

The Ninth Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network in East Asia
27-29 August 2008, Niigata, Japan

REPORT OF THE MEETING

I. Introduction

1. The Ninth Senior Technical Managers' Meeting (STM9) of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Niigata, Japan on 27-29 August 2008. 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 Japanese universities, research institutes and relevant organizations participated as resource persons. Representatives of host country government agencies and other organizations also attended the meeting as observers. The List of Participants is attached as Annex.

II. Opening of the Meeting (Agenda Item 1)

4. The Meeting was opened by the Coordinator of the EANET Secretariat, Ms. Adelaida B. Roman. In her opening address, she informed that senior technical managers of EANET have a great responsibility to provide policy makers with the most accurate scientific data for policy making. She stressed that EANET has achieved a certain level of maturity, but to prosper and be more responsive to achieve its objectives, it has to strengthen its base, promote scientific surveys and research and expand its scope, promote public awareness and establish a sound financial basis from which to grow.
5. In his welcoming speech, Dr. Hiromasa Ueda, the Director General of the Acid Deposition and Oxidant Research Center (ADORC) highlighted the great advances made since last year with the establishment of the new task forces and expert groups under the Scientific Advisory Committee (SAC) of EANET. He informed that the subjects and activities of the task forces and expert groups are closely related to the work of the national monitoring

centers and requested the senior technical managers to collaborate with the subsidiary bodies of SAC for the development of EANET from the scientific and technological view points.

III. Election of the Officers (Agenda Item 2)

6. Ms. Wong Fook Lian, Director, Environmental Health Division, Department of Chemistry Malaysia and Mr. Phunsak Theramongkol, Director, Ambient Air Quality Division, Pollution Control Department, Thailand 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 secretariat of the Meeting (EANET/STM 9/3/1).

V. Report on the Progress of EANET since the Eighth Senior Technical Managers' Meeting (STM8) (Agenda Item 4)

8. The Secretariat and the NC made presentations on the Report on the Progress of EANET since the Eighth Senior Technical Managers' Meeting (EANET/STM 9/4/1) which included a summary of the results of the questionnaire survey conducted by the NC in July-August 2008 on training activities held in the participating countries in 2007 and their future training needs. The Secretariat also made a presentation on the Outcomes of the Ninth Session of the Intergovernmental Meeting (IG9) held in Vientiane, Lao PDR on 19-20 November 2007, the Sixth Session of the Working Group on Future Development of EANET (WGFD6) held on 9-11 April 2008 in Pattaya, Thailand and the Seventh Session of the Working Group on Future Development (WGFD7) held on 29-31 July 2008 in Pathumthani, Thailand (EANET/STM 9/4/2).
9. The Secretariat provided further clarification on the difference between Option A and Option B of the Draft Text of the Instrument to Provide a Sound Basis for Contribution to EANET. It was further stressed that these two options will be merged taking into account the suggestions

of the WGFD7 and the consolidated text will be sent to all the National Focal Points and participants of WGFD7 by the first week of September 2008.

10. Other major clarifications and suggestions were as follows:

- It was informed that currently five countries, namely China, Japan, Malaysia, Republic of Korea and Thailand, are making voluntary contributions to the Secretariat budget. Three countries, namely, Japan, Malaysia, and Thailand had made voluntary contributions to the NC core budget in 2008.
- NC suggested the national centers to propose possible training themes for the individual training course at ADORC.
- It was clarified that individual training course at ADORC is open to all participating countries of EANET including Russia and Republic of Korea, but the JICA training programs on acid deposition have their own target countries.
- It was informed that the Capacity Building Workshops for Policy Makers of the Participating Countries of EANET would be held on 23-26 September 2008 with funding support from the United Nations Environment Programme (UNEP). The objective of workshop is to enhance capacity of officials involved in policy making process to contribute to the process of discussion necessary for future development of EANET as well as for building negotiation skills and knowledge on development of an international agreement/instrument.

