

The Third Interim Scientific Advisory Group Meeting  
on the Acid Deposition Monitoring Network  
in East Asia  
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Agenda Item 5

**Report on the Review of the Preparatory-phase Activities  
of  
Acid Deposition Monitoring Network in East Asia**

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Interim Secretariat  
Interim Network Center**

## I. INTRODUCTION

1. The First Intergovernmental Meeting of the Acid Deposition Monitoring Network in East Asia (EANET), held in March 1998 in Yokohama, Japan decided to start the preparatory-phase activities of EANET with the objectives

- (i) to examine the feasibility of the designed Network activities and relevant guidelines and technical manuals;
- (ii) to provide time for participating countries to further develop national monitoring systems for the Network; and
- (iii) to formulate policy recommendations for the further development of the Network.

The major activities to be implemented during the preparatory phase included:

- (i) Establishment of interim bodies;
- (ii) Development and implementation of the QA/QC programs;
- (iii) Development and implementation of training programs;
- (iv) Implementation of the preparatory-phase national monitoring;
- (v) Compilation, evaluation and storage of, and access to information;
- (vi) Preparation of a report on the state of the acid deposition problems; and
- (vii) Other relevant activities

It was decided at the First Intergovernmental Meeting that the results of the preparatory-phase activities would be reviewed by the Second Intergovernmental Meeting.

2. This report was prepared for the Interim Scientific Advisory Group, Working Group and the Second Intergovernmental Meeting of EANET to consider the relevant information on the implementation of the preparatory-phase activities.

## II. INSTITUTIONAL ARRANGEMENTS FOR THE PREPARATORY-PHASE

3. Regarding the institutional arrangements for the preparatory-phase, the Environment Agency of Japan was designated as the Interim Secretariat and the Acid Deposition and Oxidant Research Center (ADORC) was designated as the Interim Network Center (INC). Each participating country nominated its members of ISAG before the First ISAG Meeting in October 1998 in Yokohama, Japan. In addition, for the institutional arrangements at the country level, all the participating countries nominated their national focal points, designated their national centers of EANET.

## III. DEVELOPMENT AND IMPLEMENTATION OF THE QA/QC PROGRAMS

4. Draft QA/QC programs of the Network were prepared by INC, reviewed and adopted at

the First ISAG Meeting, and endorsed by the Third WG Meeting, both in October 1998 in Yokohama, Japan. Revised drafts of the following technical documents were prepared by INC, taking into account the latest scientific information and the experiences during the preparatory phase, and adopted with some modifications at the Second ISAG Meeting, endorsed by the Fourth WG Meeting both in March 2000.

- The Guidelines for Monitoring Acid Deposition in East Asia (EANET/ISAG 2/4/1)
- The Technical Manual for Monitoring Wet Deposition (EANET/ISAG 2/4/2)
- The Technical Manual for Monitoring Soil and Vegetation (EANET/ISAG 2/4/3)
- The Technical Manual for Monitoring Inland Aquatic Environment (EANET/ISAG 2/4/4)
- QA/QC Program for Wet Deposition Monitoring in East Asia (EANET/ISAG 2/4/5)
- QA/QC Program for Soil and Vegetation Monitoring in East Asia (EANET/ISAG 2/4/6)
- QA/QC Program for Monitoring Inland Aquatic Environment in East Asia (EANET/ISAG 2/4/7)
- Reporting Procedures and Formats for Acid Deposition Monitoring in East Asia (EANET/ISAG 2/4/8)

5. The participating countries were expected to follow these QA/QC programs or develop their own national QA/QC programs, taking into account their national situations. By July 2000, Japan informed INC that it would use the QA/QC programs for the Network. Many other countries have been developing their own national QA/QC programs.

6. Eight participating countries, namely China, Japan, Malaysia, Mongolia, the Philippines, Republic of Korea, Thailand and Viet Nam nominated their National QA/QC managers to play the central role for their national QA/QC activities.

7. Model standard operating procedures (SOPs) for wet deposition monitoring (SOPs for ADORC), were developed by INC and disseminated among the participating countries through various occasions such as the JICA Group Training Course. Many participating countries have been trying to develop SOPs for their respective laboratories, taking into account the equipment and other conditions of respective laboratories.

