

Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia

Presentation
on
Overview of national level implementation of the Malé Declaration in Bangladesh

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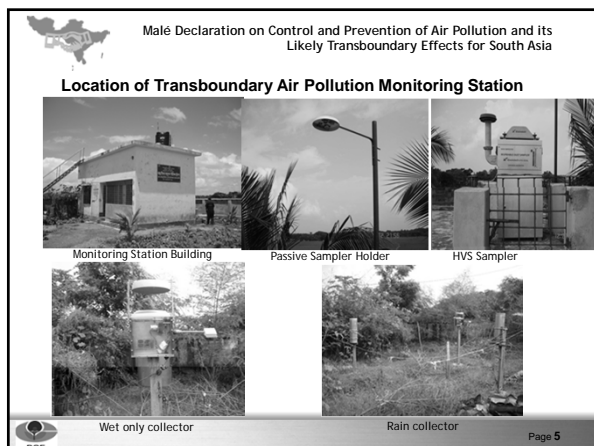
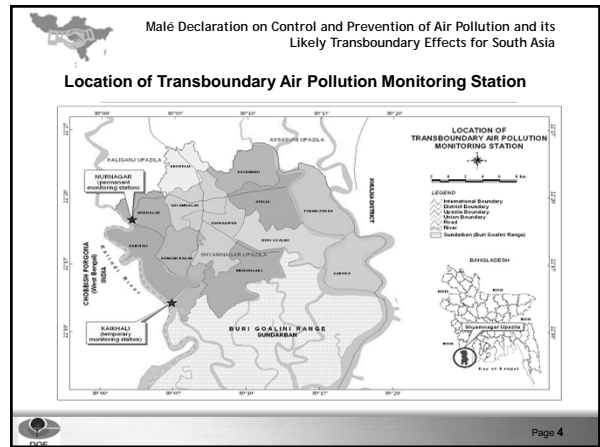
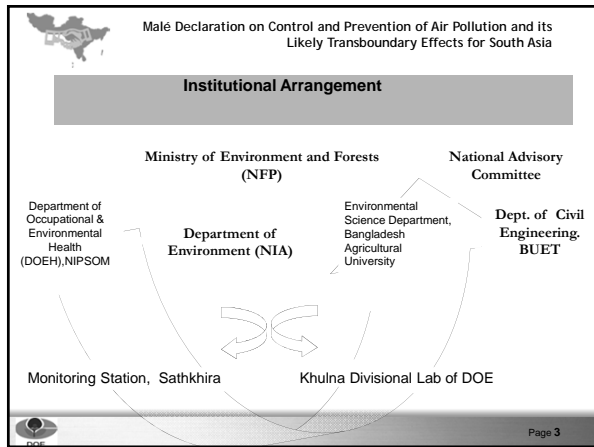
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Outline of the Presentation

- Institutional Arrangement
- Location of Trans-boundary Air Pollution Monitoring Station
- Monitoring activities-Dry and wet deposition
- Emission inventory and modeling
- Impact Assessment Activities
- Air Pollution Reduction Strategy for Bangladesh
- Awareness Activities
- Action Plan.

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Monitoring activities

- Analysis Concentration of Air Pollutants (Dry Deposition)
 - By High Volume samplers (Particulate Matter- PM₁₀) and Diffusive samplers (SO_x, NO_x and O₃).
- Rain water Analysis (Wet Deposition)
 - Sample Collection By Bulk Collector and Wet only Collector).
 - PH, EC, Anions (Sulfate, Nitrate, Chloride, Bicarbonate), Cations (Sodium, Potassium, Calcium, Magnesium, Ammonium).
 - Analyze by using PH, EC meter, Spectrophotometer and Atomic Absorption Spectrophotometer.
- Metrological Parameter
 - Data Collected from Metrological dept. of Shatkthira.

