# Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia (Malé Declaration): Current Progress and Challenges

**BAQ 2018**

**16 November 2018, Kuching, Malaysia**

## PATHWAYS TO GLOBAL CLEAN AIR

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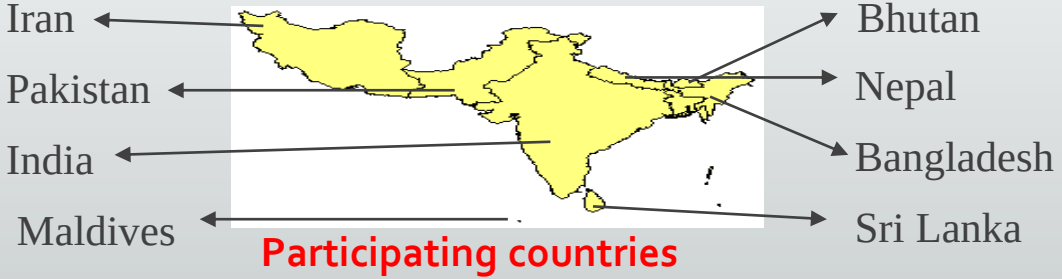
# BACKGROUND

In 1998, UNEP together with the Stockholm Environment Institute (SEI) drew attention to the possibility of the impacts of transboundary air pollution in South Asia. This initiative led to the adoption of the Malé Declaration). The Malé Declaration's objective is to aid the process of providing a clean environment through clean air. Its implementation has been carried out in phases.

**Implementation in Phases:**

- Phase I: Awareness and baseline studies (1999-2001)
- Phase II: Local capacity building for monitoring and analysis (2001-2004)
- Phase III: Capacity building on monitoring and impact assessment (2005-2008)
- Phase IV: Enhancement of regional cooperation and establishment of Regional Centers (2009-2012)
- Phase V: Promotion of policy measures to control emissions of air pollutants including SLCPs(2014-2016);
- Phase VI :Enhancement of all activities (2017-2020)



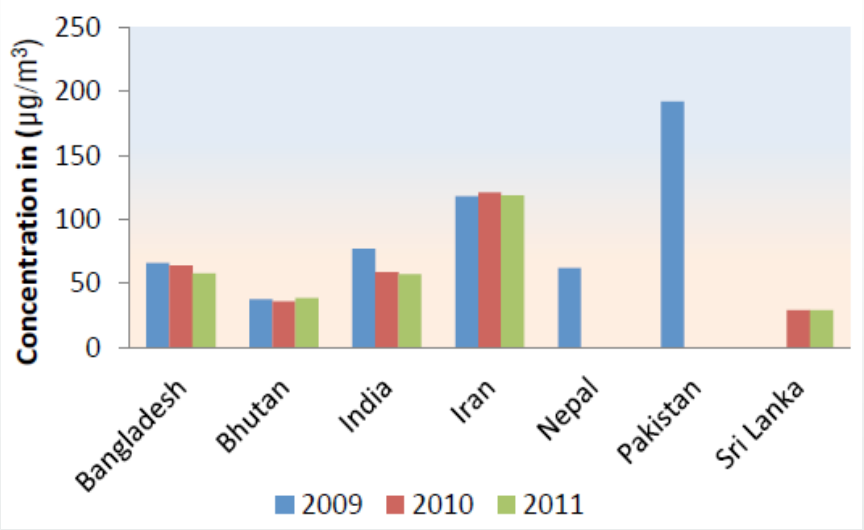
# Major activities

- Monitoring
- Impact Assessment (health impact, crop impact, corrosion impact)
- Emission Inventory
- Modelling
- Policy Development
- Awareness raising

# Monitoring

## Malé Declaration Results

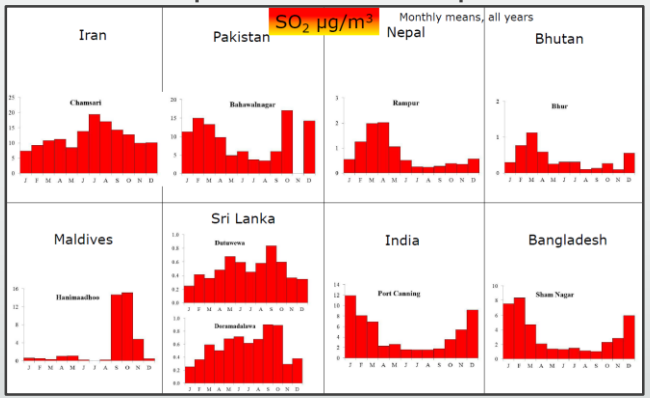
Monitoring is the backbone of all other activities and must be stable and long-term and organized in a robust network of monitoring sites. The Malé Monitoring Network was established in 2003 with at least one regional monitoring site established in each of the 8 Malé Declaration countries, further sites have subsequently been added and there are currently 15 sites in the network.