8. INC conducted an inter-laboratory comparison project on wet deposition (round robin analysis survey of uniformly prepared artificial rainwater samples) among the analytical laboratories of EANET in November 1998. The main purpose of the project was to recognize the analytical precision and accuracy in each participating laboratory through the evaluation of analytical results, and provide an opportunity to improve the quality of the analysis on wet deposition monitoring. Although this was the first attempt of the inter-laboratory comparison in EANET, all the participating laboratories submitted their analytical data. INC undertook the 2<sup>nd</sup> inter-laboratory comparison project on wet deposition in November 1999. Its results will be disclosed soon. Most of the participating laboratories employed recommended methods of EANET, particularly for pH and EC. However, for the analysis of ionic constituents, some laboratories did not equip ion chromatogram and were using spectrophotometry or other less

sensitive analytical methods.

9. For soil monitoring, INC undertook the 1<sup>st</sup> inter-laboratory comparison project in November 1999. By information obtained through the project, each participating country will be expected to recognize the analytical precision and accuracy of present data, and improve the data quality of soil monitoring in the future.

10. Wet deposition monitoring data obtained in each participating country were checked by calculation of ion balance (R1) and comparison between calculations and measurement in electric conductivity (R2). At most of the EANET monitoring sites, allowable ranges for R1 and R2 were satisfied for more than 80 to 90% of whole samples. However, at some monitoring sites, R1 and R2 were hardly within the allowable ranges. One of the causes of discrepancy of R1 and R2 seems to be the existence of organic acids and other undefined constituents.

#### IV. DEVELOPMENT AND IMPLEMENTATION OF TRAINING PROGRAMS

11. The training program for the Network, prepared by INC was reviewed at the First ISAG Meeting in October 1998, and modified with the comments by the participants. The revised training program was presented at the Third WG Meeting also in October 1998 and taken note with appreciation. The Report on Capacity Building in the Participating Countries of EANET during the Preparatory Phase (EANET /ISAG 2/5/3) was prepared by INC and reviewed at the Second ISAG Meeting in March 2000.

12. Based on the revised training program, maximum efforts were made to utilize existing training programs such as the JICA training courses. New training programs such as the training workshops on EANET were developed and implemented. Major activities during the Preparatory Phase are described below:

##### Identification of training needs

13. It is very important to know the present capacity of the participating countries in carrying out acid deposition monitoring and identify actual training needs. INC has been making effort to identify the training needs in the participating countries through its technical missions, training workshops and other regional meetings, national workshops and training courses in the participating countries, daily communications in various means etc.

##### Utilization of existing training programs (JICA Group Training Course)

14. The Japan International Cooperation Agency (JICA) has been implementing the Group Training Course on Monitoring and Control Technologies of Acid Deposition since fiscal year (FY) 1997 (from April 1997 to March 1998) for leading technical officials or researchers in

national or local governments of East Asia, in cooperation with Hyogo Prefecture. In the Training Programs for the Network, this course was identified as one of the activities under EANET.

#### Development and implementation of new training programs by INC (Training workshops on EANET)

15. The First Training Workshop on EANET was conducted by INC in November 1998 in Niigata, Japan. The objective of the workshop was to assist the participating countries in implementing the preparatory-phase monitoring activities in a smooth and effective manner, by disseminating the major outcomes of the First ISAG Meeting and the Third WG Meeting, particularly regarding the technical matters on monitoring, and by exchanging information and views on the situations of respective countries. Senior managers of the national centers participated in the workshop and discussed various issues related to EANET. Questionnaire survey on training and equipment needs was undertaken prior to the workshop and discussed during the workshop.

16. Taking into account the recommendations of the First Training Workshop, the Second Training Workshop on EANET was held from 31 August through 3 September 1999 in Beijing, China, focusing on ecological impact monitoring of acid deposition (soil and vegetation monitoring). Intensive discussions were held among soil/vegetation experts in the participating countries, which resulted in the identification of the objectives and future directions of soil and vegetation monitoring.

#### Implementation of individual training

17. The number of the individual training in Japan has been rather limited mainly because more emphasis was placed on short-term experts to the participating countries. However, considering the importance of intensive training, the individual training is expected to increase. A possibility of using existing fellowship schemes should also be explored to provide opportunities for junior researchers to study advanced sciences on acid deposition. The number of the individual training carried out by June 2000 are as follows:

- November 1998: a technical official of the Pollution Control Department, Thailand (training for the filter pack method of dry deposition monitoring);
- November 1998: the then Head , Laboratory of Hydrochemistry and Atmospheric Chemistry, Russia (training for the filter pack method of dry deposition monitoring);
- April 1999: an official of the Ministry of Environment, Indonesia;
- April 1999: nine members from the Sate Environmental Protection Administration and the three cities, China;
- March 2000: Assistant Director of Environmental Management Bureau, the Philippines; and;

- May to June 2000: two officials of the Pollution Control Department, Thailand (training for the wet and dry deposition monitoring and data management).

