Malé Declaration - UNEP

Data Reporting

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MONITORING REQUIREMENTS

- **Dry Deposition Monitoring**
  - **Air Concentration Sampling**
  - **Diffusive (Passive) Sampling**
- **Wet Deposition Monitoring**
  - **Wet(Wet) Method**
  - **Wet(Bulk)Method**
- **Meteorological data collection**

AIR CONCENTRATION MONITORING Requirements

- **Frequency :**
  - 24hr composite (two samples – 9am to 9pm and 9pm to 9am)
  - 10days in a month between 5th and 25th of each month

- **Parameters:**
  - PM10 /RSPM
  - NRSPM
  - SPM
  - SO_2
  - NO_2

Frequency and Parameters

S No	Country	Year	Month	PM_{10}	SPM	SO_2 NO_2
1	Bangladesh	started 2008	Jun, Aug , Sep	√	×	×
			Oct ,Nov,- Dec	√	×	×
		2009	Jan	√	√	×
		2009	Apr, May,Jun,Aug	√	×	×
		2010	May, Jun , Aug	√	×	×
2	India	2006 – 08	Jan 06 -- Mar 08	√	×	√
3	Iran	2006	Oct, Nov, Dec	√	√	√
		2007	Apr - Aug	√	√	√
		2008	May, Jun, Jul , Aug	√	√	×
		2010	Apr, Jun, Jul, Aug	√	√	×

Frequency and Parameters

S No	Country	Year	Month	PM_{10} RSPM	NRSPM TSPM	SO_2 NO_2
4	Nepal	2006	Feb – Dec	√	√	√
		2007	Jan, Feb , Mar, Apr, Nov, Dec	√	√	√
		2008	Jan - Apr, May - Dec	√	√	√
5	Pakistan	2007	Feb - Dec	√	√	√
		2008	Jan, Feb, Apr - Jun			

Observations – Air(H)

- **Data reporting format is sometimes dd/mm/yy and sometimes mm/dd/yy.**
- **Form names not standard, sometimes not mentioned.**
- **Insufficient Data –e.g., only2 days in May and 3 days in June 2010 – Bangladesh against the requirement of 10days. In such cases the monthly mean is not representative**
- **In many cases 24hr composite samples instead of two 12hr composites**
- **Remarks related to site conditions not given to explain the odd results ,e.g. for the month of June the PM_{10} varies from 44µg/m^3 on 18th to 888µg/m^3 on 23rd- Iran**

AIR PASSIVE MONITORING Requirements

- **Frequency :**
  - Monthly composite

- **Parameters:**
  - SO_2
  - NO_2
  - O_3

General Observations on Data

- Field blanks not being run in parallel or not being run.
- Very high values of field blanks.
- Contamination of field blank.
- Improper labeling of samples.
- Samples sent to IVL after long gaps.
- Time of starting/finishing missing
- Temperature generally missing
- Date not given.
- Frequency 24 hrs to three months exposure.
- Concentrations <0.2 reported.

WET (Wet) and WET (Bulk) MONITORING Requirements

- **Frequency :**
  - **Weekly composite**

- **Parameters:**
  - **H^+(pH),**
  - **Electrical conductivity(EC)**
  - **Concentration of NH_4^+,Na^+,K^+,Mg^{2+},Cl^-,SO_4^{2-},NO_3**
  - **Precipitation**

Monitoring Months

S No	Country	Year	Months
1	Bangladesh	2006	Jan, Apr, Jun – Dec
		2007	Jan, May, Jul , Aug
		2008	May, Jun, Jul, Aug
		2009	May, Jun, Aug
		2010	Jun, Aug
2	Bhutan	2007	May –Dec
		2008	Jan – Apr
3	India	2006	Apr , Jul , Aug
		2007	May, Jun, Jul, Sep
4	Iran	2006	Jan, Feb
		2007	Aug, Sep, Nov, Dec
		2008	Jan – Apr

Monitoring Months

S No	Country	Year	Months
5	Maldives	2006	Jan, Jul – Dec
		2007	Jan
6	Nepal	2006	Jul, Aug, Sep
		2007	Feb, Aug, Sep, Nov, Dec
		2008	Jan ,Feb, Apr, May –Sep
		2009	22Feb – Dec
		2010	Jan - Aug
7	Pakistan	2007	Jan, Feb, Apr - Sep, Oct, Nov, Dec
		2008	Mar, Apr, May, Jun
8	Sri Lanka	2006	Jan, Apr, Oct – Dec
		2007	Apr - Jul
		2008	May - Jun

Frequency and Parameters

S No	Country	NH_4^+	Ions	Frequency
1	Bangladesh	√	√	Varies between 24 to 72 hrs
2	Nepal	√	√	Monthly

* Ec, pH, precipitation being reported.
** Ions - Na^+, K^+, Mg^{2+}, Ca^{2+},SO_4^{2-}, Cl^- , NO_3^-
**** Bangladesh also reporting R1 and R2

Observations

- For some of the years – data reported only for four/five months.
- Instead of weekly composite results reported on 12/24 hourly basis.
- No am / pm mentioned.
- Units of results not considered by all.
- Ion concentration being reported in µg/l instead of µmol/l.

Observations

- Precipitation and amount of sample not reported by all.
- Reporting forms wrongly named.
- Reporting months and periods random no set pattern.
- Reporting formats have not been understood properly as most of the columns remain blank.

METEROLOGICAL MONITORING
Monitoring Months

S No	Country	Met. Station	Year	Available wind Data
1	Bangladesh	Kulna	2006 2007 2008 2009 2010	Mar, Apr, Jun, Jul, Aug, Sep Feb, May – Sep, Dec May, Apr, Jun, Aug, Sep Jan, Apr Aug
2	Bhutan	Gelephu		NA
3	India	Port Canning		Jan 06 – Mar 08
4	Iran	Chamsari	2004 2005 2006	2004,2005,2006 Annual Averages
5	Maldives	Hanimaadhoo		NA

RECOMMENDATIONS

- For the results to be useful, the site selection, monitoring(sampling), analysis and reporting need to be standardised
- Adequate & capable manpower must be provided
- Frequent change in staff must not take place. Not more than 25% of the staff must be changed at a time
- Longer hands-on training must be provided within the countries followed by frequent visits(refresher courses) by trainers/experts – atleast once in six months
- Regular instrument care, maintenance, must be ensured
- Proper maintaining of site records and observations
- SOP's to be followed strictly, in-house QA/QC capability must be developed within each country
- The project Incharges of the respective countries must scrutinise the data and take corrective measures. Incorrect data must not be reported.
- Above all, the importance of following a uniform protocol must be realised.

THANK YOU