

Progress in the Implementation of the RAPIDC Programme

Johan Kuylenstierna, SEI

Aspects covered:

- The aims and structure of the RAPIDC Programme
- Progress in PIII 2005 - 2008
- The Future



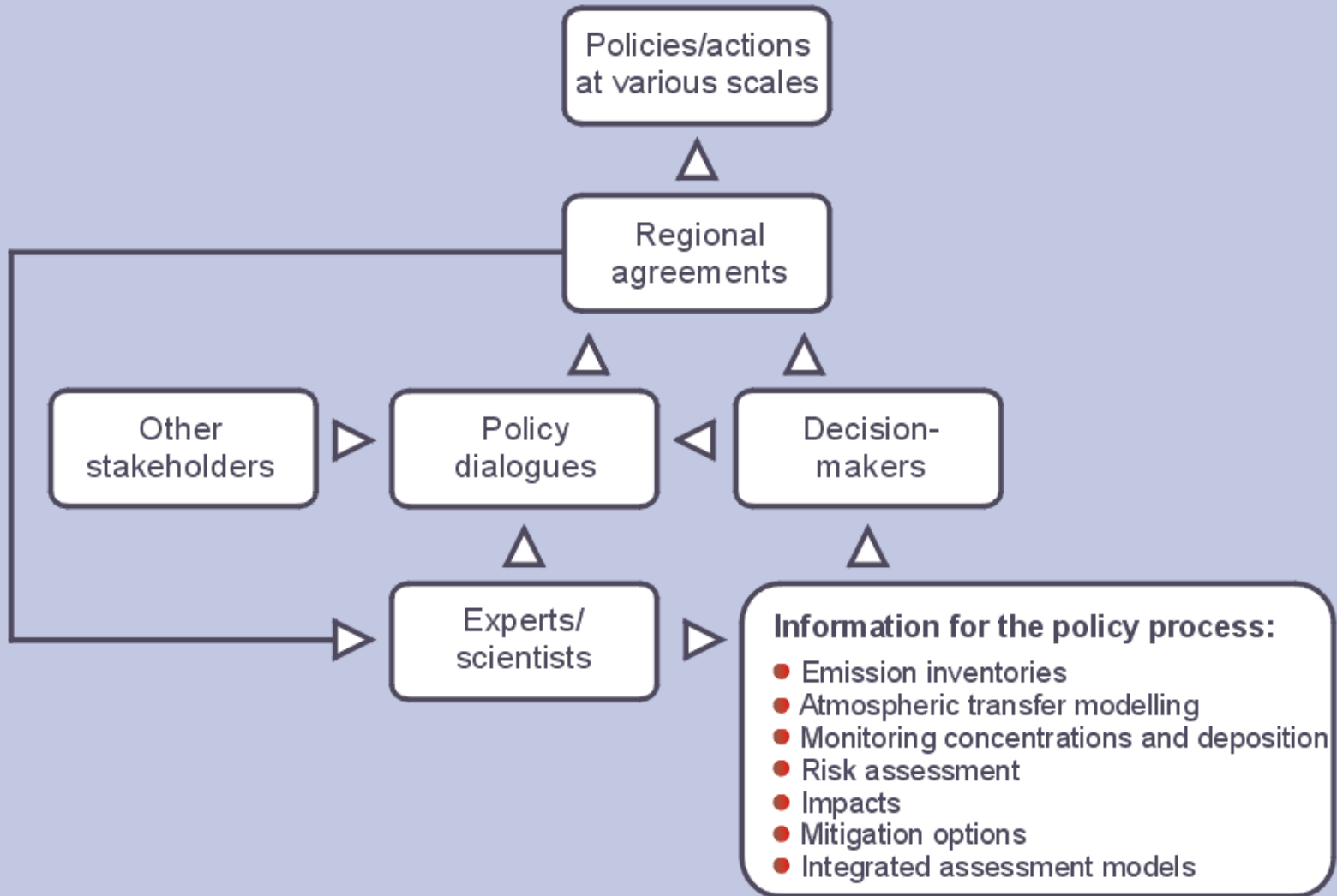


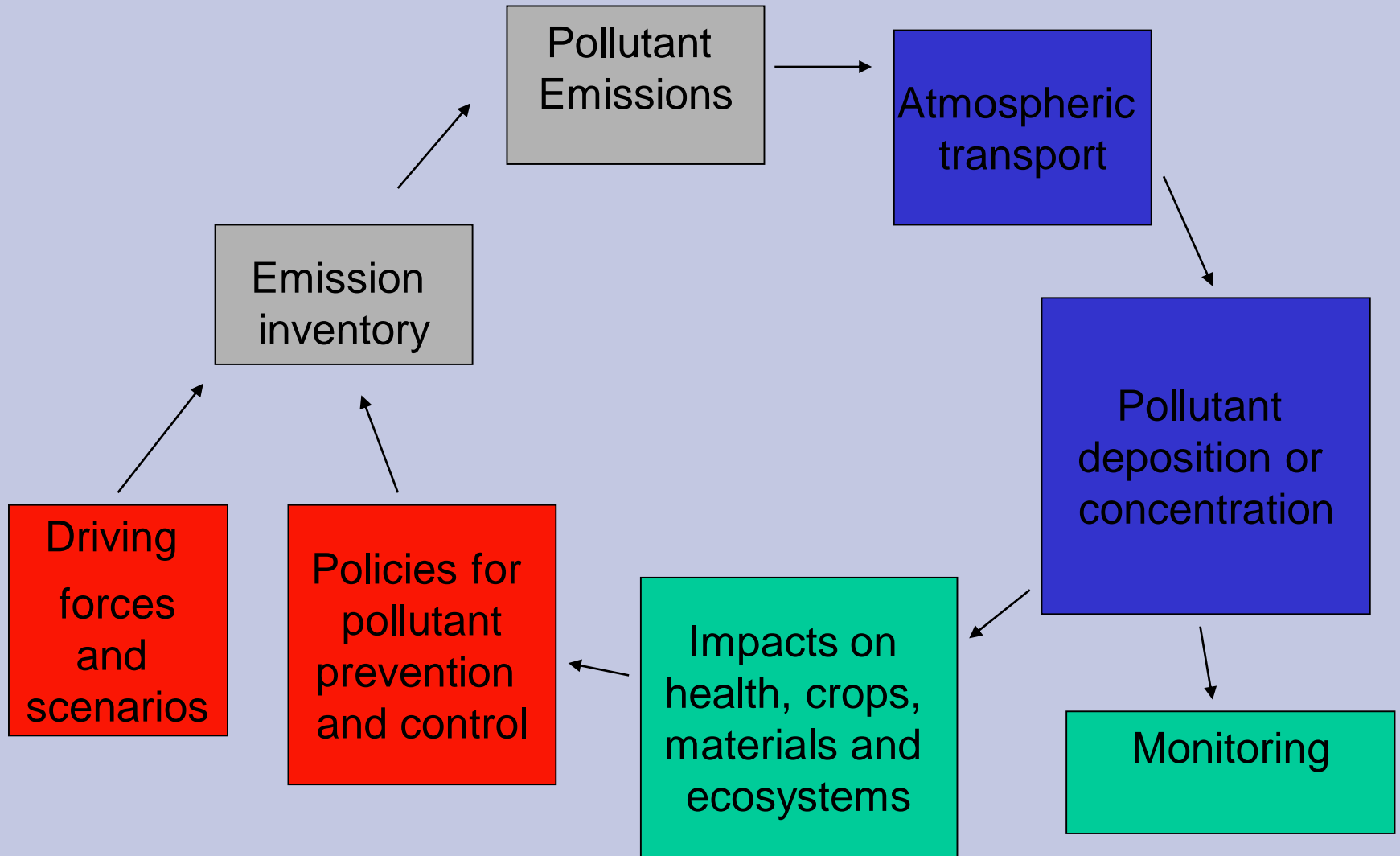
RAPIDC Programme Purpose

‘to facilitate the development of agreements and/or protocols to implement measures which prevent and control air pollution through promoting international cooperation and developing scientific information for the policy process’

