REPORT

TRAINING PROGRAMME AND REFRESHER COURSE

8 –12 March 2004, CPCB, Delhi, India

C O N T E N T S

LIST OF ACRONYMS

AIT	Asian Institute of Technology
CPCB	Central Pollution Control Board
IVL	IVL Swedish Environmental Research Institute
MoC	Monitoring Committee
NIA	National Implementing Agency
QA/AC	Quality Assurance / Quality Control
SACEP	South Asia Co-operative Environment Programme
SEI	Stockholm Environment Institute
Sida	Swedish International Cooperation Development Agency
UNEP/RRC.AP	United Nations Environment Programme / Regional Resource Center for Asia and the Pacific

R E P O R T

The third regional training on monitoring transboundary air pollution was held at Central Pollution Control Board (CPCB), Delhi, India during 8 – 12 March 2004. The major objective of the training are to ***provide detail technical support on monitoring transbountrary air pollutants and to discuss the issues encountered in operating the monitoring sites in each country.*** *This centralized training program was to* ***strengthen the monitoring network based on the common methodologies and standards at the national level and to exchange the experience on developing national monitoring stations****. This is the third regional training program under the Malé Declaration on the Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia.*

The training program was attended by laboratory technicians who are in charge of Malé Monitoring Station in participating countries as well as the members of Monitoring Committee (MoC), IVL, UNEP, and AIT. A list of the participants is enclosed in Attachment 1.

The training was organised by UNEP RRC.AP, in collaboration with SACEP, IVL, SEI and CBCP, Ministry of Environment & Forests, India. The training was funded by Sida as a part of the Programme on Atmospheric Environment Issues in Developing Countries.

1. Opening Session

The training program started with the welcome and opening address by Mr. J. S. Kamyotra, CPCB and follow by Mr. Mylvakanam Iyngararasan (UNEP RRC.AP), Dr. Kevin Hicks, SEI. Opening remarks were followed by the self-introduction of participants.

2. Introduction to training program

Mylvakanam Iyngararasan of UNEP-RRC.AP presented a brief on the project objectives; the activities during the Phase II implementation of Male' Declaration; and the objective of the training program (Attachment 3). The first training was held at UNEP RRC.AP, Bangkok during 29 – 31 may 2002. The Second centralized training program was held at CPCB, Delhi, India during 4 – 9 August 2003. At the end of the 2nd training program the participants felt the need to have refresher training to familiarize the participants on laboratory analysis.

3. QA/QC programme

Martin Ferm from IVL and Sagar Dhara (MoC) discussed the appropriate QA/ QC activities (Attachment 4a and 4b). The presentation include the potential QA/QC activities during site section, choice methods, sampling, sample storage, analysis, reporting, and intercomparision. This was followed by a discussion various issues faced by the countries in operating the monitoring stations. Major issue discussed was

the operational difficulties at remote site which is a major obstacle in implementing the QA/QC activities. It was suggested look for alternative power sources such as solar power for the countries facing the low voltage problem at the site.

4. Laboratory Sessions

Laboratory sessions were conducted preventive maintenance for High Volume Sampler, calibration for high volume sampler, pH meter and electric conductivity meter.

Laboratory session was also included the analysis of major anions and cations in rainwater. The methods used to determine each of the ions during the training session is provided in the table 1.

Table 1: Parameters analysed and methods used

Parameter	***Method***
PH	Electrometric method
Electric Conductivity	Electrometric method
Acidity	Titration method
Alkalinity	Titration method
Magnesium	EDTA titration cum calculation
Sodium	Flame Photometric method
Potassium	Flame Photometric method
Chloride	Argentometric method
Sulphate	Thorin method
Nitrite	Colorimetric method
Ammonium	Phenate colorimetric method

A technical manual describing each of the methods are available as a separately volume.

During the laboratory sessions participants were also grouped into three groups and analysed blind samples for each of the parameters.

Results from each of the group (table 2) were presented at the end of the program and each of the data points were discussed for possible errors and improvements. The results were also interpreted and each of the groups was evaluated for their performance.

Table 2: Results of blind analysis

Mean of all Groups	Group-1	Group-2	Group-3	Reference value
pH	7.85	7.61	7.86	**7.86**
EC	412	440	425	**419**
Nitrate	0.68	0.60		**0.60**
Alkalinity	95.00	92.00	92.00	**92.00**
Sodium	40.20	41.20	40.80	**40.00**
Potassium	13.50	13.40	13.20	**13.50**
Total Hardness	110.00	117.00	111.00	**117.00**
Calcium	32.00	32.00	32.00	**33.00**
Magnesium	8.00	9.00	8.00	**9.00**
Chloride	46.00	46.00	45.00	**46.00**
Acidity	7.00	7.00	9.00	**8.00**
Ammonium	0.44	0.45	0.48	**0.49**

5. Data reporting

After the review of national advisory committee, monitoring results from the national monitoring sites are being stored at the national database developed based on the standardized reporting format. National databases are housed at the NIAs as part of the their database management system. Upon receiving the national database UNEP will consult with the monitoring committee to ensure the quality of the data and then it will be stored at the regional database based at UNEP RRC.AP.

Mr. Iyngararasan form UNEP RRC.AP presented the data reporting under the Malé Declaration. The presentation included: need for high quality data; reporting format for wet deposition, air quality, meteorological parameters, site details; and database management system. The regional database currently operational at UNEP RRC.AP also presented to the participants. Data reporting manual used during this training program is available as a separate volume.

