The Tenth Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network in East Asia
26-28 August 2009, Pathumthani, Thailand

REPORT OF THE MEETING

I. Introduction

1. The Tenth Senior Technical Managers' Meeting (STM10) of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Pathumthani, Thailand on 26-28 August 2009. The Meeting was organized by the Network Center (NC) of EANET in collaboration with the Secretariat for EANET.

2. Senior officials involved in EANET monitoring activities from Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Russia, Thailand and Viet Nam participated in the Meeting.

3. Some experts from Thailand university and Japan research institutes participated as resource persons. Representatives of the host country government agencies and other related organizations also attended the Meeting as observers. The List of Participants is attached as Annex of this report.

II. Opening of the Meeting (Agenda Item 1)

4. The Meeting was opened by Dr. Hajime Akimoto, Director General of the Acid Deposition and Oxidant Research Center (ADORC). He stressed that next year (2010) is the Tenth Anniversary of EANET. He emphasized that it is a good timing to look back on what have been accomplished for the last ten years and to look forward on the future direction in the next ten years. He pointed out that discussions at the Agenda Item 9, "Importance of Ozone and Aerosol Measurements in East Asia" would be helpful to strengthen the future activities of EANET.

5. Ms. Adelaida B. Roman, Coordinator of the Secretariat for EANET delivered the Welcome Remarks. She mentioned that we need the best proven data for decision making. Science is needed as a basis for policy making. She expressed her appreciation for the efforts made by the Senior Technical Managers in the national level. She also provided the updated

information on the Revised Draft Text of the Instrument to Provide a Sound Basis for Contribution to EANET.

III. Election of the Officers (Agenda Item 2)

6. Dr. Wijarn Simachaya, Director, Air Quality and Noise Management Bureau, Pollution Control Department, Thailand, Ms. Suren Otogonjargal, Engineer, Central Laboratory of Environment and Metrology, National Agency for Meteorology and Environment Monitoring, Mongolia, and Ms. Novy Farhani, Head, Environmental Laboratory Services Division, Environmental Management Center, Indonesia were elected as Co-chairpersons of the Meeting.

IV. Adoption of the Agenda (Agenda Item 3)

7. The Session adopted the Agenda as proposed by the NC as the secretariat of the Meeting (EANET/STM 10/3/1).

V. Report on the Progress of EANET since the Ninth Senior Technical Managers' Meeting (STM9) (Agenda Item 4)

8. The Secretariat and the NC made presentations on the "Report on the Progress of EANET since the Ninth Senior Technical Managers' Meeting (STM9)" (EANET/STM 10/4/1). The report included the outcomes of the Eighth Session of the Scientific Advisory Committee (SAC8) held on 15-17 October 2008 in Hanoi, Viet Nam and meetings of the Task Forces and Expert Groups under the Scientific Advisory Committee (SAC). Moreover, the Secretariat made a presentation on the "Outcomes of the Tenth Session of the Intergovernmental Meeting, Third Special Session and Eighth Session of the Working Group on Future Development" (EANET/STM 10/4/2) highlighting the discussions on the "Revised Draft Text of the Instrument to Provide a Sound Basis for Contribution to EANET".

9. Major clarifications and suggestions were as follows:

- One country informed that additional information on the national training activity to be included in the Annex 3 of the Report on Progress of EANET since STM9 (EANET/STM 10/4/1) has been sent to the NC.
- Following a suggestion to disclose the Minutes of Meetings of the Task Forces (TFs) and Expert Groups (EGs) on the EANET website, it was clarified that the Minutes should be first reported to the SAC since the TFs and EGs were established under the SAC. This issue could be discussed during the Ninth Session of the Scientific Advisory Committee (SAC9).

VI. National Monitoring Plans of the Participating Countries (Agenda Item 5)

10. The representatives of the participating countries made presentations on their national EANET activities and monitoring plans. Major comments and discussions were as follows:

i. Cambodia

- Air concentration monitoring by the filter-pack method has not yet started at Phnom Penh site due to lack of chemical reagent. It was clarified that the data by the filter-pack method could be collected in the late 2009.
- Constrains and needs concerning the national monitoring were described such as lack of equipment, maintenance capabilities, lack of financial resources, etc.

ii. China

- Information on the inter-laboratory analysis of rain water samples among four cities was provided. This was part of the national activities on EANET in 2008.
- There was no new remote site established for the EANET monitoring recently, although several candidate sites have been identified in cooperation with the NC technical missions. It was clarified that the national monitoring on air quality and acid deposition would be conducted at 14 background sites starting from next year. It was informed that additional EANET monitoring sites would be selected depending on some factors such as technical capabilities of local organizations, available financial resources, and depending on the government's decision.
- It was clarified that the measurement of ozone by automatic monitor has started at some sites and possibility of the data submission from EANET monitoring sites would be

discussed taking into account the standardization of calibration method for ozone monitoring.

