

The Sixth Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network
in East Asia
27-29 July 2005, Hanoi, Viet Nam

REPORT OF THE MEETING

I. Introduction

1. The Sixth Senior Technical Managers' (STM6) Meeting of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Hanoi, Viet Nam on 27–29 July 2005. The Acid Deposition and Oxidant Research Center (ADORC) as the Network Center (NC) for EANET organized the meeting, in collaboration with United Nations Environment Programme Regional Resource Centre for Asia and the Pacific (UNEP RRC.AP) serving as the Secretariat for EANET, and in cooperation with Institute of Meteorology and Hydrology (IMH), the Ministry of Natural Resources and Environment of Viet Nam.
2. The Meeting was attended by the senior technical managers from 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 the Chemical Coordinating Center (CCC) of the Co-operative Programme for Monitoring and Evaluation of the Long Range Transmission of Air Pollutants in Europe (EMEP), from Japanese university and Japanese institute, Vietnamese research institutes as resource persons. Representatives of host country government and relevant bodies as well as researchers from relevant institutes in Viet Nam were invited as observers.
4. The list of participants is attached as Annex.

II. Opening of the Meeting (Agenda Item 1)

5. The session was opened by the Secretariat of EANET, Dr. Jiang Wei, Coordinator delivered the opening address.
6. Dr. Tran Thuc, Director of IMH, delivered the welcome speech on behalf of the meeting host organization.
7. Dr. Hiromasa Ueda, Director General of ADORC, made the introduction of the meeting

objectives and organization.

III. Election of the officers (Agenda Item 2)

8. Dr. Vu Van Tuan from Viet Nam, Mr. Fu Qiang from China and Mr. Lim Sze Fook from Malaysia were elected as co-chairpersons of the Meeting.

IV. Adoption of the agenda (Agenda Item 3)

9. The Meeting adopted the agenda as proposed by NC.

V. Review of the recent scientific and technical activities of EANET since STM5 (Agenda Item 4)

10. NC presented a brief report on the scientific and technical activities of EANET since the Fifth STM Meeting (STM5). The progress and important achievements of EANET were introduced. The necessity of efforts by participating countries was pointed out for the submission of monitoring data and the results of inter-laboratory comparison projects. Some clarifications were done as follows:

- The submission of 2004 data by several participating countries was delayed due to tight schedule established in the Work Program and Budget in 2005. The data submission in next year was proposed before the end of June 2006.
- As for inter-laboratory comparison projects, participating laboratories were requested to conduct analysis and submit the results as soon as possible after receiving the samples. NC will inform participating laboratories on prepared values of concentrations after the receiving of the data from country.

11. NC introduced the overview of the questionnaire survey on the national training activities in the participating countries in 2004 including the contents of the training.

12. The outcomes of the First Meeting of the Drafting Committee (DC) for the Periodic Report on the State of Acid Deposition in East Asia were presented by NC. The decisions and time schedule of report preparation were introduced as well as relevant follow-up activities. Major discussion and clarifications were on preparation of national assessments (Part II):

- The distributed draft content for the national assessment was proposed by DC upon the request of SAC to provide orientation for report preparation by the participating countries.
- The participating countries can submit their assessment to be prepared in line with their

own decisions on particular topics, details and conclusions. DC is supposed to discuss and provide recommendations on materials where appropriate.

- The preliminary draft national assessments were requested to submit to NC by the end of July 2005 for overview of proposed materials and comments by DC.

13. The Secretariat made a presentation on outcomes of the Second Session of the Working Group for Future Development of EANET (WGFD2) held on 20-21 June 2005, Bangkok, Thailand. The discussions and comments of WGFD2 on the contents of draft report on Feasibility Study on appropriate instrument to provide sound basis for financial contribution for EANET and draft Report for Policy Makers were introduced. The comments on the draft Work Program and Budget for EANET in 2006 and the Guidelines on Administration and Financial Management for the Secretariat and NC were also presented. The Secretariat announced the arrangement for the Fifth Session of the Scientific Advisory Committee (SAC5) and the Seventh Session of the Intergovernmental Meeting (IG7) to be held in Niigata, Japan.

