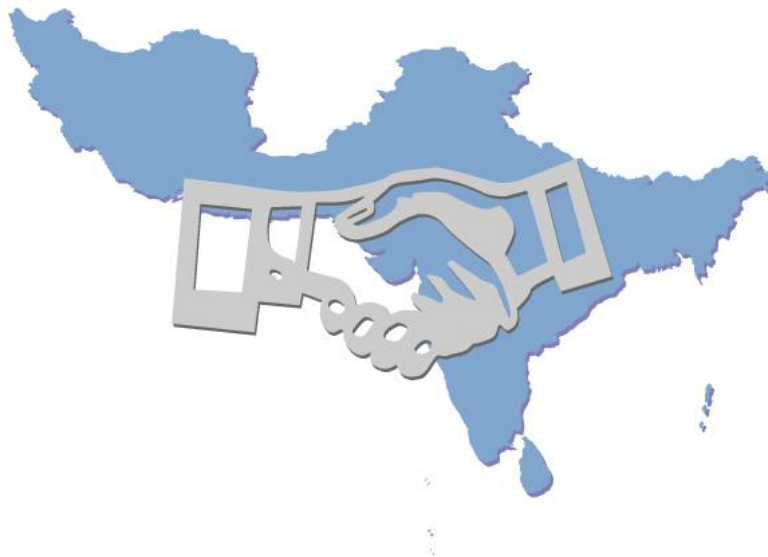


Male' Declaration

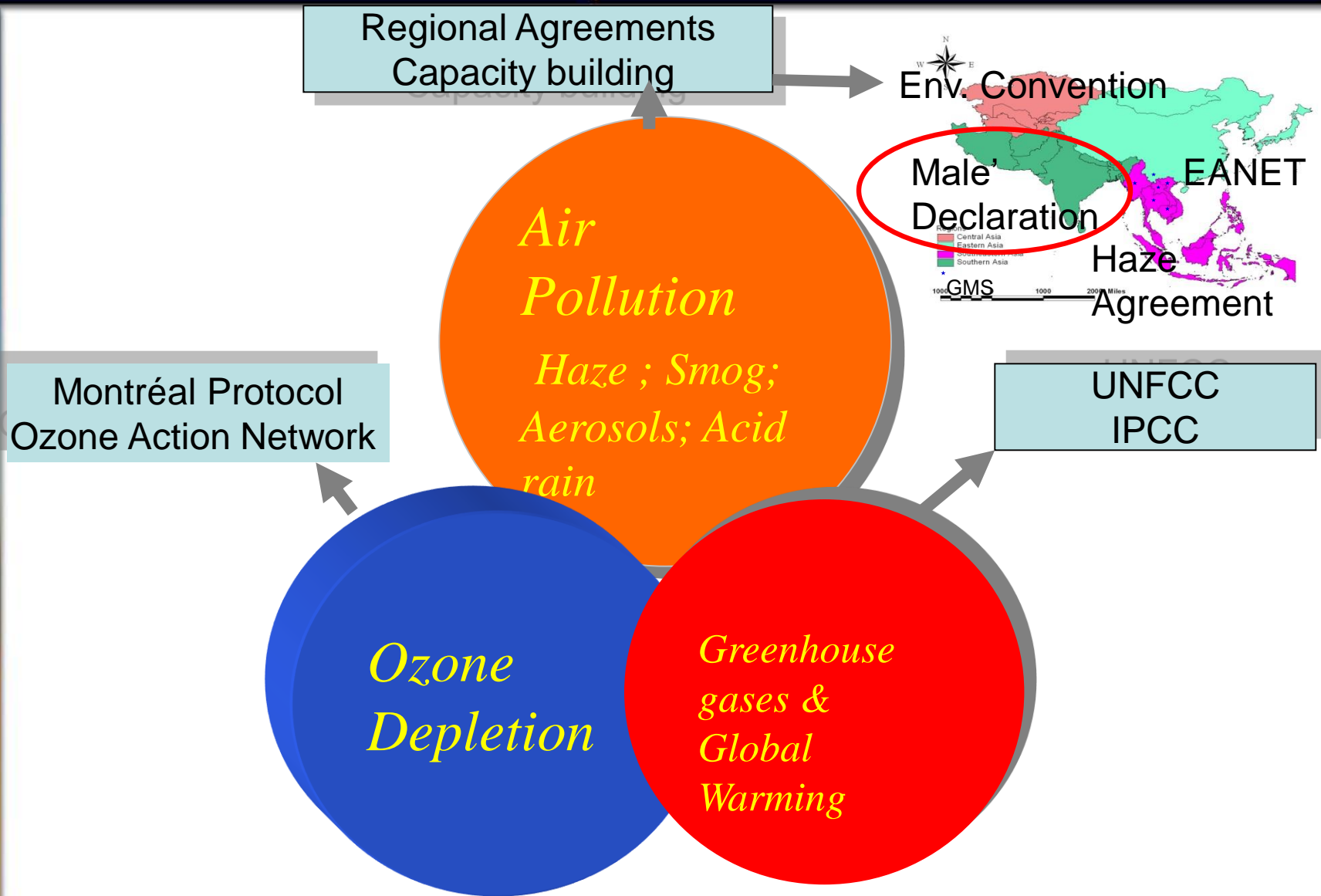
Review of Progress in Phase III



by
**Secretariat
UNEP**



Response to atmospheric issues



The Non-CO₂ trace gases contribute as much as CO₂ to the increase in atmospheric Greenhouse effect (Ramanathan et al, JGR, 1983)