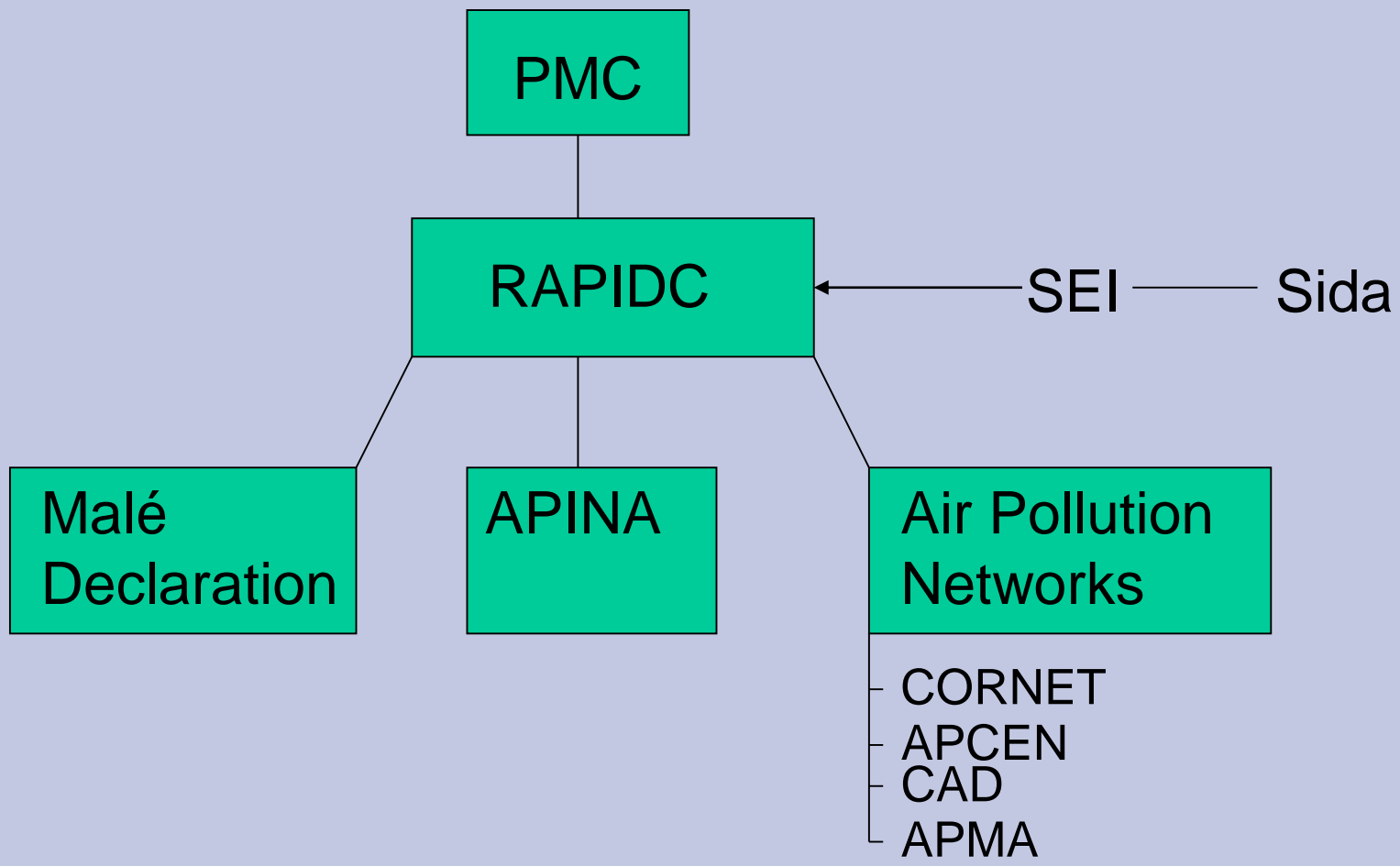


RAPIDC Approach

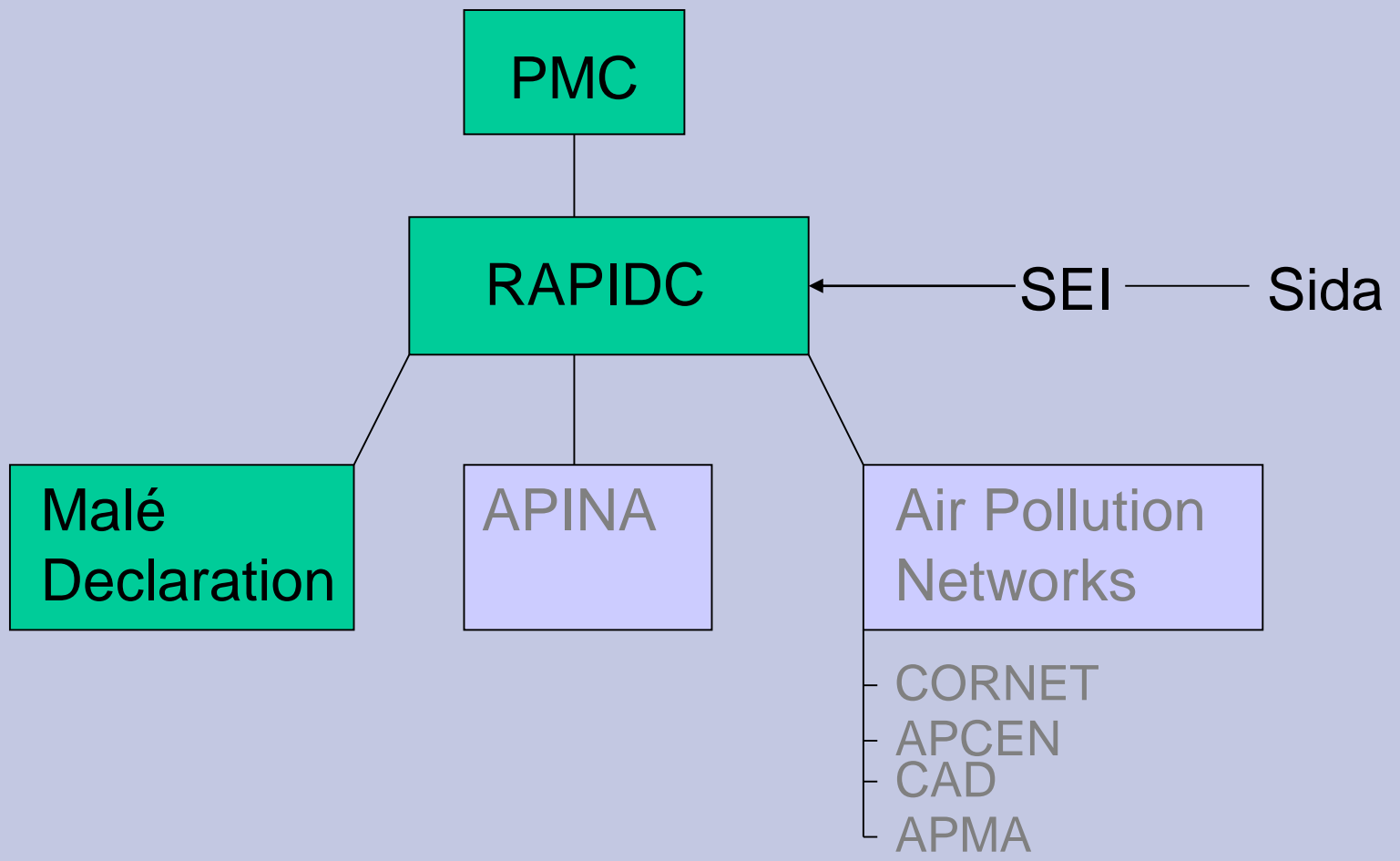


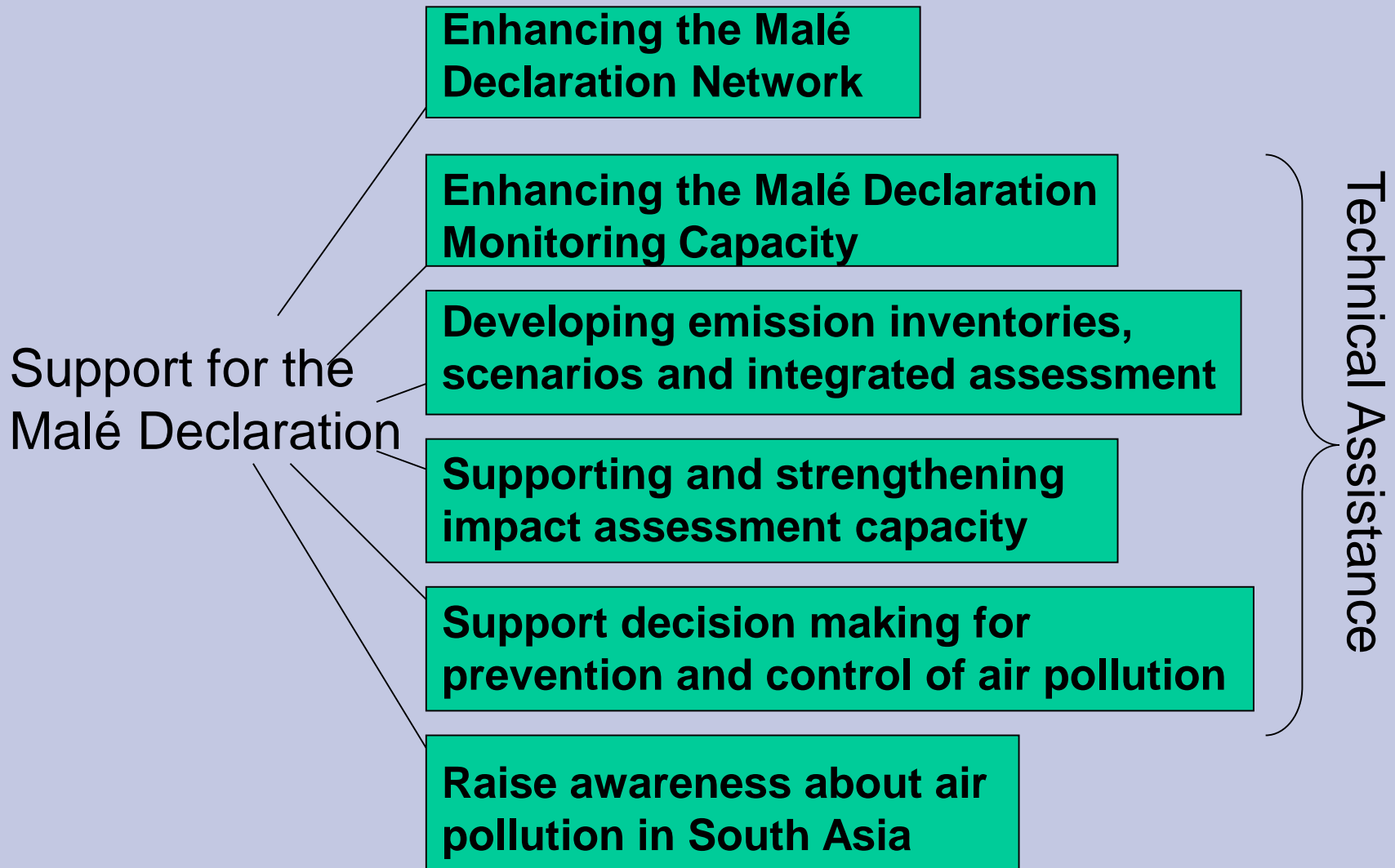


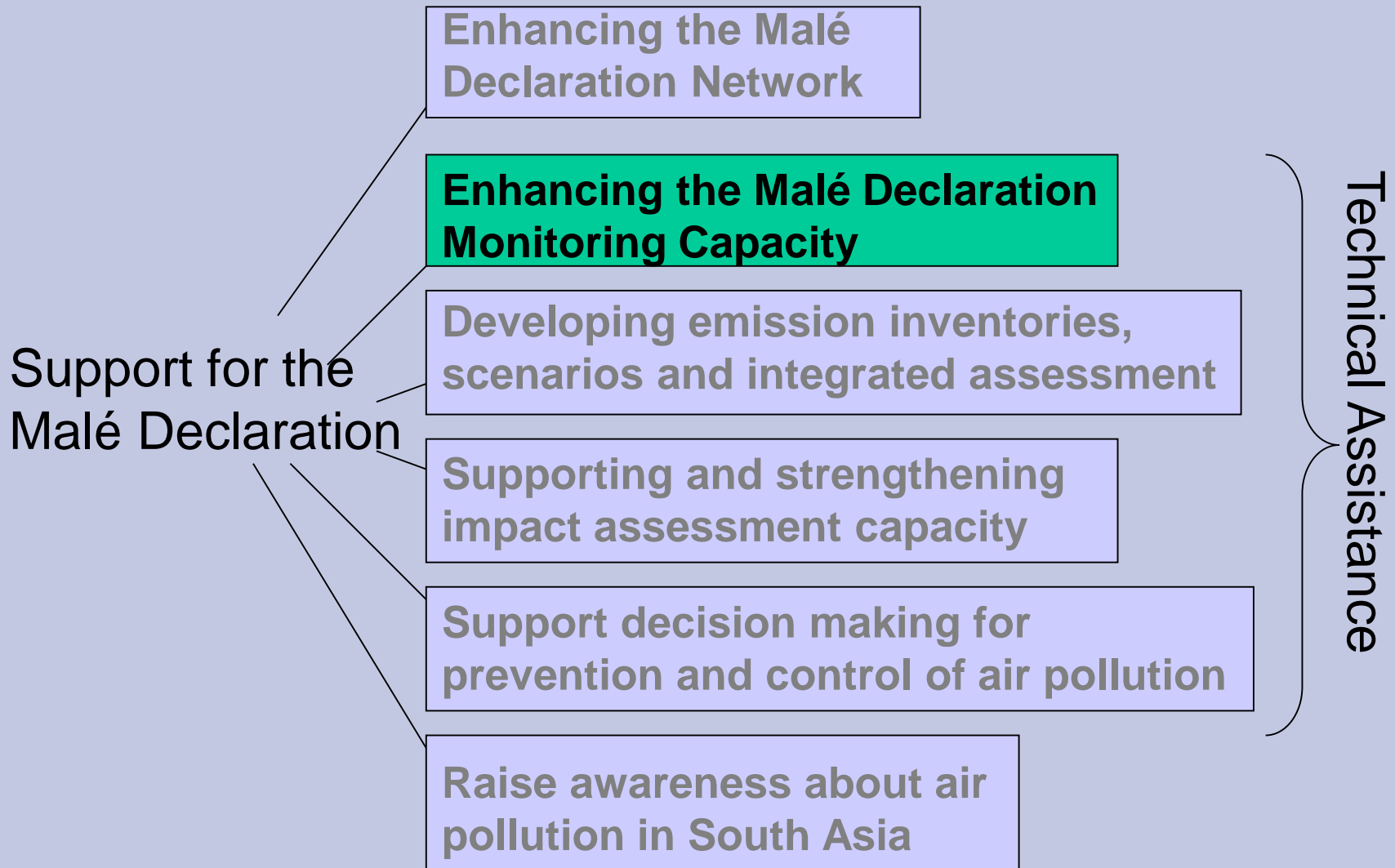
RAPIDC Structure



RAPIDC Structure







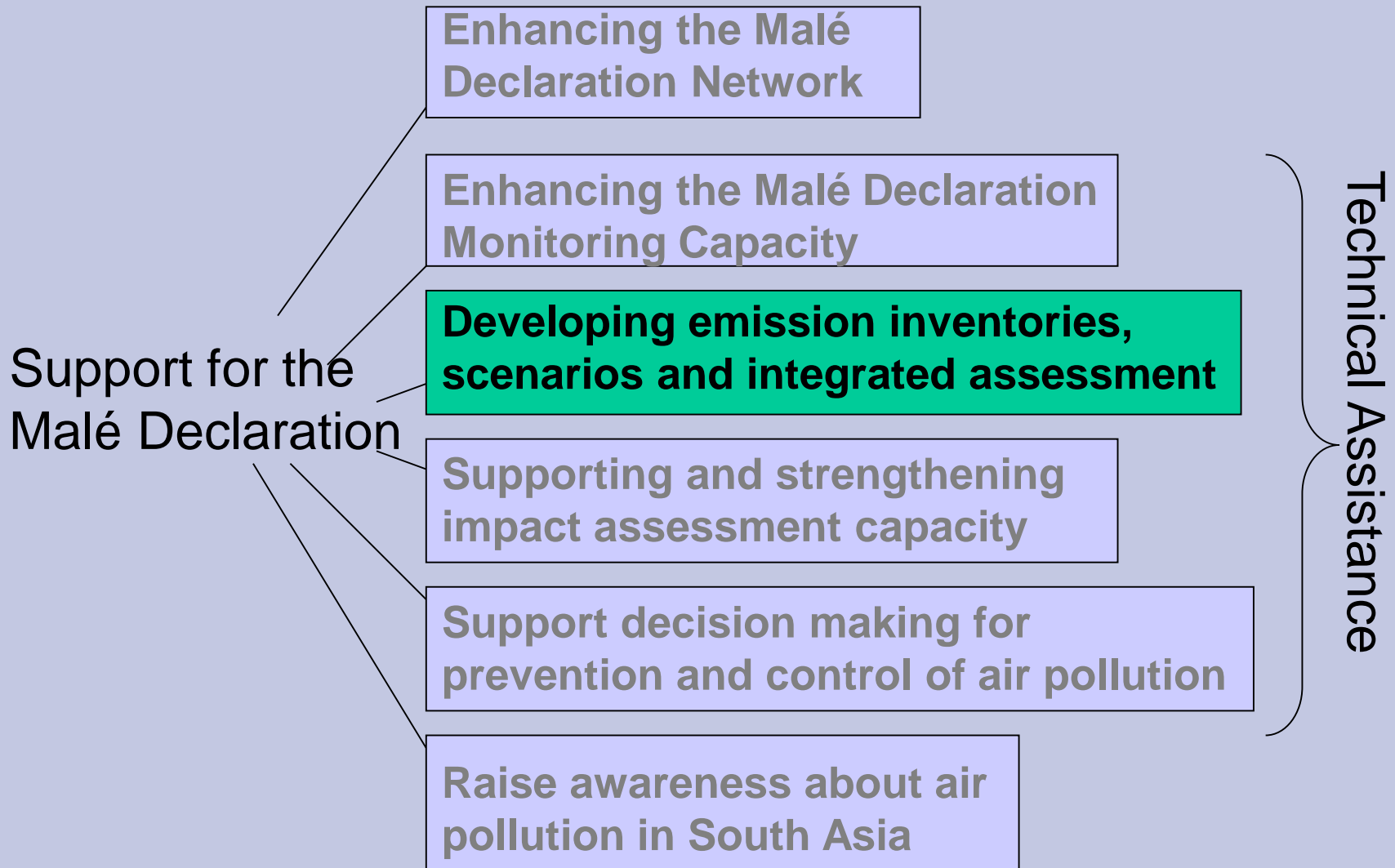
Monitoring

Monitoring Committee Exists to help implementation

