Case Study -MSW treatment and Disposal- SCP Model of PPP in CIDCO area of Navi Mumbai in Maharashtra

o Processing of Biodegradable solid waste by Windrow composting at site located adjacent to the final Landfill site at Chal Village, Taloja (BIV)
- ✓ Capacity of the plant 50 T / day raw input
- ✓ Area allocated is 1.4 ha.
- ✓ Facility of manual sorting provided at unloading platform
- ✓ Residue/ Rejects expected at 20%

o Sanitary Engineered Landfill site
- ✓ Total area earmarked for development is 14 ha
- ✓ Area allocated is 6 Ha. for landfill cell for present input of 25 % of 65 T/day for 15 years
- ✓ Landfill has been designed by NPC environment group

oCost of Installation, Operations and Maintenance of Integrated facility= Processing and Landfill
- ✓ Capital cost of constructing Processing and landfill facility including site development is Rs. 1.76 crores.
- ✓ Annual operating cost will be Rs. 325 per Tonne of waste in put to the site (Approx. Rs. 1.93 crores per annum for three years contract)

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Further Testing of New Innovative Ideas context of EPM Process

- Waste Water Treatment.
- Decentralized SWM system at City Level.
- Developing Regional Sanitary Landfill Site in MMR using EPM Process.
- Rainwater Harvesting
- Urban Poverty Linked Solid Waste Management

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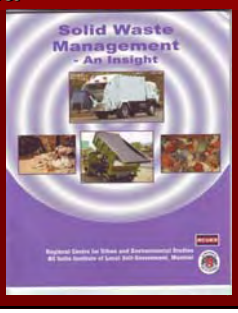
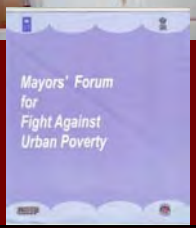
Day1: The India-SCP experiences by Dr Sneha Palnitkar

EPM Process Used in Urban Poverty Linked Solid Waste Management in India



Mayors to Integrate SCP / SWM Approach in Urban Poverty Alleviation



SCP Tools / SWM Strategies & Good Practices Used in State Strategy Development and Capacity Building of ULBs

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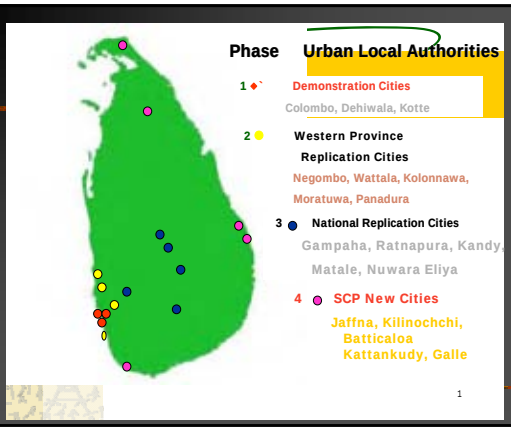
Day1: The Sri Lanka-SCP experiences by Dr Fahmy Ismael

SRI LANKA

SCP-EPM
COUNTRY AND CITY
ACHIEVEMENTS

1

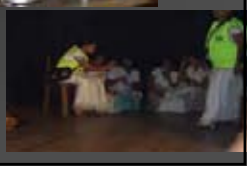


2

Waste Water Treatment

3

Disaster Management Ratnapura



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Demo Projects in Colombo

- Green Star Project – control of dengue
- Reduction of Non-Revenue Water
- Air Quality Management
- Waste Water Management at Weligodawatta

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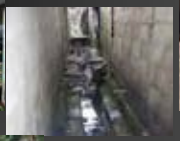
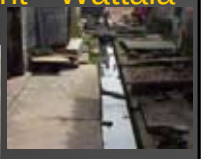
Waste Water Treatment - Wattala





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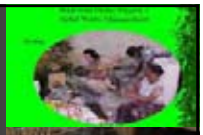
Day1: The Sri Lanka-SCP experiences by Dr Fahmy Ismael

Solid Waste Management Sorting Centres



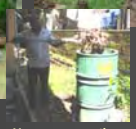
Waste separation

Solid Waste Manage -ment -Bio Gas Units

Bio-gas

8

Solid Waste Management Composting



Home composting

9

Solid Waste Management

- Major issue in most LAs in Sri Lanka
- **The project was the first to introduce innovative and alternative methods of reducing waste.**
- Promoted Local Authorities to make budgetary provisions
- Attracted community contribution.

SUCCESS OF THE DEMO PROJECTS LED TO UP SCALING citywise

10

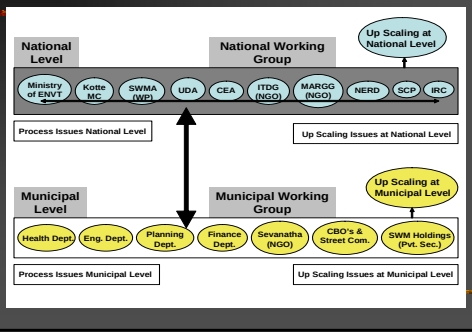
Up scaling Basic Urban Services

- **Development of an integrated SWM Strategy from a demo project - the first of its kind in Sri Lanka**
  - Powerful new technical approach to SWM : '3' R Concept
  - Great public demand - Home composting up scaled
- **New Partnerships – strengthening strategies**
  - Ministries - Technical Institutes (NERD,ITDG) - NGOs facilitating community, promoting partnerships
- **EPM process was exposed as a Good way to sl**
  - Helped agencies to Focus on poor .
- **Political Ownership**
- **SWM strategies led to micro enterprises**

Participatory approach

11

Development of Strategy through Partnerships



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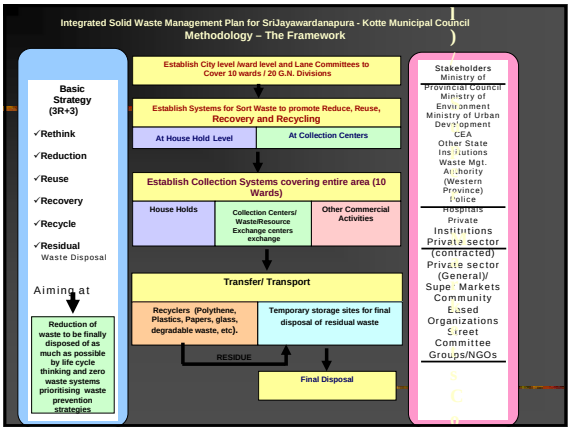
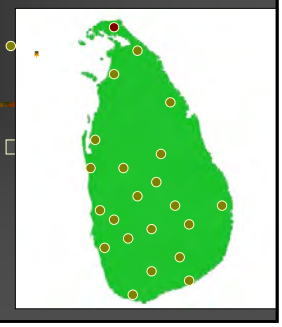
Day1: The Sri Lanka-SCP experiences by Dr Fahmy Ismael



Spread locally and accepted in the National program

Cities began to "copy" practices and develop their own City SWM Strategies eg. Kotte, Negombo, N' Eliya …

Process Adopted in the national strategy on SWM



14

With the SCP showing success and increasing acceptance, UNDP requested the project to implement a program on Localization of MDGs

15

LOCALIZATION OF MDGs

- With the experience of SCP, localisation of MDGs was introduced into 9 cities
- Was easy to adapt process, mainstreaming into city development plans
- The FIRST to introduce the MDG localization concept

16

In pursuing the MDGs the SCP/UGSP has promoted

- Good Governance
- Ensuring Environmental Sustainability through the identification of environmental issues and developing strategies and action plans through a participatory process
- Eradication of Poverty and Hunger through the process of empowerment to the poor and promoting micro-level enterprises.
- Strengthening primary health care activities in local authorities

LOCALISATION OF THE MDGs

17

THE NEW STRATEGIES…*strengthened the LAs*

- Introduced Working Group Concepts
- More involvement of community
  - Pro Poor Strategies - Gender issues strengthened-NGO facilitating process
- Improving Environmental & Management Information System (EMIS)
  - Stakeholders / Profiles / Mapping
  - Using data base for strategies
- Introduced and strengthened the Capacity Building Process

18

PARTNER INSTITUTIONS

- Sri Lanka Institute of Local Governance
- Sevanatha
- Management and Resources for Good Governance
- University of Moratuwa
- Centre for Urban and Regional Planning
- Open University

19

Management Tools

- Customized Toolkits
- City Profiles
- Training Modules – SLILG,University,CURP
- GIS – Training Modules/Mapping
  – Cell at SLILG

Training Modules used by SLILG, CURP and University as part of their routine program

20

Documentation

- SCP Toolkit has been customized, translated into Sinhala & Tamil and distributed to all LAs
- Demo –projects have been documented and disseminated through
  - National Replication Workshop - 2001
  - Provincial Replication Workshop - 2001
  - Meeting of National Mayors Forum - 2002
  - National Seminar on Good Urban Governance - 2002

21

DISSEMINATION



22

Dissemination ….

- Leaflets, brochures, handouts – distributed at most meetings / workshops
- HIS has documented the first two phases of the SCP –distributed locally and internationally.
- The capacity-building activities has been analyzed and recommendations made and documented.
- The role of Toolkits in Supporting Good Governance has been reviewed in a document 'Making Urban Governance Work' by Govt. of Japan through Regional Office.
- The SCP, Sri Lanka 1999-2006 – An Anthology of Good Governance Practices.

23

CAPACITY BUILDING




24

- A full time Training Adviser worked on the SCP program coordinating training needs of Las with SLILG
- Necessary training modules prepared – 20
- Filled the 'gap' that existed between LA and SLILG
- EMIS centre established at SLILG providing GIS/EMIS training to Las with support from University of Moratuwa (UoM)

25

- This partnership led to the UoM implementing the EMIS/EPM approach as a tool at the UoM
- The UoM is now working very closely with Las all over the island
- Training initiatives and the partnership with training institutes such as the SLILG, CURP, UoM supported the cause for a national policy on capacity building for LAS

26

National Application

- The participatory mechanisms and the EPM approaches were a totally new concept to all LAs in Sri Lanka.
- The training programs and the training needs survey conducted led to the formulation of a Capacity Development Action Plan which called for more intensive and long term training.
- This was implemented in partnership with the national training institute and supported by the IHS

27

National Application

- SCP's capacity building initiative helped the two Ministries to understand the importance of developing a full-pledged program of local government capacity building.
- **As a result, a National Strategy for Local Government Capacity Building was formulated and approved by the Cabinet of Ministers for implementation.**

28

National Application

- The Ministry of Urban Development and Ministry of Home Affairs Provincial Councils and Local Government (MAPC & LG) has obtained the approval of the Cabinet of Ministers **to mainstream participatory decision making in local governance in Sri Lanka and to mandate the Ministry of PC & LG with the responsibility for promoting good governance in local government.**

29

National Application

- **Sri Lanka Institute of Local Governance**
  - established GIS Unit
  - using training modules as a routine practice
- **Centre for Urban & Regional Planning**
  - training modules used as part of curriculum for planners
- **University of Moratuwa**
  - using it for training for local authorities
  - GIS training provided for local authorities
- The SCP experiment in AQM in Colombo evolved into a national exercise.
- Supported the **Urban Sector Policy Framework** being a National Task Force Member

30

Day1: The Sri Lanka-SCP experiences by Dr Fahmy Ismael

Day1: The Philippines-SCP experiences by Noel Duhaylungsod

The SCP-EPM Process in Island Coastal Zones

(Insights from Actions of the Cities' Lipa, Tagbilaran and Cagayan De Oro in the Philippines)

Noel C. Duhaylungsod, National Adviser, UN Habitat-Philippines, July 2008

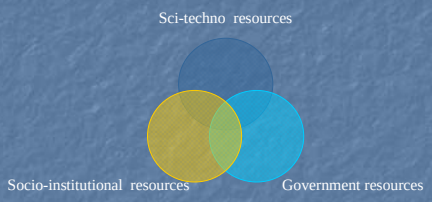
1

History of the collaborative intervention (UNHabitat/Rep. Phils.)

- (1995-98) Integrated Environmental Management for Sustainable Development
- (1998-2001) Strengthening Local Environmental Planning and Management for Cities
- (2001-present) Sustaining gains, mainstreaming adaptation-mitigation processes, and policy development/reform

2

EPM Process Conceptual Framework



At the gravitating core of the interaction is ***environment***, which holds the key in building community resilience to climate change impacts, thus progressing towards urban sustainability

3

The Effectiveness of the SCP-EPM Process was demonstrated at the city level on the following:

(1) Coastal zone management projects

(2) Policy development and implementation

(3) Pollution Management

(4) Managing ecosystem continuum

(5) Food security

4

Documentation available

- Asian Institute of Management – Lipa City experience
- University of the Philippines-School of Urban and Regional Planning – Tagbilaran City
- Liceo De Cagayan University – Cagayan De Oro City

5

"The social burden on scavengers at the city dumpsite was a priority of the solid waste issue."

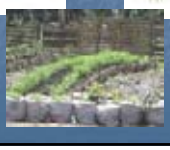
Collecting garbage

EPM TWG preparing for the forthcoming City Consultation.

6

Day1: The Philippines-SCP experiences by Noel Duhaylungsod

Allotment garden



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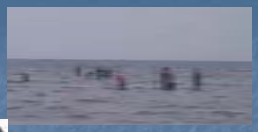
Demarcating mangrove area for rehabilitation; grown mangrove trees on estuary



8

Customization of Tools

- STH identification and mobilzation coupled with community organizing techniques
- Translating qualitative information into GIS-based information – (social process generated information)

9

Well demarcated fish sanctuary with artificial reefs

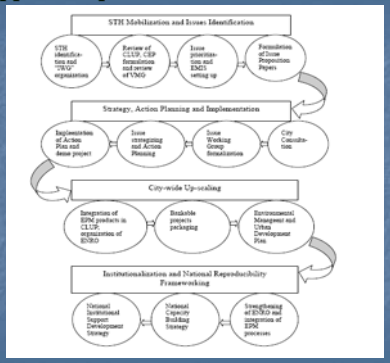
Community workshop for mapping, scheduling, etc.

10

- Democratized EP formulation – merging technical writing with “social language”
- TWG>WG with strong influence on decision making & negotiation, elevating > quasi body of governance

11

Philippine adaptation of the EPM Process Model



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Curricularization

- Module development > 10-module-based curriculum
- 3 unit graduate course at UP-SURP; MA course at LDCU?; Executive course at AIM?
- Trainers' Training – customized tools are integrated in the modules >> Bangkok and Beijing TOT

13

"Expanded" Anchor Institutions

- 15 academic institutions and NEAs as AIs
- LCP & PUF as key centers of advocacy
- Discussion to organize a NCSU at HUDCC drawing the different urban STH (public and private)

14

Policy development

- DENR Administrative Order (NSP)
- DILG Memorandum Circular
- Integration of the EPM process in CLUP: National Guide
- Measuring SWM Board Functionality)

15

16

Reproducible Products

National scale

- Strategy on Capacity Building on Sustainable Urban Development
- Strategy on Institutional Support Development
- Policy tool/instruments (Department Administrative Order, Manual, Guide, Working Paper)

17

City

- Sectoral Plan integration
  - > Strategic Environmental Management Plan > Executive & Legislative Agenda – Lipa City
  - > 10-Year Solid Waste Management Framework – Lipa City
  - > Integration of the EP and S&AP in CLUP & CIP- CDO
- ENR Office institutionalization
  - CDO City
  - Lipa City?

18

Success Factor - 1

- Brought together local and national stakeholders to integrate bottom-up and top-down decision making which implemented national policies and strategies at the local-level, whilst local actions were able to influence national agenda

19

Success Factor - 2

- Ensured broad-base participatory environmental governance

20

Success Factor - 3

- Enabled a wide variety of stakeholders to gain new concepts and skills through a learning-by-doing process supported by a comprehensive toolkit on EPM

21

Success Factor - 4

- Training- Capacity Building requires time and resource consuming hands-on training support - it cannot just be left to reading the tools – needs back-up and someone leading the learning process

22

Success Factor - 5

- Balance between process and product - at the end there needs to be a clear improvement in the lives and physical conditions of the urban poor. This requires constant project management to keep focused on delivery in a timely manner, whilst taking due time for broad based stakeholder Capacity Building

23

Success Factor - 6

- Inclusion of policy holders and decision makers with practitioners through the process enables the institutionalisation of lessons learned into local/national government practices

24

Success Factor - 7

- "Anchor Institution" includes National Enhancing Agencies, by virtue of their mandates and the availability of EPM experts (exposed and skilled) to assist cities go through the process; Experts lead in tool adaptation or development, developing educative modules (formal and non-formal training) and reflection for concept and methodology refinement.

25

Success Factor - 8

- Apart from the usual city-city sharing of experiences and knowledge, the LGU-to-LGU coaching concept is an effective approach in EPM application in "new" cities.

26

Success Factor - 9

- Multi-stakeholder involvement is effective in sustaining the gains of the EPM process. The advocacy roles that civil society (NGO and Peoples' Organization) and private sector provide the needed momentum of integrating and institutionalizing the EPM process in city governance, past the project life.

27

References

Cagayan De Oro City, Tagbilaran City, Lipa City documentation reports.

Noel C. Duhaylungsod. "Chaps. 2-4 in SCP in the Philippines". June 2008.

28

Day 1 : The Thailand-SCP experiences by Dr Paul Chamniern

Practical Knowledge and Tools Management for Sustainable City Empowerment

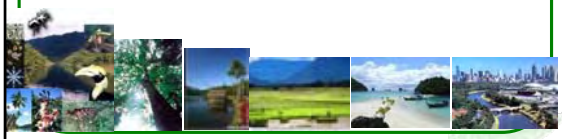
Chamniern Paul Vorratnchaiphan PhD
Senior Director
Thailand Environment Institute

Thailand Environment Institute (TEI)

- Long-term experience with grass-roots level and community-based Demonstration projects
- Long-term work-Relationship and Cooperation with International partner agencies, such as CIDA, DANIDA, GTZ and SCP

Environment Planning Management : EPM

- Provision of theoretical framework and guiding principles
- Lays excellent Foundation for Local Governments and NGO's
- TEI translates these principles into practice



Current Trend: Decentralization of Thai Land use Planning

In the process of de-centralization more responsibilities and funds allocated to Local Governments

Principle

The expectation: Municipalities assume key-role in land-use planning

Apart of the largest municipalities, only few local authorities have the capacity to fully adopt spatial planning practices

Reality

There is only little involvement of citizens, which limits their capacity to participate in land-use planning

"Local Governments cannot perform to the new high standards expected by Central Thai Government"

Why is Spatial Planning still weak in Thailand?

- Top-down process, managed by experts
- Limited public participation
- Public and practitioners lack skills and proper understanding of the planning process and built environment
- Little integration between the spatial plan and local development plan

All Thai stakeholders must adopt to change in a strong consultative, cooperative and participatory process

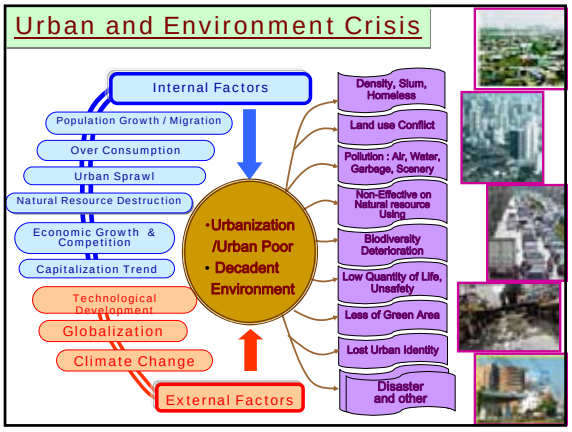
A major issue in Thai Planning

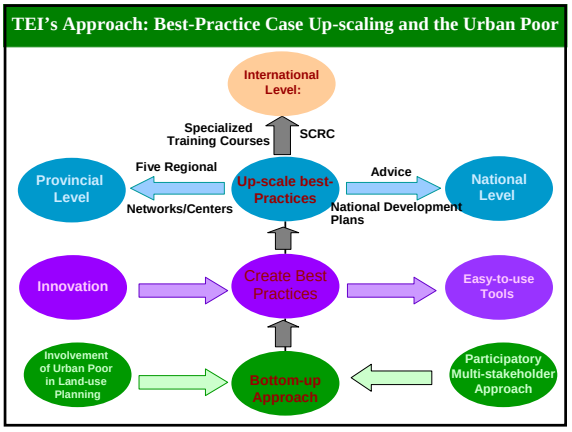
Local Development Planning mainly carried out by local governments

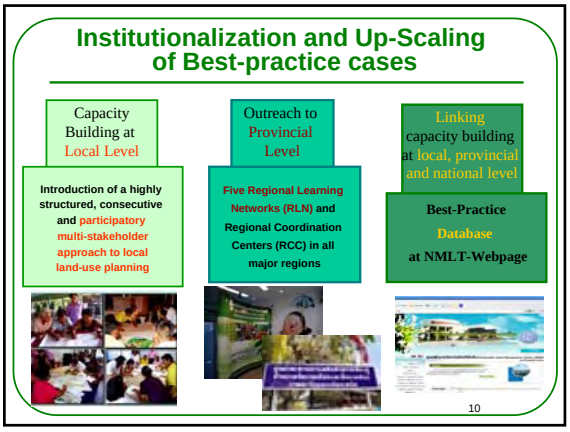
Weak Link and Integration between Local Development Planning & Land-use Planning

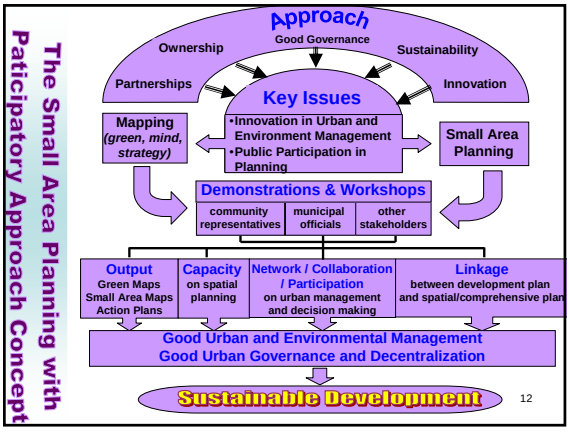
Land-use Planning Mainly undertaken by national planning agencies through Provincial offices

Day 1 : The Thailand-SCP experiences by Dr Paul Chamniern









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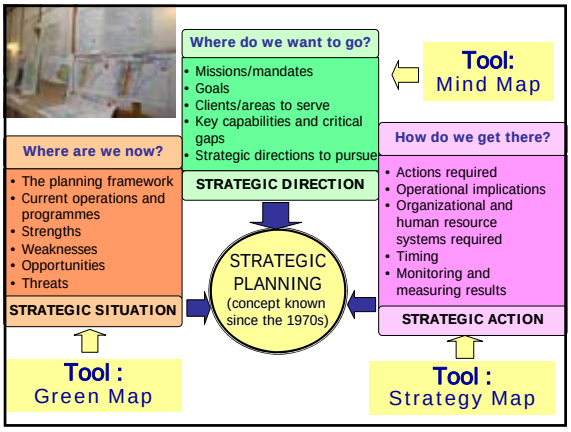

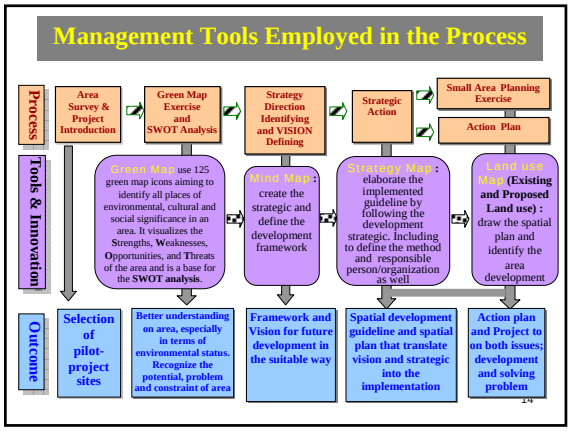

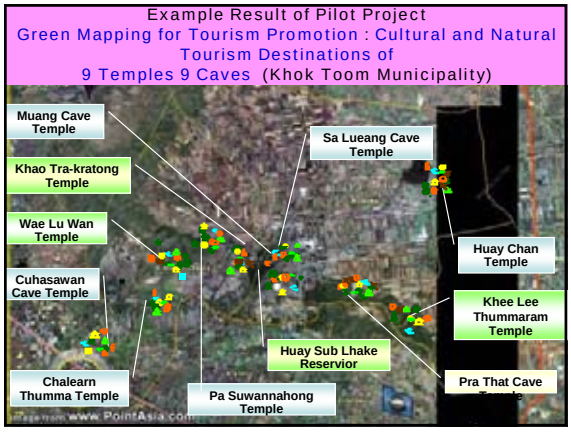

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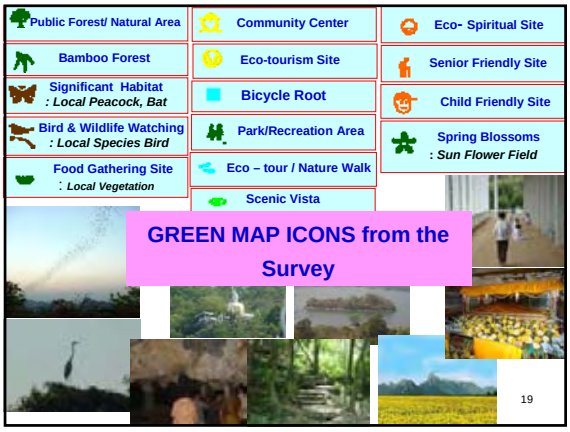

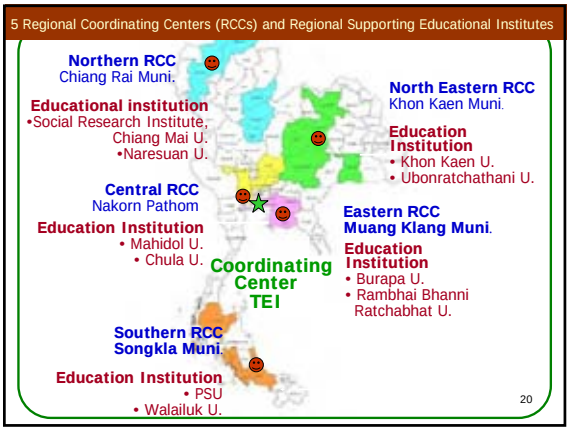

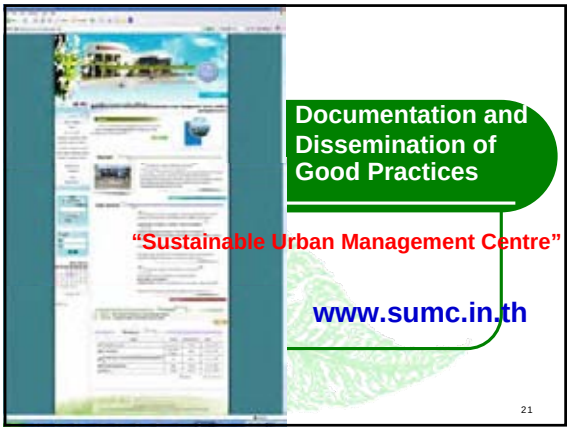

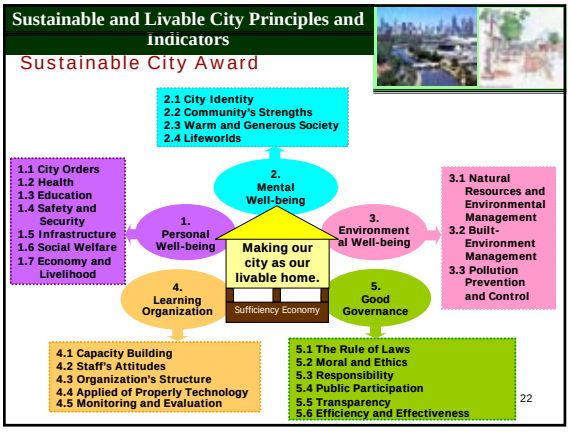

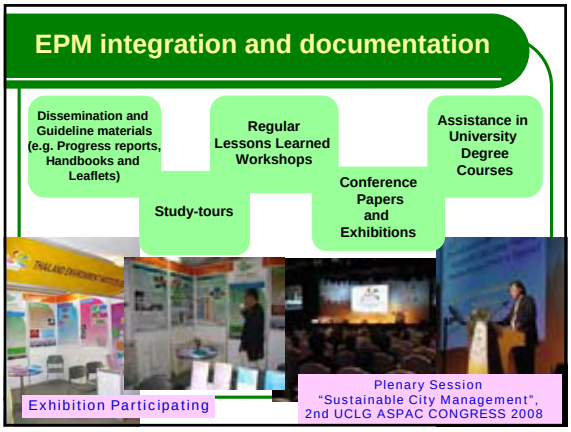

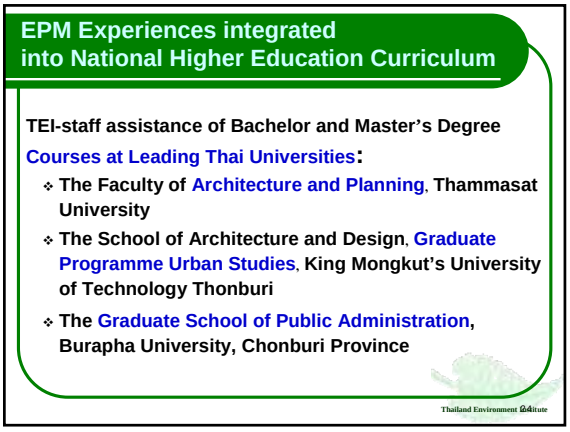

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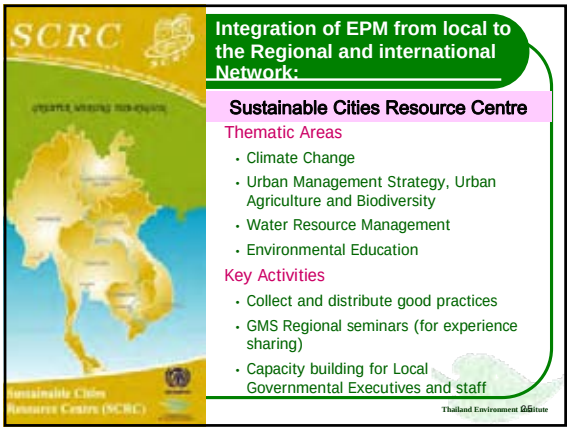


Day 1 : The China-SCP experiences by Dr .Li Zhenshan

Towards Sustainable Urbanisation: Strengthening City and National Partner Capacities to Mitigate and Adapt to Climate Change Impacts

Manila, Philippines: 26th - 28th August 2008

SCP Experiences in China

Li Zhen-shan, Pan Xiao-dong

DISC, ACCA21-PKU, CHINA

1

Introduction to SCP in China

SCP Ⅰ: Shenyang, Wuhan

SCP Ⅱ: Guiyang, Panzhihua, Hailin

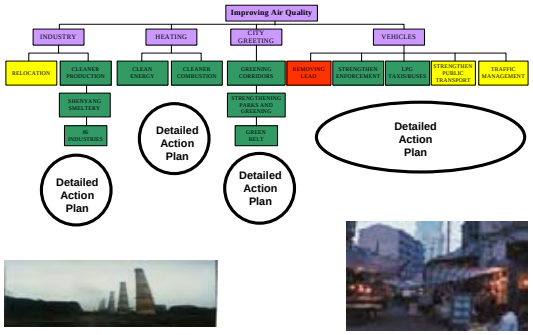
SCP Ⅰ: Demon-project upscaling

Shenyang, Wuhan : 1997 -1999.

City	Issues	Demo-projects
Shenyang	▪ Air pollution ▪ Inadequate water supply and quality ▪ Liquid Waste Management ▪ Industrial Re-structuring and Technology	•Introduction of unleaded petrol •Dual water distribution in Teixi District •Construction of the North Wastewater Treatment Plant • Closure of the Copper smelting plant •Creation of Industrial Parks
Wuhan	▪ Surface Water Pollution ▪ Solid Waste Management ▪ Strengthening Water Supplies	•Cleaning the lakes •Landfill construction •Reducing river pollution

3

Shenyang: Air Quality Improvement Strategy



Achievements

Through this strategy the city:

- close/relocate the most polluting industries,
- Introduce cleaner fuels for its heating systems
- Introduced LGP for buses and taxis
- Today Shenyang has dropped out WHO`s top 20 worst cities

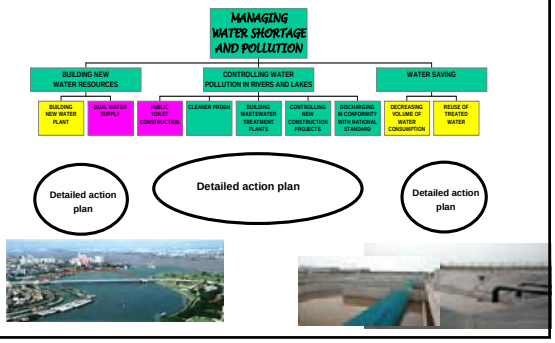
5

Wuhan: demon-projects upscaling

Wuhan Environmental management strategy

6

Water Resource Improvement Strategy



Wastewater Treatment

5 +6

wastewater treatment plants

Solid waste disposal

- **7+5 solid waste treatment plants**

9

SCP Ⅱ: Demon-city upscaling

(1) Guiyang, Panzhihua, Hailin, 2005-2007

(2) National sustainable communities

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National Sustainable Communities of China

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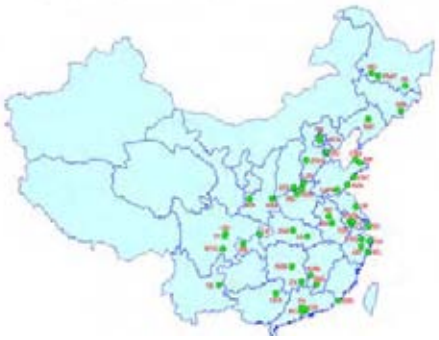


11

Guiyang

12

Demon-projects

- Eco-economic city Planning
- Demonstration Project Ⅱ
  (1) Altering the fuel oil into the gas project of vehicles in Guiyang
- (2) Guiyang Sanlian Dairy Co. Ltd. Biogas Demonstration Project


Experiences

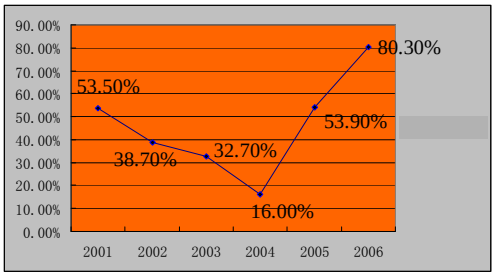
- The smooth implementation of SCP is ensured by the powerful political support.
- Considering Guiyang' situation
- Stakeholders' participation is the key to success of SCP.

14

Panzhihua


15

Air Quality Standards-reaching Rate 2001-2006



16

Building Awareness


Experiences

- **Adapt SCP to suitable approaches for the development of Panzhihua;**
- **Develop cross-section cooperation, make the sound transformation of work mode, improve work efficiency, and maximize utilization rate of resources;**
- **Public participation in environmental management, make more people gave counsels for the development of Panzhihua, and bring forward better suggestions and advices;**
- **to try the best to get enough political support to promote the popularization and development of SCP in Panzhihua, and continuously perfect and develop localization of SCP.**

18

Hailin

Priority issues:

Wastewater treatment
Ecological restoration
Water resource management

Project Implementation

Policy

Cross-section Working Group

Awareness rising

Mayor-box, Public forum

Achievements

- 1. Through project implementation and demonstration projects construction, raise the Hailin awareness of the sustainable development, and promote the coordination development of economy, society and environment.
- 2. Improve the ability and consciousness of the managers. Through more than two years project implementation, Hailin can use SCP project concepts and methods to apply to the city management model, which has laid a good foundation for the long-term development of Hailin.
- 3. The cross-section cooperation is increasing, increases the cooperation capacity of stakeholders. After completion of this project Hailin will continue to treat the sustainable development as the goal, and promote the comprehensive and coordinated development.

23

SCP Training

1. Translate and localize UN-Habitant SCP manual and toolkit. We translated 9 books of SCP series in Chinese, and edited one training manual in English, including examples from China.
2. Establish a training group including the representatives from Wuhan and Shenyang.
3. Participate international training

If we view SCP as a open university, SCP tools is text books in the university. (Core knowledge)

24

Day 1 : The China-SCP experiences by Dr .Li Zhenshan

Training material

Training Group

Dr. Peng HAN

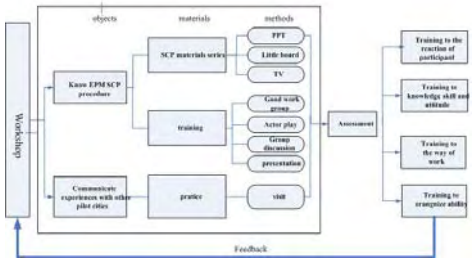
Dr. Zhenshan Li

Prof. Wen Huang

Dr. Xiaoling Mao

Dr. Tianhong LI

Training Curriculum



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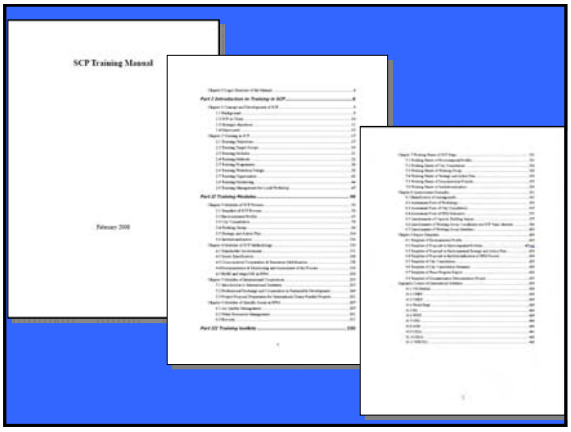
International training

-- **PP workshop (Korea)**
-- **TOT1 (Bangkok)**
-- **TOT2 (Beijing)**
-- **EMIS training (Nairobi)**
-- **InWent training (German)**



Documentation

Dissemination

Various media
- -- newsletter
- -- website
- -- news report

Various channel
- -- NSC forum
- -- international forum
- -- CSCs exhibition

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Dissemination

32

Dissemination

ACCA21 attend Nanning international conference on sustainable urban development

Disseminate SCP/EPM process in Sustainable Communities Forum held on December 26-29, 2005

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Partner Performance

- All partners have successfully carried out respective project tasks.
- Persistence when facing difficulties and challenges.
- Active participation in additional activities during project process.
- Strong commitment and collaborative attitude.
- Strong willingness of building up new international cooperation.

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SCP Impact

- Reinforcement in introduction of SCP concept and process as a successful urban management tool based on first round SCP project.
- SCP tools and curriculum development through localization serving as long term instrument for future promotion in a wider range.
- Create significant impact on pilot cities in area of urban environment management through project implementation.

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SCP Impact

- Begin to generate influence at central level.
- Build up international cooperation platform for all partners and potential NSCs.
- Strong need to continue SCP project in China to further disseminate project experience and outcomes to better serve sustainable urban management in China.

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Factors of Success

- **Raise awareness for pilot cities through various China SCP activities.**
- **Obtain Higher political acceptance and support.**
- **Build multi-stakeholder cooperation.**
- **Through learning by doing process, SCP methodologies and tools better understood and accepted.**

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Factors of Success

- **Information and experience sharing benefits pilot cities.**
- **Take new approach and new thinking method when deals with city problems.**
- **International visibility and cooperation capacity enhanced for institutions and cities.**
- **Attempt to combine SCP procedures into daily administrative work.**

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Thanks

Sincere gratitude to UN-HABITAT HQ/Fukuoka Office, five pilot cities and other partners in China SCP Ⅱ project for their hard working , support and cooperation.

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Towards a sustainable and harmonious city !

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Achievement and Lessons Learnt — SCP in Korea

Kwi-Gon Kim (Ph.D)
Professor, SNU, Director, IUTC

Hoon Lee
Researcher, SNU

1

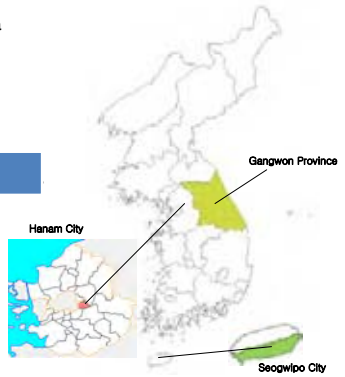
1. Introduction

Overview of SCP in Korea

Hanam City:

Seogwipo City :
[Feb 2005-Dec 2007]

Gangwon Province :
[Oct 2006 – Dec 2008]



2

2. SCP in Korea
2. 1. SCP Experiences in Korea
2.1.1 Hanam City

1) Overview of the Hanam Eco-City Plan

☼ Population : 125,311 (1998)

☼ Total Area : 93.46㎢

☼ Green Belt Area : 86.411㎢ (92.5%)

3

Development vs. Preservation

- ☞ The city is a strategic transportation city, located most closely to Seoul among cities in capital area
- ☞ The city has excellent environmental conditions including 53% of the entire city as forests and rivers of 81 Km
- ☞ The most typical green belt city with 98% of its area designated as green belt since 1970.
- ☞ Various development activities have been restricted by relevant laws and regulations
- ☞ Citizens have been restricted to exercise their property rights and isolated from development benefits

Identification of priority issues

- ☞ Lack of economic self-sufficiency, need for a new development vision when in a green belt area
- ☞ Lack of environmental self-sufficiency
- ☞ Destruction of natural resources
- ☞ Incomplete ecological network

The Purpose of the Hanam Eco-city Plan

"To transform Hanam from a rural and carelessly developed city to a sustainable and environmentally sound city with a well-structured city development and growth management and self-sufficiency."

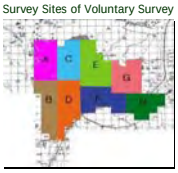
4

2) Activities

Establishment of Environmental Profile(EP) and EMIS

- Voluntary Survey Method

- Survey Sites of Voluntary Survey



- Expert Survey Method

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Identification of Issues

Segment	Major habitats	Present state	Key Issues	Photographs
Rivers & Streams	Han Riverside Wetlands, Dukpoong Stream, Mangwol Stream, Cho-E Stream, Sangok Stream	Water pollution is worsening because it is difficult to maintain water volume in rivers	Securing average water volume and water quality improvement	
Small Streams / Valleys	Upper Streams of Major Rivers, Yangji Valley, Kogol Valley, Hangdong Valley	Water quality of upper stream is poor due to lack of sewage disposal and collection pipes	Set up collection pipes and sewage disposal facility to ease and prevent water pollution	
Wetlands / Ponds	Sangsachang dong, Cho-E dong Saraegi Wetland, Yangjigol Pond	Wetlands are often reclaimed and diverged as cultivation land or cattle shed sites ; proactive preservation required	Cultivation land by reclaiming wetland and building cattle shed recklessly	

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Segment	Major habitats	Present state	Key Issues	Photographs
Lakes / Reservoirs	Kambook Reservoir	Hanam has two Reservoirs; both are used as fishing sites today and lost their functions as habitats	Diversion of reservoirs as fishing sites	
Agricultural Area	Dukpoong dong, Choonkoong dong, Mangwol Stream Area	Green houses are set up a high percentage of agricultural land; the function of agricultural land as green area and habitats is very low	Secure a green area axis by creating green area in facility complexes and restore soundness of rice paddy ecosystem	
Grassland Area	Kambook dong, Han Riverside (Paldang Bridge-Baealmi) Grassland	In case of grassland, development-driven destruction is most likely; serious destruction threats exist.	Construction of new road between Paldang Bridge and Baealmi destroys riverside green area	

Segment	Major habitats	Present state	Key Issues	Photographs
Forest Area	Mt. Kumdan Area	Forest area is in a relatively better state because of designation of green belt	Increasing linkage between forest area and nearby habitats	
Residential Area (Including Green Area)	Sinjang dong(urban green area), Cho-E dong(nature village), Dukpoong Park	In new town area, green area is secured centering on apartment complexes. In case of old town, green area is in absolute short	In new town, increasing linkage between existing green areas; in old town, securing insufficient green area urgently	

Establishment of Strategies and Action Plans

Strategy Development Principles

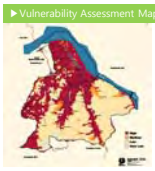
- ☞ Protection of Endangered Wildlife
- ☞ Stakeholder Involvement & Empowerment

Establishment of Hanam Biodiversity Strategy

▶Diversity Assessment Map

▶Naturalness Assessment Map

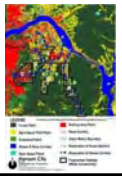
▶Vulnerability Assessment Map



▶Rarity Assessment Map

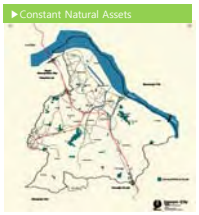
▶Typicalness Assessment Map

▶Habitat Value Assessment Based on Landscape Ecological Principles



▶Critical Natural Capital

▶Constant Natural Assets



▶Supportive Capital

▶Supportive Capital

▶ Hanam Biodiversity Strategy Map

Pilot Projects

Summary of Pilot Projects

Eco-city planning & development pilot projects	Pilot projects implemented	Pilot projects under implementation / to be implemented
Urban afforestation to create an evergreen city	- Plantation of trees along roads - Creation of pocket park - Plantation of street flower beds - School playground afforestation - Setting up and upgrade of park facility - Re-plantation of contributed trees - Creation of Sundong tree orphanage - Safety area afforestation - Hwangsan Road tree re-plantation - Changwoo theme park tree plantation - Creation of flower beds in Dukpoong Bridge 3 - Sangok stream tree plantation - Central median tree plantation - Changwoo-dong theme park creation - Theme park grass plantation - Green school creation (Dongbu Elementary School)	

Eco-city planning & development pilot projects	Pilot projects implemented	Pilot projects under implementation / to be implemented
Creation of rivers and wetlands breathed by life of nature	- Mangwol stream flood prevention project	- The Han Riverside bicycle road and promenade creation plan
Supply of CNG bus	- Setting up natural gas bus charger at public bus garage : 1 set - Annual replacement of diesel bus with natural gas bus : 137 buses	
Reduction of air pollutants including exhaust gas	- Setting up air pollution measuring device	- Establishment of a mechanism to reduce ozone - Reduction of air pollutant exhaust from vehicles - Control of sites discharging air pollutants
School environment improvement in conjunction with eco-city	- Afforestation of an area around school playground - Removal of fences (Put natural stone or rose vine fences)	- Removal of fences in 2 schools - Park creation in 1 school

Eco-city planning & development pilot projects	Pilot projects implemented	Pilot projects under implementation / to be implemented
Building light railway vehicle(LRV)		- Build LRV between Sangil station of SMR line 5 and Changwoo-dong of Hanam
Operation of environment-friendly water purification plant with ISO 14001 certification	- ISO 14001 certification (2002. 5. 17)	- The first follow-up review (Nov. 2002)

Examples of Pilot Projects in Hanam

A Hanam Project for People and Wildlife : Wetland Eco-park along the Han River to Increase Urban Biodiversity

THE PROJECT

☞ To transform a substantial area of existing wetland along the Han River into a ecological park

POTENTIAL PARTNERS

☞ The public and voluntary sectors are working in partnership, Hanam City has policy commitment to improve wildlife value of the area.

☞ Expert guidance on wildlife habitat creation is available from Seoul National University

A Hanam Project for People and Wildlife : Creation of Green Pocket Park

Before the Project

During the Project

After the Project

THE PROJECT

☞ To create 10 parks(4,010m2) in residential areas and along roads both for easy access by residents to offer rest areas and for wildlife habitats

POTENTIAL PARTNERS

☞ Hanam City has worked with local residents based on concensus-building process.

2.1.2. Seogwipo City

1) Overview

General Information

☞ Population : 155,024 (2007.12)

☞ Total Area : 870 ㎢

☞ Yearly budget : US$420,000,000 (2008) ㎢

Background

☞ The experience of Hanam SCP earned reputation that the application of SCP with focus in biodiversity and ecological restoration is effective in Korean Cities which have object of becoming Eco-cities.

Objectives

☞ Develop an eco-city model for sustainable development at a local government level through the pilot application of UN-HABITAT SCP approach to Seogwipo

☞ Host the 2007 SCP general assembly

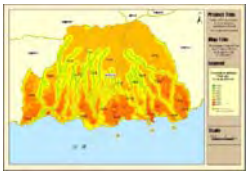
☞ Accumulate experiences applicable to other cities in Korea

☞ Launch an eco-city network in Korea

2)Use of EMIS as a Strategic Tool

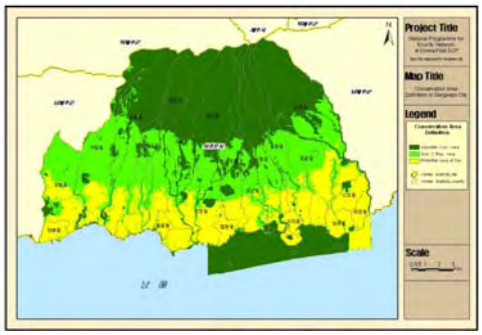
Seogwipo Land Coverage Analysis Map (meso-classification)

Seogwipo River and Wetland Assessment Map (scored)



Wetland Park and Eco-pond Comprehensive Assessment Map

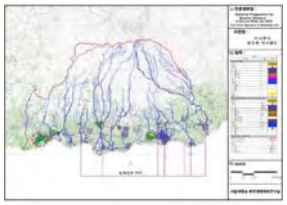
Green Area Nature Map (scored)



Final Designation of Absolute Conservation Area, Conservation and Restoration Area and Development Area

☞ **Strategy for Short-Term and Long-Term Plan**

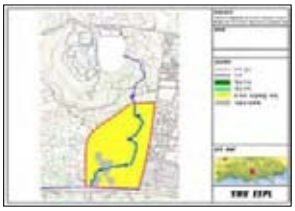
Short-term plan



Long-term plan

☞ **Strategy for Major Areas in the city**

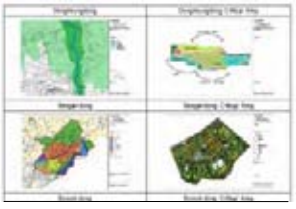
Hydrological Cycle System Strategy Map by Major Area (around new town area)

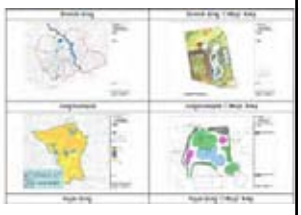


Hydrological Cycle System Strategy Map by Major Area (Jungmun Complex)

22

☞ **Strategy for Neighborhood Unit**





3) Demonstration Projects

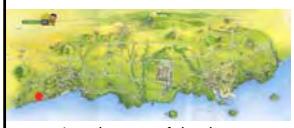
Selection Criteria by Pilot Project Type and Project Site

Type of Pilot Project	Selection Criteria	Site
Wetland ecological park	- Milder the slope the better - High level of flux - Where rivers converge - Where drainage is difficult - The area size is big - Located close to forest - Pfs of floodgate is between 7-8 - Far away from roads, villages and pollution source (Shim Yoon-Jin,2004)	Entire section of Dae Wang Soo Cheon
Waterscape park	- Rich in water volume - Width between the river and embankment is wide - Healthy waterside vegetation - High in biodiversity in aqua ecology - High in scenic value - Low in disaster damage	Some section of Ak Geun Cheon
Designate river within the forest as park	- High in scenic value - Variety in forest layers and high in share of grassland - High potential to be used as site for environment education thanks to its rich biodiversity - Has open space that can be turned into a park	Near Ung Tto Falls
Create passageway for wild animals	- Area with frequent road kills - Habitat has been cut due to roads, etc.	5.16 Road
Ecological parking lot	- Paved with impermeable materials to prevent any rainwater penetration - High potential as habitat for living creatures	Seogwipo Port
Introduce photovoltaic system	- High in irradiance of solar energy - Utilize buildings that can consume produced energy	Seogwipo Medical Center
Create eco pond using rainwater	- Space that can deliver physical and ecological continuity - Topography: 1/10 of slope inclination - Watergate: Where water can enter - Soil hardness: Less than 20mm - Drainage: Poor only in some spots - Permeability: Area with high saturation permeability - Underground water level: High - Accessability: Easy to access. But physical access by humans should be kept as minimum	Seogwipo City Hall
Green space at rooftop of buildings	- Height of building allows for less impact from wind - Utilization of rooftop is low - Strong enough to withstand building's load - Habitat that can act as source area exists nearby	Sewage treatment plant
Restoration of sand dune vegetation	- Sand loss at sand dune is underway - Coast has high ecological value - High is scenic value	Jungmun Beach

④ Pilot Projects - Examples
Daewangsoo Cheon Wetland Ecological Park

▶Basic Concepts

- Creation of eco-park with freshwater wetland, blackish water wetland and salt water wetland as located on near the coast
- Creation of space for wildlife habitat where humans are not permitted
- Creation of many areas with wooden decks to maximize conservation of wetland habitat
- Adoption of native wetland plants
- Provision of open water to allow birds incoming



Location map of the site

Profile of the site

④ Pilot Projects - Examples
Daewangsoo Cheon Wetland Ecological Park

A bird´s-eye-view of the plan

A details of eco-park plan

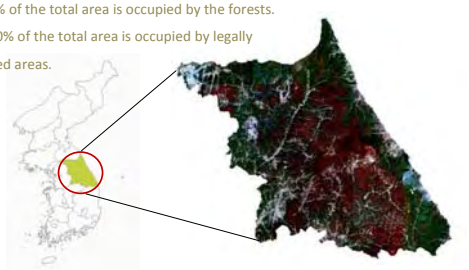
④ Pilot Projects - Examples
Eco-Pond through the Use of Rainwater at Seogwipo City Hall

Plan for Seogwipo City Hall Eco-Pond

2.1.3. Gangwon Province

1) Overview

- ☞ population: ca. 1.50 million
- ☞ area : 16,932.55㎢
- ☞ over 83% of the total area is occupied by the forests.
- ☞ about 20% of the total area is occupied by legally protected areas.



