

The Fourth Senior Technical Managers' Meeting  
of the Acid Deposition Monitoring Network  
in East Asia  
1-3 October 2003, Niigata, Japan

## REPORT OF THE MEETING

### I. Introduction

1. The Fourth Senior Technical Managers' (STM) Meeting of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Niigata, Japan on 1–3 October 2003. The meeting was organized by the Acid Deposition and Oxidant Research Center (ADORC) as the Network Center for EANET, in collaboration with UNEP Regional Resource Center for Asia and the Pacific (RRC.AP) serving as the Secretariat for EANET, and in cooperation with the Ministry of Foreign Affairs and the Ministry of the Environment of Japan, Niigata Prefecture, and Niigata City.
2. The Meeting was attended by senior technical managers from all of the twelve participating countries, namely, Cambodia, China, Indonesia, Japan, Lao P.D.R, Malaysia, Mongolia, Philippines, Republic of Korea, Russia, Thailand and Viet Nam, who are responsible for technical issues on EANET activities in each country. The representative of Myanmar attended the meeting as an observer.
3. The Meeting was also attended by experts from Japanese universities, research institutes, local governments and relevant bodies as resource persons. Researchers of relevant institutes in Niigata were invited as observers to the Meeting.
4. The list of participants is attached in the Annex.

### II. Opening of the Meeting (Agenda Item 1)

5. The Meeting was opened with remarks by Dr. Jiang Wei, Coordinator of the EANET Secretariat.
6. Dr. Tsumugu Totsuka, Director General of ADORC, made the introduction of the meeting organization.

### III. Election of the officers (Agenda Item 2)

7. Ms. Leong Chow Peng from Malaysia, Ms. Leonita Diano Baetiong from Philippines and Mr. Phunsak Theramongkol from Thailand were elected as 1 \_\_

co-chairpersons of the Meeting.

IV. Adoption of the agenda (Agenda Item 3)

8. The Meeting adopted the agenda as proposed by the Network Center (NC).

V. Review of the scientific and technical activities of EANET since the Third STM Meeting (Agenda Item 4)

9. NC presented a short summary of scientific and technical activities of EANET since the Third Session of the STM Meeting. The meeting was informed that JICA had decided to continue its training course on EANET for at least five years from 2003 considering its importance in the implementation of EANET activities. The participating countries expressed their appreciation for the efforts made by the Japanese Government.

10. Ms. Adelaida Roman, Programme Officer of the EANET Secretariat, briefed the meeting regarding the report on further financial arrangement for EANET to update and inform the participants on this issue. For any further clarification, she informed the body that this can be discussed during the next IG meeting.

VI. Overview of the EANET activities of the participating countries presented by the Network Center and the participating countries (Agenda Item 5)

11. NC presented an overview of national monitoring plans in the participating countries.

12. The participating countries made presentations on the EANET monitoring activities in their individual country. Major discussions on this topic included the following:

i. Cambodia

- Within the implementing of activities, Cambodia confronts some constraints like human resource, financial support and analytical equipment, including reagents and related chemicals that requesting for supporting from NC and/or international organizations.

ii. China

- The current situation of monitoring using filter-pack method was clarified.

### iii. Indonesia

- The intention was given to establish at least one wet deposition monitoring site at each of major islands in future, and the searching of relatively simple monitoring equipment is tried to install, for example, automatic rain sampler.
- It was clarified that PUSLITANAK, Center for Soil and Agro-climate Research and Development, would conduct forest monitoring in addition to soil monitoring.
- It was commented that PUSAIR had some plan where Sicikeh-Cikeh Lake in Sumatra Island is concerning development of monitoring sites in inland aquatic monitoring.

### iv. Japan

- It was clarified that Ochiishi station classified as remote site is fully operational, and while the Tokyo station classified as urban site is not operational.

### v. Lao P.D.R.

- It was explained that monitoring parameters other than pH and EC could not be analyzed due to the lack of necessary equipment, standard solution, reagents and human resources. In this connection, Lao P.D.R. requests assistance from NC to provide training, technical consultants, and analytical equipment, including related reagents/chemicals.
- Lao P.D.R. was requested to make necessary arrangement for institutional aspect for EANET such as nomination/designation of SAC members, etc.