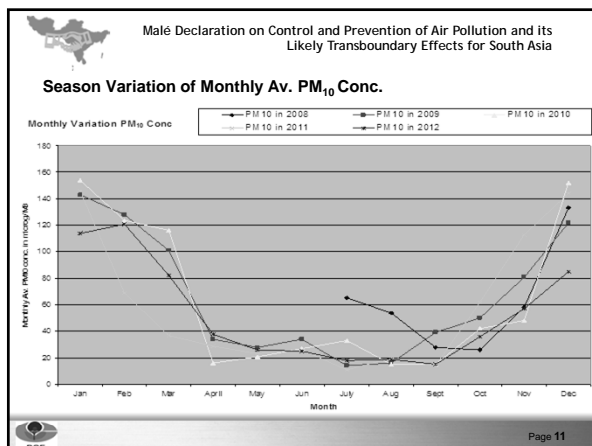
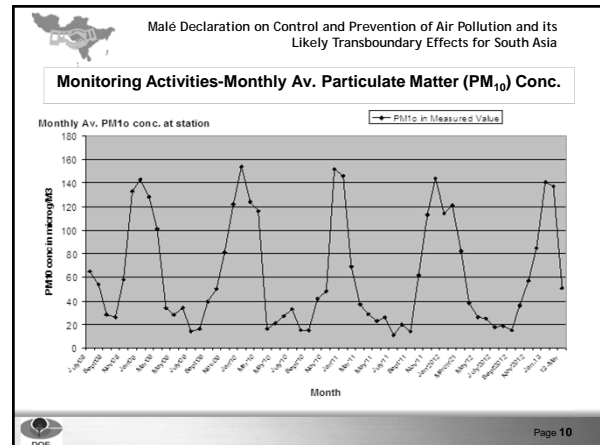
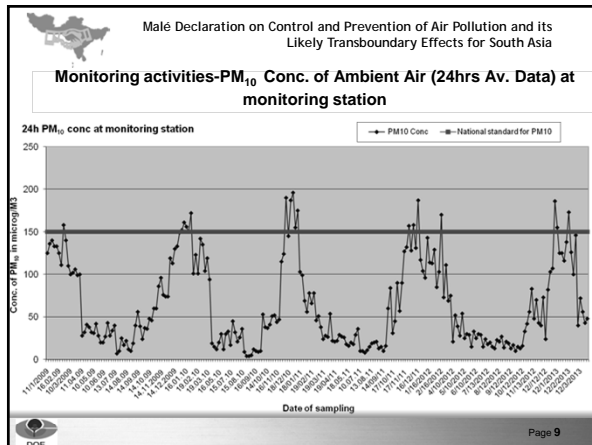
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Monitoring activities

- Standard Operating Procedure (SOP) has been translated in local language.
- Participation of inter Laboratory Comparison programme by UNEP/AIT.
- National Advisory Committee has been formed and this committee is having meeting in every three months .
- High Volume sampler for PM₁₀ Monitoring has been started from July' 2008.
- Passive sampler for SO₂ and NO₂ Monitoring have been started from July' 2004.
- Passive Sampler for O₃ Monitoring has been started from July' 2006
- Rain water Sampling has been started from 2007.