Malé Declaration: National Implementing Agencies

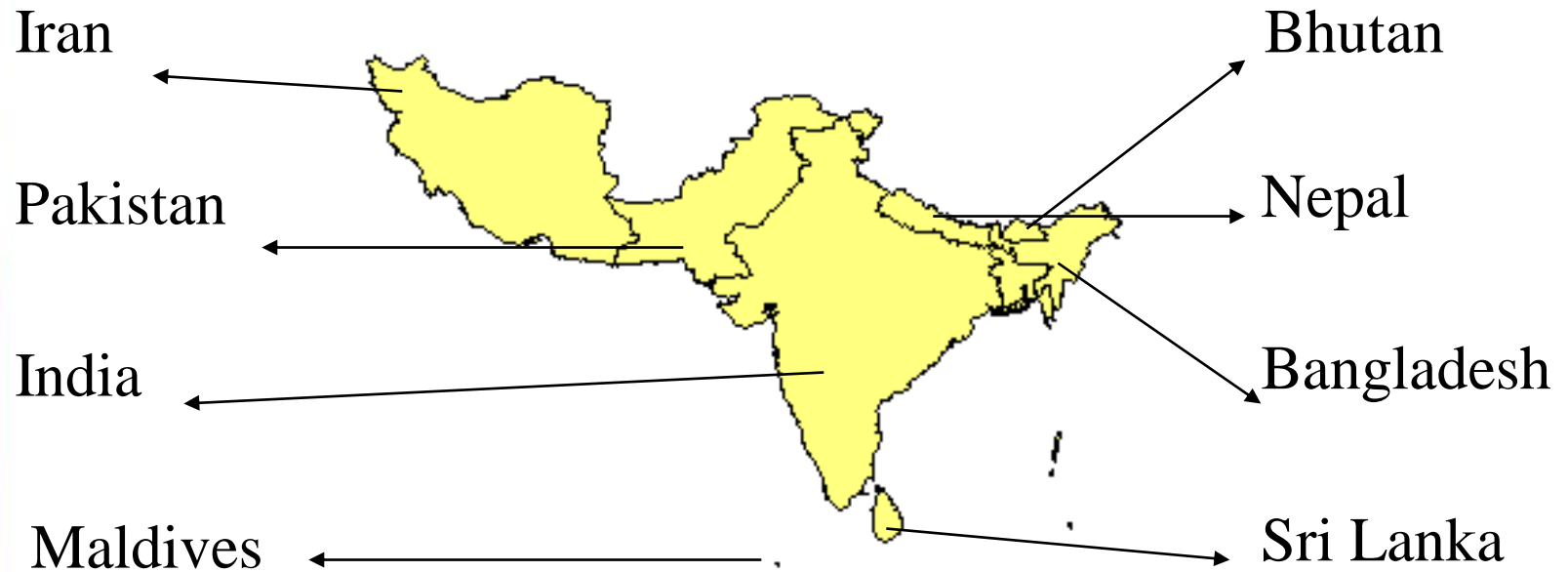
Development

- March 1998: Policy Dialogue
- April 1998: Adoption of the Declaration

Implementation

- Phase 1: Awareness and baseline studies
- Phase 2: Local capacity building for monitoring and analysis

Member States





Phase III (2005-2008) Objectives



IG 6; October 2004, Tehran, Iran

1. Strengthen the **regional cooperation** and stakeholders participation under the Malé Declaration;
2. Strengthen the **capacity building** programmes initiated during Phase II;
3. Enhance the capacity of NIAs on emission **inventory development and Integrated Assessment Modeling**
4. Enhance the analytical and **impact assessment capability** at the national level through integration of findings from local pollution studies and conducting assessment studies;
5. Provide **decision support information** for policy formulation and air pollution prevention ; and
6. **Raise awareness** for action through targeted dissemination



1. Regional Cooperation

Strengthen the regional cooperation and stakeholders participation under the Malé Declaration



Ob 1. Regional Cooperation: IG Cooperation

- ☞ **IG7: India, October 2005**
- ☞ **IG8: Bhutan, September 2006**
- ☞ **IG 9: Maldives, October 2007**