Background

☞ After two successful application of biodiversity with eco-restoration in SCP approach in two Korean cities, the need for application in broader area, beyond each municipal area, was realized. Therefore, application in regional level, in corporation with City/County level was suggested and adopted.

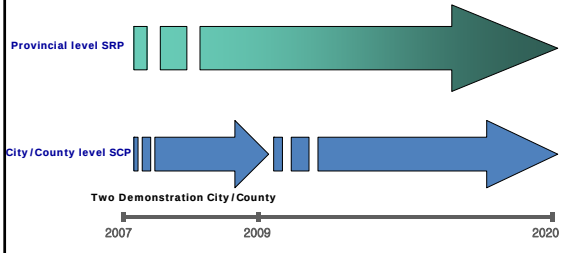
Objectives

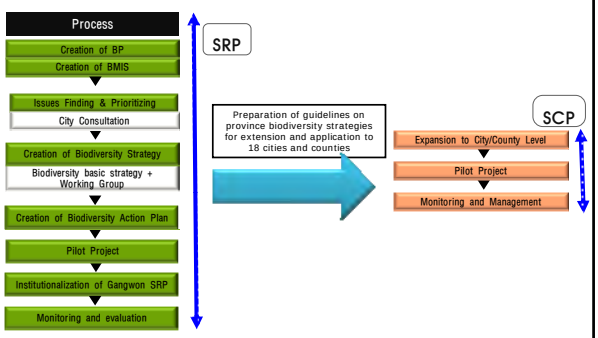
- ☞ Regional plan for conservation & restoration of the biodiversity,
- ☞ provides framework from the biodiversity aspects to establish each city/county's long term general plan or city's basic plan, and
- ☞ provides data for sustainability assessment and strategic environmental assessment from the biodiversity aspects of Gangwon Province's different policies, plans and programs.
- ☞ Application of UN-HABITAT Gangwon SCP Project at Regional level

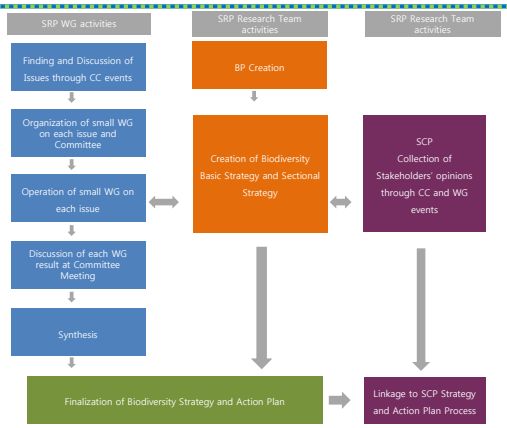
Approach

▶ SRP : Sustainable Regional Program : Provincial level

▶ SCP : Sustainable City Program : 18 City/County level







2) Creation of EMIS and BMIS

Seogwipo SCP

EP

EMIS

Gangwon SCP/SRP

EP + BP

EMIS + BMIS

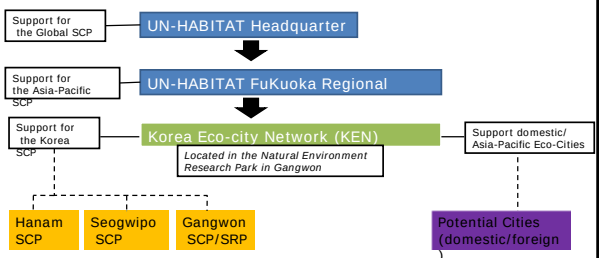
BP : Biodiversity Profile
BMIS : Biodiversity Management Information System

EP and BP in Provincial level have been created. The materials are also created in EMIS format, thereby providing a basic foundation allowing easy and wide access from the public and stakeholders to the materials for information sharing and updates. The BMIS and EMIS is planned to be located in SCPKN homepage in near future. Based on the SRP EMIS and BMIS, EMIS and BMIS of City/County level will be developed and shared.

2.2. Anchoring Institutions

2.2.1. KEN

Location and Organization chart of the Korea Eco-city Network(KEN)



(Changwon City, Kathumanda(Nepal), etc

First established as SCPKN(SCP Korea Network), the Network has become a non-profit corporation aggregate under Ministry of Environment(MOE) since Feb 2008, under the name of 'Korea Eco-city Network'(KEN) to effectively replicate SCP experiences to national level, as well as to provide support to Asia-Pacific nations.

The first domestic demonstration project by KEN is the creation of Rain Garden in external space of IUTC's Resident Hall(under construction).

KEN is not only focusing with domestic level, but also expanding to foreign nations. The first foreign demonstration project will be the creation of eco-pond in Nepal, where the Network will arrange and provide basic concepts and designs in corporation with Nepalese institutions and Seoul National University(SNU)

The project will be a replication of Rain Garden experience with IUTC in Korea

In the future, under the support from MOE, KEN will promote and conduct research, book publish, network through different cities and institutions for eco-city creation.

Also, under the support from International Urban Training Center(IUTC), KEN will expand and replicate to Asia-Pacific Cities.

2.2.2. IUTC

International Urban Training Center (IUTC) was officially launched under the support of UN-HABITAT on May 3, 2007 as a leading Asia regional governance capacity building institution for sustainable urbanization. IUTC has delivered national and international training courses that strengthen the capacities of municipal authorities to undertake and implement sustainable urban development practices.

Through IUTC, experiences from three SCP cities(province) have been shared with people and institutions from Asian-Pacific nations. To share the experiences and techniques more effectively, IUTC is currently developing a web-site in which all the valuable information on eco-cities will be shared through internet.

3. Conclusion

- The adaptation of SCP from 3 Korean cities has been effective and certainly has been improving since the first introduction of SCP in 1998.
- The observance of SCP Process by UN-HABITAT also has been greatly improved after each project as lessons learned from prior application has been effective, in particular, involvement of various stakeholders.
- As the recognition of the SCP in Korea has improved, the scale of each project also has been increased.
- Under the Korean context, issues require broader approach than city level, and the progress and results from Gangwon regional program will be an excellent example of regional level approach with EPM tools.
- SCP and EPM tools have shown to be still effective approach and tools for more developed nation such as Korea, and in accordance with future-oriented subject such as biodiversity, they can continue to serve as increasingly effective approach and method for decision-making process in nations with different economy scales.
- Throughout KEN and IUTC, experiences learnt from SCP in Korea Cities will be shared, replicated and strengthened to national and international level

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2.4 Factor of success:

Afternoon sessions were structured around round table discussions on the factors of success; two groups were organized; the Urban EPM practitioners group summarised "Success Factors" based on the following core elements: EPM process, toolkits, expert group, network for City2City exchanges, others (political support, demo-project funds, etc). And the "Anchoring Institutions" (AIILSG, SLILG/UM, TEI, BU, Korea Eco-City Network) group reviewed implementation of the regional anchoring strategy, including feedback on the first draft curriculum modules by IHS. Plenary reporting back factors of success is summarized below.

2.4.1 The EPM process

As a success factor, the EPM process was recognized to be very instrumental not only to consolidate consultative mechanisms to address urban development issues at the city level, but also to promote broader partnerships that ensure participation of civil society, public and private sectors in the service delivery, especially to deepen pro-poor impacts. This has been reflected in the management of solid waste as an urban poor livelihoods strategy as well as through participatory shelter upgrading. Whilst the engagement of the key stakeholders in the EPM process was pointed out as fundamental for "institutionalizing" a participative planning process, changes in the LGU administration were highlighted as main factors affecting the sustainability of the integrated process and continuous use of its products, re-emphasizing the importance of strong political support at the national level.

In terms sustainability, it was highlighted that the EPM process facilitated ways to leverage resources through follow-up investment packages, emphasising that there is room to explore complementary instruments to further develop and strengthen these financing mechanisms.

It was also noted that the EPM process contributed to influence attitudinal changes towards the application of principles of good governance in the urban context. In the case of Sri Lanka for example, the EPM process contributed to strengthen the national urban development framework and the preparation of urban plans for each pilot city, including the consolidation of a solid waste management strategy.

2.4.2 The EPM toolkits

Also noted that the local adaptation and customization of the toolkits were fundamental for advocacy and awareness raising. Exemplary toolkits like the EMIS and Environmental Profile straightened the city database and supported important process like the city consultation,

since the mixture of systematic and "peoples" data provided excellent basis for negotiation on priority issues and actions to be taken. Whilst the resulting compilation of integrated data has to be simple but scientific and systematic reflecting participatory collection of information, the information generation should be also socially relevant and practical for the betterment of the physical situation and welfare of people. Moreover, in most of the countries the preparation of the City Profile has made lasting contribution to the institutional development of the local authorities.

In addition, it was also highlighted that the city consultation and working group tools were key elements to facilitate the EPM participatory approach. Moreover, improvement of the tools was recommended especially to strengthen the way to better facilitate full involvement and support of national/provincial/ local governments, private sector and grassroots in good governance process.

2.4.3 City to City exchanges

The cross-sharing of experiences at national and international levels was highlighted as an influential factor for scaling up good practices and facilitating Environmental Planning and Management (EPM) sustainability. Moreover, the LGU-LGU coaching approach was recognized as very effective within countries and cross-country cities; Solid Waste Management (SWM) appeared to be one of key areas where this approach resulted in successful mainstreaming of good practices especially in Sri Lanka, India and the Philippines. It was also noted that documenting basis of coaching complementary to the documentation of individual experiences of cities is extremely important not only to facilitate the peer learning but to convince public sector on the efficacy and usefulness of social mobilization, broader partnerships and innovative methodologies to address issues of concern in the urban context. Thus the need to strengthen documentation skills and further integrate documented practices in knowledge management nodes to facilitate EPM mainstreaming in current environmental planning.

2.4.4 Expert Group/ Anchor Institutions

The role of the Anchor Institutions was highlighted as a successful component to operationalise national partnerships and strengthen EPM capacity building integrated into national training, support on documentation and up-scaling. whilst in the Philippines and Sri Lanka anchor institutions have integrated EPM in their institutional curriculum, in India, Thailand China and Korea anchor institutions have utilized their experiences on Environmental Planning and Management implementation for new tool development. The importance of the institutional strength and political linkages of the anchor institution with the Local Authorities was indicated as a challenge, and also spotlighted the need of further

guidance on how to create the adequate environment for effectively and efficiently work with the key city stakeholders.

2.4.5 Successful factors contributing to address Climate Change concerns

- Application of awareness raising and empowering process of EPM can be used in addressing Climate Change impacts. The participatory mechanisms such as city consultation could be instrumental for strengthening stakeholder participation and involvement.

- EPM process has well proven experience localizing global and national issues, therefore it could be a reliable resource for "localizing climate change"

- Awareness raising at the city level could be also be consolidated through the systematic collection and analysis of data in a profile which allows the city to develop a clear strategy of action to address climate change concerns. Moreover, the Working Group mechanisms could be expanded as to focus on developing adaptation and mitigation strategies etc.

- Bridging the gap between local issues and climate change needs would be fundamental to make an optimal use EPM process as supporting mechanism. Moreover, as EPM tools have been useful for promoting and mainstreaming good governance principles, well adapted can be complementary to Climate Change tools.

- The Expert group and anchor institution mechanism could be instrumental to mainstream the capacity building however it would be necessary further inclusion of institutions/experts related to climate change

SECTION III: THE WORSHOP- DAY 2

Day 2- (Wednesday 27th August):
Raising Awareness on Cities and Climate Change Challenges;
– Building an Asia Knowledge Sharing Platform to support Cities addressing Climate Change Impacts -

The second day of the 2008 SCP-Asia Regional Expert Group Meeting provided the opportunity for the partners to become better informed on Climate Change Impacts in the region, and facilitated discussions on how the SCP/LA21 process (Environmental Profile – City Consultation – Working groups – Strategies and Action Plans – Institutionalisation) can be strengthened and applied to support cities address the Climate Change Impacts that they face – both by mitigating their own emission of Green House Gases, as well as developing strategies to adapt to the consequences of Climate Change such as:

- vulnerability to sea-level rise, flood and disaster management,
- water resource management, food security,
- transport and clean air, energy conservation,
- building/settlement design; and solid waste management

The SCP regional Advisor at UN-HABITAT ROAP, Angela Pinzon, prepared a background regional paper introducing an overview of the impacts of climate change on Cities in Asia including mitigation and adaptation strategies as baseline discussion document for day 2 and day 3 sessions (see Annex 3). Complementary global and regional perspectives of climate change impacts were introduced to further expand this conceptual framework.

The day two sessions were structured in presentations focused on the national, regional and global perspectives of climate change impacts and soft launched UN-HABITAT Global Sustainable Urban Development Network (SUD-Net) a new programme which will focus on urban governance, decentralization, and environmental issues - the latter supported by a new "Cities in Climate Change Initiative" (CCCI) which will advise cities on how to mitigate and adapt to climate change through improved urban planning, offering lessons made and best practices from other networking partners. SUD-Net will be based on a website, but also materialize in concrete individual support by UN-HABITAT, coaching and partnering with local authorities to strengthen the local level.

3.1 The Day 2 Programme:

08.30 **Introduction to the Workshop,** by Eden Garde, UN-HABITAT Programme Manager, Manila

08.40 **Welcome Remarks,** by Ms Nileema Noble, United Nations Resident Coordinator, Manila

08.50 **Introduction to the SCP-Asia Network activities**, by Dr Fahmy Ismael, Sustainable Cities Programme, Sri Lanka

09.00 **Climate Change Impacts in the Philippines**, by Government of Philippines representative

09.20 **Cities in Climate Change – The global Perspective**, by Dr Ahmed Iftekhar, Global Cities Institute, RMIT University, Melbourne

09.40 **Cities in Climate Change – An Asian Perspective**, by Kemal Taruc, Environmental Specialist, Indonesia

10.00 **Coffee break**

10.20 **National-level scoping of Cities in Climate Change:** Country presentations summarising the following:

- National policies and strategies to mitigate and adapt to Climate Change Impacts
- Main national partners to be involved, why, and what they are doing
- City-level intervention and actions – case examples including SCP Climate Change experiences
- Management tools being used/available

10.20 **Indian Cities responding to Climate Change Impacts** by Professor (Dr) Sneha Palnitkar, All Indian Institute of Local Self Government, Mumbai, India

10.40 **Sri Lankan Cities responding to Climate Change Impacts** by Dr Fahmy Ismael, Environmental Governance Specialist, Colombo, Sri Lanka

11.00 **Philippine Cities responding to Climate Change Impacts** by Dr Noel Duhaylungsod, Environmental Governance Specialist, Manila, Philippines

11.20 **Chinese Cities responding to Climate Change Impacts** by Dr Pan Xiaodong, Director, Administrative Centre for China's Agenda 21, Beijing China

11.40 **Thai Cities responding to Climate Change Impacts** by Dr Paul Chamniern, Senior Director, Thai Environment Institute, Bangkok, Thailand

12.00 **Korean Cities responding to Climate Change** Impacts by Professor (Dr) Kwi-Gon Kim, Soeul National University, Environmental and Ecological Planning Lab, Seoul, Korea

12.20 **Discussion on presentations** facilitated by Bernhard Barth, Human Settlements Officer, Training and Capacity Building Branch, UN-HABITAT, Nairobi, Kenya

13.00 **Lunch**

14.00 **Regional Programmes supporting Cities to address Climate Change Impacts**

14.00 **UN-Habitat's Strategy on Cities in Climate Change, SUD-Net and its "Cities in Climate Change Initiative"** by Cecilia Njenga, Human Settlements Officer, Urban Environment Section, Urban Development Branch, Global Division, UN-HABITAT, Nairobi, Kenya

14.15 **Role of Air Quality Management to Mobilise Local Action on Climate Change** by Sophie Punte, Deputy Executive Director, Clean Air Initiative for Asian Cities Centre – CAI-Asia Centre, ADB, Manila, Philippines

14.30 **ADB's Energy Efficiency Initiative/Clean Development Mechanism – Reducing Transportation Impacts** by Jamie Leather, Senior Transport Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines

14.45 **Climate Change Mitigation and Adaptation through Decentralised Solid Waste Management in small towns** by Adnan Aliani, Human Settlements Officer, Poverty and Development Division, UNESCAP, Bangkok, Thailand

15.00 **UNEP's Sustainable Building and Construction Initiative** by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

15.15 **Climate Resilient Cities – Reducing Vulnerabilities to Climate Change Impacts** by Mukami Kariuki, Local Government Programme Coordinator, World Bank, Manila, Philippines

15.30 **United Cities and Local Governments Perceptions and Actions regarding Cities and Climate Change** by Peter Woods, Secretary General, UCLG-Asia and the Pacific, Sydney, Australia

15.45 **Coffee Break**

16.00 **Exemplar Asian Cities present their efforts to address Climate Change Impacts**

16.00 **Klang Municipality**, by Mayor Somchai of Klang Municipality, Thailand

16.15 **Addressing Climate Change Impacts in Makati,** Philippines, tbc

16.30 **Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam** by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines

16.45 **Changwon the Environmental Capital addressing Climate Change Impacts,** by Ms Han Jun Hwa, Environment Division, Changwon City

17.00 **Day's Reflections and Conclusions**, by Bernhard Barth, Human Settlements Officer, Training and Capacity Building Branch, UN-HABITAT, Nairobi, Kenya

19.00 Closing **Cocktails**

3.2. Introduction to the workshop day 2:

Ms Nileema Noble, United Nations Resident Coordinator in Manila, presented the welcome remarks of the second day sessions which highlighted the important role of the cities addressing climate change and their vulnerabilities especially in developing countries to adverse impacts. Whilst making reference to the IPCC Four Assessment Report and the serious implications that are projected to occur in Asia, Ms. Noble highlighted that the Philippines is moving towards developing a programme for climate change adaptation in the Bicol region spearheaded by UN-Habitat on behalf of the UN team through the MDG fund supported by the Government of Spain and the UN. Especial emphasis was made on both the fruitful UNDP- UN-HABITAT cooperation implementing EPM to address environmental concerns and the relevance of the workshop to generate an expanded strategy that make use of the SCP good experiences to respond to the needs in the region addressing climate change. (See Annex 4)

Ms. Eden Garde, UN-HABITAT Programme Manager, in Manila introduced the workshop session making emphasis on the segments of the morning and afternoon sessions; (1) Climate Change Impacts in the Philippines, (2) Cities and Climate Change the Global and Regional Perspectives, (3) National perspectives of SCP- Asia partners, SCP/ LA21 Asia & Launching SUD-Net/ CCCI (4) Potential Regional Programme Support (4) City best practices

3.3 Climate Change Impacts in the Philippines: Ms. Sheila Encabo, Director of the National Economic and Development Authority (NEDA), highlighted the implications of climate change in the Philippines and introduced the strategies that have been set up to Address Climate Change such as; (1) Climate Change Adaptation Programme supported by the World Bank , (2) Risk Assessment for Hydrological Hazards, (3) Mainstreaming Disaster Risk Management (4) strengthening Institutional Capacities to adapt to Climate Change funded by UN-Spanish Grant fund. Coping mechanisms have been improved through the implementation of pilot adaptation projects.

Day 2: Climate Change Impacts in the Philippines, by Government of Philippines representative, by Sheila Marie M. Encabo, Director,National Economic and Development Authority

Presentation Outline

1. Background
2. Philippine Context
   - Impacts of Climate Change
   - Institutional Structure
   - Existing Initiatives

Background

- Climate change is a global phenomenon with local consequences in varying nature and extent
- Highly affected sectors / resources are vital to the economy of developing countries like the Philippines
- Measures instituted are yet limited but have potential for up-scaling through concerted support

Impacts of Climate Change
The Philippine Context

Quantified impact in:

- 70% of municipalities and cities in coastal areas with 50 million people affected by sea level rise and increasing frequencies of typhoons and storm surges
- PhP115 Billion in economic losses from 1995 to 2007 from combined impact of flash floods, typhoons and dry spells on productive sectors

Impacts of Climate Change
The Philippine Context

Unquantified impact in :

- Agriculture
- Forestry
- Biodiversity
- Coastal and marine
- Water
- Energy
- Health

Institutional Structure
The Philippine Context

1. **Presidential Task Force on Climate Change**
   - created thru Administrative Order (AO) 171 on 20 February 2007 in view of the important influence the energy sector plays in mitigating climate change impact
2. **Inter-Agency Committee for Climate Change**
   - created by virtue of Presidential A.O. 220 on May 8, 1991 to serve as the technical and policy body that will coordinate all climate change-related activities

Day 2: Climate Change Impacts in the Philippines, by Government of Philippines representative, by Sheila Marie M. Encabo, Director,National Economic and Development Authority

Existing Initiatives
under the Official Development Assistance (ODA) Portfolio

A. Philippines Climate Change Adaptation Program Phase 1 (World Bank)- *project implementation stage*

Focus areas:

1. Institutional development for CC adaptation policies
2. Implementation of cost effective CRR in key productive areas;
3. Strengthen the NDCC; and
4. Provision of scientific information for climate risk management

Existing Initiatives
under the Official Development Assistance (ODA) Portfolio

B. Productive Sector Risk Assessment for Hydro-Meteorological Hazards- *project completion stage*

Output:

Risk assessment and risk modelling report for hydro-meteorological hazards (cyclones, droughts, floods) in the agriculture sector, particularly rice sector in Region 2

Note: The output of this project will input into the WB-GEF PhilCCAP1 Project

Existing Initiatives
under the Official Development Assistance (ODA) Portfolio

C. Mainstreaming Disaster Risk Management (DRM) in Sub-national Development and Land Use/Physical Framework Planning in the Philippines (EC-DIPECHO and UNDP)- *project completion stage*

Outputs:

1. Guidelines for the preparation of DRM enhanced RDP, RPFP and PDPFP;
2. Policy papers on mainstreaming DRM in national planning documents (NFPP,MTPDP, National Comprehensive DRM framework);
3. Capacity building on the use of the DRM guidelines; and
4. 8 DRM enhanced RDP,RPFP and PDPFP

Existing Initiatives
under the Official Development Assistance (ODA) Portfolio

D. Strengthening the Philippines' Institutional Capacity to Adapt to Climate Change (UN-Spanish Grant Fund)- *project inception stage*

Donor: Government of Spain thru the MDG Achievement Fund Thematic Window on Environment and Climate Change

Duration: 2008-2010 (3 years)

Amount: 8 Million US

Major Partners:

Government of the Philippines (NEDA, DENR, DA, DOST-PAGASA, DOH, DOLE, HUDCC, HLURB, DTI, Province of Albay)

United Nations (UNDP,UNEP,FAO,HABITAT, ILO, WHO)

MDG-F for Climate Change
Programme Summary

This joint programme will:

1. Determine vulnerability of critical sectors of the Philippines to climate change;
2. Strengthen the country's adaptive capacity by enhancing the planning, programming and implementation capacities of key stakeholders; and
3. Undertake five (5) adaptation demonstration projects to develop / test systems for potential upscaling and replication.

MDG-F for Climate Change
Programme Outcomes

Outcome 1: Climate risk reduction (CRR) mainstreamed into key national & selected local development plans & processes *(e.g. land use/devt/investment planning & programming, EIA system)*

Outputs:

a. Baseline risk scenario & CRR/adaptation monitoring system developed for priority sectors (water, agriculture, coastal,forestry,health);
b. Adaptation options for key sectors assessed,valued and prioritized;
c. CRR mainstreaming guidelines adopted by key NGAs and selected LGUs

Day 2: Climate Change Impacts in the Philippines, by Government of Philippines representative, by Sheila Marie M. Encabo, Director,National Economic and Development Authority

Programme Outcome 2

Outcome 2 : Enhanced national & local capacity to develop, manage & administer projects addressing climate change risks *(through better & effective forecasting, improving climate dependent services, strengthening academe's capacity to assist local authorities)*

Outputs:

a. National capacity assessment

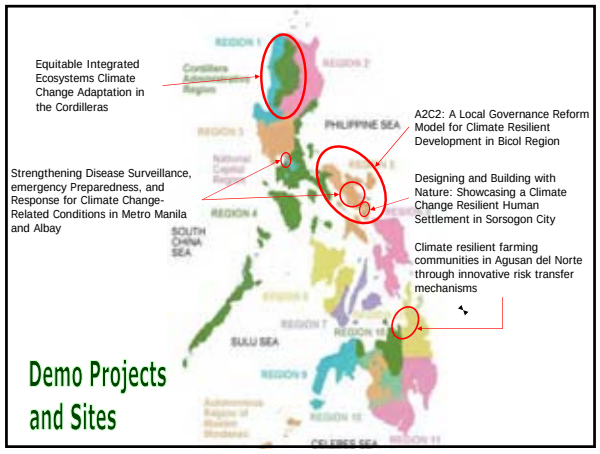
b. CRR capacity development programme developed and implemented for stakeholders identified above

Programme Outcome 3

Outcome 3: Coping mechanisms improved through pilot adaptation projects.

Output:

Five adaptation demonstration projects



End

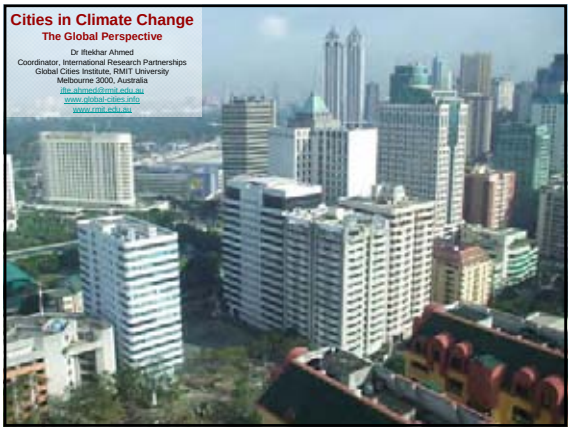
3.3 Cities in Climate Change Global and Regional Perspectives:

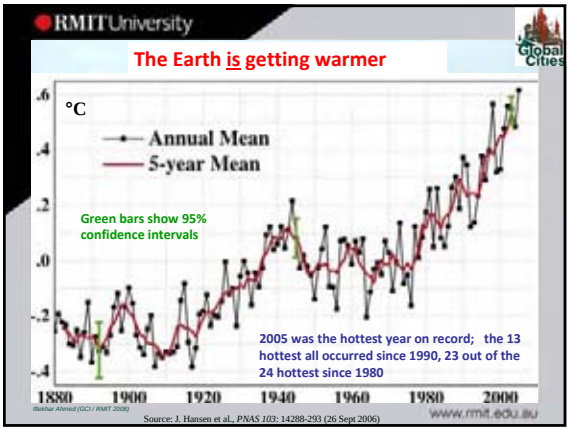
The framework on Climate Change and Cities was further developed by Dr. Ahmend Iftekhar who highlighted the global responses to climate change impacts making especial reference to Adaptation strategies. Moreover, contextualizing Climate Change concerns in Asia Mr. Kemal Taruc emphasised on the high urbanisation trends that this region is encountering and will encounter in the future. Mr. Taruc made a wide analysis on the vulnerabilities in cities of developing countries in Asia and invited to reflect on the need to transform current Asia urban development to reduce ecological foot print and secure more resilient cities in the future.

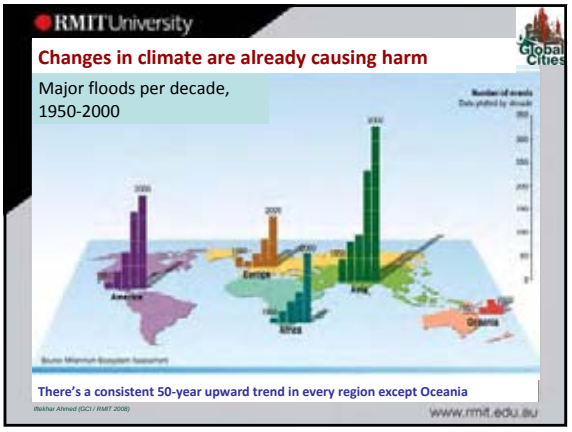
3.4 National Perspectives:

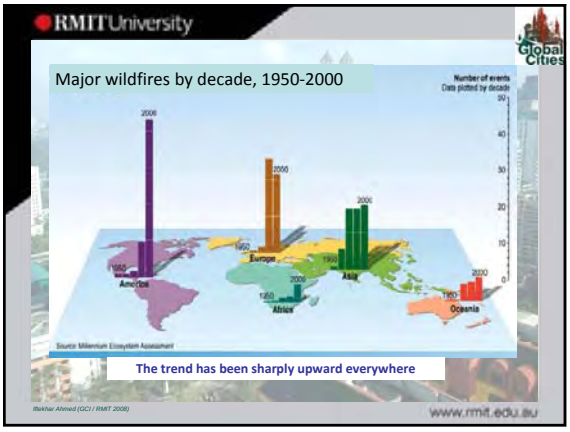
To give an over-view of ongoing activities and partnering opportunities, SCP partners presented their national climate change related mitigation and adaptation policy and strategies, and provided examples of city-level interventions and actions including SCP-Asia mitigation/adaptation experiences see below.

Day 2:Cities in Climate Change – The global Perspective, by Dr Ahmed Iftekhar, Global Cities Institute, RMIT University, Melbourne









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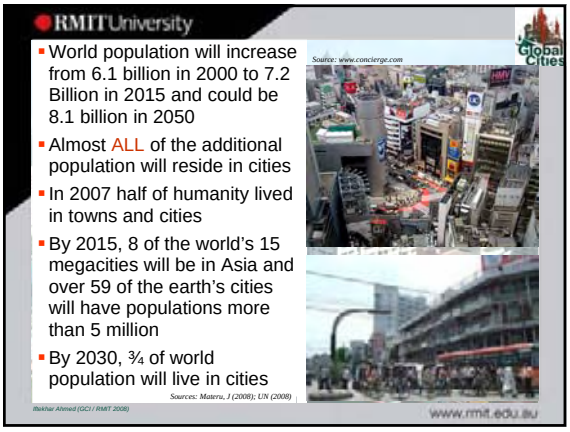

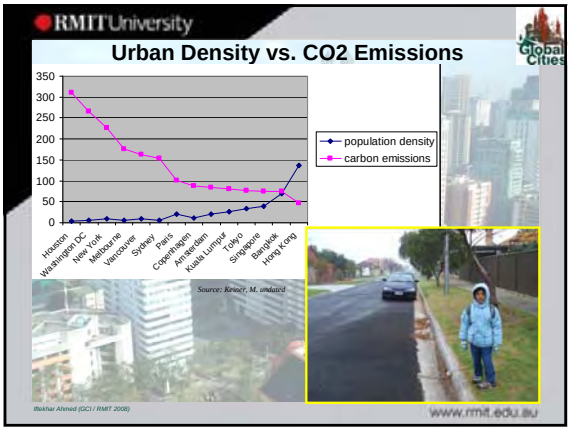

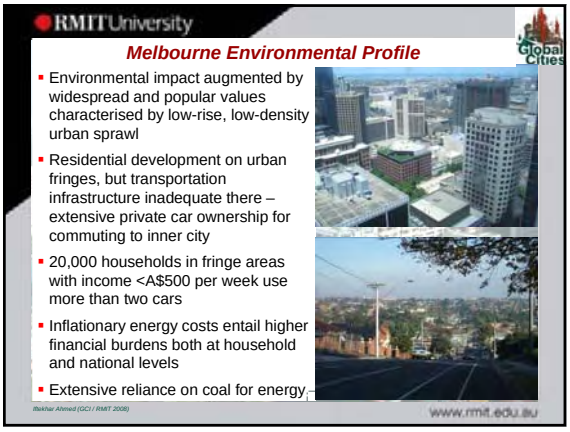

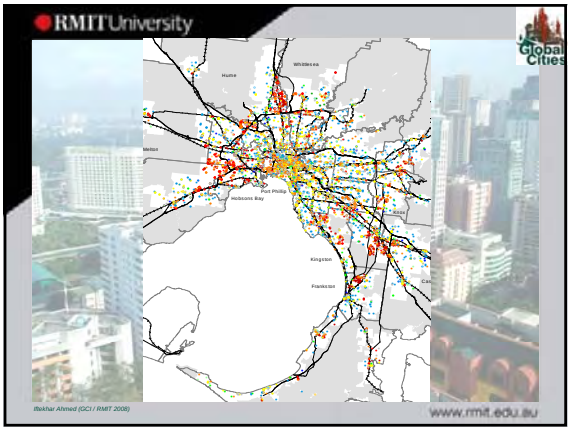

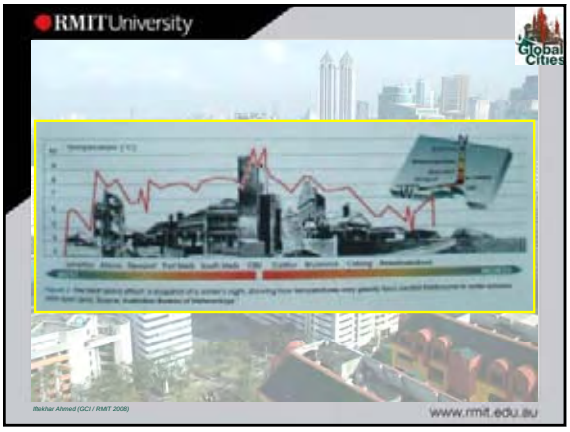

Day 2:Cities in Climate Change – The global Perspective, by Dr Ahmed Iftekhar, Global Cities Institute, RMIT University, Melbourne

RMIT University

Melbourne: Institutional CCA/M and Sustainability Initiatives

- New institutional arrangements – VicUrban, Growth Areas Authority (GAA) - to address long term urban development sustainability
- Public-Private partnerships for environmental quality promoted by Melbourne City Council eg $5m Sustainable Melbourne Fund with Investa Property Group for Greenhouse Guarantee Program
- Zero Net Emissions by 2020 – ambitious, but backed by comprehensive policies and programmes
- Already reduced CO2 by 26%; 2010 target – 50%
- Promotion of voluntary carbon market – flexibility for enterprises in emissions management (ETS – national context)
- Carbon sequestration – offsetting by tree planting eg Greenfleet – 17 trees/car
- Member of Large Cities Climate Leadership Group supported by Clinton Foundation's Climate Initiative
- Consecutive planning instruments – the City of Melbourne 2010 to be succeeded by Future Melbourne during 2010-2020 and finally the visionary Melbourne 2030 (includes a Climate Change Task Force)

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

Melbourne: Micro-level CCA/M and Sustainability Initiatives

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

Melbourne: Green Buildings

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

Global Cities Institute

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

What? The Institute

- A major research institute focused on globalization and global climate change
- A trans - disciplinary institute bridging the science/engineering and social sciences/humanities divide
- ***Key Task:***

  To research processes of global change in the urban context with the view to planning and projecting sustainable ways of living

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

Why? Context

- Most people in the world now live in urban centres
- Global change (positive and problematic) is intensified and accelerated in urban centres
- Cities are zones of change and innovation, but also vulnerable to major shocks and insecurities with significant impacts upon hinterlands and regions
- Cities face a growing challenge of providing secure and sustainable places to live

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

Day 2:Cities in Climate Change – The global Perspective, by Dr Ahmed Iftekhar, Global Cities Institute, RMIT University, Melbourne

RMIT University

How?

Research Strategies

- Systematically **map** and **compare**
  - the impacts (positive and problematic) of globalization and global climate change on cities and their hinterlands in the Asia-Pacific region.
  - the strategies deployed within those cities in response to global change.
  - the potentials that exist for secure and sustainable living.
- ***Key research concepts:***

Insecurity | Resilience | Sustainability | Adaptation

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Where?

Category 1 & 2 Cities

Iftekhar Ahmed (GCI / RMIT 2008) map source: wikipedia www.rmit.edu.au

RMIT University

Research Programs

- **Climate Change Adaptation**
- **Globalization and Culture**
- **Community Sustainability**
- **Urban Infrastructure**
- **Human Security**
- **Learning Cities**

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RMIT University

Global Climate Change Adaptation Program

Goal: *to create a global framework for the infrastructural adaptation of cities to climate change*

Objectives:

- *to complete an assessment of the relative vulnerability of strategically-chosen cities in the Asia Pacific region*
- *to design strategies to increase resilience of those cities in relation to climate-change impacts.*
- *to implement an initiative composed of specific urban-infrastructural adaptive responses based on RMIT's scientific and technological innovations that exemplify the general global principles that should frame urban climate-change adaptation*

Iftekhar Ahmed (GCI / RMIT 2008) www.rmit.edu.au

RMIT University

4 Integrated Program Activities:

1. Assess and map the vulnerability of urban infrastructure in selected cities in Asia Pacific to climate change impacts
2. Develop scenarios and strategic pathways for urban infrastructural adaptation
3. Implement an adaptive infrastructural initiative in two cities — one Australian and one in the Asia-Pacific region; and
4. Propose a global framework for equitable and efficient allocation of adaptation costs; and convene a global or regional mayoral event on World Environment Day 2008, to launch a global city compact for implementing city-level adaptation commitments

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Global Framework Project

- To involve cities in international adaptation collaborations
- Identifying reasons why cities would want to collaborate
- Eg. to assist another city with adaptation funding if benefits re: trade, R&D, learning about response management, diasporic, downwind causing acid rain, smoke, flooding, etc
- Issues of partnership, transfer mechanisms, locations and take-up
- Global framework of rules for adaptation (legal and moral) for cities to cooperate
- Being scoped and various potential partners approached

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Day2:Cities in Climate Change – An Asian Perspective, by Kemal Taruc, Environmental Specialist, Indonesia

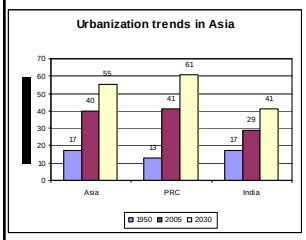
CITIES in CLIMATE CHANGE INITIATIVES

Kemal Taruc
Environment Management Specialist
UN-Habitat, Jakarta

SCP-Asia Regional Expert Group Meeting
Manila - August 25-27, 2008

ASIA IS GROWING AND URBANIZING

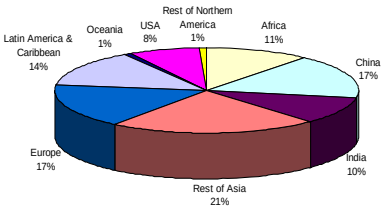
- Almost 2/3 of world population (6.6B) lives in Asia and more than ½ of it lives in China & India
- Currently 35% of Asian population is URBAN and Expected to reach 50% by 2025
- Population densities are 50% higher compared to world averages



- Number of mega cities is growing fast in Asia
- Seven out of top 10 "BIG" cities are in Asia

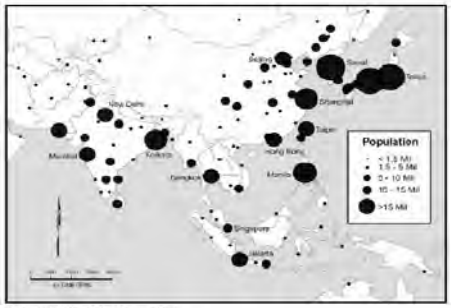
No. of Mega Cities	1950	1975	2000
World	1	5	17
Asia	0	2	11

Distribution of the world's urban population 2000

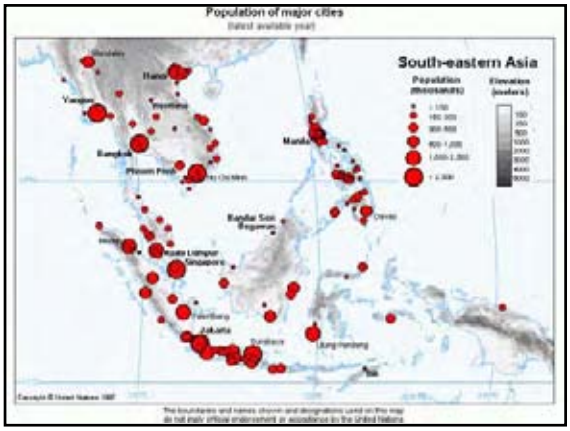


Satterthwaite, D. (IIED)

Asia's Primate Cities and Urban Centers



Prasad et.al. 2008



Developing Countries Most At Risk:
6 Climate Threats

Asia-Pacific countries

Drought	Flood	Storm	Coastal 1m	Coastal 5m	Agriculture
Malawi	Bangladesh	Philippines	All low-lying Island States	All low-lying Island States	Sudan
Ethiopia	China	Bangladesh	Vietnam	Netherlands	Senegal
Zimbabwe	India	Madagascar	Egypt	Japan	Zimbabwe
India	Cambodia	Vietnam	Tunisia	Bangladesh	Mali
Mozambique	Mozambique	Moldova	Indonesia	Philippines	Zambia
Niger	Laos	Mongolia	Mauritania	Egypt	Morocco
Mauritania	Pakistan	Haiti	China	Brazil	Niger
Eritrea	Sri Lanka	Samoa	Mexico	Venezuela	India
Sudan	Thailand	Tonga	Myanmar	Senegal	Malawi
Chad	Vietnam	China	Bangladesh	Fiji	Algeria
Kenya	Benin	Honduras	Senegal	Vietnam	Ethiopia
Iran	Rwanda	Fiji	Libya	Denmark	Pakistan

Source: World Bank. 2008

Day2:Cities in Climate Change – An Asian Perspective, by Kemal Taruc, Environmental Specialist, Indonesia

Observed Impacts in Asia

Intense Rains and Floods

- Serious and recurrent floods in Bangladesh, Nepal and N-E India in 2002, 2003 and 2004; Mumbai (India), 2005: 1 million people lost their homes. Jakarta, 2007: 36 died, 360,000 homeless, 190,000 sick; also in 2004, 2002.

Droughts

- 50% of droughts associated with El Niño
- Droughts in Orissa (India) in 2000-2002: crop failures, mass starvation affecting 11 million people

Cyclones / Typhoons

- Increasing intensity of cyclones formation in Bay of Bengal and Arabian Sea since 1970
- Cyclone Nargis in Myanmar, 2008: 100 000 deaths

Pachauri, 2008.

Some likely impacts of climate change

Change	Impacts on urban areas	Impacts on health
Warm spells/heat waves frequency up on most land areas	Heat islands in cities; vulnerable populations; air pollution worsened	Increased risk of heat-related mortality; groups at risk; respiratory diseases up
Heavy precipitation events, frequency up over most areas	Floods/landslides, households losing homes, possessions, assets, livelihoods. Large population displacements and disruption of city economies, transport and other infrastructure damaged.	Deaths, injuries and dislocations; risks from food and water borne diseases up. Health services and emergency services unable to cope.
Intense tropical cyclone activity increases		
Increased area affected by drought	Water shortages, distress migration into urban centres, hydro-electric constraints	Increased food & water shortages, malnutrition and food and water borne diseases up
Increased incidence of extreme high sea level	Loss of property and livelihoods, damage to tourism, damage to buildings, salinization of water?	Coastal flooding, increasing risk of death and injuries

Satterthwaite (IIED), 2007.

Flood in Jakarta, Indonesia, Feb. 8, 2007.

Typhoon Krosa, knocking over buildings in Taiwan (2007)

Philippines, 2006

Hoi An in central Vietnam, 2006

Dealing with Urban Poverty

UN-HABITAT estimates 38% of total urban growth will be an informal one in the coming decade → Increased vulnerability

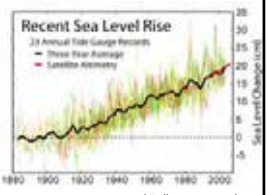
- Poor basic service delivery
- Inadequate shelter & no tenure security
- Overcrowding, homelessness
- Environmental health problems
- Segregation, violence and crime

WORSE OFF WITH CLIMATE CHANGE IMPACTS

UNDP, Jakarta

Regional Impacts: East Asia and the Pacific

- Decreased freshwater availability
- Endemic morbidity and mortality due to diarrhoeal disease associated with floods and droughts
- Degradation of marine and coastal ecosystems by sea-level rise and temperature increases
- Sea-level rise potential results in displacement of millions of people
- Damage to aquaculture industry by sea water intrusion
- Increased threats to the ecological stability of wetlands, mangroves and coral reefs



http://www.mps.mpg.de

Source: The World Bank, 2008. *Concept Paper Annex 1*

Day2:Cities in Climate Change – An Asian Perspective, by Kemal Taruc, Environmental Specialist, Indonesia

Regional Impacts: South Asia

- Increased intensity and frequency of storm surges, cyclones, floods and droughts
- Negative impact on agricultural yields particularly in arid zones and flood-affected areas
- Decrease in river flows in the Himalayan countries, unreliable supplies of fresh water and the need for management of shared transboundary systems
- Sea-level rise and its impact on coastal livelihood through flood, damage to groundwater aquifers, loss of wetlands and ecosystems

Source: The World Bank, 2008. *Concept Paper Annex 1*

Where are we now??

REFLECTION on ASIAN URBANISM

The strong dual-character of Asian cities:

- Urbanization -- an expansion of non-agricultural activities into industrial areas and modern services, → embarking to the global economy.
- Urbanization – as the displaced rural migrants who make a new live in the city → pre-modern, in-/semi-formal economy of the marginalized groups (i.e., urban poor, that also supports the modern sectors).

WHICH URBANISM for ASIA?

Gandhi was once asked if he expected India to attain the same standard of living as Britain. He replied:

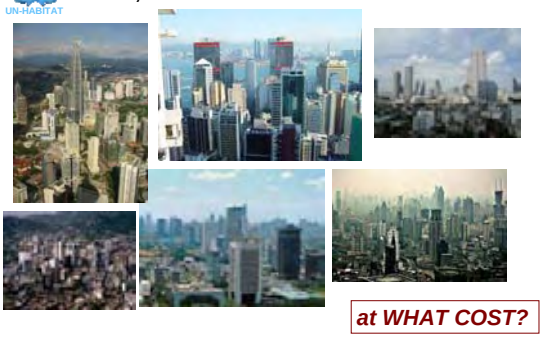
It took Britain half the resources of the planet to achieve this prosperity. How many planets will a country like India require!

Pachauri, 2008.

Less? (half-) modern, yet more manageable impacts in city life?

Day2:Cities in Climate Change – An Asian Perspective, by Kemal Taruc, Environmental Specialist, Indonesia

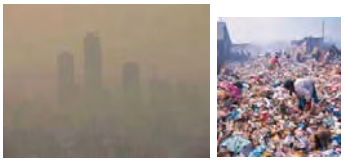
or, these PRIMATE CITIES?



at WHAT COST?

HIGH VULNERABILITY?

HIGH COST?



VULNERABILITY Assessment (UNDP-Indonesia)

SOME CHALLENGES:

- Vulnerability assessment and identification of adaptation options were very limited → ***the roles of SCP/SUD-Net on CCCI ?***
- Number of sectors being covered was limited → ***priority setting in the more comprehensive, cross-sectoral national/local agenda***
- Methodologies applied in determining the climate change scenarios were different → ***need local knowledge, best practices adjusted locally.***

UNDP, Jakarta

Example: UNEP Actions to support vulnerable countries

1. **Global Adaptation Network**
2. **Legislators and Planners Forum**
3. **Sustainable Water Resource Management**
4. **Integrated coastal zone management**
5. **Conserving biodiversity**
6. **Highland-Lowland Partnership**
7. **Building climate resilient cities**
8. **Reducing the risk of climate-related disasters and Conflicts**
9. **Mobilizing knowledge for policy setting**
10. **Knowledge-Based Planning**
11. **Adaptation Knowledge Management**
12. **Technology for Adaptation**

Liu, 2008. UNEP.

Example: World Bank's 6 Action Pillars

1. **Make effective climate action – both adaptation and mitigation – part of core development efforts**
2. **Address the resource gap through existing and innovative instruments for concessional finance**
3. **Facilitate the development of innovative market mechanisms**
4. **Create enabling environment for and leveraging private sector finance**
5. **Accelerate the deployment of existing and development of new climate-friendly technologies**
6. **Step-up policy research, knowledge management and capacity building**

Source: The World Bank, 2008.

TRANSITION STRATEGY

SCP-Asia/SUD-Net - CCCI

Day2:Cities in Climate Change – An Asian Perspective, by Kemal Taruc, Environmental Specialist, Indonesia

CLIMATE CHANGE IMPACTS
as a NEW OPPORTUNITY
to REDRAW ASIAN URBAN TRENDS

→ innovative urbanism
→ minimum ecological footprint
→ Asian eco-cities
→ local knowledge coping with CCI

RETHINKING ASIAN URBAN VALUES

a network to support knowledge building on EPM (and beyond) among Asian urban practitioners

SCP-Asia/SUD-Net - CCCI

Thank you . . .

REFERENCE:

Leinbach, Thomas R. 2006. "Geography of Southeast Asia, GEO 332," Department of Geography, University of Kentucky.

Liu, Jian. 2008. "UNEP Training Workshop on Climate Change Adaptation." UNEP.

Moreno, Eduardo. 2007. "Building a Global Monitoring System on Secure Tenure: Challenges and Opportunities." *Expert Group Meeting on Land Policy Indicators For Africa,* Addis Ababa, 3-4 May.

Pachauri, R.K. 2008. "Climate Change -- Issues and Challenges for India. " WMO-UNEP.

Prasad, N., Ranghieri, F., Sinha, R., and Kessler, E. 2008. "Reducing Vulnerabilities to Climate Change Impacts and Strengthening Disaster Risk Management in East Asia's Cities." *Climate Resilient Cities,* Pattaya, Thailand.

REFERENCE:

Satterthwaite, David. 2007. "Climate change and cities in low- and middle-income nations; what constraints adaptation and mitigation?" International Institute for Environment and Development (IIED).

The World Bank. 2008. "Towards a Strategic Framework on Climate Change and Development for the World Bank Group."

Wu, Junhui. 2007. "Addressing the Growing Sustainable Energy Challenge in Asia." Energy & Transport Sector, East Asia and the Pacific Region, The World Bank.