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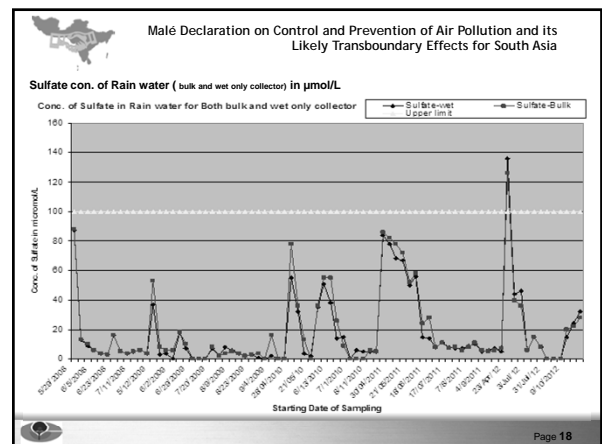
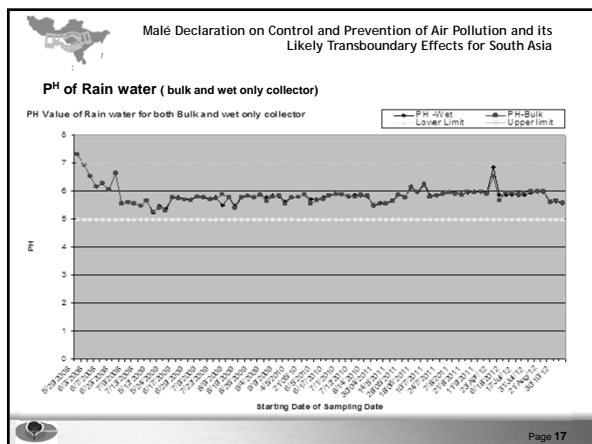
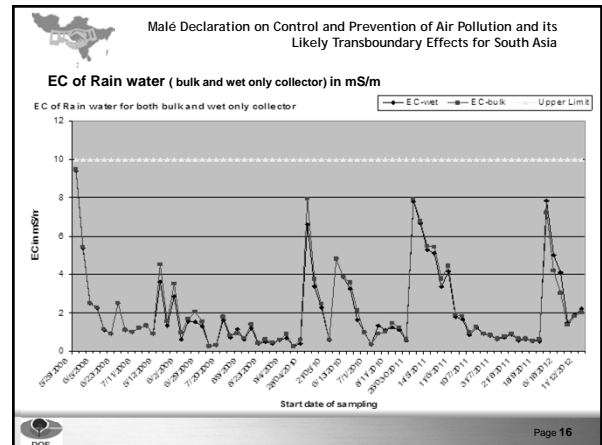
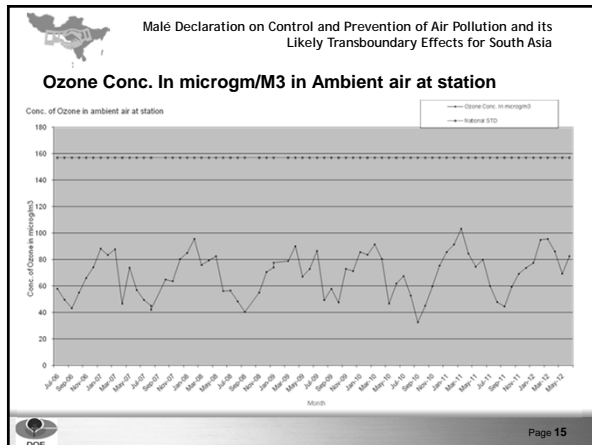
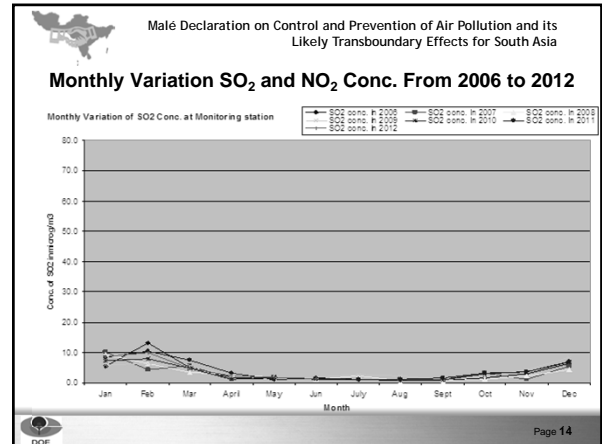
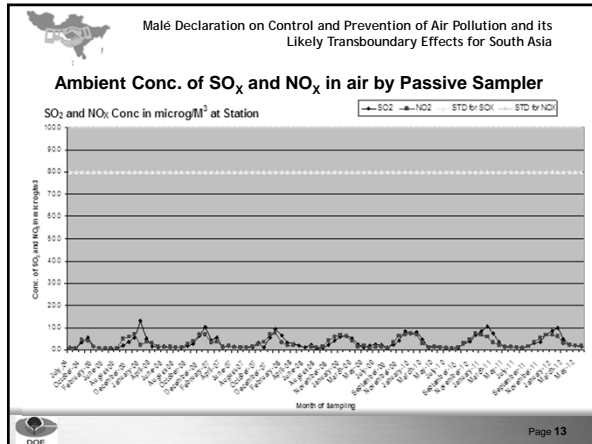