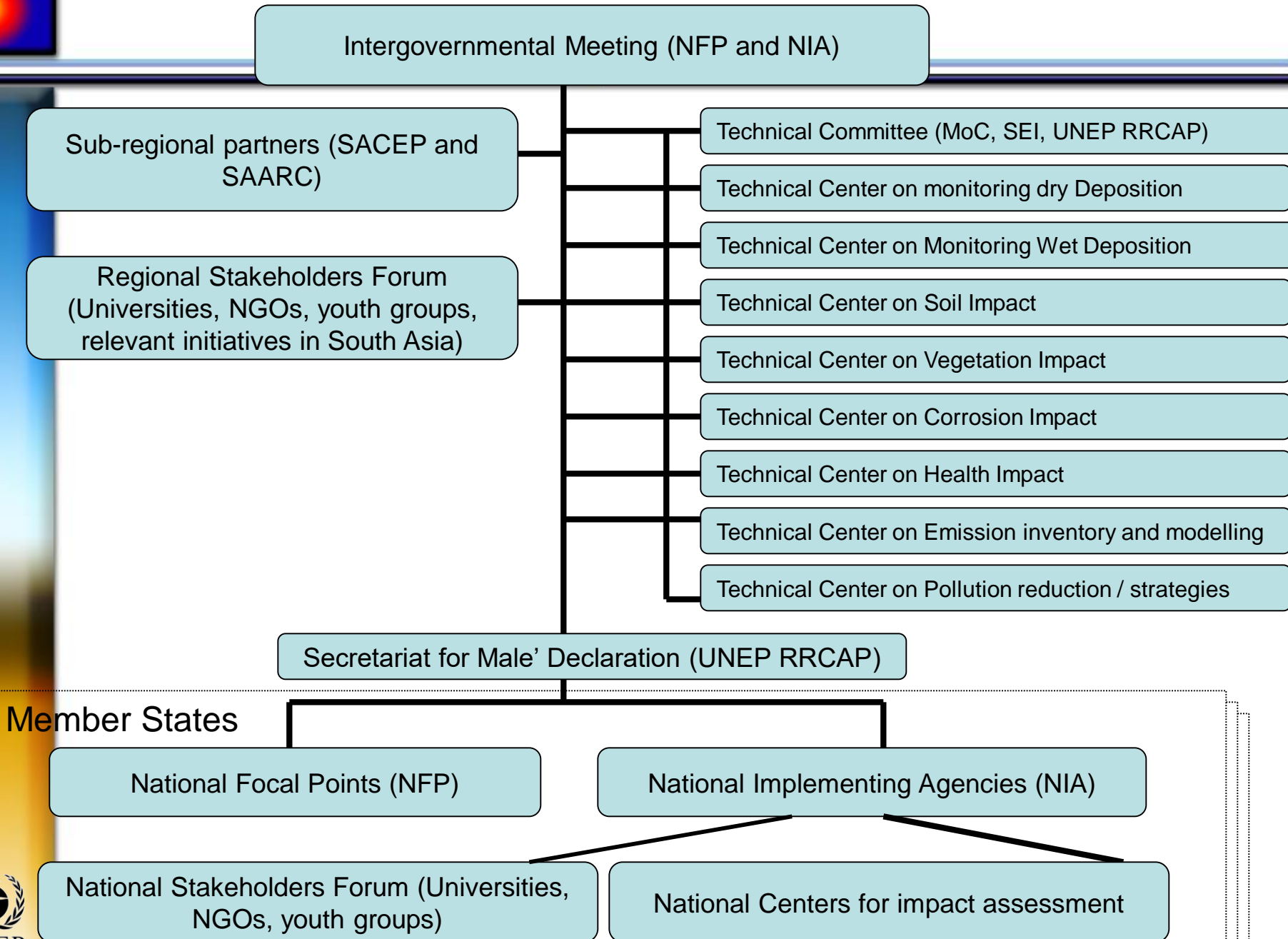
- Evaluated the implementation since adoption
- Extended organizational structure
- Establishment of specialized centers
- Recommended to increase the financial sustainability through local contributions
- Agreement on promotion of policy cycle (Task force on Future development of the Male' declaration)
- Co-benefit of addressing air pollution climate change
- Collaboration with other networks (such as EANET, LRTAP)



Proceedings:

www.rrcap.unep.org/md/Maléreport/

ORGANIZATIONAL CHART OF MALE' DECLARATION





Ob 1. Regional Cooperation: Stakeholders

- ➔ **National stakeholders meeting in Sri Lanka, June 2007**
- ➔ **National Stakeholders meeting in Nepal, March 2008**
- ➔ **National Stakeholders meeting in Bhutan, April 2008**
- ➔ **National advisory Committee meetings**
- ➔ **Convened 3 Regional Stakeholders cum Coordination Meetings**

- **Recognized-**

- National forum on air pollution at the national level

- Regional forum on air pollution at the national and regional level respectively