### vi. Malaysia

- A new gas analyzer system and a TEOM particulate monitor system will be installed at the Tanah Rata site in 2003.
- The Government of Malaysia hosted the workshop on Elaboration and Development of Forest monitoring in East Asia, which was jointly organized by EANET Network Center and the International Cooperative Programme on the Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) held in Seremban in December 2002. The NC expressed its appreciation to the EANET Focal Point and UPM for their cooperation and assistance.
- Dry deposition monitoring at the new GAW station in Danum Valley would be carried out using the Filter Pack method. This may be upgraded to automatic instruments in the future.

- The analysis of organic acids in wet deposition is important in tropical regions because ion balance could be affected if they are not taken into consideration.
- Results of organic acid determination will be presented at the next STM meeting.

#### vi.vii. Mongolia

- Forest monitoring was not included in the items of soil and vegetation monitoring in Mongolia. However, it was suggested that data of the Joint Research Project in the Bogdkhan Mountain could be used also for EANET since the measurements were made following EANET Technical Manual.

#### vii.viii. Philippines

- It was clarified that the parts of wet sampler (cooler and motor) and dry sampler (gas volume meter and pump) which were broken down due to power interruption were repaired and they are now operational.
- The public awareness action plans include preparation of teaching guide and model lesson plan for the elementary school level. The printing of acid deposition brochures is delayed very much, however the printing company has promised to finish it within October 2003.
- It was clarified that “coordination with power plants in establishing of monitoring sites” did not mean the sites will be established near the emission sources.
- It was clarified that proposed site for acid deposition monitoring in remote area was WMO monitoring station on Mt. Sto. Tomas, Benguet.

#### viii.ix. Republic of Korea

- Republic of Korea has been using three-stage filter pack method with PM2.5 cut impactor. Sequential filter pack instrument recommended by US/EPA is applied to the sampling. It is clarified that continuous daily sampling in a six-day cycle is done in a year.
- It was clarified that some wet deposition samples contaminated by Yellow sand were canceled.
- Republic of Korea was requested to submit revised national monitoring plan and 2002 data including air quality monitoring to NC.

#### ix.x. Russia

- It was clarified that the decline of larch tree forest observed in Bolshye Koty area was not induced by air pollution, but affected by attacks of some insects

and micromycetes under certain natural conditions, including climatic ones.

- It was noticed that manganese concentration in plant was higher in background environment in comparison with urban areas.
- The clear relationship between contents of some elements in needles/leaves and defoliation levels was observed and a few important indicator elements, such as Mn and F, were clarified in the survey around the Russian monitoring sites Mondy, Listvyanka and Irkutsk. It was suggested that the elemental analysis of needles/leaves should be discussed in the process for development of the sub-manual on forest monitoring.
- A new aquatic monitoring site (Pereemnaya river) was suggested to establish next year.

x-xi. Thailand

- The reasons were explained why TMD's monitoring data in 2001 and 2002 had not been submitted to NC.
- It was expected that TMD's monitoring data in 2003 and 2004 would be improved by training of staff.
- Continuous sampling strategy was recommended for monitoring using filter pack.

xi-xii. Viet Nam

- In relation to the information about the establishment of the new Ministry of Natural Resources and Environment, it was clarified that the institutional framework for EANET in the country had not been changed significantly.
- It was clarified that new site for monitoring on inland aquatic environment was under consideration because Hoabinh Reservoir has water of high alkalinity and too big area.
- As for the expected time for the decision on the new monitoring plan for EANET, it was explained that it would be decided probably in next year.

13. As an observer country, Myanmar introduced their environmental monitoring activities together with institutional situation on the environment management.

VII. Consideration of a preliminary draft data report on the acid deposition monitoring in 2002 (Agenda Item 6)

14. NC presented a preliminary draft data report on the acid deposition in the East Asian Region: 2002. Major discussions on this topic included the followings:

- i. Wet deposition monitoring data
  - It was suggested that NC should use not only site names but also site identification codes in each site.
  - It was suggested that some notes for blank, asterisks and shadows should be put at the bottom of tables.
  - It was pointed out that Korea should submit the monitoring data in 2002 as soon as possible.
  - It was commented that Malaysia would submit the revised data by next week.
  - It was suggested that causes of high pH and high nss-Ca concentration at two Chinese sites were due to neutralization by soil particles including Yellow Sand. Same results were observed on the monitoring by SEPA.
  
- ii. Dry deposition (air concentration) monitoring data
  - It was clarified that detection limits described in Table 4.25 meant expedient values because actual limit depended on each specification.
  - It was suggested that unit of  $\text{nmol/m}^3$  was suitable for the dry deposition section in the data report because of harmonization with wet deposition data. The issue should be discussed in SAC3.
  