14. NC made a presentation on the Draft Report on the 5-Year Medium Term Plan (MTP5) for EANET. The process of revision and circulation of MTP5 before consideration at IG7 was explained with summary of comments and suggestions by participating countries and WGFD2. Participants were invited to make comments and provide suggestions as appropriate, for elaboration of document. Major comments and suggestions were suggested:

- Common understanding of the environmental issues in East Asia could be shared among the different groups through the dissemination of relevant information and scientific results prepared by scientists in the proper manner.
- For other countries in East Asia which have not been involved in EANET, common understanding could be shared by promotion of the monitoring results and reliable information from EANET.
- It was suggested that more attention should be paid to QA/QC activities in MTP5.
- Tasks of new direction should be distinguished with respect to different schemes for implementation regarding man-power, fellowships or new sub-center.
- It was mentioned that the regional model would be more important for the participating countries.
- It was discussed while emission inventory could be suggested as the first priority of new development for EANET, the implementation of modeling and correspondent coordination would be needed.
- Some countries expressed opinion that proposed Task Force on Emission Inventory will be very important to discuss uncertain topics and issues for developing emission inventory to be accepted by EANET countries.
- It was pointed out that the modeling activity and emission inventory should be used for environment management and assessment together with monitoring taking into account the past experience of a participating country. The numerical model has been considered as a

low-cost tool with the use of personal computers.

15. NC reminded the Joint EANET/EMEP Seminar on Integrated Modeling and Monitoring for the Assessment of Long-range Transboundary Atmospheric Pollution Transport, to be held in Moscow, Russia on September 23-24, 2005. The nominations from participating countries are still waiting by the Secretariat and organizers after invitation letter to NFPs.

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

16. NC presented an overview of national monitoring plans in the participating countries including the revision of them after SAC4. Site information of Cambodia and changes of three monitoring sites on inland aquatic environment were included.

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

- i. Cambodia

- It was confirmed that analysis of all mandatory parameters of wet deposition samples will be started after installation of ion chromatographs (IC) to be provided by the Secretariat using the saving money.

- ii. China

- Overview of EANET monitoring activities was presented with particular explanation of changes of monitoring sites for ecological surveys.
- The plan to start filter-pack monitoring in Xiamen in 2006 was emphasized with request on NC support from technical aspects. An official letter for the support is proposed.
- Checking standard solutions was suggested to improve the data quality of wet deposition.

- iii. Indonesia

- It was informed that LAPAN, Bandung City, would like to participate in the next inter-laboratory comparison project on wet deposition in 2005.

- iv. Japan

- Acidification phenomenon of soils and stream waters could be seen in the catchment of Lake Ijira, one of the EANET monitoring sites in Japan. It was informed that the intensive survey will be carried out for three years to clarify processes and mechanisms of the acidification and its outcomes would be informative for the future EANET monitoring in the participating countries.

v. Lao P.D.R.

- It was confirmed that joint brochure project will be started soon after its approval by the government.
- IC will be provided to Lao PDR by using the savings of the Secretariat. It was expected to analyze all mandatory parameters of wet deposition as soon as IC would be installed in the laboratory.

vi. Malaysia

- Malaysia informed the meeting of the latest developments: The National Focal Points is under the Ministry of Natural Resources and Environment; Inland aquatic environment monitoring began in 2004 at the Semenyih Lake; QA/QC activities were improved; Change in flow rate of filter pack sampling was mentioned; Corrosion study at EANET monitoring site was introduced; Persistent organic pollutant monitoring at EANET remote site.
- NC requested information on the POPs monitored at the remote site.

