

# Malé Declaration

on Control and Prevention of Air Pollution  
and Its Likely Transboundary Effects for South Asia



BANGLADESH

An overview of progress  
within the last decade...



# BANGLADESH

## Status of Implementation 2008



Participants of National Stakeholder Meeting, 2004, Dhaka

### Background

Air pollution has become one of the major problems in the large cities of Bangladesh. Cities like Dhaka, Chittagong and Khulna are facing serious health concerns due to air pollution. The principal air pollutants in Dhaka City and other large cities are particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulphur dioxides (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), ozone (O<sub>3</sub>) and carbon monoxide (CO). Among these air pollutants, particulate matter has become a major concern. The trend of PM<sub>10</sub> and PM<sub>2.5</sub> concentrations in Dhaka City has been given below.

### Major Sources of Air Pollution and Impacts

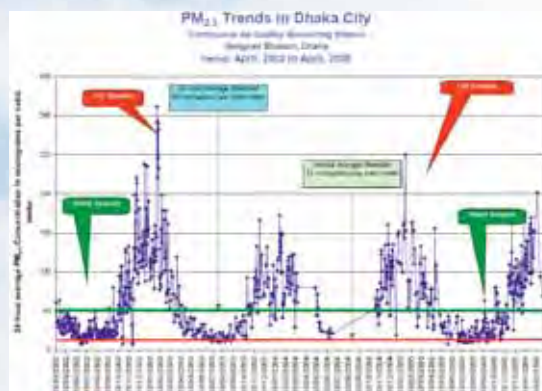
In Dhaka City, a huge fleet of motorised vehicles such as buses, mini and minibuses, trucks, cars, jeeps, three-wheelers and motorcycles emit toxic substances such as CO, NO<sub>x</sub>, SO<sub>x</sub>, HC and their derivatives, and particulate matter.

As a response to this serious vehicular air pollution faced by the country, an initiative was taken by the Government in 2002 to clean the air of Dhaka City by restricting the movement of vehicles more than 20-years-old, imposing a total ban on two-stroke three-wheelers, introducing environmentally-friendly transport systems such as CNG-fueled four-stroke three-wheelers, double-decker buses and proper traffic management. The introduction of CNG driven air conditioned city bus service is an outcome of this initiative.

Lead is another major health hazard, considered a main cause of environmental diseases among children and adults. In response, the Government of Bangladesh executed a landmark decision to provide only lead-free gasoline.



The trend of PM<sub>10</sub> concentration goes up in the dry season and goes down in the rainy season.



The trend of PM<sub>2.5</sub> concentration goes up in the dry season and goes down in the rainy season.

### The Malé Declaration in Bangladesh

Bangladesh is implementing in phases activities since the adoption of Malé Declaration in the 7<sup>th</sup> Governing Council Meeting of SACEP in 1998.

In phase I, a baseline study was carried out and a National Action Plan was prepared. In phase II, selection of monitoring station was done, lab equipment was supplied, training of lab technicians was conducted, a permanent monitoring station at Shatkhira near Sunderban was set up and monitoring activities were carried out.

At present, the extended program of Malé Declaration Phase II, is under implementation. In this extended program, monitoring activities on wet and dry deposition are going on. An Atomic Absorption Spectrometer (AAS) has been made operational. The AAS operational and maintenance training program had been organised recently in Khulna Divisional Office of the Department of Environment.

### Participating Institution

Bangladesh Metrological Department (BMD) is providing met data on a monthly basis. National Institute of Preventive and Social Medicine (NIPSOM) and Environment Science Department of Bangladesh Agricultural University are also involved in health impact and crop impact studies, respectively.

### Enhancing Impact Assessment Capacity

While conducting the air pollution impact study on health and crop, the capacity for doing this kind of studies by the local institutes has been enhanced in a great way.