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

11. 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

- It was clarified that major constraints associated with wet deposition monitoring is the lack of analytical reagents. There is also lack of budget to start filter pack monitoring.
- It was explained that passive tube sampler had been used for gas concentration monitoring of SO₂, CO and NO₂ by the Department of Pollution Control, the Ministry of Environment (MOE), Cambodia.
- NC was requested to develop capacity of the MOE staffs regarding laboratory analysis

and QA/QC.

ii. China

- It was informed that the Ministry of Environmental Protection (MEP), China has a plan to establish several background monitoring sites including in Yunnan Province and Fujian Province. The plans are being prepared by relevant agencies including the MEP, China and may possibly be finished within one to two years.
- It was clarified that wet and dry deposition monitoring in Weishuiyuan site in Xi'an has stopped since conditions around the site had significantly changed due to new emission sources and construction of a main road near the site. SEPA (present MEP) decided to stop the monitoring as the site could no longer meet the EANET criteria for a rural site.
- It was informed that observations of tree decline are made every year from 2008 following the EANET guidelines, except in the Xi'an site which is very difficult to access due to its remote location. So far the reasons for tree decline are not clear.

iii. Indonesia

- Regular meetings at the national level were held to share information on laboratory activities and discuss monitoring development and data. It was informed that such meetings are useful to improve data quality and to identify causes of strange or unusual data.
- It was informed that two different types of passive samplers, CSIRO (IVL-type) sampler and Ogawa sampler, were used in a project to measure NO₂ and SO₂.
- It was informed that new monitoring sites had been selected for wet deposition in Maros, for soil and vegetation in Bogor, and for inland aquatic environment in Situgunung.

iv. Japan

- It was informed that a 5-year periodic report from 2003 to 2007 is being prepared and possibly published with an English abstract in the next year.
- A plan for feasibility studies of O₃ monitoring by using passive sampler involving participating countries of EANET was introduced. The plan may include comparison of passive sampler monitoring with automatic monitoring. It was pointed out that performance studies on passive samplers are necessary in the East Asian region and technical documents on passive sampler monitoring should be developed with

accumulation of experience.

v. Lao PDR

- Training programs for data processing and reporting in order to interpret the data are needed. NC informed that it would consider providing such training in the individual training course at ADORC. A resource person who is one of the lecturers for the JICA-HIC course informed that there is already a plan to include this topic in the JICA-HIC training course.

vi. Malaysia

- So far, soil and vegetation monitoring has not been carried out following the required guidelines due to manpower constraints in the organization in charge of the monitoring. It was informed that soil and vegetation monitoring may be able to restart when a permanent staff is assigned in the organization for this work.
- Effectiveness of measurement of organic acids for ion balance was discussed. It was clarified that R1 and R2 performance had improved when organic acids were considered.
- It was informed that the data on organic acids has been submitted to the NC.

vii. Mongolia

- Wet deposition monitoring in Ulaanbaatar site using the wet-only sampler was stopped in the winter season due to high levels of air pollution and very low precipitation.
- It was clarified that the core and diaphragm of the pump of the filter-pack sampler installed on the rooftop of a building at the Ulaanbaatar site was occasionally damaged due to severe cold condition in winter of Mongolia. It was suggested that the NC and the national center should continue to have close communication to resolve this problem since it is also important to collect data during the wintertime.
- It was informed that the laboratory required some new reference standard solutions.

viii. Myanmar

- It was clarified that since the wet-only sampler was installed in May 2007, wet deposition data was available from that month onwards.
- Ion electrodes were used for measurement of ion concentration in wet deposition. It was

suggested that some species, such as Mg^{2+} , could not be measured accurately by this method and other instruments such as Ion Chromatograph (IC) and Atomic Absorption Spectrophotometer (AAS) should be used instead.

- It was requested for IC and AAS for the determination of cations and anions from NC or the Secretariat.

ix. Philippines

- It was suggested that measurement of bicarbonate and organic acids should be considered to improve ion balances, since the mean pH of rainwater samples were relatively high (higher than 5.0).
- It was clarified that the Philippines currently has 4 sites for vegetation monitoring. Two new monitoring sites for soil and vegetation monitoring, La Mesa Watershed and ERDS Research Station, has been established and surveyed for urban and remote sites in 2007 and 2008 respectively. The monitoring data for La Mesa Watershed is expected to be included in the Data Report 2007.
- The site identified for inland aquatic environment is a dam in an urban area.

x. Republic of Korea

- The 3-stage filter pack method is applied with one-day sampling in every 6 days in Republic of Korea. It was pointed out that the data from the 3-stage filter pack method could not be directly compared with the weekly data obtained by the 4-stage filter pack method. It was informed that 4-stage filter pack method is another method for HNO_3 .
- NC informed that the results of the joint research project between NC and Republic of Korea on dry deposition monitoring methodology will be reported later as data evaluation is still ongoing.

xi. Russia

- A project is being promoted to integrate the monitoring data and information from the national networks on atmospheric environment monitoring in Russia including the national part of EANET, EMEP, GAW-PC, and ICP-IM and the national networks IBMoN and regional part of PC Network.
- It was informed that there is a possibility of voluntary collaboration with international network centers (NILU, ADORC) on inter-comparison among national monitoring as well

as on coordination on their development with the Strategies of EMEP, GAW and EANET with the assistance of relevant focal points, network centers and experts.

