The Third Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network
in East Asia
2-4 October 2002, Niigata, Japan

REPORT OF THE MEETING

Introduction

1. The Third Senior Technical Managers' (STM) Meeting of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Niigata from 2–4 October 2002, organized by the Acid Deposition and Oxidant Research Center (ADORC) as the Network Center for EANET, in collaboration with UNEP Regional Resource Center for Asia and the Pacific (RRC.AP), and in cooperation with the Ministry of Foreign Affairs and the Ministry of the Environment of Japan, Niigata Prefecture, and Niigata City.

2. The Meeting was attended by senior technical managers of all of the eleven participating countries, namely, Cambodia, China, Indonesia, Japan, 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 Lao P.D.R. attended the meeting as an observer.

3. The Meeting was also attended by experts from international organizations as well as Japanese universities, research institutes, local governments and relevant bodies.

4. Researchers of relevant institutes in Niigata observed the Meeting.

5. The list of participants is attached in the Annex.

Opening of the Meeting

6. The Meeting was opened with remarks by Mr. Iyngararasan Mylvakanam, Senior Programme Officer, UNEP RRC.AP, serving for the Secretariat for EANET.

7. Dr. Tsumugu Totsuka, Director General of ADORC, made the introduction of the meeting organization. On that occasion, he introduced Dr. Sergey A. Gromov as Deputy Director General of ADORC in charge of the Network Center, who had been

appointed on 1 October 2002.

8. Mr. Osamu Mizuno of Japan, Ms. Bulgan Tumendemberel of Mongolia and Dr. Vu Van Tuan of Viet Nam were elected as co-chairpersons of the Meeting. (The sessions of the first day and the afternoon sessions of the third day were chaired by Dr. Vu, the morning sessions of the second day were chaired by Mr. Mizuno and the afternoon sessions of the second day and the morning sessions of the third day were chaired by Ms. Bulgan.)

9. The Meeting adopted the agenda as proposed by the Network Center (NC).

Review of the scientific and technical activities of EANET since the Second STM Meeting

10. NC presented a short summary of scientific and technical activities of EANET during the period between the Second and the Third STM Meetings. In response to a question about possible activities on emission evaluation, NC explained the review of existing initiatives on development of emission inventories and numerical modeling was in line with the work program for EANET in 2002.

Overview of the EANET activities of the participating countries presented by the Network Center and the participating countries

11. NC presented an overview of national monitoring plans in participating countries.

12. After the overview, the participating countries made presentations on their EANET activities. The Meeting considered the activities of the participating countries and provided comments and suggestions for their further elaboration. Major discussions on this topic included the followings:

    i. China
    - The dry deposition parameters are monitored by the automatic air quality monitoring system in China.
    - It was explained that it would be difficult to extend monitoring sites other than four cities considering even current monitoring activities had not necessarily reached satisfactory level.

ii. Indonesia

- It was clarified that some automatic monitors at two sites were stopped due to maintenance troubles, and dry deposition monitoring method would be changed to filter pack method only in one site at EMC.
- It was clarified that monitoring data were verified by each laboratory that analyzed the monitoring data.
- It was pointed out that exchangeable acidity or exchangeable Al and H should be listed in the parameters of soil analysis for calculation of effective cation exchange capacity (ECEC).

iii. Japan

- It was pointed out that most of the monitoring sites were located in coastal area and data could be influenced by sea salt. It was clarified that wet deposition monitoring data were rejected if the contribution of sea salt was more than 75%.
- It was clarified that the specific location for the new EANET site in Tokyo had not been decided.

iv. Malaysia

- It was confirmed that the results by filter pack should be used for the data report in order to compare with filter pack data of other countries and the results by passive sampler should be attached in the report.
- Regarding the study comparing filter pack and passive sampler in Tanah Rata, possible reasons for the difference of the results were discussed.
- It was requested to clarify the location of the second soil and vegetation monitoring site by UPM.
- It was explained that a good monitoring site for inland aquatic environment and an appropriate institute for the monitoring had not been found yet.
- It was pointed out that the brochure development project for public awareness had been funded by not JICA but Japan Environment Corporation.

v. Mongolia

- It was clarified that the amount of snow precipitation in winter season is 5-10 % of annual amount.
- It was suggested that the relevant experts of other institutions such as university should be involved for soil and vegetation monitoring.

vi. Philippines

- It was confirmed that there were no wet/dry deposition monitoring sites in remote area.
- It was clarified that the participants in the training program, seminar and workshop mentioned in the presentation did not consist the same group.