Stations have been set up, but not all parameters are being monitored in all stations

training courses and other capacity building developed

Countries must explain their capacity building needs clearly to ensure that all stations function properly



Emission Inventories

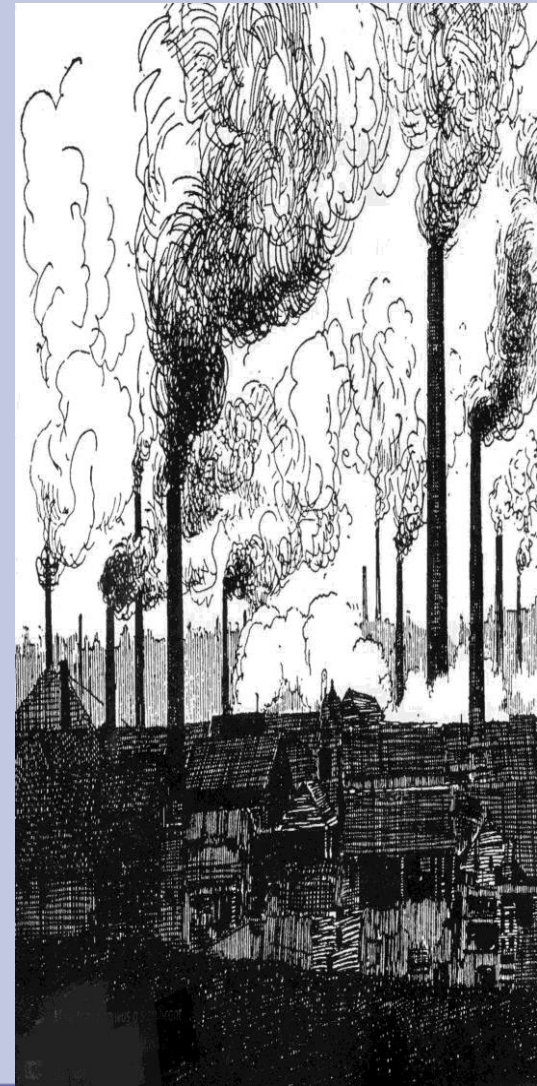
Requests for help in developing emission inventories from NIAs