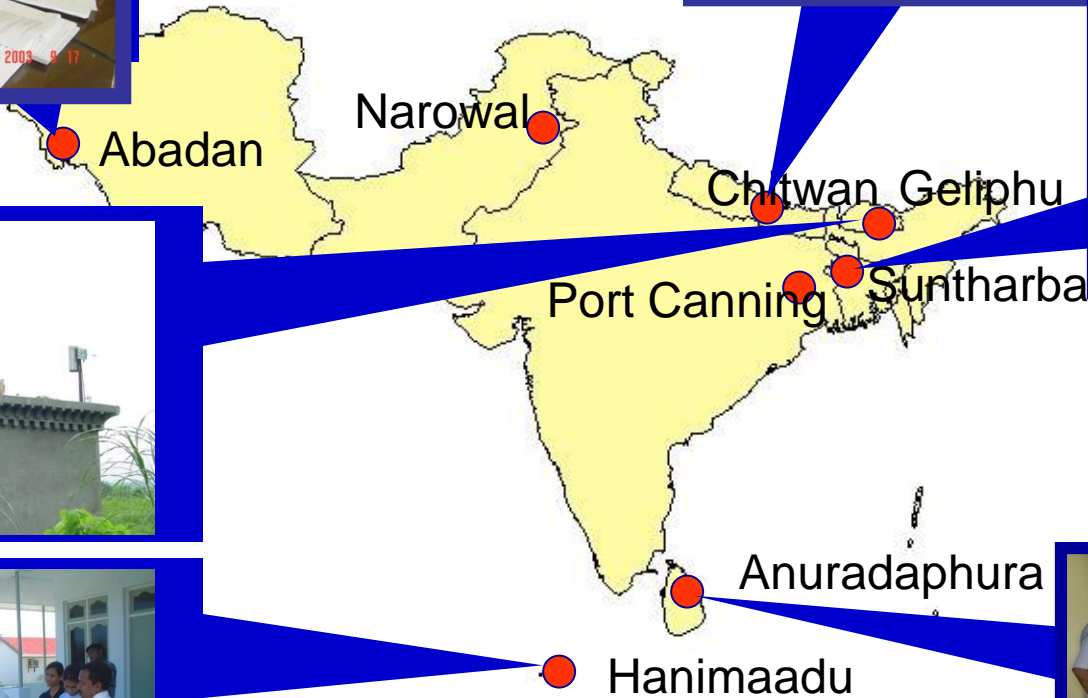
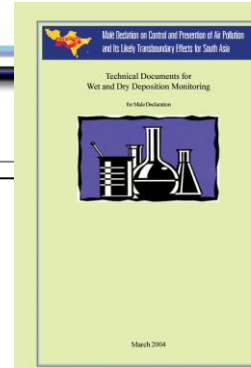


2. Monitoring

Strengthen the capacity building programmes initiated during Phase II



Ob2. Monitoring: Extended monitoring network



7 monitoring sites at the start of phase 3
14 monitoring sites at the end of phase 3