Yedla, Sudhakar. 2008. "Climate Change Mitigation Initiatives in Urban Transportation – Strategies to Promote Non-Motorized Modes in Indian Cities." *International Workshop on Evaluating Climate Change and Development*. Alexandria, Egypt, 10-13 May.

http://www.unep.org/wed/2007

http://www.usatoday.com/weather/news/2006-12-02

http://news.bbc.co.uk/cbbcnews/hi/newsid

http://galihsurya.dagdigdug.com/

http://www.heavypet.com/indonesia.html

http://flickr.com/photos/jonolist/413486333/

http://petahijau.wordpress.com/2007/

http://cache.daylife.com/imageserve/05IrgEt35s9Kf/610x.jpg

http://www.daylife.com/photo/

http://bialoglowy.blogspot.com/2007_02_01_archive.html

http://www.mps.mpg.de/projects/sun-climate/glch_body.html

Day 2: Introduction to the Sustainable Cities Programme-Asia Network activities, by Dr Fahmy Ismail, Sustainable Cities Programme, Sri Lanka

Sustainable Cities Programme **"SCP-Asia"**

- supporting Cities to address Climate Change Impacts

A joint facility of:
United Nations Human Settlements Programme
Regional Office for Asia & the Pacific (UN-Habitat-ROAP), and
United Nations Environment Programme (UNEP)

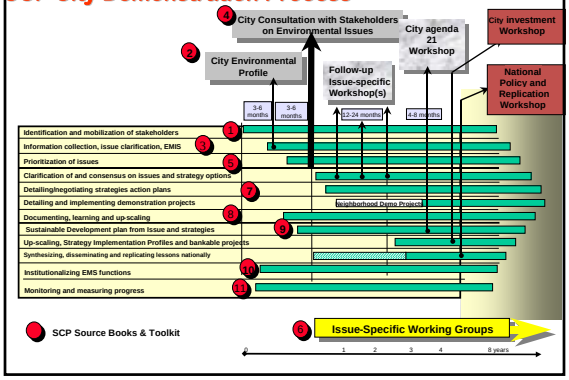
http://www.fukuoka.unhabitat.org/topics/SCP/scp_e/scp.main_e.html

Sustainable Cities (SCP)/LA21 Programmes Today some 120+ cities network globally

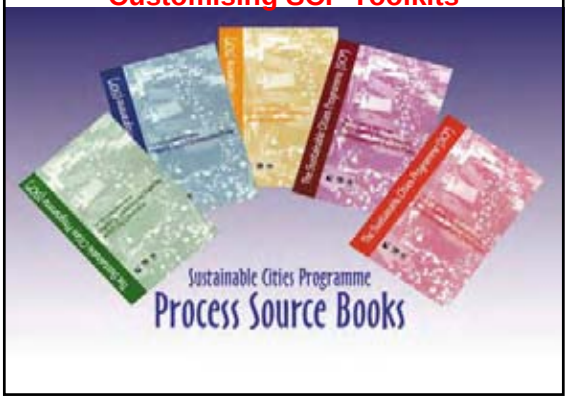
A UN-HABITAT/UNEP joint EPM Capacity-Building Facility for improving the Urban Environment

UN-Habitat/UNEP Sustainable Cities Programme

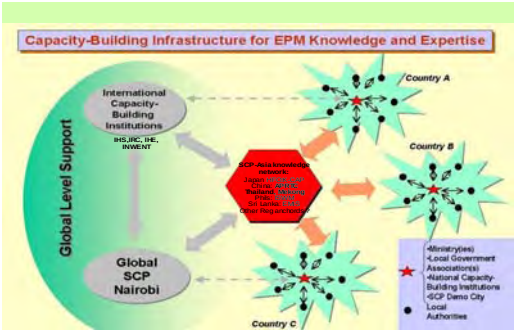
SCP City Demonstration Process



Customising SCP Toolkits



Building the Global-Local Institutional Support Structure



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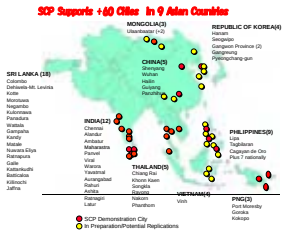
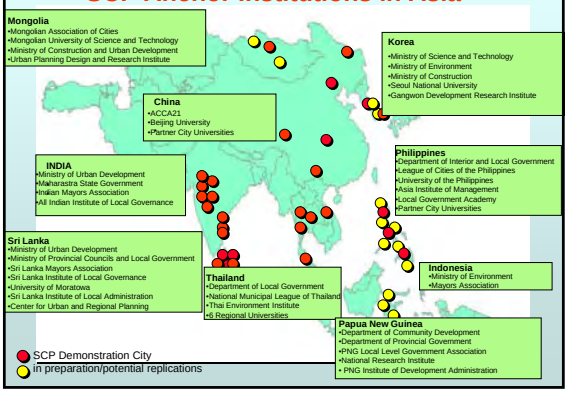
Sustainable Cities Asia Network



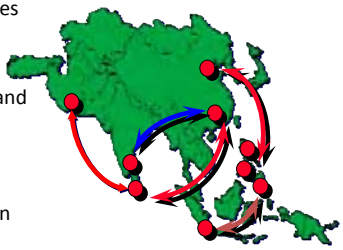
SCP-Asia applies Agenda 21 principles to support implementation of the Habitat Agenda and MDGs 7/10 and 7/11, by building local capacities to apply global environmental conventions and agreements at the local and national levels.

SCP Anchor Institutions in Asia



Developing Regional Network of Support

- city to city exchanges
- support project development
- share information and experience
- pool expertise and technical resources
- organise joint action



UN-Habitat/UNEP Sustainable Cities Programme

Air Quality Management to Mitigate Climate Change Impacts

Country- city	Issues	Strategy	Demo-projects
China- Shenyang	•Industrial emissions •Coal burning for power generator •Escalating vehicular emissions •Low proportion of open areas	•To close or relocate the most polluting industries, •Introduce cleaner fuels for its district heating systems •Change buses and taxis over to LGP •Greening the city with rapid carbon fixing trees	•Closure of the Copper smelting plant •Introduction of unleaded petrol •Creation of Industrial Parks
India- Chennai	•Severe Traffic Congestion	•Maximizing existing infrastructure investments • Improving the modal share of transit systems	• Traffic Congestion and Air Quality: • Synchronized traffic lights •Overpasses to maintain flows •Separation of sub-urban and regional rail transport •Increased public transport access •Phasing school closure hours •Time sharing market opening hours

Air Quality Management to Mitigate Climate Change Impacts

Country- city	Issues	Strategy	Demo-projects
Sri Lanka - Colombo	•Vehicular emissions •Energy production •Factory emissions •Indiscriminate open burning of refuse	•Lead and emission reduction policy changes •Enhance city infrastructure •Lead and emission reduction policy changes •Solid Waste Management 3Rs •Capacity building	•Restructuring of roundabouts •Bus bays •Segregation of pedestrians •Synchronization of traffic lights •City greening •Awareness campaigns against use of leading petrol
China - Panzhihua	•Industrial emissions •Inadequate technologies to reduce pollutants •Vehicular emissions •Energy production	•Industrial restructuring and strengthening pollutant emission controls •Introducing industrial clean energy systems and clean energy promotion	•Awareness raising campaigns for cleaner production •Strengthening vehicular and industrial emissions control mechanisms •Introducing LNG in buses •Introducing solar heating systems for community use. •Developing bio-fuel industry with Jatropha

Solid Waste Management to Reduce Methane Emissions

Country- city	Issues	Strategy	Demo-projects
Sri-Lanka - COLOMBO KOTTE DEHIWALA MORATOWA NEGOMBO KOLONAWA PANADURA WATALLA GAMPAHA KANDY RATNAPURA NUWARA-ELIYA MATALE	•Solid waste management •Collection & disposal	•Create awareness and knowledge about solid waste and various management methods • Create and strengthen partnership with the community and public ,private and NGOs for sustainable management. •Reduce volume of waste for disposal • Introduce separation at source with home composting • Introduce waste and recycling community sheds •Introduce bio-gas production to reduce municipal market.	• Home Composting Bins • Biogas Units • CDM (Matale) • Community Waste collection and Sorting centres • Community level Environment Promotion Center (only Gampaha)



Photos from Sevanatha

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Solid Waste Management to Reduce Methane Emissions

Country- city	Issues	Strategy	Demo-projects
Philippines- Cagayan de Oro Tagbilaran Lipa	•Solid waste management •Collection & disposal	•Create awareness and knowledge about solid waste and various management methods • Create and strengthen partnership with the community and public ,private and NGOs for sustainable management. •Reduce volume of waste for disposal • Introduce separation at source with home composting • Introduce waste and recycling community sheds	• Community-based solid waste management • Sorting wastes at source • Bio-composting and organic fertilizer production • Allotment gardens & Peri-urban agriculture

Photos DILG/ Uzeo de Cagayan University

Coastal Management as platform to mainstream adaptation mechanisms to Climate Change

Country- city	Issues	Strategy	Demo-projects
Philippines – Cagayan de Oro & Tagbilaran.	• Coastal Resource Management	•Preserve marine resources, especially coral reefs for protection against more violent storm surges •Increase the fish catch of fisher folks and rehabilitate/reforest the marine ecosystem. •Create and strengthen partnership with the community and public ,private and NGOs for sustainable management.	• Mangrove Restoration • Fish sanctuary project •City-Coastal Cleaning Campaigns

Mangrove rehabilitation (Artificial Reef)

Monthly Coastal cleanup day

THE WAY FORWARD

Supporting cities to meet global conventions:

- •Climate Change
- •Reducing Land base pollution to regional Seas
- • Strengthening Urban Biodiversity

Day 2 :Indian Cities responding to Climate Change Impacts by Professor (Dr) Sneha Palnitkar, All Indian Institute of Local Self Government, Mumbai, India

India's Initiatives Towards Climate Change-Legislations

- The Water (Prevention and Control of Pollution) Act, 1974, as amended up to 1988
- The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987
- Environment Protection Act,1986.
- Hazardous Waste Management Rules,1989.
- Bio-Medical Waste(Management and Handling)Rules,1998

2

- National Forest Policy, 1988
- Forest (Conservation) Act, 1980
- The Eco Sensitive Zone - Pachmarhi, Notification, 1998
- Re-cycled Plastics Manufacture and Usage Rules, 1999
- Coastal Regulation Zone - Notifications

3

- Dumping and Disposal of Flyash - Notification
- Noise Pollution (Regulation and Control) Rules, 2000
- Municipal Solid Wastes (Management & Handling) Rules, 2000 - Notification
- Ozone Depleting Substances (Regulation) Rules, 2000 - Notification

4

- Wildlife Protection Act, 1972 & Wildlife (Protection) Amendment Act, 2002.
- Biological Diversity Act, 2002.

5

Coastal Zone Management

- Balance between economic development and environmental protection, the Coastal Regulation Zone Notification, 1991, declares the limits of the coastal zone, and classifies it into four categories of CRZs

6

Day 2 :Indian Cities responding to Climate Change Impacts by Professor (Dr) Sneha Palnitkar, All Indian Institute of Local Self Government, Mumbai, India

- Regulatory Commissions Act, 1998 empowers Commissions to Rationalise Electricity Tariffs, Promote Environment Friendly benign Policies.
- Indian Electricity Act, 1910 and Electricity Act, 1948 amended to allow private sector in generation and distribution of Power.

7

Fundamental Tenets of Strategy

- The Commitments under International Treaties
- Kyoto Protocol & Clean Development Mechanisms
- Energy Efficiency and Conservation.
- Developing Fuel Efficient Equipment, Increasing Awareness & Establishing Institutional Mechanisms
- Alternate energy sources
- Technology Upgradation

8

India's National / State Level Strategies on Climate Change

9

Afforestation and Land Restoration

Actions:

- Establishing Relevant Institutional Mechanisms:
  - National Waste Land Development Board
  - National Afforestation and Eco-Development Board

10

Actions - Forests

- Protecting Existing Forests.
- Putting Check on Diversion of Forest Land for Non-Forestry Purposes.
- Encouraging Farm Forestry / Private Area Network and Controlling Forest Fires.
- Afforestation Programme with Peoples' Participation under Joint Forest Management.

11

Actions-Renewable Energy Solar (Photo Voltaic Systems),

- Wind Energy,
- Bio-Gas,
- Small Hydropower Projects (1423 MW)

12

Oil

- Reduction of Gas-flaring.
- Installation of Waste Heat-Recovery Systems.
- Energy Audits.
- Equipment Upgradation.
- Substitution of Diesel with Natural Gas.
- Establishment of PCRA (Petroleum Conservation Research Association)

13

Gas

- In the Residential Sector and Usage of GAS.
- Major Investments in Developing Infrastructure for Long Distance and Local Distribution.

14

Transport

- Upgradation of Vehicular Emission Norms – Bharat 2000.
- Emission Standards (Bharat Stage II).
- Transport Policy, 2006 for Cities

15

Industrial Developments

Actions:

- Promotion of Fuel – Efficient Practices and Equipments.
- Replacement of Old and Inefficient Boilers and other Oil-operated Equipment.
- Fuel Switching and Technology Upgradation.

16

Power

Actions

- Reforms in Power Sector and Technology Improvements to enhance the Combustion Efficiency of Conventional Coal Technology leading to Conservation of Coal and Savings in Emissions.
- Power Sector Reforms – Regulatory Restructuring, Corporatization, Privatization and Unbundling of State Owned Utilizes.
- Encouragement to Privatisation in Transmission

17

CRZ

Actions:

- Coastal Zone Management Authorities have been constituted in all 13 coastal states and union territories.
- To protect fragile ecosystems in these areas,
  - Restrictions on various activities in the area between 200-500 m of the high tide line,
  - Area up to 200 m from the high tide line designated a 'no development zone' (MoEF, 2002).

18

Day 2 :Indian Cities responding to Climate Change Impacts by Professor (Dr) Sneha Palnitkar, All Indian Institute of Local Self Government, Mumbai, India

Green Buildings

Actions:

- **LEED India NC (New Construction), a fully indigenous rating to suit the National context has been launched effective 1 Jan 2007**
- **Vision of Indian Green Building Council is to usher in a green building revolution in India**

19

Rain Water Harvesting

Actions:

- Growing demand for water
- Gap between demand and supply
- Necessity for water conservation
- RWH a solution to water crisis
- RWH in Residential Sector
- RWH in Industries
- Recharge of Wells

(e.g. Direction of Urban Development Department, Government of Maharashtra for installation of Rain Water Harvesting Structures.)

20

Air Pollution

Actions:

Important measures taken by the government to control air pollution :

- The ambient air quality of various cities and towns is monitored regularly through a network of 290 monitoring stations under the National Ambient Air Quality Monitoring Programme.
- Emissions from highly polluting industrial units and thermal power plants are regularly monitored and action is taken against the defaulting units.

21

- Unleaded petrol supplied to the entire country from February 2000. Sulphur is being progressively reduced in diesel. Fuel quality standards for petrol and diesel have been notified.
- Gross emission standards for on-road vehicles and mass emission standards for all categories of new vehicles have been notified under the Central Motor Vehicles Rules, 1989.
- Fiscal incentives are provided for installation of pollution control equipment.

22

City Level Climate Change Actions

Renewable Energy :

- Solar Energy –Street Lights / Residential Buildings Institutions.
- Bio-Gas Projects – Solid / Liquid Waste Management.

23

City Level Strategy on Residential Buildings

- Fuel Efficient Equipment / Appliances – Compact Fluorescent Lamps, Pumps for Lifting Water in High Rise Buildings.

24

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Transport at City Level

- Switch over from Petrol / Diesel to CNG.
- Usage of Cars with Certain Numbers on Certain Dates-Mumbai
- Upgradation of Vehicular Emission Norms.
- Battery Operated Vehicles-Mumbai and Pune.
- Awareness Building about Pollution at City Level

25

City Level Strategy on Green Coverage & Buildings

- Preservation & Enhancement of Green Cover / Trees in Cities.
- Development of Green Buildings.

26

City Level Strategy for Solid Waste Management)

- Segregation & Minimization of Waste.
- Decentralized Solid Waste Management.
  - Vermi-composting.
  - Composting.
  - Bio-Gas Technology.
  - Waste Recycling and Reuse
  - Developing Common Landfill Site by Pooling few Cities

27

Air – Pollution at City Level

- Air Quality Monitoring at various locations in Cities.
- Emission Control at City Level.

28

City Level Strategy for Water Supply & Sanitation

- Water Usage.
- Reuse of Water.
- Water Treatment
- Rainwater Harvesting

29

Urban Poverty Alleviation at City Level

- Slums & Low Income Settlements.
- Basic Service Delivery to Poor.
- Integrating Urban Poor in SWM.
- Informal Sector & Measures at City Level.

30

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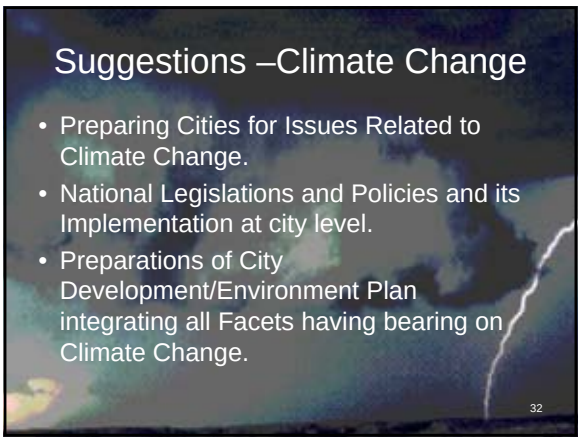


Day2 : Sri Lankan Cities responding to Climate Change Impacts by R.P.K.S Mahanama, Department of Town and Country Planning, University of Moratowa, Sri Lanka

Mitigating **Climate Change Impact**

through; improved

Solid Waste Management (SWM)

strategies and interventions

P.K.S. Mahanama (FITP, SL)
Head, Dept. of Town & Country Planning
University of Moratuwa
Moratuwa
Sri Lanka

2009/1/6 1

Impact of Climate Change – Sri Lanka

- Rising Temperature – (Increasing warmer days – Nuware Eliya)
- Sea Level Rising – (impact on Coastal cities)
- Extreme weather Conditions- (Floods and Droughts)
- Threat to food supply – (Paddy production, Price increase)
- Threat to fresh water supply – (all cities)
- Loss of Biodiversity – (Tourism both Eco and Leisure)
- Threat to Human Health – (Vector Born Diseases - Dengue,)

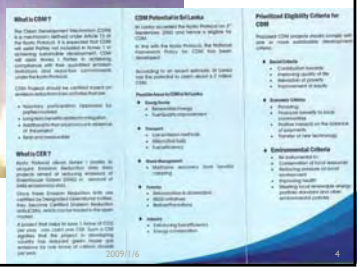
2009/1/6 2

Impact of Greenhouse Gases on Cities

Greenhouse Gases emit to the urban air environment from different sources.

- Energy Sector
- Transportation, Navigation
- **Waste Management**
- Agricultural crops
- Industrial Process and product use
- Other

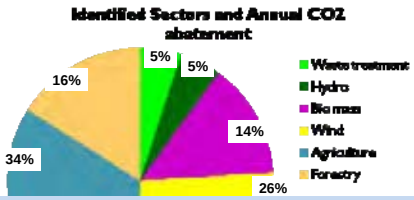
2009/1/6 3



Sri Lankan Initiatives

2009/1/6 4

Potentials for Carbon Trading



- Sri Lanka's current emission level which is around 600 kilograms is low compared to the global per capita carbon threshold of 2,200 kg.
- Sri Lanka's potential for emission reduction is estimated around
  - 6,232,468 tons of CO2 per year
  - US$ 74,789,616 per year
- Sri Lanka Out of the total of 15million tons CO2 marketed in the international market so far Sri Lanka has sold only 174,000 tons CO2

2009/1/6 5

Impact of Sea Level rising- Sri Lanka

2009/1/6 6

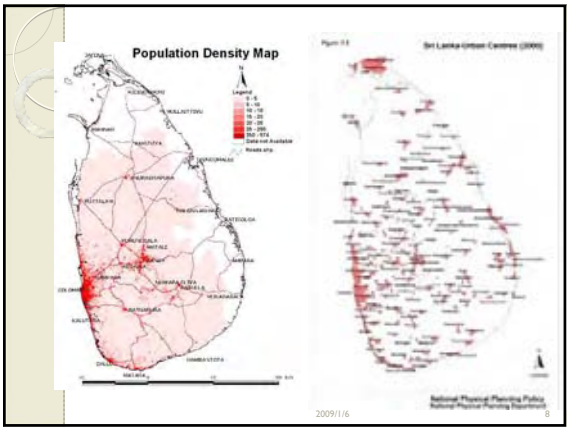
Day2 : Sri Lankan Cities responding to Climate Change Impacts by R.P.K.S Mahanama, Department of Town and Country Planning, University of Moratowa, Sri Lanka

Impact of Sea Level rising- Sri Lanka

- 24% (15726 sq.km) of the country belongs to coastal terrain.
- 35% of the total population of Sri Lanka live in urban areas. Out of them 65% live in coastal terrain.

30% of the coastal terrain vulnerable to be affect from 2m sea level rising

2009/1/6



2009/1/6 8

What Sri Lankan Cities Can Do?

35% of the total population (approx. 7 mill) of Sri Lanka live in urban areas.

- Energy conservation - planning and designing of energy saving cities and buildings,
- Transportation – pedestrianisation of city centers, public transport, use of LNG
- **Solid waste management**

2009/1/6 9

Green House Gas
Emitting Waste Categories

- **Possible Areas to CDMA Sri Lanka – National policy**
  - Methane recovery from landfill capping

2009/1/6 10

Greenhouse Gaseous Emission From Solid Waste

- Methane CH_4 emissions from **Solid Waste Dumping Site** are the largest source of greenhouse gas emissions in the Waste Sector
- **Incineration and open burning** of waste containing fossil carbon, e.g., plastics, are the most important sources of CO_2 emissions in the Waste Sector.
- Nitrous oxide N_2O is produced in many **treatments** but the importance depending on the type of treatment and conditions during the treatment.
- Waste **treatment and discharge** can also produce emissions of non-methane volatile organic compounds ($NMVOC_s$), nitrogen oxides (NO_x), and carbon monoxide (CO) as well as of ammonia (NH_3).

2009/1/6 11

Solid Waste Generation & Collection

- Total collection of MSW by local authorities in Sri Lanka is around 2900 tones/day
- Around 60% (1663 tones) collected in the Western Province
- Around 43% (1257 tones) collected in Colombo District.
- Around 25% (700 tones) collected within Colombo Municipal limits, the most urbanized area

Ranges[tones/day]	Number of Local Authorities
Up to 1	111
1-2	48
2-5	76
5-10	26
10-20	23
20-50	19
50-100	5
100-150	2
>150	1
Total Number of Local Authorities	311

Solid Waste Generation By Local Authority
Source: Central Environmental Authority, Sri Lanka

2009/1/6 12

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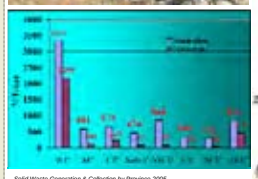
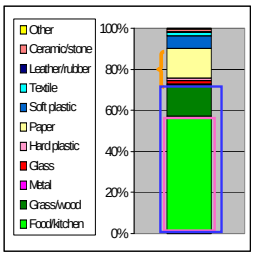
Solid Waste Generation & Collection



Solid Waste Generation & Collection by Province,2005
Source: Waste management authority of western province

Composition of Municipal Solid Waste (MSW)



Waste Composition – Gampaha MC

80% - biodegradable waste
60% - food waste

↓

Low Calorific Value
&
High Moisture

↓

Composting	Burning
✓	?

Solid Waste Disposal Methods

- Open Dumping
- Burning

Under Sri Lankan LA conditions, the most common method of waste disposal is open dumping

This create several environmental issues including ;

Green House Gaseous emission

Sri Lankan Initiatives — Solid Waste Management Policy

1. Management of solid waste from **generation to disposal** should be systematized
2. Priority should be given to **reuse and reduction of waste** over **recycling** and recycling over disposal
3. Disposal of **hazardous waste** should be considered on a special basis
4. Haphazard disposal of solid waste should be prohibited.
5. **Sanitary land filling** using disposable solid waste should be given the necessary support and encouragement.
6. **Composting of organic waste** should be promoted at several levels of waste generation and disposal, such as households, community organizations, PPS and ULAs

Legal responsibility of Solid Waste Management is with Local Authorities (311 Local Authorities)Municipal Council Ordinance (1947 No 29), Urban Council Ordinance, (1939 No 61) Pradesheeya Sabha Act (1987 No 15)

Pilisaru:2012 - The national solid waste management programme

Objective: To maximize re- utilization of resources discarded as waste and disposal of residue in an environment-friendly manner.

Implementing Agencies: - Ministry of Environment and Natural Resources (MENR)
- Central Environmental Authority Ministry
- Local Government and Provincial Councils

Fund: - The government of Sri Lanka 5. 6 billion rupees budget allocation
- The Korean International Cooperation Agency (KOICA) 450 million rupees grant

- **composting of waste**
  - Estimated annual production capacity of the compost (75 per cent of the fertilizer requirement of the country) - 100000 tones
  - Estimated annual profit -130 million
  - Estimated reduce importation of urea fertilizer - saving 1.6 billion of foreign exchange
- **waste recycling**
  - waste collection centers are set up all local authorities to encourage re-cycling process of waste
- **waste disposal**
  - technical and financial assistance for the composting and biogas generating programmes
  - convert lands used for dumping solid waste by local authorities into compost generating sites

***Pilisaru*' project contribute to Clean Development Mechanism by removing dumping sites which emit methane could be avoided resulting in the control of global warming.**

Sri Lankan Action — Solid Waste Management Practices

- Sanitary land filling
- Engineered landfill
- Composting
- Recycling
- Incineration
- Bio-Gas Production

Composting

- Composting is suitable for waste consisting of high organic matter.
- Composting technologies haven't developed to a great extent and it could vary from in-vessel to open windrowing.
- On site composting of generation is also viable in Sri Lanka

  E.g.: Balangoda Urban Council Windrow System

  Kuruwita Pradesheeya Sabha Windrow System

2009/1/6 19

Composting

- Composting technologies are comparatively cheaper than energy recovery methods.
- Usually 350-500kg of manure can be produced from one ton of municipal wastes, according to
  - Location of the factory
  - Weathering conditions.
- Composting must be free of any
  - Pathogens
  - Grass seeds
  - Toxic substances
  - Ammonia
  - Heavy metals
  - Bad odour.

This will not be achieved unless sorting of the original municipal wastes takes place, and the rules of the production process are perfectly followed.

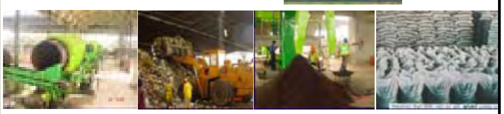
2009/1/6 20

Composting

- The most common practice is small-scale composting bins

Organization	Number
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Total	>70000

Distributionn of Composting bins, 2005
Source: Central Environmental Authority, Sri Lanka



Composting plant- BURNS Environmental Technologies Ltd

2009/1/6

Land Filling

- Land filling methods are still the most common methods through out the world.
  - Sanitary landfills
  - Engineering land filling

Sanitary landfilling is a physical facility used for disposal of solid waste in surface of soil with engineered facility to minimize public health and environmental aspects.

- Operating a sanitary landfill would be rather expensive from Sir Lankan standards. Therefore, most suitable would be something in between open dumping and sanitary landfill

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Waste to Energy - *Bio- Gas Production*

- Waste to energy technology is most suitable for waste with high calorific value and low moisture.
- However with the production of Refuse Derived Fuel {RDF} these technologies can now be introduced to Sri Lanka.
- Again the prohibitive factor would be the very high initial capital costs involved.

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Bio- Gas Production/ Bio-Methanation

- Anaerobic digestion of organic substances produce Bio-Gas

Bio- Gas Project at Kotte MC

- Biogas is composed of
  - highly flammable methane gas (55 - 70%)
  - Carbon dioxide (25 – 35%)
  - traces of hydrogen sulphide
  - traces of nitrogen sulphide.

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Day2 : Sri Lankan Cities responding to Climate Change Impacts by R.P.K.S Mahanama, Department of Town and Country Planning, University of Moratowa, Sri Lanka

Benefits of Bio-Gas Production

- The cost of energy generation is reduced through the use of a low-cost renewable source.
- It is an effective waste treatment method.
- The sludge by-product is used as a soil fertilizer
- Environmental problems associated with waste dumping are avoided
- Less fossil fuel is consumed


Bio-gas Project at Muthurajawela
Source: Central Environmental Authority, Sri Lanka

PRODUCING BIO-GAS

Private Sector Initiatives

brandix

Bio-gas Initiative

❖An Anaerobic Digestion process is in operation at our garment finishing facility (Brandix Finishing Ltd - BFL).

❖This process generates bio-gas of approximately 600 Litres per day from the bio-degradable waste accumulated (bio sludge and food waste).

❖This renewable energy source is utilised in the plants' canteen facility.

❖Another Anaerobic Digestor is currently under construction at the Group's Green Factory.

SOLID WASTE RECYCLING PROJECT

Nuwara Eliya Municipal Council - LA and the private operator also earn money

Dehiwala-Mount Lavinia Municipal Council- Solid waste recycling project run by a community-based organization.

The Chilaw PS has partnered with an NGO and implemented a recycling programme for about 500 families within their LA limits.

Karuwalagaswewa PS - Solid Waste Management and Recycling Program

brandix

Recycling Waste Paper

Private Sector Initiatives

A systematic method of solid waste collection, storage and recycling was introduced.
polythene is collected and stored at a centralised Waste Management Centre.
The materials are subsequently distributed to poultry farms and recycling Companies.
This resulted in the recycling of 123 tons of waste paper and saved:

❖ The felling of 2,098 fully-grown trees

❖3,923 m3 of water

❖493,797 Kwh of electricity

❖370 m3 of landfill

COMPOST MAKING PROJECT

Anamaduwa PS - Compost manure Project
Collecting garbage and recycle as compost

Bingiriya PS -Collect the Garbage from the Fairs from the towns of Weerapokuna, Bowatta, Bingiriya, Vilaththawa and Salvehiniya plants from tanks in the area and make compost.

Chilaw UC -Collecting Garbage, Composting, Selling non decay items

Galgamuwa PS -Solid Waste Management
Preparing Budgets buying trash cans and placing them, Implementing awareness programs, Collecting Garbage Seperately.

Kalpitiya PS - Providing Compost bins in Wanni Mundhalama area

Karuwalagaswewa PS -Construct a compost Manure production site on a 5 acre land in Nilabamma, Saliyawewa. It will be a solution for the waste problem, and by doing that get the people to use compost manure in agriculture. From 2008.

Wariyapola PS
Colletion and transport of waste from the entire area of Wariyapola
Strengthen Recycling activities


Wariyapola PS
Colletion and transport of waste from the entire area of Wariyapola
Strengthen Recycling activities





AWARENESS PROGRAMMES

School Awareness programme in Gampaha- Solid waste recycling and Composting

- Choose 6 schools by discussion with GMC Mayor and its staffs
- Awareness programs to teachers
- Awareness programs to students
- Construction of the storage by JICA. (Could be any other organizations)
- Ask students to bring recyclables from home to school regularly, say twice a month.
- Keep them in the storage up to a certain amount.
- Sell them to recyclers.
- Recyclers are willing to visit school to collect materials.
- Buy some school goods by this money.



Introduce Service Delivery Training module for solid waste Planning and Disposal

Implemented by Asia Foundation

The Main Objectives of this module

❑To provide guidance to LAs in Sri Lanka and officials who engage in SWM activities.
❑ To provide knowledge, skills and tools for planning LA waste management activities in a systematic manner.
❑To assist LAs to practice waste disposal methods which minimize impacts on the environment and society, and to monitor and manage the workforce engaged in waste management.
❑To assist LAs to ensure a satisfactory level of waste management that meets the needs and demands of citizens.

Day2 : Sri Lankan Cities responding to Climate Change Impacts by R.P.K.S Mahanama, Department of Town and Country Planning, University of Moratowa, Sri Lanka

Day 2 :Philippine Cities responding to Climate Change Impacts by Dr Noel Duhaylungsod, Environmental Governance Specialist, Manila, Philippines

Climate Change Adaptation-Mitigation Measures for Island Coastal Zones

Noel C. Duhaylungsod, National Adviser, UN Habitat-Philippines, August 2008

Archipelagic Country

Lipa City

Tagbilaran City

Cagayan De Oro City

Current Physical Situation

- A meter sea rise will affect 64 of 81 provinces or 44% LGUs; submerge ~ 700M m^2 by 2095 to 2100
- 85% of GDP comes from areas at risk
- 2006, world's top climate victim of frequent and stronger tropical cyclones/drought-flooding cycles
- Immediately affecting 8,568,968 people by extreme weather
- Losses could reach $4.5 billion

- 85% of LGUs like Tagbilaran City is in the inter-tidal zones
- Cities located in alluvial fans like Cagayan De Oro City are vulnerable to flash flooding
- Landlocked cities like Lipa City are vulnerable to flooding

Magnified disaster in cities because;

- Massive extraction of geologic water - aquifer salinization (2 km in Manila) and contamination (Las Pinas City heavy metals)
- Construction/digging/infrastructure weight - land subsidence and possibly solifluction

- Congestion by settlers/industry - waterways clogging and diversion
- Environmentally critical zones are occupied by people and industries (watersheds in Rizal)

Day 2 :Philippine Cities responding to Climate Change Impacts by Dr Noel Duhaylungsod, Environmental Governance Specialist, Manila, Philippines

CCAM Initiatives

- Policy development and implementation
  - >> National policy reform/implementation
  - >> LGU-level policy initiatives
- Projects
  - >> Solid Waste Management
  - >> CDM Registration
  - >> Coastal Resource Management
  - >> Carbon sink projects
  - >> Disaster management projects
  - >> Emission control projects
  - >>

平成21年1月6日 7

Action Plan on Climate Change

Areas of Concern

- Rapid Assessment (Vulnerability /Adaptation)
- Adaptation Measures
- Mitigation Measures
- Public Awareness
- Mainstream Climate Change in Politics, Plans and Programs

平成21年1月6日 8

Co-Benefits of Sectoral Program

-Energy-

Program	Co-benefits
• Intensifying renewable energy resource development • Increasing the use of alternative fuels • Enhancing energy efficiency and conservation programs	• Reduction of fossil fuel imports • Increase the country's self sufficiency • Promote the use of indigenous energy • Promote use of clean energy technology • Reduce air pollution

平成21年1月6日 9

Co-Benefits of Sectoral Program

-Forestry-	
• Green Philippines Program	• Forestation of degraded forestlands • Reduce soil erosion • Generate employment opportunities • Ensure sustainability of national resource base
-Waste Management-	
• Waste Management	• Waste reduction • Less methane release • Cost savings from the use of methane gas

平成21年1月6日 10

"Big" CC-Policy concerns: National

- Congruence –harmonization of policies
- Turfing the CCI challenge
- Support to policy implementation
- Approach to CCI is technocratic

平成21年1月6日 11

LGU-District/Provincial

- Centre for Initiatives and Research on Climate Adaptation – CIRCA (Albay)

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- "Sorsogon Bay Development Authority"
- "Cagayan Valley Development Cluster"
- Methane gas sequestration – Payatas dumpsite
- Carbon sink forestation – Caliraya Watershed Reforestation

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LGU-City

- Coastal zone management adaptation project
  - >> Mangrove rehabilitation
  - >> Artificial reefing-fish sanctuary
  - >> Cluster Materials Recovery Facility – SWM
  - >> Coastal clean up programs

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Coastal clean-up

(Tagbilaran City, Cagayan De Oro City)

平成21年1月6日 15

Methane gas capture/conversion

平成21年1月6日 16

CDS (CA/WB/UNH) = 36 cities

L-MDG = 14 Resource Cities

Lipa City

Tagbilaran City

Cagayan De Oro City

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"Big" CC Concerns: LGU

- There is clutter of CC initiatives which LGU is simply the recipient of goods and services
- LGUs are swarmed
- Many of the initiatives are highly technical in nature, "disallowing" LGUs into the process
- Ownership of development effort is in question
- Projects are left hanging after external funds run dry

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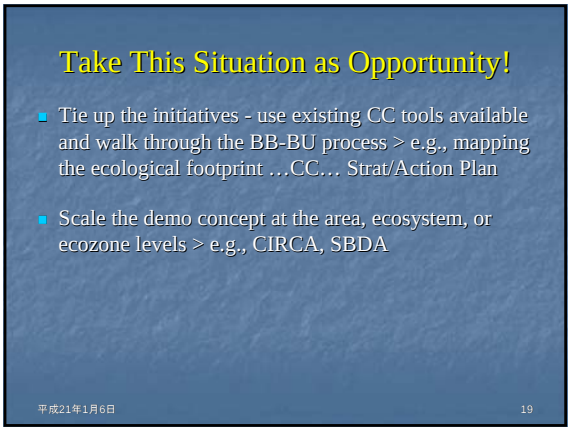

Day 2: Chinese Cities responding to Climate Change Impacts by Dr Li Zhenshan, University of Beijing, China

Going Green: China Cities in Climate Change

Pan Xiaodong
The Administrative Center for China's Agenda21
2008.9

1

Outline

- China national strategies and policies on Climate Change
- National major campaigns
- City responses and actions
- Ideas and suggestions

2

China's views and stands on climate change

- To address climate change within the framework of sustainable development
  - Climate change concerns environment and development, but fundamentally more of development
- To follow the principle of 'common but differentiated responsibilities' of the UNFCCC.
  - Due to historical and practical responsibilities, developed countries should take the lead in reducing GHG emissions
- To place equal emphasis on both mitigation and adaptation
  - Mitigation and adaptation are integral components of the strategy to cope with climate change, thus should be placed with equal emphasis.

3

China's strategies and policies on Climate Change

- *CPC's Proposals on the 11th Five-year Plan* : to 'attach importance to the control of GHG emissions'.
- *The outline of the 11th Five-Year Plan for National Economic and Social Development:* Striving to make achievements in controlling GHG emissions.
- *The Outline of the National Program for Medium- and Long-term Science and Technology Development:* Prioritize energy and environment in S&T development; Prioritize monitoring and measures of global environment change in the field of environment.

4

National Leading Group to Address Climate Change and Energy Conservation & Pollutant Discharge Reduction

- The State Council decides to establish the National Leading Group to Address Climate Change and Energy Conservation & Pollutant Discharge Reduction
  - Leader: Premier Wen Jiabao
  - Members: chief leaders from relevant ministries of the State Council

5

Outline

- China national strategies and policies on Climate Change
- National major campaigns
- City responses and actions
- Ideas and suggestions

6

Day 2: Chinese Cities responding to Climate Change Impacts by Dr Li Zhenshan, University of Beijing, China

China's National Assessment Report on Climate Change

- Issued in December 2006 by MOST and other departments
  - China's first national assessment report on climate change and its impacts.
- Purposes
  - To provide scientific basis for developing long-term strategy of national economic and social development
  - To provide scientific support for China to engage in international actions on climate change
  - To summarize China's scientific achievements in climate change and suggest directions for future scientific research
- Main Contents
  - Scientific basis of climate change
  - Impacts of and adaptation to climate change
  - Social and economic evaluations of climate change

7

China's National Climate Change Programme

- Issued by the State Council on May 30,2007.
- Outlining objectives, basic principles, key areas of actions, as well as policies and measures to address climate change for the period up to 2010.
- China's first comprehensive policy document on response to climate change, also maybe the first national climate change programme in developing countries.

8

China's Scientific and Technological Actions On Climate Change

- Issued by MOST and other governmental agencies on June 14, 2004.
- Purposes
  - Effective implementation of the key tasks in the Outline of the National Program for Medium- and Long-term Science and Technology Development

  - – to provide S&T support to the implementation of the CNCCP Program
  - – to coordinate climate change-related scientific research and technological development
  - – to enhance the comprehensive S&T capacity in response to climate change

- Outlining concrete objectives and key tasks

9

The General Work Plan for Energy Conservation and Pollutant Discharge Reduction

- Issued by the state council on May 23, 2007
- Main objectives
  - In 2010,cut energy consumption for every 10000 yuan (1377 dollars) of GDP by 20 percent, the water consumption for per-unit industrial added value will decrease by 30 percent , the municipal waste treatment rate will no less than 70 percent, the comprehensive utilization rate of industrial solid waste will above 60 percent.
  - In the 11th Five-Year Plan period (2006-2010), the total emissions of major pollutants will be reduced by 10%
- Main measures
  - curb excessive growth of high-energy consuming and heavy-polluting industries.
  - speed up the elimination of backward production capacity.
  - actively promote structural readjustment of energy
  - ……

10

Mass Campaign aiming at energy saving and GHG reducing

- National campaign: Mass Actions for Energy-saving and Emission saving.

Cities' Actions:

---Laying city plans;

---Carrying on city actions covering the whole society, for instance new consumption and living style ;

---Joint city actions, for instance the Turning off lights for 30 minutes action involving 7 metropolitan cities including Beijing, Shanghai, Nanjing, Wuhang, Nanjing, etc.

---Full participation of all parties like governments, the civil, enterprises, medias, education system, youth league, women league, S&T department, etc.

11

Joint City Action: Turning off lights for 30 minutes

Yuzhong District, Chongqing City

Before the action

Action

12

Day 2: Chinese Cities responding to Climate Change Impacts by Dr Li Zhenshan, University of Beijing, China

Mass Campaign aiming at reducing GHG

- MOST and ACCA21 compiled publicity materials on energy conservation and pollutant discharge reduction
  - ***Booklet of Public Energy Conservation and Pollutant Discharge Reduction***
- 36 behaviors in daily life for energy conservation & pollutant discharge reduction
  - **An annual total saving of 77 million ton national wide**
  - **A reduction of 200 million tons of CO2 emissions (that of Netherlands in 2004)**

13

Outline

- China national strategies and policies on Climate Change
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- Ideas and suggestions

14

City Climate Change strategy: building low carbon city

- Since 2007, Baoding city put forward the objective of building "Low Carbon City".
- After years' development, enterprise related with new energy and energy equipment have expanded to more than 100. This city will create an enterprise and industry group based on cleaner production technologies.
- The wind power industry chain and solar photovoltaic industry chain and energy-saving industry chain will be the key industry to develop.

Baoding

15

Cleaner energy

- **Natural gas and other types of clean energy have been introduced to improve thee fuel structure.**
- **Enhancing vehicle emission control. Development of the public transport system has always received priority in the city's development plan.**
- **Industrial pollution control. Those with high energy consumption and high polluting industrial plants forced to closed.**

Beijing

16

City with bigger Carbon Sink

Chongqing will invest 48 billion Yuan to build a urban forest. The forest cover in this region will come to 45 percent in 2017 and 1.78 million mu new forest area will cover this city. At that time, more CO2 will be absorbed.

17

Eco-City

- In 2001, Guiyang Committee of the CPC and Guiyang People's Government determines the policy of City Development by Environment.
- In 2004， Guiyang People's Government pointed out the general development policy of Grant Guiyang as the goal, ecotype economy city as the orientation, circular economy development as the approach course, and forest city as the characteristic.
- **In 2005，to be one of the SCP city of UN**

In the past and the present of Guiyang

Guiyang

Day 2: Chinese Cities responding to Climate Change Impacts by Dr Li Zhenshan, University of Beijing, China

City GHG control

- **Raising Awareness of Climate Change**
- **Control air pollution, particularly industrial dust and smoke dust**
- **Clean energy alternative. For example, biodiesel produced by Jatropha curcas, solar energy application in most of the communities,**

The Plan of establishing national model city for environmental protection

Panzhihua

19

Metropolitan Climate Change Strategy

Shanghai, as one of the pilot cities to explore ways for low carbon development in China's urban areas, will find solutions in the building energy conservation, renewable energy and energy saving products application. And sum up a viable model to popularize this model to the whole country successively.

Shanghai

20

Outline

- China national strategies and policies on Climate Change
- national major campaigns
- city responses and actions
- Ideas and suggestions

21

Ideas and suggestions

- National strategy and advocacy
- Primarily focus on awareness raising and capacity building
- Merge into city development strategy and plans
- Intensively Incorporate with city industrial and economic transition like industrial structure restructure, energy-saving and emission reduction.
- Technologies and marketing approaches like CDM.
- Information and best practices co-sharing.
- Using SCP approaches and tools.

22

- Thank you!!!

23

Day2 Korean Cities responding to Climate Change Impacts by Professor (Dr) Kwi-Gon Kim

Cities addressing Climate Change Impacts – Why Biodiversity matters

Kwi-Gon Kim (Ph.D)
Professor, SNU
Director, IUTC

Hoon Lee
Researcher, SNU

1. Importance of Climate Change Impacts on City Biodiversity

- Biodiversity is the variability among living organisms from all sources, including, terrestrial, marine, and other aquatic ecosystems, and their ecological complexes.
- It includes genetic, species, habitat and ecosystem diversity.

Ecological services (carbon cycle, flood control/drainage-city greening, water purification, climate control – Energy Conservation - Green Buildings)	Economic values (tourism, forest, foodstuffs, medicines)	Cultural values (aesthetic, spiritual, cultural landscapes)

- Economic value of biodiversity in Korea: 28.44 trillion won/yr
- Wood products: 13 trillion; marine products: 4 trillion, livestock: 2.6 trillion
  Biological control values of crops & forests: 4 trillion

<source: Korea Environment Institute, 2000>

Climate Change Impact on City Biodiversity

Changes in distribution
Increased extinction rates
Changes in reproduction timings
Changes in length of growing seasons for plants

Impacts on City Biodiversity (species)

Reduced Economic values to the city (e.g. less tourism)	Reduced Ecological Services to the city (e.g. less carbon cycle, flood control)	Reduced Cultural Value to the city (e.g. less natural landscape)

Impacts on City

2. Roles of Biodiversity against Climate Change

- Examples of activities that promote mitigation of or adaptation to climate change include:

Maintaining and restoring native ecosystems
Protecting and enhancing ecosystem services
Managing habitats for endangered species
Creating refuges and buffer zones
Establishing networks of terrestrial, freshwater and marine protected areas that take into account projected changes in climate

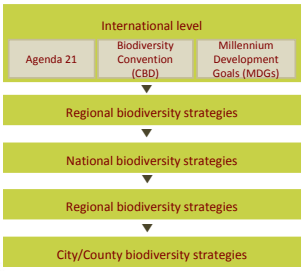
Rain Gardens, City Greening, Eco-Restoration , Regional Planning, etc

Mitigation of or Adaptation to Climate Change

3.Biodiversity Improvement against Climate Change

3.1 Approach to biodiversity management

- Approach methods for biodiversity management can be classified into international, regional, national, regional(provincial), city/county level according to space size, and a connectivity has to be provided among the strategies of each space level.



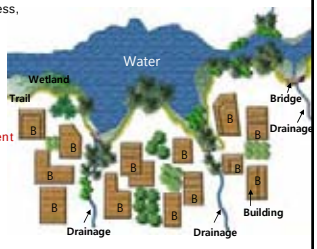
(Source : Kwi-Gon Kim, Strategies and Implementation of Sustainable Development , 2003)

3.2 Tools

3.2.1 Stormwater Chain (Total Water Cycle Management

☞ A tool to protect surface and ground water quality, maintain the integrity of aquatic living resources and ecosystems, and preserve the physical integrity of receiving streams through the incorporation of multifunctional site design elements into the rainwater management plan, including on-lot microstorage, functional landscaping, open drainage swales, reduced imperviousness, flatter grades, increased runoff travel time, and depression storage.

☞ A tool for flood control as an Adaptation to Climate Change while providing wildlife habitat for the urban biodiversity improvement and green scenery and individual gardens to the citizens.



3.3.1 Best Practices of Rain Gardens in Korea

1) Rain Garden in UNESCO Green Rooftop

☞ In order to maximize natural energy, rainwater is collected and used for rain garden and wetland, and the photovoltaic modules provide electricity necessary for water circulation in the wetland.

<Master plan map>

<Rainwater circulation map>

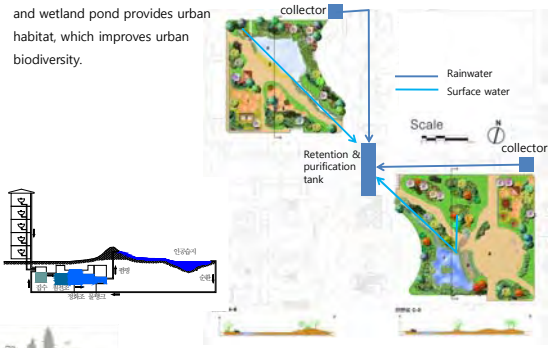
Rainwater Garden on rooftop

Rainwater retention storage tank

The water stored in the rainwater retention tank, which is located below the ground, is used for eco-pond and water channel in the courtyard.

2) Rain Garden in the Seoul I-park Apartment courtyard

☞ Rainwater is used to create water circulation system in residential complex, and wetland pond provides urban habitat, which improves urban biodiversity.



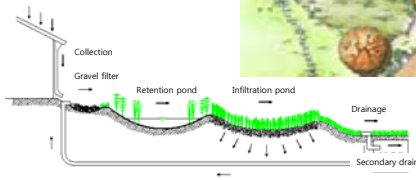
Many number of small rainwater garden inside the Courtyard

Rainwater Eco-pond Rain Garden in the Courtyard

3) Samsung Everland Rain Garden in Yongin City

☞ Rainwater treatment system model

『 Gravel filter → Retention pond→ Infiltration pond→ Secondary retention system(Re-circulated to retention pond) 』



☞ Effects

① Retention effect from the use of retention pond
- 25% decrease of runoff rainwater in rainy water
- 12% decrease of peak runoff rainwater in rainy season

② Infiltration and retention effect through the use of infiltration pond
- 20% of runoff rainwater is infiltration
- Infiltration pond also has retention effect

Before the installation of pond

Right after the installation of rainwater retention and infiltration pond

Recent image with diverse vegetation

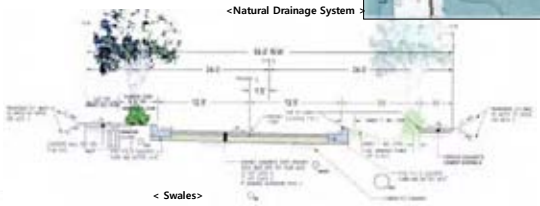
3.3.2. Best Practices of Rain Gardens Abroad

1) Rain Garden in High Point Neighborhood (Seattle, U.S)

☞ The strategy of creating natural drainage system

- Shallow grass swale was planted along the road in preparation of small rainfall
- Conventional drainage pipe was installed in preparation of large rainfall
- Rainwater retention and eco-pond of 16 acre

<Natural Drainage System >



< Swales>

☞ Details in High Point Neighborhood

Rainwater collecting pond

Community Rain Garden

Children's Park with porous pavement and environmentally friendly materials

Drainage System on roadside

Splash block

☞ Salmon-shaped splashblock at the bottom of rainwater drainage pipe allows natural flow of rainwater to grass swale

☞ Natural drainage system and outlet on roadside become swale during rainy season

Keymap

☞ Salmon-shaped splashblock at the bottom of rainwater drainage pipe allows natural flow of rainwater to grass swale

☞ Natural drainage system and outlet on roadside become swale during rainy season

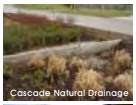
Keymap

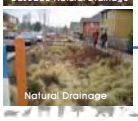
☞ Small dam inside natural drainage system prevents overflow of rainwater

☞ Grass swale to allow rainwater flow

Keymap

☞ Natural Drainage System

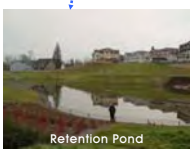





Retention & Drainage


Drainage Swale


Soakaway & Infiltration



3.4 Best Practices for Biodiversity Management to reduce Climate Change Impacts at City Level in Korea – Hanam City

Biodiversity Strategy Plan

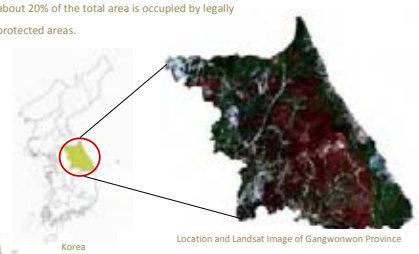
- By conducting habitat appropriateness assessment for 13 items such as diversity, rarity, naturalness and ecological status, applying natural environment assessment criteria, identified areas to protect from biodiversity aspects, areas to improve for biodiversity enhancement and areas to restore and create for biodiversity were identified, and by planning Hanam's principal green network, identified areas where green networks needed to be connected from network aspects.
- On this basic strategies, biodiversity conservation and sustainable use were established.