#### Implementation of national training programs

18. As of June 2000, five countries, namely Indonesia, Mongolia, the Philippines, Thailand, and Viet Nam have reported INC of the implementation of their national training programs. Two other countries, namely Japan and Malaysia have informed INC that they are not carrying out training activities specifically designed for acid deposition monitoring, but do so under the broader training schemes.

19. Many countries carried out their training activities during the INC technical missions. Some countries integrated the subjects on acid deposition and its monitoring into the existing training activities. It may be noted that Thailand undertook specific workshops on acid deposition monitoring techniques, particularly on SOPs and QA/QC program for wet deposition monitoring. The Philippines held a workshop on RAINS ASIA model, apart from direct EANET activities. Some other countries also held workshops related to RAINS ASIA.

20. INC has been providing technical support and in some cases, financial support for the national training activities upon request. Some other organizations, such as the Asian Development Bank (ADB), the United Nations Environment Programme (UNEP), the World Bank, and the Japan International Cooperation Agency (JICA) provided similar support for national training activities of the participating countries.

#### Relevant activities for capacity building

21. INC dispatched various technical missions to the participating countries. The first batch of missions were sent to all the participating countries in the period between June and September 1998, to visit (candidate) network monitoring sites and laboratories, and hold technical discussions with local experts on acid deposition and its monitoring, particularly concerning draft QA/QC programs and data reporting procedures and formats. The second batch of technical missions were sent mostly in the period between April and September 1999 to exchange information and experiences on the preparatory-phase activities and clarify technical matters. The third batch of technical missions were dispatched between June and September 2000, with particular emphasis on monitoring for soil and vegetation and inland aquatic environment. In some countries, technical workshops were undertaken during the INC technical missions. Special INC missions on soil and vegetation monitoring were dispatched in August 1999 for the Philippines and Viet Nam to jointly undertake soil and vegetation surveys. The missions were also undertaken to China, Mongolia, the Philippines and Viet Nam in October/ December 1999 to join the national workshops for evaluating the preparatory-phase activities. These missions were considered very useful for INC in grasping the present capacities of the participating countries and for the participating countries in holding detailed

technical discussions among various experts from relevant agencies and academies.

22. INC implemented the technical cooperation programs for Mongolia (FY 1999, following similar technical cooperation program in FY 1997-1998 by the Overseas Environmental Cooperation Center), the Philippines and Viet Nam (FY 1998-1999) by providing technical as well as financial support to these countries. Major objectives of these programs were to assist the countries in developing the national monitoring plans, implementing the preparatory-phase network monitoring, and evaluating the results of the preparatory-phase activities. Wet only samplers, filter pack kits and some other equipment and spare parts were provided for the network monitoring sites. Joint soil and vegetation surveys between Japanese and local experts were undertaken in the Philippines and Viet Nam. National workshops were organized to evaluate the results of the preparatory-phase activities.

23. In consultation with the EANET bodies, JICA dispatched short-term experts on acid deposition monitoring to the participating countries, namely, China, Indonesia, the Philippines, Thailand and Viet Nam. JICA also undertook its project formulation mission to Malaysia, Thailand and Viet Nam.

24. From FY 1998, INC started a joint research program on acid deposition monitoring in frigid zones with the Limnological Institute, Russian Academy of Science Siberian Branch (RAS/SB). Under this program, wet deposition monitoring as well as dry deposition monitoring started in a remote site, to study appropriate methodologies for monitoring in frigid zones. The program also included the soil and vegetation monitoring and monitoring for inland aquatic environment in Siberia. The number of the network monitoring sites was increased to two in FY 1999. This program is expected to continue for a few years.

## V. IMPLEMENTATION OF THE PREPARATORY-PHASE NATIONAL MONITORING

25. All the participating countries prepared their draft national monitoring plan and informed them to the Interim Secretariat. These were reviewed by the First ISAG Meeting and reported to the Third WG Meeting. Five countries officially informed their finalized plans to the Interim Secretariat.

26. It was expected that the participating countries would start the national monitoring for EANET at the latest from January 1999. Some countries, however, started their national monitoring later than that time (the latest country that started the monitoring was from August 1999).

27. During the preparatory phase, wet deposition monitoring for EANET started at 38 sites, including 16 remote, 7 rural and 15 urban sites respectively. Out of these sites, 23, 7, and 8 sites adopted daily, weekly and event samplings respectively. At most sites, wet only samplers are used, while manual sampling is adopted at some sites. Most laboratories participating in the

preparatory-phase monitoring have equipment required for analysis of wet deposition samples. In a few laboratories, further ion chromatograph (IC) may need to be obtained. During the preparatory phase, dry deposition monitoring (air concentration monitoring) for EANET started at 31 sites, including 14 remote, 5 rural and 12 urban sites respectively. Out of these sites, automatic instruments are used at 21 sites, and filter packs are used at 10 sites. Low volume air samplers, denuders are used at some sites. Data on soil and vegetation survey were submitted to INC for 4 sites from 4 countries. Data from the Philippines, China and Malaysia are expected to be submitted soon. Data on inland aquatic environment were submitted to INC for 7 sites from 6 countries.

