

**Chairman's Summary of the Third Expert Meeting on
Acid Deposition Monitoring Network in East Asia**

16 November 1995

1. The Third Expert Meeting on Acid Deposition Monitoring Network in East Asia was held in Niigata, Japan from 14 to 16 November 1995. It was hosted by the Environment Agency of Japan, Niigata Prefecture and Niigata City. It was attended by 54 experts from 10 countries (China, Indonesia, Japan, Korea, Malaysia, Mongolia, Philippines, Singapore, Thailand and Vietnam), eight experts from five international organizations (the Acid Rain Network in South, East, and Southeast Asia (ARNSESEA), the Commonwealth Scientific and Industrial Research Organization (CSIRO), the European Monitoring and Evaluation Programme (EMEP), the United Nations Environmental Programme/Regional Office for Asia and Pacific (UNEP/ROAP), and the World Bank), and 92 observers from local governments, universities and public organizations in Japan.

2. The Meeting was chaired by Mr. Saburo Kato (Japan), with Mr. Cheng Weixue (China) and Dr. RTM Sutamihardja (Indonesia) as vice-chairmen, with the exception of agenda item 7 "Reviews on Acid Deposition Monitoring Techni-ques/Methodologies" which was chaired by Prof. Hajime Akimoto (Japan), and vice-chaired by Dr. Greg Ayers (CSIRO).

3. The purpose of the Meeting was to finalize the Conceptual Design of an Acid Deposition Monitoring Network in East Asia (hereinafter abbreviated as "Conceptual Design"), and to discuss expansion and supplementation of the "Guidelines for Monitoring Acid Deposition in East Asia" (hereinafter abbreviated as "Guidelines") adopted at the Second Expert Meeting, which included discussion of the development of technical manuals and development of guidelines for dry deposition monitoring.

4. At the beginning of the Meeting, a keynote presentation by Dr. H. Dovland of EMEP, and an invited presentation by Dr. J. Shah and Mr. R. Ramankutty of the World Bank, were made.

5. Regarding the establishment of an Acid Deposition Monitoring Network in East Asia (hereinafter abbreviated as "Network"), participants used a preliminary paper prepared by the Secretariat as the basis for discussion. After vigorous discussion, revisions were made and the "Conceptual Design of an Acid Deposition Monitoring Network in East Asia" was adopted (see attached document).

6. During the discussion on the Conceptual Design, many participants emphasized that the Network should be established as soon as practical, but no later than the year 2000. It was also emphasized that the participants should make joint efforts towards reaching a formal agreement on the Network by, for instance, reporting the major results of this meeting to high-level fora, such as ECO-ASIA and APEC, and obtaining their endorsement in collaboration with international and regional organizations.

7. As for the geographic coverage, the participants agreed that the term "EAST ASIA" is used in a broad sense which includes Northeast Asia and Southeast Asia.

8. Regarding the expansion and supplementation of the Guidelines, presentations were made on various aspects of acid deposition monitoring by Dr. H. Hara (Japan), Dr. T. Fukuyama (Japan), Dr. J. P. Hettelingh (EMEP), Dr. G. Ayers (CSIRO), Prof. Z. Feng (China) and Dr. H. Dovland (EMEP). One topic of discussion that came out of the presentations concerned the advantages (i.e. accuracy and low cost) of passive sampling. It was agreed that its applicability should be examined.

9. It was proposed that working groups should be set up for the preparation of the following:

- 1) Draft Technical Manual for Wet Deposition Monitoring,
- 2) Draft Guidelines for Dry Deposition Monitoring,
- 3) Draft Technical Manual for Monitoring of Soil and Vegetation,
- 4) Draft Technical Manual for Monitoring of Inland Aquatic Environments.

These working groups will consist of a small number of experts who will draft a preliminary manual or guideline which will then be circulated for critical review. The manuals and guideline will be adopted at an expert meeting. The Environment Agency of Japan indicated its willingness to extend efforts to support such activities.