3.5 Best Practices for Biodiversity Management to reduce Climate Change Impacts at Regional Level in Korea – SRP in Gangwon Province

1) Overveiw of Gangwon Sustainable Region Programme(SRP)

① Site Overview

- population: ca. 1.50 million
- area : 16,932.55㎢
- over 83% of the total area is occupied by the forests.
- about 20% of the total area is occupied by legally protected areas.



Korea

Location and Landsat Image of Gangwonwon Province

② Approach of Gangwon SRP

- Regional plan for conservation & restoration of the biodiversity,
- Provides framework from the biodiversity aspects to establish each city/county's long term general plan or city's basic plan, and
- Provides data for Strategic Environmental Assessment from the biodiversity aspects of Gangwon Province's current policies, plans and programs.
- Application of UN-HABITAT Gangwon SCP Project at Regional level

Review of Policies and Plans related to Biodiversity

▼

Preparation of Biodiversity Profile(BP) and Establishment of Biodiversity Management Information System(BMIS)

▼

Establishment of Preliminary Biodiversity Strategy

▼

Strategic Environment Assessment of Current Gangwon Provincial Policies and Plans on Proposed Preliminary Biodiversity Strategy

▼

Establishment of Biodiversity Strategy

▼

Preparation of Guidelines on Biodiversity Strategy to reduce impacts from Climate Change

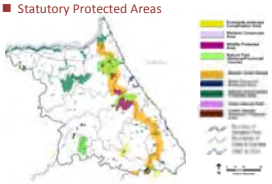
Flow of Gangwon SRP

2) Application of Gangwon SRP

① Preparation of BP and Establishment of BMIS

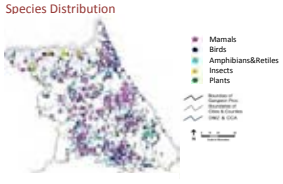
a. Preparation of BP

■ Statutory Protected Areas



■ Habitat Distribution

■ Species Distribution



b. Establishment of BMIS

❖ Gangwon BMIS was built as the following form at province, habitat, city/county and special area level, respectively

Gnagwon BMIS
Gangwon River and Stream Habitats BMIS
Cholwon County BMIS
DMZ BMIS

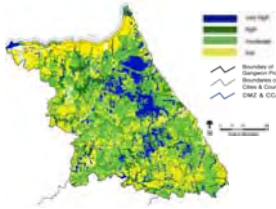
State | Analysis | Biodiversity Index | Biodiversity grade | Biodiversity important areas | Information about the for Biodiversity important areas

Main page of the Gangwon BMIS

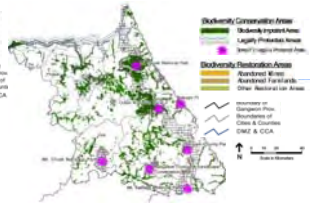
Page of Gangwon Biodiversity index

② Establishment of Preliminary of Biodiversity Strategy

■ Gangwon biodiversity grade map



■ Gangwon biodiversity Conservation & Restoration map



Gangwon biodiversity conservation and restoration map

③ Strategic Environment Assessment of Current Gangwon Provincial Policies and Plans on Proposed Preliminary Biodiversity Strategy

a. Strategic environment assessment of 7+6 plan

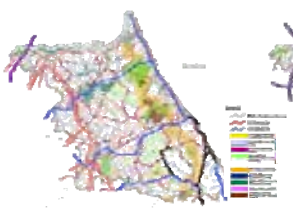
Strategic environment assessment of 7+6 plan superimposed on Gangwon Province Biodiversity state

❖ Being propelled development projects focused on Gangwon Province's 7 growth axes and 6 areas, the 7+6 plan aims at improvement of Gangwon Province's competitiveness, interconnecting regional specialization axis and each living territory.

❖ However, these plans bring about habitat fragmentation over all the territory of Gangwon Province, so that adverse effect from biodiversity basic strategy's ecological corridor aspects and damage of the biodiversity ·otected areas are expected.

b. Strategic environment assessment of the 3rd Gangwon Province General Plan revision plan

❖ When overlapping the road and railroad construction plan of the 3rd Gangwon Province General Plan with the map denoting Gangwon Province biodiversity protected areas, result the following; habitat fragmentation in not only the biodiversity protected areas but ecological corridors appeared due to the construction which cross the Great Baekdu Mountain Range.

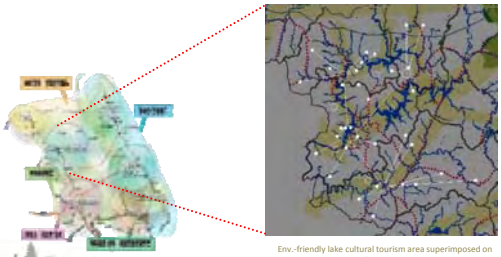


railroad construction plan superimposed on Gangwon Province biodiversity state and

Gangwon Province biodiversity state and road construction plan superimposed on Gangwon Province Biodiversity state

c. Strategic environment assessment of the 4th Gangwon Province Tourism Development Plan

❖ The plan is divided into 7 areas, so that site specific tourism resource can be developed. For environmentally-friendly lake cultural tourism area corresponding to one of the areas overlapping with biodiversity strategic map resulted the following; habitat fragmentation and ecosystem damage are expected.



Env.-friendly lake cultural tourism area superimposed on Gangwon Province Biodiversity state

d. Strategic environment assessment of Gangwon Province region innovation 5 year plan

Strategic environment assessment of Gangwon Province region reform 5 yr plan superimposed on Gangwon Province Biodiversity state

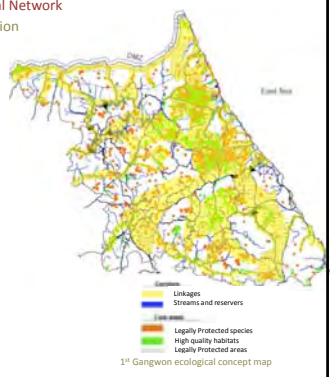
❖ Being development projects to raise overall industries in Gangwon Province thru 5 projects among bio-industry, medical instrument industry, new materials, disaster control industry, tourism & cultural industry and regional industries, the plan is formed of point elements, so that potential habitat fragmentation as well as ecosystem damage is expected.

④ Establishment of Biodiversity Strategy

a. Conception for Gangwon Ecological Network

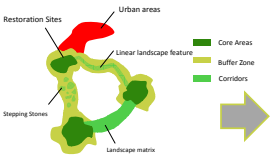
☞ 1st ecological network conception

<application model: The Regional Reserve System>

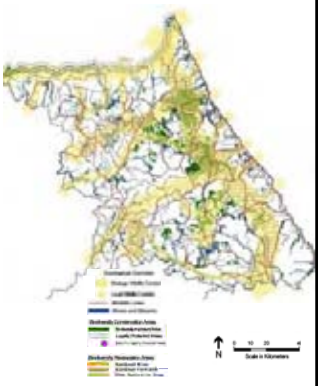


1st Gangwon ecological concept map

☞ 2nd ecological network conception



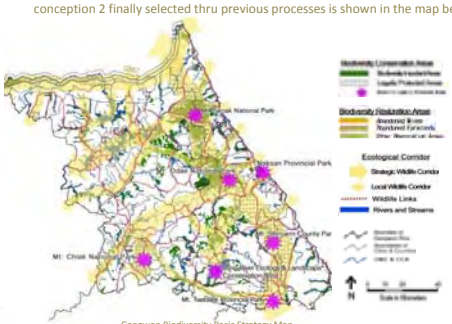
<application model: SNU EEPL Ecological Network Model>



2nd Gangwon ecological concept map

b. Establishment of Final Biodiversity Strategies

❖ Established biodiversity basic strategy map which reflected the ecological network conception 2 finally selected thru previous processes is shown in the map below.



Gangwon Biodiversity Basic Strategy Map

⑤ Preparation of Guidelines on Biodiversity to reduce Impacts from Climate Change

❖ Major purposes of this guideline are to provide instructions based on long term and local biodiversity strategies which will be a framework when establishing city/county long term general plans or city basic plans.

Gangwon Province Level	Gangwon City/County Level
Guidelines on Biodiversity to reduce Impacts from Climate Change	Establishing city/county long term general plans or city basic plans

4. Conclusion

☞ Biodiversity itself is a complex that is not only related to wildlife plants and animals but also to various elements that affect a city in many aspects including ecological, economic and cultural aspects.

☞ As biodiversity has been directly and indirectly affected by climate change, and improvement of biodiversity reduces the impacts from the climate change, biodiversity is a crucial indicator of climate change and its impacts.

☞ In order to maintain and improve competitiveness of a city, well-being of residents as well as wildlife, planning and action for maintenance and improvement of biodiversity should be taken in site level, district level, city level, regional, national level, as well as global level, with due considerations for climate change

Day 2 :Thai Cities responding to Climate Change Impacts by Dr Paul Chamniern, Senior Director, Thai Environment Institute,

Thai Cities Addressing Climate Change Impacts

Carrying Capacity:
An Alarming Issue

สถาบันสิ่งแวดล้อมไทย
Thailand Environment Institute

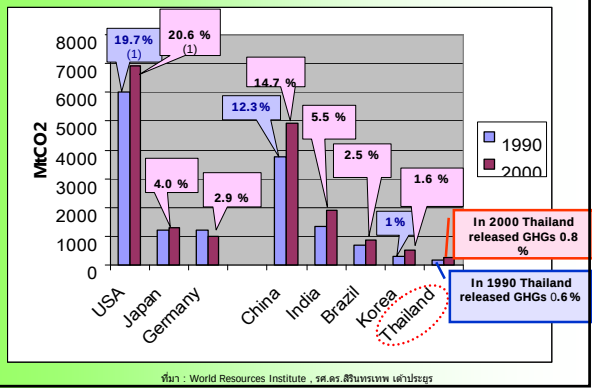
Chamniern Paul Vorraratanachaiphan

Climate Change:
Urban Agenda in
the New Millennium

Quality of Life and Economic Collapse

The Poor, the most Affected

การปล่อยก๊าซเรือนกระจกของประเทศไทย เมื่อเปรียบเทียบกับประเทศอื่น ๆ บางประเทศ



ที่มา : World Resources Institute , รศ.ดร.สิรินทรเทพ เต่าประยูร

National Strategies in Coping with Climate Change (2008-2012)

Stragegy 1: To strengthen adaption measures in coping with and in reducing climate change impacts

Strategy 2: To mitigate green house gases and/or increase GHG absorbi ng capacity

Strategy 3: To support research and development activities in increasing better understanding of climate change and its impacts

Strategy 4: To create awareness and participation of all stakeholders in dealing with climate change issues

Strategy 5: To increase capacity of concerned institutes and personnel

Strategy 6: To develop operational capacity in cooperating with concerned international organizations

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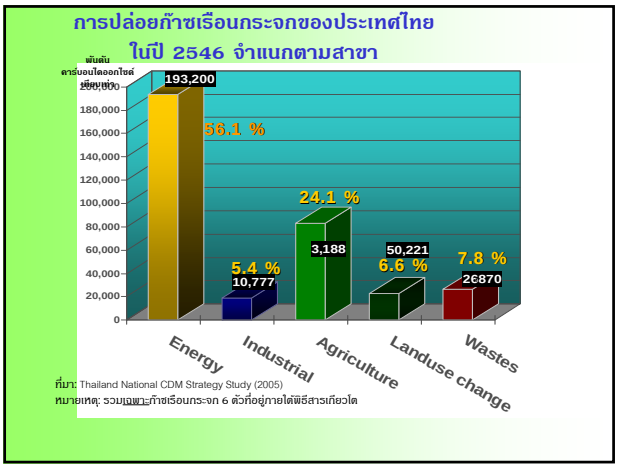


Adaptation Framework to Global Warming

Community ⇔ Technician/Researcher ⇔ Local Government

Adaptation to Climate Change

Local wisdom + Economic and Social Mechanism + Government Policy

Reduce impacts (Prevention) | Reduce damages (Increase Carrying Capacity)

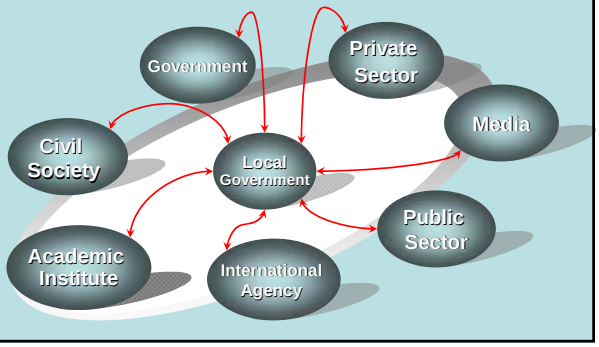
- **Study the risks of communities and other groups**
  (at a level of impact might cause the different damages different communities and groups)
- **Community's Risk Evaluation from the impacts of climate change**
- **Carrying Capacity and Adaptation Evaluation of different groups and community**

สถาบันสิ่งแวดล้อมไทย (สสท.)
Thailand Environment Institute (TEI)

Thailand Environment Institute Initiatives

supporting local governments, communities and schools in coping with climate change

Local Network



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Stop Global Warming

2-Local Initiatives: Local Governments and Schools

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Thailand Environment Institute (TEI)

Project Main Activities

1. Training Workshop of Stop Global Warming Task Force, consisting of municipal staff and school teachers
2. Young Generation Leaders. Youth camp: Climate Change Knowledge, leadership training, Stop Global Warming Commitments and Initiatives, collaborative action plans
3. Launching Stop Global Initiatives in each city and schools, with USD 2,500 support
4. Learning and Sharing: Monitoring, Evaluation, Exhibition, Awards

Exhibition

Stop global warming Year 3

Schools for Better Climate

2- Integrating Climate Change in Teaching Curricula

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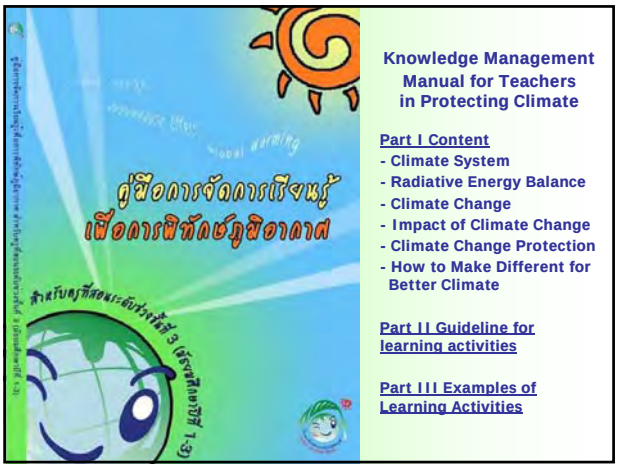

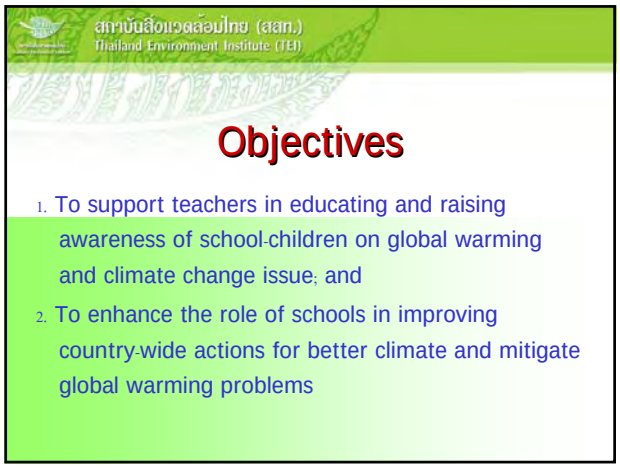

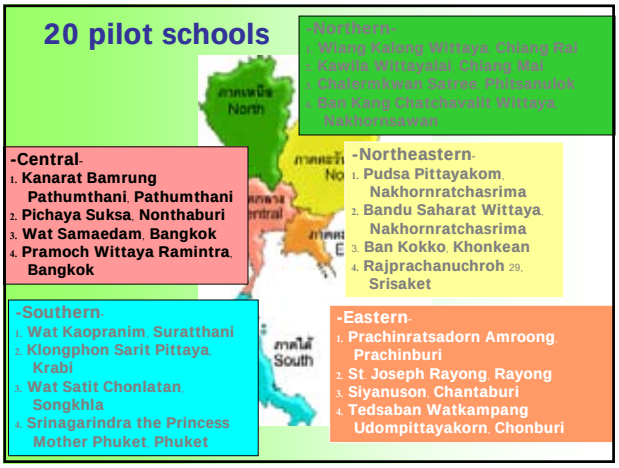

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Training on Climate Change for Municipalities

In 5 Regional Learning Centers of Municipal League of Thailand

Local Governments :

How to Mitigate GHG

Content composed of:

- Statistic and date on temperature increasing
- How the Global temperature increasing?
- Impact of Global Warming to cities
- What we are doing to abate the Global Warming?
- How the LGO participate in Global Warming Abatement?
- Example of LGO's project on Global Warming Abatement

สถาบันสิ่งแวดล้อมไทย (สสท.)
Thailand Environment Institute (TEI)

Objectives

1. To develop operational guidelines on Climate Protection and Global Warming Abatement for Local Government Organization
2. To provide knowledge and understanding on Climate Change and Global Warming for Executives and municipal staff
3. To promote participation of Local Government Organization in climate protection related to current situations and problems

สถาบันสิ่งแวดล้อมไทย (สสท.)
Thailand Environment Institute (TEI)

Project Main Activities

1. Develop curriculum and training material
2. Municipal staff training on global warming and climate change
3. Support the pilot municipals to do projects on Climate Change Protection and Global Warming Abatement
4. Resulting reporting and monitoring and evaluation to the pilot municipals

Output of the project

VCD

- Part 1 – Global Warming
- Part 2 – Example of municipal activities on Global Warming Abatement

Global warming exhibition

Photos from seminars

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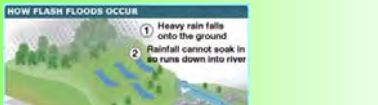
Landuse:A Crucial Adaptation Measure in Coping with Flood Problem, Thungsong Municipality as a case



น้ำท่วมฉับพลัน
(Flash Flood)

น้ำท่วมสร้างความเสียหายทั้งชีวิตและทรัพย์สิน

การใช้ประโยชน์ที่ดินปัจจุบัน เมืองทุ่งสง

คลองตมตั้งแต่ทางรถไฟ มีสภาพเช่นเดียววัน

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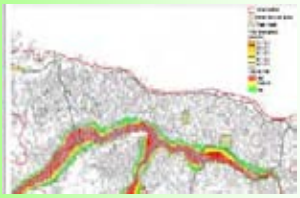
เมืองทุ่งสงตั้งอยู่บนทางน้ำธรรมชาติหลายสาย

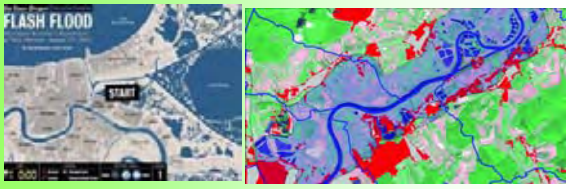
เมืองทุ่งสงมีการขยายตัวรวดเร็ว ชุมชนรุกลำน้ำตามธรรมชาติ

การตัดถนน ทำให้เกิดการกัดเซาะพังทลายหน้าดิน

ข้อเสนอแนะกรณีเมืองทุ่งสง

จัดทำแผนที่เสี่ยงภัยน้ำท่วม (Flood Risk Map)





การสูญเสียสภาพแวดล้อมตามธรรมชาติ

Day 2 :Thai Cities responding to Climate Change Impacts by Dr Paul Chamniern, Senior Director, Thai Environment Institute,

3. เรียนรู้พื้นที่ จัดทำฐานข้อมูล และวิเคราะห์ข้อมูล โดยใช้แผนที่ของเมือง และสัญลักษณ์กรีนแมปเป็นเครื่องมือ

กระบวนการจัดทำกรีนแมปเมืองทุ่งสง

กระบวนการจัดทำกรีนแมปเมืองทุ่งสง

4. ศึกษาสภาพปัญหา และจัดลำดับความสำคัญของปัญหา นำเสนอต่อผู้บริหาร เพื่อ ผลักดันสู่นโยบาย

Sufficiency :

A Road to Reduce Global Warming

An Initiative and Contribution from Private Energy Provider Sector to 5 Regional School Networks

EGCO GROUP

สถาบันสิ่งแวดล้อมไทย (สสท.)
Thailand Environment Institute (TEI)

1. To advocate high potential schools to conduct a curriculum reform under the concept of “Sufficiency: A Road to Reduce Global Warming (S-ReGlow)” in order for these schools to serve as a learning source and model for other schools in the region in the context of energy and environmental conservation, global climate protection, as well as global warming mitigation.
2. To disseminate the guidelines for the curriculum reform in relation to the climate change and global warming mitigation to at least other fourteen schools in every regions.
3. To promote children’s roles in the participation and initiatives of promoting the public awareness in the issues of climate change and global warming.

สถาบันสิ่งแวดล้อมไทย (สสท.)
Thailand Environment Institute (TEI)

Project Main Activities

1. Select high potential schools to serve as the learning centers for each region.
2. Provide the training to ten teachers from each learning center.
3. Establish seven learning centers in every region in the country.
4. Conduct a contest of the learning media.
5. Extend the network to be two schools for each learning centers for the total of 14 schools.
6. Hold a workshop to gather the participants from fourteen schools in the network.
7. Organize the exhibition on “Youths of the next generation care for the global climate”.
8. Produce the media and publication regarding the global warming in order to disseminate to the general public.

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Renewable Energy Responding to Sufficiency Economy in Mae Hong Son

With the Support of UNDP, Thailand
Global Environment Facility

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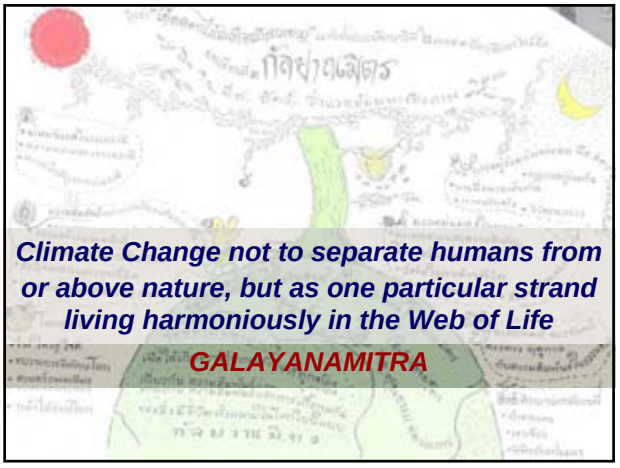
Outcomes

Outcome 1: Provincial institutions have the capacity to plan and implement an integrated renewable energy programme

Outcome 2: Villages have access to sustainable and cost-effective sources of renewable energy

Outcome 3: Village-level institutions have the capacity to manage renewable energy sources

Outcome 4: Social acceptance of decentralized renewable energy sources provides the basis for effective replication and scale-up



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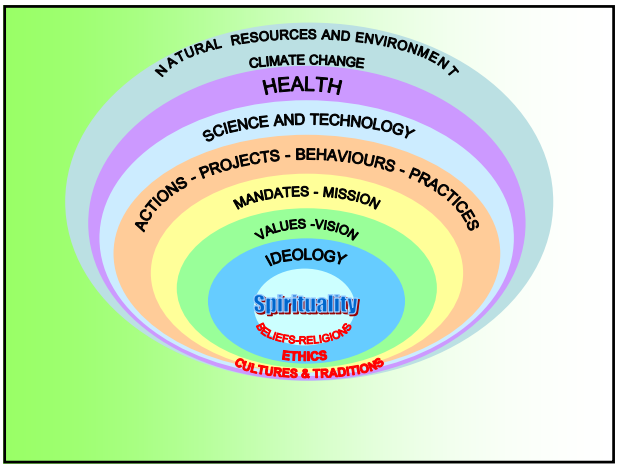
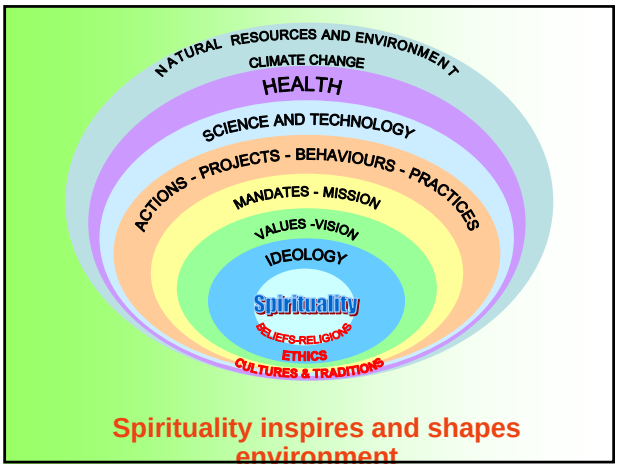
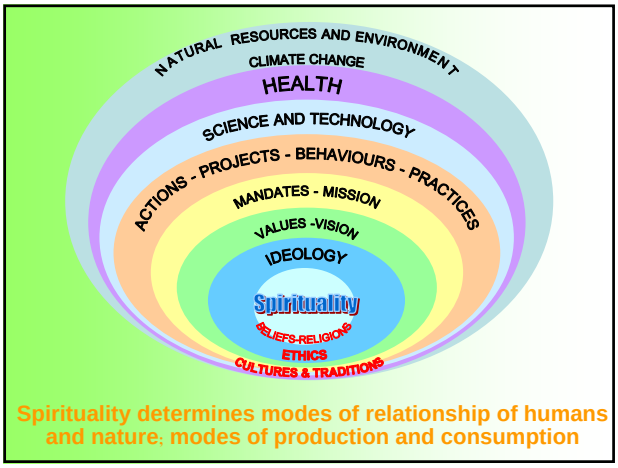




Spirituality inspires and shapes environment



Spirituality determines modes of relationship of humans and nature; modes of production and consumption

3.5 SCP/LA21 to SUD-Net/ CCCI: Launching UN-HABITAT`s Cities and Climate Change Strategy

In order to mainstream sustainable urbanisation principles and practices globally and regionally, and as part of the implementation of the Medium Term Strategic and Institutional Plan (MTSIP), UN-HABITAT is establishing the Global Sustainable Urban Development Network (SUD-Net).

The soft launching of SUD-Net was conducted during the workshop; It was clarified that this initiative aims to re-invent networking by exchanging specific knowledge and best practices among and beyond networks, international and national organizations and institutions, local governments, universities and other research and training institutes, the private sector and the public. SUD-Net is starting with an initiative on “Cities in Climate Change” (CCCI), which will contribute to strengthen the ability of local governments to mitigate and adapt to climate change, which will in turn introduce the urban dimension into the Asian Regional and global discussions on climate change.

3.6 Potential Regional Programme support and opportunities for partnerships

Complementary to the national presentations and to initiate an Asia Knowledge sharing platform, an over view of the current initiatives on Climate Change of international programmes were presented including good practices at the city level. The presenters included Asia’s leading Regional Climate Change Support Programmes such as the Clean Air Initiative – Asia Centre; ADB’s Energy Efficiency Initiative/Carbon Market; UNEP’s Green Buildings Programme; UNESCAPs Clean Development Programme, UCLG-ASPAC and CityNet support to Local Government Associations introduced their initiatives as well.

Practical experiences and good practices from **Klang Municipality**, **Makati City** and **Changwon County** were also presented as exemplar Asian cities addressing Climate Change Impacts.

Day 2:UN-Habitat's Strategy on Cities in Climate Change, SUD-Net and its "Cities in Climate Change Initiative" by Cecilia Njenga, Human Settlements Officer, Urban Environment Section, Urban Development Branch, Global Division, UN-HABITAT,

UN-HABITAT and Climate Change

Challenge: Urbanization

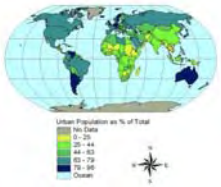
Urban dwellers in developing countries:

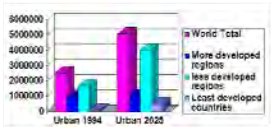
- 1990 1.4 bio.
- 2030 ~ 3.8 bio.
  - = 60 mio./year
  - = doubling 2000-2030
  - = 80% of the global urban population growth

Challenge: Urbanization

Share of urban population

	Global	Africa	Lat.Am.	Asia
2000:	50%	37%	72%	48%
2030:	60%	53%	84%	54%





Challenge: Urbanization

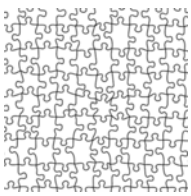
Cities and agglomerations

2004: 19 Mega-Cities (>10 mio. inh.)

2015: 27 Mega-Cities, 23 of them in dev. countries
+ 325 cities > 1 mio.

SUD-Net

Sustainable Urban Development Network



Basic assumptions

- Hypothesis 1
  - Climate change will exacerbate existing environmental problems
- Hypothesis 2
  - Environment and poverty are interlinked

Day 2:UN-Habitat's Strategy on Cities in Climate Change, SUD-Net and its "Cities in Climate Change Initiative" by Cecilia Njenga, Human Settlements Officer, Urban Environment Section, Urban Development Branch, Global Division, UN-HABITAT,

Purpose of SUD-Net

- To contribute as pilot initiative to MTSIP, Focus Area 2
  - "Participatory urban planning, management and governance"
- To respond to MTSIP's call for
  - Normative policy documents (country-specific tools)
  - Global advocacy (Campaign for "planning")
  - Knowledge management / capacity building
  - Network management

  in support of MDG 7, targets 10 (access to drinking water and sanitation) and 11 (improving life of slum dwellers)
- To spearhead the Global Campaign on Sustainable Urban Development

Main objective of SUD-Net

- To contribute to (more) sustainable urbanization
  - Strengthening the performance of national and local governments
  - Decentralization
  - Improving environmental living conditions in cities
- Through
  - Networking (web-based and real)
  - Policy dialogue and participation of civil society
  - Tool development & knowledge management
  - Awareness creation, education, training and capacity building

What is SUD-Net?

- Multidisciplinary and global network of partners
  - Practice (local authorities, NGOs)
  - Research (universities) & training
  - Support (international organizations, networks)
  - Private sector

Partnership platform for the exchange of knowledge and best practices

Components of SUD-Net

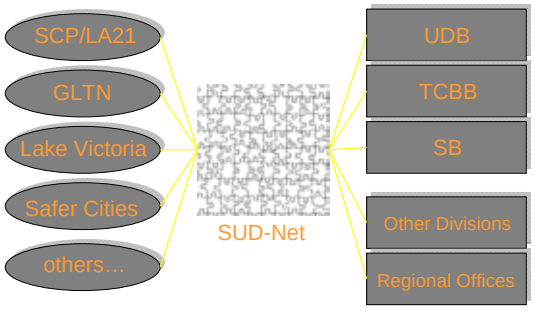
- Urban Governance
- Decentralization and strengthening of local authorities
- Environmental management and planning at the local level
  - Impacts of climate change, mitigation and adaptation at the local level

Starting initiative of SUD-Net

- Cities in Climate Change Initiative (CCCI)
  - Objective:

    "To enhance climate change mitigation and preparedness of cities in developing countries within the framework of SUD-Net."
  - Results:
    - Greater awareness
    - Mainstreamed urban issues at country level
    - Better skills, improved capacities
    - Improved planning (Local climate change action plans)
      - Tools, Guidelines, Best practices, ...
    - Improved cooperation research - practice
    - etc.

SUD-Net: Internal Cooperation



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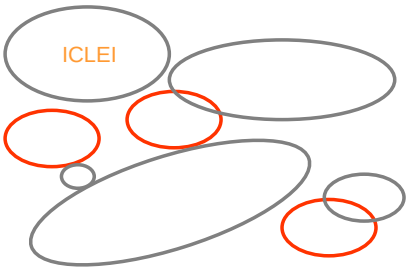
SUD-Net: External Cooperation



SUD-Net: External Cooperation

SUD-Net: External Cooperation

Evolution of SUD-Net

- Seed funding "CCCI" component
- Project document
- Implementing CCCI
- Official launch at WUF IV
- Additional components

Evolution of SUD-Net

- Further sub-components inside "Environment"
  - Local water management
  - Arctic Cities
  - Biodiversity
  - Mobility
  - Energy
  - etc.

Recommendations

Day 2 :Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines.

ADB's Adaptation Program:

Asian Mega Coastal Cities and Adaptation
HCMC Study –Progress Report

Jay Roop, Environment Specialist
Asian Development Bank
August 2008

ADB

Mega Coastal Cities Study

- ADB (Ho Chi Minh City)
- World Bank (Bangkok, Kolkota)
- Japanese Bank for International Cooperation Institute (Manila)
- Each assessment will address three major questions (i) what environmental, social and economic effects are expected due to climate change, and what is the projected magnitude of these impacts; (ii) what adaptation measures could each city employ to address the threats and related impacts; and (iii) what are the key policy priorities for decision-makers to deal with the threats.

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Why HCMC?

1. **ADB's significant investment interests (over $ 2 billion of infrastructure loans planned or ongoing),**
2. **HCMC PC's strong interest in receiving support from ADB and**
3. **HCMC's extreme sensitivity to climate change (**The OECD has concluded that, globally, HCMC is one the ten cities most likely to be severely affected by climate change. Ho Chi Minh City is ranked fifth by population exposed to the effects of climate change by 2070**)**

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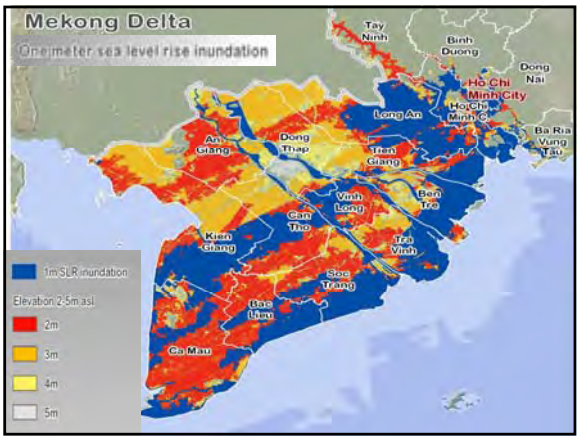
HCMC Rapid Assessment

The initial steps in the rapid assessment consisted of two separate activities:

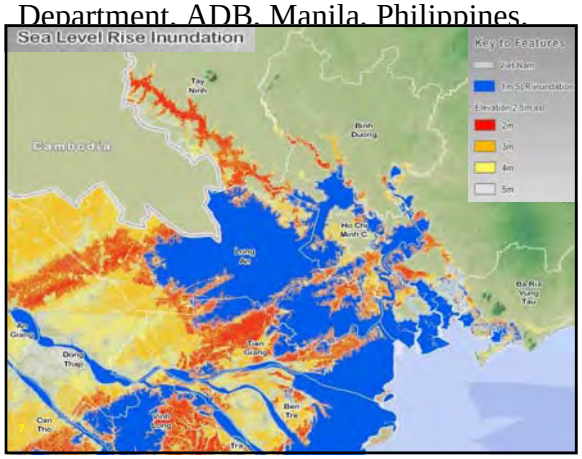
1. the **modelling of sea level rise inundation zones** from digital surface data, and
2. the **socioeconomic and environmental vulnerability analysis** through spatial overlays of the SLR inundation zone (with national GIS layers)

The assessment (i) identified the challenges with climate change/sea level rise estimations and (ii) linked rapid SLR assessment with development planning.

ADB



Day 2 :Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines.



HCMC Rapid Assessment Results

1. Vulnerability to 1m Sea Level Rise

- The fifth most affected province in all of Viet Nam is Ho Chi Minh City, which is also the largest urban area affected with 43% of the province threatened with inundation.
- Of the remaining ten most affected provinces, nine are located in the Mekong Delta, a region with strong economic, social and environmental linkages to HCMC

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HCMC Rapid Assessment Results

2. Impacts on Population

- Ho Chi Minh City contains 7.5% of the national population and would have more than 660,000 people or 12% of the city's population affected by inundation. HCMC's current population growth areas are highly threatened by sea level rise inundation.
- Large poor populations live in HCMC in areas of high predicted SLR inundation.
- Much of the country's urban population growth of one million per annum is in HCMC so the numbers of people potentially exposed would be shown to be much higher were population projections made.

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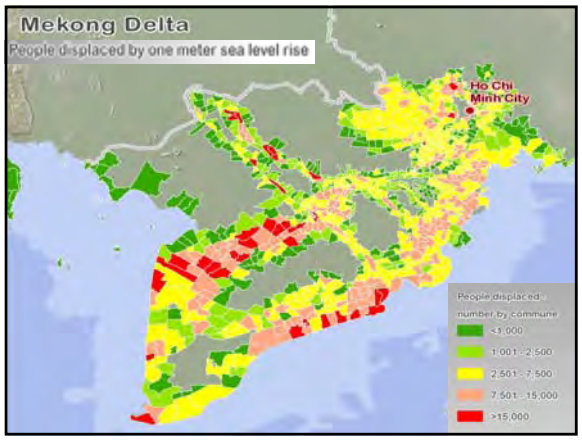
Poor affected by a 1 m SLR in Vietnam's portion of Mekong delta (if no adaptation)

Province	Number of poor	% of total affected poor people nationally
An Giang	50,563	3.1
Bac Lieu	110,818	6.7
Ben Tre	245,310	14.8
Ca Mau	69,614	4.2
Can Tho	118,875	7.2
Dong Thap	71,011	4.3
Kien Giang	101,964	6.2
Long An	198,812	12.0
Soc Trang	133,798	8.1
Tien Giang	121,743	7.3
Tra Vinh	139,597	8.4
Vinh Long	123,595	7.5
Total	1,485,700	89.7
Ho Chi Minh City	48,567	2.9

ADB



HCMC Rapid Assessment Results

3. Impacts on Land Use

- During 2001-2005, more than 366,400 ha of agricultural land in the coastal plains and deltas around HCMC were converted to urban area or industrial parks to accommodate this rapid growth. Those areas of new development are threatened by sea level rise inundation.

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Day 2 :Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines.

HCMC Rapid Assessment Results

4. Impacts on Industry

- Almost 500 medium to large enterprises are affected in HCMC accounting for 9% in the province. HCMC also has some 24,000 small manufacturing enterprises operating in the city located in areas already vulnerable to inundation. Since the area in and around HCMC has 65% of all manufacturing enterprises in Viet Nam, any disruption due to inundation and flooding is likely to have significant socio-economic implications such as unemployment, productivity losses and reduced revenues

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Province	Industrial Estate - Name	Status: operating	Status: under construction	Status: not indicated
Ho Chi Minh City	Binh Chieu	0.1		
	Cat Lai	0.9		
	Cat Lai 4		1.9	
	Hiep Phuoc 1	0.8		
	Hiep Phuoc 2		0.7	
	Le Minh Xuan	0.0		
	Linh Trung 1 Export/Industrial Zone	2.5		
	Linh Trung 2 Export/Industrial Zone		2.7	
	Phong Phu		1.8	
	Tan Binh	4.0		
	Tan Phu Trung		1.7	
	Tan Tao	0.0		
	Tan Thuan Export/Industrial Zone	0.1		
	Tan Toi Hiep	1.6		
	Tay Bac Cu Chi	0.1		
	Vinh Loc	0.8		

ADB

HCMC Rapid Assessment Results

5. Impacts on Transport

- With a sea level rise of one meter, some 4.3% or 9,200 km of existing national and local roads will be permanently under water including 574km of dykes. Almost 90% of affected road infrastructure is in the Mekong Delta region surrounding HCMC
- 16% of HCMC's roads would be inundated

ADB

Phase II – More Detailed Analysis

Downscale IPPCC Scenarios
+
Use 1:5,000-25,000 maps
+
Conduct Socio-economic surveys
+
Overlay socio-economic and land use plans
+
Overlay expected adaptation actions and land use plans
=
practical tool for improving sustainability of HCMC and addressing one of their top priorities: poverty reduction

ADB

Phase II Approach

1. Assess historical knowledge base;
2. Model climate change and its consequences on the hydrology of coastal cities;
3. Impact Assessment,
4. Adaptation options identification; and
5. Strategy Development.

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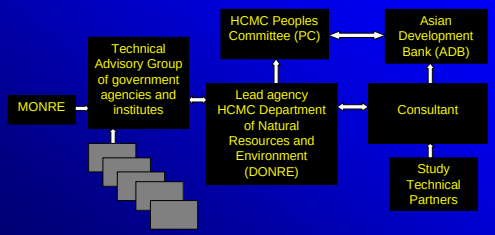
Phase II Organization



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Day 2 :Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines.

Phase II Schedule

Aug-Sept	Task 1: Baseline description: (i) General baseline and trends; (ii) Climatic and natural disasters baseline and trends; (iii) Development sector baseline and trends
30 Sept	Preliminary Findings Report
Aug-Oct	Task 2: Modelling impact on the hydrology of HCMC watershed: (i) Climatic modelling; (ii) Analysis of threats; (iii) Sector overlays
Sept - Oct	Task 3: Impact Assessment (i) Sector impact assessment; (ii) Valuation; (iii) Hotspot analysis
Oct-Nov	Task 4: Identification of Adaptation options
16 Oct	Mid-Term Report
Nov	Task 5: Development of the strategy
Nov	Consultation and discussion: HCMC workshop and stakeholder consultation leading to final adaptation options and priorities.
17 Nov	Draft Final Report detailing results from Tasks 1 through 5 submitted for synthesis with other city studies and comment
30 Jan	Final Report incorporating comments from ADB and Government.

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Project Support to the National Plan

This project helps government address the National Targeted Plan for Climate Change (NTP) priorities and is intended as a pilot approach for potential application in all other economic regions of Vietnam. NTP

Priorities:

- Assessment of climate change impacts on sectors and regions
- Development of actions plans to respond to climate change
- Development and implementation of pilot projects to respond to climate change
- Strengthen capacity in organization, institutions and policies on climate change
- Enhance capacity and effectiveness of science and technology development and application
- Awareness raising, public participation strengthening and human resources development
- Mainstreaming the NTP in strategies, plans, socio-economic development planning and other local/sectoral development plans
- International cooperation

ADB

Day 2: Role of Air Quality Management to Mobilise Local Action on Climate Change by Sophie Punte, Deputy Executive Director, Clean Air Initiative for Asian Cities Centre – CAI-Asia Centre, Manila, Philippines

Clean Air Initiative for Asian Cities Center

The role of Air Quality Management to mobilize local action on Climate Change

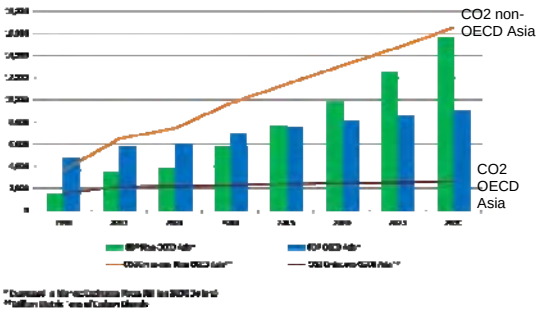
Sophie Punte
Deputy Executive Director
CAI-Asia Center

2008 SCP-Asia Regional Expert Group Meeting
27 August 2008
Manila, Philippines

Outline

- Air quality and climate change linkages
- Clean Air Initiative for Asian Cities (CAI-Asia)'s role

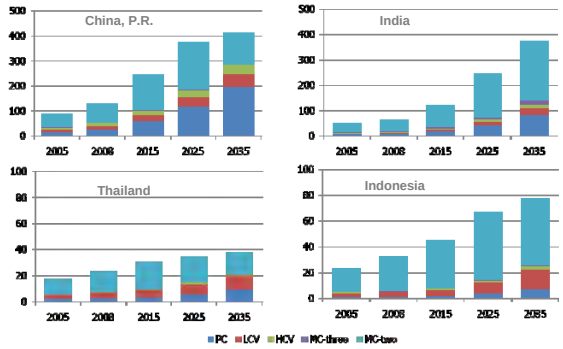
Same causes: Economic and industrial growth



Source: Energy Information Administration. International Energy Outlook 2007

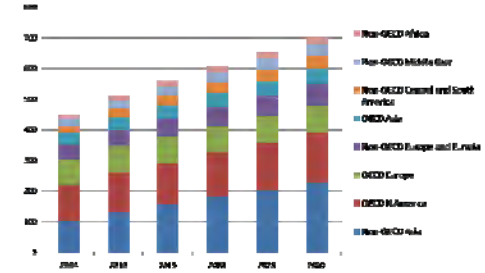
Same causes: Vehicle growth

(in millions of vehicles)



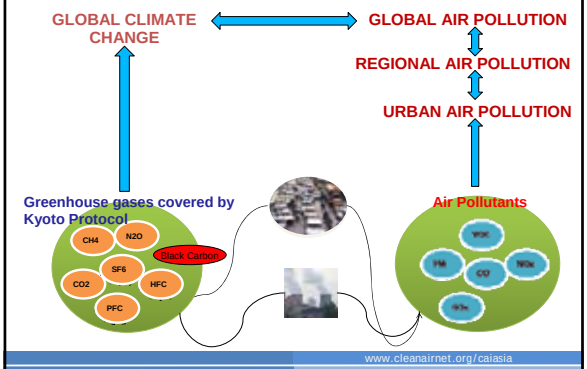
Same causes: Energy consumption

World Marketed Energy Consumption by Country Grouping, 2004-2030(Quadrillion Btu)



Sources: 2004 Energy Information Administration (EIA), International Energy Annual 2004 (May-July 2006), web site www.eia.doe.gov/iea. Projections: EIA, System for the Analysis of Global Energy Markets (2007).

Interacting effects



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Overlapping solutions

Co-benefits: 2 definitions

Co-benefits from the **global climate change perspective:** additional benefits beyond GHG reductions resulting from climate change mitigation measures

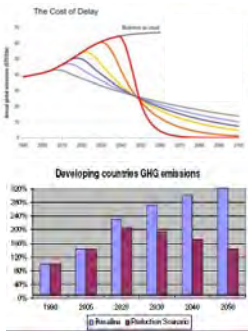
- Reduced air pollution
- Associated health benefits
- Improved energy security through reduced energy costs and dependency on oil imports
- Increased access to energy

Co-benefits from the **Asian regional/local perspective:** additional GHG reductions resulting from measures aimed to address

- Development issues, such as air pollution and associated health
- Problems, lack of energy access and security, and other socio-economic problems

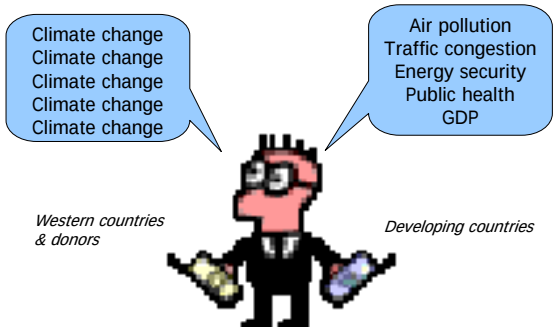
Co-benefits: importance to Asia

- To stay within 2 ºC increase, drastic emission cuts needed from 1990 – 2050:
  - 60-80% developed countries
  - 20% developing countries
- Addressing urban air pollution provides a unique opportunity to mitigate global climate change through local actions RIGHT NOW



Source: Fourth Assessment Report IPCC WG III

Co-benefits: 2 messages

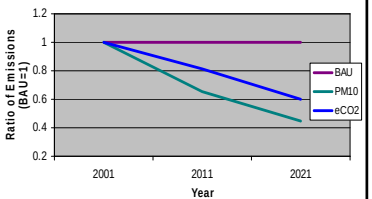


Co-benefits: example Hyderabad

- Transport sector largest source of GHG and air pollutants
- Range of transport measures implemented
- Co-benefits (projected)
  - 40% CO2 reduction
  - 50% PM10 reduction

India Transportation Measures
More effective public transit service (i.e., bus, rail, footpaths)
Traffic management and measures to improve traffic flow
Maintenance and operation training programs for two-stroke vehicles

Impact of More Effective Bus Service Scenario:
Ratio of BAU to More Effective Bus Service Scenario Emissions



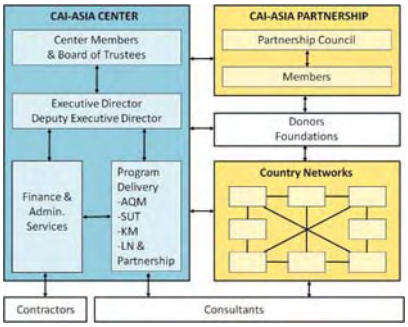
Integrated environmental Strategies
http://www.epa.gov/ies

Clean Air Initiative for Asian Cities (CAI-Asia)

- CAI-Asia began as a multi-stakeholder initiative by ADB, WB and the United States – Asia Environmental Partnership (a project of USAID) in 2001
- The CAI-Asia Center was incorporated in June 20, 2007 as a non-stock, non-profit corporation in the Philippines
- Our mission: to promote and demonstrate innovative ways to improve the air quality of Asian cities through sharing experiences and building partnerships"

Day 2: Role of Air Quality Management to Mobilise Local Action on Climate Change by Sophie Punte, Deputy Executive Director, Clean Air Initiative for Asian Cities Centre – CAI-Asia Centre, Manila, Philippines

Working with Partners and Networks



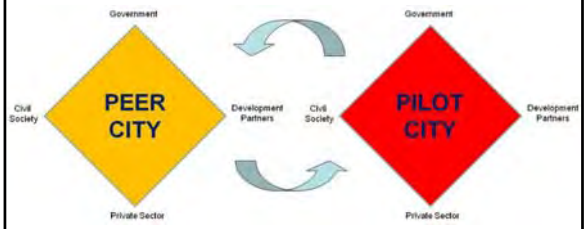
Our activities

- **Two programs**
  - Air Quality Management in Asia (AQMA) program
  - Sustainable Urban Mobility in Asia (SUMA) program
- **Supporting activities**
  - CitiesACT Portal
  - Better Air Quality (BAQ) workshops
  - Governmental Meeting, Regional Dialogue
- **Special projects**
  - GHG accounting in the Philippines
  - CAI-Asia paper on status of co-benefits in Asia- June 2007 (http://www.cleanairnet.org/caiasia/1412/article-71843.html)

Our approaches to cleaner air in Asian cities

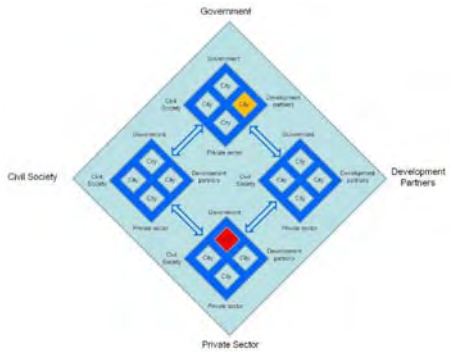
- Co-benefits
- City-to-City Learning
- Partnerships and Networks
- Scaling out and scaling up

City-to-city learning



Country Networks

Regional Network



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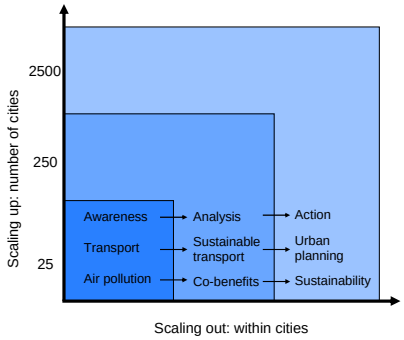
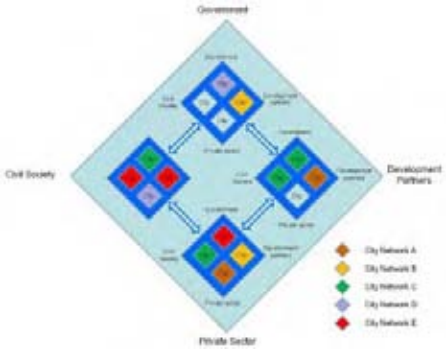
Scaling out and scaling up



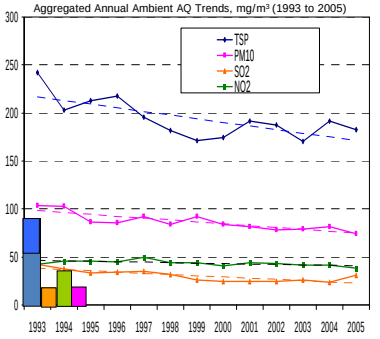
Scaling up through City Networks!



