

# Malé Declaration

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



PAKISTAN

An overview of progress  
within the last decade...



# PAKISTAN

## Status of Implementation 2008



### Background

Over the last few years, Pakistan has made rapid strides in economic development. Rapid urbanisation, growth in the number of vehicles and industrialisation have all inevitably led to greater energy demands, which are reflected in increasing air pollutant emissions. The problem of air pollution has thus been on the rise in major urban centers of the country.

Fossil fuels are the ultimate source of the energy demands in Pakistan, either directly or via conversion to electrical energy, Suspended Particulate Matter (TSP, PM<sub>10</sub> and PM<sub>2.5</sub>) in ambient air is the primary issue of concern for Pakistan. Since Pakistan is a semi-arid region, the rate at which air pollutants are able to be flushed out is significantly lower than in other regions, especially that of particulate matter (PM). Also, many lesser developed areas of the country are devoid of facilities for domestic natural gas consumption, thus relying upon biomass burning as an energy source, a significant contributor to indoor air pollution.



*National Stakeholder meeting held on 14<sup>th</sup> December, 2004, Islamabad*

### The Malé Declaration in Pakistan

The Pakistan Environmental Protection Agency (Pak-EPA) acts as the National Implementing Agency (NIA) for the Malé Declaration. In coordination with the Pakistan Meteorological Department (PMD), Pak-EPA has established a station and laboratory at Bahawalnagar for the purpose of monitoring transboundary air pollution. The following activities have been completed :

- Installation of ambient air monitoring equipment for Particulate Matter [PM<sub>10</sub> and TSPM (Total Suspended Particulate Matter)]
- Installation of wet deposition monitoring collectors (bulk and wet only)
- Installation of diffusive samplers (for NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub>) according to the monitoring protocol
- Establishment of a laboratory for the analysis of basic parameters of samples collected from the bulk and wet-only collectors.

Training was imparted to the Meteorological Department officials at Bahawalnagar to cover the following aspects:

- Wet deposition monitoring
- Air concentration monitoring
- Dry deposition monitoring
- Diffusive samples monitoring
- Monitoring intervals and data reporting
- Good laboratory practices
- Equipment calibration
- Distillation water preparation and usage

Due to the complexities involved in the analysis of SO<sub>2</sub> and NO<sub>2</sub> from the High Volume Samplers, this particular activity has yet to be initiated. However, training of staff by the Pak-EPA has been completed in 2007.

The city and surrounding areas are dependent on biomass burning for cooking, heating, and industrial purposes. The situation of local air pollution worsens in winter due to extensive use of biomass for heating purposes, along with calm wind conditions. This local factor should be considered when interpreting the concentrations of transboundary air pollution.

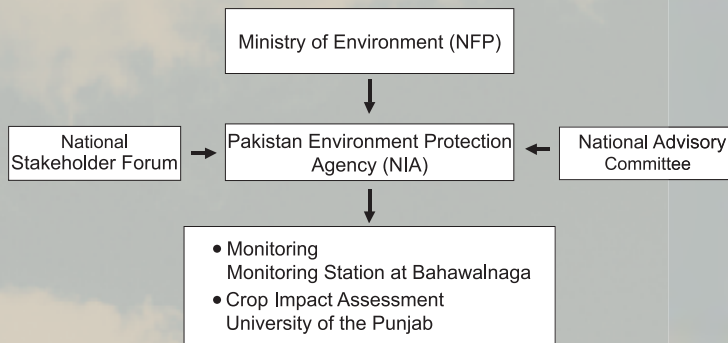


*Monitoring station at Bahawalnagar*



## An overview of progress within the last decade

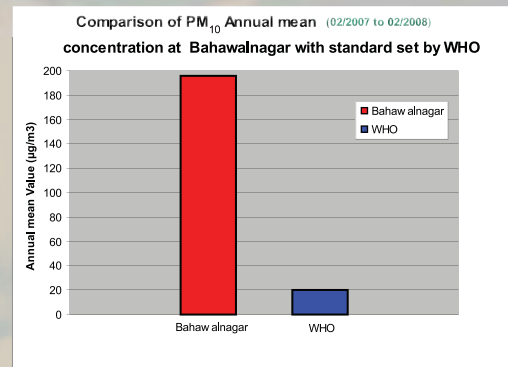
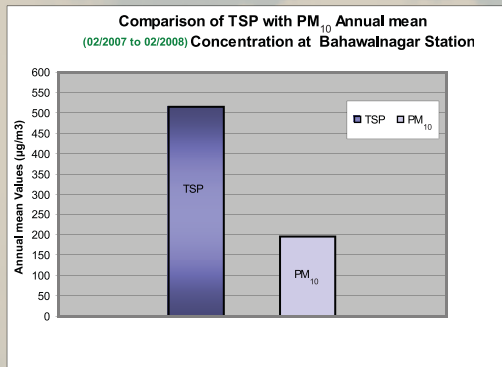
### Institutional Arrangement : Pakistan