Manual and workbook developed, coordinated by SEI

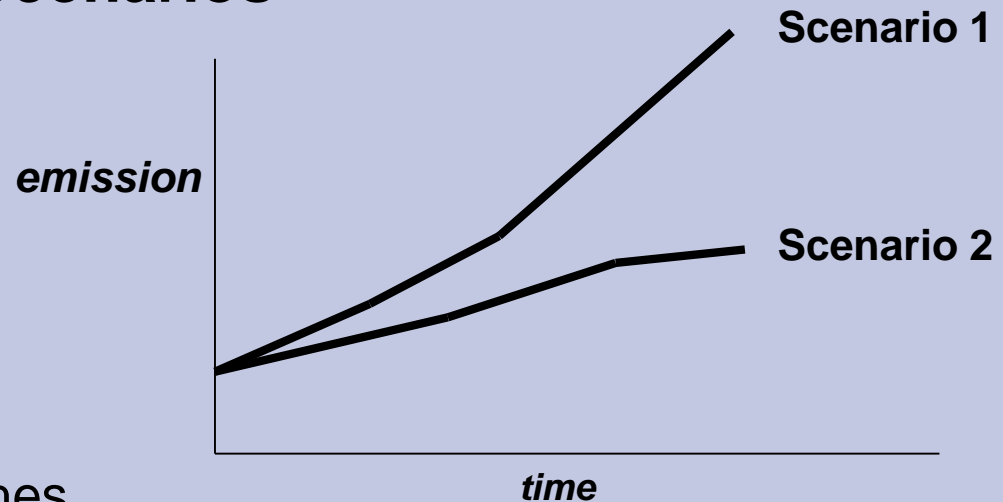
Training courses 2006 (held) and are being developed for 2007

Will help countries to develop the inventories – work plan was agreed by participants by next workshop – need delivery in order to move forward

Essential that same participants come to subsequent training workshops



Emission Scenarios



Requests for help in developing emission scenarios from NIAs

Manual / description of approaches developed by IIIEE

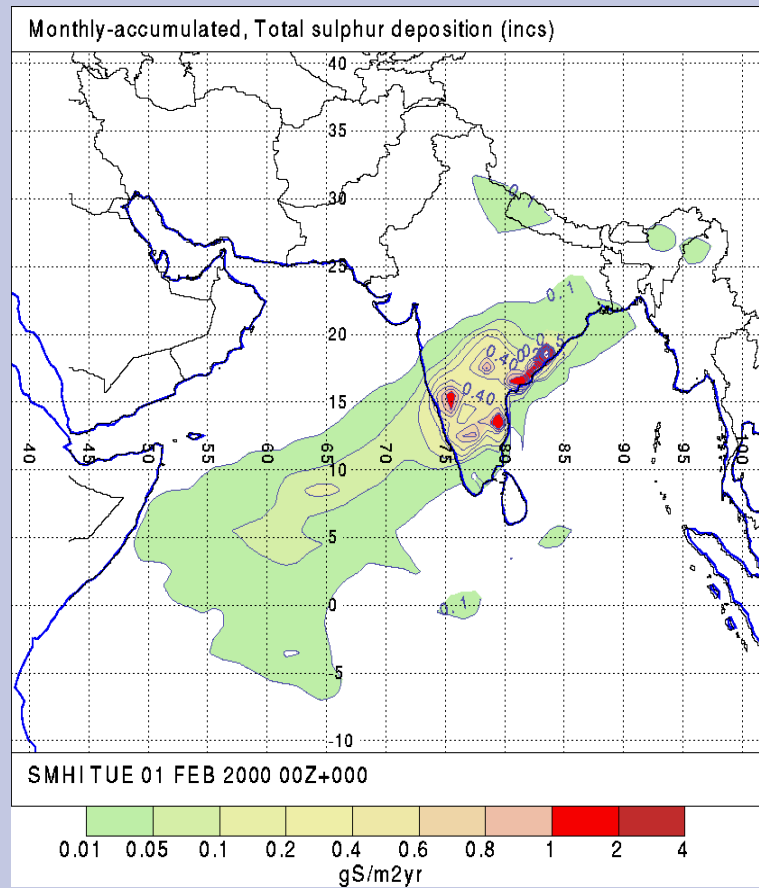
Training courses – 2006 done and more in 2007

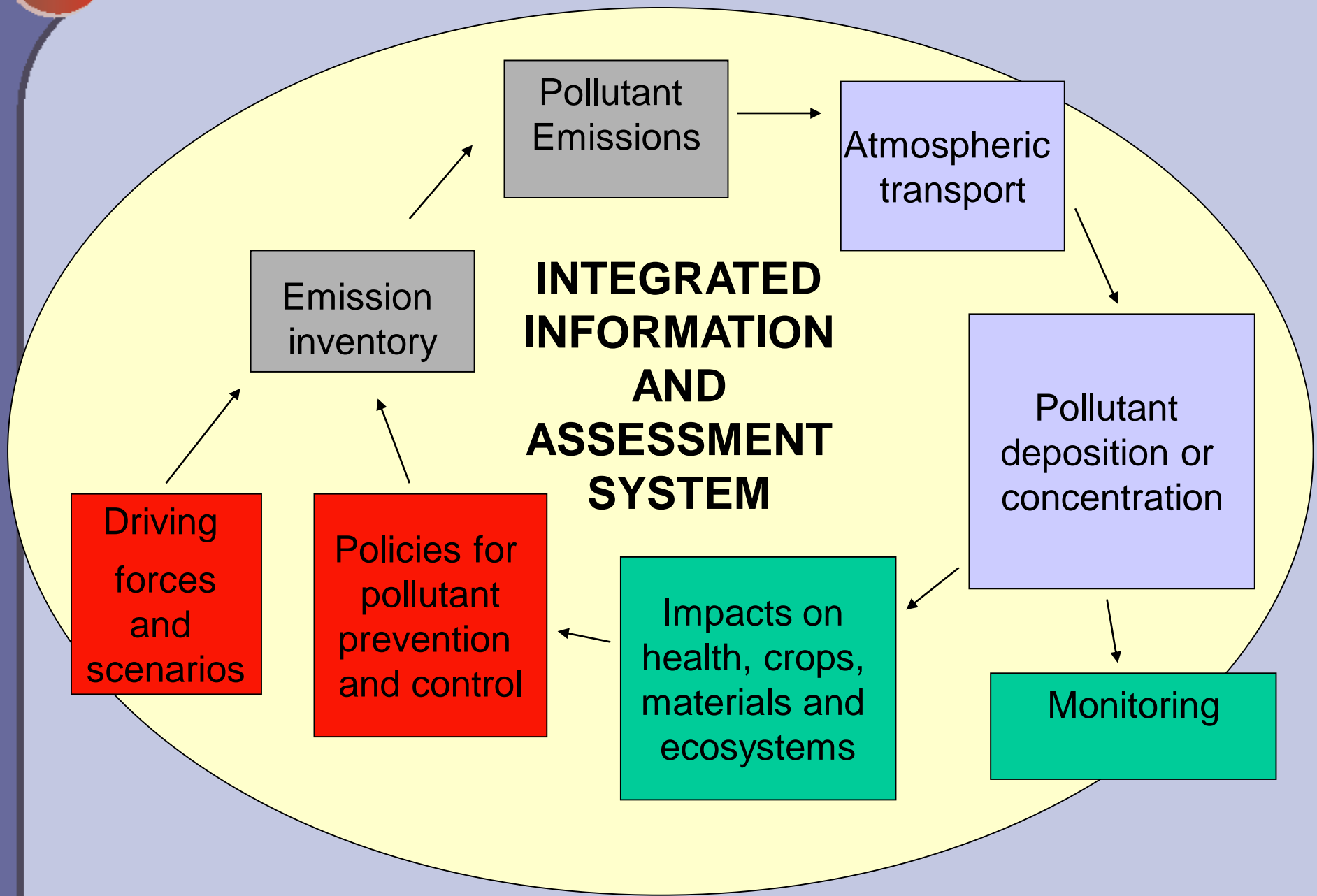
Will help countries to develop the scenarios

Essential that same participants come to subsequent training workshops

Atmospheric Transport of Pollutants

- MATCH model already used in Malé IIAS
- First training of meteorologists in principles of atmospheric transport in July 2006
- Seven countries attended - High quality participation
- MATCH model to be installed at Malé Secretariat 2006/7
- Further training courses are being developed for 2007