vii. Mongolia

- Difficulties on the filter-pack method in winter season were mentioned.
- NC suggested submitting the application for JICA support to get atomic absorption spectrometer as soon as possible.

viii. Philippines

- It was confirmed that good results of wet deposition in 2004 were obtained successfully after repairing of equipment.
- It was clarified that the survey on soil and vegetation was carried out in 2004 and the data were expected to be submitted to NC soon.

ix. Republic of Korea

- It was clarified that the survey on soil and vegetation was carried out in 2004 and the data should be submitted to NC soon.
- NC requested to submit the hourly data of dry deposition monitoring.
- It was suggested to promote a domestic discussion in order to establish the monitoring site on inland aquatic environment.

x. Russia

- The information of new monitoring site on inland aquatic environment was presented.

xi. Thailand

- It was informed that the Third Country Training Course on Emission Inventory and Modeling for Acid Deposition Assessment will be on January 15 – February 3, 2006 and

Pollution Control Department (PCD) has already sent the information on this course to the National Focal Points. It was requested that the information should be shared also with the EANET bodies.

- Data of some rural sites showed similar values to those of urban sites. It was suggested that re-categorization or re-location of the sites would be discussed.

xii. Viet Nam

- Proposal on new monitoring plan submitted to the government was introduced. It was expected to revise the national monitoring plan in order to start the EANET monitoring in middle and southern parts of Viet Nam.
- National monitoring on wet deposition is carried out of 10-day interval, and this might cause a difficulty of data comparability. It was emphasized that the sampling frequency would be daily or weekly for harmonizing with the standard method on EANET.
- It was mentioned that experience on emission inventory in Viet Nam would be informative for EANET activities.

18. As an observer, the representative of Myanmar presented preliminary results of rainwater analysis. A process to prepare application for participation in EANET has started in their country. NC informed that JICA had already sent the invitation letter for the JICA-HIC Training Course, and NC also suggested the possibility of the individual training in ADORC after approval of their admission at IG7.

VII. Consideration of a preliminary draft data report on the acid deposition monitoring in 2004 (Agenda Item 6)

19. NC presented a preliminary draft Data Report on the Acid Deposition in the East Asian Region 2004. It was informed that Cambodia and Republic of Korea did not submit the data on EANET monitoring in 2004 before STM6. Major explanation and discussions on this topic included the following:

i. Wet deposition monitoring data

- The data of Cambodia and Republic of Korea will be included in the revised report.
- NC requested participants to confirm the data and the information of the preliminary draft data report.
- NC was requested that same manner of the significant digit should be used for consistency in preparation of the data report.
- Appropriate manner of unit description was recommended for the data presentation.

ii. Dry deposition (air concentration) monitoring data

- The data of Republic of Korea will be included in the revised report.

iii. Soil and vegetation monitoring data

- The data of Philippines and Republic of Korea will be included in the revised report.

iv. Inland aquatic environment monitoring data

- Meteorological data of Hoa Binh Station has already been submitted to NC. It was clarified that the data could be used for the information on the properties of Hoa Binh Reservoir in the data report.

20. NC presented a progress on a detailed mechanism of the procedures on data and information disclosure. Major explanation and discussions on this topic included the following:

- Information on dissemination of disclosed data on CD will be announced at the EANET website after STM6 together with registration form for request.
- The distribution of disclosed data through download from EANET website will be established within 2006 after completeness of technical tasks and webpage registration system.
- It was recommended that disclosed data on CD should include meta data.
- NC was requested to distribute the CD to the participating countries for checking.

VIII. Consideration of preliminary draft reports on inter-laboratory comparison projects in 2004 (Agenda Item 7)

21. NC presented preliminary draft reports on inter-laboratory comparison projects on wet deposition, soil, and inland aquatic environment in 2004. Major discussions on this topic are as follows:

- NC will send samples of inter-laboratory comparison projects in November 2005.
- Participating laboratories were requested to conduct analysis as soon as possible after receiving of samples and submit the results before February 28, 2006.

i. Project on wet deposition

- Most of laboratories participated in the seventh attempt on the inter-laboratory comparison project 2004.
- NC presented the application of two types of Youden diagram approach to data examination.

ii. Project on soil

- It was informed that analytical results of laboratories of Indonesia, Malaysia and Republic of Korea were not included in the presented draft due to late submission but they could be

used for revised report.