- Clarification was made that air concentration measurement by automatic sampling, passive sampling and the filter-pack methods would start at one site as one of the activities of the research project on the Feasibility Study on Low Cost Methodologies for Monitoring Air Concentrations.

iii. Indonesia

- It was informed that meetings are convened regularly at the national level to review the monitoring data prior to submission to the NC and also to evaluate the monitoring sites.

iv. Japan

- The comprehensive summary report on acid deposition was published in March 2009 based on the National Program on Acid Deposition Monitoring in Japan from 2003 to 2007.
- Information regarding the trends on annual ozone concentration from 1998 to 2007 was provided. It was further clarified that high ozone concentration in May 2007 in Japan could be due to transboundary air pollution, based on the information provided by the experts.
- It was informed that the continuing acidification of the Ijira Lake catchment area was due to acid deposition.

v. Lao PDR

- The dry deposition monitoring using filter-pack method will be installed in September 2009.
- Technical assistance and capacity building for technical staff are requested to ensure effectiveness of acid deposition monitoring in Lao PDR.

vi. Malaysia

- It was informed that a new monitoring site for wet deposition at Kuching was established since January 2008. The dry deposition monitoring at this site will be conducted starting 2011.

- It was mentioned that a new site for soil and vegetation monitoring at Bintulu will be established in the near future.

vii. Mongolia

- So far, air concentration monitoring by the filter-pack method was not conducted at Ulaanbaatar site in winter because the filter-pack system could not work under the severe cold condition in Mongolia. It was clarified that the air concentration monitoring would be conducted continuously for the whole year from the winter in 2009 since the filter-pack system could be moved inside the building during winter time.
- It was also informed that the use of an impactor for the filter-pack method would be necessary to avoid clogging of the F0 filter, particularly for heavily polluted air in Ulaanbaatar during winter.

viii. Myanmar

- The new Ion Chromatorgraph (IC) and ultrapure water production system donated by Japan International Cooperation Agency (JICA) were installed in August 2009. Thereafter, training on the operation and maintenance of these two instruments was conducted.

ix. Philippines

- There were several problems encountered concerning monitoring equipment, laboratory instrument, and power failure.
- Operation in the laboratory was stopped from November to December 2008.
- It was informed that research activities are being conducted to make characterization of some lakes relative to acid deposition.

x. Republic of Korea

- It was reported that the Atomic Absorption Spectrometry and the Indophenol Blue methods were used for the analysis of metal cations and ammonium, respectively. However, Ion Chromatograph may also be used according to the report of the inter-laboratory comparison project.

xi. Russia

- It was informed that the monitoring of ozone using passive sampler will be conducted at three monitoring sites and new ion chromatography system (Dionex ICS-3000) was installed in 2009.

xii. Thailand

- It was clarified that Nakhon Ratchasima site would be reclassified from “remote” to “rural” because of changes of the infrastructure.
- It was clarified that the automatic gas monitoring station at Nakhon Ratchasima Province was not operated in 2009 due to the budget constrain. However, with the new approved budget, this site will be renovated and operated next year. It was also informed that Nakhon Ratchasima Province was selected as one of the study areas for the joint project with German government.
- In view of comparison and harmonization of the data from Khanchanaburi site with other EANET monitoring sites, it was suggested that the establishment of continuous monitoring site could be considered instead of using the mobile unit.

xiii. Viet Nam

- It was informed that three new sites on wet and dry deposition monitoring have been established, according to the new national monitoring plan approved by the government. The NC may provide the necessary technical support as requested.

11. The NC made a presentation on the “Overview of the National Monitoring Plans of the Participating Countries” (EANET STM10/5) which included the latest information provided by the participating countries.

12. The Meeting was informed that to date there are 55 wet deposition monitoring sites, 47 dry deposition monitoring sites, 29 soil and vegetation monitoring sites, and 18 inland aquatic monitoring sites in EANET. It was suggested to update the list of monitoring sites to reflect the current development.

VII. Consideration of the preliminary draft Data Report 2008 (Agenda Item 6)

13. The NC presented the Preliminary Data Report 2008 (EANET/STM 10/6) which contains a summary of the monitoring data in 2008 and related information submitted by the participating countries. According to the agreed procedures, the participating countries were required to submit their data and information to the NC before 30 June 2009 to be compiled, checked, stored and analyzed. The Meeting reviewed the preliminary draft Data Report 2008.

