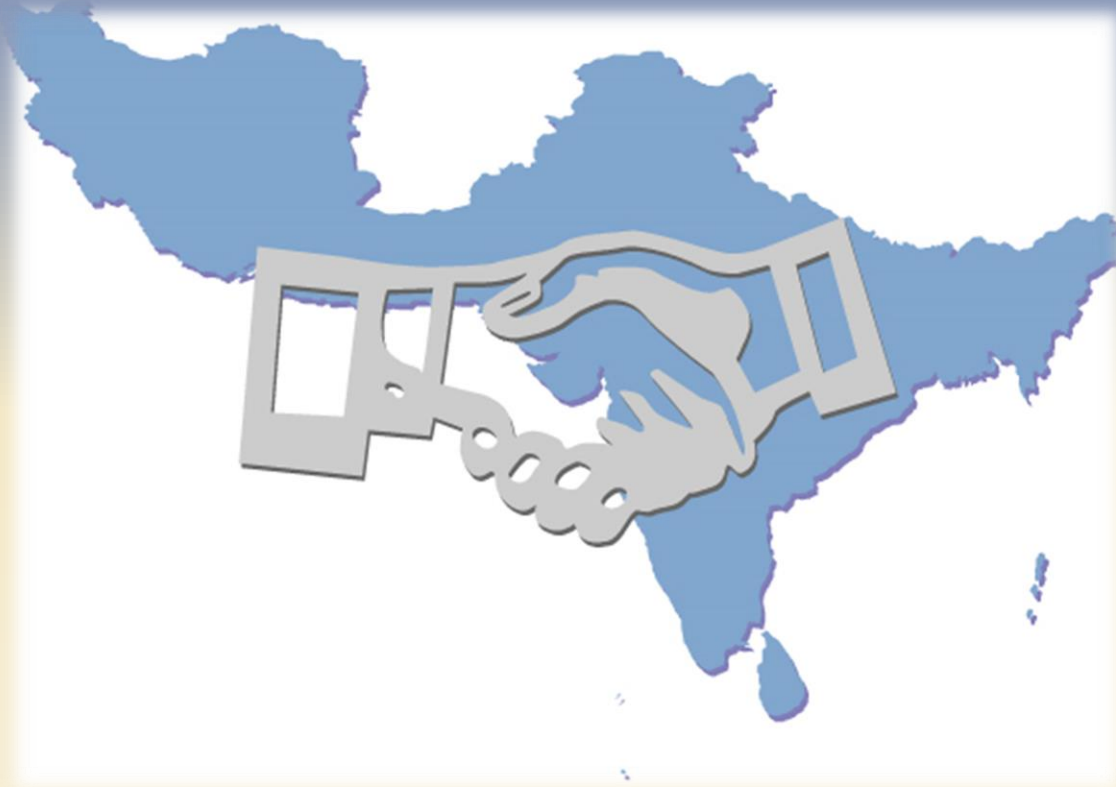


# The Malé Declaration



**Monitoring and Data reporting 2008**



# Monitoring and Data reporting under Phase III

	<b>Content</b>	
	<b>Monitoring Stations</b>	<ul style="list-style-type: none"><li>• Monitoring Site</li><li>• Site Audit</li></ul>
	<b>Data reporting status</b>	<ul style="list-style-type: none"><li>• Status of Monitoring</li><li>• Data Quality</li><li>• Result</li></ul>
	<b>Revised Technical manual</b>	<ul style="list-style-type: none"><li>• Background</li><li>• Six volumes</li></ul>



## Monitoring sites under Phase III

Country	Monitoring station (total 15 stations)
Bangladesh	1. Kulna
Bhutan	1. Gelephu,(near to India boarder) 2. Thimphu
India	1. Port Canning 2. Dawki in Meghalaya (bordering Bangaldesh) 3. Lakshadweep islands 4. Pathankot in Punjab (near Pakistan boarder) 5. Dara
Iran	1. Chamsari (Ilam province) 2. Zahedan (near to the city)
Maldives	1. Hanimaahu
Nepal	1. Rampur
Pakistan	1. Bahaal Nagar
Sri Lanka	1. Dutuwewa 2. Haton place in the Central Province



# Monitoring sites under Phase III

## Status of New monitoring site

Equipment installation

- Bhutan
- - Iran
- Sri Lanka

➤ India



Temperature



Wind monitor



Passive sampler



New bulk collector



Whether station for Iran



Wet only collector



## Monitoring sites under Phase III

### Site Audit

Bhutan	Gelephu	16-17 September 2006
Bangladesh	Kulna	4-5 May 2007
Nepal	Rampur	10-11 May 2007
Sri Lanka	Mihintale	13-14 June 2007
Maldives	Hanimaadhu	4-5 October 2007
Iran	Chamsari	22-27 June 2008
Pakistan	Bahawal Nagar	August 2008
India	Port Canning	September 2008



