

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

REPORT OF THE MEETING

I. Introduction

1. The Scientific Advisory Committee (SAC) of the Acid Deposition Monitoring Network in East Asia (EANET) held its Seventh Session in Manila, Philippines on 10-12 October 2007. The Session was organized by the Secretariat for EANET and the Network Center for EANET (NC), and hosted by the Government of the Philippines.
2. The Session was attended by the members of SAC or their alternates and other nominated participants from the participating countries of EANET: Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Russia, Thailand, and Viet Nam.
3. The Session was also attended by experts from the United Nations Environment Programme, Regional Office for Asia and the Pacific (UNEP ROAP), Chemical Coordinating Center (CCC) of the Co-operative Programme for Monitoring and Evaluation of the Long Range Transmission of Air Pollutants in Europe (EMEP) under the UN ECE Convention on Long-Range Transboundary Air Pollution (CLRTAP), Kanazawa University, Japan and Frontier Research Center for Global Change, Japan. Local government officials and researchers from universities in the Philippines attended the Session as observers.
4. The List of Participants is attached as Annex I.

II. Opening of the Meeting (Agenda Item 1)

5. The Session was opened by Mr. Mylvakanam Iyngararasan, Acting Coordinator of the Secretariat for EANET. He stressed that with the increasing energy consumption and generation of more waste in the East Asian region, EANET has an important role, as the regional monitoring network, to develop capacity to help policy makers in addressing environmental issues.
6. Mr. Julian D. Amador, Director of the Environmental Management Bureau, Department of Environment and Natural Resources, Philippines presented the Keynote Address. He welcomed the participants to Metro Manila and informed of the initiatives that have been undertaken, particularly the use of clean fuels such as bio-ethanol and improvement of the mass transport system, that have succeeded in improving the trend of air quality in the Metro Manila area.

7. In his introductory remarks, the Director General of NC, Dr. Hiromasa Ueda, emphasized the importance of the Session to discuss consolidation of on-going monitoring methodologies, research activities for future development of EANET as mentioned in the Strategy on EANET Development (2006-2010) including new activities on promotion of emission inventories and modeling for more effective management of regional air pollution.

III. Election of the Officers (Agenda Item 2)

8. Dr. Sergey A. Gromov, Head of Science Sector, Environment Pollution Department, Institute of Global Climate and Ecology (IGCE), Russia was elected as Chairperson, and Dr. Wilfredo M. Carandang, Director, Institute of Agroforestry, College of Forestry and Natural Resources, University of the Philippines and Dr. Duong Hong Son, Director, Center for Environmental Research Institute of Meteorology and Hydrology, Ministry of Natural Resources and Environment, Viet Nam were elected as Vice-Chairpersons, and Dr. Esrom Hamonagan, Air Pollution Researcher, Ministry of Environment, Indonesia was elected as Rapporteur of the Session.

IV. Adoption of the Agenda (Agenda Item 3)

9. The Session agreed to include a presentation on the Workshop on Emission Inventory by Japan under Agenda Item 9. The Session adopted the Agenda (EANET/SAC 7/3/1) as proposed.
10. The Session also agreed to bring forward the discussions on Item 8 and Item 9 before Item 7 of the Agenda, as proposed by NC. The draft program (EANET/SAC 7/3/3) was amended accordingly.

V. Review of the EANET activities since the Sixth Session of the Scientific Advisory Committee (SAC6) and Eighth Session of the Intergovernmental Meeting (IG8) and Financial Report in 2006 (Agenda Item 4)

11. The Secretariat and NC made brief presentations on the Report on the Progress of EANET after the Sixth Session of the Scientific Advisory Committee (SAC6) and the Eighth Session of the Intergovernmental Meeting (IG8) (EANET/SAC 7/4/1). The Financial Report of the Secretariat and NC in 2006 was also presented. The Session was invited to comment on the reports.
12. Discussions included the following major points:

- It was clarified that the procedures for finalizing and printing of the First Periodic Report on the State of Acid Deposition in East Asia (PRSAD) in principle had been endorsed by IG8. In accordance with the decision of IG8, the final draft of both volumes of PRSAD and the Executive Summary had been forwarded to the members of the Drafting Committee of PRSAD and the National Focal Points (NFPs) for their comments and endorsement.
- The Executive Summary of PRSAD was distributed to the participants of the Session. It was clarified that Executive Summary was prepared as a supplementary document at the request of IG8.
- It was recommended that the procedures for the endorsement of PRSAD should be further clarified before preparation of the next PRSAD.
- The provision of Ion Chromatography Systems (IC) to Lao PDR and Cambodia was informed. It was clarified that the ICs were purchased using the savings of the Secretariat according to the decision of the Sixth Session of the Intergovernmental Meeting (IG6) and payments were directly disbursed by the Secretariat to the supplier.
- A question was raised by a resource person on the evaluation procedures of the joint research activities conducted by NC. NC informed that there are plans to improve the current evaluation system and one suggestion is the establishment of a new Task Force on Research Coordination to monitor EANET research activities. Relevant discussions were done under Agenda Item 9.

VI. Review of the Data Report 2006 of the Acid Deposition Monitoring Network in East Asia (Agenda Item 5)

13. NC presented the draft Data Report 2006 (EANET/SAC 7/5). The report included the wet deposition monitoring data, the dry deposition monitoring data, the soil and vegetation monitoring data and the inland aquatic monitoring data obtained by the participating countries in 2006 and submitted to NC. The meeting was invited to discuss, review and make recommendations as appropriate.
14. Major clarifications and discussions included the following:
 - i. Wet deposition monitoring data
 - It was informed that contamination was one of the major reasons for missing measurements, and in the case of Japan, the contamination was mainly due to insects and plants in the sample.
 - No precipitation data was reported in Cheju (Republic of Korea), Vientiane (Lao PDR), and Zhuhai (China) for periods of several months. NC will contact these countries to verify the data again. In this connection, NC was requested to review the dataset again and, if necessary, request countries to provide further information to explain their missing data.

- It was clarified that technical problem of the IC was the reason for the missing data in October 2006 in Lao PDR.

ii. Dry deposition monitoring data

- The seasonal trends in 2006 and annual trends from 2001 to 2006 for SO₂ and sulfate at EANET sites were introduced as preliminary analysis for data verification.
- It was informed that the annual mean of each sampling parameter was summarized for the first time in the Data Report 2006.

iii. Soil and vegetation monitoring data

- It was noted that several tables did not follow the reporting procedures recommended in the Technical Manual on Soil and Vegetation Monitoring. Some of these tables were revised in the corrigenda of the Data Report 2006. Further communications between NC and the National QA/QC Managers would be strengthened to discuss on improvements to the reporting of the survey.

iv. Inland aquatic environment monitoring data

- Annual mean values of the parameters in the monitoring of lakes or rivers from 2000 to 2006 were included in the Data Report 2006 according to the suggestion at SAC6. It was pointed out that the tables are informative for discussion on trends of the water chemistry.
- Decreasing trends of the water pH were seen in some monitored lakes or rivers. Moreover, one of the lakes showed relatively low pH, less than 6.5. It was suggested that causes of the phenomena should be investigated further by accumulating background information. It was also pointed out that aluminum species should be measured as an important indicator of acidification in such lakes or rivers.
- It was informed that Lao PDR is ready to start the monitoring.

15. The Session agreed that the final version of the Data Report 2006 including the corrigenda would be prepared and printed by NC by the end of 2007 taking the discussions above into account.

VII. Review of QA/QC activities of EANET (Agenda Item 6)

Review of Report of the Inter-laboratory Comparison Projects in 2006

16. NC presented Report of the Inter-laboratory Comparison Projects 2006 on wet deposition, dry deposition (filter pack method), soil and inland aquatic environment (EANET/SAC 7/6/1). It will be published as a combined report of all the four projects. The meeting was invited to discuss, review, and make recommendations as appropriate.
17. Major clarifications and discussions on this topic included the following:

- It was announced that the samples for the Inter-laboratory Comparison Projects 2007 would be dispatched in the middle of November 2007.
- i. Project on wet deposition
- It was informed that additional data analysis using Youden Plot was added in the report as an appendix.
- ii. Project on dry deposition (filter pack method)
- It was informed that the relative standard deviation of Cl^- and NH_4^+ were higher compared to SO_4^{2-} .
- iii. Project on soil
- Results of exchangeable cations showed that precisions of participating laboratories have wide variations, and were wider than those in 2005. It was suggested that low concentrations of the samples might affect the precision of the measurements.
 - NC informed that the soil samples dispatched to the laboratories were well mixed during the preparation process and checked for its uniformity. Therefore, difference of soil samples dispatched to the countries may not be the main cause for the low precisions.
 - The soil chemical analysis requires certain steps, such as extraction and instrumental analysis. The complicated analytical procedures might be one of the causes for the low precisions. It was suggested that each analytical step should be checked carefully to improve the precisions.
- iv. Project on inland aquatic environment
- Number of the flagged data for measurement of NH_4^+ was the largest among the surveys conducted. It was discussed that measurement procedures of NH_4^+ and detailed analytical conditions of the respective laboratories should be checked carefully to improve the accuracy of the measurements.
 - It was proposed to use natural water samples for the inter-laboratory comparison project on inland aquatic environment instead of or in addition to artificial water samples.