Ob2. Monitoring: Additional parameters

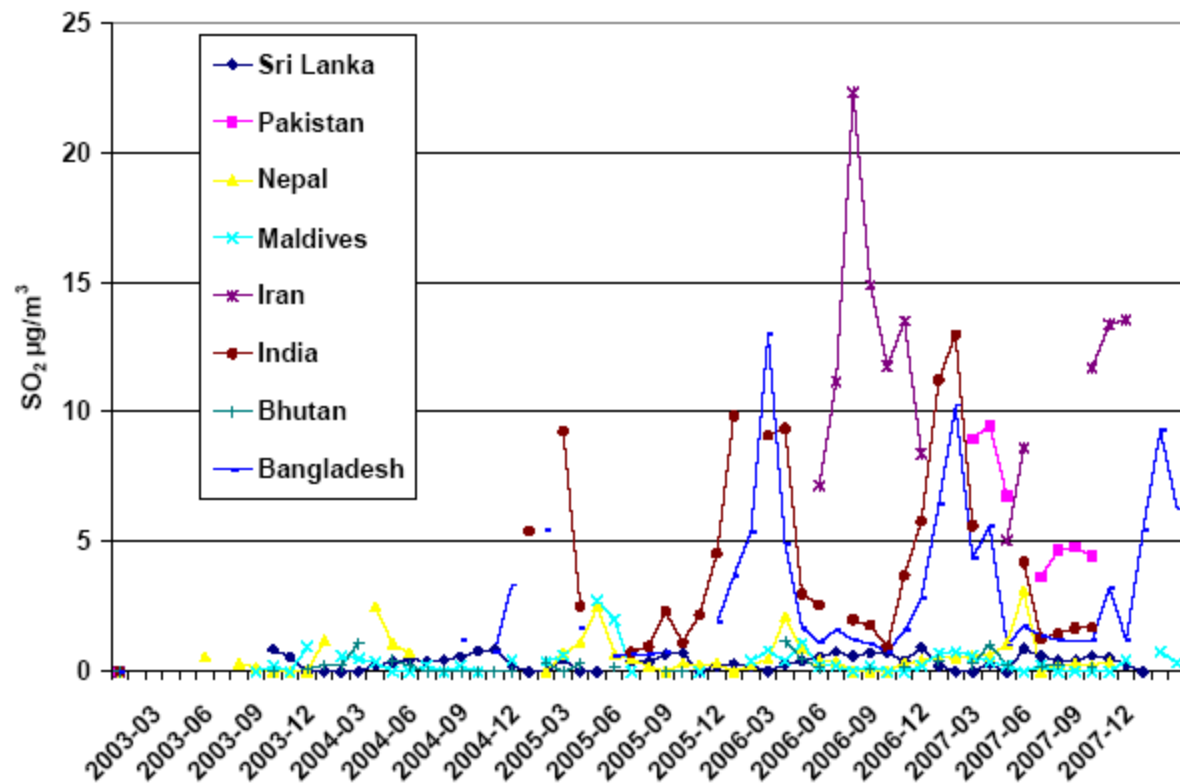
Parameter	Bangladesh	Bhutan	India	Iran	Maldives	Nepal	Pakistan	Sri Lanka
TSP	No	Yes	Yes	Yes	No	Yes	Yes	No
PM ₁₀	No	Yes	Yes	Yes	No	Yes	Yes	No
SO ₂ , NO ₂ , O ₃ with passive sampler	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SO ₂ , NO ₂ with active method	No	Yes	Yes	Yes	No	Yes	No	No
pH (rain water)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
pH (Surface water)	No	No	Yes	No	No	No	No	No
EC	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Rain Chemistry (Mg ²⁺ , Na ⁺ , K ⁺ , Ca ²⁺ , NH ⁴⁺ , SO ₄ ²⁻ , NO ₃ ⁻ , Cl ⁻)	Yes	No	Yes	Yes	No	Yes	No	Yes

Ob2. Monitoring: Established data trend

Regional data base (monthly updates)

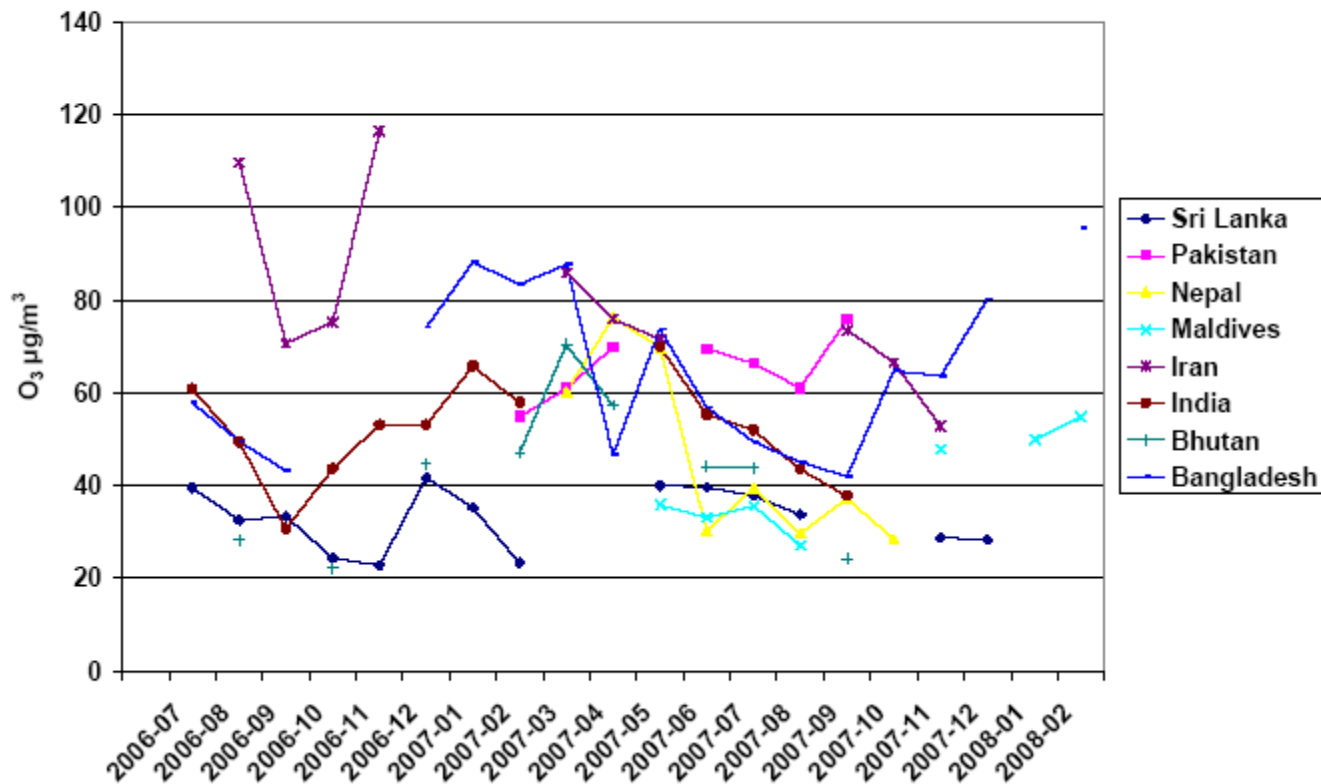
Data report (3 annual reports)