xii. Thailand

- It was informed that the Third Country Training Program on Control Strategy and Mitigation Measures on Acid Deposition would be held from 19 January to 6 February 2009 at the Environmental Research and Training Center (ERTC) in Pathumtani, Thailand. The application procedure was explained to the Meeting participants. The closing date for application is 15 November 2008.

xiii. Viet Nam

- It was informed that the new National Monitoring Plan for EANET was waiting for approval of the government.
- The NC will consider providing technical assistance to the national center to overcome the frequent failure of the filter pack kit and will also consider their request for cation standard solution.

12. The NC made a presentation on the Overview of the national monitoring plans of the participating countries (EANET STM9/5/1) which includes the latest information provided by the participating countries. The Meeting was informed that to date there are 50 wet deposition monitoring sites, 40 dry deposition monitoring sites, 26 soil and vegetation monitoring sites and 17 inland aquatic monitoring sites in the EANET network.

13. It was emphasized the importance of the efforts by participating countries to increase the number of dry deposition monitoring sites as the present network is too sparse for a proper assessment on the state of acid deposition in the region. The participating countries were also requested to check and confirm the table showing the sampling plan and schedule on soil and vegetation monitoring in the individual monitoring sites for the period 2006-2011 and inform the NC of any changes.

VII. Consideration of the preliminary draft Data Report 2007 (Agenda Item 6)

14. The NC presented the Preliminary Data Report 2007 (EANET/STM 9/6) which contains a summary of the monitoring data of 2007 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 2008 to be compiled, checked, stored and analyzed. The Meeting reviewed the preliminary draft Data Report 2007.

15. Major clarifications and discussions on this topic included the following:
 - i. Wet deposition monitoring data
 - It was informed by the representative from China that there could be a mistake in the calculation of precipitation amounts at Hongwen site. They will check it again and inform the NC later.

 - ii. Dry deposition (air concentration) monitoring data
 - It was suggested that data completeness for the sites of Republic of Korea should be reviewed since one-day sampling in every 6 days was carried out in these sites.
 - It was suggested that sampling duration or frequency should be included in the table.
 - It was clarified that the ozone monitoring in Kanchanaburi site was carried out only three times a year for duration of two weeks by using a mobile automatic monitor. It was suggested that since ozone concentrations could be high at remote sites, continuous monitoring should be done and appropriateness of the site should be discussed.
 - It was suggested that there should be more careful treatment of data below the detection limit. Taking into consideration the suggestions from the Meeting, the NC will review the method used to calculate mean value when the dataset includes values below detection limit and the reporting of the total mean value when the calculated value is below detection limit. A revision of the compiled data will be done, if necessary.
 - Sulfur dioxide is measured by an automatic monitor and the filter-pack method in several sites. It was suggested that the results of filter pack should be compared with those of the automatic monitor.
 - It was pointed out that the quality of the data obtained by the filter-pack method may depend on the skillfulness of the analysts and performance of equipments.
 - The national centers were requested to submit the data and additional information to the NC by 15 September 2008, if they have any changes.

- An automatic monitor for SO₂ at Rishiri site was not functioning well from July to October. It was suggested that the filter-pack data may be used to substitute for the missing data during this period with necessary remarks.

iii. Soil and vegetation monitoring data

- It was informed that the data from the La Mesa site in the Philippines would be included in the final report.
- It was pointed out that frequent observation of tree decline might be effective to identify possible effects due to severe meteorological events, such as typhoon. The national centers were requested to make effort to observe tree decline conditions at least once a year.

iv. Inland aquatic environment monitoring data

- The Technical Manual for Inland Aquatic Environment Monitoring recommended the selection of lakes or rivers whose alkalinity and EC are lower than 0.2 meq L⁻¹ and 10 mS m⁻¹, respectively. Since these parameters may show seasonal variation, these criteria may be not so clear. It was suggested that the revised Technical Manual which is being prepared by the Expert Group on Revision of Technical Manual on Inland Aquatic Environment Monitoring should clarify the site selection criteria in a more practical manner.
- It was noted that many monitoring lakes or ponds cannot meet the current site selection criteria. It was informed that after extensive discussion on this matter, the Expert Group will recommend that rivers or streams to be more freely accepted in the revised Technical Manual.
- It was suggested that possible options for the analytical methods should be described in the revised Technical Manual based on the latest scientific discussion, taking harmonization with the national standard methods in each country into account.
- It was suggested that aluminum concentrations should be measured for the sites in China, since pH and alkalinity were relatively low.
- NC will make corrections to some tables in the draft Data Report 2007 as appropriate.