Consideration of recommendations for improvement of QA/QC activities

18. NC presented a Report of recommendations for improvement of QA/QC activities (EANET/SAC 7/6/2). This report mentioned the required items in the QA/QC program, actual situations of the implementation in the participating countries. Some actions to achieve the expected improvement of QA/QC in EANET were proposed such as (i) development of QA/QC program by each country, (ii) preparation and improvement of SOPs by each laboratory, (iii) domestic site audit for the nominated EANET sites by the National Center at least once per year. The Session was invited to discuss the report and make recommendations.
19. Major points of the discussion were as follows:

- It was stressed that information exchange between NC and relevant organizations of the EANET participating countries should be promoted to find appropriate solutions for improvement of QA/QC activities.
- It was suggested that standard solutions used in the analysis of the inter-laboratory and actual samples by the laboratories could be sent to NC to check its quality if necessary. It was also suggested that standard solutions could be prepared by NC and distributed to the laboratories that require the solution. In addition, regular calibration and maintenance of equipment should be considered.

VIII. Consideration of updated National Monitoring Plans of the participating countries (Agenda Item 7)

20. NC presented the Overview of the National Monitoring Plans of the participating countries (EANET/SAC 7/7) based on the updated/confirmed national monitoring plans submitted by the participating countries. It was informed that currently there are 51 wet deposition monitoring sites, 39 dry deposition monitoring sites, 18 soil and vegetation monitoring sites and 15 inland aquatic monitoring sites. NC also informed of the new monitoring sites in Tokyo, Japan, Mt. Sto. Tomas, Philippines and Nakhon Ratchasima, Thailand.
21. Three countries with additional information on their national monitoring plans, namely Myanmar, Thailand, and Philippines, made presentations on their current monitoring activities.
22. Major comments and discussions on the presentations of the national monitoring plans included the following:
 - Revised monitoring plan of Cambodia was not reflected in the overview of the monitoring plan. It was informed that the information would be updated soon after SAC7.
 - It was clarified that meteorological data is available at the new monitoring site, Nakhon Ratchasima in Thailand.

IX. Consideration on Improvement of Monitoring Methodologies including Review and Revision of Technical Manuals (Agenda Item 8)

23. NC made a presentation to introduce the proposals in the discussion papers in Agenda Item 8 and 9. The proposal to establish new sub-groups under SAC to increase transparency and efficiency in the implementation of EANET activities was introduced. It was informed that detailed information on the proposals will be provided in the following presentations.

Consideration of improvement of data completeness and recommendation for improvement of equipment and maintenance

24. NC presented a discussion paper on Consideration of improvement of data completeness and recommendation for improvement of equipment and maintenance (EANET/SAC 7/8/1). The paper highlighted some of the areas where improvement may be necessary to achieve data of better quality and completeness. The Session was invited to discuss, make comments and provide further guidance.
25. Major discussions on this topic included:
- It was informed by the resource person from EMEP-CLRTAP that the establishment of a Task Force would serve to bring together relevant experts to contribute more effectively to EANET activities.
 - It was suggested that establishment of a Task Force may also contribute to improvement of analytical quality such as ion balance and the NH_4^+ analysis.
26. The Session agreed to recommend to IG the approval of the establishment of a Task Force on Monitoring Instrumentation to coordinate all matters related to monitoring instrumentation in the EANET Network. It was also agreed that the Chair of the Task Force should be a SAC member and NC would function as its Secretariat.

Consideration for establishment of new EANET sites

27. NC presented an overview of the current strategies for Establishment of new EANET sites within the EANET region (EANET/SAC 7/8/2). The paper informed of efforts made by NC and the participating countries to increase the number of monitoring sites and the selected locations of new sites to be established from now on. The Session was invited to discuss and provide comments.
28. Major clarifications included:
- Participating countries were encouraged to continue making efforts to increase the number of monitoring sites within the EANET region.

Consideration on use of less expensive monitoring methods

29. NC presented a discussion paper on Consideration on use of less expensive monitoring methods (EANET/SAC 7/8/3). The paper focused on the effectiveness of passive sampler in EANET monitoring as one of the less expensive methods. In addition, issues related to the introduction of passive samplers into the EANET network were presented. The Session was invited to discuss, make comments and provide further guidance.
30. Major clarifications and discussions are as follows:

- It was informed that passive sampler has uncertainty due to various influences such as lower concentration at remote/rural site, high temperature and humidity in tropical region, and dusts in atmosphere.
- NC informed that the current joint research with Thailand is focused on the intercomparison among filter pack, passive sampler and automatic monitor in a tropical region. It was expected that the results of the research will contribute to the development of EANET monitoring.
- It was suggested that review of existing researches on use of passive sampler should be undertaken because of various types of passive samplers which are in use by countries.
- It was suggested that with the establishment of the Task Force on Monitoring Instrumentation under SAC, information such as experiences on the use of monitoring instrumentation could be better gathered and shared among participating countries, and the implementation of new monitoring instrumentation in the EANET network would be better coordinated.

Review of the Strategy Paper for Future Directions of Soil and Vegetation Monitoring

31. NC made a presentation on the Strategy Paper for Future Directions of Soil and Vegetation Monitoring of EANET (EANET/SAC 7/8/4). The paper suggested that the strategy paper should be reviewed and revised to contribute to the implementation of the activities proposed in the Strategy on EANET Development (2006-2010). A brief explanation on the reasons and benefits of the revision and the possible work schedule was also made. The Session was invited to discuss, make comments and provide further guidance.
32. Major clarifications and discussions were as follows:
 - The Session agreed that the strategy paper for future direction of soil and vegetation monitoring of EANET should be updated considering new developments in EANET.
 - A question was raised by a resource person on relationship between the strategy paper and the Strategy on EANET Development (2006-2010). It was clarified that the revised strategy paper would describe practical action plans for future works to implement activities described in the Strategy on EANET Development (2006-2010).
 - Some of the methodologies and guidelines on forest monitoring in the current manuals do not fulfill the needs of biodiversity-rich countries in the tropical region. While the Sub-Manual on Forest Vegetation Monitoring has included additional information to cover the problem, it may not be sufficient. It was suggested that consideration on new methodologies should be included in the revised strategy paper to improve the situation.
 - It was suggested that the Chairperson of the Task Force should make the presentation on the strategy paper instead of NC.
 - Inclusion on impacts of tropospheric ozone was proposed in the revised strategy paper. It was further clarified that the ozone issue would not be the main topic in the strategy paper but some descriptions on this issue should be included to evaluate impacts of acid deposition precisely.

Consideration on revision of Technical Manuals

33. NC presented a discussion paper on Consideration on revision of Technical Manual on Wet Deposition Monitoring and Inland Aquatic Environment Monitoring (EANET/SAC 7/8/5). The paper informed that the Manuals have been in use for approximately ten years and suggests that they should be reviewed in view of new developments. The Session was invited to discuss, make comments and provide further guidance.
34. Major discussions on this topic included:
- It was pointed out that revisions should be scientifically sound and practical.
 - A technical manual for dry deposition (air concentration) monitoring has not been developed. As various methodologies for air concentration monitoring are still under discussion, it was proposed that the development of a technical manual be considered in the next Strategy on EANET Development.
 - It was pointed out that there was a priority for review of the Technical Manual for Inland Aquatic Environment Monitoring.
35. The Session agreed to recommend to IG the approval of the establishment of Expert Groups to review the Technical Manual on Wet Deposition Monitoring and Technical Manual on Inland Aquatic Environment Monitoring. It was also agreed that the Chairs of the Expert Groups should be SAC members and NC would function as the Secretariat. Experts from participating countries would be invited as well as experts from other regions with specialization in the relevant area, if necessary.

Consideration of Recommendation on the estimation methods for dry deposition flux in EANET

36. NC made a presentation on Recommendation on the estimation method for estimating dry deposition flux in EANET (EANET/SAC 7/8/6), which recommended the inferential method as the most suitable for estimation of dry deposition flux in the EANET region. In addition, issues to be discussed regarding the promotion of flux estimation were presented. The Session was invited to discuss, make comments and provide further guidance.
37. Major discussions on this topic included:
- It was commented that the frequency of the estimation of dry deposition amount depends on the methodology. Appropriate method for the flux estimation in EANET should be discussed with reference to published methodologies.
38. The Session agreed to recommend to IG the approval of the establishment of an Expert Group on Dry Deposition Flux Estimation under the existing Task Force on Dry Deposition Monitoring. It was also agreed that the Chairs of the Expert Group as well as the Task Force should be SAC members and NC would function as the Secretariat.

X. **Consideration of the research activities and other scientific activities on acid deposition including collaboration with regional/international initiatives (Agenda Item 9)**

Consideration on promotion of emission inventories

39. NC presented a discussion paper on Consideration on promotion of emission inventories (EANET/SAC 7/9/1). The paper described the necessity of an appropriate forum to discuss the promotion of emission inventory and proposed to establish an Ad hoc Expert Working Group on promotion of emission inventories and modeling activities. The Session was invited to discuss, make comments and provide further guidance.
40. The Chair of the Workshop on Emission Inventories (WEI), Dr. Akimoto from Frontier Research Center for Global Change, presented the outcomes of the Workshop on Emission Inventory held on 9 October 2007, which was funded by the Ministry of the Environment of Japan and organized by the Acid Deposition and Oxidant Research Center (ADORC), Japan.
41. Major discussions on this topic included:
- It was informed that the Workshop on Emission Inventory and the JICA Third Country Training on “Emission Inventory and Modeling for Acid Deposition Assessment” held in Bangkok, Thailand in 2005 and 2006 were very useful in improving knowledge on the importance of emission inventories in East Asia.
 - It was informed that there are experts on modeling and emission inventories in the Long-range Transport of Air Pollutants in Northeast Asia (LTP) research project and thus EANET should work together with LTP in this area.
 - The Session was informed on the project proposal on Pilot Project on Emission Inventories for Interested Participating Countries which was recently approved by the NFPs for submission to donor agencies.
42. The Session decided that the promotion of emission inventories and modeling is more appropriate as an activity of NC and suggested that an Expert Group for promotion of Emission Inventory and Modeling be established in NC in coordination with the Secretariat since the activities may include training and capacity building. NC requested that some SAC members should assist the Expert Group in its tasks.