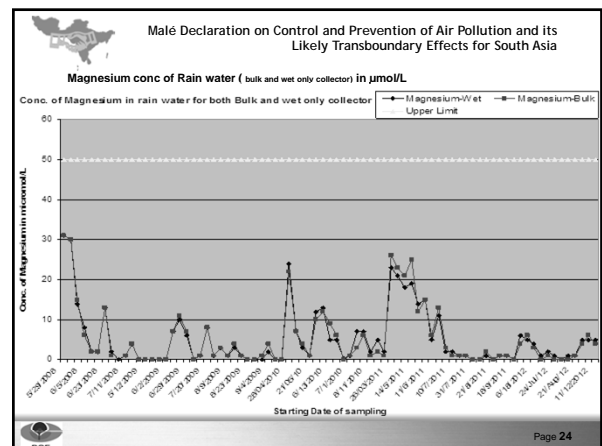
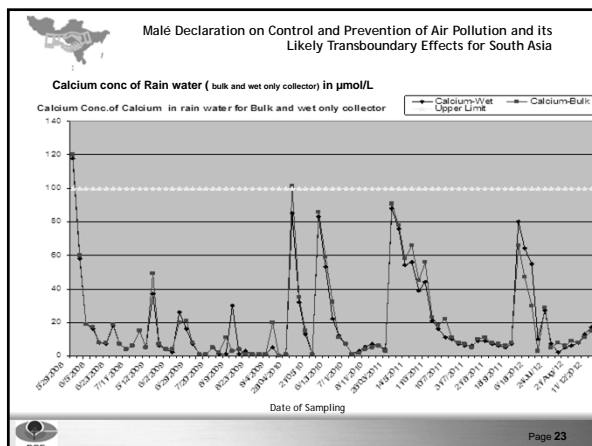
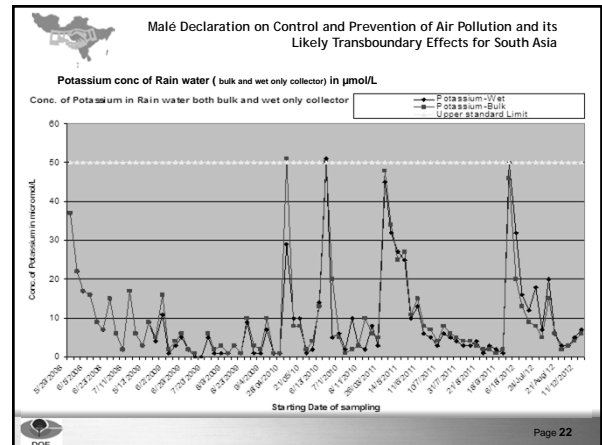
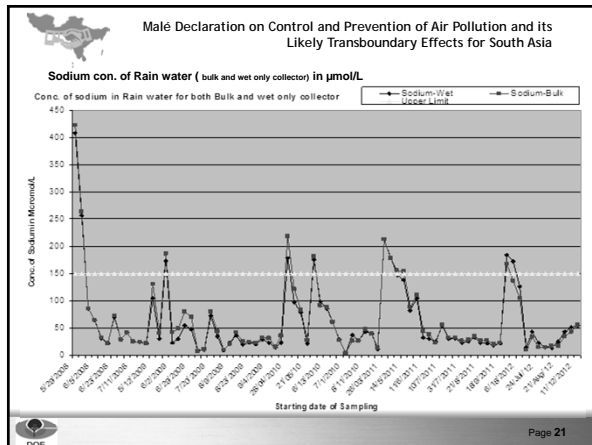
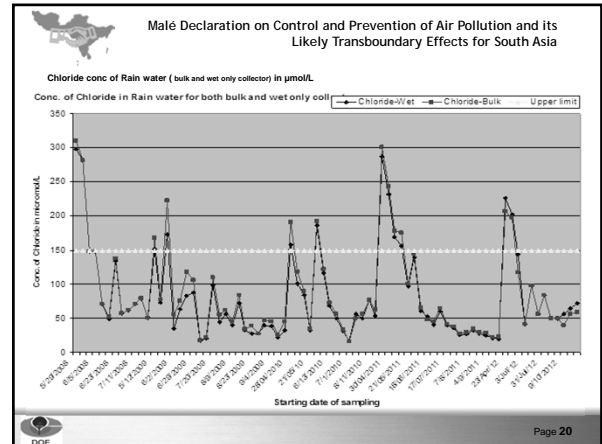
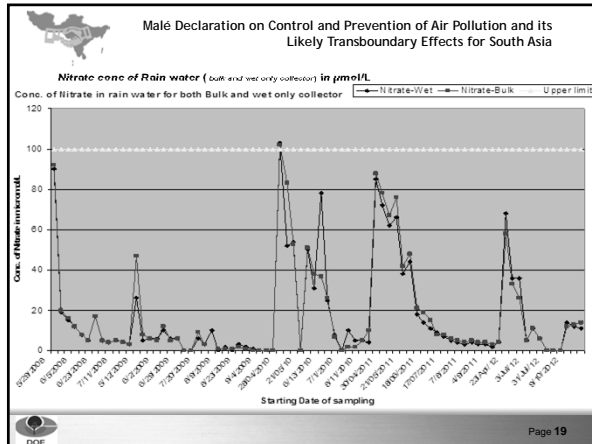
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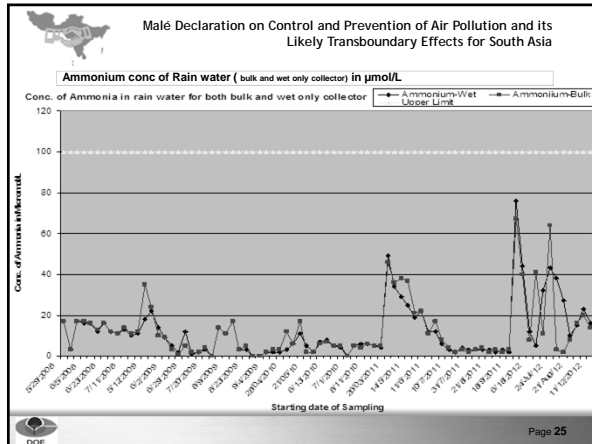
Annual Average of PM₁₀