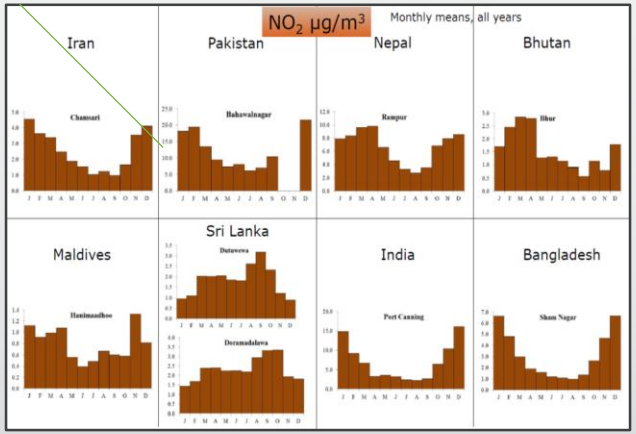

Annual average particulate matter concentrations ($PM_{10}$) at Malé Declaration Sites 2009-2011 using High Volume Samplers.
Note: All countries exceed the WHO (2005) guideline for annual mean $PM_{10}$ concentration of 20 µg/m$^3$

# Results of the Malé Monitoring Network

Passive samplers have proved the most useful monitoring method for the Malé Declaration to date, giving consistent and reliable results. Throughout Phase II, III and IV. For a large part of the region, $SO_2$ and $NO_2$ levels are highest in winter months and lowest during the summer period. The WHO guidelines (WHO 2005) are currently 40 µg/m$^3$ annual mean for $NO_2$ and 20 µg/m$^3$ 24-hour mean $SO_2$. Comparison with the mean monthly values for these pollutants shown in Figures indicates that in most Malé Declaration countries these pollutants **are not a health risk at these sites, alth**ough the situation is likely to be very different in urban areas or near point sources of pollution.




Sulphur dioxide concentrations at Malé Declaration regional sites, monthly means 2003-2012




Nitrogen dioxide concentrations with Passive Samplers at Malé Declaration regional sites, monthly means 2003-2012

# Human Health Impacts in South Asia

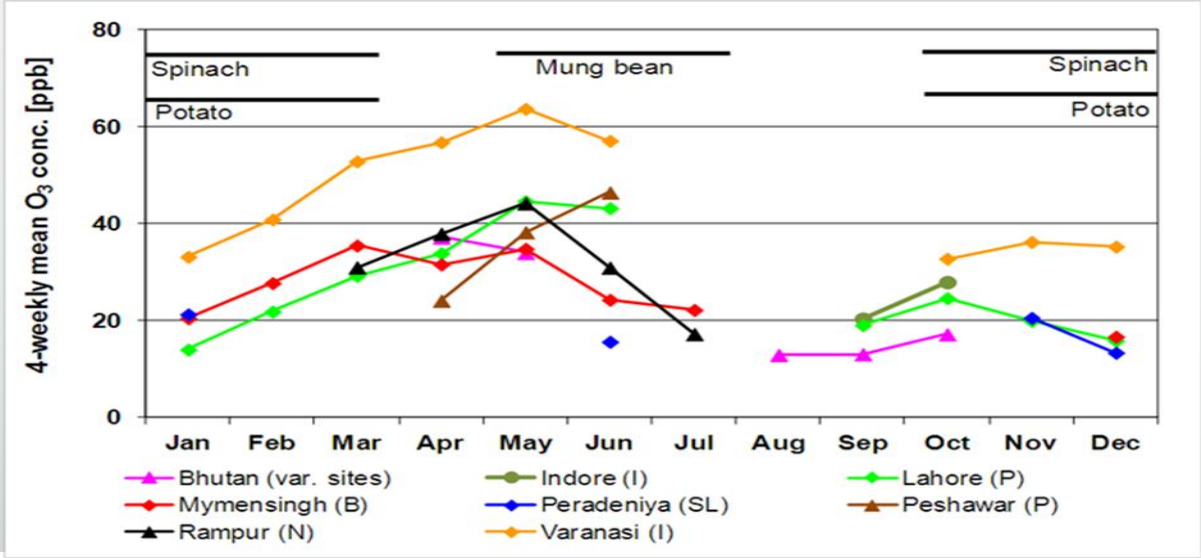
- Successful studies carried the relationship between air pollution (particulate matter (PM)) and the health of school children in Dhaka, Bangladesh, Kathmandu, Nepal and Islamabad, Pakistan.
- The Malé Declaration studies are some of the first to have been conducted where particulate matter concentrations are at the highest levels found in many large Asian cities.
- The findings of these studies emphasize the high cost of air pollution to the health of the community and the need to implement cost-effective measures to reduce emissions of health-damaging air pollutants.