Consideration on establishment of a framework for reviewing substances to be monitored including other air pollutants and monitoring parameters

43. NC presented a discussion paper on the Consideration on Establishment of a Transparent Framework for Reviewing Substances to be monitored including Other Air Pollutants and their Monitoring Parameters (EANET/SAC 7/9/2). The paper described some of the reasons for a review of the list of priority substances to be monitored by the Network. The Session was invited to discuss, make comments and provide guidance.

44. Major clarifications and discussions were as follows:
- It was clarified that the main role of SAC should be to discuss important scientific/technical topics for the network and to provide advice to IG from the scientific view point.
 - The expert from EMEP suggested that, in view that the East Asian region is experiencing air pollution problems, EANET should do its best to add relevant new parameters to the program using a step by step approach and set up different levels considering some mandatory and some optional measurements.
45. The Session agreed to recommend to IG the approval of the establishment of an Expert Group to review substances to be monitored in the Network. It was also agreed that the Chair of the Expert Group should be a SAC member and NC would function as its Secretariat.

Consideration of research activities for further development of EANET

46. The NC presented the paper on Consideration of Research Activities for Further Development of EANET (EANET/SAC 7/9/3). The cooperative research studies in Mongolia, Republic of Korea, Russia and Thailand were briefly described as well as other research activities carried out by NC in collaboration with regional and international organizations. The need for coordination of the research activities of EANET was highlighted for further development of EANET. The Session was invited to discuss, make comments and provide further guidance.
47. Major clarifications and discussions are as follows:
- Several papers were published in scientific journals based on the research projects. It was suggested that information on the publications should be shared among the EANET community.
 - It was suggested that a special report on the EANET research activities should be published annually or biannually. The publication may also include other research activities conducted in the participating countries using the EANET dataset.
48. The Session agreed to recommend to IG the approval of the establishment of a Task Force on Research Coordination to coordinate all research activities in the Network. It was also agreed that the Chair of the Task Force should be a SAC member and NC would function as its Secretariat. It was agreed that the Chairpersons of other Task Forces and Expert Groups established under SAC should be members of the Task Force on Research Coordination.
49. Further, the Session agreed to recommend to IG the approval of the establishment of an Expert Group on Preparation of the Second Periodic Report on State of Acid Deposition in East Asia to coordinate all activities relating to the preparation of the next Periodic Report prior to the formation of the Drafting Committee. It was also agreed that the Chair of the Expert Group should be a SAC member and NC would function as its Secretariat.

Consideration on collaboration with other initiatives on emission inventories and numerical modeling

50. NC made a presentation on Consideration on Collaboration with Other Initiatives on Emission Inventories and Numerical Modeling (EANET/SAC 7/9/4). The paper described the joint modeling activities conducted in collaboration with International Institute for Applied System Analysis (IIASA) in the Model Intercomparison Study in Asia (MICS-Asia) project and the relevance of the outputs to the Strategy on EANET Development (2006-2010) activities. The Session was invited to discuss, make comments and provide further guidance on direction of future activities.
51. Major point of discussion was as follows:
- It was clarified that collaboration would be promoted not only with MICS-Asia but also other initiatives in this field.

XI. Cooperation with other international programs on transboundary air pollution (Agenda Item 10)

52. NC presented a paper to report on Cooperation with other international programs and initiatives (EANET/SAC 7/10). The existing collaborative activities with some international and regional programs were described and new partnerships were proposed. The possibility of the Task Force on Hemispheric Transport of Air Pollution (TF HTAP) of CLRTAP EMEP organizing a workshop back to back with SAC8 was informed.
53. The representative from CLRTAP EMEP Dr. Kjetil Torseth presented an overview of the current EMEP activities relevant to EANET. The presentation focused on the activities of TF HTAP and its global database, the European Network of Excellence on Atmospheric Composition Change (ACCENT) Workshop on network harmonization and data intercomparability, and revision of the EMEP monitoring strategy. It was also informed that EMEP is participating in the Group on Earth Observations (GEO) and its Global Earth Observation System of Systems (GEOSS). It was pointed out that harmonization of the data obtained by relevant international initiatives including EANET would be informative for evaluation of hemispheric transport of air pollutants.
54. Prof. Hajime Akimoto, expert from Frontier Research Center for Global Change, made a presentation on hemispherical ozone transport. The presentation included the modeling analysis to determine the contributions to tropospheric ozone concentration from several source regions on the global scale. In addition, analyses of spatial distribution and source-receptor relationship analysis of tropospheric ozone concentration in East Asia was presented. It was pointed out that ozone and aerosol pollution issues in Asia should be considered more in EANET.

55. Mr. Mylvakanam Iyngararasan, UNEP ROAP, provided an update on the Malé Declaration as well as the program and activities of the Atmospheric Brown Cloud (ABC) project. He informed that Malé Declaration has developed its own emission inventory manual and is using the MATCH model for the analysis of air pollution, and their experience may be useful for promoting related activities in EANET.

XII. Consideration of the Work Program and Budget of EANET in 2008 from the scientific and technical viewpoints (Agenda Item 11)

56. The Draft Work Program and Budget in 2008 for EANET (EANET/SAC 7/11) was presented by the Secretariat and NC. This document was prepared for consideration and adoption by IG9. The Session was invited to make comments on the document from the scientific and technical viewpoints.
57. Major discussions and clarifications were on the following items:
- It was agreed that an additional paragraph informing on the establishment of the new Task Forces and Expert Groups under SAC at SAC7 should be inserted after para. 42 of the document.
 - It was noted that there was no budget to support the new Task Forces and Expert Groups in 2008. It was therefore requested that NC should include some budget to start the activities under the new Task Forces and Expert Groups.
 - It was agreed that the following amendments would be made to para. 56 of the draft document:
 - Consideration of improvement of monitoring methodologies including review and revision of the technical manuals
 - Consideration of the report on promotion of modeling activities and emission inventories
 - Consideration on general directions of research activities and implementation of other scientific and technical issues of the Strategy on EANET Development (2006-2010)
 - Review of the strategy paper for future directions of soil and vegetation monitoring of EANET
 - It was requested that more detailed information on research activities and relevant budget should be provided for review at future SAC meetings.

XIII. Other Issues (Agenda Item 12)

58. Prof. Hiromasa Ueda, Director General of ADORC gave a presentation on proposal of EANET to participate in Group on Earth Observations (GEO), and highlighted the importance of voluntary collaboration with the participating countries. NC was requested to prepare an information paper on GEO including membership conditions and benefits that

can be derived from participation of EANET in GEO to be sent to SAC members to enable them to discuss further with their national authorities.

59. Prof. Katsunori Suzuki, an expert from Kanazawa University, Japan made a presentation on the importance of inter-linkage between EANET and some related activities. He provided detailed information on three monitoring networks, namely North-west Pacific Action Plan (NOWPAP), Dust and Sandstorms Monitoring, and POPs Monitoring Workshop in East Asia.

XIV. Consideration and adoption of the Report of the Meeting (Agenda Item 13)

60. The List of the Chairpersons of the Task Force and the Expert Group as shown in Annex 2 was adopted by the Session.
61. The Report of the Meeting (EANET/SAC 7/13) was considered and adopted.

XV. Closing of the Meeting (Agenda Item 14)

62. The participants expressed their gratitude and appreciation to the organizers and host country and particularly to the staff of the Environment Management Bureau, Department of Environment and Natural Resources, Philippines for the excellent arrangements made for the meeting. The Meeting was officially closed by the Chairperson.

Annex 1

List of Participants

Participating Countries

Cambodia

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Dr. Sergey Gromov
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Dr. Duong Hong Son
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Mr. Arturo B. Bongco
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Department of Environment and Natural
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Dr. Cecille G. Magturo
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Department of Health

DLSU-Philippines

Dr. Susan M. Gallardo
Director
Asian Regional Research Program on
Environmental Technology
De La Salle University

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Ms. Rusy G. Abastillas
Weather Specialist-I
Philippines Atmospheric, Geophysical and
Astronomical Services Administration

Secretariat

Network Center

Prof. Hiromasa Ueda
Director General
Acid Deposition and Oxidant Research Center

Ms. Leong Chow Peng
Deputy Director General
Acid Deposition and Oxidant Research Center

Mr. Akira Nitta
Deputy Director General
Acid Deposition and Oxidant Research Center

Mr. Ken Yamashita
Principal Senior Researcher
Acid Deposition and Oxidant Research Center

Mr. Shinji Nakayama
Head
Information Management Department
Acid Deposition and Oxidant Research Center

Dr. Tatsuya Sakurai
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Information Management Department
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Dr. Hiroaki Yagoh
Head
Atmospheric Research Department
Acid Deposition and Oxidant Research Center

Dr. Hiroyuki Sase
Senior Researcher
Ecological Impact Research Department
Acid Deposition and Oxidant Research Center

Mr. Hirokazu Taniguchi
Senior Researcher
Acid Deposition and Oxidant Research Center