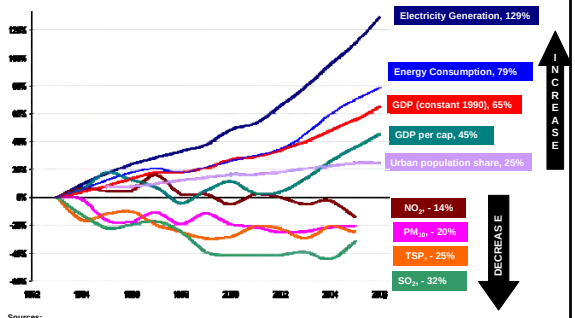
You can beat the trend: Air pollution

- Air quality in Asia is improving but still far above WHO limits
- Energy use & vehicle increase put reduction trends at risk
- PM is main pollutant of concern

WHO (1979) TSP guideline, 60-90µg/m³
WHO (2005) SO_2 24-hour guideline, 20µg/m³
WHO NO_2 guideline, 40µg/m³
WHO (2005) PM10 guideline, 20µg/m³



You can beat the trend: Air pollution



Sources:
BP Statistical Review of World Energy June 2007 - http://www.bp.com/statisticalreview
UN DESA - http://esa.un.org/unpp

For more information

www.baq2008.org

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Day 2: ADB's Energy Efficiency Initiative/Clean Development Mechanism – Reducing Transportation Impacts by Jamie Leather, Senior Transport Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines

Climate Change: A Core Development Challenge

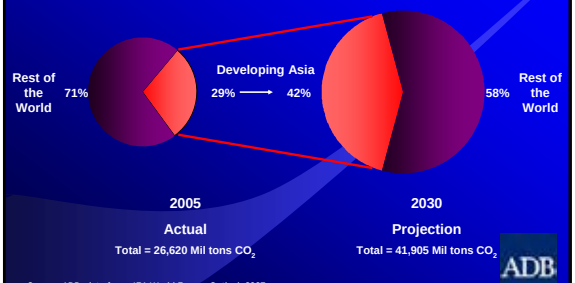
"...the current trajectory of greenhouse gas emissions could have a devastating impact on the people of Asia and around the world. An increase in the frequency and intensity of storms, droughts and heat waves, for example, would adversely affect health and livelihoods, threatening the sustainability of growth and development in the developing nations. Unless actions are taken now, progress achieved in meeting the Millennium Development Goals could be reversed in just the next two generations - during the lives of our children...and their children."

– President Kuroda

High-Level Event of Finance Ministers Meeting on Climate Change
11 Dec 2007, Bali, Indonesia

ADB

Developing Asia's Share in Global CO_2 Emissions from Energy Consumption



Source: ADB, data from IEA World Energy Outlook 2007

ADB

ADB's Climate Change Program

Mitigation	Adaptation
Energy Efficiency Initiative – Increase investments for energy efficiency and clean energy to min $1 billion/yr through loans, guarantees, TAs and grants	**ADB Adaptation Mainstreaming** – "Portfolio at Risk" analysis, integration of adaptation considerations into the CPS process, information dissemination, and staff development
Carbon Market Initiative – Use of carbon market to leverage financing resources to new GHG mitigation investments	**National Adaptation Plans & Actions** – Technical support for climate resilient development, including plans and actions to reduce risks from floods, droughts, storm surge, heat waves, etc.
Sustainable Transport Initiative – Capacity development and support to advance sustainable transport policy, planning, investment and services	**Disaster-Adaptation Integration** – Climate change risks fully integrated with planning and profiling for natural disaster preparedness and response, including associated actions
▪ Energy for All ▪ Knowledge Hubs ▪ Emerging REDD capacity ▪ GHG Inventory (ADB's footprint)	▪ Regional Cooperation/Partnerships ▪ Facilitating Access to Adaptation Funds

ADB

Energy Efficiency Initiative

Initiated: July 2005

Objective: Scale up clean energy investments to $1 billion per year starting in 2008

Status:

- Country-level strategies formulated to identify CE investments in PRC, IND, INO, PAK, PHI, VIE
- ADB's 2008 CE investments crossed $1 billion threshold on 4 June 2008
- Established Clean Energy Financing Partnership Facility (CEFPF) in April 2007, with $83.5 million contributions from Australia, Japan, Norway
- Build up institutional EE capacities in ADB
- Next priority countries: AFG, BAN, CAM, LAO, MON, UZB

ADB

Mainstreaming EE in ADB Operations

Phase I Initiation (Jul 2005 – Jun 2006)	Phase II Formulation (Jun 2005 – Dec 2007)	Phase III Implementation (2007 – 2010)
▪ Establish rationale for expanded ADB action in EE ▪ Provide priorities and framework for next steps	▪ Prepare country-level investment/action plans and project pipeline ▪ Design and establish the Clean Energy Financing Partnership Facility (CEFPF) ▪ Develop institutional capacity to scale up EE investments and perform EE monitoring & evaluation ▪ Pursue immediate EE investment opportunities	▪ Execute investment and action plan ▪ Process projects in pipeline ▪ Commit CEFPF fund

ADB

ADB's Clean Energy Investments (2003-2007)

Year	Total Approved Energy Loans (in $ millions)	Clean Energy Component (in $ millions)
2003	1,263	226
2004	1,431	381
2005	1,685	637
2006	1,812	834
2007	1,801	668
2008[1]	2,076	1,124

[1] Figures up to 4 June 2008 only.

ADB

Day 2: ADB's Energy Efficiency Initiative/Clean Development Mechanism – Reducing Transportation Impacts by Jamie Leather, Senior Transport Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines

Clean Energy Projects
(examples)

- PRC: Energy Efficiency Improvements in the Railway Sector ($800,000)
- Pacific: Promoting Energy Efficiency in the Pacific ($400,000)
- Philippines: Wind Farm Development ($200,000)
- India: Support for Clean Power Technology Transfer Phase 1 ($2,000,000)

ADB

Carbon Market Initiative

Initiated: December 2005

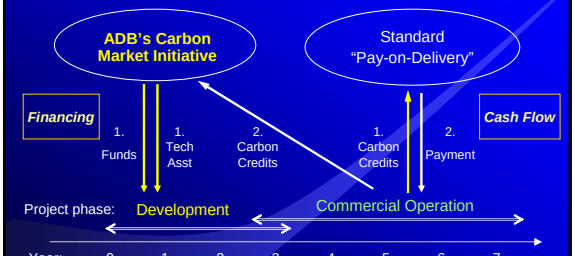
Components:

- **Carbon Financing – provide upfront payment**
  - Asia Pacific Carbon Fund (20 Nov 2006)
    - $151.8 million funding
    - pipeline of 44 projects in various stages of development
    - approx. 14.9 million tons of GHG emission reductions before 21 Dec 2012
  - Future Carbon Fund (4 July 2008)
- **Technical Support Facility – to provide capacity building, due diligence, documentation, implementation support**
  - RETA 6363: Preparing Clean Energy Projects Eligible for CDM approved on 13 December 2006
  - RETA 6438: Implementation of the TSF under the CMI
- **Credit Marketing Facility**

ADB

Carbon Market Initiative
3 Components

Turning Cash Flow into Financing



ADB

CMI Project Examples
(examples)

- PRC: Landfill gas
- Fiji: Agriculture biogas
- India: Windpower
- PRC: Medium scale (run-of-river) hydropower
- Indonesia: Geothermal power
- Pakistan: Small Hydropower
- Kyrgyzstan: Gas transmission rehabilitation
- Bangladesh: Waste composting

ADB

Sustainable Transport Initiative

Initiated: 2006

Objective: Scale up clean transport investments

- Effective and efficient integration of land use and transport planning
- Reduce fuel consumption, improve energy efficiency
  - traffic management
  - mode share
- Vehicle, engine technology and fuel sources

Status:

- Board approval 2008

ADB

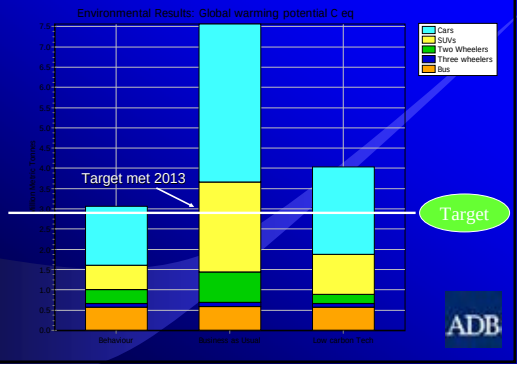
Day 2: ADB's Energy Efficiency Initiative/Clean Development Mechanism – Reducing Transportation Impacts by Jamie Leather, Senior Transport Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines

Sustainable Transport Projects (examples)

- Pakistan: BRT, Traffic management
- Vietnam: Metro rail
- Mongolia: Traffic demand management
- PRC: Energy Efficiency in the rail sector
- Pakistan: Metro rail
- India: transport energy use (Delhi)

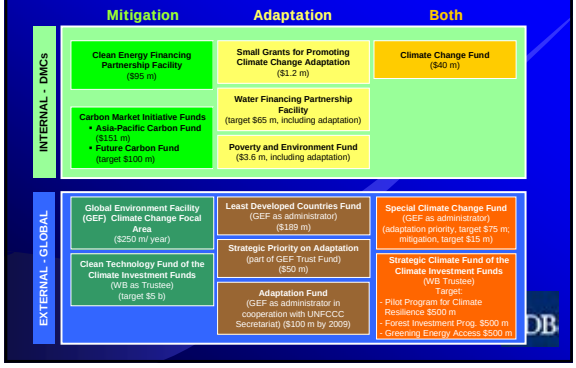
ADB

STI Delhi: Model Results 2030



ADB

Climate Change-Related Funds



Climate Change-Related Funds

ADB

Collaboration with Development Partners

Other MDBs

- Clean Energy Investment Framework (CEIF)
- Climate Investment Funds (CIF)

Bilateral partners, others

- Cities Development Initiative for Asia (GTZ, Sweden)
- Study on Climate Change Impact on Coastal Cities (JBIC, WB)
- Coral Triangle Initiative (Australia, US, GEF, NGOs)

Knowledge Institutions

- The Energy and Resources Institute (TERI), India: on clean energy
- Tsinghua University, PRC: on climate change
- National Hydraulic Research Institute of Malaysia (NARIM): on water and climate change adaptation in SE Asia
- PUB Waterhub, Singapore: on urban water management
- Asian Institute of Technology (AIT), Thailand: on 3Rs

ADB

Day2: Climate Change Mitigation and Adaptation through Decentralised Solid Waste Management in small towns by Adnan Aliani, Human Settlements Officer, Poverty and Development Division, UNESCAP, Bangkok, Thailand

Climate Change Mitigation and Adaptation through Decentralized Solid Waste Management in Small Towns and Secondary Cities

Adnan H. Aliani
Environment and Development Division
United Nations
Economic and Social Commission
for Asia and the Pacific
aliani.unescap@un.org

Addressing organic wastes

- 60% to 80% of municipal solid wastes are organic
- Untreated organic wastes, crude dumpsites and landfills generate an estimated 75 million tons of CO_2 (equivalent) (equal to driving 15 million mid-sized cars for a year)
- By 2020 CO_2 (equivalent) emissions would be 113 million tons

Four ways of reducing methane

- Landfill gas recovery
- Bio-methanization (Bio digestion)
- Incineration
- Composting
- All these approaches have UNFCC approved methodologies

ESCAP's action research in CH_4 reduction

- Landfill gas recovery
  - Guidelines published
- Bio-methanization
  - Documentation underway
- Cement plant MSW incineration
  - Documentation underway
  - Composting (3-10 ton neighbourhood plants)
  - Waste Concern BGD
  - Matale and SEVANATHA, SRL,
  - Quy Nhon and ENDA, VNM
  - Multi-media interactive manual ready

Key lessons

- Landfill gas recovery
  - Advantages: tried and tested, power generation
  - Disadvantages: capital and technology intensive
- Bio-methanization (Bio digestion)
  - Advantages: power generation, particularly good for kitchen/restaurant waste
  - Disadvantages: Sludge is usually pathogenic and needs to be treated and disposed (co-composting)

Four ways of reducing methane…

- Incineration
  - Advantages: power generation
  - Disadvantages: highly capital and technology intensive, poor operations can have catastrophic impacts, ashes often hazardous and need special disposal
- Composting
  - Advantages: tried and tested, contributes to both mitigation and adaptation
  - Disadvantages: must have an established market

Day2: Climate Change Mitigation and Adaptation through Decentralised Solid Waste Management in small towns by Adnan Aliani, Human Settlements Officer, Poverty and Development Division, UNESCAP, Bangkok, Thailand

Composting as an adaptation strategy

- Organic matter depleting due to intensive cultivation
- Less organic matter less water retention in soil
- Increased droughts and flash floods
- 90% of fertilizer is wasted
  - Pollutes water (ocean dead zones)
  - Produces N_20 (300>GHG)

Composting as an adaptation strategy

- Crises in agriculture…
  - Nutritional value of compost is low
  - Hybrid seeds need chemical fertilizer
- Solution: Designer organic fertilizer:
  - Add N,P,K, and other nutrients to compost depending on crop and soil type
  - Possible because of small volumes

Composting as an adaptation strategy

- Increases yields by 30 %
- Increases profits by 15%-25 % (BGD, VNM)
- Increases organic matter in the soil
- Improves water retention
- Reduces N_2O emissions
- Directly contributes to food security

Ongoing work…

- Upscaling to town level using carbon financing (VERs and CERs)
- Develop Integrated Resource Recovery Centres that:
  - Compost organic wastes
  - Process recyclable wastes
  - Bio-digest meat waste and septic tank sludge
  - Convert cooking oil waste into bio-diesel

Mitigation phase I (2008-2010)

- Eco-efficient infrastructure development
  - Carbon footprint measurement methodologies for SWM, Water & Wastewater, Energy use in buildings, Transport
  - Develop co-benefit/ "no-regrets" mitigation strategies
  - Prepare bankable projects for carbon finance VER, CERs
  - Develop guidelines and multi media manuals
  - Combine all methodologies in a comprehensive approach for Asian Games 2010 Village

Using carbon finance to upscale

- CERs are part of the CDM compliance market
- To get CERs three conditions must be met:
  - Reduction in CO_2
  - Additionality: GHG would not have happened
  - Sustainable development
- CDM Board approved methodologies for SWM
  - Landfill gas retrieval
  - Composting
  - Bio-methanization
  - Incineration

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Acquiring CERs

- Expensive
  - Have to hire consultants/experts
  - Independent international validators
- Complicated
  - Project Development Document preparation is difficult
  - Have to go through Designated National Authority and CDM board
- Time consuming
  - Usually takes between 6-12 months

Non CDM Carbon financing

- Voluntary Emission Reductions
  - Individuals and private companies wanting to reduce their carbon footprints

  Examples
  - HSBC, Credit Suisse, UBS want to become 'carbon neutral' operators
  - 2006 Fifa World Cup, 2006 Winter Olympics also voluntarily offset emissions
  - Many European and Asian companies are now buying VERs
  - OTC Exchange in Chicago trading VERs

Acquiring VERs is easier

- Preparation of a project information note
  - Simpler than PDD
  - No proof of additionality
- Validation
  - Submission to an independent auditor
- Implementation and monitoring
- Issuance of VERs
- VERs are not part of compliance market
- One can sell VERs and CERs for the same project

ESCAP Phase I carbon financing strategy

- Sell VERs upfront to get project financing
- Sell CERs once projects fully operational
- Current price of one ton of CO_2 equivalent
  - CER: US$ 30-40
  - VER: US$ 10-15
- CH_4 is 21 times more potent GHG than CO_2
- CER global market worth over US$ 25 billion
- VER market worth around US$ 100 million

Mitigation Phase II (2009-2011)

- Create and strengthen primary and secondary OTCs in VERs in Asia-Pacific
  - Link city level projects with financiers
  - Allow owners of VERs to trade in secondary market
- Create clear methodologies and guidelines
- Establish system of accreditation for certifying organizations at the country levels
- Buyers will be guaranteed that the VERs they buy will reduce GHGs
- All projects will have CVERs Certified Voluntary Emission Reductions

Planned ESCAP Projects for adaptation

- Urban planning for disaster mitigation
  - Mapping of hot-zones in towns
- Housing and settlements
  - Housing for eco-refugees
  - Resettlement of vulnerable slums
- Water conservation & resources management
  - Rainwater harvesting and water reuse
  - Water recharge and flash-flood prevention
- Urban food security
  - Urban agriculture "edible landscapes"

Day 2: UNEP's Sustainable Building and Construction Initiative by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

Sustainable Cities Programme - Asia Regional
Meeting: Cities addressing Climate Change Impacts
Manila, 25-28 August 2008

UNEP's Sustainable Buildings & Construction Initiative (SBCI)

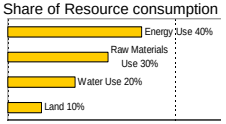
Jacob Kurian, Programme Officer, UNEP RRC.AP, Bangkok
Peter Graham, Coordinator, SBCI, UNEP DTIE, Paris

OUTLINE

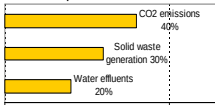
- **Making the case for SBC**
- **UNEP's initiatives**

Impact of The Built Environment in Each Country in Terms of :

Share of Resource consumption



Share of pollution emission



SBCI Information Note, UNEP 2006

Building and Construction sector contributes to:

5-10 % of employment

5-15 % of GDP

Buildings

Highest potential. Till 2030,

30 % GHG reduction potential

for residential and commercial

buildings

Sustainable Buildings

Sustainability of the built environment,

resulting in:

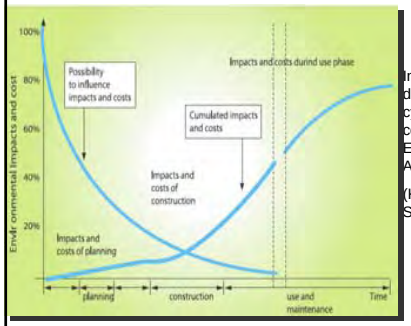
- A comfortable and healthy habitat/community
- Consuming less resources.
- Using environmental friendly materials and products
- Proper waste management systems
- Enabling community feeling and connectivity among residents

Photo credit: Chulalongkorn University

Issue	Sub-issue
Greenhouse gas emissions	**Use of non renewable primary energy - Building**
	Monitoring of energy - Building
	Use of renewable primary energy
Acidification and ozone destruction	Destruction of the stratospheric ozone layer
Mitigate impact on site ecology	Mitigating impact on existing site ecology
Enhance site ecology	Enhance native plant/animal species
Materials consumption	**Depletion and use of renewable and non renewable resources (other than primary energy)**
	Responsible sourcing of major building elements / operational materials
Water consumption	**Use of freshwater resources**
Land consumption	Re-use of previously developed sites
Climatalogical and geological risk	Minimising regional specific climatalogical risk eg flooding
Building user comfort	**Lighting & visual comfort**
	Thermal comfort
	Ventilation conditions
	Acoustic comfort
	Occupant satisfaction
Health & Safety	Indoor air quality
Sensitivity to the local community	External 'neighbourhood' impacts

Day 2: UNEP's Sustainable Building and Construction Initiative by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

Life Cycle Thinking

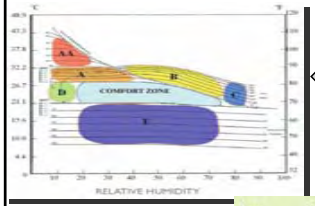


Influence of design decisions on life-cycle impacts and costs of an average European and North American building

(Kohler,N. & Moffatt, S., 2003, p.14).

Consider All Stages, Act Early, Cumulative Impacts Highest During Use

Bio-Climatic Design: Designing for Comfort Conditions Based on Bio-Climatic Features



Climate and the comfort zone
(Boonyatikarn, S. & Buranakarn, V., 2006)

Bio-climatic design options
(Boonyatikarn, S. & Buranakarn, V., 2006)

Zone	Type	Solution
AA	Very hot	Evaporative cooling
A	Hot	Evaporative cooling & wind velocity
B	Hot and humid	Wind velocity
C	High humidity	Dehumidifying
D	Very dry	Humidifying
E	Very cold	Solar radiation

Barriers to Promoting Sustainable Buildings

Economic: High 1st cost, budget constraints

Market failures: Misplaced incentives, energy subsidies

Hidden costs & benefits: Transaction costs high, Health benefits not quantified

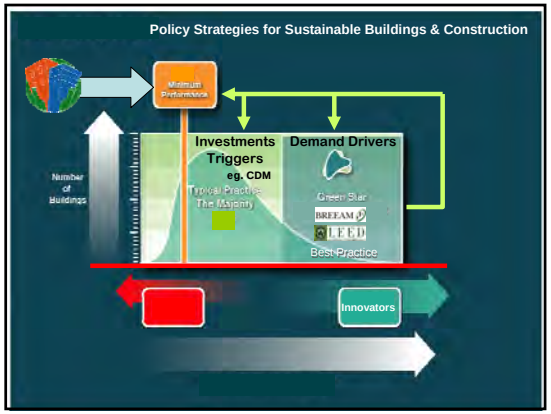
Behavioral constraints: simple opportunities neglected, low share of energy cost in disposable income

Political and Structural :

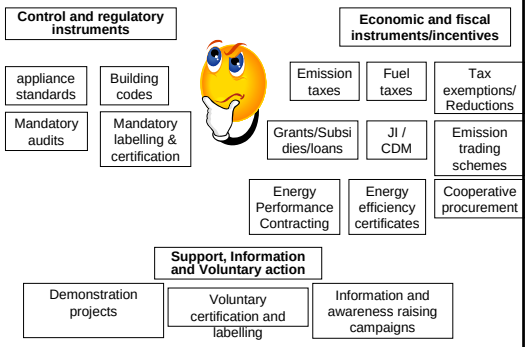
lack of government interest; lack of capacity to enforce; lack of qualified personnel; corruption

Information:

lack of information of cost benefits, Lack of education



Examples of Policy Options



Making Policy Work for SBC

- Regulatory tools are often both more effective and more cost efficient than economic tools. This is due to the fact that the building market is very fragmented.
- Best results are achieved if several tools are applied in combination with each other (sticks, carrots and tambourines)
- The public sector has a strong potential to show leadership by applying sustainable building guidelines to own buildings.

Day 2: UNEP's Sustainable Building and Construction Initiative by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

Market Transformation

Market introduction

Commercialization

Market expansion

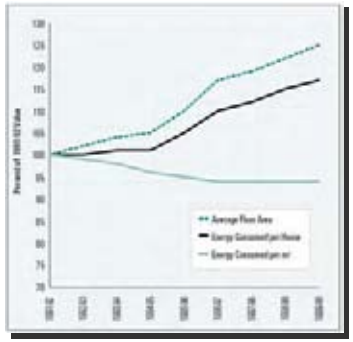
Policy measures

Table 4 Average *FirstRate* Thermal Efficiency Levels – All Class 1 Building Activities

Housing Type	1989-90 Pre-regulation	1991-1992 Immediately Post Regulation	1998-99 End of Study Period
Detached Dwellings	647 MJ/m²	414 MJ/m²	395 MJ/m²
Attached Dwellings	538 MJ/m²	353 MJ/m²	315 MJ/m²
All Dwellings	642 MJ/m²	411 MJ/m²	388 MJ/m²

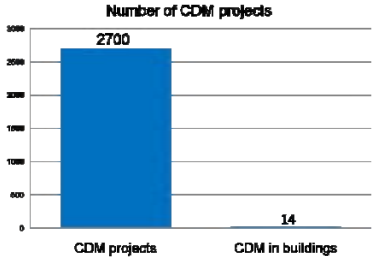
1990 — 40% less energy/m² — 1999

AGO, 1999



AGO

The Impact of CDM is Low ...



Number of Building Sector CDM projects in the pipeline Nov 2007...

Building Codes Implemented in 2005 (Deringer, 2005)

Keep in Mind

1. Sustainable Buildings are a mainstream ideology – but not yet mainstream practice.
2. The building sector/market is not able to shift towards sustainable buildings on its own. Governments must support this shift!
3. Governments can act as policy makers, as project owners, and as market players.

Day 2: UNEP's Sustainable Building and Construction Initiative by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

UNEP SBCI
Sustainable Buildings & Construction Initiative

Partnership between the Building Sector and UNEP.

Seeks to address common global challenges to sustainability in the B&C sector.

Current main thrust of SBCI

- Global policy making – Kyoto & global benchmarking
- Instruments for property investors & procurers - LCA
- Supporting developing countries to adopt SBC approaches
- Global mapping of SBC

SBCI objectives

The Global Vision for Sustainable Building &Construction

SBCI process to achieve adaptation of sustainable building and construction practices

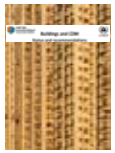
1/A common platform	2/Establish baseline	3/Tools& strategies	4/Implementation
Provide a common platform to all building & construction stakeholders for addressing sustainability issues of global significance.	Establish globally acknowledged baselines for sustainable building and construction practices based on the life cycle approach.	Develop tool and strategies for addressing a wide acceptance and adaptation of sustainable building practices throughout the world .	Promote, to key stakeholders adaptation of the above tools and strategies evaluated through pilot project.

SBCI objectives

Focus Area 1: **Benchmarking (Think Tank)**	Focus Area 2: **Climate Change (Think Tank)**	Focus Area 3: **Policy & Procurement**
Building Consensus on: - Definitions - Issues - Targets - Indicators - Methodology - Performance Case Studies Outputs: - Sustainable Buildings Report - Global Benchmarking Paper	Reporting on: - Buildings & CDM - Regional Emissions from the Sector; - Distance to Targets; - Sector innovation (GRI) Outputs: - CDM Report - 2nd Ed. Buildings & Climate Change - Regional Reports	Working to: - Encourage policy & procurement for SBC market transformation; Outputs: • Policy 'quick-scan' tool; - Carbon costs of non-compliance report - Education for SBC Guideline; - Procurement Field Guide - Tall Building S-Design Guide - LCA Brochure

Knowledge Base

- "Buildings and Climate Change: Status, Challenges and Opportunities"
- "Assessment of Policy Instruments for reducing GHG emissions from Buildings"
- "Buildings and CDM"



Available @ www.unepsbci.org

Capacity Building

Training

- 3 one week training programmes on green buildings for professionals from 6 countries
- National level training on green buildings done in Bhutan

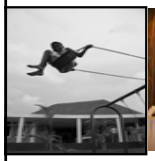
Guidelines

- "After the Tsunami: Sustainable building guidelines for South East Asia"
- "Eco-housing guidelines for tropical regions"*
- "Manual for eco-friendly community development" in Indonesia*

** Draft reports*

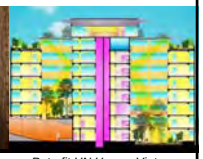
Day 2: UNEP's Sustainable Building and Construction Initiative by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand

Demonstrations in Asia



Eco-village, Sri Lanka

Green buildings project, Bangkok



Retrofit UN House, Vietnam

New UN House ,Bhutan

Retrofit UNEP RRC.AP, Bangkok

OTHERS

UN ESCAP , Bangkok

UN House, Cambodia

MoNRE, Vietnam

THANK YOU

For more information and access to reports, please refer to:

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jacob@rrcap.unep.org

Day 2 : Climate Change Initiatives in AIT and some research findings regarding adaptation in cities, by Edsel E. Sajor

On Climate Change Initiatives in AIT and Some Research Findings Related to Adaptation in Cities

Edsel E. Sajor
School of Environment, Resources and Development
Asian Institute of Technology

1

Scope of AIT Research in Climate Change

- Energy and climate change
  - Greenhouse gas mitigation option
  - Climate change policy modeling
  - Clean development mechanism (CDM)
- Water and climate change
  - quantitative projections of changes in precipitation, river flows, and water levels at the river-basin scale that update assessment and interpretation techniques
- Water pollution and climate change
  - Effective technologies through which greenhouse gases from industrial waste water such as CH_4, CO_2, and N_2O are effectively trapped without escaping into the atmosphere.
- Land use change impact on climate change
- Air pollution and climate
  - Characterization of emission of black carbon particles and other air pollutants from major emission sources in South East Asia (six cities)

2

Climate-change Sponsored Research Projects at AIT (1)

- **Asian Regional Research Programme in Energy, Environment and Climate** (Sida, Sweden)
- **Capacity Development for Clean Development Mechanism** (URC, Denmark)
- **Targeted Capacity Development for Clean Development Mechanism** (URC, Denmark)
- **Integrated Assessment Modeling for Developing Countries** (APN, Japan)
- **Baseline Methodologies for Clean Development Mechanism Projects: A Guidebook** (URC, Denmark)
- **Implications of Carbon Emission Reduction Targets** (MHIR, Japan)
- **Strategies for low carbon society in Thailand** (MHIR, Japan, ongoing)
- **Promotion of Biofuels for Sustainable Development in Thailand** (Winrock International).
- **Technology transfer for the development of wind power in Thailand** (EU)
- **Transfer of efficient technology for sugar industries in Thailand** (EU)

3 3

Climate-change Sponsored Research Projects at AIT (2)

- **Renewable Energy Technology and CDM** (Tokyo-Mitsubishi Securities)
- **SF6 and PFC Study for Thailand and Singapore: Identification of CDM Potential Project**, (Mitsubishi Securities)
- **The Potentials of Transferring and Implementing Sustainable Energy Technologies through the CDM of the Kyoto Protocol**, (EU)
- **Removal of Barriers Related to CDM in Thailand**, (Electric Power Co., Japan)
- **Ratchatewa Waste-to-energy project Feasibility Study: Feasibility Study as a requirement for the preparation of PDD**, (Mitsubishi Securities)
- **Renewable Energy Technologies in Asia: A Regional Research and Dissemination Programme**, (Sida, Sweden)

4 4

Selected Courses Addressing Climate Change Issues

- Energy, Environment and Climate Change: Issues and Strategies
- Energy Resources and Technologies
- Environmental Economics
- Energy-Economic Modeling and Policy analysis
- Development and Evaluation of Energy Projects
- Environmental Policy and Management of Energy Systems
- Land Evaluation and Resource Management
- Integrated Water Resources Management
- Climate Change and Water (planned)
- Bio-fuels for Transport System: Resources, Technologies and Environmental Issues
- Principles of Cleaner Production
- Clean Coal and Waste to Energy Technologies

5 5

A New Research Program on Climate Change

- Energy for Sustainable Development and Climate Change – A Regional Research Program (Recently approved by Sida)
- Urban Research – A planning grant from Sida
- **Climate Change Adaptation – SEA – scoping research of ISET (IDRC/DFID-supported)**

Related Programs

- **SEA-UEMA – sponsored by CIDA**
- **ARRPET – sponsored by Sida**
- **3rkh – sponsored by ADB (AIT-UNEP-ESCAP)**

6 6

Day 2 : Climate Change Initiatives in AIT and some research findings regarding adaptation in cities, by Edsel E. Sajor

Areas of Comparative Advantage for AIT

- Interdisciplinary focus of academic programs and research (technology, management, development, planning and policies)
- A neutral regional institution with a strong network in almost all countries (ministries, municipalities, NGOs, universities, private sector, etc)
- Experience in coordinating several regional research programs with more than 15 fulltime faculty members involved in ongoing CC research
- Existence of key disciplines related to Climate Change Research at AIT (e.g., Energy, Water Resources, Agriculture, Environment Engineering, Transportation Planning, Urban Environmental Management, Natural Resource Management, Regional and Rural Development Planning, Gender and Development Studies)
- Climate change has recently been officially designated as single primary thematic focus of AIT in the coming years.

7 7

CLIMATE CHANGE ADAPTATION: Selected Research Findings Related to SEA Cities (ISET-AIT Report)

Southeast Asia

8

Climate change in Southeast Asia: General characteristics

- Fairly moderate temperature increase
- Increasing variability/extremes in rainfall patterns
- Sea level rise
- More intense tropical cyclonic systems
- Increased flooding, salt water intrusion especially in Vietnam
- Drought or near-drought conditions (Indonesia during ENSO; Laos, Cambodia, Philippines, Vietnam after ENSO)
- Lao PDR, Thailand & Cambodia: long dry spells (drought) and increased flooding
- Philippines, Indonesia & Vietnam: heavier rainfall, storm surges and stronger cyclones, long dry spells, increased flooding, atmospheric haze due to increased forest fires in Indonesia during droughts

9

Vulnerable people in vulnerable places

1. **Mekong Basin: Floodplains, delta and basins**
   - 55 million people rely on the Mekong River for livelihoods and food; low social equity
   - Hydropower: alters hydrology, flow of the river; disturbs fisheries, agricultural cultivation and flood-pulse systems; highly political and interest-laden; power trade among countries
     - Flow: downstream-upstream issues due to diversion (competition between Thailand NE and VN Mekong Delta) - long droughts may intensify this
   - Floods: both positive (nourish wetlands [10% of basin], fisheries, biodiversity) and negative: flood management critical for VN & Cambodia during wet season and more cyclones can worsen flooding beyond adequate control

CC changes can potentially exacerbate existing social, political, economic, food security and ecological conditions

10

2. **Coastal, deltaic low lying areas**
   - 42 million people in Indonesia live less than 10 meters above the average sea level - located in many low lying urban areas vulnerable to flooding and storm surges (other examples: Jakarta; Semarang; Cavite, Philippines)
   - Huge migrant populations in fragile coastal areas; concentrations of informal slum settlements
   - Flood-prone deltaic areas used for multiple livelihoods and multiple water uses that lead to increasingly saline environments

11

3. **Coastal and upland areas of eastern Philippines and Vietnam**
   - In rural low lying volcanic areas such as in Albay, Philippines - cyclones and flooding inundate villages and people
   - Home to ethnic minorities
   - ENSO-related dry spells: disrupts agricultural practices on fragile lands (e.g. terraces and paddy embankments) and rainfed farmlands
   - Frequent and most ferocious cyclones: lead to severe landslides in deforested areas, flooding thus disrupting livelihoods and people's mobility and trade

12

Day 2 : Climate Change Initiatives in AIT and some research findings regarding adaptation in cities, by Edsel E. Sajor

SEA Urbanization and Climate Change Adaptation

- SEA is fast urbanizing: five countries (Malaysia, Thailand, Philippines, Indonesia and Vietnam) have an average of 43.0% urban population (205.3 M) [2006].
- Demographic and development shift to urbanization and peri-urbanization defines and characterizes:
  - particular sites and forms of eco-zone vulnerability
  - non-rural forms of social vulnerabilities
  - spatial radius of people's adaptation to cc in particular and to other non-climatic stressors in general

13

Adaptation in SEA

- Strategies
  - Planned local and autonomous
  - Constraints and enabling factors

14

Planned local adaptation: Some characteristics

- Two types of driver-actors:
  - Local government-driven
  - NGO-driven
- Characteristics of locally planned adaptation
  - Level of knowledge, awareness, and initiative on CC impact, mitigation and adaptation among local officials are generally low; no action agenda yet.
  - Most concerns and initiatives of local governments fall under conventional mandate of disaster preparedness, relief and rehabilitation.
  - Propensity of local government officials – with support from national governments – to emphasize purely technical or infrastructural fix
  - Some local governments also employ 'soft technologies' in handling disaster preparedness (e.g. community-based programs)
  - International and domestic NGOs, in partnerships with local people or governments, have been drivers of planned adaptation programs focused on vulnerability reduction and strengthening adaptive capacities of households and village communities – but still few

15

Constraining and enabling factors (1)

a. Global climate change issues spark **inter-ministry competition** and **turf wars** posing unnecessary delays and obstacles.
b. Traditional **bureaucratic rigidities** and **administrative separatism** tend to stymie the needed flexible and integrated approach to framing, planning, and implementing, and problem solving in adaptation
c. Dominant **style of governance** in SEA tends to militate against developing quality partnerships and synergies between state and societal actors made more compelling by climate change adaptation tasks

16

Constraining and enabling factors (2)

d. **Disjuncture** between broad-scale national level discussions, and local level realities in adaptation, and the need to **bridge macro-scale** analyses of climate change impact to **local** and **'more practical'** scales
e. The lack of a holistic **trans-boundary water governance** in five SEA countries along the Mekong River, particularly for managing the use and conservation of the river and its resources and resolving conflicts between inter-country parties.

17

Constraining and enabling factors (3)

f. Climate change adaptation is de-linked from local level disaster risk management systems that may be in place
g. Adaptation is understood primarily as a technical means with which to reduce/minimize CC impacts rather than a complex set of responses to factors that contribute to people's vulnerability
  - 'silo' approach:
    - identify impact → identify vulnerability → plan adaptation
    - Sector-driven and sector-focused; national ministry mandate-driven (e.g., Ministry of Agriculture → develop crop-resilient varieties or improve irrigation facilities)
  - Counterpoint: people and their climate and non-climate related vulnerabilities should be at the center of analysis; there is also need to detect unevenness in people's adaptive capacities

18

Day 2 : Climate Change Initiatives in AIT and some research findings regarding adaptation in cities, by Edsel E. Sajor

Major knowledge gaps in research and policy

- Autonomous adaptive strategies, particularly multi-local strategies that go beyond sedentary or 'in-place' strategies or productive activities
- Social networks and informal institutions that enable people's adaptive strategies and strengthen their resilience
- Social and gender equity in the adaptation context: winners and losers; differentiated strategies and benefits; issues of power and empowerment
- Climate change knowledge and planning does not connect between scales and between sectors

19

1: Mobility and credit as autonomous adaptation strategies and the systems that support them

- Diversifying livelihoods through short and long term migration where women increasingly are on the move
  - How climatic impacts amplify and affect migration
  - Systems and institutions that support mobility: transport, conduits for remittances (e.g., banks), informal trans-local and trans-national social networks, differentiated access to assets such as skills and capital
- Credit: a critical strategy for strengthening resilience
  - Informal and formal credit institutions
  - Insurance and micro finance program for savings, the formation of savings and finance cooperatives and their differentiated outcomes

20

2: Resilience to health-related impacts

- Work so far: measures for water & sanitation in climate-induced disaster situations
- Health systems to anticipate and address changing disease vectors such as active surveillance of breeding areas
- Development of gender-responsive and accessible health systems that reach the poorest populations
- Planning of water and sanitation systems and urban drainage to strengthen resilience to urban flooding and resulting health problems

21

3: Governance of adaptation across scales

- Disjunctures between sectors (environment, social development, economic) and between national and local scales that impede holistic planning and remain uninformed by autonomous adaptive strategies
- Lack of effective intermediate level of governance where possible area-based integrative management of resources, systems and services have optimal extra-local impacts on strengthening resilience and adaptive capacity
- Trans-boundary governance of resources (e.g., water resources): constraints and enabling factors for developing equitable water allocation during drought and flooding periods
- Serious capacity deficits at various levels of governance

22

Thank you.

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United Cities and local Government's Perception and Action on Climate Change

Emeritus Mayor Peter Woods OAM
Secretary General, UCLG ASPAC

It was a pleasure to see the launch of the World Bank and the UN International Strategy for Disaster Reduction's Primer, "climate Resilient Cities" at the Green Cities Workshop held in association with the UCLG-ASPAC Congress in Pattaya, Thailand only last month.

The purpose of the workshop was to create awareness and interest in climate change mitigation and adaptation strategies and investments and to gauge the thematic areas where the cities interest is strongest to ensure that the efforts are demand driven.

Case studies were presented indicating some very effective actions that have been initiated in parts of Asia and pother parts of the world.

The salient issue is that many forward-thinking Local Governments have been implementing environmentally sustainable policies for many years and certainly well before global warming became the sexy buzz word. Indeed it could be said that actions by Local governments well preceded many Central Governments in their recognition that practices that were not sustainable had to go. I well remember as a councilor and Mayor back in the 1980's and 1990's implementing actions to protect the environment, including leading many hundreds of citizens in protest to bring down central government's outrageous abuse of the environment in league with their developer friends.

These protests and direct action were successful because they were driven from the people. There is no doubt that many good initiatives happened because ordinary citizens and their local representatives were more aware than the political leadership and their bureaucracies (and their commercial collaborators) at the centre.

In commending the calling together of this regional meeting of the Sustainable Cities Programme by UN Habitat I don't want to dwell on the detail of climate change action. There are plenty here doing that. I want to put this issue in its broader political context.

All the very worthwhile interventions taken by individual Local Governments will have little impact unless put in a strategic regional, national and international context.

It is the cumulative effect of changed behaviour that will have real and lasting consequences.

Central Governments can not, having at last awoken from their environmental slumber, pass the responsibility back to Local Government to resolve.

All government, Central, Regional and Local must work collaboratively and strategically together – not on the basis of who is seen to be more important, but rather which areas of intervention. Who can do what best and most cost effectively. Sometimes this will be Central, sometimes Regional and sometimes Local.

Partnership must be a genuine engagement and not a glib, meaningless excuse to do nothing. There can be no place for the "blame game".

Local Governments must have legislative and financial empowerment to add to their existing actions, often taken at their own volition.

It is not surprising that at the Bali conference Local Government leaders and representatives constituted the second largest of all delegations.

In Bali Local Government, in association with ICLEI (which grew out of the International Union of Local Authorities, IULA), launched the Climate Protection Agreement. This agreement makes the following commitments:

1. REDUCE greenhouse gas emissions immediately and significantly. Measure and report on annual reductions of greenhouse gas emissions and constantly work to reduce reductions such that by 2050 greenhouse gas emissions will be reduced world-wide by 60% from 1990 levels and by 80% from 1990 levels in industrialized countries.

2. IMPLEMENT sub-national, national and international frameworks that are complementary and enable Local Governments by providing resources, authority and sufficient mandate to carry forward these roles and responsibilities.

3. BUILD a sustainable energy economy through energy savings and the application of new and existing renewable and high efficiency technologies, to reduce dependence on fossil and nuclear and aim for lowest – carbon options.

4. EXECUTE climate change adaptation and preparedness measures through Local Government planning, development and operational mechanisms, prioritizing the most vulnerable cities.

5. ADVOCATE that every national delegation participating in the UN Framework Convention for Climate Change negotiations include Local Government designated representation to ensure that local climate priorities and actions are included in future generations.

6. PERSISTENTLY CALL for national governments to join the international community to undertake binding carbon limits to rapidly and significantly reduce greenhouse gas emissions in the short-term and by at least 60% worldwide below 1990 levels by 2050.

It is vital that while the commendable local work continues, the advocacy role of the World voice of Local Government, United Cities and Local Governments, continues to advocate on the need for Local Government resourcing, serious involvement in the participating in National strategies and a seat at the table at UNFCCC meetings. Attaining these reasonable objectives will ensure that local actions can be more effective and the concept of shared responsibilities can be properly reinforced in a collaborative environment. Teamwork must be consolidated and all members of the team must be empowered to act.

An hierarchical approach to governance on an issue as important as this out-dated. Local Government should accept nothing less than true partnership with the other spheres of government if we can ever hope to meet our expectations.

Day 2 : CITYNET in Action on Climate Change by Ms. Vissia Aldon, City Human Resource Officer and Pasig River Rehabilitation Project Manager, Makati City, Philippines

CITYNET
in Action on
Climate Change

Prepared by:

CITYNET Secretariat
Yokohama, Japan

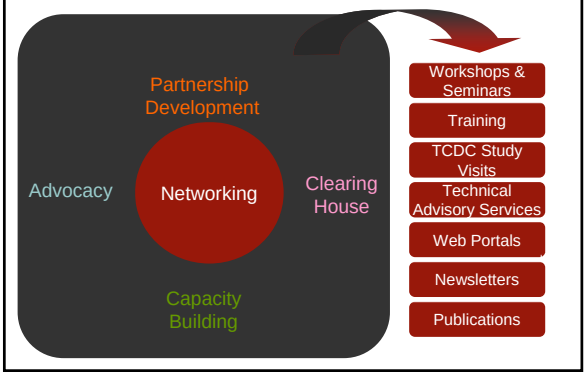
Presented by:

Vissia Marie P. Aldon
City Personnel Officer
Makati City Government
Makati, Philippines

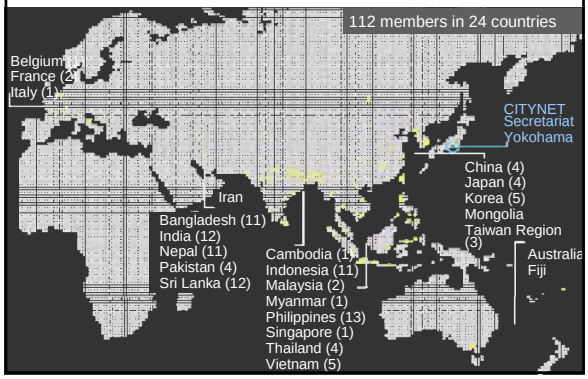
Brief on CITYNET

- Established in 1987 with the support of UNESCAP, UNDP and UN-HABITAT
- 112 members are mainly from the Asia-Pacific region (24 countries)（Only 24 members in 1987）
- An unique organisation as it involves various stakeholders:
  - 60% local governments
  - 40% development authorities, municipal associations, NGOs, research institutions and private companies
- Recognised as an International NGO with UN-ECOSOC in 1995
- Received UN HABITAT Scroll of Honour in 2002
- Has been cooperating with various international agencies

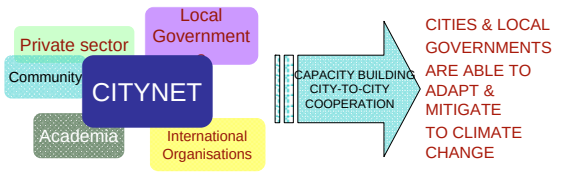
Approaches & Methods



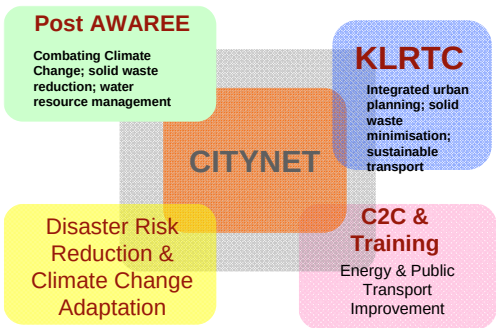
Membership



GOALS



ACTIVITIES ON CLIMATE CHANGE



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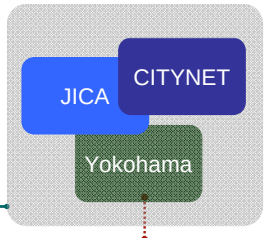
POST-AWAREE

- Post-AWAREE (Awareness on Environmental Education in Asian Cities) entitled:

"Combating Global Warming through the Achievement of Environmental Protection-Oriented Urban Society"

Dhaka
Makati
Colombo
Da Nang



Other Cities and Networks

Issues Covered

Global Warming & Role of Local Governments

01
02 Climate Change Mitigation & Adaptation
03 Solid Waste Management
Training & Capacity Building
Water resource management 04
05 Environmental Education
07 Community Participation
Public-private partnerships 06

Action Plans

- Holistic approach/plan/strategy on climate change's mitigation & adaption
- On Solid Waste Management:
  - Promote 3Rs for waste minimization – waste segregation, recycling, etc
- On Water Supply and Conservation:
  - Rain water or sky water harvesting
  - Prevention of water leakage (i.e. with support of community)
- On Environmental Education:
  - Develop tools, techniques & materials on EE
  - Training and awareness-raising on EE for environmental staff and local leaders
  - Awareness-raising campaign on climate change

ACTION PLAN - Colombo, Sri Lanka

- ON SOLID WASTE MANAGEMENT
  - Develop tools and techniques for EE
  - Identification of schools (target 12 schools per year or 60 schools for the next five years)
  - Conduct EE Programme for teachers and students
  - Collaboration with different stakeholders such as NGOs and private sector
  - Segregation of waste and introduction of composting at the school-level
  - Conduct benchmarking activities with other cities on waste reduction

ACTION PLAN - Colombo, Sri Lanka

- ON WATER MANAGEMENT
  - Introduce rainwater harvesting to parks, hotels & community centers
  - Conduct EE programmes for public on water resource management
  - Increase greenery within the city
  - Provision of metered individual connections to underserved settlements

ACTION PLAN - Da Nang, Vietnam

- ON SOLID WASTE MANAGEMENT
  - Application of the "separate model" in schools
  - Enhance the role of industries in environmental protection
  - Capacity-building for the city environmental staff/personnel

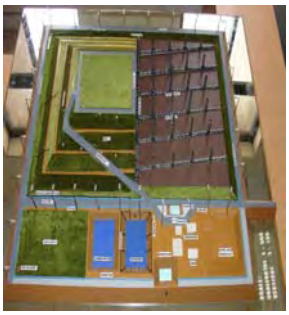
Day 2 : CITYNET in Action on Climate Change by Ms. Vissia Aldon, City Human Resource Officer and Pasig River Rehabilitation Project Manager, Makati City, Philippines

ACTION PLAN - Da Nang, Vietnam

- ON WATER MANAGEMENT
  - Application of models learned from the water management course in Yokohama ie., rainwater harvesting; two-box model on watershed conservation; community-based management for water sources
  - Conduct of EE Programs
  - Revision of the city's legal framework
  - Training at jobs
  - Calling for support from international NGOs
  - Development of community-based water management
  - Development of a municipal plan for combating global warming including adaptation and mitigation
  - Strengthen local capacity

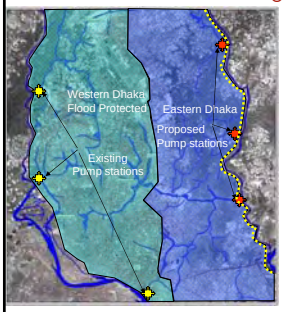
ACTION PLAN - Dhaka, Bangladesh

- ON WASTE MANAGEMENT
  - Implement EE in school education program
  - Start source separation activities in school level
  - Increase the awareness of citizens on 3Rs through leaflets and other media
  - Improve waste collection and disposal system (conversion of the open landfill into sanitary landfill)
  - Development of databank using GIS
  - Conduct regional planning on solid waste management



ACTION PLAN - Dhaka, Bangladesh

- On WATER MANAGEMENT
  - Introduce EE programmes in schools
  - Mass tree plantation programme and increase greenery
  - Excavation and re-excavation of canals to improve natural drainage system
  - Rainwater harvesting in city-owned buildings and encourage citizens to practice rainwater harvesting
  - Mandatory effluent treatment plants for all the industries
  - Maintenance of water ways encircling the city



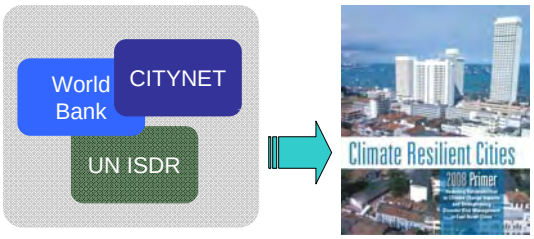
ACTION PLAN - Makati City, Philippines

- ON COMBATING CLIMATE CHANGE AND WASTE MANAGEMENT
  - Awareness raising campaign on Climate Change through orientation and launching of IEC materials (leaflets, flyers, posters)
  - Integration of Climate Change in the basic education curriculum
  - Poster and Slogan-Making Contest for Earth Day Celebration
  - Logo-making and Jingle-writing Contest

ACTION PLAN - Makati City, Philippines

- ON WATER MANAGEMENT
  - Information Education Campaign on Environmental Awareness
  - Policy formulation/ legislation on groundwater extraction
  - Rainwater harvesting, utilisation, and conservation
  - Installation of signages on water conservation in public buildings

CITYNET — Linking Disaster Risk Reduction with Climate Change



- Jointly produced: Climate Resilient Cities: 2008 Primer that aims to reduce the level of risk of disasters and impacts of climate change based on the specific typology and hazard projections of each city
- Urban Risk Profiling and Sound Practices in Asian Cities
- Capacity-building for local government leaders & officials on disaster risk reduction and climate change adaptation

Day 2 : CITYNET in Action on Climate Change by Ms. Vissia Aldon, City Human Resource Officer and Pasig River Rehabilitation Project Manager, Makati City, Philippines

Thank you!

www.citynet-ap.org / inquiries: bernadia@citynet-ap.org

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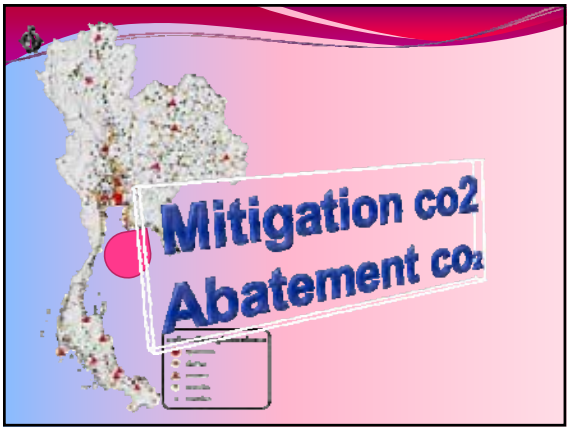

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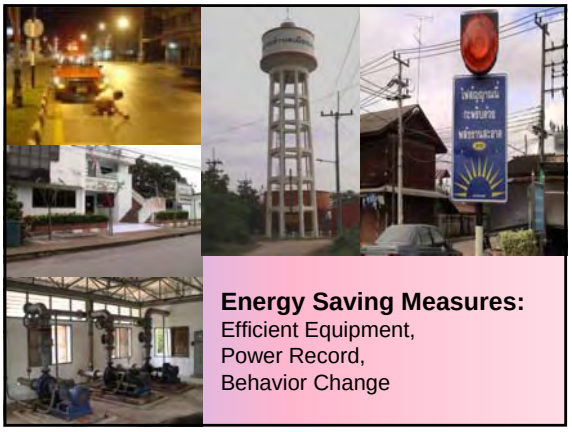

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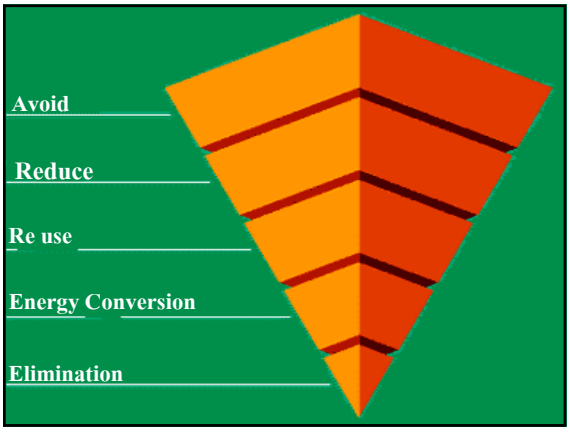

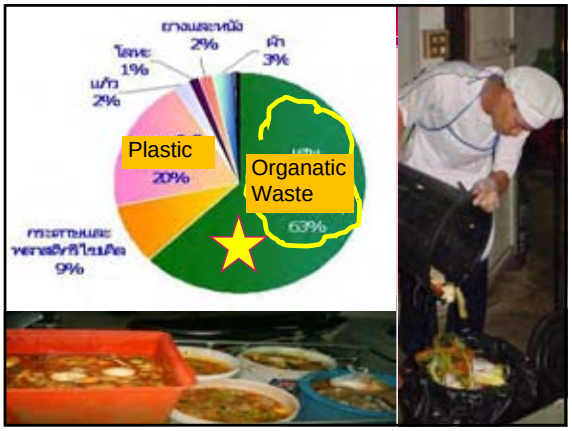

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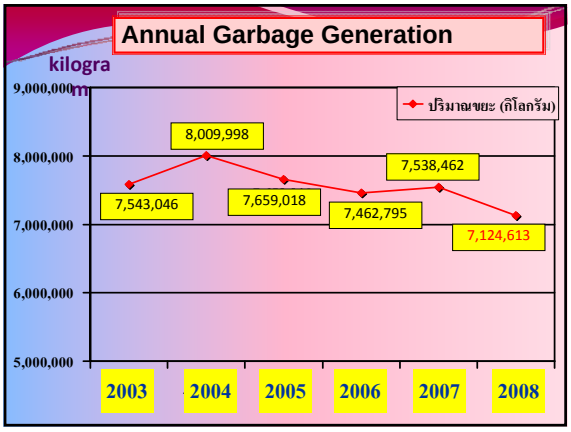

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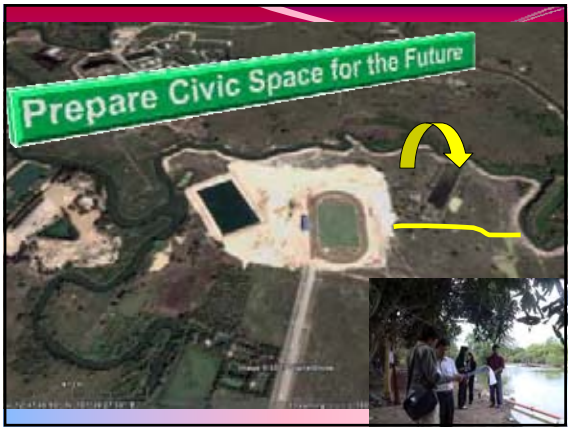

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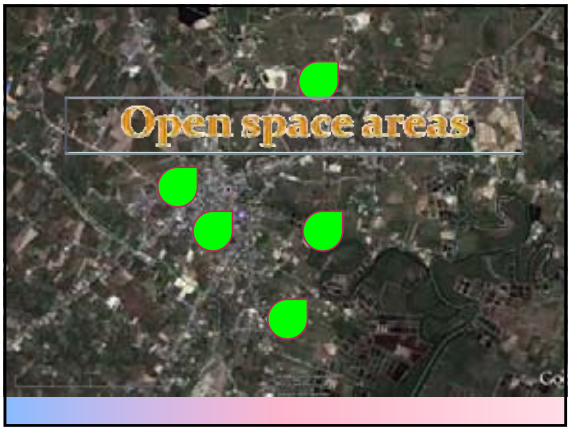

Day 2: Mitigating Climate Change: The Makati City Way by Ms. Mildred Castillo, Head, Support Services Division, Department of Environmental Services, Makati City

MITIGATING CLIMATE CHANGE: THE MAKATI CITY WAY

Presented by:

MS. MILDRED A. CASTILLO
Head-Support Services Division
Department of Environmental Services

city government of makati

OUTLINE

- **Sustainability Efforts: Joining Cities for Climate Protection Campaign of ICLEI**
- **Institutional Support**
- **GHG Emissions Reduction Target**
- **GHG Mitigating Measures & GHG Emissions Reduction**
- **Future Programs & Projects**
- **Issues and Challenges**

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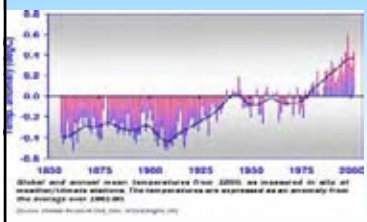
What is global warming?

