

**The Workshop on  
Ecological Impact Monitoring of  
Acid Deposition in East Asia  
(2<sup>nd</sup> Training Workshop on EANET)  
31 August-3 September 1999  
Beijing, China**

**The Workshop on Ecological Impact Monitoring  
of Acid Deposition in East Asia  
(2<sup>nd</sup> EANET Training Workshop)  
31 August-3 September 1999, Beijing, China  
Workshop Summary**

1. The Workshop on Ecological Impact Monitoring of Acid Deposition in East Asia (2<sup>nd</sup> EANET Training Workshop) was held in Beijing, China from 31 August-3 September 1999, organized by the Interim Network Center (INC) of the Acid Deposition Monitoring Network in East Asia (EANET), and hosted by the China National Center of EANET, co-sponsored by the United Nations Environment Programme (UNEP) and the Asian Development Bank (ADB). The program of the workshop is attached as Annex I.

**I. Attendance**

2. The Workshop was attended by approximately forty participants and observers from all the EANET participating countries, namely China (including representatives from Chongqing, Xiamen, Xi'an and Zhuhai), Indonesia, Japan, Malaysia, Mongolia, the Philippines, Republic of Korea, Russian Federation, Thailand and Viet Nam. The list of the participants of the workshop is attached as Annex II.

**II. Objectives of the workshop**

3. The objectives of the workshop were:

- (i) to disseminate technical information on soil and vegetation survey for the participating countries of EANET;
- (ii) to discuss and elaborate the methodologies on soil and vegetation survey and its QA/QC activities suitable for East Asia; and
- (iii) to discuss the ways for considering the monitoring guidelines and technical manual, and reviewing the QA/QC program for soil and vegetation monitoring.

**III. Conduct of the Workshop**

4. The workshop commenced with opening address by Mr. Hajime Endo, the representative of the Interim Secretariat of EANET, followed by the speeches by Mr. Lu Xinyuan, Director of the Supervision and Management Department, the State Environmental Protection Administration (SEPA) of China, and Dr. Wan Bentai, the Director of the China National Environmental Monitoring Centre (CNEMC). Mr. Katsunori Suzuki, the Acting Director General of INC, then introduced the

workshop organization.

5. The workshop elected Professor Muhamad B. Awang, Dean, Faculty of Science and Environmental Studies, Universiti Putra Malaysia as the Chairperson, and Dr. Wan Bentai and Professor Tsumugu Totsuka, Professor of Edogawa University as the Vice-chairpersons.

6. The keynote addresses titled "Forest soil condition in Europe - Results of a large-scale soil survey" and "Present status of acid deposition monitoring (soil/vegetation survey) in Chongqing, China" were delivered by Dr. Eric Van Ranst, Professor and Director of the Laboratory of Soil Science, University of Ghent and Chairperson of the Forest Soil Expert Panel of the International Co-operative Programme on Assessment and Monitoring Air Pollution Effects on Forests (ICP Forests) in the United Nations Economic Commission for Europe (UN/ECE), and Ms. Zhang Weidong, Senior Engineer, Air Environmental Research Department, Chongqing Institute of Environmental Science, respectively.

7. During the technical sessions, presentations were made by resource persons. The title of the presentations and the name of the resource persons are presented in the program of the Workshop. The excursion was undertaken to visit the Great Wall on the third day of the workshop.

#### **IV. Major conclusions and recommendations deriving from discussions**

The participants of the workshop agreed on the following conclusions and recommendations.

##### **General**

8. **Objectives of soil and vegetation monitoring:** The ultimate objective of the soil and vegetation monitoring will be to assess the impacts of acid deposition on terrestrial ecosystems in a comprehensive and systematic manner through establishment and maintenance of good quality database. To achieve this ultimate objective, step-wise approach should be adopted. The initial objectives of the soil and vegetation monitoring could be an establishment of baseline data, and also early detection of possible impacts of acid deposition, particularly on plants and forest ecosystems.

9. **Diversity in conditions relating to acid deposition and its monitoring:** The conditions relating to acid deposition such as climate, soil and vegetation in countries of East Asia are quite diverse, therefore, different methods for soil and vegetation monitoring have been adopted. Effort should be made to obtain good quality of data for comparison purpose, while allowing some flexibility in methods, taking into account the diverse conditions and capabilities in respective countries.