EANET Secretariat

Mr. Mylvakanam Iyngararasan
Senior Programme Officer
UNEP RRC.AP

Mrs. Adelaida B. Roman
Programme Officer, EANET Secretariat
UNEP RRC.AP

Ms. Sumana Ratanasawetwad
Administrative Assistant, EANET Secretariat
UNEP RRC.AP

Proposed Chairs of the Task Forces and the Expert Groups

Task Force:

Task Force on Dry Deposition Monitoring: Dr. Cho Seog-Yeon (Rep. of Korea)

Expert Group on Dry Deposition Flux Estimation: Dr. Pojanie Khummongkol (Thailand)

Task Force on Soil and Vegetation Monitoring: Dr. Wilfredo M. Carandang (Philippines)

Task Force on Monitoring Instrumentation: [Prof. Wang Ruibin (China)]

Task Force on Research Coordination: Dr. Sergey Gromov (Russia)

Expert Group:

Expert Group on Preparation of Second Periodic Report on State of Acid Deposition in East Asia:
[Dr. Muhamad bin Awang (Malaysia)]/ Dr. Hiromasa Ueda (ADORC)

Expert Group on Revision of Technical Manual on Wet Deposition Monitoring: Dr. Hiroshi Hara
(Japan)

Expert Group on Revision of Technical Manual on Inland Aquatic Environment Monitoring: Dr.
Tamara Khodzher (Russia)

Expert Group to Review Substances to be Monitored in the EANET network: Dr. Hajime Akimoto
(Japan)

[] to be confirmed

Expert Group on dry deposition flux estimation

Draft TOR

Composition of the Expert Group (5 - 8 members)

- Chairperson: from SAC
- Experts: from selected countries and related international organizations
- Secretariat: NC

Terms of Reference of the Expert Group

- Recommend frequency of estimation of dry deposition fluxes
 - every year for the Data Report
 - every 5-year for the Periodic Report
- Review of existing researches of direct measurement and inferential method
- Selection of future monitoring sites where the estimation by inferential method or direct measurements should be implemented
- Validation of inferential method by using direct measurement results obtained in and outside of EANET
- Coordination of the preparation of Technical Manual for dry deposition fluxes estimation
- Submission of Technical Manual to SAC

Recommended Timetable

Early 2008 : Establishment of the Expert Group

By the end of 2008 : The first meeting of Expert Group will be held.

At SAC10 (autumn 2010) : Submission of the draft Technical Manual for comments

By the end of 2010 : Finalization of the Technical Manual for dry deposition fluxes estimation.

Expert Group on Revision of Technical Manual on Wet Deposition Monitoring

Draft TOR

Composition of the Expert Group (5 – 8 members)

- Chairperson: from SAC
- Experts: from selected countries and related international organizations
- Secretariat: NC

Terms of Reference of the Expert Group

- Preparation of the Revised Technical Manual on Wet Deposition Monitoring. The Manual should consider detailed standard methodology for analysis of all necessary parameters including fluoride, bicarbonate, nitrite and organic acids. Reference should be made to the WMO Manual for the GAW Precipitation Chemistry Programme (2004)

Recommended Timetable

By the end of 2008 : The first meeting of Expert Group should be held.

By the SAC9 which will be held in autumn on 2009: prepare the first draft of the Technical Manual on Wet Deposition Monitoring and submit to the 9th SAC meeting for comment

Middle of 2010 : Second meeting of the Expert Group to finalize the revised Technical Manual

Expert Group on Revision of Technical Manual on Inland Aquatic Environment Monitoring

Draft TOR

Composition of the Expert Group (5 - 8 members)

- Chairperson: from SAC
- Experts: from selected countries and related international organizations
- Secretariat: NC

Terms of Reference of the Expert Group

- Preparation of the Revised Technical Manual on Inland Aquatic Environment Monitoring including consideration of sampling from rivers and streams, update with current methodologies and an integrated approach for monitoring ecological impacts

Recommended Timetable

By the end of 2008 : The first meeting of Expert Group should be held.

By the SAC9 which will be held in autumn on 2009 : prepare the first draft of the Technical Manual on Inland Aquatic Environment Monitoring and submit to the 9th SAC meeting for comment

Middle of 2010 : Second meeting of the Expert Group to finalize the revised Technical Manual

Expert Group to review substances to be monitored in the EANET network

Draft TOR

Composition of the Expert Group (up to 15 members)

- Chairperson: From SAC
- Member: At least 1 representative from each EANET member country
- Secretariat: NC

Terms of Reference of the Expert Group

- Review the list of substances to be monitored from the scientific viewpoint considering the pollutants of importance to each particular region
- Recommend substances to be added to or removed from the current list
- Recommend procedures for monitoring of proposed substances
- Submit progress reports to SAC for comments and guidance
- Prepare a final report to be submitted by SAC for consideration of IG

Recommended Timetable

First quarter of 2008 : Establishment of Expert Group. Invitations sent to the participating countries

In the second quarter of 2008 : The first meeting of the Expert Group

SAC8 in 2008 : First progress report to SAC

SAC9 in 2009 : Second progress report to SAC

SAC10 in 2010 : Finalization of the draft report

2010 : Submission of final report to IG12

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Agenda

1. Opening of the Session
2. Election of Officers
3. Adoption of the agenda
4. Review of the EANET activities since SAC6 and IG8 from scientific and technical viewpoints and the financial report for 2006
5. Review of the Data Report 2006 of the Acid Deposition Monitoring Network in East Asia
6. Review of QA/QC activities of EANET
 - review of Report on the Inter-laboratory Comparison Projects in 2006
 - consideration of recommendations for improvement of QA/QC activities
7. Consideration of updated National Monitoring Plans of the participating countries
8. Consideration of improvement of monitoring methodologies including review and revision of technical manuals
 - consideration of improvement of data completeness and recommendation for improvement of equipment and their maintenance
 - consideration for establishment of new EANET sites
 - consideration on use of less expensive monitoring methods
 - review of the Strategy Paper for Future Directions of Soil and Vegetation Monitoring
 - consideration on revision of technical manuals
 - consideration of recommendation on the estimation methods for dry deposition flux in EANET
9. Consideration of research activities and other scientific activities on acid deposition including collaboration with regional/international initiatives
 - consideration on promotion of emission inventories
 - consideration on establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters
 - consideration of research activities for further development of EANET
 - consideration on collaboration with other initiatives on emission inventories and numerical modeling

10. Cooperation with other international programmes on transboundary air pollution
11. Consideration of Work Program and Budget of EANET in 2008 from scientific and technical viewpoints
12. Other issues
13. Consideration and adoption of the Report of the Session
14. Closing of the Session

Note: Other additional topics may be considered in some agenda items.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Annotated Agenda

1. Opening of the Session

The Session will be opened by the Secretariat. The Department of Environment and Natural Resources, Philippines will deliver the Keynote Address. The Network Center (NC) will make an Introductory Remarks.

2. Election of officers

The Session will be invited to elect a Chairperson, two Vice-chairpersons and a Rapporteur of the Session.

3. Adoption of the agenda

The Session will be invited to consider and adopt the agenda of the Session.

4. Review of the EANET activities since SAC6/IG8 from scientific and technical viewpoints and the financial report of 2006

The Secretariat and NC will present a report describing the progress of EANET activities since the Sixth Session of the Scientific Advisory Committee (SAC6) and the Eighth Session of Intergovernmental Meeting (IG8) in 2006. The Secretariat and NC's financial report for 2006 will also be presented. The Session will be invited to review the reports and provide comments from the scientific and technical viewpoints.

5. Review of the Data Report 2006 of the Acid Deposition Monitoring Network in East Asia

NC will present the draft Data Report 2006 of the Acid Deposition Monitoring Network in the East Asia. The Session will be invited to review and possibly endorse the document.

6. Review of QA/QC activities of EANET

NC will present the draft Report on the Inter-laboratory Comparison Projects in 2006 consisting of the reports on wet deposition, dry deposition (filter pack method), soil and vegetation, and inland aquatic environment carried out in 2006 including the evaluation of the projects (2001-2005). The project for improvement of QA/QC activities will also be introduced by NC. The Session will be invited to consider the documents, provide guidance to NC where appropriate, and provide recommendations to the participating countries.

7. Consideration of updated National Monitoring Plans of the participating countries

NC will present a summary of the national monitoring plans of the participating countries with recent updates as informed in the reports submitted by the participating countries in 2007 and after confirmation by the National Focal Points (NFPs) and national monitoring

centers. The overview could be followed by the presentations of SAC members on any recent important changes of national monitoring plans in some participating countries as well as important national activities. The Session will be invited to discuss the EANET activities implemented by the participating countries and provide necessary comments and advices.

8. Consideration of improvement of monitoring methodologies including review and revision of technical manuals

NC will report on the progress/plans for implementation of the activities related to improvement of monitoring methodologies identified in the Strategy on EANET Development (2006-2010). The Session will be invited to discuss, provide guidance and make recommendations on the following presentations:

- i) consideration of data completeness and recommendations for improvement of equipment and their maintenance
- ii) consideration for establishment of new EANET sites
- iii) consideration on use of less expensive monitoring methods
- iv) consideration on revision of technical manuals
- v) consideration of recommendation on the estimation methods for dry deposition flux in EANET.
- vi) review of the Strategy Paper for Future Directions of Soil and Vegetation Monitoring.

To ensure effective implementation of these activities, the Session may also wish to consider assigning additional tasks to the existing Task Force on Soil and Vegetation Monitoring, Task Force on Dry Deposition Monitoring and Network of Soil and Vegetation Specialists, and make recommendations to the Intergovernmental Meeting on the establishment of new Task Forces for implementation of some of the activities which are outside the scope of the existing Task Forces.