10. Based on the above proposal, the following Japanese experts, Dr. H. Hara, Dr. T. Fukuyama, Dr. T. Totsuka and Dr. N. Ogura, were nominated as temporary coordinators for initiating the activities of the working groups. Each country will have an opportunity, if desired, to nominate experts for membership of each working group.

11. It was recommended that expert meetings be held in the future at which each country will make a report on the progress of its national monitoring system. These meetings will serve the purpose of maintaining momentum towards realization of the Network.

12. The Environment Agency of Japan proposed that it will consider hosting another expert meeting next year in Japan, the purposes of which include examination of the tasks identified in chapter 3 "Toward realization of the Network" in the attached document "Conceptual Design of an Acid Deposition Monitoring Network in East Asia," and discussion of issues related to paragraph 9. The participants gratefully acknowledged this proposal.

Conceptual Design of an Acid Deposition Monitoring Network in East Asia*

15 November 1995

1 Introduction

1.1 Background

1. Acid deposition is widely recognized as one of the most serious atmospheric environmental issues and is of global concern. International actions on a regional scale to tackle this problem have been taken in Europe and North America. East Asian countries also face a potential regional scale acid deposition problem, and have recently started to expand their monitoring activities as a result. Cooperative and collaborative action in the region is essential to address this potential problem. Agenda 21, which was adopted at the United Nations Conference on Environment and Development (UNCED) in June 1992 states: "The programmes (in Europe and North America) need to be continued and enhanced, and their experience needs to be shared with other regions of the world" (paragraph 9.26).

2. At the first Northeast Asian Conference on Environmental Cooperation held in Niigata, Japan in October 1992, participating experts proposed regional cooperation with research on and monitoring of acid deposition. This proposal was made again at the second conference (Seoul, Korea, September 1993) and the third conference (Hyogo, Japan, September 1994). At the fourth conference (Pusan, Korea, September 1995), progress on the establishment of an Acid Deposition Monitoring Network in East Asia was reported and welcomed by all participants. Also, at the Environment Congress for Asia and the Pacific (ECO-ASIA) which was held in Saitama, Japan in June 1994, participating Environmental Ministers agreed on the need for establishing a new mechanism to facilitate regional cooperation and to address environmental problems common to the region.

1.2 Expert Meetings on an Acid Deposition Monitoring Network in East Asia

3. In light of the above calls for regional cooperation on the acid deposition issue in East Asia, the First Expert Meeting on Acid Precipitation Monitoring Network (this and subsequent meetings will hereinafter be abbreviated as "Expert Meeting") was held in October 1993 in Toyama, Japan. More than 40 administrative officials and experts in the field participated in the meeting from 10 countries and 3 international organizations. The Second Expert Meeting was held in March 1995 in Tokyo, Japan with more than 60 participants from 9 countries and 4 international organizations.

* *The term "EAST ASIA" is used in a broad sense which includes Northeast Asia and Southeast Asia.*

4. These meetings clearly recognized that collaborative monitoring was an essential first step toward regional cooperation on the acid deposition issue. It was also recognized that toward this end monitoring guidelines suitable for the East Asia region should be developed. As a result, the Second Expert Meeting adopted the "Guidelines for Monitoring Acid Deposition in the East Asia Region" (hereinafter abbreviated as "Guidelines"). Also, it was expected that eventually an acid deposition monitoring network would be established in the region.

5. The Third Expert Meeting was held in Niigata, Japan in November 1995. More than 60 experts participated from 10 countries and 5 international organizations as follows: China, Indonesia, Japan, Korea, Malaysia, Mongolia, Philippines, Singapore, Thailand, Vietnam, the Acid Rain Network in South, East, and Southeast Asia (ARNSESEA), the Commonwealth Scientific and Industrial Research Organization (CSIRO), the European Monitoring and Evaluation Programme (EMEP), the United Nations Environmental Programme/Regional Office for Asia and Pacific (UNEP/ROAP), and the World Bank. The meeting, recognizing that an acid deposition monitoring network should be established in the region as soon as practical, adopted the "Conceptual Design of an Acid Deposition Monitoring Network in East Asia," the details of which are described below.