10. **Need for intensive research, particularly in the tropical region:** The mechanism of acid deposition and its impacts in the temperate region are relatively well understood, while those in the tropical region are less investigated. Intensive research activities in these fields, particularly in the tropical region should be undertaken. Such activities may cover the following subjects:

- sensitivity of plants;
- microbiological processes relating to acid deposition; and
- elements dynamics in terrestrial ecosystems.

11. **International network on specialists:** Since monitoring on impacts of acid deposition on soil and vegetation is relatively new in East Asia, exchange of information and experiences among the participating countries of EANET is particularly important. In order to facilitate such exchange, networking of soil and vegetation specialists involved in the EANET activities is indispensable. Effort should be made to establish the network as quickly as possible, starting among the specialists identified in this workshop. The maximum use of the latest information and communication technologies, such as Internet, should be enhanced in the future.

12. **Cooperation among soil and vegetation specialists and the national center:** At present, most national centers of EANET do not have specialists on soil and vegetation in their own institutions. It should be emphasized that cooperation with the specialists in this field in other agencies and academy is the key for the successful implementation of soil and vegetation monitoring. In some

countries, national coordination committees were established to maintain good communication, cooperation and coordination among relevant entities.

### **Experiences in the participating countries**

13. **Difference in monitoring experience:** Some participating countries have accumulated experiences in soil and vegetation monitoring based on the methodologies described in the technical manual, while the others have just started. Some countries need to look for financial resources and technical expertise for soil and vegetation monitoring.

14. **Lessons to learn:** Past experiences in Europe, North America and Japan could provide the participating countries with good lessons to learn, particularly to avoid mistakes they had had before.

### **Major topics to be elaborated towards the formal phase**

15. **Site selection criteria:** Site selection criteria should be elaborated, particularly in terms of the information to be collected prior to the selection of monitoring sites. Availability of satellite image and other remote sensing technologies may also be explored. The concept and the criteria for ecological sites should also be clarified. In the case that there are some difficulties in complying with the technical manual, flexibility should be given and the differences with the siting criteria should be clearly recorded.

16. **Methodologies suitable to vegetation monitoring in the tropical region:** Since the methodologies for vegetation monitoring described in the technical manual is not suitable for certain areas, particularly in the countries of the tropical region, the methodologies suitable to such areas should be integrated in the technical manual. For instance, indicator plants and/or the methodologies for observation of the forest decline should be elaborated. Hemispherical photograph using fish-eyed lens may be a good candidate method for vegetation monitoring. A possibility may be explored to use satellite image and other remote sensing technologies in the future.

17. **Analytical methods:** Based on the latest scientific information and the experiences gained in the participating countries, analytical methods for soil and vegetation monitoring should further be elaborated. In this connection, monitoring parameters should be reclassified into three categories: mandatory, optional and voluntary items. The following modifications are also recommended:

- Effective Cation Exchange Capacity (ECEC) should be employed for the estimation of cation exchange capacity;
- Exchangeable acidity is necessary to be analyzed for the calculation of ECEC;
- For calcareous soil, carbonate content needs to be analyzed; and
- Bulk density is preferred for general indication of the soil physical properties instead of analyzing three-phase distribution.

18. **QA/QC activities on soil and vegetation monitoring:** QA/QC activities using statistical approach for evaluation of collected data are very important and effective to obtain reliable data among the participating countries. QA/QC activities should be promoted, and compliance with the QA/QC program in the participating countries should be regularly monitored and assessed by the national centers as well as the (Interim) Network Center.

### **Suggested future actions**

19. **Items to be monitored during the initial stage of the formal phase:** Since many participating countries have just started the soil and vegetation monitoring for the preparatory phase, the monitoring of the same items should be continued, with some modifications and elaboration, based on the latest scientific information and knowledge. The technical manual on soil and vegetation monitoring may need to be reviewed and revised accordingly, taking into account the experiences accumulated in East Asia.

20. **Promotion of capacity building:** The capacity building of the participating countries should be promoted. In this regards, “training for the trainers” approach by using the technical manual may be adopted. Possibility may also be explored to provide regular training to the identified technicians/researchers in the sub-regions with similar conditions such as ASEAN countries.