- Global warming refers to the increase in the earth's mean temperature as a result of enhanced greenhouse effect.

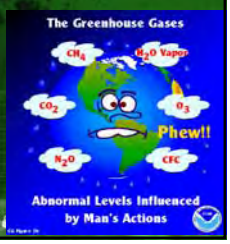


collective picture of a warming world

- global average air temperature increased by 0.74˚ C from 1906 to 2005
- Strong temperature increase since 1975 **(unprecedented)**

What is Climate Change?

Is the long-term average of a region's weather events lumped together. **Climate change represents a change in these long-term weather patterns.** They can become warmer or colder. Annual amounts of rainfall can increase or decrease.



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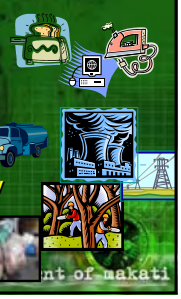
How do we contribute to Climate Change?

Some human activities that cause emissions of carbon dioxide (CO2), the main gas responsible for climate change, as well as of other 'greenhouse' gases that contribute to climate change include:

- **use of electricity** *(turning on lights, using the air conditioner, watching TV, using of computer, etc.)*
- **use of fuel** *(when we drive or ride in a car/bus/jeepney/tricycle/airplanes)*
- **when factories make things that we buy**
- **when we cut down trees**
- **the trash that we send to landfills (the biggest contributor!)**



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Some Devastating Effects of Climate Change

1. **Extreme Flooding and Landslides**

Guinsaugon Landslide, Leyte
February 2006

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2. Tropical Storms & Hurricanes

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3. Sea-level Rise due to Melting of Glaciers

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4. Vulnerability of Coastal Resources

Diversity of corals could be affected (some species could decrease or becomes locally extinct);
Massive coral bleaching in various reefs;
Fish kills and severe red tide outbreaks after strong El Niño periods.

5. Intense & Longer Droughts

5. Threatened Food Security, Primarily Agricultural & Fishing

6. Health-related Impacts

Weather-related mortality (e.g. due to heatwave), infectious diseases spread (e.g. widespread of malaria) & air quality respiratory illnesses among others (indoor & outdoor pollution).

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To bring climate change to a halt, global greenhouse gas emissions must be reduced significantly.

Part Of Environmental Sustainability Efforts

- **Makati joined the International Council for Local Environmental Initiatives (ICLEI) under the Cities for Climate Protection (CCP) Campaign - March 2004**

International Council for Local Environment Initiatives

ICLEI-CCP's mission:

To build a worldwide movement of local governments who adopt policies and implement measures that achieve measurable reductions in local greenhouse gas emissions; improve air quality; and enhance urban livability & sustainability.

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Institutional Support

Creation of special bodies to support environmental initiatives composed of members from the concerned City Departments/offices, national government agencies and NGOs:

- Makati City Environmental Protection Council (MCEPC);
- Makati City Solid Waste Management Board (MCSWMB);
- Makati Clean & Green Committee;
- Clean Cities Makati Coalition;

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MAKATI CITY WASTE REDUCTION TARGETS

The conservative target reduction percentage for 2003 was set as basis for the implementation of programs and projects as well as a start-up point for compliance to the law. The compulsory 25% reduction will be distributed among the following years:

2002 : Base Year
2003 : 5%
2004 : 10%
2005 : 15%
2006 : 20%
2007 : 25%
2008 : 30%

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PROGRAMS & PROJECTS CONTRIBUTING TO WASTE REDUCTION

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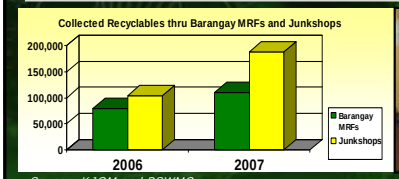
A. Barangays *(Community)*:

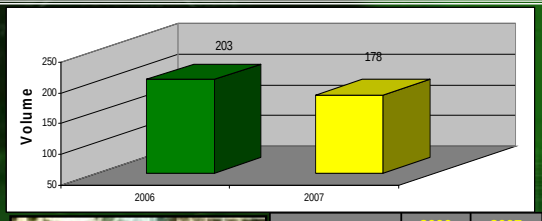
Makati City Barangay Solid Waste Segregation & Resource Recovery



Source: KJOM and BSWMC

	2006	2007
Total Collected Recyclables thru BARANGAY MRFs (in kgs)	79,753	110,144
Total Collected Recyclables thru Junkshops (in kgs)	103,458	187,144
TOTAL	**183,211 kgs.**	**297,289 kgs.**

B. Government Offices: City Hall Recyclables Collection Drive



	2006	2007
Total Volume of Paper collected (in kgs.)	**203**	**178**

Source: SWMD-IEC Section

city government of makati

C. Schools: "Batang Bantay Basura"

(Children as Guardians of Waste)

1. Recycling Project

Project in collaboration with the Dep-Ed and Department of Environmental Services.

2. Materials Recovery Facility (MRF)

All 29 public schools in Makati have MRFs

Source: Department of Education-Makati

	2006	2007	Total
Total Volume of P.E.T. Bottles Collected (in pcs.)	629,670	933,330	1,563,000

D. Health Sector: "Makiramay Sa Kalinisan ng Ating Bayan"

(Let's Take Part in Keeping our Environment Clean)

Remarks
Conduct lectures / seminar with the Funeral Administrators and maintenance personnel regarding waste segregation and proper disposal of their wastes.

E. Commercial Sector: Gulong Sulong sa Kalinisan

(Roll Towards Cleanliness)

No. of Stall Owners Apprehended (2003-095)
21

Remarks
Project on implementing Ecological Solid Waste Management System in all public and private markets as well as resource recovery program for all ambulant vendors & market stall owners.

Day 2: Mitigating Climate Change: The Makati City Way by Ms. Mildred Castillo, Head, Support Services Division, Department of Environmental Services, Makati City

F. Transport Sector - OPLAN PUV: "Tsuper ng Bayan Kaakibat sa Kalinisan" (*Our Drivers – Partners for Cleanliness*)

Remarks
❖ Orientation Seminar re: C.O. 2003-095, C.O. 2004-032, C.O. 2002-090 on all Drivers and Operators of PUV, Fx, Taxi and Tricycles operating in the City last August 23, 2007 with 175 participants.
❖ Drivers were required to have trash receptacles inside their vehicles.
❖ Strict implementation & monitoring of the compliance of all drivers and operators started on the 1st week of October.
❖138 Jeepney Drivers without trashcans were apprehended

G. Makati City Weekend Waste Market (every 2nd Friday of the Month)

City level collection of **non-traditional wastes**

Source: Philippine Business for Environment

	2006	2007
Total Volume of Assorted Waste	10,919.00 kgs. & 1680 pcs	24,795.00 kgs. & 4481 pcs
Total Amount Generated	Php 132,215.00	Php 313,547.00

Community Weekend Waste Market: 1st Magallanes Recyclables Market

Held last February 29, 2008

Source: Ayala Foundation, Inc. – SWM Program	
Total Volume of Assorted Waste	4,788 kgs.
Total Amount Generated	Php 29,589.49

Baratilyo ng Basura sa Barangay (Community-Based Recyclables Market)

- Launched last July 7, 2008 at the City Hall Quadrangle
- In partnership with Liga ng mga Barangay and Kapisanan ng Junkshop Operators ng Makati (KJOM)

Source: SWMD-IEC Section	
Total Volume of Assorted Waste	975.40 kgs.
Total Amount Generated	Php 9,490.24

H. 3B SA PASKO (November – December)

(3B: "Bawasan, Balik-Gamitin at Baguhin ang Anyo" / 3R: Reduce, Recycle and Reuse)

	2006	2007	Remarks
Estimated weight of garbage diverted (in kgs.)	11,000	14,547	Increase of 24% or 3,547 kgs.
Total Income generated (Php)	55,148	77,042	Increase of 28% or Php 21,893

Source: SWMD-IEC Section

ENFORCEMENT OF CITY ORDINANCE 2003-095 (City Solid Waste Management Code)

city government of makati

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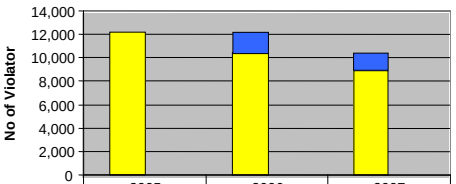
Apprehended Violators of City Ordinance 2003-095

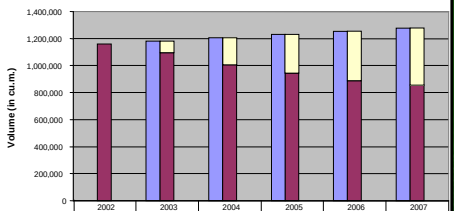


	2005	2006	2007
Apprehended Violator	12,219	10,416	8,912
% Reduction		15%	14%

Source: SWMD-Enforcement Section

ANALYSIS:
- 14% - 15% decrease was noted for the past 3 years
- Decrease can be attributed to increase level of awareness on proper Solid Waste Management for target sectors

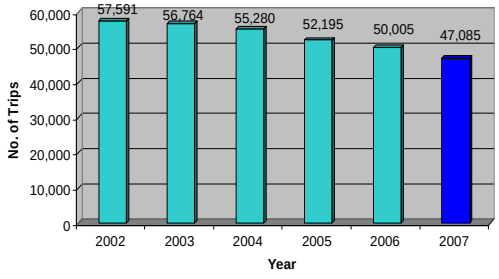
parative Volume of Garbage



	2002	2003	2004	2005	2006	2007
Projected Waste Generation		1,182,058	1,205,699	1,229,813	1,254,410	1,279,498
Actual Garbage Collected and Disposed	1,158,881	1,094,970	1,005,291	942,538	886,993	857,230
Volume of Garbage Reduced (cu.m)		87,088	200,408	287,275	367,417	422,268
Diversion Rate (%)	Base Year	7.37%	16.62%	23.36%	30%	33%

ANALYSIS:
- Volume of waste reduced for 2007 is 422,268 cu.m.
- 33% diversion rate

Reduction in the Number of Collection Trips

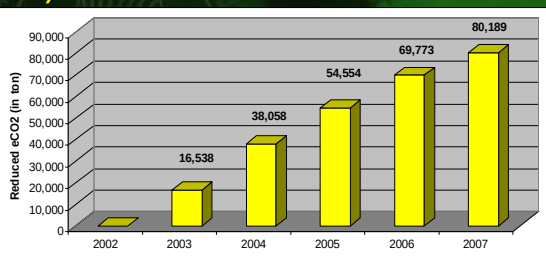


Source: SWMD-Garbage Collection and Disposal Section

ANALYSIS: •18.25% reduction of collection trips was noted for the past 5 years.

city government of makati

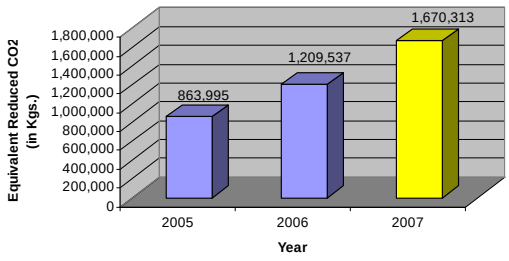
REDUCED EQUIVALENT CARBON DIOXIDE EMISSION (eCO2) FROM VOLUME OF WASTE DIVERTED (in tons)



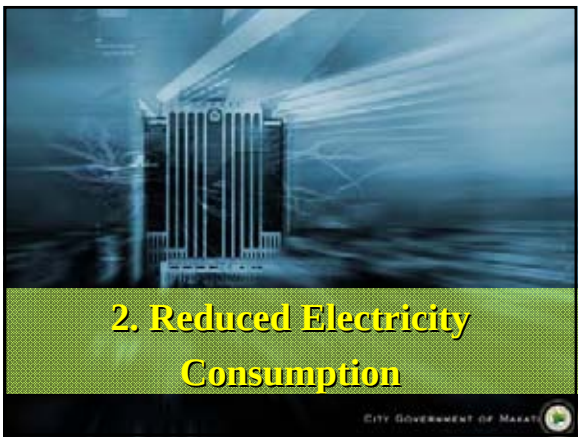
ANAYLSIS: • Computation based on ICLEI formula.

city government of makati

REDUCED eCO2 FROM DISPLACED FUEL DUE TO DECREASING GARBAGE COLLECTION TRIPS (in kgs)



ANALYSIS: • Steady increase of 30% in the reduced eCO2 that is emitted to the atmosphere.



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STREETLIGHTS

City lighting projects are designed to adopt energy saving schemes:

- Programmable lighting controller
- Reducing hours of operation of selected streetlights during non-busy hours 1:00 A.M. – 6:00 A.M.
- Installation of High-Pressure Sodium lamps or HPS has been the policy since year 2002 in streetlights
- Some streetlights existing before 2002 have been replaced with HPS lamps

CITY-OWNED BUILDINGS

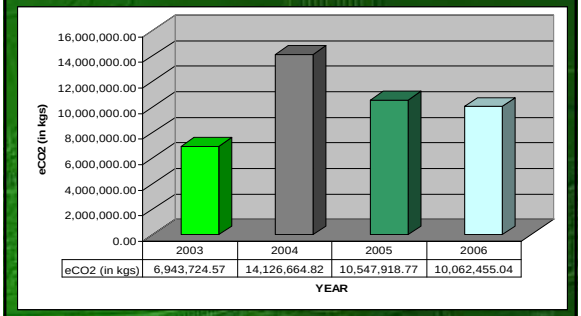
- Energy saving measures are managed by Department of Engineering under the Task Force Building Facilities and Equipment Maintenance
- Basic conservation measures implemented:
  - ✓ Reduction of operation by one (1) hour of air-condition units
  - ✓ Turned-on 8:30 AM and turned-off 4:30 PM
  - ✓ Turning-off of lights during lunch breaks
  - ✓ Reduction in the number of lights/bulbs turned-on

"Palit Ilaw Program"

(Shift to Energy Efficient Lights Program)

REMARKS: A total of 132 light bulbs were replaced with energy efficient lights having an energy savings of 11,850 Kwh. a year and 7,000 Kgs. of reduced carbon dioxide.

REDUCED eCO2 EMITTED DUE TO DECREASING ELECTRICITY CONSUMPTION (in kgs)



	2003	2004	2005	2006
eCO2 (in kgs)	6,943,724.57	14,126,664.82	10,547,918.77	10,062,455.04

Source: General Services Department (GSD)

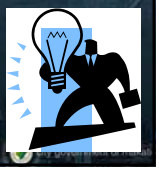
Award for Energy Efficien Streetlights

- Recognition for a commendable & innovative Citywide Streetlighting Program using Energy Efficient Lighting Systems (EELS).
- Awarded by the Department of Energy during the National Energy Week 2006 in Meralco Theater, Pasig City last December 14, 2006.

Enactment of City Resolution No. 2008-056

A Resolution Declaring 8:00 PM to 9:00 PM as "Earth Hour" of Makati City & Further Encouraging the Observance Thereof By All Residents/Households and Owners/Managers of Business Establishments and/or Buildings in Makati City in Turning Off at Least One (1) Light During the Hour Everyday to Ease Mother Earth from the Effects of Global Warming

- Enacted last May 2, 2008



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Projected Electricity Savings

If each household in Makati will turn off at least one (1) light with 20 watts, then:

119,270 household
x 20 watts light
= 2,385,400 watts = 2,385.40 kilowatt hour saved

2,385.4 kilowatt hour saved
x 0.594 equivalent emission factor
= 1,416.9 kg of equivalent CO2 saved / hour

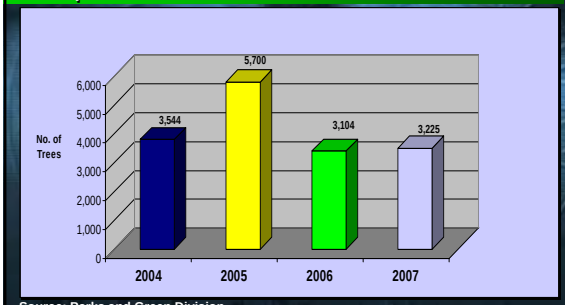
This is the amount of carbon dioxide which was prevented to be emitted in our atmosphere, thereby mitigating global warming.

REMARKS: 1 watt = 0.001 kilowatts

CITY WIDE TREE PLANTING

- Reduction of pollution levels are done through citywide tree planting activities with our partners in the private sector and NGOs.
- Tree planting activities started in 1992. At present, the Department has inventoried 87,629 existing trees citywide.
- Using the city's 2000 NSO population, currently, the tree to person ratio is at 1:6.8

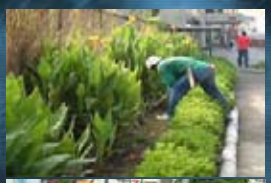
Comparative Data on Trees Planted



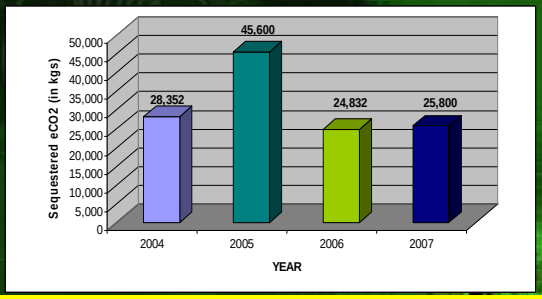
Source: Parks and Green Division

REMARKS: A tree **sequesters 8 kgs** of equivalent CO2 per year.

Roadside Planting



SEQUESTERED eCO2 FROM ADDITIONAL TREES PLANTED PER YEAR (in kgs)



REMARKS: Citywide no. of trees of 87,629 sequesters 701,032 kgs. of equivalent carbon dioxide per year.

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Introduction of E-Jeepney

- Introduced last July 4, 2007 and commercial route launched last July 1, 2008;
- Use of electricity to run jeepneys
- A prime example of positively engaging other sectors in achieving the goal of cleaner air for our cities
- 2nd phase of the project will be innovative which will aim to use energy from biodegradable waste to power an environmentally-friendly public transport system

ANTI-SMOKE BELCHING CAMPAIGN
City Ordinance No. 2004-32

- Active Anti-Smoke Belching Campaign through the passage of the ***"Vehicle Emission Control Code & Providing Penalty for the Violation Thereof"***

ANTI-SMOKING ORDINANCE
City Ordinance No. 2002-90

- Strictly being implemented which imposes a city-wide ban on smoking in all forms of public conveyance and in all enclosed establishments with an area of less than one hundred (100) sq.m
- The constant vigilance of our Law Enforcers, including our deputized senior citizens & our City Health Inspectors, has led not only to numerous apprehensions, but also to a remarkable level of compliance.

"In Makati, the Anti-Smoking Ordinance is here to stay.
And there are no If's and 'Cigarette Butts' about it!"

– Mayor Jejomar C. Binay

IEC & ADVOCACY CAMPAIGNS

- Create awareness among the citizenry & establish partners to help mitigate greenhouse gas emissions
- Conduct of special environment-related activities participated in by various sectors of the community during:
  - Earth Day
  - Environment Month
  - Earth Hour, etc.
- Distribution of IEC Material re: Climate Change

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Other Advocacy Projects:

- **BIOFUELS RUN**
  Show of support for the approval of **BIO FUELS ACT of 2006** held last November 13, 2006;
- **30 Second Biofuel Cinema Ad Turn-over** to the following cinemas:
  - Ayala Cinemas in Makati & Cebu
  - Market-Market
  - SM Mall of Asia
  - SM Mega Mall

W.A.L.K. FOR LIFE (Environment Month)

Water, Air, Land Keepers for a better environment

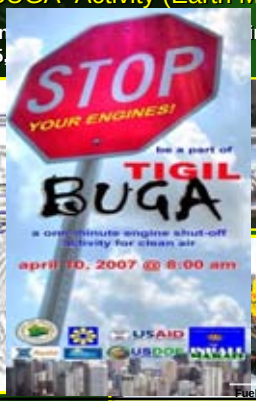
Held last June 25, 2006;

In partnership with City Government thru DES, DENR, and other members of the community;

Estimated no. of Participants = 800 persons

Annual TIGIL-BUGA Activity (Earth Month)

- **One minute engi… …ints in Makati;**
- **Held last April 15…**



Fuels for Life, Inhale Makati

TIGIL-BUGA Part 2!

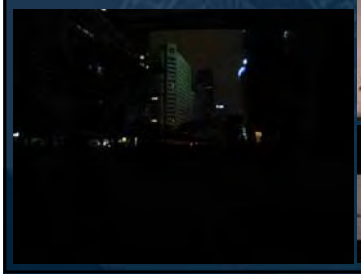
- **Held last April 28, 2008, 8:00 – 8:01 AM, at Ayala Avenue**

ORIENTATION SEMINAR ON CLIMATE CHANGE

- Orientation Seminar for City Government personnel on the effects of climate change and measures on how to mitigate GHG emissions.
- Held last March 28, 2008 in partnership with PAGASA and WWF
- Initial phase on raising the level of awareness of the City Government

EARTH HOUR

- Held last March 29, 2008 in partnership with WWF
- Citywide turning off of lights for 1 hour



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EARTH HOUR

- The event reduced **56 megawatt hours** of electricity in **Luzon** alone which is equivalent to a small coal-fired powerplant.
- **Metro Manila** reduced **16 megawatt hours** of electricity

PROJECT H.A.N.G.I.N.

Aims:

- To localize environmental health monitoring system;
- To increase capacity & capability of LGU to draft appropriate policies & plans that integrate pollution reduction and health aspects.
- The 5 monitoring sites (with high traffic volumes) are now being monitored for levels of PM10 for a period of 1 week each site.

Sites:

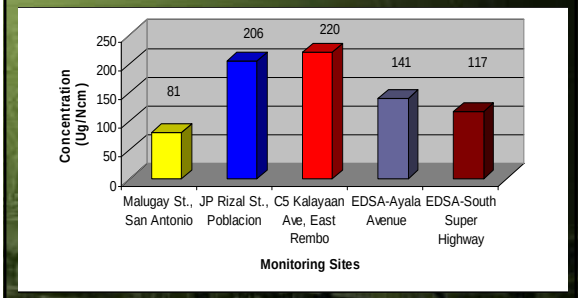
- Malugay St., San Antonio
- Makati Ave. cor. JP Rizal Ave.
- C-5 Kalayaan Ave.
- EDSA-Ayala Ave.
- EDSA-South Superhighway

Environmental Management Sector

SUMMARY OF COLLECTED DATA PM10

(MARCH 2007 – MAY 2008)

DENR STANDARD: 55 - 150 ug/Ncm



Source: DENR-EMB-NCR

Environmental Management Sector

RESULTS OF HEALTH INFORMATION SYSTEM FOR AIR POLLUTION RELATED ILLNESSES FROM MARCH 2007 – MAY 2008 (Project H.A.N.G.I.N)

Environmental Management Sector

URTI CASES PER STATION

Symptoms	Station 1: Malugay St., San Antonio Reading: 81 Ug/Ncm	Station 2: J.P. Rizal St., Poblacion Reading: 206 Ug/Ncm	Station 3: C5 Kalayaan Ave. Reading: 220 Ug/Ncm	Station 4: EDSA Ayala Ave. Reading: 141 Ug/Ncm	Station 5: EDSA South Super Highway Reading: 117 Ug/Ncm
Cough with sputum	2	102	1,523	68	223
Cough without sputum	76	22	180	74	30
Nasal Discharge	---	66	1,280	---	108
Wheezes	---	11	21	---	8
Difficulty in breathing	---	20	118	20	24
Sore throat	---	40	53	15	17
Bronchitis	1	12	52	---	6
Acute Respiratory Infection (Pneumonia)	10	25	67	1	31
Asthma	5	10	171	1	12
Upper Respiratory Infection	65	106	1,360	3	61
Chronic Obstructive Pulmonary Diseases	---	2	8	1	1
Ischemic Heart Diseases	---	2	---	1	---

Source: Makati Health Department

Environmental Management Sector

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Waste Management

- Collection of used car batteries;
- Waste-to-energy: capture of methane from waste to be utilized as energy.

Urban Greening

- Drafting of the Makati City Greening Masterplan
- Enactment of an ordinance promoting green architecture and requiring allocation of 25% equivalent of total lot area as green space
- Enactment of an ordinance to prevent indiscriminate cutting of trees

Energy Efficiency

- Use of Energy Efficient Lights (EELs) in all City Government-owned buildings
- Procurement & utilization of energy efficient equipments

Transportation

- Proposed conversion of several City Government vehicles of Makati to LPG or CNG
- Conversion of tricycles from 2-stroke to 4-stroke or conversion to LPG fueled tricycles
- Enactment of an Ordinance Providing Incentives to User's of Clean Fuel & Technology for Motor Vehicles

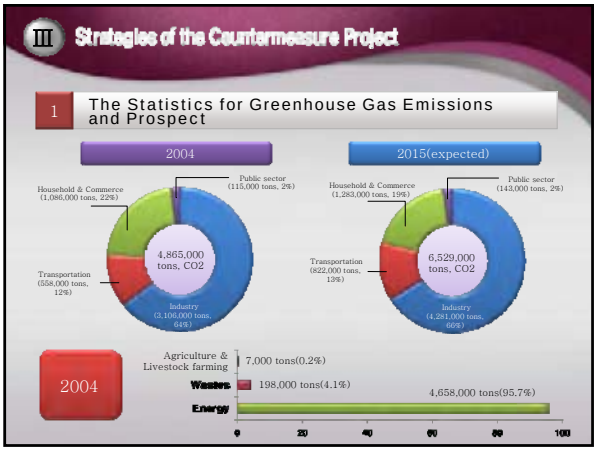
Issues / Challenges

- Accounting of carbon emissions of other sectors will still have to be established;
- Initiatives of other stakeholders is not yet documented by the City Government;
- Policy in order to reduce GHG emissions will have to be strengthened (e.g. green procurement);
- Awareness of the City Officials, the general public down to the household level on the effects of climate change and on how to mitigate GHG emissions will have to be increased.
- Social acceptability of utilizing products made out of recyclable materials is still minimal

Allocate Resources and Efforts

For a Better Environment & Future for our people

Day 2:Changwon the Environmental Capital addressing Climate Change Impacts,by Mr Rim Tae Hean,Director of Environmental Sustainability & Protection Division,Changwon City, Republic of Korea



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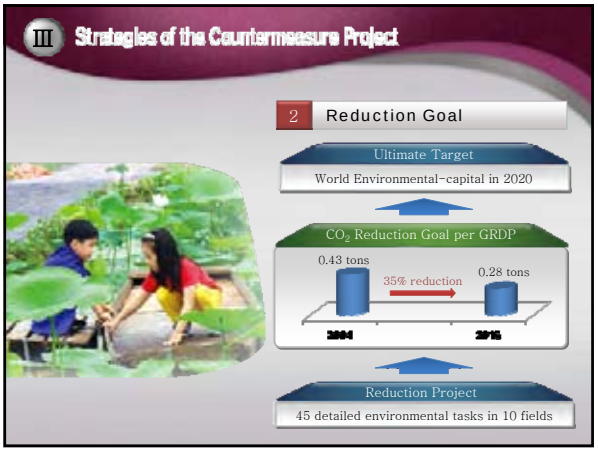

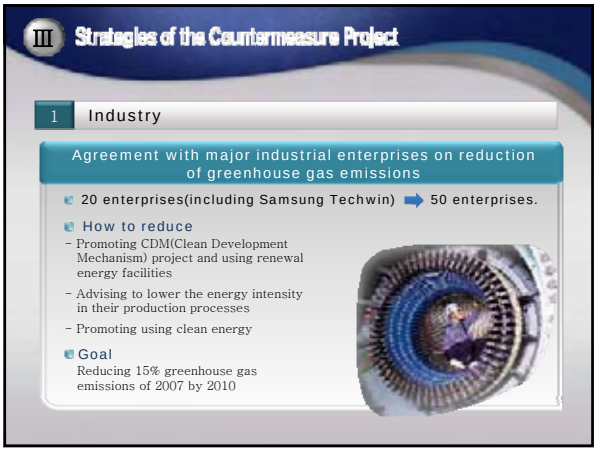

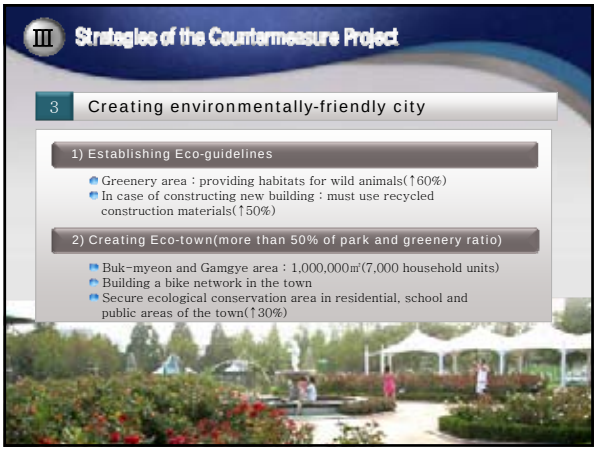

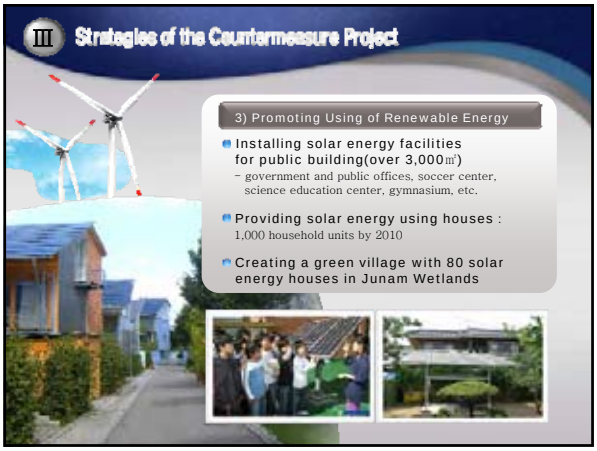

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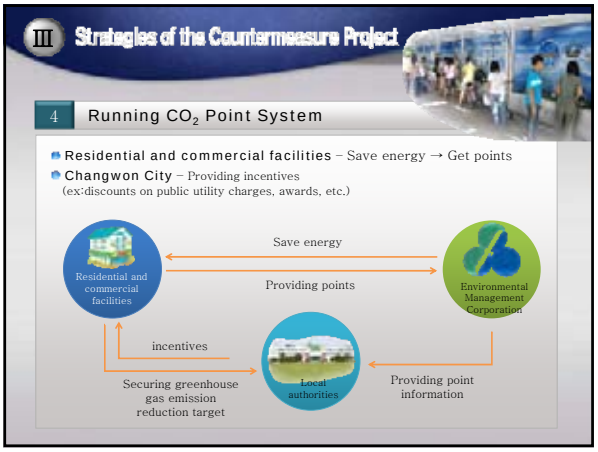
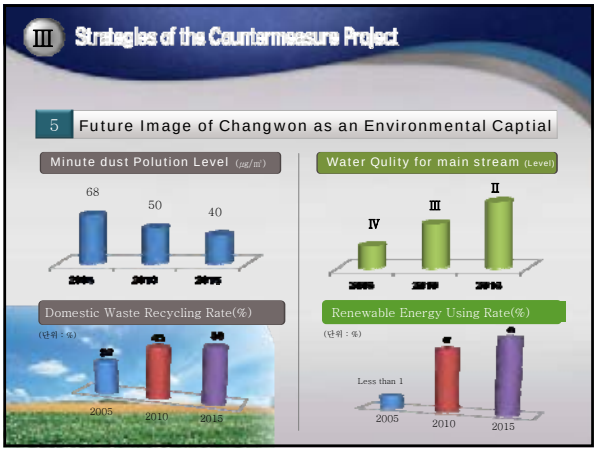
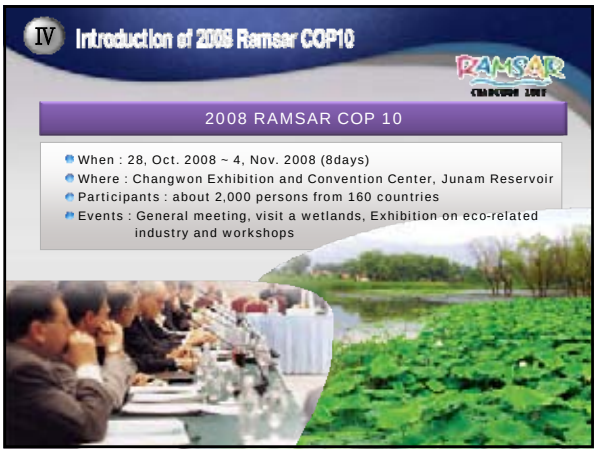






SECTION IV: THE WORSHOP- DAY 3

Day 3: Thursday 28Th August
Defining the Regional Strategy and moving towards the Climate Change Agenda

The SCP-Asia Expert Group reconvened for session three half-day on Thursday. The main objectives of session three being to discuss how UN-HABITAT's support through SUD-Net/CCCI could be operationalised in the Region, partnering with on-going initiatives, and building on the SCP-Asia network, experiences, expertise, management tools, etc.

Setting the framework for discussions Ms. Cecilia Njenga introduced the CCCI Log-frame; relevant questions regarding the CCCI implementation were also answered by Mr. Bernhard Barth who soft launched CCCI/MDG-F Sorsogon project and further detailed CCCI priorities, operational tips, country /city activities and tool development.

The concluding discussions of the workshop were focused around "SCP/CCCI-Asia Transition Strategy" considering; (1) SCP- partner engagement opportunities, (2) possible country level activities, (3) supporting training tool development, (4) University support and collaboration with local governments training institutions. The meeting was wrapped up with a SCP/CCI Transition Strategy Agreed in Principle with road map for 2008/9.

4.1 Launching CCCI/MDG-F Sorsogon project

Sorsogon City was announced as the first demo-city of CCCI in Asia. The role of the demo-project was spotlighted as to strengthen city/national/regional and global networking.
City to City exchanges, case studies and linkages with other networks were highlighted as good mechanisms to further develop the learning process. However limited resources were identified as a main constraint. Continuous documentation of the process and the strategic use of mass media were identified as a crucial element for resource mobilization.
Mr. Bernhard Barth further clarified CCCI priorities, operational tips and tool development as detailed below:

4.12 CCCI Priorities

As initial priority it was highlighted that CCCI is a City wide approach targeting mainly policy makers, focusing on local action planning linking city to national. Identifying gaps at local level in terms of spatial planning and land-use planning, it was presented as instrumental for localizing entry points to develop adaptation/mitigation strategies. Other activities included; utilization of generic tools and awareness rasing materials, linking to other institutions with capacities for outreach to local level, tools development and testing at country/ city levels.

4.1.3 CCCI operational tips

In terms of the operational implementation Mr. Barth clarified that CCCI aims mapping out Climate Change vulnerability at national/city level. ROAP will be the coordinator of the project development with SUDNET/CCCI providing modest support. Resource Mobilisation strategy will be done through CER/VER/ Trust Fund.

4.1.4 Tool Development & Techniques to facilitate their use

The draft of the ICLEI/UN-HABITAT/UNEP Handbook on Climate Change was recommended as a useful tool, ROAP agreed to circulate the document with the anchor institutions for their feedback. Among other tools for development it was highlighted awareness raising materials as fundamental especially when structured for target groups/ children.

Among the techniques recommended for the programme dissemination the Training of Trainers workshops, network of training institutions, including associations of local governments were spotlighted as the most relevant. The issue of translation and customization of the tools was also raised.

CCCI -1

Objectives
- SUD-Net Operationalization
- Policy Change with regard to Climate Change
- Tool Development
- Climate Change response on City level
- Capacity Building

CCCI -2

SUD-Net Operationalization
- Not CCCI-specific
- Launch of SUD-Net
- Website and other advocacy tools
- Advocacy events

CCCI -3

Objectives
- SUD-Net Operationalization
- Policy Change with regard to Climate Change
- Tool Development
- Climate Change response on City level
- Capacity Building

CCCI -4

Policy Change with regard to CC
- **In Pilot Cities:** Strong Stakeholder participation, in-depths situation analysis (environment, social and economic situation, governance structure etc.), implementation of national policies, development of local policies and action plans.

CCCI -5

Policy Change with regard to CC
- **In Pilot Countries:** Strong Stakeholder participation, anchoring, in-depths situation analysis (environment, social and economic situation, governance structure etc.), integration of 'urban dimension' into national CC policies.

CCCI -6

Objectives
- SUD-Net Operationalization
- Policy Change with regard to Climate Change
- Tool Development
- Climate Change response on City level
- Capacity Building

CCCI -7

Tool Development

- **Needs assessment:** Global and regional level, in-depth assessment in pilot sites
- **Management and decision making tools:** For city level decision makers
- **Technical tool kit:** For managers/ practitioners: Sectoral issues mitigation (energy, building), adaptation (infrastructure, disaster preparedness), process tools (vulnerability assessments, stakeholder consultations).

CCCI -8

Objectives

- SUD-Net Operationalization
- Policy Change with regard to Climate Change
- Tool Development
- Climate Change response on City level
- Capacity Building

CCCI -9

Climate Change response on City level

- **Implementation of policies:** as per local priorities
- **Demonstration projects:** energy/transport/buildings, biodiversity, infrastructure/slum upgrading etc.
- **Financing/sustainability:** Clean Development Mechanisms/Working with Insurance Companies/Micro Insurance

CCCI -10

Objectives

- SUD-Net Operationalization
- Policy Change with regard to Climate Change
- Tool Development
- Climate Change response on City level
- Capacity Building

CCCI -11

Capacity Building

- **In the pilot cities:** Decision makers and general public (including arts projects, clean up days etc.)
- **UN-HABITAT partner universities:** Curriculum Development, research in and support of pilot cities
- **Local Government Training Institutes:** Curriculum Development, rolling out of CC courses for local governments

Implementation Principles

- City / Human Settlement as starting point (all dimensions)
- Combine Advocacy, Policy Change, Tool Development, Capacity Building and Knowledge Management
- Simultaneous development of project components (iterative process)
- Avoid duplication, create synergies
- Build on existing initiatives
- Build on existing partnerships

SUD-Net, Cities in Climate Change Initiative

Tool Development

Bernhard Barth

Overview

1. Tools in CCCI
2. Questionnaire – response
3. Roundtable discussion

Tools in CCCI

Assessment:

- Analysis of existing tools on Global, Regional and National levels
- Needs assessment key stakeholders (e.g. SCP Partners), in-depth assessment in pilot countries and pilot cities.

Development:

- Prioritization
- Tool development by consultants in close collaboration with partners
- Review, testing publishing (by mid 2010)

Tools in CCCI

Tools for decision makers:

- Mainly addressing city level decision makers
- Focus on facts, scenarios, solutions with the aim to convince city leaders that the can and must act now and introducing them to the how-to

Tools in CCCI

Tools for managers practitioners:

- Selected sectoral issues addressing
  - mitigation, e.g. energy, transport, construction;
  - adaptation, e.g. infrastructure, poverty reduction, disaster preparedness, urban health
- Process tools
  - Situation analyses
  - Vulnerability assessments
  - Stakeholder consultations
  - Environmental budgeting
  - Financing / Insurance / CDM

Tools in CCCI

Attributes

- Practical – 'How to'
- Process – *participatory*, *national, city wide*
- Thematic – *sector specific*, *issue specific*
- With a clear target group
- For policy makers and practitioners
- Generic in nature - *for global application and local adaptation*
- Connecting the SCP/ EPM principles with the Climate Change issues

Tools in CCCI

Possible Content
- Primer / reader
- Case studies and best practises
- Decision making support tools/ interactive tools/ worksheets
- Briefing sheets
- Yellow pages – additional references

What would be the most approriate means of presenting and disseminating these tools?

Questionnaire Results -1

Priority Climate Change Issues
- Harmonize response (role of LG)
- Drought / flood / agricultural systems / food security
- Climate change and health
- Transport, solid waste management, sanitation, green spaces, bio-diversity and ecological restoration, slums
- Energy reduction
- Salinization / costal zones

Questionnaire Results -2

What tools exist?
- On awareness
- Policy initiatives and implementation
- On energy conservation
- Demo projects
- On ecological restoration
- Emergency response / disaster preparedness
- Certification
- Hazard mapping and risk assessment
- Environmental accounting / audit

Questionnaire Results -3

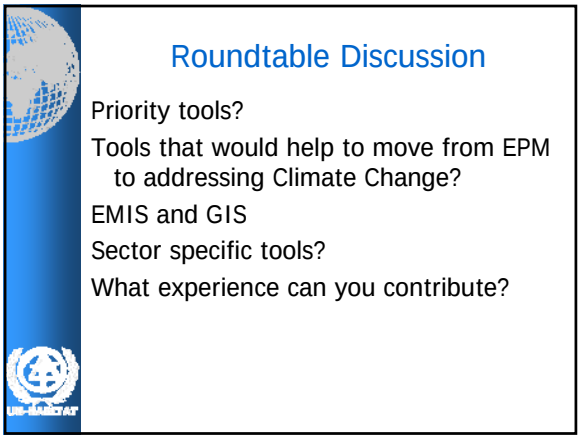
Experience with CCC related tools?
- EMIS
- Stakeholder analysis and mobilization
- Action planning and strategizing
- Awareness on city level
- Capacity building on city level
- Integrated approach to climate change
- Greenhouse gas inventories

Questionnaire Results -4

Gaps?
- Integration with existing tools
- Translating concepts and policies into practice
- Reaching local communities (regional resource hubs)
- Lack of capacities (technical/operational) on the local level.
- Process tools rather than technical tools

Questionnaire Results -5

Priority Tools
- Bottom up local planning
- CC related EPM tools like EMIS-CC-Profile
- Floods, drought, sea level rise, disease, disaster management, building codes, zoning (for LG)
- Adaptation
- How to link national to local


Roundtable Discussion
Priority tools?
Tools that would help to move from EPM to addressing Climate Change?
EMIS and GIS
Sector specific tools?
What experience can you contribute?

4.2 "SCP/CCCI-Asia Transition Strategy"

Strengths and weaknesses within the SCP network and country level activities were identified and discussed for further enhancement through the transition strategy into CCCI initiative; discussions were based upon the following key questions:

• How can SCP-Asia best use its experiences and demonstrated good practices and curricular/tools to better support Cities to address Climate Change Impacts?

• What mechanisms are needed to improve the capacity for SCP-Asia to support Cities addressing Climate Change Impacts through an improved process, new tools to fill gaps and refocus on Climate Change issues, more specialised expertise, etc?

• What support is needed from UN-Habitat (ROAP/HQ) to strengthen SCP-Asia's potential support to Cities addressing Climate Change Impacts?

4.2.1 The SCP Network and its challenges

The SCP- Asia network is visible at the regional level and widely recognized mainly at city-national level. (It is constituted by regional anchor institutions, national and local governments of 55 cities from China, India, Mongolia, PNG, Sri Lanka, South Korea and Thailand). It was highlighted that this network constitutes a very valuable resource of expertise and good practices in urban governance however it has been underutilized. Thus, to further define the regional strategy towards the climate change agenda the following issues were identified:

- Limited exchange, in need for concrete activities to be mobilized.
- Loose connectivity, in need of an articulated structure, however this requires resources.
- Need strengthening communication; IT – web based node, clarity of themes, regular meetings.
- Need of better understanding of country/city level activities as well as national-local level linkages with anchoring institutions.

4.2.2 SCP- partner engagement opportunities

Anchor Institutions expressed their interest to further define a regional strategy moving towards climate change; it was also noted that to address partly the above issues the network should be flexible and articulated through "a SUD-Net advisory committee at the regional level" composed by country focal points giving ROAP a coordinator role. Thus, anchor

institutions agreed to define the nomination of focal points internally at the country level and confirm with ROAP the nominations by country. It was also endorsed that selected focal points will nominate a chair for the advisory committee and ROAP will be the secretariat.

In recognition of the above SCP-Asia attributes, UN-HABITAT Headquarters agreed to provide resources ($300,000) through CCCI initiative to develop a CC regional support strategy, to be driven by anchor institutions preparing proposals on how they could play a more active role towards addressing the Climate Change agenda and submit it to ROAP for review.