Synthesis report (1 period report)



SO₂ results at Male' remote sites 2003 - 2007

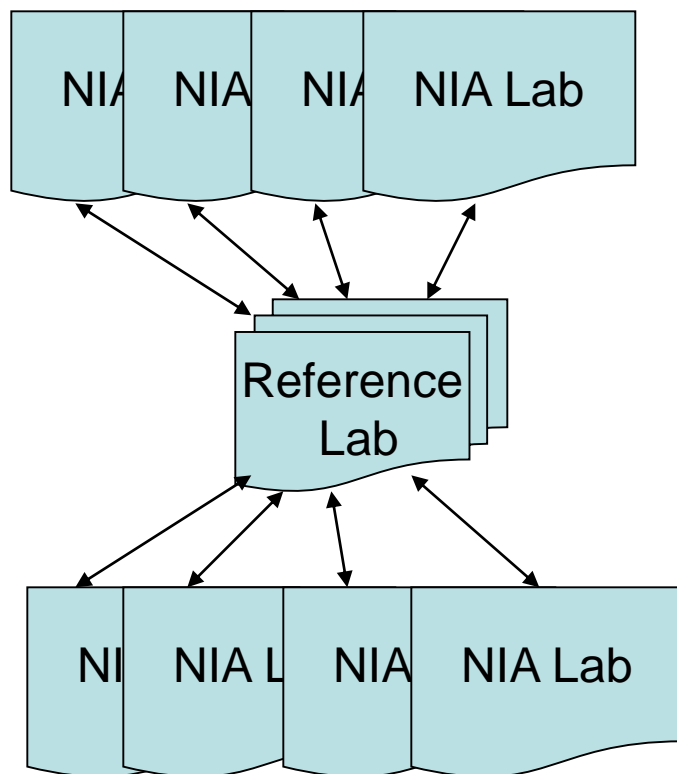
Ob2. Monitoring: Established data trend...



O₃ results at Male' remote sites 2006 - 2008



Ob2. Monitoring: Developed tools and mechanism for QC



1. Inter-laboratory Comparison

- Developed protocols
- Completed the first attempt

2. Passive sampler Inter-Comparison

- Developed protocols
- Completed the comparison study



Ob2. Monitoring: Improved skill ...



Participants, in a small groups, participates in laboratory analysis during the annual refresher course

- Fourth Regional Training Programme (March 2006)
- Fifth Regional Training Programme (March 2007)
- Sixth Regional Training Programme (March 2008)

Parameter	Group 1 Bangladesh	Group 2 Iran	Group 3 Nepal	Group 4 Sri Lanka	Group 5 Maldives	Group 6 Pakistan	Group 7 Bangladesh	Ref
pH	10.03	9.99	9.99	9.99	10	9.98	9.99	10
K ⁺ ($\mu\text{mol/l}$)	33.36	34.36	34.15	33.48	32.279	36.67	35.43	32.75
Na ⁺ ($\mu\text{mol/l}$)	142.08	142.61	142.91	140.82	139.65	152.85	137.52	143.30
Mg ²⁺ ($\mu\text{mol/l}$)	24.29	24.17	24.67	24.93	24.469	27.46	24.33	24.51
Ca ²⁺ ($\mu\text{mol/l}$)	24.29	26.25	28.31	28.10	25.32	25.12	24.25	25.09
NH ₄ ⁻ ($\mu\text{mol/l}$)	3360	3344.4	4300.00	3406.66	11.1	4110	3313.33	3453.33
Cl ⁻ ($\mu\text{mol/l}$)	1395.76	1379.78	1295.37	1360	148.89	1346.69	1565.1	1374.08
SO ₄ ²⁻ ($\mu\text{mol/l}$)	46.7	31	47.91	47.81	83.811	46.67	39.04	47.09



Ob2: Monitoring: Capacity Building on Monitoring



Rainwater Chemistry

- Anions: SO_4^{2-} , NO_3^- , Cl^-
- Cations: NH_4^+ , Na^+ , K^+ , Ca^{2+} , Mg^{2+}