- iii. Soil and vegetation monitoring data
  
- iv. Inland aquatic environment monitoring data
  - It was clarified that mandatory parameters in once a year should be measured during dry season.
  - It was clarified that duplicate or triplicate sampling was recommended due to re-measurement in case the difference of concentration between two samples will become more than 15% at one sampling site.
  - It was clarified that capacity of bottle for sampling was 1 liter or more according to the technical manual.
  - It was commented that especially frequency of  $\text{NO}_2^-$  and  $\text{PO}_4^{3-}$  should be 4 times a year.
  - It was clarified that the data of pH and EC on site measurement should be used as reference data.
  - It was commented that water color in the reservoirs may change during a year.
  - It was stressed that the low alkalinity lake should be selected as inland aquatic monitoring site.

15. NC presented a discussion paper for detailed mechanism of EANET data disclosure procedure to invite comments by the participants. Based on the comments, general feelings of the participants on this issue could be summarized as follows:

i. Data Report 1998/1999

Data Report, 1998/1999 issued in August 2000 should not be disclosed outside EANET, taking into account the data quality during the preparatory phase which needs further evaluation.

ii. Target years of raw data sets that could be disclosed

- Raw data and information obtained in the regular phase (starting in January 2001) could be disclosed outside EANET.

iii. Starting time of disclosure of raw data and information

- Raw data and information should be disclosed outside EANET one year after the confirmation of the data by SAC together with relevant information because they should be evaluated within EANET at first.

iv. Way of disclosure

- Raw data and information should be disclosed upon request by preparing CD and through the Internet web site with possible registration for download.

16. Mr. Izumi Noguchi made a presentation on alkaline dust effects on ion balance.

- NC commented that the study was important in the future consideration for wet deposition monitoring.

VIII. Consideration of preliminary draft reports on inter-laboratory comparison projects in 2002 (Agenda Item 7)

17. NC presented preliminary draft reports on inter-laboratory comparison projects on wet deposition, soil, and inland aquatic environment in 2002. Major discussions on this topic included the followings:

i. Project on wet deposition in 2002

- NC should recognize the laboratories that showed great improvement in analytical results.

- NC should verify the reason for the large number of flagged data that were submitted and the ratio of DQOs decreased from previous projects.

ii. Project on soil in 2002

- Some calculation/writing mistakes were observed in the 4th project in 2002. It was emphasized that the results and information should be conveyed to relevant persons in the participating countries for the improvement of the data quality.

iii. Project on inland aquatic environment in 2002

- It was pointed out that the results of this project were not improved.

18. NC made a presentation on results of Questionnaire Survey on Participation in International Inter-laboratory Comparison, which had been sent to the participating countries in July 2003. NC was asked to assist the participating countries when they apply to the international inter-laboratory comparison projects.

19. NC made a presentation on review of existing QA/QC activities on filter pack method. The review was implemented as the first step for the consideration of inter-laboratory study on dry deposition monitoring of EANET.

IX. Consideration of improvement of the monitoring methodologies (Agenda Item 8)

20. NC reported on progress in the developing of the Technical Document for Filter Pack Monitoring in East Asia by the Task Force on Dry Deposition Monitoring. Major discussion on this topic included the followings:

- Response by the Secretariat of the Task Force (NC) to the comments by the Task Force members, which was described in the document EANET/STM 4/8/1, were almost completely accepted by the participants.
- It was clarified that quartz filters used for the third stage of Korean method were impregnated by phosphoric acid.
- Kinds of filter and pore sizes were discussed. It was suggested that smaller pore size filters were suitable for monitoring in remote and rural sites and larger ones were suitable for high flow rate sampling to avoid pressure loss.
- The revised draft Technical Document attached to the document EANET/STM 4/8/1 will be revised taking into account the comments from the participating countries within a month.

21. NC made a presentation on activities in line with the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET. Major discussion on this

topic included the followings:

- NC explained that the EANET-ICP Forests Joint Workshop did not make any special conclusion but some important technical subjects were extracted to be discussed for the sub-manual on forest monitoring, and that European experts understood efforts for improvement of forest monitoring in East Asia.
- It was clarified that the document "Sampling Plan/Schedule for Soil and Vegetation Monitoring of EANET 2003-2007" would be updated according to information from the participating laboratories. The participating countries were requested to check this document and inform on any corrections.

22. NC made a presentation on the information about the training activities in the participating countries in 2002 obtained through a questionnaire survey. The participating countries were requested to submit additional information about training activities in 2002 including domestic training to NC, if any.