SECTION V. CONCLUSIONS

The overall objectives of the workshop were satisfactory met:

- **"Factors of Success" resulting from the past 10 years of programme implementation in the region have been synthesized.** The peer to peer experience sharing on the country implementation of SCP in day one and the results of the round table discussions consolidate the factors of success including EPM process, EPM toolkits, C2C exchanges, Expert Group (See section II), moreover SCP partners made clear linkages on how these factors of success could contribute to address climate change impacts.
- **Asian Knowledge sharing platform raising awareness on cities and climate change challenges has been initiated.** A broad overview on the climate change challenges at global, regional, national and city level was developed; participants could gain a better understanding on the climate change issues, diverse policy strategies and regional programmes support. Moreover, complementary to this ROAP has developed a baseline document which presents a baseline conceptual framework on Climate Change Impacts in Asia highlighting adaptation and mitigation frameworks, mitigations strategies plans and programmes, including an inventory of supporting frameworks and toolkits for climate change assessment (See Annex3)

- **A SCP/CCCI-Asia "Transition Strategy" to support Cities addressing Climate Change Impacts has been agreed** in principle ***reviewing*** how SCP-Asia could be strengthened/re-tooled to better respond to the new challenges. SCP partners, UN-HABITAT Headquarters and UN-HABITAT ROAP have concerted on the transition strategy road map for 2008/9.

SECTION VI. LIST OF PARTICIPANTS

China

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Klang Municipality

Mr. Somchai, Mayor, Klang Municipality

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Mr. Norberto Gomez de Liano, Deputy Coordinator General, Manila, Philippines

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H.E. Robert G. Brinks, Ambassador, Manila, Philippines

Delegation of the European Commission
Mr. Nicholas Taylor, Head of Operations, European Union, Manila, Philippines

FAO
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Mr. Peter Woods, Secretary General, Sydney, Australia

WHO

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AIDE MEMOIRE

Towards Sustainable Urbanisation: Strengthening City and National Partner Capacities to Mitigate and Adapt to Climate Change Impacts

Innovative local actions creating global results against Climate Change Impacts

Manila, Philippines: 25th - 28th August 2008

1. Background

The 2008 SCP-Asia Regional Expert Group Meeting will take place 25-28 August in Manila, Philippines. The meeting offers the SCP-Asia Expert Group the opportunity to advance their collective know-how, exchange experiences, review activities, synthesise "Factors of Success" from 10 years of operational support in the region; and discuss how to utilise Environmental Planning and Management (EPM) experiences and good practices at local, national and global levels to support cities address Climate Change Impacts and link into UN-Habitat's Global Sustainable Urban Development Network (SUD-Net) and supporting "Cities in Climate Change Initiative" (CCCI). SUD-Net is an innovative approach to re-invent networking by exchanging specific knowledge and best practices among and beyond networks, international and national organizations and institutions, local governments, universities and other research and training institutes, the private sector and the public. SUD-Net is starting with an initiative on "Cities in Climate Change" (CCCI), which will contribute to strengthen the ability of local governments to mitigate and adapt to climate change, which will in turn introduce the urban dimension into the Asian Regional and global discussions on climate change.

2. Objectives of the SCP-Asia Regional Expert Group Meeting:

The meeting will bring together the core SCP-Asia Expert Group of at least one leading urban EPM practitioner and one representative from a national anchor institution per country, supported by mayors undertaking good Climate Change practices, selected central/federal governments, heads of international support programmes to achieve the following objectives:

- To review, consolidate and validate SCP-Asia's partners' collective ability to ***upscale*** the innovations and demonstrations promoted through application of EPM processes into significant physical improvements to the lives of the urban poor, strengthened application of management ***tools*** (such as Environment Management Information Systems), supported by appropriate ***policy and legislative changes*** at the local, national and global levels, and ***institutionally anchored*** nationally and in UN-Habitat's Regional Office for Asia and the Pacific (ROAP). In the process to synthesise **"Factors of Success"** resulting from the past 10 years of programme implementation in the region.
- To link SCP-Asia EPM achievements and lessons of experience to current discussions and experiences on climate change mitigation and adaptation, support SCP-Asia and other Regional partner networks to apply these good practices to address the challenges of Climate Change Impacts by and on Cities within the framework of UN-Habitat's recently launched Cities and Climate Change strategy, SUD-Net and its supporting "Cities in Climate Change Initiative" (CCCI). Encourage regional partners to join the UN-Habitat SUD-Net/CCCI, and start to build an "**Asian Knowledge Sharing Platform"** for policy dialogue and collective action in support of Cities addressing Climate Change Impacts, particularly by ***raising awareness*** on likely climate change impacts globally, regionally and nationally; ***mapping*** national policy and city mitigation/adaptation responses and regional climate change support programmes;
- To develop a SCP/CCCI-Asia **"Transition Strategy"** to support Cities addressing Climate Change Impacts by ***reviewing*** how SCP-Asia could be strengthened/re-tooled to better respond to the new challenges, and ***discussing*** the next steps for a UN-HABITAT supported CCCI-Asia

The results and outcomes will be synthesised and reported to the SCP Strategic Advisory Committee Meeting during WUF4 in Nanjing (Day 1), and at the Oslo Climate Change Initiatives in Cities Meeting on World Habitat Day 2008 and SUD-Net Steering Group (Day 2/3).

3. Structure of the SCP-Asia Regional Expert Group Meeting

The meeting will be structured into plenary sessions, targeted presentations and roundtable discussions. Partners will share their SCP/EPM experiences of the past 5-10 years at the local, national and international levels; and strategise how to make best use of these experiences and lessons learned and to link up with other Asia Regional Support Programmes to support Cities addressing Climate Change Impacts through SUD-Net/CCCI. The Regional workshop is organised as follows:

DAY 1 (26th August): Consolidating SCP-Asia's Achievements and Identifying "Factors of Success":

Over the past ten years, the UN-HABITAT Urban Environment Section through SCP/LA21 has supported initiatives for sustainable urbanisation through a new strategy[1] designed to increase the impact of SCP/LA21 at the local, national and global levels. As part of this strategy, support was increasingly decentralized from the Programmes' international core teams to regional and national urban partners' institutions. In most countries where SCP-Asia has been active, urban institutions have been identified and are progressively assuming the role of providing technical support to local authorities and national government. This has significantly increased the capacity of Programme response to requests from local and national governments for EPM support, and strengthened the partner institutions towards becoming EPM anchoring facilities.

This 2008 SCP-Asia Regional Expert Group Meeting offers the opportunity for the SCP-Asia partners to take stock of how the strategy has worked; to what extent SCP-Asia has effectively contributed to improve urban governance, urban planning, environmental management, poverty reduction and especially the lives of urban poor communities. The participants will address the following key questions in preparation for the Meeting, prepare and submit to angela.pinzon@fukuoka.unhabitat.org by 15th August a draft annotated power-point to summarise their country/city achievements for presentation and discussion during the morning of the first day of the event:

- How have community-based demonstration projects been **up-scaled** city-wide, with what demonstrated benefits to the urban poor?
- What **management tools** were used in the process and how are these being applied as a routine?
- How have those experiences been **documented** to support such up-scaling, and thus contributed to **national policy learning and national application** of the lessons learned through the development of policy guidelines and legislative reform?
- How have the EPM experiences been integrated into **teaching curricular** and action research for larger scale professional learning impact?
- How have the SCP-Asia **Anchor Institutions** helped institutionalise, up-scale and replicate at city-level, and mainstreamed lessons learned into national policy dialogues/leading to legislative reforms and their subsequent implementation?
- How well have EPM approaches and methodologies been understood and **integrated into urban planning and management practices** at the city and national-levels?
- How are the experiences continuing to be implemented nationally, is a **"replication strategy"** in place and being implemented?

"Factors of Success" will be synthesised through moderated round-table discussions in the afternoon, with:

- leading urban practitioners reflecting on the following core elements: process, toolkits, expert group, network for City2City exchanges, others (political support, demo-project funds, etc); whilst
- anchor institutions review implementation of the regional anchoring strategy and comment on the draft IHS curricular package[2].

Each participant is to submit their own one-page bulleted reflections on such "Factors of Success" to angela.pinzon@fukuoka.unhabitat.org by 15th August, for prior synthesis to guide discussion during the Meeting

[1] See "Anchoring EPM Capacity in National and Regional Institutions – Strategy and Approach", October 2003; and "SCP Induction Workshop for Anchoring Capacity Building Institutes in Asia", October 2004.
[2] On "City Consultations"

DAY 2 (27th August): Raising Awareness on Cities and Climate Change Challenges – Towards an Asia Knowledge Sharing Platform

In order to mainstream sustainable urbanisation principles and practices globally and regionally, and as part of the implementation of the Medium Term Strategic and Institutional Plan (MTSIP), UN-HABITAT is establishing the Global Sustainable Urban Development Network (SUD-Net). SUD-Net will focus on urban governance, decentralization, and environmental issues - the latter supported by a new "Cities in Climate Change Initiative" (CCCI) which will advise cities on how to mitigate and adapt to climate change through improved urban planning, offering lessons made and best practices from other networking partners. SUD-Net will be based on a website, but also materialize in concrete individual support by UN-HABITAT, coaching and partnering with local authorities to strengthen the local level.

This 2008 SCP-Asia Regional Expert Group Meeting offers the opportunity for the partners to become better informed on Climate Change Impacts in the region, and decide whether and how the SCP/LA21 process (Profile – Consultation – Working groups – Strategies and Action Plans – Institutionalisation) can be strengthened and applied to support cities address the Climate Change Impacts that they face – both by mitigating their own emission of GHGs, as well as developing strategies to adapt to the consequences of Climate Change such as:

- vulnerability to sea-level rise, flood and disaster management,
- water resource management, food security,
- transport and clean air, energy conservation,
- building/settlement design; and solid waste management

Global and Asia Regional Cities and Climate Change issues will be presented to raise partner awareness on the issues, background papers on UN-HABITAT's Cities in Climate Change Strategy, SUD-Net and CCCI will be shared beforehand and introduced during the morning of the Meeting to facilitate partner discussions/linkages with past SCP-Asia activities. As part of this Climate Change awareness raising approach, SCP-Asia participants to the Meeting will be required to prepare and submit to angela.pinzon@fukuoka.unhabitat.org by 15th August a draft power-point that "maps-out":

- national climate change related (mitigation and adaptation) policy and strategies,
- the main partners to be involved along, with what they are doing to mitigate Climate Change Impacts in Cities,
- good practice examples of city-level interventions and actions (including SCP-Asia mitigation/adaptation experiences
- management tools being used and available;

for presentation during the morning of the second day of the event.

Asia's leading Regional Climate Change Support Programmes such as the Clean Air Initiative – Asia Centre; ADB's Energy Efficiency Initiative/Carbon Market; UNEP's Green Buildings Programme; UNESCAPs Clean Development Programme, UCLG-ASPAC and CityNet support to Local Government Associations, as well as exemplar Asian cities addressing Climate Change Impacts will be invited to make presentations of their experiences during the afternoon, to give an over-view of ongoing activities and partnering opportunities.

Day 3 (Thursday 28th August): Developing UN-HABITAT's CCCI-Asia Regional Support Strategy

The SCP-Asia Expert Group will reconvene for a half-day on Thursday to discuss how UN-HABITAT's support through SUD-Net/CCCI could be operationalised in the Region, partnering with on-going initiatives, and building on the SCP-Asia network, experiences, expertise, management tools, etc. In preparation for this, the CCCI project document and ROAP's draft GEF proposal ("Cities addressing Climate Change Impacts in the Asia and Pacific Region") will be distributed as background materials, and each participant is required to prepare and submit to angela.pinzon@fukuoka.unhabitat.org by 15th August their response to the UN-HABITAT's Training and Capacity Building Branch "tools review" questionnaire, along with a bulleted one-pager of suggested core elements that should comprise a **"SCP/CCCI-Asia Transition Strategy"** based upon the following key questions:

- How can SCP-Asia best use its experiences and demonstrated good practices and curricular/tools to better support Cities to address Climate Change Impacts?
- What mechanisms are needed to improve the capacity for SCP-Asia to support Cities addressing Climate Change Impacts (through an improved process, new tools to fill gaps and refocus on Climate Change issues, more specialised expertise, etc)?
- What support is needed from UN-Habitat (ROAP/HQ) to strengthen SCP-Asia's potential support to Cities addressing Climate Change Impacts?

Your responses to the above will be synthesised and summarised as an introduction to a roundtable discussion during the morning to draft a "SCP/CCCI-Asia Transition Strategy", following which the CCCI logframe will be introduced as a basis for more detailed discussions to map out the way forward and next steps.

3. **Draft Workshop Programme**

Day 0 (Monday 25th August): Arrival and Welcome:

19.00 **Welcome Cocktails:** Registration (Angela Pinzon), introduction of participants and welcome remarks (Chris Radford)

Day 1 (Tuesday 26th August): Consolidating SCP-Asia's Achievements and Identifying "Factors of Success"

08.30 **Introduction** to the workshop by Chris Radford: SCP-Dutch programme objectives and expectations

09.00 **Achievements and Lessons Learnt** - Country presentations summarising their experiences, challenges and good practices that demonstrate:

- the ***up-scaling*** of demonstration projects citywide;
- application of management ***tools*** (such as Environment Management Information Systems);
- ***documentation*** of these experiences for city and national ***policy learning, legislative reform and national replication***; and
- how EPM has been ***anchored*** by national capacity-building and research institutions and other partners.

09.00 The **India-SCP** experiences by Dr Sneha Palnitkar
09.20 The **Sri Lanka-SCP** experiences by Dr Fahmy Ismael
09.40 The **Philippines-SCP** experiences by Noel Duhaylungsod

10.00 Coffee Break

10.20 The **China-SCP** experiences by Dr .Li Zhenshan
10.40 The **Thailand-SCP** experiences by Dr Paul Chamniern
11.00 The **Korea-SCP** experiences by Professor Kwi-Gon Kim

12.00 **Discussion** on presentations facilitated by Bernhard Barth

13.00 **Lunch**

14.00 Facilitated **Roundtable Discussions**:

- Urban **EPM practitioners** will summarise "Success Factors" based on the following core elements: EPM process, toolkits, expert group, network for City2City exchanges, others (political support, demo-project funds, etc). Facilitated by Cecilia Njenga
- A separate **"Anchoring Institutions"** group (AIILSG, SLILG/UM, UP-SERD/DILG-LGA, TEI, BU, Korea Eco-City Network) will review implementation of the regional anchoring strategy, including feedback on the first draft curriculum modules by IHS. Facilitated by Bernard Barth

16.00 **Tea Break**

16.30 **Plenary Report-back** on "Success Factors"

17.30 **End of Day 1**

19.00 **Cocktails** to welcome Asia Regional Support Programme and exemplar city representatives by Toshi Noda Director, UN-HABITAT's Regional Office for Asia and the Pacific

Day 2 (Wednesday 27th August): Raising Awareness on Cities and Climate Change Challenges – Building an Asia Knowledge Sharing Platform to support Cities addressing Climate Change Impacts:

08.30 **Introduction to the Workshop,** by Eden Garde, UN-HABITAT Programme Manager, Manila
08.45 **Welcome Remarks,** by Ms Nileema Noble, United Nations Resident Coordinator, Manila
09.00 **Climate Change Impacts in the Philippines**, by Government of Philippines representative, by Sheila Marie M. Encabo, Director,National Economic and Development Authority
09.20 **Cities in Climate Change – The global Perspective**, by Dr Ahmed Iftekhar, Global Cities Institute, RMIT University, Melbourne
09.40 **Cities in Climate Change – An Asian Perspective**, by Kemal Taruc, Environmental Specialist, Indonesia

10.00 **Coffee break**

10.20 **National-level scoping of Cities in Climate Change:** Country presentations summarising the following:
- National policies and strategies to mitigate and adapt to Climate Change Impacts
- Main national partners to be involved, why, and what they are doing
- City-level intervention and actions – case examples including SCP Climate Change experiences
- Management tools being used/available

10.20 **Introduction to the Sustainable Cities Programme-Asia Network activities**, by Dr Fahmy Ismail, Sustainable Cities Programme, Sri Lanka
10.40 **Indian Cities responding to Climate Change Impacts** by Professor (Dr) Sneha Palnitkar, All Indian Institute of Local Self Government, Mumbai, India
11 00 **Sri Lankan Cities responding to Climate Change Impacts** by R.P.K.S Mahanama, Department of Town and Country Planning, University of Moratowa, Sri Lanka
11.20 **Philippine Cities responding to Climate Change Impacts** by Dr Noel Duhaylungsod, Environmental Governance Specialist, Manila, Philippines
11.40 **Chinese Cities responding to Climate Change Impacts** by Dr Li Zhenshan, University of Beijing, China
12.00 **Thai Cities responding to Climate Change Impacts** by Dr Paul Chamniern, Senior Director, Thai Environment Institute, Bangkok, Thailand
12.20 **Korean Cities responding to Climate Change** Impacts by Professor (Dr) Kwi-Gon Kim, Soeul National University, Environmental and Ecological Planning Lab, Seoul, Korea
12.40 **Discussion on presentations** facilitated by Bernhard Barth, Human Settlements Officer, Training and Capacity Building Branch, UN-HABITAT, Nairobi, Kenya

13.00 **Lunch**

14.00 **Regional Programmes supporting Cities to address Climate Change Impacts**
14.00 **UN-Habitat's Strategy on Cities in Climate Change, SUD-Net and its "Cities in Climate Change Initiative"** by Cecilia Njenga, Human Settlements Officer, Urban Environment Section, Urban Development Branch, Global Division, UN-HABITAT, Nairobi, Kenya
14.15 **Coastal Cities and Adaptation Challenges, Ongoing Work in Ho Chi Minh City, Vietnam** by Jay Roop, Environment Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines.
14.30 **Role of Air Quality Management to Mobilise Local Action on Climate Change** by Sophie Punte, Deputy Executive Director, Clean Air Initiative for Asian Cities Centre – CAI-Asia Centre, Manila, Philippines
14.45 **ADB's Energy Efficiency Initiative/Clean Development Mechanism – Reducing Transportation Impacts** by Jamie Leather, Senior Transport Specialist, Regional and Sustainable Development Department, ADB, Manila, Philippines
15.00 **Climate Change Mitigation and Adaptation through Decentralised Solid Waste Management in small towns** by Adnan Aliani, Human Settlements Officer, Poverty and Development Division, UNESCAP, Bangkok, Thailand
15.15 **UNEP's Sustainable Building and Construction Initiative** by Jacob Kurian, Programme Officer, UNEP, Bangkok, Thailand
15.30 **Climate Resilient Cities – Reducing Vulnerabilities to Climate Change Impacts** by Mukami Kariuki, Local Government Programme Coordinator, World Bank, Manila, Philippines
15.45 **Climate Change Initiatives in AIT and some research findings regarding adaptation in Cities** by Edsel E. Sajor, School of Environment, Resources and Development Asian Institute of Technology

16.00 **Coffee Break**
City Support Mechanisms Exemplar Asian Cities present their efforts to address Climate Change Impacts
16.15 **United Cities and Local Governments Perceptions and Actions regarding Cities and Climate Change** by Peter Woods, Secretary General, UCLG-Asia and the Pacific, Sydney, Australia
16.30 **CITYNET in Action on Climate Change** by Ms. Vissia Aldon, City Human Resource Officer and Pasig River Rehabilitation Project Manager, Makati City, Philippines
1645 **Klang Municipality**, by Mr. Somchai Chariyacharoen , Mayor of Klang Municipality, Thailand
17 00 **Mitigating Climate Change: The Makati City Way** by Ms. Mildred Castillo, Head, Support Services Division, Department of Environmental Services, Makati City, Philippines

17.15 **Changwon the Environmental Capital addressing Climate Change Impacts,** by Mr Rim Tae Hean, Director of Environmental Sustainability & Protection Division, Changwon City, Republic of Korea
17.30 **Day's Reflections and Conclusions**, by Bernhard Barth, Human Settlements Officer, Training and Capacity Building Branch, UN-HABITAT, Nairobi, Kenya

19.00 Closing **Cocktails**

Day 3 (Thursday 28th August): Developing UN-HABITAT's CCCI-Asia Regional Support Strategy

08.30 **Introduction** to the **CCCI Log-frame** by Cecilia Njenga
09.00 **Question and Answers** on CCCI facilitated by Bernhard Barth
09.15 **Revisiting Day 1's conclusions:** SCP-Asia "Factors of Success"/"Transition Strategy and Tools Questionnaire facilitated discussion on SCP-partner engagement with CCCI by Bernhard Barth
09.30 **Facilitated Discussion 1** – SCP-partners engagement

10.00 Coffee break

10.15 **Facilitated Discussion 2** – Start-up of Country-level activities
11.00 **Facilitated Discussion 3** – Training tool development
11.30 **Facilitated Discussion 4** – University support and collaboration with Local Government Training Institutes

12.00 **Final reflections** summed up by Cecilia Njenga

13.00 End of workshop **lunch**

SCP-Asia Expert Group participants are expected to return on afternoon flights

5. Results and outputs of the Regional Meetings
The meeting will explore ways to use EPM experience for sustainable urbanization and more specifically for SUD-Net and to support Cities addressing Climate Change. Specific outputs will include:

- Report for the SCP Strategic Advisory Committee Meeting during WUF4 in Nanjing, November 2008 documenting the a**chievements, lessons learnt** and **"Factors of Success"** of SCP-Asia in
    - ***up-scaling*** demonstration projects citywide;
    - supporting city and national ***policy learning, legislative reform and national replication***;
    - and EPM ***anchoring***
- Report summarising the global and Asian "Cities in Climate Change" perspectives, a summary of potential Regional Climate Change Support Programmes, with preliminary scoping of national policies and Cities addressing Climate Change in 6 Asian countries
- The main components of a **SCP/CCCI-Asia "Transition Strategy"** as a contribution to developing a framework for mainstreaming the EPM approach and lessons of experience in support of Cities addressing Climate Change to implement the UN-HABITAT Climate Change strategy and CCCI for Oslo Climate Change Initiatives in Cities Meeting on World Habitat Day, October 2008;
- A report documenting the Regional Meeting.

Sustainable Cities Programme - Asia Regional Meeting: Cities addressing Climate Change Impacts

Manila, August 2008

General Information

Manila City, Metro Manila, Philippines

I.OVERVIEW

Manila is the capital city of the Philippines. But we Filipinos call Manila "The City of Our Affections." This phrase is taken from an old Spanish writings; but it also expresses a modern sentiment.

Manila is all things for all Filipinos. It is the seat government administration, the fashion center, the intellectual pace-setter, the fountain head of all religious and educational movements; and of course, enormous shopping arcades. It is politics and art; markets and churches; banks and universities - the whole life.

For most Filipinos - especially those who have yet visit Manila - it is political and economic summit, the city of dreams. For the millions ekking out living in its slum and for its westernized middle classes; it is an asphalt jungle - gawdy and ruthless but irresistible.

Geography

Manila is actually more than Manila: the metropolis of today not only encompasses the City of Manila, but it includes seven (7) other cities and nine (9) towns.

The City of Manila has an area of 38.3 square kilometer; it is located on the west coast of the Philippine main island of Luzon, surrounded by fertile plains. The city straddles the delta of the Pasig river, a short navigable stream that connects the fresh water lake of Laguna de Bay with Manila Bay and South China Sea.

Population

Manila is home and working place to nearly 2 million industrious, charming and hospitable people; likewise the city is the haven of approximately 3 million day time transients.

Language

Literacy in Manila is relatively high. English spoken in the country, particularly in the city. It is the basic language in business, government, schools and everyday communications.

Climate

Weather condition in Manila is more or less the same as those prevailing in other cities. Due to its lower elevation, the temperature is generally higher; humidity and wind velocity are proportional higher. Manila experiences the highest amount of rainfall in the months as early as the second week of May to October. The number of storms passing the city is the same as those prevailing in the Metro Manila area.

Sustainable Cities Programme - Asia Regional Meeting: Cities addressing Climate Change Impacts

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TIME ZONE

There is only one time zone for the entire country, which is 120° East Meridian Time and eight hours in advance of the Greenwich Mean Time (GMT).

ENTRY REGULATIONS

A valid passport is required.

Except for stateless persons and those from countries with which the Philippines has no diplomatic relations, all visitors may enter the country without visas and may stay for 21 days provided they have tickets for onward journey. Holders of Hong Kong and Taiwan passports must have special permits. Visas and special permits may be obtained from Philippine embassies and consulates.

HEALTH REGULATIONS

A certificate of vaccination against yellow fever is required for travelers coming from infected areas.

AIRPORT INFORMATION

Airport and Facilities: Manila's Ninoy Aquino International Airport (NAIA) is 7 kms. from the city center, while the Manila Domestic Airport is one kilometer from the NAIA. The international airports have adequate traveler facilities: duty-free and souvenir shops, tourist information and assistance counters, hotel and travel agency representatives, car rental services, banks and automated teller machines, postal service, national and international direct dial telephone booths, medical clinics, and baggage deposit areas.

Facilities for the Physically-Handicapped: The airports are handicapped-friendly. Wheelchairs are available on request from the airline ground staff.

Customs: Visitors are advised to fill in the Baggage Declaration Form before disembarking to facilitate Customs examination. The following are allowed duty-free: reasonable quantity of clothes, jewelry, and toiletries; 400 sticks of cigarettes or two tins of tobacco; two bottles of wine or spirits of not more than one liter each. Porterage: Baggage carts are available for free. Porter services are also free. Tipping is traditional.

Check out Airline Flight Schedules

Airport Transfers: Visitors are advised to avail of accredited fixed rate or metered taxis at the NAIA's Arrival Area. At the Manila Domestic Airport, accredited transfer services are available on pre-paid coupon basis. Other airports are served by metered taxis. All airports have counters for hotel transport and car rental service. Airport Fees: P750 for international departure or its US dollar equivalent as of March 10, 2007, $15.50 US dollars; and P200 for

local departure (paid in Philippine pesos only). Departing passengers for international destinations are advised to check with airport or tourist information counters (Tel. Nos 524-1703; 832-2964) The departure fees may change without further notice.

Automated Teller Machine: American Express

Duty-Free Shopping: Duty-Free Philippines near the NAIA is the country's largest duty-free outlet carrying quality imported items and selected Philippine export products.

CURRENCY

Unit of currency: Peso (P) = 100 centavos. Bank notes: P10, P20, P50, P100, P200, P500 and P1,000. Coins: 5c, 10c, 25c, P1, P5, P10.

TIPPING

Tipping is expected for many services. The standard practice is 10% of the total bill. Tipping is optional on bills that already include a 10% service charge.

LOCAL TRANSPORT

By air, Philippine Airlines (Tel. No. [632] 855-9999) and Cebu Pacific (Tel. No. [632] 702-0888) provided daily services to major cities and towns. Asian Spirit (Tel. No. [632] 851-8888), Laoag International Airlines (Tel. No. [632] 551-9729), and Seair (Tel. No. [632] 891-8708) service the missionary routes. There are also scheduled chartered flights to major domestic destinations serviced by smaller commuter planes.

By sea, interisland ships connect Manila to major ports. Ferry services connect the smaller islands.

By land, Philtranco connects Manila to Bicol in Southern Luzon, to Samar and Leyte in the Visayas, and Davao in Mindanao.

Metered and fixed rate taxis are widely available in key cities nationwide. Jeepneys and buses are inexpensive ways of getting around most places. In Metro Manila, the fastest way of commuting is via the railway system. LRT-1 (yellow line) connects the northern district of Monumento to the southern district of Baclaran with stations situated at major intersections. MRT traverses the length of EDSA and connects North Avenue in Quezon City to Taft Avenue in Pasay City, passing through the major arteries of Makati's financial district. LRT-2 (purple line) starts at the university belt in Recto, passes through Sta. Mesa, Cubao, Katipunan, and ends in Santolan, Pasig.

LANGUAGE

Filipino is the national language. English is the business language and spoken widely.

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ACCOMMODATIONS

In Metro Manila, key cities and towns throughout the country, a wide selection of de luxe, standard, economy, and pension-type accommodations are available. In island destinations, there is a variety of resorts ranging from de luxe to special interest category.

The Department of Tourism has a Homestay Program in several destinations outside Manila. The program offers visitors the comfort of modest homes and an insight into Philippine life. For information, contact the Tourist Information Center at Room 106, Department of Tourism Building, tel. nos. (632) 524-2384 / (632) 524-1703.

DINING OUT

Filipino food is an exotic, tasteful blend of Oriental, European, and American culinary influences. There is a wide variety of fresh seafood and delectable fruits. First class restaurants offer gourmet specialties as well as Filipino cuisine.

ENTERTAINMENT AND CULTURE

Metro Manila is the center of entertainment and cultural activities. The premier venue for the performing arts, the Cultural Center of the Philippines, features world-class performances by local and international guest artists. Museums located in Manila and in some parts of the country offer a glimpse of Philippine history and culture. Art galleries exhibit the works of the country's leading and promising visual artists.

Manila's nightlife is one of the most vibrant in Asia, reflecting the Filipino's love for music. The hubs of nightlife activities are the Remedios Circle in Malate, Ayala Center and The Fort at Bonifacio Global City in Makati, Timog and Tomas Morato Avenues in Quezon City, and Eastwood in Libis, Quezon City. Nightclubs, music lounges, pubs, and sing-along bars feature Filipino bands and singers who are known for their great musical talent. De luxe hotels offer a variety of live musical entertainment. Concerts and stage plays form part of the country's entertainment scene.

For visitors who want to try their luck at the gaming tables there are casinos in Metro Manila and in the cities of Angeles, Olongapo, Tagaytay, Cebu, Davao, Bacolod, and Laoag.

SHOPPING

Visitors can choose from an exciting selection of great buys in a country known for export-quality items at reasonable prices: South Sea pearls, handwoven cloths, embroidered fineries, fashionable ready-to-wear and haute couture clothes, terra-cota, porcelain, and home accessories. Artifacts, pineapple fiber shirts, prehistoric jars, native handicrafts, and footwear are interesting items, too. The Philippines also produces fine basketry, furniture, fresh and processed fruits, exquisitely crafted jewelry, and gift items made of wood and stone.

Big malls are located in Manila, Makati and EDSA, while handicraft, antique and curio shops abound at the Ermita District in Manila.

BUSINESS AND BANKING HOURS

Private and government offices are open either from 8:00 a.m. to 5:00 p.m. or from 9:00 a.m. to 6:00 p.m. Some private companies hold office on Saturdays from 9:00 a.m. to 12:00 noon. Most shopping malls, department stores, and supermarkets are open from 10:00 a.m. to 8:00 p.m. daily. There are also 24-hour convenience stores and drugstores nationwide.

Banks are open from 9:00 a.m. to 3:00 p.m., Mondays to Fridays, with automated teller machines (ATM) operating 24 hours.

CREDIT CARDS

International credit cards such as Visa, Diners Club, Mastercard, and American Express Card are accepted in major establishments.

ELECTRICITY 220 volts, A.C. 60 cyles. Most hotels have 110-volt outlets.

WATER

Water in Metro Manila and in key cities and towns is potable and safe for drinking. Bottled water is available in many hotels, restaurants, resorts, supermarkets, and convenience stores.

COMMUNICATIONS FACILITIES

The country has international and national direct dial phone and facsimile services, mobile phone sites, internet and e-mail facilities, and worldwide express delivery service. The postal system is efficient.

Most national dailies are in English. Foreign publications are sold at major hotels, malls, and bookstores in Metro Manila and key cities. There are 7 national television stations which broadcast mainly in Filipino. Cable TV is available in many hotels in Manila and in many parts of the country.

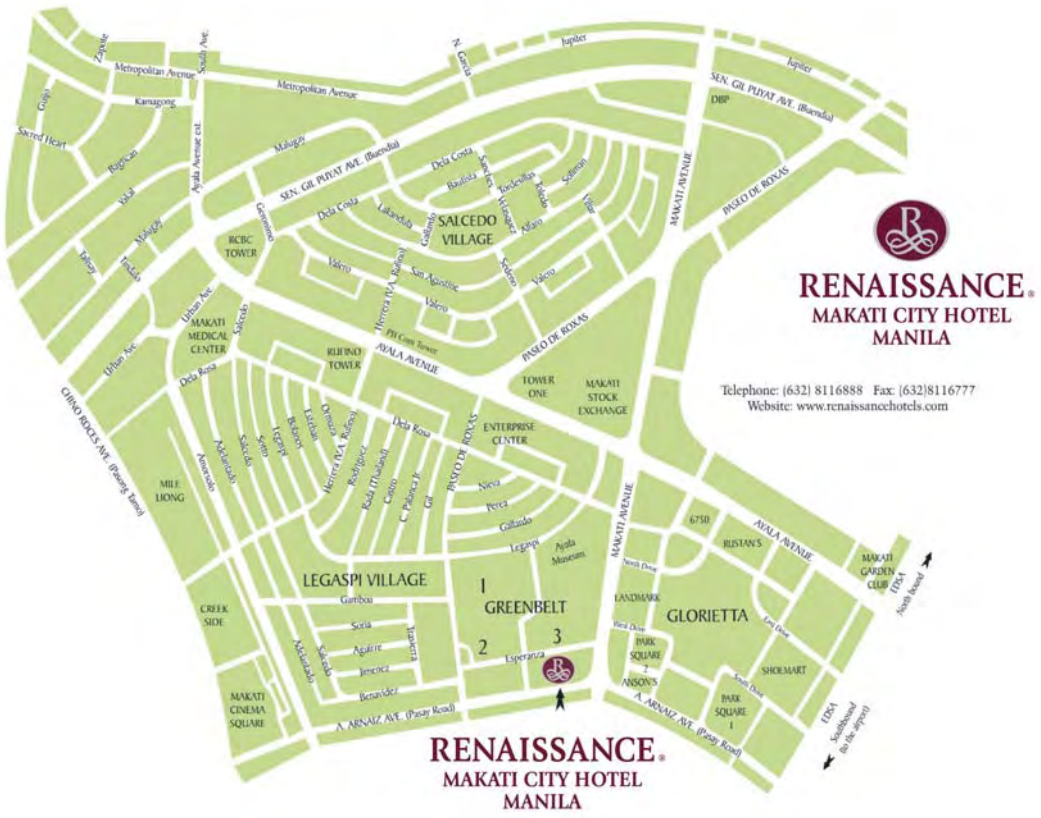
MEDICAL SERVICES

Hospitals in the country are equipped with modern facilities to meet any medical need. In some remote towns and cities, clinics and health centers provide emergency medical attention. Most hotels and resorts provide medical assistance. Hospitals are listed in the "Yellow Pages" of the local telephone directory.

Sustainable Cities Programme - Asia Regional Meeting: Cities addressing Climate Change Impacts

Manila, August 2008

II. The Venue



The Renaissance Makati Hotel In Makati, Philippines Is Located In The Commercial And Financial District Of Makati, Close To Metro Manila's Business District And Shopping, Dining, Entertainment And Cultural Attractions. The Hotel Is Within A Half Kilometer Of Ayala Museum, Glorietta And Greenbelt Park. The Cultural Center Of The Philippines Is 13 Kilometers (Eight Miles) Away. Enchanted Kingdom Is Within 35 Kilometers (22 Miles) And Busy Downtown Manila Lies Approximately 14 Kilometers (Nine Miles) From The Hotel.

Driving Directions From Manila Nonoy Aquino International Airport: Exit To Aquino Avenue, Turn Left To Mia Road. Turn Right To Edsa Left To Arnaiz Avenue. The Hotel Is 3 Blocks North.

Note: All participants will be accommodated at the Renaissance Makati City Hotel Manila
Esperanza Street corner Makati Avenue, Makati City 1228, Philippines
Tel. No.: (632) 811-6888 Fax No.: (632) 811-6777 http://www.renaissancemakatihotel.com

UN-HABITAT
United Nations Human Settlements Programme
FUKUOKA OFFICE

Sustainable Cities Programme - Asia Regional Meeting:
Cities addressing Climate Change Impacts
Manila, August 2008.

An introduction to Climate Change Impacts on Cities in Asia:

A discussion document on how cities should respond

By Angela Pinzon SCP Regional Advisor,
UN-HABITAT Regional Office for Asia and the Pacific
ROAP- Fukuoka.

1.1 Introduction

Over the centuries rising fossil fuel burning and land use changes have emitted, and continue to emit, increasing quantities of "greenhouse gases" (GHG) into the atmosphere, such as carbon dioxide (CO2), methane (CH4), and nitrogen dioxide (N2O). Having the ability to trap the heat GHGs in increasing concentrations have had a warming effect on the atmosphere, resulting in global warming. The main characteristics being increases in sub-regional temperatures; melting of ice caps, glaciers and reduced snow cover; sea-level rise from increases in ocean temperatures and ocean acidity- due to seawater absorbing heat and carbon dioxide from the atmosphere and changes in cloud cover and precipitation particularly over land. (fig1).

Asia accounts for 40 percent of the world's urban population, which will increase to 55% by year 2030. Asian cities will house more than half the world's urban population, 2.66 billion out of a total of 4.94 billion[1]. Whilst urbanisation has brought enormous economic and social benefits to most Asian countries, these benefits are not spread equally: with an estimated 727 million people living on less than $1 a day, and around half living in areas under environmental stress. Moreover, in order to meet the MDG 7/10 of halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015, 675 million people need better access to adequate sanitation, and an additional 616 million need sustainable access to safe water.[2]

According to the Intergovernmental Panel on Climate Change ("Fourth Assessment Report"),[3] the rapid pace of urbanization especially in Asia increases the vulnerability of urban areas to natural and man-made dangers. Given the higher dependency of their economies and societies to climate in the first place most developing countries are more vulnerable to climate change as they are mostly located in tropical and sub-tropical areas.

The urban poor informal settlements are generally built in fragile areas, such us coastal zones, flood prone river valleys and ravines, and geologically unstable slopes which greatly increase their vulnerability. More than 70% of the population in settlements located in South East Asia and the Pacific are most likely to be among the most vulnerable to be flooded due to sea-level rise.

Considering the above circumstances, there is no doubt that local authorities in Asia will be the front line actors to introduce local responses to these global changes. Each local authority will need to assess its own risks and vulnerability, and plan accordingly to cope with climate change impacts (rising sea levels, cyclones, droughts, flooding, environmental refugees etc) in addition to already existing problems. This evidences the urgent need to further support cities and national partners in Asia and the Pacific, to introduce and mainstream adaptation and mitigation measures in city development plans that will allow them to link global concerns to local actions.

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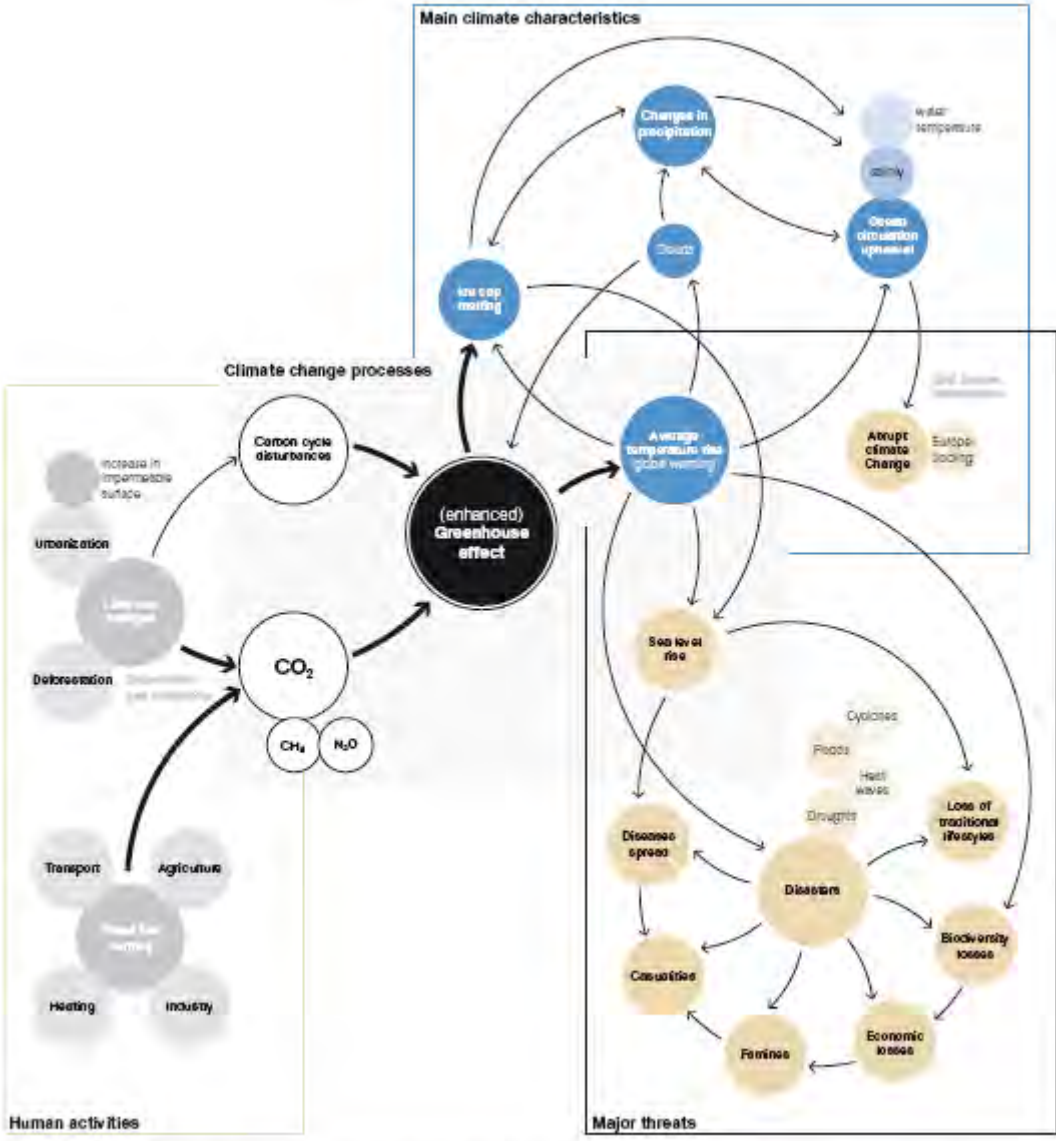
1 United Nations, DESA, Population Distribution, World Urbanization Prospects. The 2005 revision.

2 ESCAP, UNDP and ADB, 2007.Acces to basic services for the poor: The Importance of Good Governance, Asia –Pacific MDG Study Series.

3 Intergovernmental Panel on Climate Change (IPCC), Regional Climate Projections. http://ipcc-wg1.ucar.edu/wg1/wg1-report.html

Fig1 **Climate Change: process, characteristics and threats**



Source: UNEP/GRID-Arendal, 'Climate change: processes, characteristics and threats', designed by Philippe Rekacewicz, UNEP/GRID-Arendal Maps and Graphics Library, 2005, <http://maps.grida.no/go/graphic/climate_change_processes_characteristics_and_threats> (Last accessed 10 October 2007)

1.2 Climatic Zones, trends and impacts in Asia

The specific impacts of climate change on Countries in Asia will differ according to individual circumstances: geographical, social, cultural, economic and political situations, but especially the climatic conditions given that it is the largest continent on earth, spreading over four climatic zones: arid and semi-arid, temperate, north tropical and south tropical as illustrated in figure 2 and table 1 below.

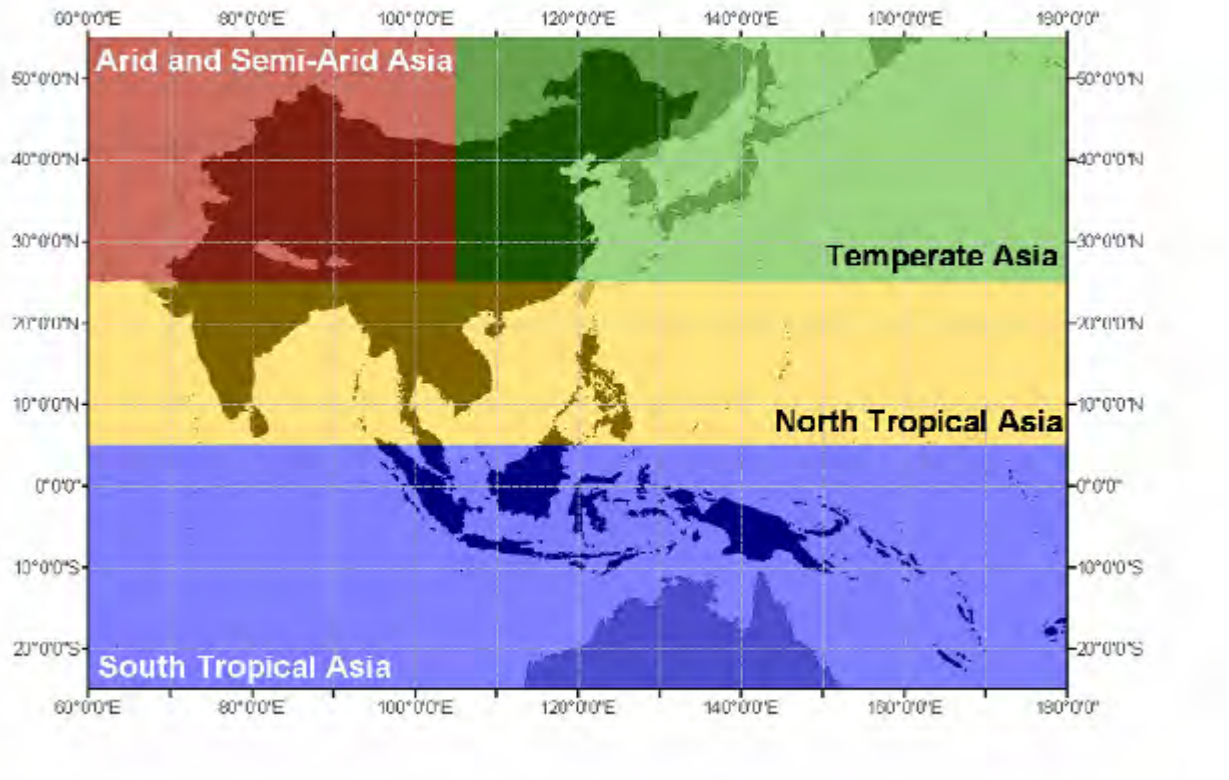


Fig .2 **Climatic Sub-regions in Asia**. Source: Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia.

Table 1. ***Climate trends in Asia`s subregions***.

Climatic Zones	location	Global warming facts	Impacts
Arid and Semi-arid	Northern India and Pakistan, as well as western China.	Central Asia registered a warming of 1-2C during the 20th century. With rainfall increases in most observing stations in Pakistan and up to 22-33% in northwest China.	Increased frequency and severity of wildfires in grass and rangelands. Melting glaciers appear to have increased the frequency of mudflows and avalanches. If continue will impact on urban water resources
Temperate	Tibetan plateau, eastern China, and the Korean Peninsula.	Temperatures in northeast China over 20th century increased in winter but decreased in summer. While southeast China warmed by 1-2C, higher rates of warning (0.16-0.32C per decade) have been observed on the Tibetan Plateau.	Severe flooding has affected Korea, Japan and China in recent years, strongly influenced by the East Asian Monsoon. Episodes of major droughts in China in1972,1978,1997 The occurrence of these more severe droughts and floods is associated with el Niño –southern oscillation
North tropical (NT)	Central and southern India, Sri Lanka, Bhutan, Bangladesh and Southeast Asia (Myanmar, Vietnam, Laos, Cambodia, and Thailand)	Observations indicate temperatures are increasing throughout much of the sub-region. A declining trend in annual rainfall has been observed in Thailand. Elsewhere, including SriLanka and Bangladesh, there few long term trends, sequences of prolonged high rain fall years followed by low rainfall years is appearing.	Tropical Asia is routinely affected by climate extremes particularly floods, droughts and Cyclones. The number of disasters has increased steady over the past 50 years. Vast areas of some tropical Asia nations are prone to flooding including 3.1 million hectares of Bangladesh and 40 million hectares of India.
South Topical (ST))	Maldives, Malaysia Philippines, PNG, Cook Islands, Fiji, Vanuatu, Tuvalu)	Observations indicate temperatures are increasing throughout much of the sub-region Records indicate that rainfall has decreased in the southwest Pacific	The economies within this region are based largely upon rural agricultural systems. And also contains some of the world's largest and most densely populated cities. A rise in sea levels would displace 24 million people in India, Bangladesh and Indonesia. Whilst relatively less sea level rise impact is expected in Cambodia Vietnam and the Philippines(TER); some pacific nations will disappear all together

Table1, drawn from CSIRO 2006 report on Climate Change in Asia/Pacific Region and IPCC reports (Regional Climate Projections 11.4 Asia & 2001 Climate Change Report WGII), lists the different impacts and projected future impacts in each climatic sub-region .

1.2 Projected impacts of climate change in Asia

Climate variability is projected to compound the current pressures on natural resources and the environment resulting from rapid urbanization, industrialization and economic development, exacerbating existing environmental, social and economic problems and bringing new challenges.

Since 1990, Asia has seen around 90% of the world's disaster-related deaths and these events are becoming more frequent. Between 2000 and 2005, the region suffered from 192 floods a year, but in2006 the number rose to 226. In 2007 floods displaced over 20 million people in northern India, Bangladesh and Nepal.[4] The scale of devastation in urban populations within Asia caused by extreme weather events in recent years highlights its vulnerabilities. Moreover, the projections (table1) on climate change impacts expose the potential risk of hundreds of million of urban dwellers in low and middle income nations.

However, Climate Change impacts are not totally negative as many countries will also receive potential benefits from some expected changes, as suggested in the fig 3 below, although at a regional level studies suggest overall economic loss

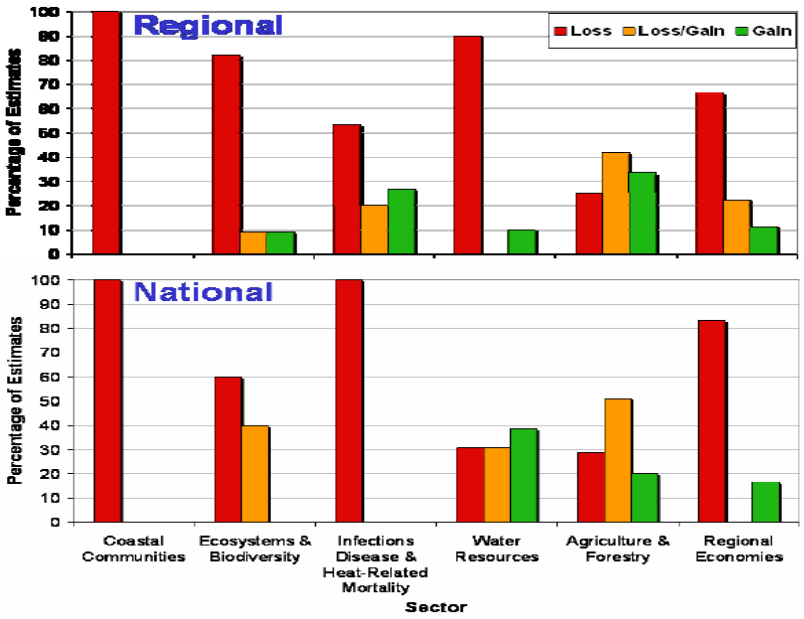


Fig3. **Indicators of vulnerability of several Asia Pacific sectors to Climate Change**. Individual estimates(n=186) of climate change impacts are presented as a percentage of sectoral estimates that reflect losses from climate change, gains from climate change or potential for both gains and losses depending upon study assumptions. Source: (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia.

Complementary to the above, regional studies also predict that not all changes will be negative; growing seasons may lengthen with better rains in some areas, or increasing temperature may deliver increased crop, livestock and fisheries yields have been predicted to increase in northeast China. However, predicting what any of these changes are in the short term is currently speculative, and beneficial impacts are likely to be overweight by the adverse impacts of unpredictable change[4]

Water resources

Maintaining the security of water resources is a priority for any population and climate change impacts on water resources may have a broad array of adverse consequences. For instance, rapidly growing settlements in semi-arid areas of developing countries, particularly poor communities that have limited adaptive capacity, are especially vulnerable to declines in water availability and associated increases in the cost of securing reliable supplies.[5]

The number of people in South East Asia living under severe water stress is likely to increase substantially in absolute terms, it is estimated that, under the full range Special Report on Emissions Scenarios (SRES), from 120 milion to 1.2 bilion, and from 185 million to 981 million people will experience increased water stress by the 2020s and the 2050s respectively[6]. The decline in the annual flow of the Red River by 13-19% and that of the Mekong River by 16-24% by the end of the 21st century is projected, and would contribute to increasing water stress[7].