☞ *Bangladesh, Bhutan, Nepal, and Sri Lanka*

Meteorological parameters

- Rainfall
- RH
- Solar radiation
- Temperature

☞ *Bhutan, Iran, Nepal, Sri Lanka*



National Training programmes

- In-country training for Pakistan for the operation of the Male' Declaration monitoring site
- Training programmes for newly recruited technicians)



3. Emission Inventory

Enhance the capacity of NIAs on emission inventory development

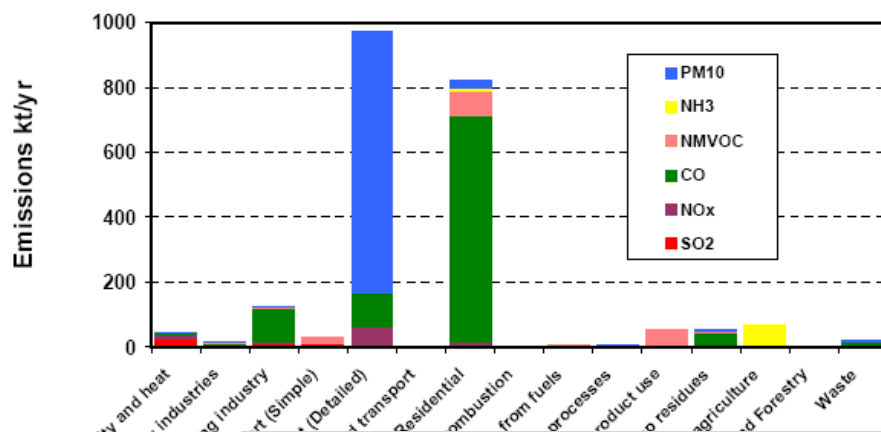


Ob3: Emission Inventory

Three training workshops on emission inventory, scenario development, and Integrated modeling (July 06; Feb 07; Jan 08)



- Standardized manual
- Skilled manpower for emission inventory compilation
- Institutionalized emission inventory compilation within the Government structure



Emission inventory for Sri Lanka

Ob3: Emission Inventory

GHG inventory and
Male' Declaration
emission inventory
process are being
integrated in
Bhutan



National Training in Bhutan (April 08)



4. Impact Assessment

Enhance the analytical and impact assessment capability at the national level through integration of findings from local pollution studies and conducting assessment studies



Ob4: Impact Assessment: Health Impact



Regional Training on Health Impact;
February 2007, RRCAP, Bangkok

Regional Trainings on Health Impact
Assessment; February 2007 and
August 2007



Case study
Dhaka, Bangladesh

Regional data generated by the local
agencies



Ob4: Impact Assessment: Rapid Urban



**National Training Programme in Nepal;
November 2006**

**National Training on Rapid Urban
Assessment; November 2006**

**Regional level training on Rapid
Urban Assessment; March 2008**

Case study

Kathmandu, Nepla



Ob4: Impact Assessment: Corrosion Impact



First Capacity building training, October 2008

Second Capacity building training, February 2008

Regional Training on Corrosion Impact Assessment; October 2006, RRCAP, Bangkok

Case study

Tehran, Iran

Agra, India

Kathmandu, Nepal

Colombo, Sri Lanka

Maldives



Corrosion monitoring track installed in Kathmandu, Nepal



Ob4: Impact Assessment: Crop Impact



Capacity building training
August 2007 in Dhaka; March 2008
Bangkok

- Indicator plants
- EDU experiment
- Passive sampler campaigns



Case Studies are being implemented in:

- Bangladesh
- Bhutan
- India
- Nepal
- Pakistan
- Sri Lanka



5. Decision support

Provide decision support information for policy formulation and air pollution prevention



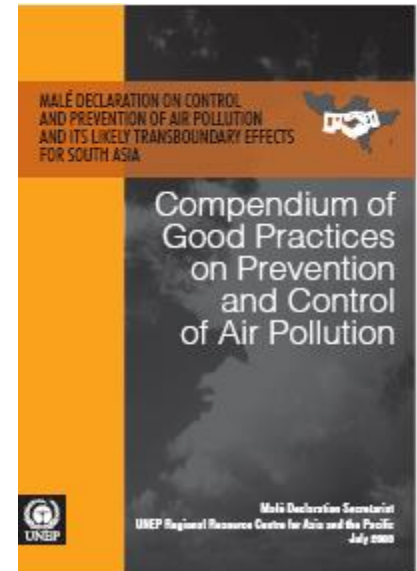
Ob5: Decision Support Information

Good practices (for pollution control and abatement)

- Compendium of good practices

Strategies for the implementation of good practices

- For the consideration of IG10





Ob5: Decision Support Information

Technical support for demonstration

- Generic guidelines for the construction of eco-housing
- 4 training programmes on the concept of eco-housing
- Provided technical support for an eco-village demonstration project





6. Rise Awareness

Raise awareness for action through targeted dissemination

Ob6. Rise Awareness

Newsletter and Brochure

- To disseminate Malé Declaration related information to the public and stakeholders.
- The content of the newsletter has largely been reports on the network's activities
- National Brochures to disseminate the achievements