28. Regarding the adequacy of site selection, the present sites were selected for the preparatory phase rather for permanent monitoring. For many of the sites, sufficient information for site selection was not available at INC. It was observed during the INC technical missions that some of them might need to be further reviewed and relocated, or improved for their location even at the same sites in the future.

## VI. COMPILATION, EVALUATION AND STORAGE OF, AND ACCESS TO INFORMATION

29. Draft data reporting procedures and formats were prepared by INC, adopted at the First ISAG Meeting, and endorsed by the Third WG Meeting.

30. As of June 2000, all the participating countries submitted the monitoring data for EANET during the preparatory phase (up to September 1999). Some countries further submitted data between October and December 1999.

31. Data submitted to INC were compiled in the data report on the acid deposition in the East Asian Region (first draft: EANET/ISAG 1/6/1) and presented at the First Informal ISAG Meeting in January 2000 in Niigata, Japan. At this meeting, it was emphasized that data verification should further be carried out. Accordingly, INC established an ad hoc group on data verification and carried out more rigorous data verification with the comments of the ad hoc group and the correspondences with the participating countries.

32. Based on the further submission of data from the participating countries and results of the data verification, the revised data report (second draft) was submitted to the Second ISAG Meeting in March 2000 in Jakarta, Indonesia. The final draft (EANET/ISAG 3/4/1) was presented at the Third ISAG Meeting in July 2000 in Manila, the Philippines. Taking into account the final comments by the participating countries, the data report was finalized in September 2000 by INC.

33. All the data submitted to INC are available for the participating countries and will be sent to them on the request basis, but will not be disclosed to others, because of the decision of



the First Intergovernmental Meeting in March 1998.

34. EANET web site (<http://www.adorc.gr.jp>) opened from July 1999 to disseminate the information on EANET worldwide.

## VII. PREPARATION OF A REPORT ON THE ACID DEPOSITION MONITORING

35. The report on the state of the acid deposition in the East Asian Region (tentative title) was expected to be developed by ISAG, based on the data report. A draft structure of the report was prepared by INC at the request of ISAG, discussed and basically endorsed at the Second ISAG Meeting. It was agreed that the title of the report should be changed to the report on the acid deposition monitoring of EANET during the preparatory phase - its results, major constraints and ways to overcome them. Based on the request by ISAG, a preliminary draft of the report was prepared by INC and distributed at the end of May among the ISAG members for their comments. The revised report was submitted and adopted with some amendments at the Third ISAG Meeting.

## VIII. OTHER RELEVANT ACTIVITIES

36. Exchange of information and experiences were promoted with other regional and global networks such as the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe (EMEP), the Commission for Environmental Cooperation (CEC) in North America, and Global Atmospheric Watch of the World Meteorological Organization (WMO) through the participation of experts to the EANET meetings, ADORC missions dispatched to those networks etc.

37. EANET has also been trying to promote cooperation with other initiatives in the East Asian Region relating to the acid deposition problem. For instance, it has been closely communicating and cooperating with the United Nations Project on Transboundary Pollution Modeling, the Project for Long-range Transboundary Air Pollutants in Northeast Asia by China, Japan and Republic of Korea, the NEASPEC Project on Emission Inventory and the Environmental Data Clearing House, RAINS ASIA Projects by the World Bank and the Asian Development Bank, etc.

38. In order to improve public awareness as well as that for decision-makers on acid deposition problems, ADORC developed in FY 1998 two brochures for the general public and school children, and videotape for the general public. Joint projects were undertaken in FY 1999 between China and ADORC, and between Thailand and ADORC to develop similar brochures for public awareness. In FY 2000, joint brochure projects were undertaken between Malaysia and ADORC, and between the Philippines and ADORC, and joint video project between China and ADORC. A workshop to share the relevant information and experiences on this topic will also be undertaken.

39. The East Asian Workshop on Acid Deposition Problems was held in October 1999 in Bangkok, Thailand by the Pollution Control Department (PCD) of Thailand and JICA to disseminate the latest knowledge and understanding on acid deposition problems among government officials in respective countries, to identify future actions to develop an East Asian region-wide cooperative program for addressing the problem, etc.