vii. Republic of Korea

- Republic of Korea was requested to submit the 2001 data as soon as possible.
- It was pointed out that further discussion on filter pack method should be done taking into account Korean experience in this matter.
- It was clarified that another classification system of soil (Soil Taxonomy) was used in Republic of Korea, and that the soil type on soil monitoring has not been redefined according to the FAO-UNESCO classification.
- It was clarified that site selection for inland aquatic monitoring had not been successfully completed yet.

viii. Russia

- It was clarified that new elements (CO, O_3) for dry deposition monitoring at Mondy would be included in the new national monitoring plan 2003. From the year 2003 meteorological parameters will be measured automatically at Mondy and Listvyanka sites.
- The first evaluation of long-term monitoring data in Russia was presented with following discussion on calculation of total acidity deposition.

ix. Thailand

- It was commented that analysis of vegetation samples was not a mandatory item in the Technical Manual on soil and vegetation monitoring, however, mandatory items of forest monitoring, such as general description of forest and understory vegetation survey, suggested to be carried out.
- It was clarified that "Khao Lam" dam was the same place as "Vachiralongkorn" dam.

x. Viet Nam

- It was pointed out that exchangeable acidity or exchangeable Al and H should be included in the list of parameters for soil analysis to calculate ECEC.
- It was introduced that new monitoring plan would be admitted by the government and the number of monitoring sites would be increased.

13. Cambodia, whose application for the participation in EANET was approved at the Second Session of the Intergovernmental Meeting in November 2001, presented

their experiences on ambient air concentration monitoring as well as future plan for acid deposition monitoring, and their constraints and needs.

- It was confirmed that there was one laboratory in Phnom Penh and no laboratories in Siemreap Province and Sihanoukvill where wet/dry deposition monitoring sites would be located.

14. As an observer country, Laos introduced their environmental monitoring activities together with institutional situation on the environment management.

Consideration of a preliminary draft data report on the acid deposition monitoring in 2001

15. NC presented a preliminary draft data report on the acid deposition in the East Asian Region: 2001. Major discussions on this topic included the followings:

i. Wet deposition monitoring data
- It was pointed out that the presence of unmeasured organic acid anions or bicarbonate ion in wet deposition samples should be taken into account when identifying samples of questionable data quality based on allowable range of R1 and R2.
- Relating to the above issue, it was introduced that some of the participating countries measured bicarbonate when pH was higher than 6.

ii. Dry deposition (air concentration) monitoring data
- It was stressed that NO_2* (NOx* - NO) data in rural and remote sites measured by Chemiluminescence detection method cannot compare with NO_2 data measured by other methods.
- It was suggested that chemical species determined as “second priority” in the Strategy Paper for Future Direction of Dry Deposition of EANET were equally important with “first priority” chemical species.

iii. Soil and vegetation monitoring data
- It was pointed out that the repeated analysis of soil chemical analysis had been reported only by Japan and it should be promoted for each laboratory according to the Technical Manual.

iv. Inland aquatic environment monitoring data
- The participating countries were requested to check the original data of

flagged values.

16. NC explained the schedule for developing the data report as follows:
    - The National Centers of the participating countries are expected to check the data and submit to NC in two weeks.
    - NC will revise the preliminary draft report based on the response from the National Centers.
    - The revised preliminary draft report will be distributed among the verification groups to receive comments before the Second Session of the Scientific Advisory Committee (SAC).

Consideration of preliminary draft reports on inter-laboratory comparison projects in 2001

17. NC presented preliminary draft reports on inter-laboratory comparison project on wet deposition, soil, and inland aquatic environment in 2001. Major discussions on this topic included the followings:

    i. Project on Wet deposition in 2001 and Project on Inland aquatic environment in 2001
    - NC was requested not to remove the outlying data which is greater than a factor of 3 of S.D. from the average and to investigate the reasons for the problems.

    ii. Project on Soil in 2001
    - It was pointed out that reference values are unknown for the prepared soil extract sample since it was not artificial. It was clarified that comparable values were obtained in the participating laboratories and possible causes of some outliers were identified in this project. It was suggested that higher-precision data would be obtained by the improvement in some processes of the analytical methods.
    - It was suggested that laboratory codes should be described using ISO codes, which was used as the Internet country code.

18. NC made a presentation on Questionnaire Survey on QA/QC Activities of the Participating Countries, which had been sent to the participating countries in September 2002. NC explained its plan to submit the report of the survey at SAC2.