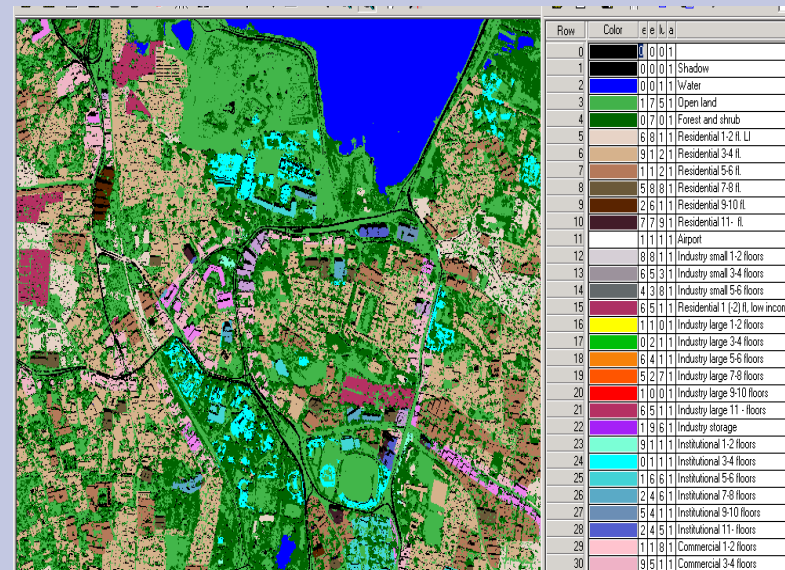


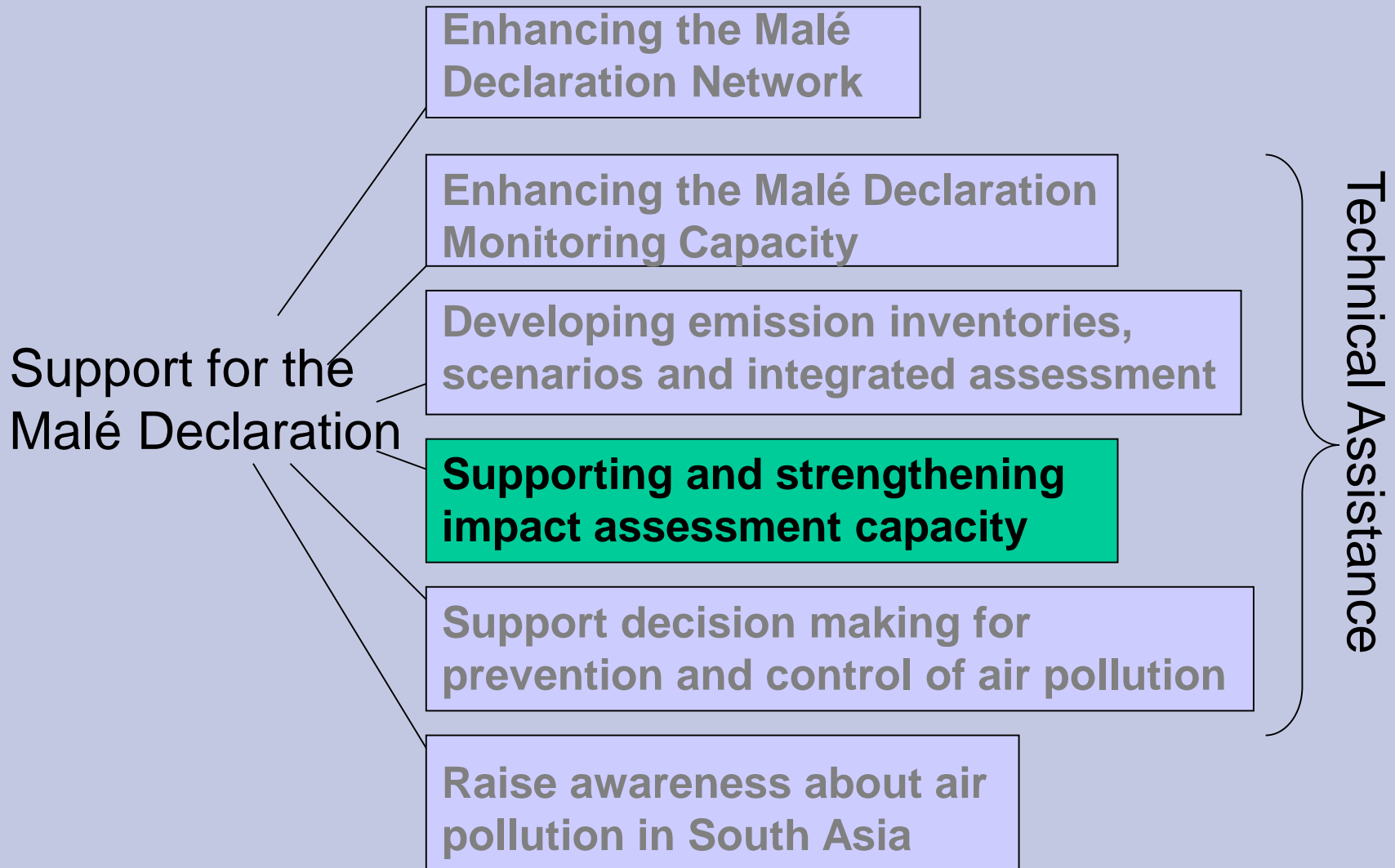


Rapid Urban Assessment (RUA)

Planned activities

- Training in methods for all countries
- Application of RUA in Kathmandu, Nepal, 2006/07
- Top-down emission inventory for city harmonized with Malé manual
- Disaggregation of emissions using satellite data
- Dispersion modelling in urban area
- Monitoring campaign (PM/NO₂)

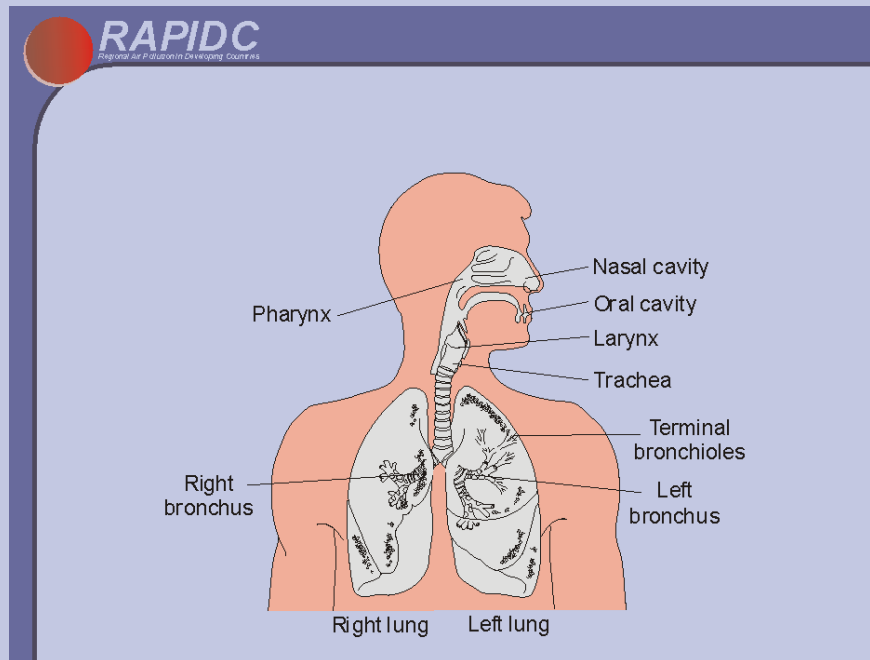




Human health impacts

1. Setting up a group of health experts to assess the status of health impact studies in South Asia
2. Hold training workshops in assessment methods – learning by doing
3. Undertake a health study

Training workshop in Bangkok 9-13 October 2006 and in 2007



Schools study to determine air pollution impacts on children's health in Dhaka

Study to be undertaken by MoE and NIPSOM: NIPSOM currently developing detailed plan. Questionnaire to parents. Children to be chosen. Staff to be trained and then 6 week study

Personnel: Epidemiologist, Nurse, Technicians to be recruited to run study

Method: 100 randomly selected asthmatic children chosen and 50 control

- 10 teachers chosen and trained
- Monitoring site near or at school
- Spirometry for all 150 children twice daily
- All symptoms recorded, all data logged and analysed by epidemiologist/ statistician

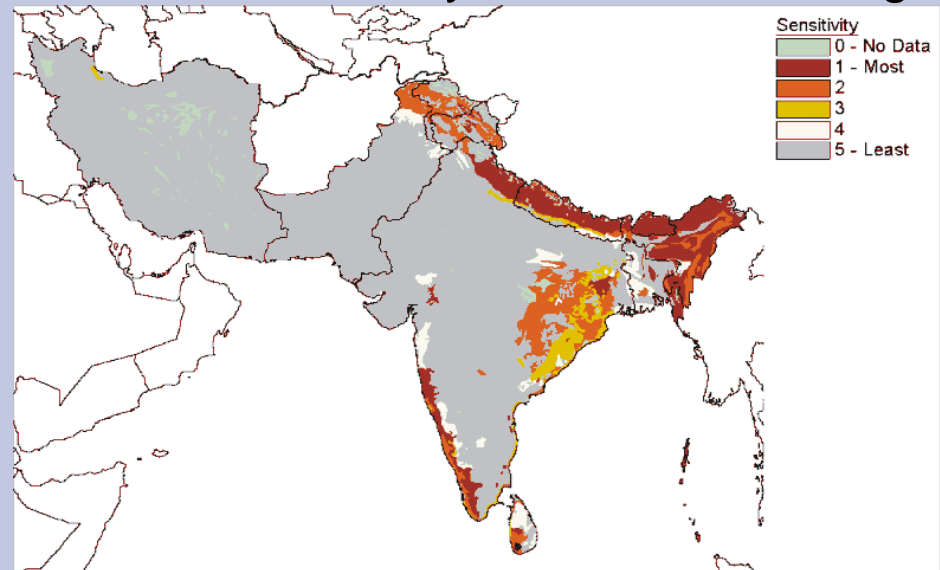


Acidification studies

Training workshops to be held in 2007. Suitable institutions to be chosen in 2006