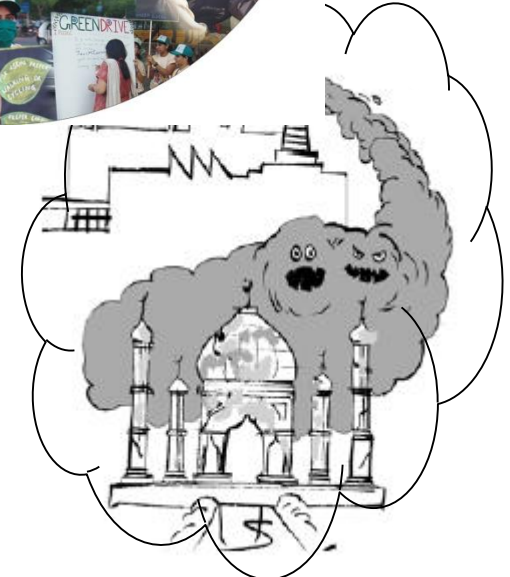
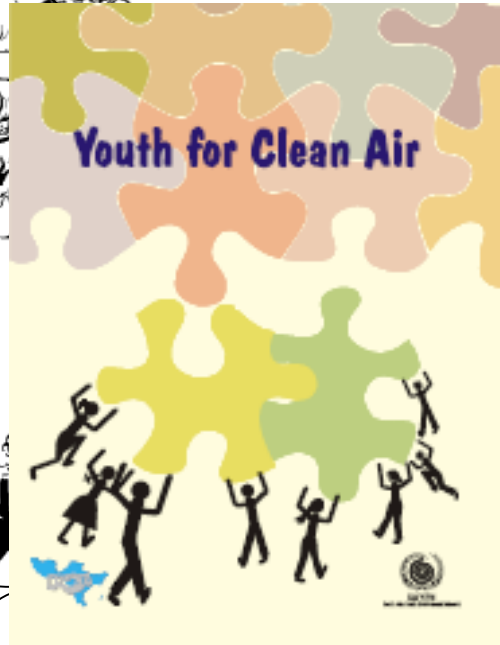




Ob6. Rise Awareness...

Networking with youths

- South Asia Youth Environment Network (SA'YEN) active awareness





Rise Awareness...

National Level Awareness programmes

- TV programmes, Stage drama, Posters
- Workshops

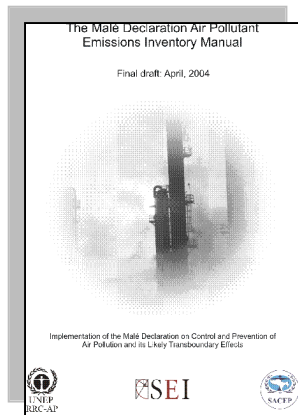


Air Pollution and Asthma:
workshop to promote intervention;
Bangalore, India, Jan 2008

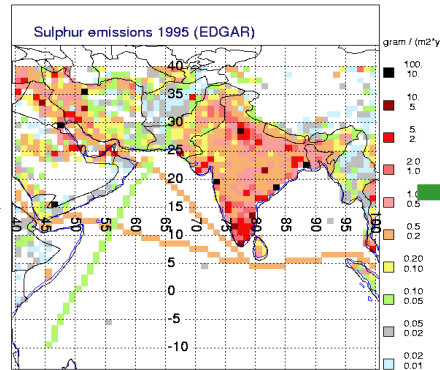


Dr. C. S. Karim, Hon'ble advisor, Ministry of Environment & Forest, Agriculture, Fisheries & Livestock, Bangladesh answering the media questions on Male' Declaration

Summary of Progress



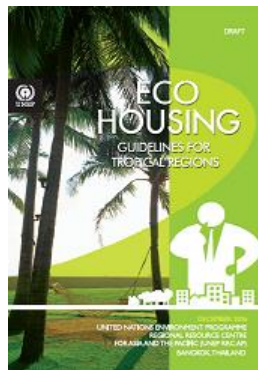
EMISSION INVENTORY



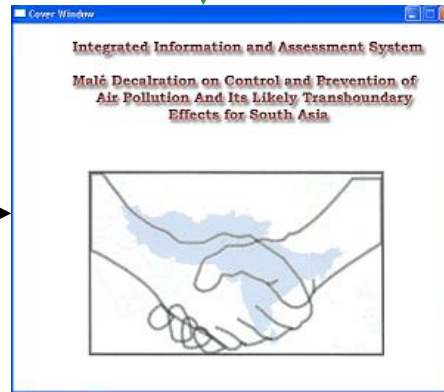
MATCH MODEL



MONITORING



GOOD PRACTICES



IIAS

INFORMATION FOR DECISION MAKING

IMPACT STUDIES

- Health
- Crop
- Corrosion