VIII. Consideration of the preliminary draft Report on Inter-laboratory Comparison Projects in 2007 (Agenda Item 7)

16. The NC presented the preliminary draft Report on the Inter-laboratory Comparison Projects in 2007 for wet deposition, dry deposition (filter pack method), soil, and inland aquatic environment (EANET/STM 9/7). The meeting was invited to discuss and provide comments, as appropriate.
17. Major discussions included:
 - i. Inter-laboratory Comparison Project on wet deposition
 - NC announced that artificial rain water samples for the project 2008 on wet deposition will be distributed in the middle of October 2008 and the deadline for the data submission would be the end of February 2009.
 - ii. Inter-laboratory Comparison Project on dry deposition (filter pack method)
 - It was suggested that more consideration is needed on analysis of the low concentration filter samples.
 - iii. Inter-laboratory Comparison Project on soil
 - Soil samples were extracted by 1M ammonium acetate for determination of exchangeable base cations and the extracts were measured by AAS. It was suggested that differences in the extraction process and the instrument analytical conditions may have contributed to the variability of the results from the laboratories.
 - iv. Inter-laboratory Comparison Project on inland aquatic environment
 - NC was requested to correct the name of the participating laboratory from Malaysia.

IX. Consideration on Improvement of Monitoring Methodologies (Agenda Item 8)

18. The NC made a presentation on Report on research activities on acid deposition (EANET/STM 9/8/1). This report provided updates on current joint research activities undertaken by the NC with participating countries.
19. The discussions on this topic included:
 - It was clarified that the joint research project with Thailand used the same procedures for the filter-pack method as the EANET monitoring.

20. The Network Center introduced an Overview of the Task Forces and Expert Groups formed under SAC (EANET/STM 9/8/2). This was followed by several presentations by the NC on the activities of the Task Forces and Expert Groups which have held their first meetings:
 - i) Report on the activities of the Task Force on Monitoring Instrumentation (EANET/STM 9/8/3)
 - ii) Report on the activities of the Task Force on Research Coordination (EANET/STM 9/8/4)
 - iii) Report on the activities of the Task Force on Soil and Vegetation Monitoring (EANET/STM 9/8/5)
 - iv) Report on the activities of the Expert Group on Dry Deposition Flux Estimation (EANET/STM 9/8/6), and
 - v) Report on the activities of the Expert Group on Revision of the Technical Manual on Inland Aquatic Environment Monitoring (EANET/STM 9/8/7)

21. Major discussion on this topic included:
 - i) Overview
 - It was confirmed that the Task Force on Dry Deposition Monitoring (TFDDM) will hold its meeting on the evening of 14th October 2008 and the Expert Group on Preparation of the Second Periodic Report on the State of Acid Deposition in East Asia will meet on the evening of 16 October 2008 in Hanoi, Viet Nam. The participants of the Eighth Session of the Scientific Advisory Committee (SAC8) will represent their respective countries at the TFDDM meeting.

 - ii) Task Force on Monitoring Instrumentation
 - It was informed that the Task Force had conducted a questionnaire survey on the status of monitoring instrument in the participating countries in July-August 2008.

 - iii) Task Force on Research Coordination
 - It was informed that the Task Force will propose to SAC8 the implementation of three high priority research projects using EANET funds in 2009.

 - iv) Task Force on Soil and Vegetation Monitoring
 - It was clarified that the Action Plan for Future Direction of Soil, Vegetation, and related Ecosystems Monitoring (2009-2014) has included detailed milestones and target years for the implementation of the specific activities. Moreover, it was informed that the Action

Plan had already mentioned necessity of additional budget and possible application of grants to support the specific activities.

v) Expert Group on Dry Deposition Flux Estimation

- It was informed that the Expert Group is developing a technical manual on dry deposition flux estimation so that every country will be able to calculate the dry deposition flux at its own sites by this manual. NC will consider reporting the values calculated by participating countries in the Data Report of EANET.

vi) Expert Group on Revision of the Technical Manual for Inland Aquatic Environment Monitoring

- It was informed that the Expert Group had discussed and agreed that rivers and streams could be selected as the monitoring site more freely, if appropriate lakes or ponds cannot be found. The site selection criteria would only be modified in the revised Technical Manual for Inland Aquatic Environment Monitoring, since some other monitoring procedures such as sampling frequency and parameters to be measured should be modified accordingly.
- Information on the catchment area is important as meta data of the inland water for interpretation of the data. It was suggested that importance of the catchment should be described in the revised Technical Manual.
- The definitions of some parameters were not clear in the current Technical Manual. The significance of the parameters was also not fully explained. It was suggested that definition and significance of the respective parameters to assess the impact of acid deposition should be described in a clearer manner in the revised Technical Manual.
- It was suggested to consider a dam as a possible monitoring site.