6. Meteorological Station Demonstration

Mr. Rakesh Agarwal from Envirotech International demonstrated an automatic meteorological monitoring station. His also presented the fundamentals of meteorology and its important in analysing the transboundary air pollution. Detail of his presentation is given in Attachment 6.

7. Site visit

On the 5th day of the training program participants visited the Air Quality Monitoring Stations setup by CPCB in Delhi city. The station is monitoring the pollution level at traffic road.

8. Closing Session

Evaluation forms were distributed to participant in order to evaluate the training programs. Thirty three percent of the participants rated the program as excellent while forty four marked good. The evaluation form and the complete results of the evaluation are given in the Attachment 5.

Mr. Kamyotra, on behalf of CPCB, Mr. Sagar Dhara on behalf of MoC, and Mr. Iyngararasan on behalf of UNEP RRC.AP delivered the closing remarks and thanked all the participants and resource persons for making the program successful.

Attachment 1

List of Participants

Bangladesh 1. Mr. Md Mokbul Hossain Senior Chemist DOE, Khulna Divisional Office Department of Environment 18/6, Central road, Khalishpur Housing Estd, Khulnd-9000, Bangladesh. Tel: 880-41-761164 Mobile: 880-018-819058	 2. Mr. Md Asadul Haque Junior Chemist, DoE, Chittagong Divisional Office Department of Environment Chittegong, Bangladesh Tel: 880-11-217679
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Attachment 2

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

Training Program and refresher course

8-12 March 2004; CPCB, New Delhi, India

Duration ® Day –	**09.30 a.m. – 11.15 a.m.**		**11.15 a.m. – 11.30 a.m.**	**11.30 a.m. – 01.00 p.m.**	**01.00 p.m. – 02.00 p.m.**	**02.00 p.m. – 05.30 p.m. Hrs.**
Day 1	Opening	Maintenance, handling and troubleshooting of equipments	Tea	Maintenance, handling and troubleshooting of equipments	Lunch	Quality Assurance/ Quality Control Program
Day 2	Data reporting		Tea	Spectophotometer analysis	Lunch	Spectophotometer analysis
Day 3	Calibration of High Volume Sampler		Tea	Calibration of pH and EC meters	Lunch	Demonstration of Meteorological station
Day 4	Analyzing 8 anions and cations		Tea	Analyzing 8 anions and cations	Lunch	Analyzing 8 anions and cations
Day 5	Field visit to Air Quality Monitoring Stations					
Day 6	Departure of participants					

Attachment 3

Attachment 4

Attachment 5

(EVALUATION)

Please complete and hand in the final program evaluation form.

Please indicate your opinion about each section of the training workshop by circling the appropriate number.
1 = not at all 2 = a little 3 = somewhat 4 = mostly 5 = completely

Overall objectives and content					
1. Were the objectives clear and precise?	1	2	3	4	5
2. Were the objectives attained?	1	2	3	4	5
3. Was the content linked to the objectives?	1	2	3	4	5
4. Was the content well structured?	1	2	3	4	5
5. Was the content presented clearly?	1	2	3	4	5

Comments on the overall objectives and content of the training workshop:

_____
_____
_____
_____
_____

Methodology

6. Was the methodology used appropriate for the training program and you as a professional?	1	2	3	4	5
7. Did the methodology help you to share your own knowledge and experience?	1	2	3	4	5

For you, what were the strong points of the methodology? What could be improved?

_____
_____
_____
_____
_____

Training materials
Were visual aids (for example, overhead transparencies) clear and easy to follow?
Yes ___ No ___
How much did you use the training materials during the training? Never ___ Occasionally ___ Daily ___
Was the training material easy to use? Yes ___ No ___

How could the training materials be improved?

_____
_____
_____
_____
_____
_____

Logistics

8. Was the meeting venue adequate?	1	2	3	4	5

9. Was the timing of the agenda comfortable?	1	2	3	4	5
10. Was the length of the sessions appropriate?	1	2	3	4	5

Other comments on logistics:

_____
_____
_____
_____
_____
_____

How will this program help you in your job? Please be specific.

_____
_____
_____
_____
_____

Did the instructors teach the course effectively? Please be specific.

_____
_____
_____
_____
_____
_____

How would you improve the training or make it more interesting?

_____
_____
_____
_____
_____
_____

11. Overall, how would you rate the training? Please circle one.

Excellent Good Average Unsatisfactory Poor

General remarks

_____
_____
_____
_____
_____
_____

Summary of evaluation

Question	Not at all (%)	A little (%)	Somewhat (%)	Mostly (%)	Completely (%)
Overall objectives and content					
1. Were the objectives clear and precise				88.89	
2. Were the objectives attained?			22.22	66.67	
3. Was the content linked to the objectives?			11.11	77.78	
4. Was the content well structured?			33.33	44.44	11.11
5. Was the content presented clearly?			11.11	55.56	22.22
Methodology					
6. Was the methodology used appropriate for the training program and you as a professional?			22.22	55.56	11.11
7. Did the methodology help you to share your own knowledge and experience?			11.11	55.56	22.22
Logistics					
8. Was the meeting venue adequate?			11.11	33.33	44.44
9. Was the timing of the agenda comfortable?		11.11	22.22	44.44	11.11
10. Was the length of the sessions appropriate?		22.22	22.22	33.33	11.11
	Excellent (%)	Good (%)	Average (%)	Unsatisfactory Poor (%)	
11. Overall, how would you rate the training? Please circle one.	33.33	44.44	11.11		