- Real soil samples were dispatched for the project, and therefore, “true” or “prepared” values of the samples were unknown. It was clarified that the outliers were statistically identified by using the Cochran and Grubbs methods in the report.

iii. Project on inland aquatic environment

- It was pointed out that improvement of the measurement of NH_4^+ is necessary because there is no progress since last year.

22. NC presented a new QA/QC activity on filter pack method in EANET. Taking the results of the transportation test study into account, NC prepared the draft plan of 1st inter-laboratory comparison survey. Major clarification of the proposed project included the following:

- Samples of the survey will be distributed to participating laboratories at the same time as the artificial rainwater in the middle of November 2005.
- 3 types of filter (alkali-impregnated filter, acid-impregnated filter and blank filter) are to be used for inter-laboratory comparison survey.
- The H_2O_2 solution and deionized water should be used for extraction of F2 and F3 filters respectively.
- Samples should be analyzed within 3 months after receiving because of low stability of the contents.

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

23. NC presented a report on Discussion on Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET. Major clarifications and discussions on this topic include the following:

- NC, as the secretariat of Task Force on dry deposition monitoring, developed the draft of “Revised Edition of Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” taking into account the discussions and the information from STM5 and SAC4.
- It was clarified that PM_{2.5} measurement described in the Strategy Paper means only particle mass concentration which was monitored by Automatic monitors.
- It was clarified that Passive Sampler would be effective for gaseous components. However further investigation such as field intercomparison study among several methods was recommended to evaluate differences from Filter Pack Method.

24. NC made a presentation on activities in line with the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET. Major points on this topic included the following:

- NC introduced the document on the sampling schedule/plan of soil and vegetation monitoring in the individual monitoring sites and the actual situation of the data submission. The senior technical managers were requested to inform NC of their sampling

schedule/plan to update the document.

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

25. NC introduced the on-going research activities on acid deposition being conducted as joint research projects with Russia on evaluation of atmospheric environment in East Siberia and Primorsky Region, with Thailand on dry deposition flux and on catchment analysis, with Mongolia on plant sensitivity to acid deposition, with Republic of Korea on aerosol monitoring, as well as collaboration with existing initiatives on developing emission inventory and numerical modeling. Major discussion included the followings:

- i. Joint project with Russia on evaluation of atmospheric environment in East Siberia and Primorsky Region
 - Phase 2 project was summarized with a comparison of monitoring results on wet and dry deposition with data from other regions.
 - In-cloud processes were supposed to be a cause of higher concentration of wet deposition compounds at Mondy station.
- ii. Joint project with Thailand on dry deposition flux
 - Analytical results were presented with focus on the ozone dry deposition in the dry season.
 - It was clarified that evaluated dry deposition velocity of ozone is reasonable and high values of ozone flux in dry season were caused by high concentrations during this time.
- iii. Joint project with Thailand on catchment analysis
 - The input/output fluxes such as deposition amounts and stream water discharge will be monitored while application of mathematical modeling is planned to be considered by co-researchers later with accumulation of the measurement data.
 - Some clarifications were done on the wind direction and soil conditions of the candidate catchment.
- iv. Joint project with Mongolia on plant sensitivities
 - Explanation on number/frequency of the passive sampling was done based on measurement programs in 2001 and 2003.
 - It was pointed out that peak value of instantaneous SO₂ concentrations might be significantly higher than measured by passive samplers and effects of SO₂ should also be discussed with high time-resolution data.
- v. Joint Research Project on Aerosol Monitoring with Republic of Korea
 - Outline and schedule of the joint research were introduced with clarification that chemical