Consideration of improvement of the monitoring methodologies

19. NC made a presentation on the draft Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET, which had been developed by the Task Force on Soil and Vegetation Monitoring. Major discussion on this topic included the followings:
    - It was discussed that parameters to be monitored should be elaborated for evaluation of the impact of acid deposition on soil and forest.
    - It was clarified that criteria for selection of the reference catchments would be discussed in the process on design of the case study.
    - NC is now waiting for the comments for the draft Strategy Paper from the Task Force Members, and the revised draft would be introduced to the Second Session of SAC.

20. NC reported on progress in developing the Technical Document for Filter Pack Monitoring in East Asia by the Task Force on Dry Deposition Monitoring. Major discussion on this topic included the followings:
    - The activities of Japan Environmental Laboratories Association (JELA) on the 4-stage filter pack method were presented and experiences and availability of the method in Japan were introduced.
    - It was pointed out that the filters specified in the draft technical document are difficult to obtain in some countries.
    - It was clarified that solvent volume for extraction could be lower than recommended volume (20 ml) when air concentrations were too low to be detected.
    - It was commented that size of aerosols collected by the 4-stage filter pack method might be slightly larger than PM_{10}.
    - It was introduced that high humidity can cause a reduction of gas concentration measured by filter pack method because condensed water in the filter pack system could trap the gases, according to the experiences in US and Australia. It was pointed out that filter pack monitoring in humid regions such as Southeast Asia should be carefully examined. It was also commented that passive sampler have been used to monitor gases in humid regions.
    - It was suggested that NC should promote a comparison study between the 4-stage filter pack method and other methods such as passive sampler in cooperation with participating countries, CSIRO, NOAA and JELA.

21. NC made a presentation on the information on the capacity building/training activities obtained through the questionnaire survey on training activities in 2001 in the participating countries and the questionnaire survey implemented in 2001 on capacity building activities by relevant organizations.

Consideration of the research activities on acid deposition

22. NC introduced the on-going research activities on acid deposition, that is, a joint research project with Russia on acid deposition monitoring in frigid zone, a joint research project on dry deposition flux, and a joint research project with Mongolia on plant sensitivity to acid deposition. Major discussion on this topic included the followings:

i. Joint project with Russia on acid deposition monitoring in frigid zone
   - It was pointed out that the species composition of diatom was important in acidification monitoring of the lake water quality.
   - It was requested to specify "lake type" classification of lakes with low pH value.

ii. Joint project with Thailand on dry deposition
   - Methodologies of flux measurements were discussed.
   - Although the project currently focuses on SO_2 and O_3 fluxes, other species such as NO_2 and aerosols were expected to be included in the project

iii. Joint project with Mongolia on plant sensitivities
   - The distance between the power plant and the monitoring sites, and dominant wind direction was clarified.
   - It was clarified that the air concentration measurement by passive sampler was carried out only in growing season since the target tree species was deciduous tree.
   - It was discussed that calibration method for the passive sampler should be considered since the value was not comparable to that by the automatic monitor.
   - It was clarified that detailed plan for exposure test has not been decided, and it would be considered based on the preliminary studies of the target species.

23. NC made a presentation on a review of existing initiatives on developing emission inventories and numerical modeling. Major discussion on this topic included the

followings:

- Information about activities of GEIA inventory estimation and MATCH model applied in Southeast Asia was provided by participants.
- It was suggested that NC and participating countries should share the information of relevant activities on developing emission inventory and numerical modeling in East Asia.
- It was noted that model-intercomparison approach was effective to create common understanding of the status of the acid deposition problem in East Asia.

24. NC presented a draft proposal for future direction of research activities on acid deposition for the consideration by the participants. Major discussion on this topic included the followings:
    - It was suggested that the three items of the second priority research activities should be started quickly taking into account their importance in the acid deposition problems.
    - It was pointed out that methodologies of data assessment, such as R1 and R2 treatments studied in the joint project with Russia, should be encouraged in a category of the first priority.
    - Fund raising for research activities was considered to be a problem for both the participating countries and NC.
    - It was suggested that linkage with other science communities was useful to know latest scientific concerns and possible financial resource.
    - It was emphasized that not only financial resources but also human resources were essential for research activities.
    - It was introduced that the atmospheric photochemistry and aerosols in large scale such as hemisphere scale were recent concerns.
    - It was suggested that the categories in the second priority should be reconsidered so that the future direction would be more clarified.

<u>Other issues</u>

25. Dr. Bruce Boundy Hicks made a presentation on research activities on atmospheric deposition of the Air Resource Laboratory, NOAA. He emphasized importance of integrated monitoring including concentration in air and precipitation, dry and wet deposition and relevant meteorological parameters, taking into account global issues. Estimated emissions of ammonia and mercury in US were introduced as examples of existing research activities on these key species.