NFP : National Focal Point  
NIA : National Implementing Agency



Spinach plant: EDU treated and non EDU treated (65 days)  
(Crop Impact Study at University of Punjab, Pakistan)



### Summary of Baseline Information

	2000	2008
Nature of problem	- Urban vehicular - Industrial - Indoor air pollution	Higher values of PM <sub>2.5</sub> in ambient air
Status of monitoring	No systematic monitoring; scattered monitoring	Limited monitoring mechanisms in place. Data from different stations linked to Central Laboratory for Environmental Analysis and Networking at Islamabad.
Pollutant monitored	SO <sub>2</sub> , NO <sub>x</sub> , PM, CO, metals	NO, NO <sub>2</sub> , CH <sub>4</sub> , NMHC, CO, SO <sub>2</sub> , O <sub>3</sub> , PM Rainwater PH, Rainwater EC
Number of monitoring stations	- 3 portable/mobile - 5 proposed	- 7 functional fixed air quality monitoring stations - 3 operational mobile ambient air monitoring stations - 5 operational vans equipped with stack emissions monitoring devices and analysers.
Capacity to study air pollution	Limited	Improved
AQ standards	Emission standards for industries; ambient air quality standards for power plants operating on oil and coal.	Ambient air quality standards have been drafted and are currently undergoing consultative process before notification.





## An overview of progress within the last decade

### Response

#### Institutional/Legal

- 1983
  - Enactment of Pakistan Environmental Protection Ordinance
  - Establishment of the Pakistan Environmental Protection Council
- 1988-1989
  - Establishment of Environmental Protection Agencies
- 1997
  - Creation of the Pakistan Environmental Protection Act
- 2000
  - Environmental Tribunals Procedures and Qualifications Rules
  - Draft Hazardous Substances Rules
  - Review of Initial Environmental Examination and Environmental Impact Assessment (IEE/EIA) Regulations
  - Environmental Laboratories Certification Regulations
- 2001
  - Establishment of National Environmental Quality Standards (self-monitoring and reporting by industries) Rules
  - Industrial Pollution Charge (Calculation and Collection) Rules
  - Environmental Samples Rules

#### Others

- Phase out of two-stroke rickshaws.
- Setting up computerised vehicle tuning centers.
- Introduction of compressed natural gas as vehicular fuel.
- Introduction of CNG buses for mass transit in big cities.
- Tax incentives for installing pollution control devices.
- Issuance of Environmental Protection Orders and/or closure of pollution-causing Industries.
- Imposition of fines on offenders.
- Awareness campaigns.
- Road map for introduction of Euro standards for vehicular emissions has been devised.
- Draft Ambient Air Quality standard and Pakistan Clean Air Program (PCAP) under consultative process.

### Recommendations

- Pakistan may introduce control technologies focusing on fuel or combustion technique modifications, or alternatively, removing pollutants from flue gases. Pre-combustion control techniques are often the simplest and most cost-effective method of reducing emissions and could involve the use of low pollutant fuels.
- Atmospheric emissions may be reduced through the use of alternative fuel such as natural gas.
- Combustion modification techniques such as low NO<sub>x</sub> burners and fluidised bed combustion may be employed to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions. However, modern combustion technology is relatively expensive.
- Post-combustion control, which involves the removal of pollutants from flue gases and vehicle exhausts, may be introduced for the purpose of removing SPM from flue gases through gravity settling chambers, cyclones, spray chambers, bag filters and electrostatic precipitators.
- Catalytic converters may be introduced to control motor vehicle pollutants.
- The introduction of new manufacturing processes could also lead to significant reductions in industrial emissions. For example, the use of low temperature hydrometallurgical techniques could reduce the SO<sub>2</sub> emissions associated with traditional metal smelting methods.
- The introduction of simple chimneys and vents for domestic stoves and heaters can greatly improve indoor air quality.

### 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.**



**Pakistan NFP: Ministry of Environment**

**NIA: Pakistan Environment Protection Agency, Islamabad**