21. **Activities recommended to be implemented by EANET:** The following activities are recommended for implementation by the (Interim) Network Center.

- to establish a network on soil and vegetation specialists among the participating countries of EANET in order to facilitate the exchange of information and experiences;
- to elaborate the target groups and subjects of the training on soil and vegetation monitoring by EANET;
- to implement the inter-laboratory comparison program of chemical analysis on soil monitoring of EANET, and to elaborate it as appropriate;
- to establish a task force on soil and vegetation monitoring for EANET in order to develop a step-wise strategy towards the ultimate objective of soil and vegetation monitoring, elaborate the methodologies suitable for East Asia, and undertake meetings and examine the milestones; and
- to strengthen collaboration with other international organizations relating to acid deposition problems.

22. **Leading role of the national centers and the national training programs:** The national centers of EANET should take the leading role in providing the necessary training in the respective participating countries. Appropriate training activities for soil and vegetation monitoring should also be integrated in the national training programs, taking into account the available resources in respective countries.

23. **Domestic coordination mechanism:** Since the study on ecological impacts of acid deposition requires various different disciplines, communication, coordination and cooperation among different agencies/institutions are important. Establishment of a domestic coordination mechanism, such as a national coordination committee among different agencies/institutions may need to be explored in respective countries.

## V. Others

24. All participants expressed their gratitude and sincere appreciation for the efforts made by the organizer and the host country for having arranged this important workshop.

Beijing, China, 3 September 1999

Katsunori Suzuki  
Secretary

Workshop on Ecological Impact of Acid Deposition in East Asia

Muhamad Bin Awang  
Chairperson

**Workshop on Ecological Impact Monitoring of Acid Deposition in East Asia  
(2<sup>nd</sup> Training Workshop on EANET)  
Workshop Outline**

1. Background

According to the documents titled “Implementation of Preparatory-Phase Activities of EANET”, agreed upon at the First Intergovernmental Meeting in March 1998 and the training program reviewed at the First Interim Scientific Advisory Group (ISAG) Meeting, the training for EANET activities should make maximum use of existing training programs and develop and implement a new training program by the Interim Network Center (INC). INC, therefore, held the 1<sup>st</sup> Training Workshop on EANET in November 1998 in Niigata, Japan and disseminated the various decisions and relevant technical information, materials needed for the preparatory-phase EANET activities among the participating countries.

Following the recommendations at the 1<sup>st</sup> Training Workshop that the next Training Workshop should have focused topics such as soil and vegetation monitoring, and in consultation with experts in the participating countries, INC decided to organize the 2<sup>nd</sup> Training Workshop in August 1999 in Beijing, China to mainly focus on ecological impact monitoring of acid deposition (soil and vegetation monitoring).

2. Objectives

The objectives of the Workshop are:

- (i) to disseminate technical information on soil and vegetation survey for the participating countries of EANET;
- (ii) to discuss and elaborate the methodologies on soil and vegetation survey and its QA/QC activities suitable for East Asia; and
- (iii) to discuss the ways for considering monitoring guidelines and technical manuals, and reviewing the QA/QC program for soil and vegetation monitoring.

3. Dates and venue

31 August through 3 September 1999 at the China-Japan Friendship Environmental Protection Centre, Beijing, China

4. Organizer

The workshop will be organized by the Interim Network Center and hosted by the China National Center of EANET, co-sponsored by the United Nations Environment Programme and the Asian Development Bank.

5. Participants

Approximately 50 participants and observers mainly from the participating countries of EANET (the following experts on soil/vegetation monitoring are expected.):

- Experts who are actually conducting the soil and vegetation survey in the participating countries of EANET (one each from the participating countries);
- Experts who have been contributing to the methodologies on soil and vegetation monitoring of EANET;
- Experts of international organizations etc. who have excellent expertise and experiences in soil and vegetation monitoring; and
- Experts who are actually conducting the soil and vegetation survey in the four cities (Chongqing, Xi'an, Xiamen and Zhuhai) in China (one each from the cities).

Voluntary participation from the participating countries whose participation expenses are borne by them, will be welcomed.

6. Program of the Workshop

Attached as Annex.