# Status of Monitoring under Phase III

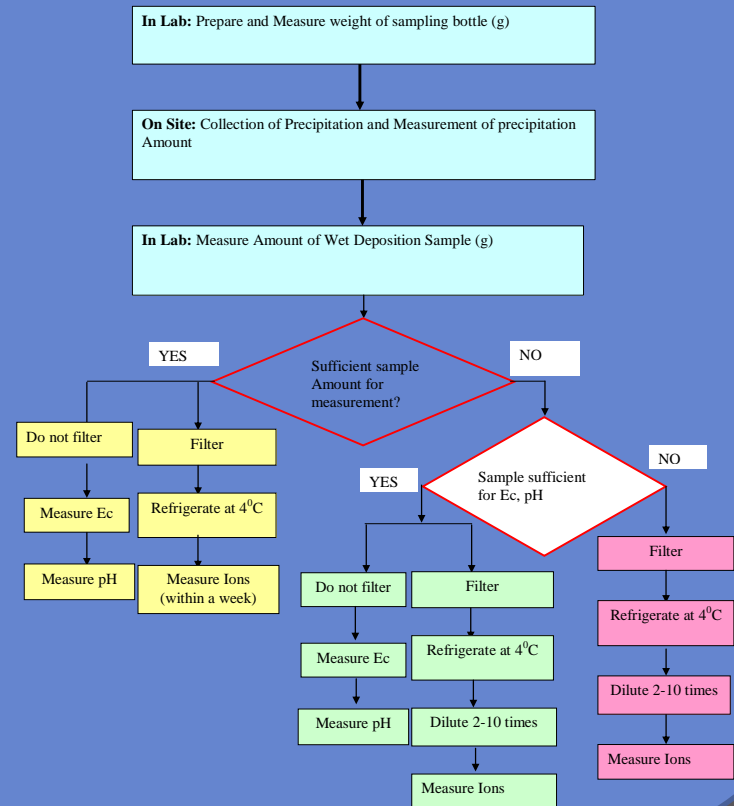
1. Wet Deposition Monitoring,
2. Dry Monitoring, and
3. Collection of Meteorological data

## 1. Wet Deposition Monitoring

**All countries report Wet monitoring data**

**Note: India and Maldives wet data (not in data analysis report)**

A flow chart for sampling and analysis of the wet deposition samples





# Wet deposition monitoring under Phase III

**Table 2-2 Sampling Frequency for Wet Deposition Monitoring using Wet only and Bulk collector**

S No	Country	Name of site	Characteristics of sites	Sampling Interval	Sampling Months
1	Bangladesh	Kaikhali Forest station, Shamnagar, Satkhira	Remote	Daily	2004: Jul, Oct 2005: Aug, Sep, Oct 2006: Apr, Jun 2007: May, Jul, Aug
2	Bhutan	Bhur, Gelephu	Remote	Daily	2003: Jul, Aug, Sep, Dec 2004: Jan, Feb, Aug, Dec
3.	India	Port Canning	Rural	Random	2005: Oct 2006: April, July, Aug 2007: May, June, July, Sept
4	Iran	Chamsari, Ilam	Remote	Weekly	2004: Nov, Dec 2005: Jan, Nov, Dec 2006: Jan, Feb, Oct, Nov, Dec 2007: Jan, Feb
5	Sri Lanka	Dutuwewa	Remote	Weekly	2003: Nov, Dec 2004: Jan to Jul
6	Nepal	Rampur	Rural	Monthly	2006: Jul to Dec 2007: Jan to Aug
7	Pakistan	PBO Bahawal Nagar	Rural	Monthly	2007: all months (EC, pH only) 2008:Jan
8	Maldives	MCOH, Hanimaadhu	Remote	Monthly	2005: Jun, Jul, Aug, Sept, Dec 2006: Jan, July, Aug, Sept, Oct, Nov, Dec 2007: Jan



# Dry Monitoring under Phase III

- a) High Volume Samplers (HVS) (PM10 and SPM )
- b) Diffusive (Passive) sampler (SO<sub>2</sub>, NO<sub>2</sub> and Ozone)

S.No	Method	Duration/Frequency	Parameters
1	Diffuse(Passive) Sampling	Monthly composite	Concentration of SO <sub>2</sub> , NO <sub>2</sub> , and O <sub>3</sub>
2	Air concentration Sampling(Using High Volume samplers)	24hr composite(consisting of two samples – 9am to 9pm and 9pm to 9am)To be carried out for 10days in a month between 5 <sup>th</sup> and 25 <sup>th</sup> of each month	Concentration of PM <sub>10</sub> , NRSPM, TSPM