X. Consideration of the research activities on acid deposition (Agenda Item 9)

23. NC introduced the on-going research activities on acid deposition, that are a joint research project with Russia on acid deposition monitoring in frigid zone, a joint research project on dry deposition flux, a joint research project with Mongolia on plant sensitivity to acid deposition, and collaboration with existing initiatives on emission inventories and numerical modeling. Major discussion on this topic included the followings:

- i. Joint project with Russia on acid deposition monitoring in frigid zone
  - Causes of the seasonal variation of  $\text{NH}_3$  gas concentration were discussed.
  - Comparison of Siberian data with Japanese data on mercury and lead concentration in snow cover was discussed.
  - It was clarified that Japanese data used for the analysis were selected taking the eruption of Mt. Miyake into account.
- ii. Joint project with Thailand on dry deposition
  - Diurnal variations and levels of ozone deposition velocities were discussed.
  - It was expected that similar studies would be conducted for other kinds of forest.
- iii. Joint project with Mongolia on plant sensitivities
  - The information about the Power plant No.3 was clarified: capacity of the

power plant was 300MW, SO<sub>x</sub>/NO<sub>x</sub> treatment system has not been installed, air concentration data around the plant had not been obtained before the project and main wind direction was north-west.

- NC explained that one of experts from National University of Mongolia studied forest monitoring methodologies used in Europe and he attended the forest workshop in Malaysia, and they know the methodologies for forest monitoring although the monitoring had not been carried out in Mongolia.
- Possibility of O<sub>3</sub> and/or heavy metals impact effects was discussed as the causes of tree decline. Further discussion should be made based on the survey of 2003.
- Importance of heavy metal contents, such as level of Mn concentrations, was emphasized for assessment of tree decline based on the studies in Russia.

iv. Collaboration with existing initiatives on emission inventories and numerical modeling

- Domain of the model developed for the TAcIDES project and suggested as one of the models to join MICS-Asia Phase II was clarified.

24. NC presented a discussion paper for research activities towards relatively short-term objectives of EANET. Major recommendation on this topic included the followings:

- The interest to establish linkage with IGBP/IGAC Composition of Asian Deposition (CAD) initiative in view that CAD addresses some of the priority research areas of EANET.
- The suggestion to receive help in developing of emission inventory in participating country was done due to importance of this issue for national modeling activity.
- Secretariat of EANET expressed a readiness to receive proposals from participating countries on future development of EANET including capacity building and promotion of research activities.

## XI. Other issues (Agenda Item 10)

25. Dr. Hiroshi Hara made a presentation on “Wet Deposition Chemistry in East Asia” He emphasized that acid-base chemistry provides an important and useful basis to interpret the monitoring data. It was clarified that the data set used for this presentation was screened taking data incompleteness into account. Participants expressed their interests about incorporation of ammonia into calculation of effective hydrogen fluxes and importance of this issue for data on NH<sub>4</sub><sup>+</sup> at Mondy,

and  $\text{SO}_4^{2-}/\text{NO}_3^-$  relationship at monitoring sites in China and at Los Banos was also discussed. It was requested to expand the study to the field of dry deposition.

26. Dr. Hajime Akimoto introduced “ABC” project of UNEP under the title of “Atmospheric Brown Cloud – Asia and its relevance to EANET”. He explained a new concept on the linkage between air pollution and climate change and suggested future relevance to EANET. In response to a question from a participant, a study program on impact of  $\text{O}_3$  on rice fields by collaboration between Japanese and Chinese scientists was mentioned.
27. A participating country raised an issue on method validation under the requirement of ISO 17025 and suggested NC should carried out a standard method validation procedure which will be used in the monitoring programs. It is important thing indicated that participating countries use the good methods and also the participating countries could refer to when they conduct their own method validation. NC commented that the participating countries already had QA/QC programs developed based on international standards which were used in other relevant network such as EMEP and NADP, but the suggestion would be considered.
28. One of newly participated countries in EANET stressed that they would like to implement monitoring activities like other countries but they needed NC’s assistance for their capacity building and institutional strengthening. NC responded that it would be important to make efforts to catch up with other countries but it should be done step by step as other countries had improved their activities since the preparatory phase.

## XII. Visit on the relevant facilities to acid deposition problems

29. The participants visited Maki Acid Deposition Monitoring Site.

## XIII. Wrap-up of the Meeting (Agenda Item 11)

30. This report was considered and adopted.

## XIV. Closing of the Meeting (Agenda Item 12)

31. The Meeting was officially closed.

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