14. Major clarifications and discussions on this topic included the following:

i. General

- It was suggested that the conclusion or executive summary as well as the statistical analysis on annual trends be included in the Data Report, if possible.

ii. Wet deposition monitoring data

- It was requested that the data of some countries should be submitted to the NC before SAC9.

iii. Dry deposition (air concentration) monitoring data

- It was mentioned that the graphical presentations on the annual trends per country (2001-2008) were very informative.
- Sulfur dioxide is measured by both automatic monitor and filter-pack method in several sites. However, if data from both methods are available, only the automatic monitoring data are included in the data report.

iv. Soil and vegetation monitoring data

- It was pointed out that observation of tree decline should be done at least once a year according to the Sub-manual on forest vegetation monitoring.

v. Inland aquatic environment monitoring data

- It was informed that the revised Technical Manual discussed by the Expert Group might include the definition and meaning of the parameters for the field surveyors and laboratory staff.
- It was suggested that the starting year of the monitoring should be included in Table 6.2, “Outline of inland aquatic environment monitoring”.
- It was clarified that the monitoring point at Zhuxiandong has been changed since 2004. The Data Report 2008 should be corrected as appropriate.

- It was suggested that the data of inland aquatic environment should be evaluated site by site at first, taking into account the characteristics of the catchment/watershed.

VIII. Consideration of the preliminary draft Report on Inter-laboratory Comparison Projects in 2008 (Agenda Item 7)

15. The NC presented the preliminary draft Report on the Inter-laboratory Comparison Projects in 2008 for wet deposition, dry deposition (filter pack method), soil, and inland aquatic environment (EANET/STM 10/7). It was mentioned that the deadline for submission of the results of the Inter-laboratory Comparison Project 2009 will be 28 February 2010. The meeting was invited to discuss and provide comments, as appropriate.

16. Major discussions on this topic included the following:

i. Inter-laboratory Comparison Project on wet deposition

- It was requested that distribution of the higher concentration sample should be considered since actual rain samples in certain sites were higher than the artificial samples. For now, prepared concentrations are set on the typical average concentrations for all the monitoring results.
- It was suggested that organic acids should be considered as additional parameters for the inter-laboratory comparison project.

ii. Inter-laboratory Comparison Project on soil

- It was clarified that “repeatability” showed triplicate analysis under the same condition while “within-laboratory reproducibility” showed repeat analysis by different conditions in a same laboratory, such as the analysis in a different day.
- It was suggested that the triplicate analysis might be effective to obtain the representative value in a laboratory, since the variance under “repeatability condition” is often lower than that under “within-laboratory reproducibility condition”.

iii. Inter-laboratory Comparison Project on inland aquatic environment

- Most of flagged data were the data of NH_4^+. It was pointed out that the analytical procedures of NH_4^+ should be carefully checked for improvement.

IX. Progress report on scientific and technical activities of EANET (Agenda Item 8)

17. The NC made presentations on the status of the activities being conducted by the EGs of SAC. The presentations included:

i) Progress Report on Revision of the Technical Manual on Wet Deposition Monitoring (EANET/STM 10/8/1)

ii) Progress Report on Preparation of the Technical Manual on Dry Deposition Flux Estimation (EANET/STM 10/8/2)

iii) Progress Report on Revision of the Technical Manual on Inland Aquatic Environment Monitoring (EANET/STM 10/8/3)

18. Major discussions included the following:

i) Technical manual on wet deposition monitoring

- It was informed that the revision of each chapter is being carried out by the EG members and the draft revised Technical Manual will be presented at SAC9 for its consideration.

ii) Technical manual on dry deposition flux estimation

- Evaluation of dry deposition flux for nitrogen species in United States (US) Network includes nitric acid gas, nitrate in PM and ammonium ion in PM. It does not include ammonia gas.

iii) Technical manual on inland aquatic environment monitoring

- It was suggested that local pollution sources and natural geology must be identified.
- It was also suggested that a step-wise approach should be considered for the monitoring parameters because some countries cannot follow all mandatory parameters.

19. The NC also made a presentation on the current ecological impact research activities and the soil and vegetation research plan for EANET (EANET/STM 10/8/4) which was discussed by the Task Force on Soil and Vegetation Monitoring.

20. Major discussions on this topic included:

- "Trial campaign for measurement of ozone concentration in forest area and its effects" is planned by the TF according to the Strategy Paper for Future Direction of Soil, Vegetation, and related Ecosystems Monitoring of EANET. It was pointed out that ozone

should be considered as an important factor for tree decline, although the decline could be caused not only by ozone but also by synergistic effects of several air pollutants.