Other particular challenge for water resource management are extreme events, such us prolonged droughts which undermined food security, or extreme rainfall events which increase flood risk. In Asia global warming is causing the melting of glaciers in the Himalayas. In the short term, this means increased risk of flooding, erosion, mudslides in Nepal, Bangladesh, Pakistan and north India during wet season. Any intensification of the monsoon and/or increase in the melting is likely to contribute to further flood disasters in Himalayan catchments. In the long term, global warming could lead to a rise in the snowline and disappearance of many glaciers causing serious impacts on the populations and cities relying on the 7 main rivers in Asia fed by melt water from the Himalayas[8].

Flooding could increase the habitat of the brackish-water fisheries but could also seriously affect the aquaculture industry and its supporting infrastructure, particularly in the heavily populated megadeltas.[9]

The intensification of rainfall leading to floods will put water infrastructure at risk in cities. During floods, water and waste water treatment facilities are often out of service, leaving the population with no sanitary protection.[10]

[4] Department For International Development (DFID) 2004.Report on Climate change in Asia.
[5] IPCC 2008.Technical paper VI: Climate Change and Water, (WGII 7.4).
[6] Arnell,2004:Climate change and global water resources: SRES emissions and socio economic scenarios.
[7] analysis ADB,1994)(WGII 10.4.2)
[8] UNFCC. 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
[9] IPCC. 2008.Technical paper VI: Climate Change and Water
[10] IPCC. 2008.Technical paper VI: Climate Change and Water, (WGII 3.2,3.4.4,8.2.5).

In Asia, the population that will be most affected by climate change with respect to water services are those located in already water-stressed basins of southern Asia and northern China and particularly those living in megacities, rural areas strongly dependent on ground water, small islands and in glacier- or snowmelt-fed basins.[11]

It is expected that Asia will be facing chronic food and water insecurity, epidemic diseases which may impede economic development in some nations, while degraded landscapes and inundation of populated areas by rising sea levels may ultimately displace millions of individuals, forcing intra and inter-state migration [5)]. Challenges to water resource management will be also be exacerbated by sea-level rise which contributes to salt-water intrusion into available fresh water resources[12].

Coastal zones

The IPCC has developed different scenarios on the possible rate of Sea Level Rise (SLR) until the year 2100. Projecting changes by 9-88 cm with a total rise of up to 1m is possible by the year 2100(relative to 1990). In addition to coastal inundation, climate change- induced sea-level rise will exacerbate local tides to affected coastal communities and ecosystems in Asia.

It is expected that tens of millions of people in low-lying coastal areas of south and Southeast Asia will be affected by sea level rise and an increase in the intensity of tropical cyclones. Most at risk are the low-lying river deltas of Bangladesh, India, Vietnam and China, the Philippines, as well as small island states Fig4.
Coastal inundations are likely to seriously affect the aquaculture industry and infrastructure particularly in heavy-populated megadeltas. Equally the stability of wetlands, mangroves and coral reefs will be increasingly threatened.[13]
Bangladesh is one of the most commonly-cited examples of a nation with a high degree of vulnerability to sea-level rise. Estimates of the effects of a 1 metre rise in sea-level of Bangladesh indicate the loss of approximately 30,000 Km2 of land area to permanent inundation. Subsequent erosion of the remaining coastline would contribute to further land loss, resulting in the displacement of millions of people including many cities, loss of high-value agricultural land, intrusion of saline waters into surface and groundwater, increased risk of backwater effects that exacerbate flood risk, loss of coastal vegetation and forest)[14]

Large sections of Mumbai, Dhaka and Shanghai are only 1 to 5 meters above the sea level. Thus Mumbai is likely to suffer from more serious storm surges and increased frequency and intensity of extreme weather; it is expected that those low-income households living in informal or illegal settlements, will face the greatest risks from SLR and flooding[15].

[11] IPCC,2008 Technical paper VI: Climate Change and Water, (WGII 3.3.3,3.5.1).
[12] IPCC,2008.Technical paper VI: Climate Change and Water, (WGII 3.4.2).
[13] UNFCC, 2007. Report on Climate change: Impacts, vulnerabilities and adaptation in developing countries.
[14] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia
[15] IIED, 2007 Report on Climate Change and Cities: Adapting to Climate Change in Urban Areas "The possibilities and constraints in low- and middle-income nations".

SLR is expected to accelerate the degradation of the coastal and marine resources of coastal cities, especially ports. Such resources are being over exploited in the last decade due to economic forces as well as weaknesses in policies, regulation and information. The multiplicity of institutions and ambiguities in their jurisdictions; and the lack of integrated approaches have increased the management and planning problems of the coastal and marine resources in most developing countries[16]

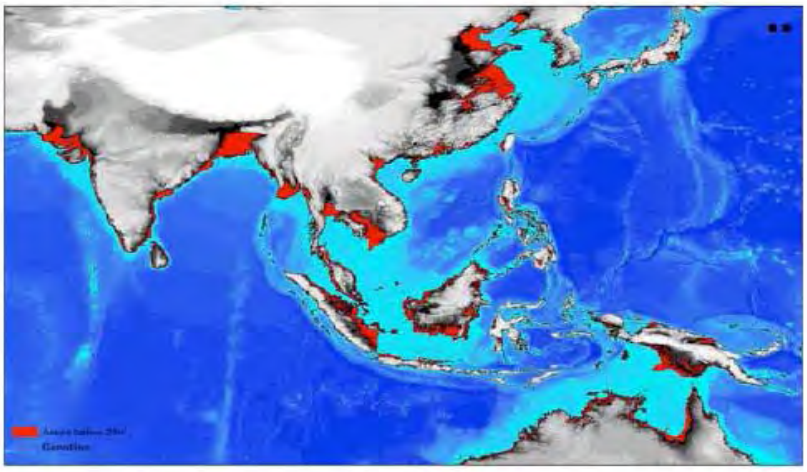


Fig4. **Vulnerability of the Asia Pacific Region to sea-level raise**. Land areas in red are below 20 meters in elevation, highlighting the most low laying areas [17]

Agriculture

Grassland productivity is expected to decline by as much us 40-90 per cent for an increase of temperature of 2-3 C, combined with reduced precipitations, in the semi-arid and arid regions of Asia.[18]

By the 2050s, 50% of agricultural lands are very likely to be subjected to desertification and salinization in some areas.[19]

Agricultural irrigation demand in arid and semi-arid regions of Asia is estimated to increase by at least 10% for an increase in temperature of 1C.[20] In north China, irrigation from surface water and groundwater sources is projected to meet only 70% of the water requirement for agricultural production, due to the effects of climate change and increasing demand[21]

Enhanced variability in hydrological characteristics will be likely to continue to affect grain supplies and food security in many nations in Asia[22]. Moreover, food security is projected to be a major problem in dry areas where agricultural land subject to salinization and erosion reducing crop yields and livestock productivity.[23]

[16] Chistensen et al.(2007). Cruz et al (2007)
[17] Brooks,N., Nicholls,R., and Hall, J (2006). Sea-level Rise: Coastal Impacts Responses. Available at: http://www.wbdgu.de/wbdgu_sn20006_ext03.pdf
[18] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
[19] UNFFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
[20] Fischer et al., 2002a; Liu,2002
[21] (Liu et al.,2001;Qin 2002) (WGII 10.4.1)
[22] IPCC,2008.Technical paper VI: Climate Change and Water (WGII 10.4.1.2)
[23] UNFCC, 2007 . Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

Being exposed to various climate hazards, the vulnerability of Asia is also affected by the sensitivity of different nations and sectors to these hazards when they occur. The climate and subsequently agricultural productivity and water resources of South and Southeast Asia are strongly influenced by summer and winter monsoons. Runoff from monsoon rains increases stream and river flows affecting water availability for environmental and human uses. Yet, during times of extreme monsoon years, excessive rainfall contributes to flooding and crop damage. Thus much of Asia`s food and water security in changing climate is likely to be influenced by the effects of global climate on the monsoons[24].

Production of rice, maize and wheat in the past few decades has declined in many parts in Asia due to increasing water stress, arising partly from increasing temperatures, increasing frequency of el Nino events, and a reduction in the number of rainy days[25]

- **Human Health**

Improving the standard of public health in Asia/Pacific is a fundamental development goal, and one which necessitates consideration of a wide range of issues from food security and nutrition, to water resources, to extreme weather events[26] Climate change is likely to pose a number of challenges for the region`s public health, in both direct and indirect ways. In fact, work by WHO suggests that climate change has already taken a human toll in the region, largely due to the effects of climate change on infectious disease.[27]

In Asia the principal impacts of climate change on health will be on epidemics of malaria, dengue, and other vector-borne diseases[28]. An increase in the frequency and duration of severe heat waves and humid conditions during the summer is likely to increase the risk of mortality, principally in the old and urban poor populations of temperate and tropical Asia [29].

In May 2002, temperatures in the Indian state of Andhra Pradesh reached 49C, Poor labourers and rickshaw drivers formed the highest proportion of the 1,000 people who died.[30] High temperatures and poor urban air quality such as in Chongqing, China and in Jakarta, Indonesia, could contribute to widespread heat stress and smog induced illness in urban populations[31] The risks to life and human settlements will be higher due to increases in the intensity of tropical cyclones[32]

- **Environmental displacements of human populations**

Unregulated migrations in response to climate change- induced displacement may contribute to national and sub-regional security issues as migrants move to new areas without social support mechanisms or sufficient resources to assimilate or establish stable communities[33]. This may be particularly problematic and will add

[24] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia
[25] IPCC, 2008 .Technical paper VI: Climate Change and Water.
[26] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia
[27] Patz,J.A, Cambell-Lendrum,D,and Foley, J.AS, 2005.Impact of regional climate change on human health.
[28] Martens P, Kovats R S, Nijhof, de Vries P, Livermore M T J, Bradley D J, Cox J and Mchel A . 1999. Climate Change and future populations at risk of malaria. Global environmental Change.
[29] EpsteinY, Sohar E and ShapiroY.1995. Exceptional heatstroke: a preventable condition. Journal of medical science,Israel.
[30] For news stories in this event see http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?id=3943&method=full.
[31] (Cruz et al.2007)
[32] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
[33] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia

pressures to recipient cities in Asia, exacerbating current challenges on ecosystems goods and services, water resources, public health, infrastructure and land- use planning and emergency management elevating human security concerns.

Environmental displacements of human populations may result from three basic causes: short-term events such as natural disasters, long-term environmental change that induces individuals to move away from degraded environments that can no longer sustain the population, and development of new infrastructure for environmental management. It is estimated that approximately 150 million individuals would be affected in various countries in the Asia/Pacific region by a metre of sea-level rise.[34] Moreover, since urban growth in Asia is projected to continue in the coming decades, the vulnerabilities of urban populations in low and middle income nations and how they are managed will have large implications for the development of appropriate adaptive strategies.

Failures in food and water security, natural disasters, and progressive degradation of ecosystem goods and services are all factors that can act to undermine human security, and threaten the health and sustainability of urban and rural communities of entire nations.[35]

- **Biodiversity**

It is expected that there will be a northward shift of the boreal forest in north Asia, although the likely increase in the frequency and extent of forest fires could limit this expected forest expansion. The risk of extinction for many species will increase due to the synergistic effects of climate change and habitat fragmentation.[36]
Indeed, impact assessment studies have identified four key ecological aspects were Asia/Pacific will be most vulnerable: coral reef communities, mangrove wetlands, tropical and temperate forests, and high altitude montane species. Changes in the high altitude biomes of the Tibetan Plateau may see desert and steppe systems give away to forest and grasslands. However, the existing grasslands of Arid Asia and the boreal forest of China are projected to decline, while wildfires and dieback may affect some tropical forest[37].

NOTE: It is important to note, however, that the impacts of climate change will not be isolated within individual sectors. In reality, the individual sectors identified above are interconnected. Water resources, agriculture and economy growth can not be separated from the health of human populations and urban/rural communities, in the same way that rising sea-levels and coastal erosion will degrade coastal wetland ecosystems and habitats as readily as they will undermine human settlements and enterprises.

[34] Nicholls ,R.J ,1995. Synthesis of vulnerabilityanalysis studies. In preparing to Meet the Coastal Challenges of the 21st Century, Vol1, the Netherlands.
[35] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia
[36] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
[37] Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2006, Report on Climate Change in Asia/Pacific Region, Australia

2. Response to Climate Change Impacts at the City level: Adaptation and Mitigation Frameworks

The lives and livelihoods of hundreds of million of people will obviously be affected by what is done (or not done) in urban centers with regard to climate change over the next 5-10 years. Urban centers are key players both in the generation of greenhouse gases and strategies to reduce this generation, especially in reducing dependence on carbon-based fuels.[38] They are also the concentrations of a large portion of those who are most at risk from the effects of climate change –and the enterprises that generate most of the world`s GDP, which will pay for both mitigation and adaptation responses. Whilst the need for city/ municipal governments and civil-society groups to act to reduce greenhouse- gas emissions is well established, and with many city governments in Asia already acting on this, the felt overarching need is to act to reduce urban residents` vulnerability to the many direct and indirect impacts of climate change. In addition , most of the urban centers (and nations) that face the highest risks from the negative effects of climate change are those with almost negligible contributions to the greenhouse gases in the atmosphere; most also have serious constraints on their adaptive capacity[39].

IPCC's Fourth Assessment Report presents the different aspects of climate change, the evidences of current and projected future impacts, spotlighting the zones or groups most affected. It emphasised the importance of responding to climate change by adapting to its impacts, and by reducing GHG emission (mitigation), while also noting that the capacity to adapt and mitigate is dependent on socio-economic / environmental circumstances and the availability of information and technology.[40]

The 13th Conference of the Parties to the United Nations Framework Convention of Climate Change (UNFCC) at Bali in December 2007 re-confirmed the increased willingness of city governments to take action in addressing climate impacts. At the Bali conference, Member States agreed on a road map of the key issues to be negotiated by the end 2009. These included adapting to negative consequences of climate change such us drought and floods, reducing GHG emissions; and widely deploying climate-friendly technologies and financing both adaptation and mitigation approaches[41]. Similarly, the C40 Climate Leadership Group of Large Cities (including Bangkok, Hanoi, Hong Kong, Jakarta, Seoul, Shanghai, and Tokyo from East Asia) are cooperating to reduce green house emissions[42].

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38 Romero Lankao , Patricia ,2007." Are we missing the point? Particularities of urbanization, sustainability and carbon emissions in Latin American cities", Environment and Urbanization. Vol 19, No1.

39 International Institute for Environment and Development (IIED), 2007.Human Settlements Discussion Paper Series: Climate Change and Cities-1.

40 Technology is identified as the practical application of knowledge to achieve particular tasks that employs both technical artifacts (hardware, equipment0 and (social) information (software, know –how for production and use of artifacts)

41 ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity.

42 World Bank,2008. Climate Resilient Cities: Premier Reducing vulnerabilities to Climate Change Impacts and Strengthening Disaster Risk Management in East Asian Cities.

The rapid pace of urbanisation in Asia with concentration of an ever-increasing share of the population, which is highly dependent on natural resources in order to continue to grow and develop will limit the capacity to adapt to environmental change especially in LDCs. Thus, it is even more important that the urban poor should be supported to manage climate risk, which requires understanding people's vulnerabilities to cope with external impacts, integrating local coping strategies, and making the best use of traditional knowledge in synergy with government and local interventions[43].

Successful national economies will increasingly depend on well-functioning and resilient urban centers. Urgent action therefore is needed to address current city vulnerabilities to extreme weather, and to build into expanding urban centers their capacity for protection from likely future changes. Most buildings and infrastructure have long lives; what is built now needs to be able to cope with climate change- induced risks over the next few decades; whilst Ninety-nine percent of households and business in low-income nations do not have disaster insurance, a fact which threatens national financial institutions each time there is a major disaster[44]

To fully address climate change in the region, governments need to better integrate their macro economics, social and environmental policies. Doing so includes the need for measures to integrate economic and fiscal policies with industrial development, pollution control, energy use, urban planning and development, agricultural and water management, health and sanitation, forestry and natural resource management. [45]

Systematic planning and capacity-building are needed to reduce the risk of disasters and raise the resilience of communities to the likelihood of increasing extreme events such as droughts, floods and tropical cyclones at the city level. International assistance to support adaptation in the context of national planning and for sustainable development, more capacity-building, and the transfer of modern technology is also necessary[46].

2.1 Adaptation Strategies, Plans and Programmes

The most effective adaptation approaches for developing countries are those addressing a range of environmental stresses and factors. Strategies and programmes need to link with coordinated efforts aimed at poverty alleviation, enhancing food security and water availability, combating land degradation and reducing the potential loss of biological diversity and ecosystem services; as well as improving adaptive capacity among the responsible and affected stakeholders; urban poor communities, local/national government, NGOs, etc.[47] Adaptation actions that reduce existing climate vulnerability and mainstream climate change into existing activities also contribute to reduce future vulnerability to climate change (Table2).

[43] Department For International Development (DFID) 2004.Report on Climate change in Asia.
[44] IIED, 2007 Report on Climate Change and Cities: Adapting to Climate Change in Urban Areas "The possibilities and constraints in low- and middle-income nations".
[45] ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity.
[46] ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity.
[47] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

Table2. **Adaptation Measures in key vulnerable sectors highlighted in national communications of developing countries**

Vulnerable sectors	Reactive adaptation	Anticipatory adaptation
Water Resources	– Protection of groundwater resources – Improved management and maintenance of existing water supply systems – Protection of water catchment areas – Improved water supply – Groundwater and rainwater harvesting and desalination	– Better use of recycled water – Conservation of water catchment areas – Improved system of water management – Water policy reform including pricing and irrigation policies – Development of flood controls and drought monitoring
Agriculture and food security	– Erosion control – Dam construction for irrigation – Changes in fertilizer use and application – Introduction of new crops – Soil fertility maintenance – Changes in planting and harvesting times – Switch to different cultivars – Educational and outreach programmes on conservation and management of soil and water	– Development of tolerant/resistant crops (to drought, salt, insect/pests) – Research and development – Soil-water management – Diversification and intensification of food and plantation crops – Policy measures, tax incentives/subsidies, free market – Development of early warning systems
Human health	– Public health management reform – Improved housing and living conditions – Improved emergency response	– Development of early warning system – Better and/or improved disease/vector surveillance and monitoring – Improvement of environmental quality – Changes in urban and housing design
Terrestrial ecosystems	– Improvement of management systems including control of deforestation, reforestation and afforestation – Promoting agroforestry to improve forest goods and services – Development/improvement of national forest fire management plans – Improvement of carbon storage in forests	– Creation of parks/reserves, protected areas and biodiversity corridors – Identification/development of species resistant to climate change – Better assessment of the vulnerability of ecosystems – Monitoring of species – Development and maintenance of seed banks – Including socioeconomic factors in management policy
Coastal zones and marine ecosystems	– Protection of economic infrastructure – Public awareness to enhance protection of coastal and marine ecosystems – Building sea walls and beach reinforcement – Protection and conservation of coral reefs, mangroves, sea grass and littoral vegetation	– Integrated coastal zone management – Better coastal planning and zoning – Development of legislation for coastal protection – Research and monitoring of coasts and coastal ecosystems

Source: National communications of non-Annex I Parties[31] and UNFCCC Sixth compilation and synthesis of initial national communications from Parties not included in Annex I to the Convention. Note by the secretariat. Addendum 5. Climate change impacts, adaptation measures and response strategies[32]

[31] <http://unfccc.int/2674.php>
[32] <http://maindb.unfccc.int/public/adaptation>
[33] <http://unfccc.int/3633.php>
[34] <http://unfccc.int/2979.php>
[35] <http://unfccc.int/resource/docs/2005/sbi/eng/18a05.pdf>

Despite the fact that that adaptive capacity is slowly increasing in some parts of Asia, for example the success of early warming systems for extreme weather events in Bangladesh and the Philippines, capacity is still constrained due to poor resource bases, inequalities in income, weak institutions and limited technology[48]. Urgent action is needed to address not only current city vulnerabilities, but also to build into expanding urban centers better protection against likely future changes.

[48] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

Cities need to understand their local climate better and thus be able to predict local climate change. Hence the need to national meteorological centers and other specialized centers for systematic observations of national and local climate systems. Information gathering-data should constitute the city knowledge base, providing inputs for climate models and thus plan adaptation options. The major climate variables include temperature, ***rainfall, sea surface temperature, sea level rise, wind speeds, tropical cyclones (including hurricanes and typhoons) snow and ice cover***.

Interestingly the World Bank on the report on Climate Resilient Cities,2008[49] suggests that the city information base should include the following:

- **City/community base Map** which represents the graphic representation of the layout of the city /community which includes built environment, land resources.(community boundary, roads, houses, community buildings and facilities, vacant land.
- **City/community socio-economic Profile Map** which shows economic activities, vulnerable population, population statistics.
- **City hazard profile map** which registers potential hazard-affected areas and locates potential climate change impacts through the development of scenario planning. (Natural hazards including earthquakes, floods, storm surges, typhoon, tsunamis etc.)
- **The future growth Map**
- **City Institutional Map**

The report also recommends preparing a City Typology and Risk Characterization Matrix with the following contents:

- City description / geographical location of the city
- Size and main characteristics of the city area and population.
- Governance structure as related to disaster risk management
- Financial resources of the city
- Built environment
- Political and economic impact of disasters
- Hazards and disaster response system
- Climate Change Impacts

In Asia, the Beijing Climate Center has some regional climate programmes with other Asia developing countries such as the Islamic Republic of Iran, Nepal, Sri Lanka and Uzbekistan.[50] Collaboration between national and international providers of climate information and the users in all sectors of such information for adaptation to

[49] World Bank,2008. Climate Resilient Cities: Premier Reducing vulnerabilities to Climate Change Impacts and Strengthening Disaster Risk Management in East Asian Cities.

[50] UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

change is vital, as well as generating awareness among different user communities of the usefulness of climate information[51]. There is a need to open similar exchanges among Asian cities.

At the UNFCC Asia workshop 2007, vulnerability and adaptation assessments were identified as vital tools for developing countries to evaluate and implement responses to climate change. Assessment of impacts and vulnerabilities to climate change and the development of adaptations require good quality information carefully packaged, including city description, climate data and the current situation of different sectors such as water resources, agriculture, food security, coastal zones, human health, biodiversity, natural hazards, and climate change impacts. The tables 3 and 4 of paragraphs 2.4 and 2.5 below provide a broad overview of different frameworks/ toolkits for climate change management.

As described above, adaptation to climate Change requires local knowledge, local competence and local capacity within local governments and communities. It needs households and community organizations with the knowledge and capacity to act. It also requires a willingness among local governments to work with lower income groups.

The choice of adaptation interventions depends on natural local circumstances. To enable workable and effective adaptation measures, city governments, local research institutions non-government organizations, and civic society as a whole must consider integrating climate change in their planning and budgeting in all levels of decision making[52]. Thus adaptation to climate change is clearly linked to all sectors of development and environmental management and should promote broad based partnerships whilst capitalizing contributions of the private enterprises through corporate social responsibility ventures.

However, improving adaptive capacity in Asia involves much more that executing a particular adaptation project. Instead, it is fundamentally a process of building working institutions that have knowledge and the ability to manage the process of climate adaptation, as well as generating the resources (human, technical and financial) to implement adaptation actions. Hence improving the adaptive capacity of Asia/Pacific nations requires continued economic development that will lead to the establishment of robust institutions, infrastructure, and the growth of human and financial capital.

51 UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.
52 UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

Fig 5. Selected examples of planned adaptation by sector .Source IPCC 2007

Sector	Adaptation option/strategy	Underlying policy framework	Key constraints and opportunities to implementation (Normal font = constraints; *italics = opportunities*)
Water {WGII, 5.5, 16.4; Tables 3.5, 11.6,17.1}	Expanded rainwater harvesting; water storage and conservation techniques; water reuse; desalination; water-use and irrigation efficiency	National water policies and integrated water resources management; water-related hazards management	Financial, human resources and physical barriers; *integrated water resources management; synergies with other sectors*
Agriculture {WGII 10.5, 13.5; Table 10.8}	Adjustment of planting dates and crop variety; crop relocation; improved land management, e.g. erosion control and soil protection through tree planting	R&D policies; institutional reform; land tenure and land reform; training; capacity building; crop insurance; financial incentives, e.g. subsidies and tax credits	Technological and financial constraints; access to new varieties; markets; *longer growing season in higher latitudes; revenues from 'new' products*
Infrastructure/ settlement (including coastal zones) {WGII 3.6, 11.4; Tables 6.11, 17.1}	Relocation; seawalls and storm surge barriers; dune reinforcement; land acquisition and creation of marshlands/wetlands as buffer against sea level rise and flooding; protection of existing natural barriers	Standards and regulations that integrate climate change considerations into design; land-use policies; building codes; insurance	Financial and technological barriers; availability of relocation space; *integrated policies and management; synergies with sustainable development goals*
Human health {WGII 14.5, Table 10.8}	Heat-health action plans; emergency medical services; improved climate-sensitive disease surveillance and control; safe water and improved sanitation	Public health policies that recognise climate risk; strengthen health services; regional and international cooperation	Limits to human tolerance (vulnerable groups); knowledge limitations; financial capacity; *upgraded health services; improved quality of life*
Tourism {WGII 12.5, 15.5, 17.5; Table 17.1}	Diversification of tourism attractions and revenues; shifting ski slopes to higher altitudes and glaciers; artificial snow-making	Integrated planning (e.g. carrying capacity; linkages with other sectors); financial incentives, e.g. subsidies and tax credits	Appeal/marketing of new attractions; financial and logistical challenges; potential adverse impact on other sectors (e.g. artificial snow-making may increase energy use); *revenues from 'new' attractions; involvement of wider group of stakeholders*
Transport {WGII 7.6, 17.2}	Realignment/relocation; design standards and planning for roads, rail and other infrastructure to cope with warming and drainage	Integrating climate change considerations into national transport policy; investment in R&D for special situations, e.g. permafrost areas	Financial and technological barriers; availability of less vulnerable routes; *improved technologies and integration with key sectors (e.g. energy)*
Energy {WGII 7.4, 16.2}	Strengthening of overhead transmission and distribution infrastructure; underground cabling for utilities; energy efficiency; use of renewable sources; reduced dependence on single sources of energy	National energy policies, regulations, and fiscal and financial incentives to encourage use of alternative sources; incorporating climate change in design standards	Access to viable alternatives; financial and technological barriers; acceptance of new technologies; *stimulation of new technologies; use of local resources*

Note:

Useful methodologies for assessing adaptation options include both top-down and bottom-up approaches. Top-down methodologies include the use of modeling and scenario analysis which can provide useful backgrounds to decision making, and is strong in terms of the biophysical aspects of impacts, but do not perform well in representing human interactions and local activities to adapt. Hence as a complement any bottom-up approach is needed to build up upon local coping strategies, indigenous knowledge and technologies, local institutions and sectors in responding to current climate variability[53].

An example of this approach is UNFCCC's National Adaptation Programmes of Action (NAPAs) for use by LDCs to identify their urgent and immediate adaptation needs. The priority projects identified by NAPAs include[54]:

- Improved forecasting for farming, extreme events and disaster management
- Improved water management for drinking and agriculture by understanding water flows and water quality, improved rainwater harvesting, water shortage, and diversification of irrigation techniques;
- Improved food security through crop diversification, developing and introducing drought, flood and saline-tolerant crops, improving livestock fisheries breeding and farming techniques, developing local food banks for people and livestock, improving local food preservation;
- Better land and land use management through erosion control and soil conservation measures, agro forestry and forestry techniques, forest fire management and finding alternative energy sources to wood and charcoal, as well as better town planning;
- Coastal zone management including coral, mining monitoring, reef restoration, and improving coastal defenses through forestation, reforestation, set-back areas and vegetation buffers;
- Improved health care through flood shelters and assistance shelters as part of community emergency preparedness programmes, better health education, better access to primary health care such as distribution of treated mosquito nets and better malaria surveillance programmes and habitat clearance;
- Capacity building to integrate climate change into sectoral development plans, involving local communities in adaptation activities, raising public awareness and education on climate change, and enabling representation at international meetings and promotion of sustainable tourism.

Since the NAPAs have been a good framework for LDCs, NAPA need to be adapted to cities planning and decision making process through City Adaptation Programmes of Action and locally focused LAPAs (Local Adaptation Programmes for Action)[55].

53 UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

54 UNFCC, 2007. Report on Climate Change: Impacts, vulnerabilities and adaptation in developing countries.

55 IIED, 2007 Report on Climate Change and Cities: Adapting to Climate Change in Urban Areas "The possibilities and constraints in low- and middle-income nations".

Recommendations from the Asia workshop (UNFCCC2007).

- Improve observations and data availability, including islands, mountainous and coastal ecosystems, at the national regional and global levels/ harmonization and consistency of data provided from the different sectors
- Improve and strengthen the Global Climate Observing System observational networks (CapB on information analysis)
- More capacity building and transfer of technology and funds
- Systematic planning and capacity building to reduce the risk of disasters and raise the resilience of communities to increasing extreme events such as droughts, floods and tropical cyclones.
- Exchanging information on tools used on vulnerability and adaptation assessments to improve capacity building
- Develop a higher resolution regional center for climate impact studies
- Establish a roster of experts with specialized skills
- It is important to link climate vulnerability to socio-economic studies and long-term periodic and socio-economic assessments. Preserving indigenous knowledge that is relevant to community level responses and gender specific vulnerabilities.

Insurance measures

Promoting insurance-related actions can be beneficial for many developing countries by transferring risk from possible climate change impacts. According to the Convention (article 4.8) insurance related actions constitute one of the three main means of response to the adverse effects of climate change alongside funding and technology transfer[56].

One of the benefits of promoting insurance-related actions is that it may help advance efforts on quantifying risks and potential losses due to climate change. Thus insurance rates could reflect mitigation measures such as the implementation of hazard plans, forecasting and warning systems, undertaken by a community, individuals, governments and stakeholders[57].

Micro financing is also an option for addressing risks. In Bangladesh the micro financing institutions, Proshika and Grameen, with their long acquaintance with the impacts of disasters on the poor have started to promote loans to reduce vulnerability to climate change. Loans are available for safer housing, diversifying incomes, from agriculture, and sharecropping to more disaster-proof activities and mobile assets, and for rapid credit to promote fast recovery immediately after disaster.

[56] UNFCC, 2007. Synthesis of outputs of the work of the Least Developed Countries Expert Group, the Consultative Group of Experts on National Communications from Parties not in cluded in Annex I to the Convention and the Expert Group on Technology Transfer,relevant to adaptation planning practices. http://unfcc.int/resource/docs/2007/sbsta/eng/10.pdf>.

[57] The UNEP Financial Initiative (UNEP FI) explores the area of sustainable insurance. (UNEP FI 2007)

Fig6. Possible cost-effective insurance initiatives for developing countries to help adaptation to climate change Source @UNFCC 2007

2.2 Mitigation Strategies, plans and programmes

Almost 90% of global greenhouse gas (GHG) emissions come from five sources: energy (25.9%), industry (19.4%), forestry (17.4%), agriculture (13.5%) and transport (13.1%). Extensive use of fossils fuel, deforestation, agricultural practices, solid and liquid waste disposal are responsible for much of global warming. The emission pattern of GHG in the Asia-Pacific region is quite similar to that found at the global level, except that emissions from land use are much higher than the average whilst those from transport and industry are somewhat lower.[58]

Mitigating global warming requires targeting GHG sources. Moreover since the severest impacts of climate change will come in Asia and the Pacific, the countries of the region need to develop policies that reduce green gas emissions encourage wide deployment of climate friendly technologies, and prepare the region for adaptation to the negative impacts of climate change.[59]

There is high level of agreement and much evidence that a wide variety of national policies and instruments are available to governments to create the incentives for mitigation action. Their applicability depends on national circumstances and an understanding of their interactions, but experiences from implementation in various countries and sectors shows there are advantages and disadvantages for any given instrument fig7.

The challenge is how build human and local government institutional capacities to make best use of these strategies and interventions. Should there be City Mitigation and Adaptation Action plans?

[58] World Resources Institue,2007;Stern,2006
[59] ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity.

Fig 7. **Selected examples of key sectoral mitigation technologies, policies and measures, constraints and opportunities.** Source IPPCC 2007.

Sector	Key mitigation technologies and practices currently commercially available. *Key mitigation technologies and practices projected to be commercialised before 2030 shown in italics.*	Policies, measures and instruments shown to be environmentally effective	Key constraints or opportunities (Normal font = constraints; *italics = opportunities*)
Energy Supply {WGIII 4.3, 4.4}	Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal and bioenergy); combined heat and power; early applications of carbon dioxide capture and storage (CCS) (e.g. storage of removed CO_2 from natural gas); *CCS for gas, biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy, including tidal and wave energy, concentrating solar, and solar photovoltaics*	Reduction of fossil fuel subsidies; taxes or carbon charges on fossil fuels	Resistance by vested interests may make them difficult to implement
		Feed-in tariffs for renewable energy technologies; renewable energy obligations; producer subsidies	*May be appropriate to create markets for low-emissions technologies*
Transport {WGIII 5.4}	More fuel-efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shifts from road transport to rail and public transport systems; non-motorised transport (cycling, walking); land-use and transport planning; *second generation biofuels; higher efficiency aircraft; advanced electric and hybrid vehicles with more powerful and reliable batteries*	Mandatory fuel economy; biofuel blending and CO_2 standards for road transport	Partial coverage of vehicle fleet may limit effectiveness
		Taxes on vehicle purchase, registration, use and motor fuels; road and parking pricing	Effectiveness may drop with higher incomes
		Influence mobility needs through land-use regulations and infrastructure planning; investment in attractive public transport facilities and non-motorised forms of transport	*Particularly appropriate for countries that are building up their transportation systems*
Buildings {WGIII 6.5}	Efficient lighting and daylighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves, improved insulation; passive and active solar design for heating and cooling; alternative refrigeration fluids, recovery and recycling of fluorinated gases; *integrated design of commercial buildings including technologies, such as intelligent meters that provide feedback and control; solar photovoltaics integrated in buildings*	Appliance standards and labelling	Periodic revision of standards needed
		Building codes and certification	*Attractive for new buildings.* Enforcement can be difficult
		Demand-side management programmes	Need for regulations so that utilities may profit
		Public sector leadership programmes, including procurement	*Government purchasing can expand demand for energy-efficient products*
		Incentives for energy service companies (ESCOs)	*Success factor: Access to third party financing*
Industry {WGIII 7.5}	More efficient end-use electrical equipment; heat and power recovery; material recycling and substitution; control of non-CO_2 gas emissions; and a wide array of process-specific technologies; *advanced energy efficiency; CCS for cement, ammonia, and iron manufacture; inert electrodes for aluminium manufacture*	Provision of benchmark information; performance standards; subsidies; tax credits	*May be appropriate to stimulate technology uptake* Stability of national policy important in view of international competitiveness
		Tradable permits	Predictable allocation mechanisms and stable price signals important for investments
		Voluntary agreements	Success factors include: clear targets, a baseline scenario, third-party involvement in design and review and formal provisions of monitoring, close cooperation between government and industry
Agriculture {WGIII 8.4}	Improved crop and grazing land management to increase soil carbon storage; restoration of cultivated peaty soils and degraded lands; improved rice cultivation techniques and livestock and manure management to reduce CH_4 emissions; improved nitrogen fertiliser application techniques to reduce N_2O emissions; dedicated energy crops to replace fossil fuel use; improved energy efficiency; *improvements of crop yields*	Financial incentives and regulations for improved land management; maintaining soil carbon content; efficient use of fertilisers and irrigation	*May encourage synergy with sustainable development and with reducing vulnerability to climate change, thereby overcoming barriers to implementation*
Forestry/forests {WGIII 9.4}	Afforestation; reforestation; forest management; reduced deforestation; harvested wood product management; use of forestry products for bioenergy to replace fossil fuel use; *tree species improvement to increase biomass productivity and carbon sequestration; improved remote sensing technologies for analysis of vegetation/soil carbon sequestration potential and mapping land-use change*	Financial incentives (national and international) to increase forest area, to reduce deforestation and to maintain and manage forests; land-use regulation and enforcement	Constraints include lack of investment capital and land tenure issues. *Can help poverty alleviation.*
Waste {WGIII 10.4}	Landfill CH_4 recovery; waste incineration with energy recovery; composting of organic waste; controlled wastewater treatment; recycling and waste minimisation; *biocovers and biofilters to optimise CH_4 oxidation*	Financial incentives for improved waste and wastewater management	*May stimulate technology diffusion*
		Renewable energy incentives or obligations	Local availability of low-cost fuel
		Waste management regulations	Most effectively applied at national level with enforcement strategies

ESCAP on the report of the Economical and Social Survey of Asia and the Pacific, 2008 suggests a Regional Framework for managing climate change (fig8) which includes measures on the following seven points:

- **Promote eco-efficiency**: Improving energy efficiency could have a triple dividend; enhanced energy security, a better local environment and less GHG emissions. This green growth approach was endorsed by the fith Ministerial Conference on Environment and Development in Asia and the Pacific in March 2005. Specific measures for green growth could include taxing older, less efficient vehicles; offering tax incentives to companies that invest in newer and cleaner technologies, lowering the taxes on low-energy consumption lights and introducing more graded users on electricity. Governments can also promote lifestyles and consumption changes by encouraging civil society organizations to take a more prominent role in advocating environmental sustainability.
- **Go carbon neutral**: Promote partnerships between governments and civil society organizations which could encourage producers in developed countries that sell products in Asia and the pacific to go carbon neutral and induced demand for clean development mechanism (CDM) projects in the region. An easy source of local carbon offsets are sanitation and urban solid waste management.
- **Expand carbon trading**: The CDM is designed to help industrialized countries reduce the costs of meeting their emission targets under the Kyoto Protocol by achieving reductions at lower cost elsewhere. The mechanism allows developing countries to pursue carbon trading and reduces global emissions.
- **Support technology transfers**: The CDM is meant to assist transfer of cleaner technologies to developing countries, but there is also need to promote South-South cooperation within and across regions.
- **Green the land**: Reducing emissions from deforestation and degradation as key approach to mitigating carbon emissions in the post-2012 framework. South and South-East Asia are losing over 28,000 squre kilometers of land every year due to deforestation.
- **Manage waste efficiency**: Urban solid and liquid wastes emit 21 times more potent as GHG than CO2. Converting urban solid wastes into compost and organic fertilizer not only reduces methane emissions but increases soil productivity and reduces the use of chemical fertilizers, keys for adaptation and mitigation fig 8. The government of Andhra Pradesh, India is providing 40-50% financing for projects that turn urban wastewater, particularly from slaughter houses into electricity.

Whilst strongly focused on mitigating GHG emissions, ESCAP also promote the implementation of adaptation measures. The adverse impacts of climate change on agriculture and food security re-affirm the importance on investing in research and development to create drought-resistant and heat- resistant seed varieties. Increased water stress necessitates changing farm practices to suit the changing environment. Sea level rise and the resulting climatic hazards will require greater efforts in early warming sea defense construction and architectural innovation. Natural disasters will be a particular challenge for smaller towns and cities which have concentrated

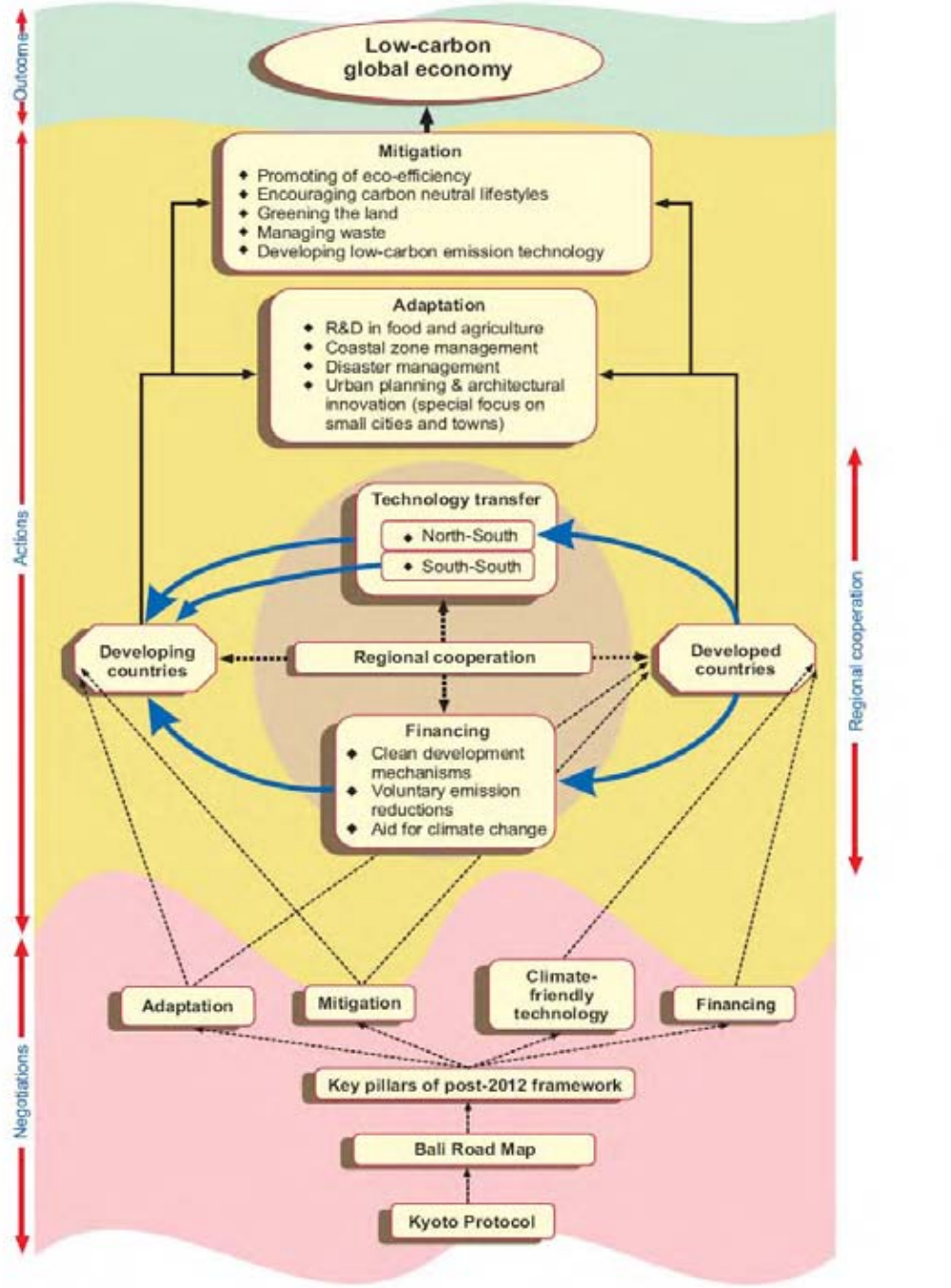
populations and pro poor urban planning. Lacking basic environmental and disaster-management infrastructure and services, these places have much laxer enforcement of building control measures than do larger cities. Almost 50% of the region's urban population lives in such towns and cities[60]. Ideally it makes sense for cities to prepare " City Mitigation and Adaptation Action Plans"

Opportunities for Regional Support to Cities Addressing Climate Change Impacts

ESCAP has recently been advocating for a Regional Climate Change Management Strategy which is illustrated in fig8 :

[60] ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity.

Fig8. Framework for managing climate change. Source ESCAP,2008. Economic and Social Survey of Asia and the Pacific: Sustaining Growth and Sharing Prosperity



2.3 Summary of country-city initiatives in Asia

(TO BE COMPLETED WITH INFO FROM THE WORKSHOP)

City cases	Vulnerabilities	Initiatives on Mitigation	Initiatives on Adaptation

2.4 Preliminary Regional Climate Change Co-operations / Initiatives in Asia

Regional Programmes/ Institutions	Description
APP **Asia Pacific Partnership on Climate Change** .	• An initiative to promote co-operation with respect to clean energy technology. Targets key industrial sectors; members account for 50% of world energy use and emissions (China,India, Japan,USA, Australia, Canada and south Korea) • Each sector has an action plan and projects are being implemented • Focuses on partnerships with business and international organizations
APEC	• **The Asia Pacific Economic Cooperation** Set " aspirational" goal of 25% reduction in energy intensity by 2030 at September 2007 meeting.
CDM initiatives-ADB-	• China, South Korea and India are among the largest hosts of CDM projects in the world
Clinton	• TO BE COMPLETED
Citynet	• TO BE COMPLETED
CAI-ASIA	• TO BE COMPLETED
UCLGASPAC	• TO BE COMPLETED
UN-HABITAT	• TO BE COMPLETED
UNESCAP/	• TO BE COMPLETED
UNEP	• TO BE COMPLETED
World Bank	• TO BE COMPLETED

Other Initiatives	• Australia`s Global initiative on Forest and Climate addressed the impact of deforestation on climate change, partnering with Indonesia • Many countries have bilateral partnerships within Asia, the EU or with the US

2.5 Inventory of Supporting Frameworks and toolkits for Climate Change Assessment

Toolkit	Description	Training available
IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations	The guidelines outline a seven step process 1-definition of the problem 2-selection of methods 3-testing of the methods 4-selection of scenarios 5--assessment of physical and socioeconomic impacts 6-assessment of autonomous adjustments, 7-Evaluation of adaptation strategies. A range of methods is identified at each step Enable comparative estimates of impacts and adaptation in different sectors of regions.	**UNITAR Climate Programme http://unfcc.int/2709.php**
UNDP Adaptation Policy Framework (APF)	Provides guidance on designing and reduce vulnerability to climate change, reducing potential negative impacts and enhancing beneficial consequences of a changing climate. Flexible 5 steps • Defining project scope and design • Assessing vulnerability under current climate • Characterizing future climate related risk • Developing an adaptation strategy • Continuing the adaptation process The framework focuses on the involvement of stake holders at all stages and it can be applied in all sector and all regions particularly developing countries.	**http://ncsp.undp.org/report_detail.cfm/Projectid=151**
Guidelines for the National Adaptation Programmes for Action (NAPA)	This is a programme for LDCs to address their current adaptation needs The guiding elements imply that NAPA process should emphasize: 1-A participatory approach involving stakeholders 2-A multidisciplinary sustainable development 3-Gender equality A country driven approach Sound environmental management 4-Cost-effectiveness 5-Simplicity, and 6-Flexibility The guidelines stress the importance of conducting participatory assessment of vulnerability to current climate variability and extreme events as a starting point for assessing risk due to climate change. Requires Involvement of different stake	**http://www.unitar.org/ccp/napaworkshops.htm,** **http://www.napa-pana.org**

	holders (national, sectoral, local) and including existing coping strategies are an integral part in the assessment process	
Assessment of Impacts and Adaptation to Climate Change in Multiple Regions and Sectors (AIACC)	Global initiative to advance scientific understanding of climate change vulnerabilities and adaptation in developing countries. While it does not prescribe an explicit framework for undertaking vulnerability and adaptation assessment but it does offer a toolkit for researchers useful in the design of projects, as well as tenets of a general approach.	**http://sedac.ciesin.columbia.edu/aiacc/toolkit.html** **other references** **http://aiaccproject.org/meetings/meetings.html** **http://sedac.ciesin.columbia.edu/aiacc**
United Kingdom Climate Impacts Programme (UKCIP) Climate Adaptation; Risk, Uncertainty and Decision Making	Proposes a step-wise approach to vulnerability and adaptation assessment in a risk uncertain decision-making framework. There are eight stages in the framework: 1-identify problems and objectives 2-establish decision making criteria 3-assess risk 4- identify options 5-appraise options, 6-make decision, 7-implement decision 8-monitor,evaluate and review	**http://www.ukcip.org.uk** **other references** **http://www.branchproject.org/documents/final report/Annex1.pdf** **http://** **www.espace-project.org/part1/publications/pdf123.pdf**
World Bank Climate Resilient Cities A premier on reducing vulnerabilities to climate change impacts and strengthening disaster risk management in East Asian Cities	Proposes a guide for local governments in East Asia Region to better understand the concepts and consequences of climate change. The premier is applicable to a range of cities-from those starting to build awareness on climate change to those with climate change strategies and institutions already in place. Provides examples of City profiles.	**www.worldbank.org/eapsd** **www/worldbank.org/eapurban**
ICLEI Guide book for Local, Regional and State Governments	The toolkit focuses on five milestones of preparedness 1.Initiate climate resilience effort 2.conduct a climate resilience study 3. Set preparedness goals 4.Implement the preparedness plan 5. Measure progress and updating. Toolkit developed for the Climate Resilient Communities Program to help governments through the USA to improve their resiliency to climate change impacts.	**http://www.iclei.org**
TCPA (Town and Country Planning Association) Climate change adaptation by design: a guide for sustainable communities	The guide considers how adaptation options are influenced by geographical location and the scale of development. It considers the correlated roles of the planning system, communities, other stakeholders and delivery bodies. Provides	**www.acclimatetise.uk.com**

Annex

Impacts of Climate Change on the Millennium Development Goals

Millennium Development Goal	Potential impacts of climate change
Goal 1 Eradicate extreme poverty and hunger	– Damage to livelihood assets, including homes, water supply, health, and infrastructure, can undermine peoples' ability to earn a living; – Reduction of crop yields affects food security; – Changes in natural systems and resources, infrastructure and labour productivity may reduce income opportunities and affect economic growth; – Social tensions over resource use can lead to conflict, destabilising lives and livelihoods and forcing communities to migrate.
Goal 2 Achieve universal primary education	– Loss of livelihood assets and natural disasters reduce opportunities for full time education, more children (especially girls) are likely to be taken out of school to help fetch water, earn an income or care for ill family members; – Malnourishment and illness reduces school attendance and the ability of children to learn when they are in class; – Displacement and migration can reduce access to education.
Goal 3 Promote gender equality and empower women	– Exacerbation of gender inequality as women depend more on the natural environment for their livelihoods, including agricultural production. This may lead to increasingly poor health and less time to engage in decision making and earning additional income; – Women and girls are typically the ones to care for the home and fetch water, fodder, firewood, and often food. During times of climate stress, they must cope with fewer resources and a greater workload; – Female headed households with few assets are particularly affected by climate related disasters.
Goal 4 Reduce child mortality **Goal 5** Improve Maternal Health	– Deaths and illness due to heat-waves, floods, droughts and hurricanes; – Children and pregnant women are particularly susceptible to vector-borne diseases (e.g. malaria and dengue fever) and water-borne diseases (e.g. cholera and dysentery) which may increase and/or spread to new areas – e.g. anaemia resulting from malaria is currently responsible for one quarter of maternal mortality; – Reduction in the quality and quantity of drinking water exacerbates malnutrition especially among children; – Natural disasters affect food security leading to increased malnutrition and famine, particularly in sub-Saharan Africa.
Goal 6 Combat HIV/AIDS, malaria and other diseases	– Water stress and warmer conditions encourage disease; – Households affected by AIDS have lower livelihood assets, and malnutrition accelerates the negative effects of the disease.
Goal 7 Ensure environmental sustainability	– Alterations and possible irreversible damage in the quality and productivity of ecosystems and natural resources; – Decrease in biodiversity and worsening of existing environmental degradation; – Alterations in ecosystem-human interfaces and interactions lead to loss of biodiversity and loss of basic support systems for the livelihood of many people, particularly in Africa.
Goal 8 Develop a global partnership for development	– Climate change is a global issue and a global challenge: responses require global cooperation, especially to help developing countries adapt to the adverse effects of climate change; – International relations may be strained by climate impacts.

Source: Source: National communications of non-Annex I Parties and UNFCCC Sixth compilation and synthesis of initial national communications from Parties not included in Annex I to the Convention. Note by the secretariat. Addendum 5. Climate change impacts, adaptation measures and response strategies