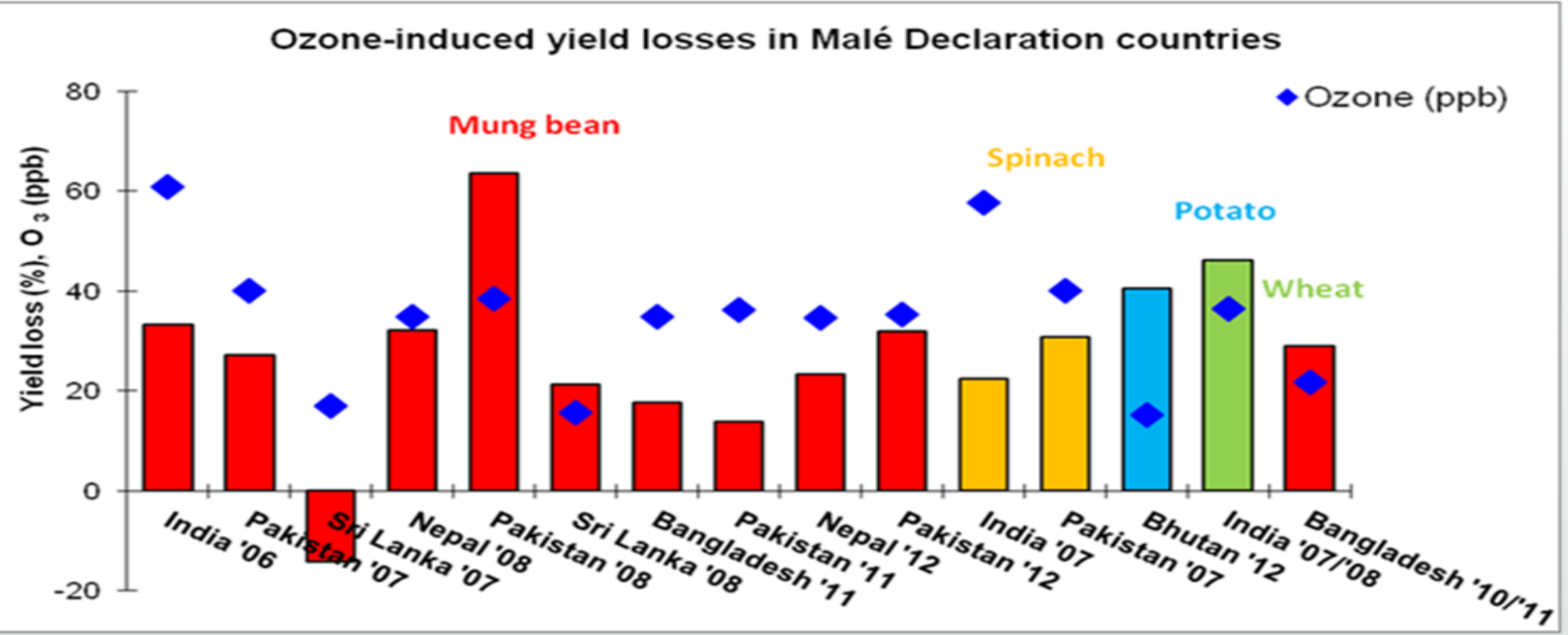
**Fiigure:** *Research Assistant guiding the children to measure the peak expiratory flow rate (PEFR) in Kathmandu, Nepal*

# Crop Impact Study

## Evidence of wide-spread impacts of ozone on crops in South Asia

- Ambient four-weekly mean $O_3$ concentrations at various experimental sites across South Asia as monitored with passive samplers






Ozone-induced yield losses for Mung bean, spinach, potato and wheat in various South Asian countries as recorded during field experiments conducted between 2006 and 2012.

# Ecosystem Impacts in South Asia

- Modelling studies and training events under the Malé Declaration have demonstrated that there are limited areas in South Asia which may be at risk from acidification from sulphur and nitrogen pollution such as parts of Sri Lanka and eastern India.
- Modelling results suggest that acidification will not be a major issue compared to other air pollution problems in South Asia but further field research is required to determine the real extent of the problem.
- A potentially greater problem to ecosystems and their biodiversity than acidification in South Asia is eutrophication (excessive input of nitrogen and other nutrients). Nitrogen pollution from the transport, industry and agriculture is linked to health impacts, impacts on ecosystems, crops and climate, as well as the formation of ground-level ozone.