9. Consideration of research activities and other scientific activities on acid deposition including collaboration with regional/international initiatives

NC will present overview of the ongoing research activities, planned research and other scientific activities related to acid deposition, which are important for the future development of EANET as identified in the Strategy on EANET Development (2006-2010). The Session will be invited to discuss, provide guidance and make recommendations on the following presentations by NC:

- i) consideration on promotion of emission inventories
- ii) consideration on establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters
- iii) consideration of research activities for further development of EANET
- iv) consideration on collaboration with other initiatives on emission inventories and numerical modeling

The outcomes of the Workshop on Promotion of Emission Inventories held on 9 October will be reported. The Session may also wish to consider making recommendations to the Intergovernmental Meeting on the establishment of new Task Forces for implementation of

some of the new activities.

10. Cooperation with other international programmes on transboundary air pollution

The representatives of international organizations, regional networks in other regions and other invited experts will be invited to brief the Session on their latest developments, newly planned activities and on other relevant scientific information of interest to EANET. NC will present a brief review on EANET's cooperation with international programmes such as TF HTAP on hemispheric transport of air pollution. The Session will be invited to make recommendations on further collaboration with other international programmes.

11. Consideration of the Work Program and Budget of EANET in 2008 from scientific and technical viewpoints

The Secretariat and NC will present the draft Work Program and Budget in 2008. The draft revised definitions of the NC core budget and additional budget will be introduced by the NC. The estimated voluntary contributions from the participating countries to the Secretariat budget and NC core budget will also be presented. The Session will be invited to consider the document from scientific and technical viewpoints, to discuss and make suggestions concerning areas relevant to the activities of SAC, for adoption at the Ninth Session of the Intergovernmental Meeting.

12. Other issues

The Session will consider any other issues raised by the participants.

13. Consideration and adoption of the Report of the Session

The Session will be invited to consider and adopt the Report of the Session.

14. Closing of the Session

The Session will be closed by the Chairperson.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Program

Wednesday, 10 October 2007 (First Day)

- | | |
|-------------|--|
| 08:30-09:00 | Registration |
| 09:00-09:30 | Opening [Agenda item 1 - 3] <ul style="list-style-type: none">- Opening Remarks by the Secretariat- Keynote Address by the Department of Environment and Natural Resources, Philippines- Introductory Remarks by the Director General, ADORC- Election of officers- Adoption of the agenda |
| 09:30-10:30 | Review of the EANET activities since SAC6/IG8 from scientific and technical viewpoints and the Financial report in 2006 [Agenda item 4] |
| 10:30-10:45 | Coffee Break |
| 10:45-12:30 | Review of the Data Report 2006 of the Acid Deposition Monitoring Network of East Asia [Agenda item 5] |
| 12:30-14:00 | Lunch Break |
| 14:00-15:30 | Review of QA/QC activities of EANET [Agenda item 6] <ul style="list-style-type: none">- review of Report on Inter-laboratory Comparison Projects in 2006- consideration of recommendations for improvement of QA/QC activities |
| 15:30-15:45 | Coffee Break |
| 15:45-17:30 | Consideration of improvement of monitoring methodologies including review and revision of technical manuals [Agenda item 8] <ul style="list-style-type: none">- consideration of improvement of data completeness and recommendation for improvement of equipment and their maintenance- consideration for establishment of new EANET sites |
| 18:30 | Reception Dinner |

Thursday, 11 October 2007 (Second Day)

- 09:00-10:30 Consideration of improvement of monitoring methodologies including review and revision of technical manuals [continuation of Agenda item 8]
- consideration on use of less expensive monitoring methods
 - review of the Strategy Paper for Future Directions of Soil and Vegetation Monitoring
 - consideration on revision of Technical Manuals
- 10:30-10:45 Coffee Break
- 10:45-11:30 Consideration of improvement of monitoring methodologies including review and revision of technical manuals [continuation of Agenda item 8]
- consideration of recommendation on the estimation methods for dry deposition flux in EANET
- 11:30-12:30 Consideration of the research activities and other scientific activities on acid deposition including collaboration with regional/international initiatives [Agenda item 9]
- consideration on promotion of emission inventories
 - consideration on establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters
- 12:30-14:00 Lunch Break
- 14:00-15:30 Consideration of the research activities and other scientific activities on acid deposition including collaboration with regional/international initiatives [continuation of Agenda item 9]
- consideration of research activities for further development of EANET
 - consideration on collaboration with other initiatives on emission inventories and numerical modeling
- 15:30-15:45 Coffee Break
- 15:45-17:30 Consideration of updated National Monitoring Plans of the participating countries [Agenda item 7]

Friday, 12 October 2007 (Third Day)

- 09:00-10:00 Cooperation with other international programmes on transboundary air pollution [Agenda item 10]
- 10:00-11:00 Consideration of Work Program and Budget of EANET in 2008 from scientific and technical viewpoints [Agenda item 11]
- 11:00-11:15 Coffee Break
- 11:15-12:30 Other issues [Agenda item 12]
- 12:30-14:00 Lunch Break
- 14:00-16:00 Consideration and adoption of the Report of the Session [Agenda item 13]
- 16:00 Closing of the Session [Agenda item 14]

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

**Report on the Progress of EANET after the Sixth Session of the Scientific
Advisory Committee (SAC6) and the Eighth Session of the Intergovernmental
Meeting (IG8)**

I. INTRODUCTION

1. This report is prepared to review the progress of the Acid Deposition Monitoring Network in East Asia (EANET) activities after the Sixth Session of the Scientific Advisory Committee (SAC6) held in October 2006 in Pathumthani, Thailand and the Eighth Session of the Intergovernmental Meeting (IG8) held in November 2006 in Hanoi, Viet Nam.

II. INSTITUTIONAL AND ADMINISTRATIVE ARRANGEMENT

II-1 Signing of Contracts/Agreements

2. In March 2007, the Ministry of the Environment (MoE), Japan and the United Nations Environment Programme, Regional Resource Centre for Asia and the Pacific (UNEP RRC.AP) signed agreements regarding the Japanese contribution in 2006 for the EANET activities including both the Secretariat and the Network Center (NC) budget, and for NC budget covering the period January to March 2007 as well. Similarly, in March 2007 the Japan Environmental Sanitation Center (JESC) and the UNEP RRC.AP finalized the agreements for the transfer of budget for the implementation of NC core and additional budget activities in 2006 and for the first quarter of 2007.
3. A Sales Contract was executed between UNEP, RRCAP and the Archemica International Co. Ltd. for the procurement and complete installation of the Dionex Ion Chromatography System for Cambodia and Lao PDR, using the saving money of the Secretariat as decided by the Sixth Session of the Intergovernmental Meeting (IG6) in 2004. New equipment was installed to the national centers of Cambodia and Lao PDR in November 2006. NC also instructed staff of the laboratories of the national centers how to use the equipment.
4. The Contract for the transfer of the saving money of the Secretariat to NC for the implementation of the research fellowship program in 2006 was signed between JESC and UNEP, RRCAP in March 2007.

II-2. Staff Recruitment

(1) Secretariat

5. During IG8, a decision was made to facilitate the recruitment process for the Coordinator position at the Secretariat. On 26 April 2007, the Secretariat issued a vacancy announcement for the Coordinator position. The Secretariat received four applications from participating countries. On 4 June 2007, the list of candidates was sent for comments of the National Focal Points (NFPs). As per approved procedure of recruitment, the Secretariat established a selection committee. On 19 July 2007, the selection committee held its meeting to review the applications of the candidates and the comments of the NFPs and selected the final candidate for the Coordinator. The final candidate was sent to all NFPs for comments.

(2) Network Center

6. In accordance with the revised “Guidelines for Recruiting the Deputy Director General of the Acid Deposition and Oxidant Research Center (ADORC) in charge of the Network Center of EANET (2005)”, JESC in cooperation with the Secretariat for EANET carried out the recruitment procedure of the next Deputy Director General (DDG) of ADORC in charge of the Network Center from August 2005. The Selection Committee of JESC was held in May 2006, and selected Ms. Leong Chow Peng, Malaysia as a final candidate. After considering the comments from the participating countries, she was selected as DDG of ADORC in charge of the Network Center by JESC. In accordance with the contract with JESC, she started on her EANET tasks in ADORC from March 2007.