Mapping sensitivity of soils/ ecosystems to acidification

- Using soil map – reclassify into relative sensitivity classes according to manual
- Compare to deposition



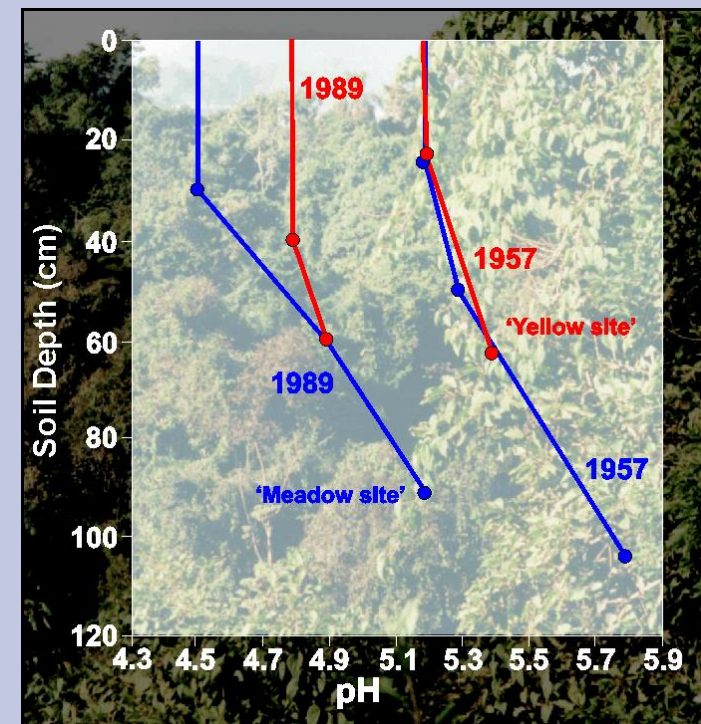
Terrestrial Ecosystem Sensitivity to Acidic Deposition in South Asia (preliminary assessment

Source: Kuylenstierna *et al.* 2001

ii. Time development of acidification

- Apply methods in manual to soil data from monitored site

Soil acidification at Mt. Lu in southern China (Zhao, 1996)



Male Declaration Crop Impacts Study

Project activities:

- Using Indicator Plants to assess risk of ozone pollution
- Chemical protectant studies
- Ozone survey (Bhutan)

Confirmed countries: Bhutan, India, Pakistan, Bangladesh

First Training Workshop

Venue: Varanasi, India,
November 2006

Host: Prof. Madhoolika
Agrawal, Banaras Hindu
University





Risk assessment using Indicator Plants

1. Undertake biomonitoring study using plants sensitive to ozone
 - i. Grow cuttings in pots with standard soil and wicks to keep moist
 - ii. Tend plants
 - iii. Assess damage to plants
 - iv. Analyse data at training workshop

Pilot Clover bio-monitoring study delayed due to problems with plant import permit to India



Ozone induced injury on clover

Assessing Yield Reductions

- i. Establish sites with crop plants grown in pots with standard soils and wicks to keep plants at standard moisture
- ii. Spray soil of some pots with EDU (ethylene di-urea) and control pots not sprayed. EDU protects plants from ozone.
- iii. Harvest plants and compare yields of protected and un-protected crops

Pilot chemical protectant study using EDU and mung bean is currently running in Varanasi, India

Country studies in 2007



Malé Corrosion Activities

Exposing standard samples on racks

4 Malé sites: India, Iran, Nepal and Sri Lanka – equipment sent and installation this autumn

ii. Exposure of kits

In Kathmandu with RUA

iii. Stock at risk study

In Kathmandu with RUA

Joint Corrosion and Health training for the Malé Declaration and International CORNET meeting, Bangkok October 2006





Corrosion Impact Activities

i. Exposing standard samples on racks

- to determine an absolute measure of corrosion and develop dose-response relationships
- assemble rack and expose samples pre-prepared by SCI
- Need to monitor SO_2 , NO_2 , O_3 , HNO_3 and PM (total deposited) bi-monthly
- rain pH and amount (weekly)
- Need a met station measuring $^{\circ}\text{C}$ and RH



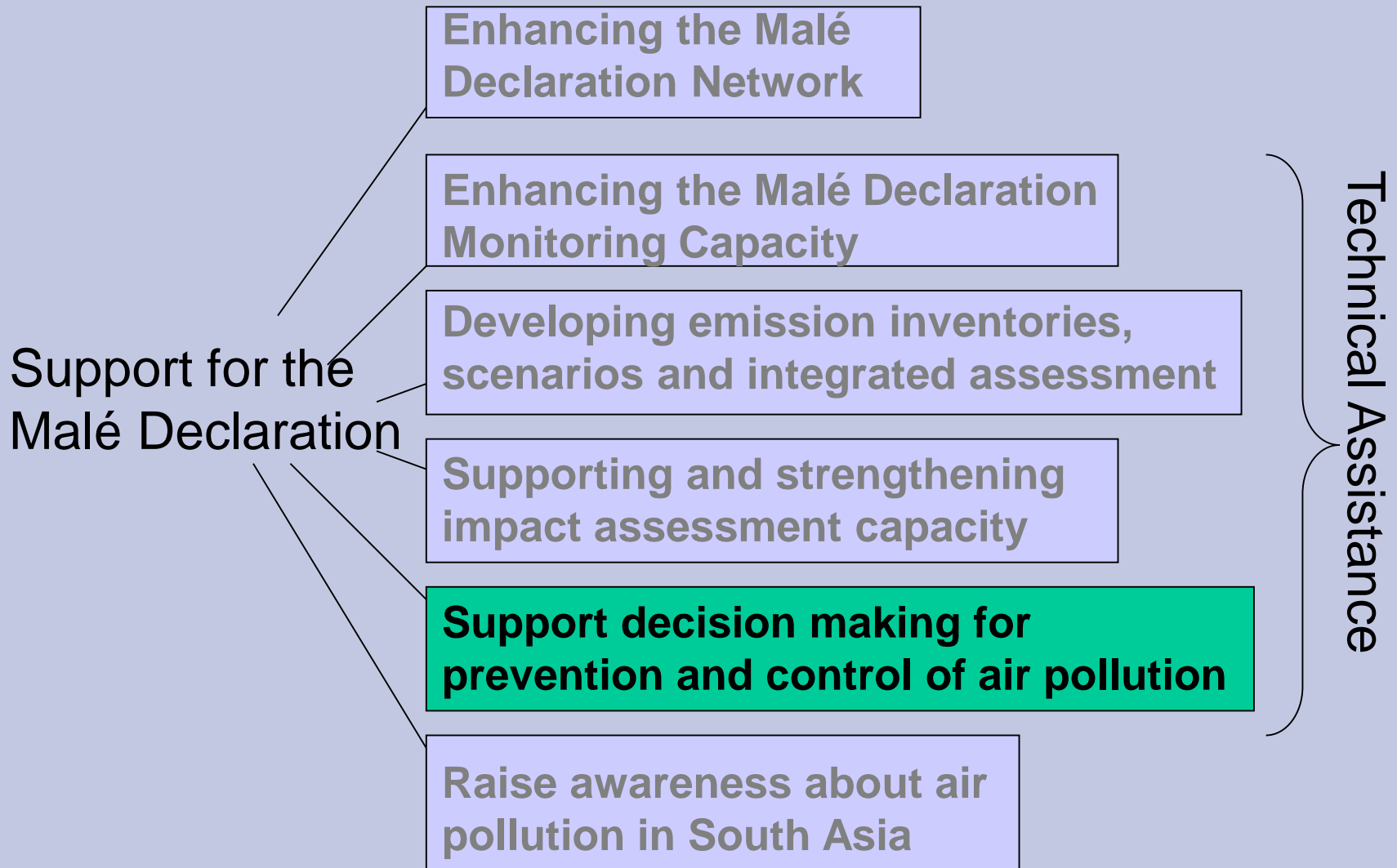
4.3 Potential Corrosion Impact Activities

ii. Exposure of kits

- to determine a relative measure of corrosion in sites with different levels of pollution absolute measure of corrosion
- Expose for 1 year
- up to 10 sites per city E.g. 2 metals and one stone sample per site
- Passive monitoring of gases only

iii. Stock at risk study

- identify materials in typical buildings (random inventory of 100s of buildings)
- Generalise occurrence of buildings across city
- Include street infrastructure and vehicle fleet
- Estimate economic losses for materials where have D-R relationships