- analysis will be performed for PM_{2.5} collected by filter pack on daily basis.
- Intensive monitoring will be performed in the same period with LTP intensive monitoring in October 2005.
 - Workshop on this research will be held during next NC technical mission.
- vi. Collaboration with existing initiatives on emission inventories and numerical modeling
- Collaboration with MICS-Asia was mainly introduced including preliminary analysis of project and discussion on model performance. Some information can be obtained on the website maintained by NC.
 - It was pointed out that EANET data was used to validate model performance.
26. NC presented a draft proposal for future research activities of highest priority which include researches for improvement of monitoring in terms of measurement methodologies, QA/QC activities and expansion of monitoring network as well as studies on state and trend of acid deposition of different scales in East Asia. The direction and background of important longer term researches were explained with reference to new scientific findings and available research information/tools. Major discussion on this topic included the following:
- It was pointed out that all EANET data should be used for future researches, in particular for assessment of the state of acid deposition and model validation.
 - The application of open-path measurement equipment is mentioned as challenging for investigation of air pollution trend but mostly suitable for urban air quality monitoring.
 - The possibilities to obtain meteorological and other input data for modeling were explained with examples of experience of participants.
 - The more intensive observations including passive sampling campaigns were mentioned as one way to expand research studies in EANET.

XI. Other issues (Agenda Item 10)

27. NC presented the announcement on the Research Fellowship in 2005 based on the draft guideline considered by WGFD2. The possible research fields were proposed by NC for fellowship studies in 2005. Major explanations and clarifications were:
- An announcement will be sent to NFPs and SAC members after STM6.
 - NC will provide the format for application together with announcement.
 - It was necessary to prepare the schedule for fellowship in 2005 as shorter as possible due to time constraints, and procedure of fellow selection is established as similar to ones applied by many research support organizations.
28. Dr. Kjetil Torseth, expert from EMEP-CCC, presented general overview of the CLRTAP and its institutional setup, the role of protocols for atmospheric pollution mitigation and the current

prognosis of environmental problems in near future. The activity of EMEP-CCC in data collection and compilation, quality assurance, their application for model validation and assessment studies were observed together with examples of intercomparison studies on laboratory analysis and field measurements. The cooperation and relations with other monitoring programs in Europe and worldwide were introduced as well as new initiatives on intercontinental pollution issues. The EMEP Monitoring Strategy for 2004-2009 was mentioned with brief explanation on programs for stations of different levels. Many issues of EMEP and EANET activities were pointed as very similar and further coordination could be helpful. The CCC offered all interested EANET laboratories to participate in their laboratory intercomparison projects.

29. Prof. Hiroshi Hara, expert of atmospheric chemistry, presented results of analysis by means of EANET data from 2000-2003. Comparison study with European and North American measurements was introduced. It was clarified that precipitation chemistry in East Asia showed specific characteristics. It was pointed out that dry deposition process should be studied taking interactions between vegetation and atmosphere into account, especially in tropical regions.
30. Dr. Tomoyuki Hakamata, expert of soil monitoring, made a presentation on the hierarchical sampling strategy for soil monitoring, which had already been described in the Technical Documents on Soil and Vegetation Monitoring in East Asia adopted in 2000 including the introduced statistical model. The usefulness of the hierarchical model for evaluation of data quality on the network was introduced based on the experience in Japan. It was stressed that the sampling strategy should be referred when soil survey would be done in most monitoring sites for coming years.

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

31. The Report of the Meeting was considered and adopted.

XIII. Closing of the Meeting (Agenda Item 12)

32. All the participants expressed their gratitude and appreciation for the efforts made by the organizers and host country, particularly Institute of Meteorology and Hydrology, the Ministry of Natural Resources and Environment, Viet Nam, for having arranged this important meeting.
33. The Meeting was officially closed.

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Annex

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29 July 2005

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