26. Dr. Gregory Peter Ayers made his comments on passive gas sampler presenting results of monitoring by passive samplers. He pointed out that passive samplers could provide comparable data with active samplers, and could ensure stable data in rural and remote sites. It was suggested that passive samplers would provide a useful tool for understanding total acid deposition.

27. Dr. Hiroshi Hara introduced the paper on chemical composition of precipitation in Japan that had been published in a scientific journal in this year. He demonstrated annual and seasonal trends of that chemical composition such as non-sea-salt sulfate, non-sea-salt calcium, ammonium and nitrate.

Visit on the relevant facilities to acid deposition problems

28. The participants visited the Higashi-Niigata Thermal Power Station.

Wrap-up of the Meeting

29. This report was considered and adopted.

Closing of the Meeting

30. All the participants expressed their gratitude and sincere appreciation for the efforts made by the organizer for having arranged this important meeting.

31. The Meeting officially closed.

Annex

The Third Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network
in East Asia
2-4 October 2002, Niigata, Japan

List of Participants

19 September 2002

PARTICIPANTS

CAMBODIA

Mr. Dara Hang
Vice chief of Air Quality
Noise and Vibration Management Office
Ministry of Environment

CHINA

Mr. Wang Ruibin
Senior Engineer
China National Environmental Monitoring (CNEMC)

INDONESIA

Mr. Djurit Teguh Prakoso
Air Laboratory Supervisor
Sarpedal LH
SARPEDAL, Kawasan PUSPIPTEK

JAPAN

Mr. Osamu Mizuno
Assistant Director
Global Environment Issues Division
Global Environmental Bureau
Ministry of Environment, Japan

Ms. Riyo Miyashita
Staff
Global Environment Issues Division
Global Environmental Bureau
Ministry of Environment, Japan

Dr. Yukitomo Tsutsumi
Senior Scientific Officer
Atmospheric Environment Division
Japan Meteorological Agancy

MALAYSIA

Ms. Leong Chow Peng
Director of Environmental Studies
Malaysian Meteorological Service

MONGOLIA

Ms. Bulgan Tumendemberel
Chief Engineer
Central Laboratory of Environmental Monitoring

PHILIPPINES

Ms. Leonita Diano Baetiong
Chief, Laboratory Services Section
Research and Development Division
Environmental Management Bureau
Department of Environment and Natural Resources

Republic of KOREA

Ms. Hoe-Jung Noh
Researcher
Soil Environment Division

RUSSIA

Ms. Veronika Alexandrovna Ginzburg
Scientist
Institute of Global Climate and Ecology, Roshydromet and RAS

Dr. Tamara Victorovna Khodjer
Vice-Director, Limnological Institute of RAS SB

THAILAND

Mr. Phunsak Theramongkol
Acting the Chief
Monitoring 1&2 Sub-division
Pollution Control Department (PCD)
Ministry of Science, Technology and Environment (MOSTE)

VIET NAM

Dr. Vu Van Tuan
Deputy Director
Institute of Meteorology and Hydrology
Hydro-Meteorological Service of Vietnam

Observer Country

LAO People's Democratic Republic

Mr. Kham Nammixay
Deputy Chief
Environment Monitoring Quality Center (EMQC)
Environmental Research Institute (ERI)
Science Technology and Environment Agency (STEA)

Resource Persons

Dr. Hajime Akimoto
Director
Atmospheric Composition Research Program
Frontier Research System for Global Change

Dr. Tsunehiko Otoshi
Professor
Tohoku University of Community Service and Science

Dr. Tomoyuki Hakamata
Director
Department of Rural Environment
National Institute for Rural Engineering

Dr. Hiroshi Hara
Head, Environmental Chemistry Section
National Institute of Public Health

Dr. Haruo Fukuhara
Professor
Faculty of Education and Human Sciences,
Niigata University

Commonwealth Scientific and Industrial Research Organization (CSIRO)

Dr. Gregory P. Ayers
Assistant Chief
CSIRO Atmospheric Research

National Oceanic and Atmospheric Administration (NOAA)

Dr. Bruce Boundy Hicks
Director
Air Resources Laboratory
NOAA

World Meteorological Organization Global Atmosphere Watch (WMO GAW)

Dr. Gregory Peter Ayers
Assistant Chief
CSIRO Atmospheric Research

Dr. Bruce Boundy Hicks
Director
Air Resources Laboratory
NOAA

Dr. Hiroshi Hara
Head, Environmental Chemistry Section
National Institute of Public Health