6. Furthermore, the meeting strongly urged participants to make joint efforts towards reaching a formal agreement on the network, which includes development and/or review of national acid deposition monitoring systems and working actively with relevant national authorities, and, if appropriate, international organizations.

2 Network

2.1 Purpose

7. Establishment of an acid deposition monitoring network (hereinafter abbreviated as "Network") is dedicated to creating a common understanding of the status of the acid deposition among countries and organizations of the East Asia region, and to providing useful inputs for assessment of acid deposition for decision-making at various levels aimed at preventing adverse impacts of acid deposition in the region. Important contributions towards the accomplishment of these purposes will be made through central collection of acid deposition monitoring data and results gathered by each participating country, and through compilation and publication of reports on the state of acid deposition in the East Asia region which are to be prepared based on analysis and evaluation of the monitoring data and results. The Network is also expected to facilitate exchange of technical expertise in the region related to monitoring activities and to facilitate international cooperation in relevant technical fields of study.

2.2 Structure of the Network

8. The Network should be composed of the following elements:

- (i) implementation of acid deposition monitoring by each country;
- (ii) quality assurance/quality control (QA/QC) of monitoring systems;
- (iii) data reporting and information exchange systems;
- (iv) central compilation and analysis of monitoring data;
- (v) promotion of technical cooperation in the field of acid deposition monitoring; and
- (vi) other elements to be specified by the Governing Council described in section 2.6 below.

Additionally, it is recognized that a comprehensive assessment of acid deposition, as required for sound policy development, also requires data on emissions, ecosystem sensitivities, and use of numerical transport, transformation and deposition models. These topics are incorporated in Chapter 4 "Future development of the Network."

2.3 Geographic coverage

9. The Network should be composed of those countries in the East Asia region, including Northeast Asia and Southeast Asia, who express their desire and intention to participate in the Network (hereinafter abbreviated as "participating countries").

2.4 Network Center

10. An Acid Deposition Monitoring Network Center (hereinafter abbreviated as "Network Center"), which has the functions described in paragraph 13 below, should be established to operate the Network.

11. The establishment of one or more branches of the Network Center, which share the functions (i.e., sections (iv) and (vi) of paragraph 13) of the Network Center, might be considered in the future.

12. The Network Center is expected to be established in Japan.

13. Under the approval and guidance of the Governing Council (described in section 2.6 below), the Network Center should:

- (i) compile, analyze and store data submitted by participating countries, perform the same for

appropriate data gathered from other sources, and publish periodic reports;

(ii) provide participating countries with data upon request. In addition, consideration will be given to the issue of disclosure of information in possession of the Network Center to audiences beyond the participating countries (e.g., use of data, for scientific purposes only, by outside individuals and organizations).

(iii) promote technical assistance to those participating countries which intend to establish a national monitoring strategy/plan or national monitoring stations;

(iv) develop and implement education/training programs for monitoring personnel;

(v) implement quality assurance/quality control (QA/QC) programs and promote technical assistance to participating countries including the maintenance of monitoring equipment in relation to the programs;

(vi) provide fora for the exchange of information, experience, etc., within the East Asia region, and cooperate, as necessary, with fora in other regions; and

(vii) implement other functions as specified by the Governing Council.

2.5 Participating countries

14. A participating country, to the best of its ability, should establish a national center, a national monitoring strategy/plan, and a network of monitoring stations, and implement an acid deposition monitoring program, taking into full account the Guidelines.