7. Working language

In principle, English

Interpretation between English and Chinese will be provided at the morning sessions of the First Day.

**Workshop on Ecological Impact Monitoring of Acid Deposition in East Asia  
(2<sup>nd</sup> Training Workshop on EANET)  
Program**

First Day

- 09:00-09:30 Registration
- 09:30-10:00 Opening speeches  
by Mr. Hajime Endo, Interim Secretariat of EANET  
Mr. Lu Xinyuan, Director, Supervision and Management Department,  
State Environmental Protection Administration of China  
Dr. Wan Bentai, Director, China National Environmental Monitoring  
Centre
- Introduction of the Workshop organization  
by Mr. Katsunori Suzuki, Acting Director General, Acid Deposition and  
Oxidant Research Center (Interim Network Center of EANET)
- Election of Chairperson etc.
- 10:00-11:00 Keynote addresses (30 minutes each)
- Forest soil condition in Europe - Results of a large-scale soil survey  
by Dr. Eric Van Ranst, Professor and Director of the Laboratory of Soil Science  
of the University of Ghent, and Chairman of the Forest Soil Expert Panel of  
UN/ECE ICP Forests
- Present status of acid deposition monitoring (soil/vegetation survey) in Chongqing,  
China  
by Ms. Zhang Weidong, Chongqing, China
- 11:00-11:30 Coffee break

**Session One: Methodologies on soil and vegetation monitoring for EANET**

- 11:30-12:00 Overview of the methodologies on soil and vegetation monitoring for EANET by  
Professor Tsumugu Totsuka, Edogawa University and the Coordinator of Technical  
Manual Working Group for Soil and Vegetation
- 12:00-13:30 Lunch
- 13:30-13:50 Concept of QA/QC activities for soil monitoring by Dr. Tomoyuki Hakamata,  
Associate Division Director for Research, Division of Environmental Planning,  
National Institute of Agro-Environmental Sciences (15 minutes presentation, 5 minutes  
discussions)
- 13:50-14:35 Siting and fieldwork by Dr. Hiroyuki Sase, Researcher, INC (30 minutes presentation,  
15 minutes discussions)

- 14:35-15:20 Analytical methods by Dr. Seiichi Ohta, Director, Forest Site Section, Forestry and Forest Products Research Institute (30 minutes presentation, 15 minutes discussions)
- 15:20-15:50 Coffee break
- 15:50-16:20 Implementation of QA/QC activities for soil monitoring by Dr. Tomoyuki Hakamata, Associate Division Director for Research, Division of Environmental Planning, National Institute of Agro-Environmental Sciences
- 16:20-17:00 Overall discussions
- 18:30- Reception hosted by INC

## **Second Day**

### **Session Two: Present status and problems on soil and vegetation monitoring in the EANET participating countries**

- 09:00-09:10 Overview on the present status of soil and vegetation monitoring in China, the Philippines and Vietnam by Professor Tsumugu Totsuka, Edogawa University and the Coordinator of Technical Manual Working Group for Soil and Vegetation
- 09:10-09:30 Case study of Malaysia by Professors Muhamad B. Awang and Wan Md. Zin. B. Wan Yunus, University Pertanian Malaysia
- 09:30-09:50 Case study of Thailand by Dr. Jesada Luangjame, Technical Forest Official Level 8, Royal Forest Department, Forest Research Office and Dr. Pichit Pongsakul, Soil scientist, Soil science Division, Department of Agriculture
- 09:50-10:30 Discussions
- 10:30-11:00 Coffee break

### **Session Three: Methodologies on soil and vegetation monitoring suitable for East Asia**

- 11:00-12:00 Discussions
- 12:00-13:30 Lunch
- 13:30-15:00 Discussions
- 15:00-15:30 Coffee break
- 15:30-17:00 Discussions
- 18:30- Reception hosted by SEPA



**Third day**

08:00-16:30      Excursion for Great Wall

19:00-            Informal Drafting Committee

**Fourth Day**

**Session Four: Wrap up**

09:00-10:30      Wrap up discussions

10:30-11:30      Consideration and adoption of the workshop summary (conclusions and recommendations)

11:30-12:00      Closing

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**31 August - 3 September 1999  
Beijing, China**

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**3 September 1999**

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