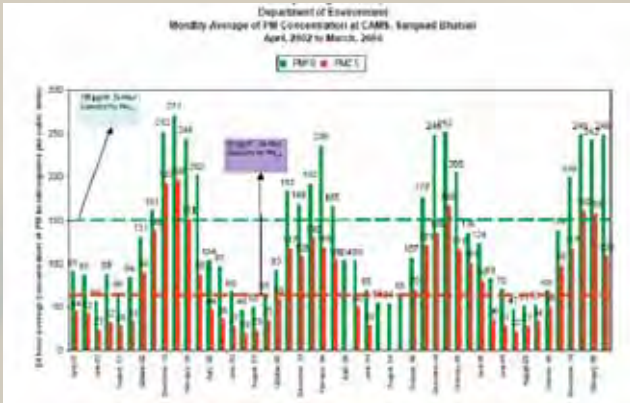
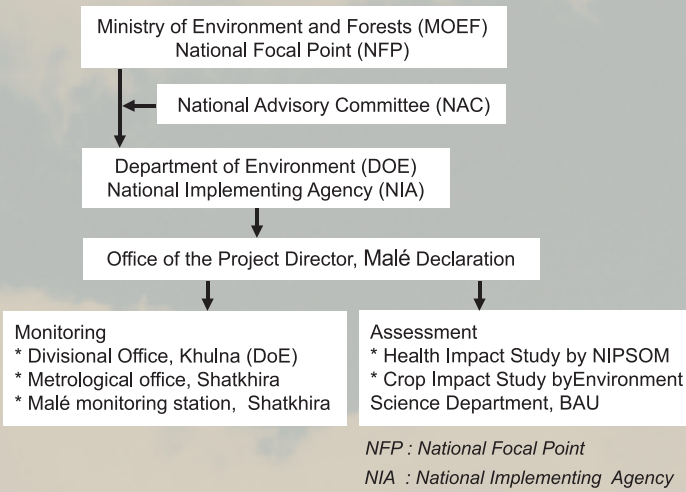
### Awareness

Awareness activities will be carried with media. Awareness materials being developed for print and electronic media.



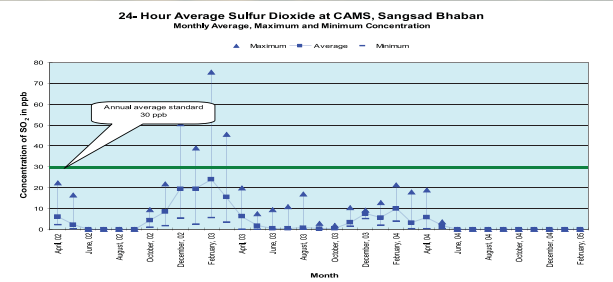
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## The Institutional Arrangement

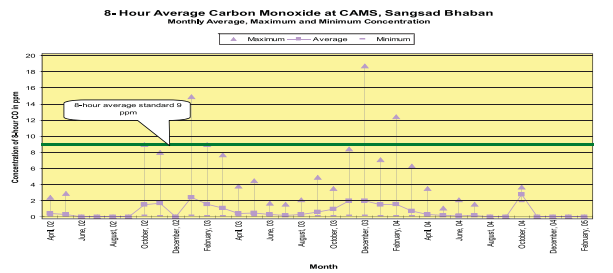


## Status of Air Pollution

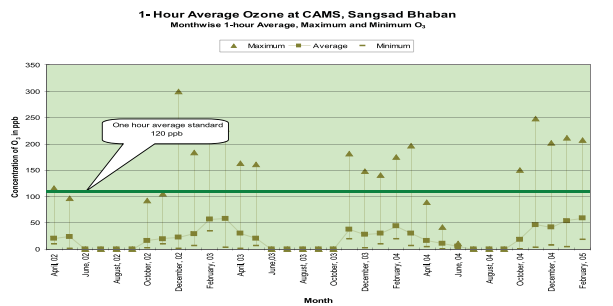
| Pollutant          | Status of problem            |
|--------------------|------------------------------|
| Particulate matter | Major Problem                |
| SO <sub>2</sub>    | Moderate                     |
| NO <sub>2</sub>    | Moderate                     |
| O <sub>3</sub>     | ---                          |
| CO                 | Moderate                     |
| HC                 | Moderate                     |
| Pb                 | Controlled by lead phase-out |
| Others             | ---                          |