II-3. Publications of Proceedings and Summaries of the Meetings and Newsletter

7. An issue of the EANET Newsletter, dated July 2007 was published by the Secretariat in collaboration with NC.
8. After SAC6 and IG8, publications of proceedings and summaries of the following meetings were completed and distributed to the participating countries and participants of the sessions:
 - Fifth Session of the Scientific Advisory Committee (SAC5)
 - Seventh Session of the Intergovernmental Meeting (IG7)
 - Third Session of the Working Group on Future Development of EANET (WGFD3)
 - Second Special Session of the Working Group on Future Development of EANET (WGFD-S2)

- Seventh Senior Technical Managers' Meeting (STM7)
- Seventh Workshop on Public Awareness for Acid Deposition Problems (WSPA7)
- Fourth Session of the Working Group on Future Development of EANET (WGFD4)

III. EANET MEETINGS

III-1. Working Group on Future Development of EANET (WGFD)

9. WGFD4 was held on 4-6 June 2007 in Pathumthani, Thailand in order to discuss the documents that are required to be developed by the Working Group for review/endorsement/adoption/approval, etc. at the Ninth Session of the Intergovernmental Meeting (IG9) in November 2007. The WGFD4 session discussed the Draft Text of the Instrument to Provide a Sound Basis for Contribution to EANET, Revised Procedures and Guidelines for Voluntary Financial Contributions to the Secretariat and NC budget, Draft Set of Procedures to be followed by EANET in Preparation of Project Proposal for Potential Donors, Brief Report on the Capacity Building Course on Future Development of EANET for Officials and Experts in the Participating Countries of EANET and so on.
10. The Fifth Session of the Working Group on Future Development of EANET (WGFD5) was held on 12-14 September 2007 in Pathumthani, Thailand in order to discuss the documents that were prepared based on the discussion at WGFD4. The WGFD5 session discussed the revised Draft Texts of the Instrument to Provide a Sound Basis for Contribution to EANET, the Report on Revised Procedures and Guidelines for Voluntary Financial Contributions to EANET, the Priority Projects for submission to Potential Funding Agencies, the Draft Work Program and Budget in 2008 for EANET and so on.

III-2. Scientific Advisory Committee of EANET

11. SAC6 was held on 25-27 October 2006 in Pathumthani, Thailand in order to discuss all of the important technical and scientific issues of EANET including consideration on the Periodic Report on the State of Acid Deposition Monitoring in East Asia (PRSAD), the 5-Year Medium Term Plan (MTP) for EANET, the Data Report on acid deposition monitoring in 2005, Review of QA/QC activities in the participating countries, research activities and so on. The Draft MTP was revised for the adoption at IG8 in November 2006. Regarding PRSAD, it was decided that PRSAD should be finalized by Lead Authors based on the comments from SAC6, NFPs and external reviewers prior to submission to IG8.

12. Regarding the Seventh Session of the Scientific Advisory Committee (SAC7), in June 2007 the Environmental Management Bureau (EMB), Philippines officially notified their intention to host SAC7 in accordance with the request from the Secretariat. SAC7 will be held in Manila, Philippines in October 2007.

III-3. Intergovernmental Meeting of EANET

13. IG8 was held in Hanoi, Viet Nam on 29-30 November 2006. Major decisions during the IG8 include the following:
 - 1) Adoption of the Terms of Reference (TOR) of the Working Group on Future Development of EANET for 2007-2008;
 - 2) Discussion on the Components of the Instrument to Provide a Sound Basis for Financial Contribution to EANET;
 - 3) Adoption of the “Strategy on EANET Development (2006-2010)” (hereinafter “EANET Strategy”. The name of 5-Year MTP was changed to Strategy on EANET Development (2006-2010);
 - 4) Discussion on the Report on the Review of the RRC.AP/AIT System and Establishment of a Trust Fund, and the Rules and Regulations of the Japan Environmental Sanitation Center (JESC) and the Acid Deposition and Oxidant Research Center (ADORC);
 - 5) Discussion on the Revised Procedures and Guidelines for Contribution to EANET, and Report on Ways in Obtaining Financial Support from International Funding Agencies;
 - 6) Endorsement on the Outcomes of the Sixth Session of the Scientific Advisory Committee (SAC6) including PRSAD; and
 - 7) Adoption of the Work Program and Budget in 2007 for EANET and so on.
14. During IG8 in November 2006, Lao PDR expressed their willingness to host the IG9 in 2007. IG9 will be held on 19-20 November 2007 in Lao PDR.

III-4. Eighth Senior Technical Managers’ Meeting (STM8)

15. At the First Session of the Working Group on Future Development of EANET (WGFD1) held in August 2004, NC was suggested to consider a possibility of convening the future Senior Technical Managers’ Meetings in a participating country other than Japan. In accordance with the suggestion, NC asked the participating countries in February 2007 if they could host STM8. Indonesia expressed their willingness to host STM8 in their country. After receiving the letter from the National Focal Point of Indonesia (Ministry of Environment, Indonesia), NC decided to hold STM8 in cooperation with Indonesia. STM8 was held in Bogor, Indonesia on 1-3 August 2007. The meeting discussed the national monitoring plans of the participating countries, the preliminary draft data report on acid deposition monitoring in 2006, the preliminary draft report on inter-laboratory comparison projects in 2006, improvement

of monitoring methodologies and the research activities of EANET on acid deposition.

III-5. Task Forces

16. NC continued its functions as the Secretariat of i) the Task Force on Dry Deposition Monitoring, ii) the Task Force on Soil and Vegetation Monitoring, and iii) the Network of Soil and Vegetation Specialists to promote the improvement of monitoring methodologies.

(1) Task Force on Dry Deposition Monitoring

17. With regard to the “Revised Edition of Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” endorsed at SAC5, following the suggestion at SAC6, the discussion among the Task Force members on Dry Deposition Monitoring including the possibility of the application of several methods were started.

(2) Task Force on Soil and Vegetation Monitoring

18. The Task Force on Soil and Vegetation Monitoring of EANET prepared the final draft of the sub-manual on forest monitoring as one of the activities in line with the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET and submitted it to SAC6. The sub-manual was endorsed after discussion with a few modifications on terminology. NC distributed the endorsed sub-manual to the task force members, the participating countries of EANET and other relevant organizations in 2007.

III-6. Drafting Committee for the Periodic Report on the State of Acid Deposition in East Asia (PRSAD) and relevant workshop

19. NC, in collaboration with Lead Authors, was requested to draft a summary of PRSAD for policy makers at IG8 in November 2006. The Second Lead Authors Meeting of Drafting Committee (DC) was held on 10-11 May 2007 in Niigata, Japan in order to elaborate the contents of PRSAD and to prepare the draft summary. Lead Authors discussed and finalized the draft summary. NC as the Secretariat of DC, circulated the final versions of PRSAD to all DC members in June 2007 for their comments and to the NFPs in July 2007 for endorsement.
20. The three reports of PRSAD namely, Executive Summary, Part I: Regional Assessment and Part II: National Assessments have been sent for printing in early August 2007 after finalization. Draft final versions of PRSAD have been distributed to the participants of STM8. Copies of the printed reports will be distributed by the Secretariat to member countries as soon as they are printed.

IV. INTERNATIONAL COOPERATION - PARTICIPATION IN EANET-RELATED MEETINGS AND WORKSHOPS

IV-1. Seventh Collaborative Assessment Network (CAN7)

21. The representative of NC participated in 7th Collaborative Assessment Network (CAN7) meeting and pre-meeting discussions (5-6 November 2006) in Bangkok, Thailand. The updated information on progress of EANET activities were delivered during the meeting including their institutional and technical aspects. The development of e-KH (Environmental Knowledge HUB) by UNEP RRC.AP and CAN-partners were observed and discussed including role of EANET and other organization in cooperation on creating Environmental Databases.

IV-2. Long-Range Transboundary Air Pollutants in Northeast Asia (LTP)

22. NC has been collaborating with the International Joint Research of Long-range Transboundary Air Pollutants in Northeast Asia (LTP), which is implemented by the experts of Korea, China, and Japan. The 9th Expert Meeting for Long-range Transboundary Air Pollutants in Northeast Asia, organized by NIER, Republic of Korea, was held in Daegu, Republic of Korea, from 7 to 9 November 2006. The Meeting was attended by the experts of Working Group and Sub-working Group from China, Japan and Republic of Korea. Annual reports on monitoring and modeling activities in each country were presented by the experts of three countries. The sub-working groups of each country are supposed to prepare and submit the Annual Report of LTP Project in 2006 until the end of March 2007 following the adopted formats. In addition to that, it was agreed in the meeting that the 3rd stage of LTP project would be conducted in 2008-2012. Draft contents of the 3rd stage were proposed from the Secretariat, however it was decided that the detailed contents would be discussed in the next meeting.

IV-3. Expert Meeting on Precipitation Chemistry Data Synthesis and Community Product

23. During the World Meteorological Organization (WMO) Expert Meeting on Precipitation Chemistry Data Synthesis and Community Product in Geneva, on 23 January 2007, the representatives of NC provided information on accumulated monitoring data for the period of regular phase of EANET and the procedure for dissemination. It was agreed to include the EANET monitoring data for 2001-2005 into the common data set of relevant networks around the world with the purpose of development of the global precipitation chemistry assessments under coordination by

WMO-GAW. Necessity of special preparation of the information was accepted by all the networks in terms of consistency, data quality, averaging procedures. It will be started its process late summer 2007.

IV-4. Better Air Quality (BAQ) Workshop

24. The representatives of NC and the Secretariat participated in Better Air Quality (BAQ) 2006 Workshop in Yogyakarta, Indonesia on 12-16 December 2006. Overview presentation was made at the special panel session with explanation on EANET principles, main activities and recent progress on institutional and technical development. The main directions of cooperation among Clean Air Initiative (CAI) members were observed as well as principles of CAI-Asia and its new arrangement for institutional and financial basis.

IV-5. Task Force on Hemispheric Transport of Air Pollution (TF HTAP)

25. The representative of EANET participated in Joint Task Force on Hemispheric Transport of Air Pollution (TF HTAP) and WMO Workshop on Integrated Observations for Assessing Hemispheric Air Pollution held on 24-26 January 2007 in WMO Headquarter (in Geneva, Switzerland). Problems of coordination, data harmonization and creation of infrastructure for modeling studies were discussed among the monitoring networks and researchers. Development of 2007 Interim Assessment Report of the TF HTAP was discussed with possible contribution from EANET.