**Need consistent exposure in monitoring of Passive samplers**

**No HVS data from Bangladesh, Bhutan and Sri Lanka**





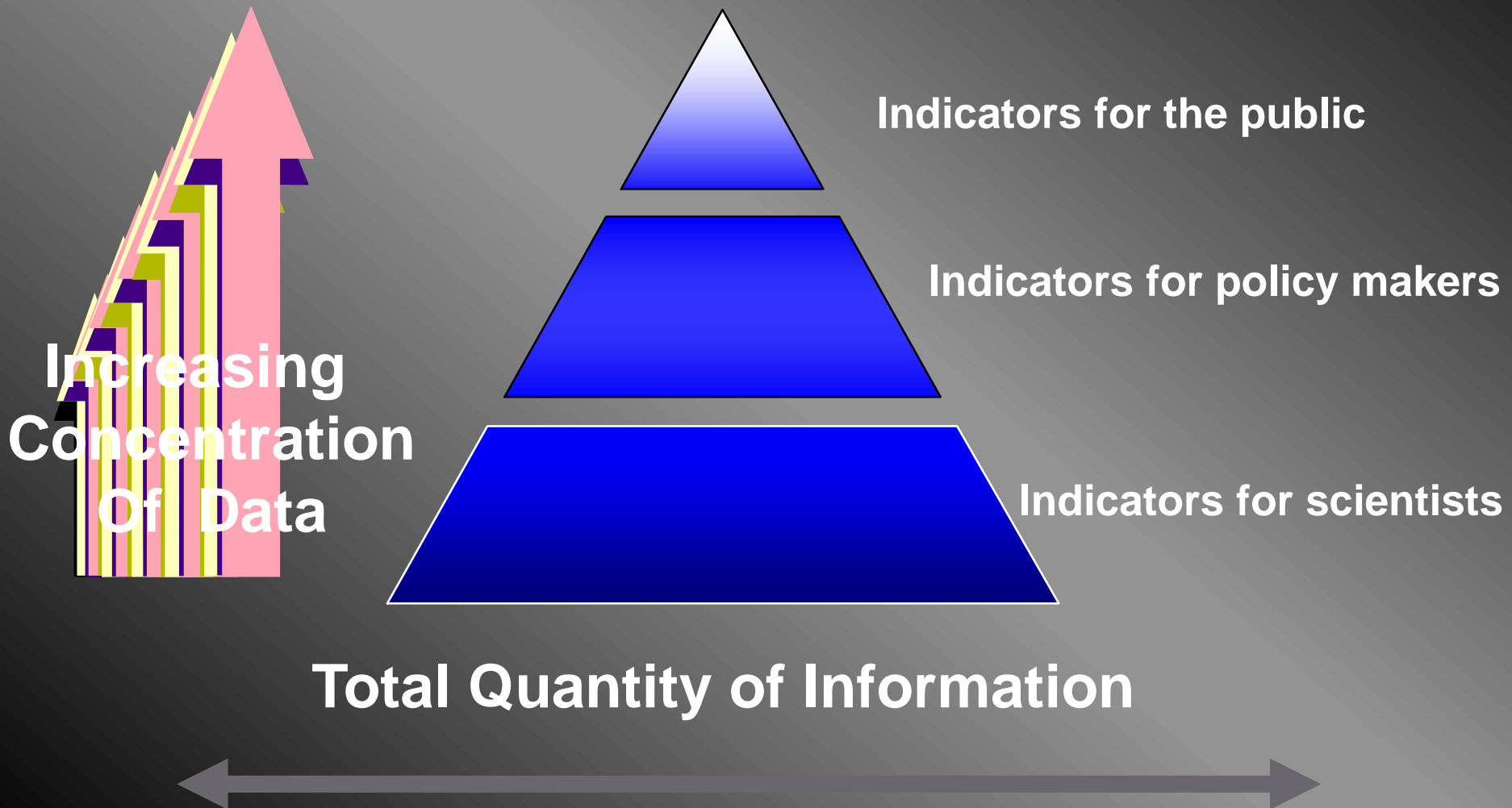
## Meteorology data under Phase III

### Meteorological Data Received

S No	Country	Met. Station	Year	Available wind Data
1	Bangladesh	Kulna	2007	Sep, May, Jul, Dec, Aug
			2008	May, Apr
2	Bhutan	Gelephu		NA
3	India	Port Canning		2004,2005,2006,2007, 2008 (Jan-Mar)
4	Iran	Chamsari		2004,2005,2006 Annual Avgs
5	Maldives	Hanimaadhu		NA
6	Nepal	Rampur		NA
7	Pakistan	Bahawal Nagar	2007	Apr - Dec
			2008	Jan, Feb, Apr, Jun, May
8	Sri Lanka	Dutuwewa		NA