Policy Options

NIAs agree that policy options should now be discussed

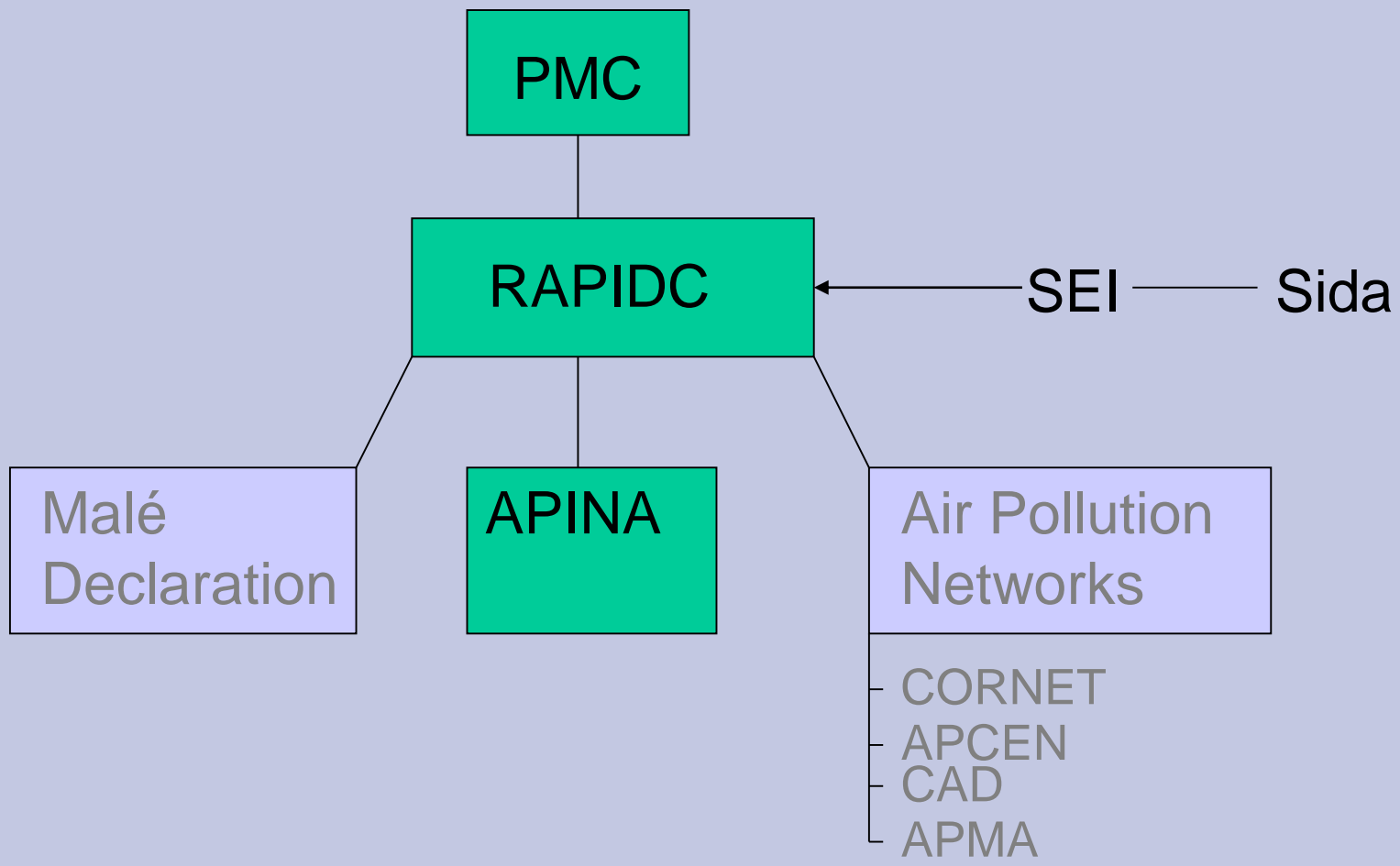
Description of main different policy approaches developed by IIIIEE with case studies of successful application

First training held in July 2006

Further training courses are being developed for 2007

Potential for application/ relevance of options to different Malé countries to be investigated in 2007

RAPIDC Structure



APINA – Air Pollution Information Network for Africa

- APINA is a network of policy makers, scientists, NGOs, industry and other stakeholders formed in 1998
- APINA has the objective to ensure that existing impacts of air pollution in Africa are tackled and emerging risks are prevented.
- It aims to fill the gaps in knowledge on air pollution and ensure that currently available information and concerns are articulated to policy makers in Africa.

Air Pollution Issues

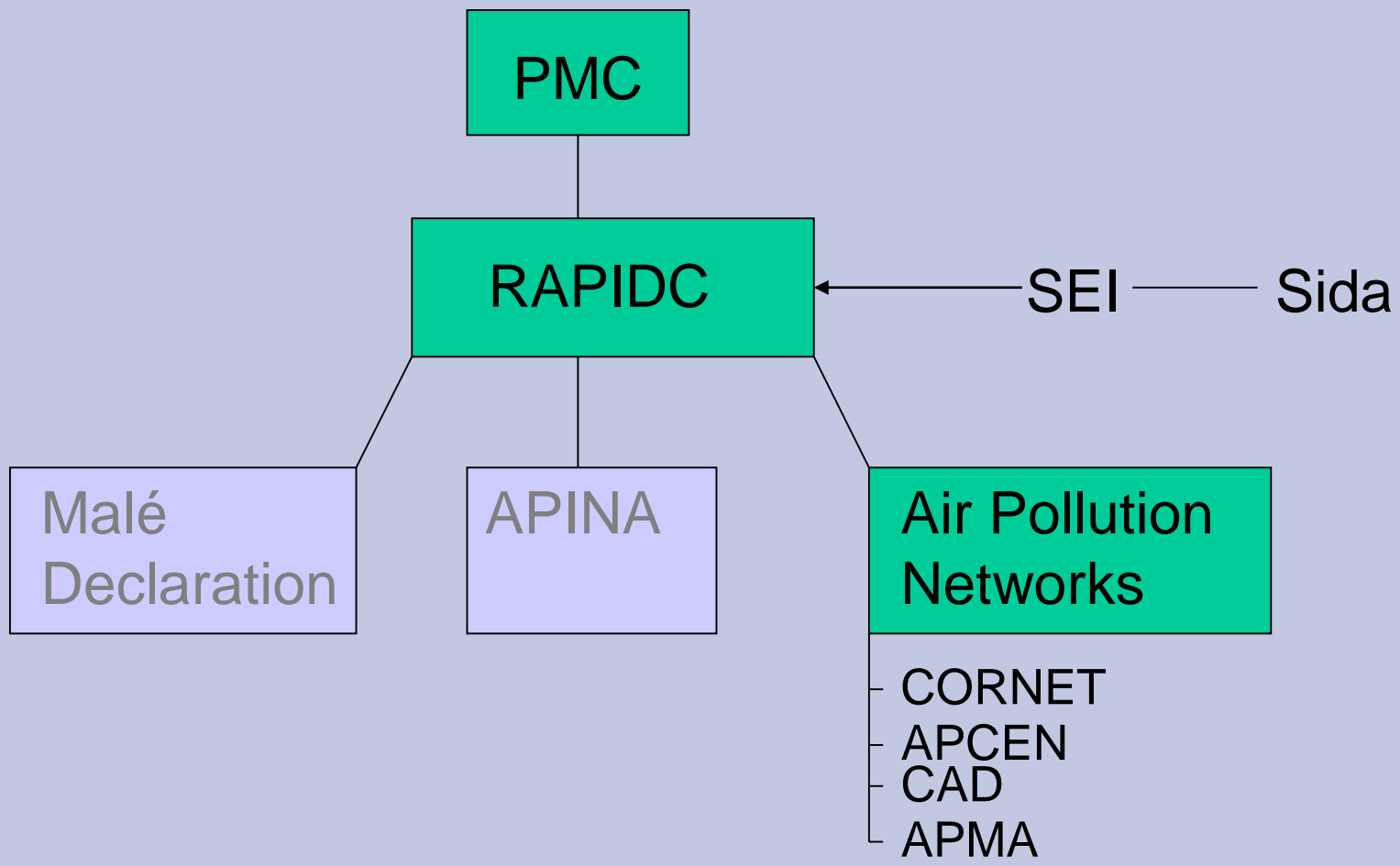
- Most of the household energy use in southern Africa is derived from biomass
- More than 90% of the electricity is derived from coal – emissions
- There is a metal industry which releases sulphur dioxide which has local and transboundary effects
- Motorised transport is increasing in the region – imported reconditioned vehicles
- Biomass burning is also a major problem and has been found to be comparable to industrial pollution

APINA Activities

Like Malé, APINA carries out activities on all aspects of the air pollution policy cycle including:

- Emission inventories (similar progress to Malé, linked to ministries)
- Atmospheric transfer modelling
- Deposition Monitoring
- Impacts (health, crops, ecosystems, corrosion)
- Rapid urban and integrated assessment
- BAQ Sub-Saharan Africa (Training and Ministerial Meeting in Nairobi July 2006)
- Decision making support information

RAPIDC Structure



RAPIDC Air Pollution Networks

APCEN – Air Pollution Crop Effects Network

CAD – Composition of Asian Deposition

CORNET – Corrosion Network

APMA – Air Pollution in the Mega Cities of Asia

APCEN – Air Pollution Crop Effects Network

Global network linking air pollution and crop effects scientists

Methods build upon successful UNECE Network activities

Project activities:

- Using Indicator Plants to assess risk of ozone pollution
- Chemical protectant studies
- Coordination of exposure experiments



APCEN – Status of pilot studies

Biomonitoring study in Potchefstroom, South Africa, using ozone-sensitive and ozone-resistant genotypes of white clover terminated in April 2006

Main results: Clover plants grew well in southern African climate and showed slight ozone-induced foliar injury

APCEN network meeting

Assessing air pollution impacts on crop productivity

September 19-21, 2006, Stellenbosch, South Africa

- To discuss and agree protocols for biomonitoring campaign
- To evaluate the status quo of APCEN and develop strategies how to expand and link the network globally
- To transfer experience in assessments of air pollution impacts on crops and air quality management tools between regions; IGAC satellite session
- To bring together regional air pollution experts, decision-makers and other appropriate stakeholders to ensure development of suitable pollution abatement strategies and discuss priorities for future