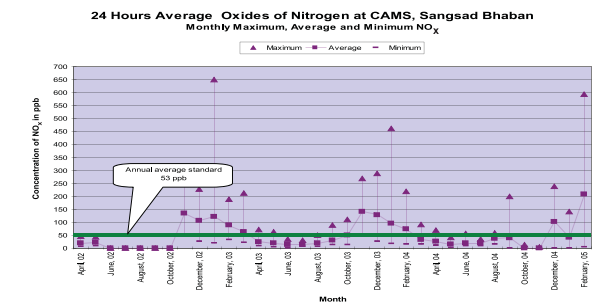
The trend analysis of Sulfur Dioxide in Dhaka city



The trend analysis of Carbon Monoxide in Dhaka city



The trend analysis of Ozone in Dhaka city



The trend analysis of Oxides of Nitrogen in Dhaka city

## Summary of Baseline Information

|                                 | 2000  | 2008   |
|---------------------------------|---|--|
| Nature of problem               | - Vehicular<br>- Industrial                       | -Improved in vehicular emission<br>-Same as before for industrial emission   |
| Status of monitoring            | No systematic Monitoring; Random Monitoring exist | Improved   |
| Pollutant monitored             | SPM, SO <sub>2</sub> , NO <sub>x</sub> , CO, Pb   | CO, SO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> , pH, PM, EC, Cl <sup>-</sup> , Na <sup>+</sup> , K <sup>+</sup> , Mg <sup>2+</sup> |
| Number of monitoring stations   | 1   | 4  |
| Capacity to study air pollution | Limited   | Capacity has been built to study health and crop impacts   |
| AQ Standard                     | Exist   | Revised air quality standards  |

## Achievements

- Data have been generated from monitoring activities and compilation is on-going.
- One monitoring station has been established at Shatkhira near Sunderban for regular transboundary air pollution monitoring.
- Capacity building to assess air pollution's impacts on health and crop is underway.
- Data collection by Peak Flow Meter among 180 students of three selected schools of Dhaka City has been done.
- The crop impact study has progressed satisfactorily at the Bangladesh Agricultural University at Mymensingh.



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### Response

#### Legal

Vehicle emissions standards for Bangladesh were stipulated in the Environmental Conservation Rules 1997. The standards included were reviewed and new Vehicular Emission Standards for both in-use and new imported vehicles were publicised in September 2005 by the Government of Bangladesh.



-Promotion of CNG Vehicles: One of the major components of the UTEIS action plan was the abatement of 3-wheeler vehicular emissions by introducing new CNG fueled 4- stroke 3-wheelers. A number of CNG filling stations were opened in Dhaka and both public and private sector transports run by gasoline and diesel fuel, are now being converted to CNG.

- Standards for Stationary Point sources: The 1992 Brick Burning Control Act was introduced to mitigate emissions from brick kilns and fields. The Act is one of the primary pieces of legislation aimed at controlling stationary sources of emission in the country. According to the rules, chimney height of the brick kilns should be 120 ft.

- Control of slow moving vehicles in the road: Government has banned rickshaws from few roads in Dhaka City, which has improved traffic movement and air quality situation in the city.

- Mass transport: To reduce air pollution in Dhaka, government has also introduced double-decker buses in some roads as mass transport, which needs to be expanded as needed in the country.

#### Financial:

Financial support has been given to purchase CNG buses and set-up CNG stations in various locations of Dhaka City.

### Recommendations:

- Introduction of Environmental Sustainable Transport System (EST)
- CNG stations in all major cities should be set up, where natural gas is available.
- Road network need to grow avoiding traffic congestion in Dhaka and other major cities.
- Introduction of 3R (Waste Reduce, Reuse and Recycle)
- Building construction materials in the site should be kept covered.
- Environment Management System (EMS) should be introduced in all industries for emission control.
- Regular monitoring of ambient air quality should be undertaken and released for information of the public.
- More Monitoring Stations are required to be set up in the country.
- Awareness raising on air pollution and role of individuals in its prevention should be emphasised.

### Coordinating Agencies



UNEP Regional Resource Centre for Asia and the Pacific (UNEP RRC.AP) Bangkok, Thailand



South Asia Cooperative Environment Programme (SACEP) Colombo, Sri Lanka



Stockholm Environment Institute (SEI) Stockholm, Sweden



Sida, the Swedish International Development Cooperation Agency is funding this part of the Malé Declaration implementation as part of the Regional Air Pollution in Developing Countries (RAPIDC) programme.



Bangladesh NFP: Ministry of Environment & Forest NIA : Department of Environment