Municipal Experts

Mr. Izumi Noguchi
Researcher
Hokkaido Institute of Environmental Science

Mr. Tomohiro Inoue
Senior Researcher
Chiba Prefectural Environmental Research Center

Dr. Tetsuhito Komeiji
Assistant Chief of Section
The Tokyo Metropolitern Research Institute for Environmental Protection

Dr. Tsuyoshi Ohizumi
Senior Research Scientist
Niigata Prefectural Institute of Public Health and Environmental Sciences

Dr. Susumu Kato
Senior Researcher
Mie Prefectural Science and Technology Promotion Center

Dr. Mitsuhiro Matsumoto
Technical Manager
Water Environment Division
Nara Prefectural Institute for Hygiene and Environment

Mr. Hideaki Tsuzuki
Senior Researcher
Kyoto Prefectural Institute of Hygienic and Environmental Sciences

Dr. Yoshinori Nishikawa
Senior Research Scientist
Environmental Pollution Control Center
Osaka Prefecture

Dr. Toshio Kawaraya
Professor
The University of Wales Distance Leaning M. Sc. of Program in Japan

Dr. Masahide Aikawa
Senior Researcher
Hyogo Prefectural Institute of Public Health and Environmental Sciences

Dr. Akira Utsunomiya
Section Chief
Fukuoka Institute of Health and Environmental Sciences

Japan Environmental Technology Association (JETA)

Mr. Yasuo Toyazaki

Director
Kimoto Electric Co., LTD.

Mr. Masashi Taguchi
Manager
Sales Department
Nippon Instruments Corporation

Mr. Shuji Toyama
Associate Manager, R&D Dept. Group 3
R&D Center
DKK-TOA CORPORATION

Niigata Prefecture

Mr. Yoshio Tanikawa
General Director
Niigata Prefectural Institute of Public Health and Environmental Sciences

Mr. Tamio Nagano
Deputy Director
Environmental Management Division
Niigata Prefecture

City of Niigata

Mr. Masashi Saito
Technical Staff
Environmental Pollution Control Division
City of Niigata

Observers

Niigata University

Dr. Masashi Yamamoto
Professor
Faculty of Agriculture
Niigata University

Dr. Yoji Taguchi
Assistant Professor
Faculty of Engineer
Niigata University

Dr. Toshio Ishizuka
Professor
Faculty of Science
Niigata University

Niigata Universiry of Pharmacy and Applied Life Sciences

Dr. Kikuo Oikawa
Professor
Faculty of Applied Life Sciences
Niigata University of Pharmacy and Applied Life Sciences

Environmental Science Research Niigata

Mr. Hiroshi Hoshino
Manager
General Affairs Dept.
Environmental Science Research Niigata

Joetsu Environmental Science Center

Mr. Shigeru Sato
Environment Manager, Environment Division
Joetsu Environmental Science Center

Secretariat for EANET

Mr. Iyngararasan Mylvakanam
Senior Programme Officer
United Nations Environment Programme/
Regional Resource Center for Asia and Pacific (UNEP RRC. AP)
Asian Institute of Technology

Network Center for EANET

Acid Deposition and Oxidant Research Center (ADORC)

Dr. Tsumugu Totsuka
Director General

Dr. Sergey Arkadyevich Gromov
Deputy Director General

Mr. Motokazu Iwata
Deputy Director General

Mr. Teruo Shimanuki
Head
General Affairs Department

Mr. Akihito Morizumi
Head Clerk
General Affairs Department

Ms. Emiko Kato
Administrative Staff
General Affairs Department

Ms. Aya Ohashi
Administrative Staff
General Affairs Department

Mr. Jiro Sato
Head
Planning and Training Department

Mr. Ken Yamashita
Senior Researcher
Planning and Training Department

Ms. Ayako Kawauchi
Administrative Staff
Planning and Training Department

Dr. Norio Fukuzaki
Head
Atmospheric Research Department

Ms. Satomi Kondo
Researcher
Atmospheric Research Department

Mr. Minoru Shimotori
Researcher
Atmospheric Research Department

Dr. Hiroyuki Sase
Senior Researcher
Ecological Impacts Research Department

Mr. Hiroyasu Kobayashi
Researcher
Ecological Impacts Research Department

Mr. Akiomi Takahashi
Researcher
Ecological Impacts Research Department

Dr. Hisashi Hasome
Head
Data Management Department

Mr. Tomio Fujita
Principal Researcher
Data Management Department

Dr. Kazuhide Matsuda
Researcher
Data Management Department

Dr. Junling An
Researcher
Data Management Department

Ms. Ayako Aoyagi
Researcher
Data Management Department
Fax: +81-25-263-0567