# Malé Declaration OUTCOMES

1. Strengthened regional cooperation on transboundary air pollution
2. Strengthened monitoring ($SO_2$, $NO_2$, $O_3$, $PM_{2.5}$, $PM_{10}$ and TSP) and capacity building programmes
3. Enhanced capacity on emission inventory and Integrated Assessment Modeling
4. Enhanced analytical and impact assessment capability at the national level through integration of findings from local pollution studies and conducting assessment studies, (e.g. crop impact assessment. health impact assessment studies)
5. Enhanced policy formulation and air pollution prevention; and
6. Awareness raised on transboundary air pollution in South Asia region.

# PROGRESS

## 1) Eight (8) Regional Centres:

IG12 adopted and agreed on the location of regional centers as follows:

1. Regional Centre on Wet and Dry Deposition Monitoring -India
2. Regional Centre on Crops and Vegetation Monitoring -Pakistan
3. Regional Centre on Soil Monitoring -Bhutan
4. Regional Centre on Corrosion Impact Assessment -India
5. Regional Centre on Health Impact Assessment -Bangladesh
6. Regional Centre on Emission Inventories –Sri Lanka
7. Regional Centre on Modelling Atmospheric Transport of Air Pollution-Iran
8. Regional Centre on Pollution Reduction Policies/Strategies – Nepal / Maldives

Ig15 in 2016, Colombo, Sri Lanka

**2) Phase VI implementation (2017-2020), by IG15 in 2016**

**3) Roadmap for Emission Reduction in South Asia for adoption by IG;**

**4) Draft Strategy on Male' Declaration (2019-2023) for adoption by IG**

# Phase VI (2017- 2020)

The objectives of Phase VI include:

- To enhance and strengthen monitoring of air pollutants, including short-lived climate pollutants, emission inventory and modelling, as well as impact studies and awareness-raising that will facilitate science-based political decision-making for the immediate benefit of the whole region and beyond.

- To improve assessment of air pollution and promote mitigation measures and emission control in South Asia region.

# Report of the Export Group on Strengthening the Framework of Malé Declaration, including the Roadmap for Emission Reduction in South Asia

- I Introduction
- II. Review of the existing Standards
- 2.1. Ambient Air Quality Standards
- 2.2. Emission Standards for industrial sources
- 2.3. Mobile sources for the member countries
- III. Identification of the sectors for which standards need to be proposed
- IV. Available technologies in each country
- V. Issues of implementation in the member countries
- VI. Recommendations
- 6.1 Substances and pollutants to be standardized
- 6.2 Procedures for monitoring and emission reduction
- 6.3 Roadmap for emission reduction from selective sectors in South Asia


IG14 in 2015, Bangkok

# Draft Strategy for Malé Declaration (2019-2023)

## Main goals and objectives to be achieved in five years:

1. **To strengthen and enhance capacity building on the following aspects:**

- Control of air pollution and development of standards;
- Integrated air quality monitoring network, including monitoring of SLCPs and greenhouses gases;
- Clean air technology;
- Knowledge on transboundary air pollution through regional cooperation which contribute to effective policy measures.

2. **To continue and enhance monitoring and develop regional database;**

**3. To continue the health impact assessment and economic impact of air pollution;**

**4. To raise awareness on transboundary air pollution, including energy efficiency and resource conservation.**


TFFD6, Nepal, Nov. 2017

# Challenges:

1. Need to strengthen monitoring activities, capacities, and capability in the country including SLCPs, e.g. Black Carbon;
2. Monitoring facilities and equipment need upgrading, some have malfunction;
3. Technical support needed, clean air technology on emission reduction ;
4. The network needs improvement on emission inventory and modelling;
5. Awareness raising for public and policy makers is needed on current trends on atmospheric issues including SLCPs;
6. Need pilot projects and research/impact assessment studies;
7. Financial constraints and need innovative solutions;
8. Continued multilateral cooperation should be enhanced to secure long-term and sustainable progress of the network.

# Challenges: needing further cooperation and support

- The countries in the region are so diverse and mostly the air pollution network activities in Asia are voluntarily financially contributed by member countries. However, the support from donors and development agencies, developed countries on project funding or piloting projects on air pollution, technical assistance, research activities and capacity building activities are truly appreciated and much needed.

- On Male' Declaration, the 8 Regional Technical Centres in South Asia could play key role but require funding.

- Thank you for your attention!

Website
http://www.rrcap.ait.asia/male