15. A participating country should provide the Network Center with the following information and data when it initiates participation in the Network and periodically thereafter:

(i) name, address and telephone and facsimile numbers of the national center and contact person(s). For those participating countries who do not have a national center, the institution and contact person(s), names, addresses and telephone and facsimile numbers of the national focal point(s);

(ii) a national monitoring strategy/plan. For those participating countries who do not have a national monitoring strategy/plan, a description of the existing national monitoring system;

(iii) names, addresses and geographical description of the monitoring stations;

(iv) monitoring data obtained in accordance with the Guidelines. As for those participating countries who did not apply the Guidelines, a detailed description of methods used in addition to monitoring data; and

(v) other information as specified by the Governing Council.

16. A participating country may request the Network Center to provide it with monitoring data in accordance with procedures specified by the Governing Council described in section 2.6 below.

17. Participating countries should cooperate with each other in establishing monitoring stations and in furnishing monitoring equipment, etc.

2.6 Governing Council

18. A Governing Council composed of representatives from the participating countries should be established to govern the Network and Network Center.

19. The Governing Council should make decisions on important issues relevant to the operation of the Network and Network Center.

20. The Governing Council should establish a Science Advisory Committee and other appropriate committees to advise it on any scientific, technical, or other aspects relevant to the Network. Experts from countries outside the group of participating countries can be members of the Science Advisory Committee.

2.7 Secretariat

21. A Secretariat should be established for effective management of the Network program.

22. With the approval and guidance of the Governing Council, the Secretariat should convene the Governing Council and perform other necessary tasks as designated.

2.8 Financial issues

23. It is desirable that participating countries bear their country's respective costs for establishing a national center, a national monitoring strategy/plan, national monitoring stations, etc. For those participating countries who need financial assistance, efforts to enhance existing assistance sources and to

find other sources should be undertaken.

24. It is desirable that the major financial burden for operation of the Network Center be borne, on a voluntary basis within budgetary constraints, by the country or appropriate body/bodies in the country in which it is established.

3 Toward realization of the Network

25. Taking into account the many factors involved in the establishment of the Network, it is deemed appropriate that the Network should be established as soon as practical, but no later than the year 2000. To establish the Network according to the schedule indicated above, the following efforts are required:

- (i) development and review of national monitoring systems;
- (ii) preparation for establishing the Network Center;
- (iii) enhancement of the Guidelines and development of technical manuals;
- (iv) promotion of international cooperation;
- (v) a formal agreement on the establishment of the Network; and
- (vi) the convening of expert meetings to consider various of the above issues.

3.1 Development and review of national monitoring systems

26. Participating countries are expected to develop national monitoring systems taking into full consideration the Guidelines. To this end, it is necessary to create national monitoring strategies/plans. Then, in accordance with the created national monitoring strategies/plans, participating countries should make step-by-step efforts to establish a sampling system, analysis system and national monitoring center, and to cooperate with other concerned organizations. For those countries which already have an existing national monitoring system, it is necessary to review their system and to enhance it as appropriate taking into full consideration the Guidelines.

27. For those participating countries who need assistance in implementing an acid deposition monitoring program, it is expected that mutual cooperation among participating countries will be promoted. To this end, the possibility of sending missions, convening symposia, etc to assist such countries should be considered.

3.2 Preparation for the establishment of the Network Center

28. The country in which the Network Center is to be established should make preparations, in consultation with the other participating countries and in accordance with the necessary functions as described in paragraph 13, for the establishment of the Network Center so that it can start operations on schedule. Data reporting procedures shall remain open for discussion. Although the procedures of the European Monitoring and Evaluation Programme (EMEP) can serve as an exemplary model, careful consideration of its applicability to the East Asia region must be made. Further collaborative consideration on this issue needs to be pursued. To this end, the possibility of convening expert meetings should be considered.

3.3 Enhancement of Guidelines and development of technical manuals

29. It is necessary to expand and improve the Guidelines adopted at the Second Expert Meeting and to develop and improve technical manuals for the monitoring of a) wet deposition, b) soil and vegetation, and c) inland aquatic environments, which will expand and supplement the Guidelines. Each participating country should, to the best of its ability, develop a national monitoring system in accordance with the Guidelines and their supplementary technical manuals. Further, it is necessary to develop guidelines for dry deposition monitoring even though there is still a lack of expert consensus on the best methods for such monitoring. Also, it is necessary to enhance the "quality assurance and quality control" and "data management" sections of the Guidelines. To these ends, the possibility of convening expert meetings should be considered.