IV-6. Model Inter-comparison Study (MICS-Asia)

26. In order to investigate the differences among the long-range transport models developed for East Asian region, NC has been collaborating with the Model Inter-comparison Study (MICS-Asia). The Ninth Workshop on the Transport of Air Pollution in Asia was held at the International Institute for Applied Systems Analysis (IIASA), Austria on 27-28 February 2007, financially supported by ADORC in order to review the recent activities on modeling and emission inventories and to discuss the future framework and its concrete procedure as Phase 3 project. Since various activities are expected in the next phase, the concrete framework and its procedure could not be decided during the workshop. The project cannot start Phase 3 project as a result, however it was agreed among participants to implement the interpolation of studies in Phase 2 and further investigation for the improvement of model performance on individual basis.

IV-7. Conference for Environment and Health Asia

27. EANET attended the Conference for Environment and Health Asia held in Seoul, Republic of Korea on 7 May 2007, which was organized by World Health Organization (WHO) and UNEP. On the same day after the conference, the first regional meeting of the Thematic Working Group on Air Quality was held to discuss work plans for the Thematic Working Group. EANET is supporting this regional initiative through our involvement in the activities of one of the three sub-groups; which is the Sub-Group on Transboundary Air Pollution. A representative from ADORC attended the High-Level Officials' Meeting and the Ministerial Regional Forum on Environment and Health held in Bangkok, Thailand on 8-9 August 2007.

IV-8. International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests)

28. NC sent a mission to the 23th Task Force Meeting of International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) held in Zvolen, Slovak Republic on 12-16 May, 2007. Progress of the EANET activities was reported to European forest monitoring network, and possibility of further collaboration between EANET and ICP Forests was also discussed.

V. COMMUNICATION WITH PARTICIPATING COUNTRIES AND OTHER RELEVANT AGENCIES

29. The Secretariat received communications from some NFPs regarding a few changes on institutional bodies of EANET in their respective countries, e.g. NFPs, Scientific Advisory Committee (SAC) members, etc., from time to time and circulated this information to all concerned.
30. The Secretariat is communicating continuously to all concerns regarding administrative and financial matters for EANET which include: contracting with ADORC for the NC activities and the MoE, Japan, communicating with some countries regarding transfer of voluntary contributions to EANET, promotion of public awareness and others.
31. The Secretariat and NC maintained close communication with the participating countries in all related activities of EANET and relevant organizations such as United Nations Economic Commission for Europe (UN/ECE).

VI. COMPILATION OF DATA AND DISSEMINATION OF DATA AND RELEVANT INFORMATION

VI-1. Data reports

32. After presentation and consideration of the draft “Data Report on the Acid Deposition in the East Asia 2005 (Data Report 2005)” at SAC6, NC finalized it taking into account the comments at SAC6 and then distributed it to NFPs, National Centers, SAC members and other relevant organizations in November 2006. Data Report 2005 was disclosed outside of EANET in January 2007.
33. All the participating countries have submitted their monitoring data in 2006 to NC.

VI-2. Dissemination of EANET data

34. In accordance with the Detailed Mechanism of Article 4 of the Procedures on Data and Information Disclosure for EANET decided by the Third Session of the Scientific Advisory Committee (SAC3) and the Fifth Session of the Intergovernmental Meeting (IG5) held in Pattaya, Thailand in 2003, all of the EANET monitoring data in 2001, 2002, 2003 and 2004 were disclosed outside of EANET in January 2007 with dissemination on CD upon the requests. The data of 2005 will be disclosed in January 2008.

VII. STRENGTHENING OF TECHNICAL CAPACITY IN THE PARTICIPATING COUNTRIES

VII-1. Dispatch of technical missions

35. NC dispatched technical missions to the participating countries to exchange information and experiences, to provide technical advices and to disseminate the latest technical information. As of the end of July 2007, NC missions were sent to Cambodia and Lao PDR (November 2006), Thailand (November-December 2006), Malaysia (December 2006), R. of Korea (February 2007), Indonesia (August 2007), Russia (September 2007) after SAC6/IG8.
36. NC technical mission to Cambodia and Lao PDR in November 2006 visited the labs of Ministry of Environment (MOE), Cambodia and Environment Research Institute (ERI) of Science Technology and Environment Agency (STEA), Lao PDR and confirmed that two new Ion Chromatograph (IC) systems installed by using the saving of the Secretariat to the labs can be operated without any problems. (See Annex: Results of Technical Missions of NC since SAC6/IG8).

VII-2. Implementation of the technical cooperation programs

37. With the financial support by MoE, Japan, NC has implemented the technical

cooperation programs for some participating countries in Japanese Fiscal Year (JFY) 2006 and 2007 by providing technical and financial support to the countries. Wet only sampler was sent to Department of Meteorology and Hydrology (DMH), Ministry of Transport, Myanmar, and a filter-pack kit was sent to Xiamen Environmental Monitoring Center, China. Technical and financial assistance were rendered for the Cambodia, China, Lao PDR, Mongolia, Myanmar and Philippines including above wet only sampler and filter-pack kit.

VIII. IMPLEMENTATION AND COORDINATION OF QA/QC ACTIVITIES

VIII-1. EANET 2005 inter-laboratory comparison projects

38. Following the discussion on the draft reports of 2005 inter-laboratory comparison projects (the eighth one on wet deposition, the first one on dry deposition (filter pack method), the seventh one on soil and the sixth one on artificial surface water) at SAC6, NC finalized these reports taking into account the comments at SAC6 and distributed them to the participating laboratories in January 2007.

VIII-2. EANET 2006 inter-laboratory comparison projects

39. NC distributed samples of the 2006 inter-laboratory comparison projects (the ninth one on wet deposition, the eighth one on soil and the seventh one on artificial surface water and the second one on dry deposition (filter pack method) to the participating countries in November 2006.
40. All the participating countries have submitted their EANET inter-laboratory comparison projects data in 2006 to NC.

VIII-3. Other inter-laboratory comparison projects

41. Several national centers and EANET laboratories of participating countries in Japan, Philippines, Russia and Thailand took part successfully in the international inter-comparison 2006 (20th project) organized as a part of the Convention on Long-range Transboundary Air Pollution (CLRTAP) International Cooperative Programme on Assessment and Monitoring of Acidification in Rivers and Lakes (ICP-Waters). NC also promoted a participation of EANET laboratories in this EMEP 24th inter-laboratory comparison on artificial rain water in 2006.

IX. IMPLEMENTATION OF CAPACITY BUILDING ACTIVITIES

42. Following training activities have been implemented in accordance with the request from the participating countries and “Training Programs for EANET in the Regular Phase” endorsed at the Third Session of the Intergovernmental Meeting (IG3) in November 2001.

IX-1 Capacity Building Course on Future Development of EANET

43. As suggested by China, the Capacity Building Course on Future Development of EANET for Officials and Experts in the Participating Countries of EANET was held in Pathumthani, Thailand on 28 May - 01 June 2007. It was organized by the Secretariat in cooperation with NC.
44. The objective of the course was to enhance capacity of officials and experts to contribute to the process of discussion/negotiation by providing them with the relevant necessary knowledge on acid deposition and other transboundary air pollution issues, practical negotiating skills, and information on some international institutional arrangements.

IX-2 Assistance for national training activities

45. In line with the Training Programs for EANET in the Regular Phase, NC implemented a questionnaire survey of the national training activities carried out in the participating countries in 2006.
46. The survey indicated that training on acid deposition and other related air pollution issues have been successfully carried out in most of the EANET countries by national trainers.

IX-3 Utilization of existing training programs (Japan International Cooperation Agency (JICA) Training Course)

(1) JICA Area Focused Training Course on EANET

47. “JICA Area Focused Training Course on EANET” in JFY 2006 was held from 10 October through 16 December 2006 in Kobe and some other places in Japan. Ten trainees attended this course from ten EANET participating countries, namely Cambodia, China, Indonesia, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Thailand and Viet Nam. Several lectures were delivered by NC staffs in Kobe for this period. In addition, during the visit of JICA trainees to Niigata, NC presented lectures and demonstrated practices on acid deposition monitoring of EANET.
48. NC has maintained close communication and coordination with the organizers of JICA

training course on the curriculum by sending its staff to the steering committee informing of EANET activities in a timely manner.

49. The training course in JFY 2007 will be held in October - December 2007 in Kobe, Japan. Ten trainees will be invited from the ten EANET participating countries. NC in cooperation with JICA and the EANET participating countries will make effort to select appropriate trainees from the participating countries.

(2) JICA Third Country Training Course

50. JICA Third Country Training on “Emission Inventory and Modeling for Acid Deposition Assessment” in Thailand was held from 14 January through 2 February 2007. NC dispatched experts to Thailand during this training as lecturers of the training. There were 19 trainees from 8 EANET countries, namely Cambodia, China, Indonesia, Malaysia, Mongolia, Myanmar, Thailand and Viet Nam to get the knowledge and information on acid deposition monitoring and introduction courses on emission inventory and modeling studies. (Phase I of this course was completed in February 2007.)
51. Since the last course was finished in February 2007 (Japanese Fiscal Year (JFY) 2006), JICA asked Ministry of the Environment, Japan to dispatch an expert to Thailand before the course in JFY 2006 so as to evaluate this phase of the training course. In accordance with the request from Ministry of the Environment, Japan, NC staff was dispatched to Thailand in December 2006. Based on the result of the evaluation, JICA decided to continue the training course for two more years from 2008 (JFY 2007) in Thailand. The title of the next phase of the training course is “Third Country Training on Control Strategy and Mitigation Measures of Acid Deposition”. General Information (GI) was sent to the EANET countries in August 2007.