X. Consideration of other scientific and technical issues (Agenda Item 9)

22. Prof. Wang Ruibin, from the China National Environmental Monitoring Center (CNEMC) made a presentation on issues concerning monitoring of wet and dry deposition (EANET/STM 9/9/1). He described his views on the present state of EANET and some issues related to acid deposition that should be address by the network. Among the research topics suggested are assessing and reviewing the representativeness of the monitoring sites and parameters, a comparative study on different methods, harmonization of the monitoring methods, and further development of QA/QC methods.

23. Dr. Toshimasa Ohara from the National Institute for Environmental Studies (NIES), Japan made a presentation on Integrated approach to air quality management (EANET/STM 9/9/2). He introduced the Regional Emission Inventory in Asia (REAS) 1980-2000 and future projections of Asian emissions generated using the air quality model developed by NIES, Japan. His research shows that emissions of air pollutants such as NO_x, CO, SO₂, black carbon has been significantly increased due to the rapid economic growth in Asia. It was informed that the multi-scale forecast system for air pollutants using the air quality model and emission inventory are useful tools for air quality management in Asia.
24. Dr. Junko Shindo from the National Institute for Agro-Environmental Studies (NIAES), Japan made a presentation on nitrogen cycle and its environmental effects in Asian ecosystems as an integrated approach to ecosystem impact assessment (EANET/STM 9/9/3). She introduced the changes in the global nitrogen cycle in recent years due to increased nitrogen load from agricultural practices and ammonia emission from livestock farming and their effects on the environment. Various scenarios for future prediction of N load were discussed for Southeast Asia, China and Japan-Republic of Korea. It was pointed out that N concentrations in stream water in forested ecosystems would be increased with increase of N deposition.

XI. Other Issues (Agenda Item 10)

25. The Secretariat made an introduction and presentation on the draft of the Second Report for Policy Makers on EANET (EANET/STM 9/10/1) based on the comments from the Workshop on Second Report for Policy Makers held in Pathumthani, Thailand on 28 July 2008 and comments received from the participating countries. The Meeting was invited to provide comments for further improvement of the report. Major suggestions were as follows:
- National achievements related to acid deposition and air pollution control measures are to be reported in Section 3.4 of the Report.
 - It was clarified that the Executive Summary contains the key messages to the policy makers and not only a summary of the report.
 - It was suggested that some important scientific information such as eutrophication resulting from increasing N deposition could be included in the report.

- It was clarified that some new diagrams could be included and the existing diagrams showing status of acid deposition in East Asia may be modified later taking into account the comments from the SAC.
26. The NC made a presentation on the EANET Science Bulletin (EANET/STM 9/10/2), a publication produced by the NC for EANET which shall contain reports of the joint research activities of EANET and the reports from the EANET Research Fellowship Program. Comments and suggestions on this topic included the following:
- It was informed that the EANET Science Bulletin is a new activity of the NC to be implemented in 2008 and participating countries are invited to submit relevant scientific and technical research papers for inclusion in the publication.
 - It was clarified that the copyright of the paper published in the EANET Science Bulletin would remain with the authors.

XII. Scientific Presentations (Agenda Item 11)

27. Dr. Kazuhide Matsuda, from Meisei University, Japan gave a presentation on Methodologies for dry deposition flux estimation in EANET. He highlighted recent field studies on dry deposition flux in East Asia and an updated parameterization to estimate deposition velocity for consideration of dry deposition flux estimation in EANET.
28. Dr. Akinori Takami, from NIES, Japan introduced Intensive monitoring campaigns of air pollution conducted in and around Japan. He also introduced the NIES monitoring station (NIES-CHAAMS) which was established in June 2005 at Cape Hedo, Okinawa. Finally, he showed several important findings obtained from the intensive monitoring campaigns.

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

29. The Report of the Meeting (EANET/STM 9/12) was considered and adopted.

XIV. Closing of the Meeting (Agenda Item 13)

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

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List of Participants

29 August 2008

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