3.4 Promotion of international cooperation

30. International cooperation at the bilateral, multilateral and regional levels is indispensable for realization of the Network in East Asia. Technology transfer should be promoted for the purpose of establishing and managing monitoring and research programs in participating countries.

31. In addition, it is important to promote cooperation and coordination of various tasks related to the Network, notably those related to capacity building.

3.5 Formal agreement on the establishment of the Network

32. Formal agreement is necessary to establish the Network. The ministerial meeting of ECO-ASIA, ESCAP, APEC, or some other body could be used as the forum for such a formal agreement. Taking into account meeting schedules, it seems practical as a first step that the results of the three expert meetings be reported to the Environmental Ministers' meeting of ECO-ASIA to be held in June 1996 and at this time approval of this document by the Ministers be sought. Efforts to obtain formal approval will then be continued at all appropriate high level meetings.

3.6 Convening of expert meetings to consider various of the above issues

33. Further expert meetings will be required to consider problems relevant to the establishment of the Network.

4 Future development of the Network

4.1 Enhancement of the Network

34. Even after the Network is established, it is important to continue making efforts to expand, refine and enhance the Network.

4.2 Development of emission inventories

35. It is desirable for participating countries to conduct systematic surveys of the sources and quantities of emissions of major acid deposition-related pollutants such as SO_x and NO_x, and to evaluate annual emission trends. To this end, it is important to develop guidelines for compilation of emission inventories taking into due consideration the conditions in East Asia.

36. Development of emission inventories will be useful for numerical modeling of acid deposition phenomena, and for promoting measures to reduce loads of those substances that cause acid deposition. In addition, they will be valuable for effective promotion of local air pollution control measures in participating countries.

4.3 Numerical modeling of acid deposition

37. Numerical models should be developed to simulate long- and medium-range transport, dispersion, chemical transformation and deposition of acid deposition-related substances, and to evaluate potential acid deposition impacts on ecosystems in East Asia. The World Bank and the Asian Development Bank have taken the initiative in developing such a model, the "RAINS-ASIA" model. The first development phase has been completed and a second phase is expected to commence. It is important to maintain a close link with this program and other related modeling programs.

4.4 Adverse effects on ecosystems

38. There remain numerous phenomena to be elucidated related to adverse effects of acid deposition on soils, vegetation and inland aquatic environments. Research efforts to gain insights into the causal mechanisms of such adverse impacts needs to be continued. Knowledge of adverse effects on ecosystems should be improved by (a) collecting data on impacts of acid deposition, (b) validating and improving knowledge of critical loads and levels, including their geographic distributions, and (c) investigating other models and approaches to evaluate adverse ecological effects. Monitoring of

depositions and concentrations of air pollutants, and of environmental impact indicators should be emphasized in areas at risk.

4.5 Promotion of joint and/or cooperative surveys and studies

39. Building on monitoring network activities, efforts should be made to promote joint and/or cooperative surveys and studies at all levels (governmental, university, private, etc.) in the region. Such joint and/or cooperative surveys and studies would include clarification of acid deposition formation and its impacts on ecosystems, acid deposition countermeasures, development of long-range transport models, etc.

5 Future prospects

40. Through efforts such as described in this document, it is hoped that the countries of East Asia will come to share a common perspective on the acid deposition problem in the region, and will steadily implement various countermeasures to prevent the adverse impacts of acid deposition. For this to take place, however, international cooperation must be promoted to support the initiatives of participating countries related to this problem. A regional framework, which reflects the East Asian experience, can be useful not only as the basis for promoting national acid deposition countermeasures, but also as the basis for facilitating prevention of transboundary air pollution problems in East Asia.