CAD – Composition of Asian Deposition

The CAD project is divided into two components:

- 1) Network development and best practice
- 2) Training scientists from Asia

Activities:

- Linkages with DEBITS, Malé Declaration, EANET, and ABC
- Inter-calibration with EANET program
- Passive sampler inter-comparison study
- CAD Workshop at IICT, Hyderabad (Dec 2006)

CAD – Composition of Asian Deposition

Outcomes:

Measurements are now being initiated at two new sites in ecologically sensitive parts of northern India: Pant Nagar and Jorhat

- An Indian Research scholar has been employed in the CAD project and several student projects, including one PhD, are being carried out using CAD data
- A comprehensive review of Indian deposition data and their interpretation has been published (Kulshrestha et al., 2005: Atmospheric Environment 39, 7403-7419). This review is to large degree based on CAD activities during the past several years

CORNET – Corrosion Network

Global network of scientists looking into the impact of air pollution on the corrosion of materials

- **Exposing standard samples on racks**
Network of sites across Asia and southern Africa
- ii. **Exposure of kits**
- iii. **Stock at risk study**



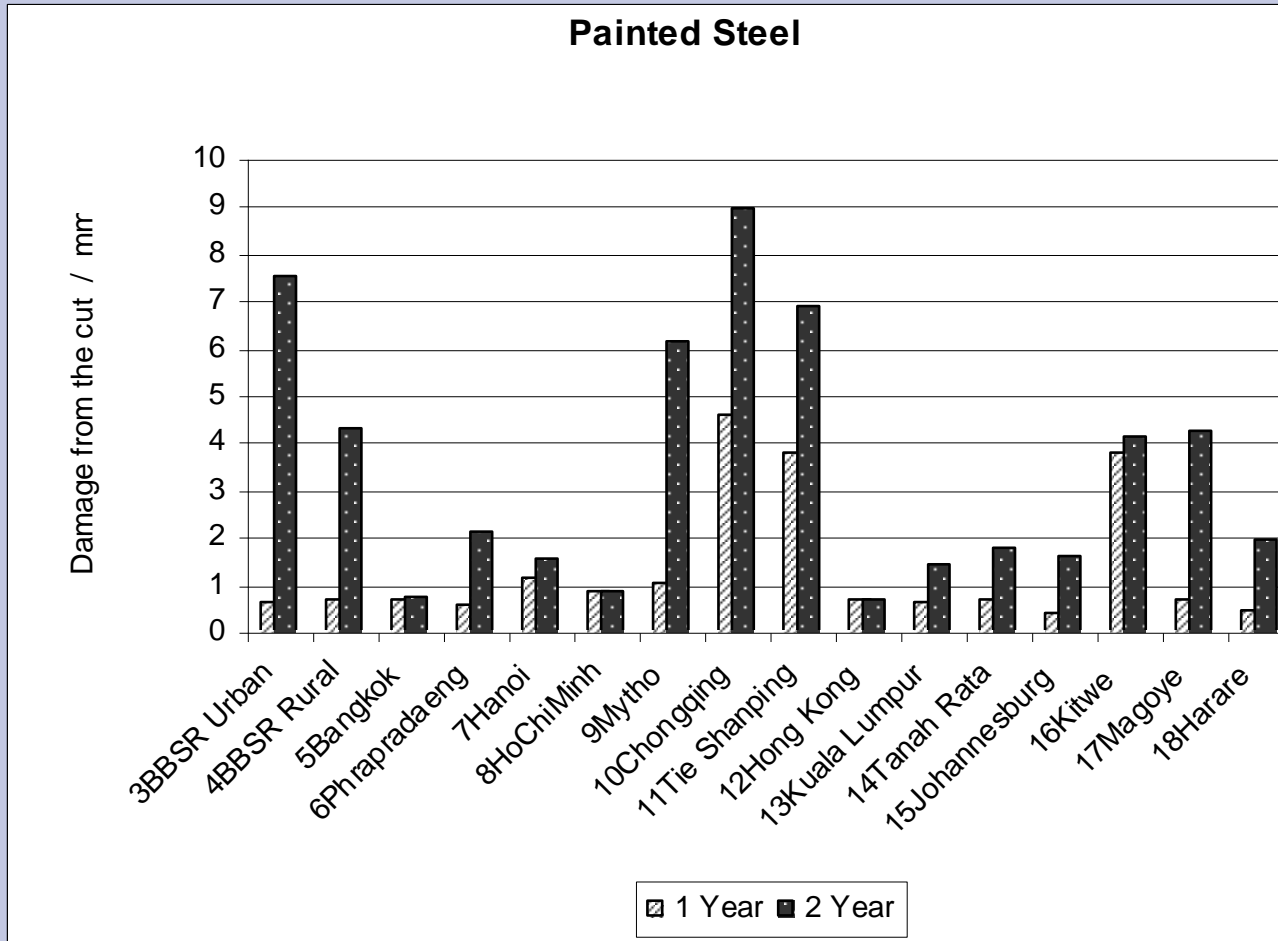
CORNET - progress

- Joint Corrosion and Health training for the Malé Declaration and International CORNET meeting, Bangkok October 2006
- The trend analysis started in the summer of 2005 and will be completed in connection with the 4-year samples.

The purpose of the trend exposure is to:

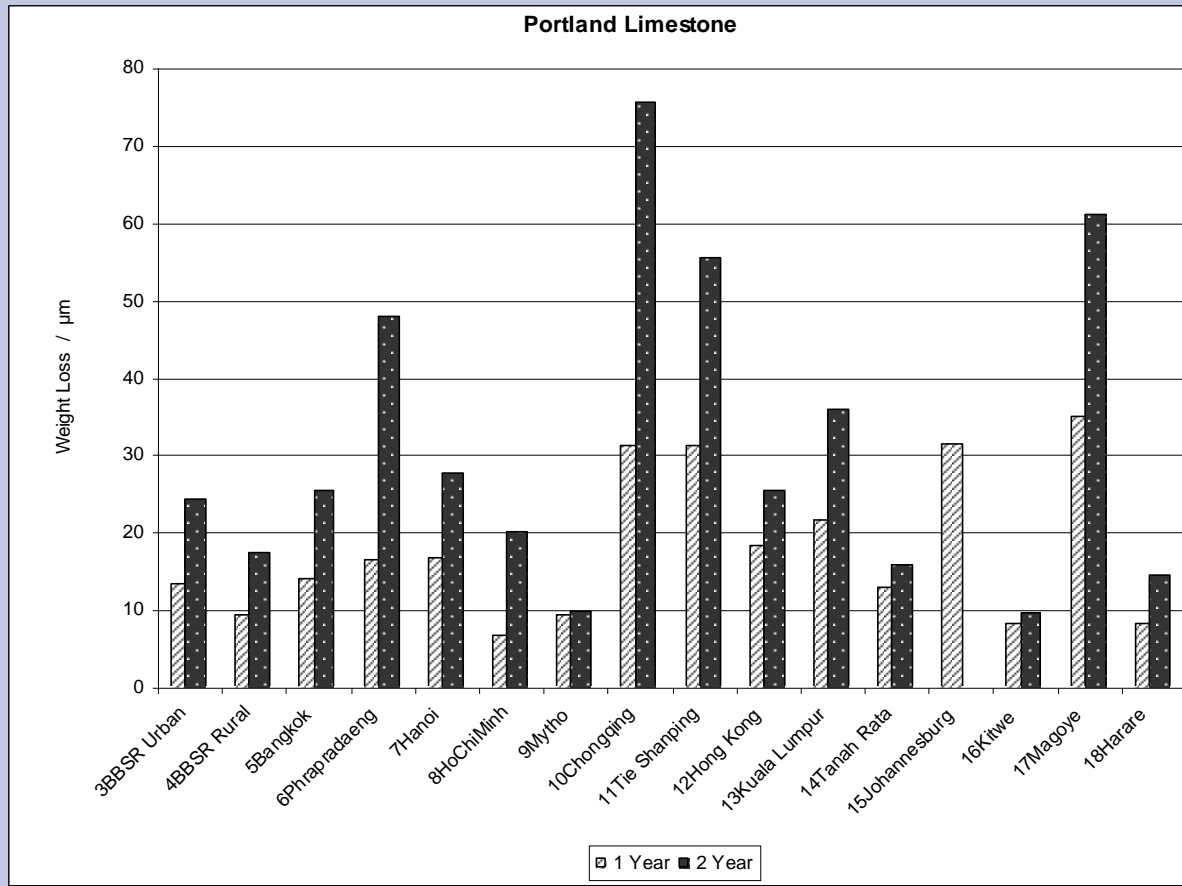
- establish trends in pollution and corrosion
- transfer knowledge on evaluation of specimens to the region

Corrosion Results



Degradation of painted steel after 1 and 2 years of exposure

Corrosion Results



Recession of limestone after 1 and 2 years of exposure

APMA – Air Pollution in the Mega Cities of Asia

- Support AQM strategy formation in selected Asian cities is currently being identified.
- The benchmarking report prepared for publication and will be published by Earthscan in 2006.
- Development of an AQM information system (AMIS-Asia) for Asian cities to facilitate the transfer of AQM and best practice to support decision-making processes and strategy formation.

The Future:

Ownership

RAPIDC will not be coordinated by SEI in the future (2008-)

Direct contract between Sida and Malé Secretariat

SEI can continue to advise as required by countries/secretariat

Countries have to implement activities. RAPIDC can only provide technical assistance

Priorities:

Consolidation of Monitoring Network and activities

Implementation of emission inventories and scenarios

Implementation of impact studies

Linkage to other regional initiatives