- "Identification of the areas susceptible to acid deposition" is planned by the TF as well. It was clarified that the sensitivity of soil, rock, and vegetation species to acid deposition will be reviewed and summarized based on previously published literatures at the first.

X. Importance of ozone and aerosol measurements in East Asia (Agenda Item 9)

21. The NC introduced the importance of ozone and aerosol measurements in East Asia. The presentations included:

i) Dr. Hajime Akimoto presented the "General Introduction to Measurement of Ozone and Aerosols" (EANET/STM 10/9/1). He briefly described the processes and linkages of air pollution and acid deposition particularly concerning ozone and aerosol. He stressed that monitoring of ozone and aerosol is important to enhance our understanding of the acid deposition in the region and for evaluation of environmental impacts. Clarification was made on causes of seasonal changes in ozone concentration in some EANET participating countries.

ii) Dr. Keiichi Sato presented the "Methodologies for Monitoring Ozone and Aerosols" (EANET/STM 10/9/2). He introduced the principles and instrument operations of various ozone and PM measurement methods. He explained the characteristics and possible artifact for each measurement method. He also stressed that the traceability of ozone to Standard Reference Photometer of international organization is currently being established in Japan.

iii) Dr. Ken Yamashita presented the "Risk Assessment of Ozone and Aerosol on Human Health and Ecosystem" (EANET/STM 10/9/3). He described the negative impacts of ground-level ozone and particulate matter on human health which included the effects to the respiratory system, increase in morbidity and mortality rates, etc. His presentation also explained the detrimental effects of ozone on crops and vegetations.

22. Prof. Wang Ruibin, China made a presentation on "Ozone Monitoring". He introduced that ozone concentration showed the maximum value during the afternoon and this diurnal trend was different from those of other air pollutants. He also provided information on site selection criteria, ozone monitoring equipment, and traceability system of the calibration.

23. Dr. Liudimila Golobokova, Russia made a presentation on “Aerosol Concentration at Russia Monitoring Sites of EANET”. She reported the correlation of aerosol ion concentrations among different monitoring sites. Clarification was made on the geometric mean concentration of ions in soluble aerosol fraction. They could be qualified as peculiar “clarkes” for ground air in Baikal region and Far East. The relative concentration distribution of ions can be considered as a universal model approximation.

XI. Other Issues (Agenda Item 10)

24. The NC introduced the EANET Regional Scientific Workshop on Acid Deposition in East Asia 2009 to be held on 12-13 October 2009. Comments and suggestions on this topic included the following:

- It was suggested that outcomes from the workshop should be shared with the National Focal Points of EANET.
- It was announced that the information on the workshop, including the draft program and the registration form, could be obtained from the EANET website.

XII Scientific Presentations (Agenda Item 11)

25. Dr. Junko Shindo from the National Institute for Agro-Environmental Sciences (NIAES), Japan gave a presentation on “Development of a catchment-scale model of elemental cycle in tropical ecosystems for evaluation of acidification and nitrogen leaching”. She reported that the developed model could partly simulate the seasonal changes of biogeochemical processes in a tropical seasonal forest, which were recorded by the joint research project on catchment analysis in the Sakaerat site, Thailand.

26. Dr. Masahide Aikawa from Hyogo Prefectural Institute of Environmental Sciences, Japan, gave a presentation on “Data analysis of 4-stage filter-pack method” based on EANET and Japanese Environmental Laboratories Association (JELA) activities. On the summary, the significant geographical (longitudinal/latitudinal) gradient was observed on SO_4^{2-} concentration while the SO_2 showed no significant longitudinal/latitudinal gradient and was largely influenced by the local SO_2 emission.

27. Dr. Savitri Garivait, Joint Graduate School of Energy and Environment-King Mongkut's University of Technology Thonburi (JGSEE-KMUTT), Thailand gave a presentation on "Air pollutants and greenhouse gases emissions from biomass open burning in Thailand". She reported that field burning of agricultural residues contributed to greenhouse gas emissions more than forest fire in Thailand.

XIII. Consideration and adoption of the Report of the Meeting (Agenda Item 12)

28. The Report of the Meeting (EANET/STM 10/12) was considered and adopted.

XIV. Closing of the Meeting (Agenda Item 13)

29. The Chairperson thanked the participants, resource persons, the NC and the Secretariat for their active contributions and cooperation and officially closed the Meeting.

Annex

List of Participants

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