NA : Not available

# DATA, INFORMATION & INDICATORS RELATIONSHIP





## Result of the data under Phase III

Parameter	Banglades h	Bhutan	India	Iran	Maldives	Nepal	Pakistan	Sri Lanka
TSP	No	Yes	Yes	Yes	No	Yes	Yes	No
PM <sub>10</sub>	No	Yes	Yes	Yes	No	Yes	Yes	No
SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> with passive sampler	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SO <sub>2</sub> , NO <sub>2</sub> with active method	No	Yes	Yes	Yes	No	Yes	No	No
pH (rain water)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
EC	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Rain Chemistry	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Met data	Yes	No	Yes	Yes	No	No	Yes	No

Yes=46 , No=18



## Result of the Data under Phase III

### General comments

- All the countries reported the results of ambient air sampling using diffuse/passive samplers
- In many cases the samplers are sent very late to IVL or incorrect labeling
- However, most of the countries seem to have become more familiar/comfortable with the entire monitoring procedure particularly since 2007 when most of the countries became regular in carrying out the sampling and reporting the result as per the required protocol
- Only four countries India, Iran, Nepal and Pakistan have reported the HVS data
- Only Bangladesh, Maldives, Nepal and Sri Lanka have measured all the cations and anions in the wet only samplers (50%)
- The results indicates that most of the countries are as yet in the process of strengthening their monitoring and analytical capabilities.



# QA/QC and Data Quality under Phase III

**No data is better than Data of Unknown or Bad Quality**

## Technical Manual

- Volume 1: Introduction to the Malé Network monitoring programme
- Volume 2: Basic concepts
- Volume 3: Instruments and analytical methods for the field
- Volume 4: Instruments and analytical methods for the laboratory
- Volume 5: Data reporting procedure and format*
- Volume 6: Quality assessment and quality control

**Standard operating manual**



## QA/QC and Data Quality under Phase III

**No data is better than Data of Unknown or Bad Quality**

	<b>Primary vols required</b>	<b>Secondary vols required</b>
Field data collectors	3, 5	1, 2, 6
Laboratory scientists	4, 5, 6	1, 2
NIA managers	1, 5, 6	2, 3, 4

### Second attempt of Inter-laboratory comparison

- India

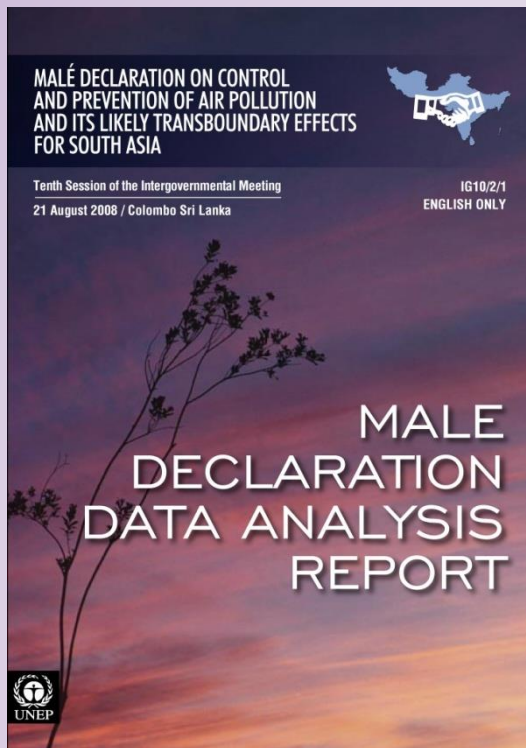
- Pakistan

-- Nepal

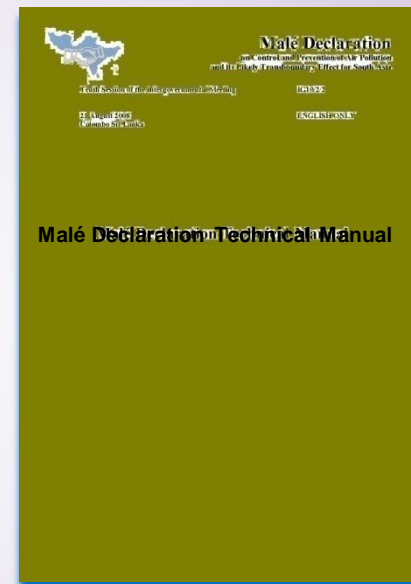
Remaining countries need to  
send sample analysis report  
by Aug 2008



# Monitoring Data Analysis



Need your comments on  
Data analysis report by  
31<sup>st</sup> August



Male' Declaration Website

<http://www.rrcap.unep.org/male/>



## Monitoring under Phase III

**THANK YOU**