Year	PM ₁₀	Nation standard
2009	68	50
2010	66	50
2011	58	50
2012	51	50

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Observation about Dry deposition Monitoring

- Same trend of PM conc. Variation like previous years
- PM Conc. Observed higher value during Dec, Jan and Feb
- SO₂ and NO₂ conc. at station observed much lower than national standard
- SO₂ and NO₂ conc. Observed higher Value during Dec, Jan and Feb
- Annual Average of PM₁₀ is decreasing trend.
- Ozone conc. Relatively higher than others gaseous substances.
- All Rain water samples analyzed data have been checked QC and QA by R₁ and R₂ Calculation.

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Emission inventory and modeling

- Emission Inventory, Emission Scenario and Modeling under Malé Declaration on Control and Prevention of Air Pollution And Its Likely Transboundary Effects for South Asia

The emissions inventory under the current exercise is based on a common methodology developed by the Swedish Environmental Institute (SEI) for countries in South Asia - itself derived from various inventory approaches used in other regions of the world using 2005 data. According to the SEI approach, sources of air emissions are categorized into ten sectors.

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Emission inventory and modeling

1. Combustion in the energy industries,
2. Combustion in the manufacturing industries and construction,
3. Transport,
4. Combustion in other sectors
5. Fugitive emissions from fuels
6. Industrial processes
7. Solvent and other product use
8. Agriculture,
9. Vegetation fires and forestry, and
10. Waste

Each sector has several sub sectors. For each sector the basic approach for calculating emissions of a particular pollutant is simple in concept.

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Emission inventory and modeling

DIFFICULTIES

- Data are not available in all sectors.
- Data are not in same time frame.
- Incomplete data

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Health Impact Assessment


Assessment of Impact of Air Pollution among School Children of selected school of Dhaka City

3 schools of Dhaka City
Survey:1680 Students (Class V-IX),
Duration: 7 Days
Main Study:180 Students(120 Asthma=60 Non-Asthma),
Duration:42 Days

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Assessment of Impact of Air Pollution among School Children of selected school of Dhaka City



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Assessment of Impact of Air Pollution among School Children of selected school of Dhaka City



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Assessment of Impact of Air Pollution among School Children of selected school of Dhaka City

Findings:

- The study was concluded with that the air pollution especially the particulate matter (PM_{10} and $PM_{2.5}$) are causing respiratory health problems particularly of the children in Dhaka, who are suffering from asthma.
- The air pollution is not only affecting the health of the children but also causing adverse economic implication in the family and as well as in the nation

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Air Pollution Impact on crop

- Study 1: Biomonitoring study using white clover in relation to tropospheric ozone concentrations
- Study 2: Chemical protectant study using EDU in Potato, Mubean, wheat and spinach.
- Findings-The prevailing O_3 concentrations at Bangladesh Agricultural University Campus area led to a decrease in biomass of the O_3 -sensitive clover genotype and also in local cultivars, which indicates that sensitive crop cultivars might be at risk in the farming areas of Mymensingh District.

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Air Pollution Impact on crop




Fig. Ozone resistant white clover plants cultivated in Mymensingh

Fig. White clover plants suffering with air pollutant (tropospheric ozone)

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Fig. A

Fig. B

Fig. A. Wheat plant cultivated with EDU

Fig. B. Wheat plant suffering with tropospheric ozone

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Air Pollution Reduction Strategy for Bangladesh

- Prepared by Department of Civil Engineering, Bangladesh University of Engineering and Technology with the financial help of UNEP.
- Major features -
 - Analyze the air pollution status of Bangladesh.
 - National Air Quality Management and standard
 - Sources of Air pollution in Bangladesh
 - Effects of Air Pollution
 - Past Air Quality strategies of Bangladesh.
 - Air Pollution Control Approaches
 - Evaluation of Past Air Quality strategies
 - Recommended Strategies for Air Pollution Reduction
 - Other policy issues

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Awareness Activities

Awareness material for print and electronic media developed

Print Material:

- Posters-20,000
- Leaflets-20,000
- Stickers-10,000

Electronic Media Material:



- TV spots- 4 Nos.
- Docodramas-3 Nos.
- Folksongs- 2 Nos.

Bus Sticker- 6 Nos.

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Awareness Activities

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Awareness Activities

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Future Plan

- All parameters will be monitored as usual.
- 2nd monitoring station may be set up, if fund is made available.
- PM_{2.5} may measured ,if it is included as a parameter in *Malé Declaration*.

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Thank you....

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