IX-4. Implementation of individual training

52. The individual training at NC has been implemented taking into account specific situations in the participating countries. One trainee from each from Cambodia, China, Lao PDR and Myanmar received individual training at NC from 13 February through 8 March 2007 on wet deposition monitoring, dry deposition, soil/vegetation monitoring, inland aquatic environment monitoring and data management. Trainees from Cambodia and Lao PDR were instructed how to use IC. One trainee from Indonesia also received individual training at NC from 26 February through 8 March 2007, on soil/vegetation and inland aquatic environment monitoring and data management.

IX-5. Workshop on Emission Inventory

53. During WGFD4 held in June 2007, the Secretariat announced that Japan had offered to provide financial contribution for a workshop to promote the understanding of emission inventories among participating countries of EANET. This workshop will be held back-to-back with SAC7 in Manila, Philippines in October 2007.

X. RESEARCH ACTIVITIES

54. In order to attain the objectives of EANET, it is important to evaluate appropriately the actual situation of environmental impacts of acid deposition and to research on monitoring methodologies and development of analytical methods suitable for East Asia. NC performed following research activities under considerations of the regional characteristics.

X-1. EANET research fellowship

55. Following the discussion at IG6 on EANET held in Siem Reap, Cambodia, November 2004, it was agreed that research fellowship should be established in NC during 2005-2006, and two researchers would be invited each year from the participating countries with the budget allocated in accordance with the "Proposal on the possible use of the previous savings of the Secretariat (EANET/IG 6/9)".

(1) Research fellowship in 2005

56. The researchers from China and Philippines that conducted researches at NC under the EANET research fellowship in JFY 2005 have submitted the scientific papers to NC. The titles of their researches are "Assessment of ozone concentration in Asia, especially in terms of long term exposure" and "Determination of Unanalyzed Components in Rainwater".

(2) Research fellowship in 2006

57. Based on the Guidelines for short-term research fellowship discussed at the Second Session of the Working Group on Future Development of EANET (WGFD2), NC in cooperation with the Secretariat carried out the application procedure on the research fellowship in 2006. NC received 8 applications from 7 participating countries named Cambodia, Indonesia, Mongolia, Philippines, Russia, Thailand and Viet Nam. Considering the contents of proposed research plans, from the viewpoint of promotion of research activity and future development of EANET, NC decided to invite two researchers one each from Mongolia and Russia.

58. The researcher from Mongolia was attached to NC from the beginning of November to

the end of December 2006 and the researcher from Russia from the end of October to the beginning of December 2006. The titles of the researches are “Determination of unanalyzed components in precipitation water” and “Application of scientific climatological approach and statistical methods for optimization for EANET network” respectively. Based on the results of their research, the researchers are expected to prepare the scientific papers on mentioned themes for publication.

(3) Research fellowship in 2007

59. NC has sent a new letter of “Announcement on application of the Research Fellowship of the Network Center in 2007” to NFPs and SAC members on 22 June 2007. Based on the experience of the fellowship research in 2006, two researchers will be invited from the participating countries to conduct their studies in ADORC in accordance with the decision of the Selection Committee of NC.
60. As of early August 2007, NC has received 5 applications from researchers in Cambodia, China, Myanmar, Philippines and Vietnam. The Selection Committee of NC was held in late August 2007 and will inform the result soon.

X-2. Joint research projects with the participating countries

(1) Joint research project with Russia

61. The joint research project Phase 3 with the Limnological Institute, Russian Academy of Science, Siberian Branch (RAS/SB) has been implemented. Annual acid deposition as well as heavy metals (mercury and lead) and lead isotope ratio in rain and snow have been determined at four sites in East Siberia and Primorsky Region in Russia. The methodologies on data analysis used in the project for the acid deposition data were expected to be useful for evaluation of EANET monitoring data. The monitoring data were important to evaluate long-range transportation of air pollutants from Europe and industrial regions of Russia to East Asia.

(2) Joint research project on dry deposition monitoring with Thailand

62. Following the termination of the Joint Research on dry deposition flux (Phase I) from January 2000 to December 2005, NC and Pollution Control Department (PCD), Thailand agreed to establish Phase II of the Joint Research Project focusing on QA/QC of gas concentration monitoring method in tropical region in August 2005. The difference of gas concentrations among some different types of monitoring methods (automatic monitor, filter-pack method, and passive sampling method) in tropical region in East Asia will be evaluated through the joint research. Measurement of gas concentrations by several types of monitoring methods has been carried out at Bangkok

EANET monitoring site.

(3) Joint research project on catchment analysis with Thailand

63. NC has started a joint research project on catchment analysis in Thailand with the Royal Forest Department (RFD) and Environmental Research and Training Center (ERTC), Thailand by using a fund from the Global Environment Research Fund of the Ministry of the Environment, Japan. Monitoring on input (deposition) and output (stream water) fluxes in/from a small catchment area, and analyses on other biogeochemical aspects have been carried out continuously, and nutrient dynamics and acid deposition impacts in the area would be estimated. Outcomes of this project will be informative to evaluate impacts of acid deposition on terrestrial ecosystems in tropical region including Thailand as well as other regions in East Asia.

(4) Joint research project with Mongolia

64. NC and Central Laboratory of Environment and Meteorology (CLEM), Mongolia continued passive sampling of O₃ and SO₂ and measurement of tree growth in the Bogdkhan Mountain, where tree decline was reported. The data will be informative for discussion on acid deposition impacts on forest ecosystems.

(5) Joint research project with Republic of Korea

65. In the discussion at SAC4 for the improvement of dry deposition monitoring methodologies, it was suggested that a study on PM₁₀, PM_{2.5} and their components at special sites should be considered. In line with the suggestion of SAC4, the project on aerosol monitoring was planned as a joint research between National Institute of Environmental Research (NIER), Ministry of the Environment, Republic of Korea and NC. Workshop to be discussed the results was held in February 2007 in R. of Korea. In order to evaluate aerosol sampling methodology and PM_{2.5} behavior in Japan and R. of Korea, intensive monitoring was conducted on 12-27 October 2006 and 16-31 May 2007. The results have been summarized each other and the results and future plan will be discussed in a small workshop held in the technical mission of NC to R. of Korea.

X-3. Other research activities

66. Catchment analysis is one of the issues described in the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET. For obtaining basic data on this issue, research activities were implemented in a small catchment area in Shibata City, Niigata Prefecture, Japan. The data will be informative for development of guidelines or manual on catchment monitoring as well as implementation of the joint research project on catchment analysis with Thailand.

XI. ACTIVITIES RELATED TO PUBLIC AWARENESS FOR ACID DEPOSITION PROBLEMS

XI-1. Joint public awareness projects with selected participating countries to develop national brochures

67. Since 1999, the (Interim) Network Center (INC/NC) has been undertaking joint projects with selected participating countries to develop their own national brochures and/or videotapes/VCD on acid deposition. In 2005, NC undertook a project with Lao PDR to develop brochures, and supported an in-country workshop in Cambodia held in February 2006.
68. In JFY 2006, NC undertook the project with Myanmar to develop their national brochure, and a project on support of an in-country workshop in Lao PDR..A public awareness brochure in Myanmar language on acid deposition problems was developed by Department of Meteorology and Hydrology (DMH), Myanmar. NC supported financially a workshop held in Vientiane, Lao PDR as a national workshop in November 2006 and February 2007. (See paragraph 69.)

XI-2. Workshop on Public Awareness for Acid Deposition Problems

(1) Workshop on Public Awareness for Acid Deposition Problems

69. NC organized the Seventh Workshop on Public Awareness for Acid Deposition Problems (WSPA7) on 6 - 7 February 2007 in Niigata, Japan. Major objectives of the Workshop were: (1) to introduce the progress of EANET activities; (2) to exchange information and share experiences on achievements at the national and regional levels relating to acid deposition monitoring, progress on pollution control in the participating countries and transboundary pollution issues; (3) to share information on recent progress of public awareness activities in the participating countries; (4) to introduce the public awareness activities in Japan on environmental education and environmental conservation by non-governmental organization (NGO)/non-profit organization (NPO) and companies in various fields. The workshop was attended by approximately thirty participants and observers from Cambodia, China, Indonesia, Japan, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Russia, Thailand and Viet Nam. The participating countries made presentations on atmospheric pollution control, wet and dry deposition and public awareness activities in their countries. Some relevant municipalities, local sector and Non-profit organization also made presentations on their policies, etc. Active discussions on air pollution issues and raising public awareness activities were performed.

(2) National Workshops on Public Awareness on Acid Deposition

70. The First National Workshop on Public Awareness on Acid Deposition was held in Vientiane, Lao PDR on 10 November 2006. Environment Research Institute (ERI), Science Technology and Environment Agency (STEA), Lao PDR organized the meeting in collaboration with the Secretariat and NC. The meeting was attended by about 100 participants including relevant governmental agencies, Provincial Science Technology and Environment Offices (PSTEOs), private sectors, academe, worker unions and so on. Various air quality issues such as prioritization of monitoring parameters were discussed. The Second National Workshop was held in Vientiane on 2 February 2007 attended by about 50 participants from the relevant organizations. The dissemination of the brochure and future plan of public awareness on acid deposition in Lao PDR were discussed.
71. The National Workshop on Public Awareness on Acid Deposition was also held in Phnom Penh, Cambodia on 13 November 2006. The Department of Pollution Control, MOE, Cambodia organized the meeting in collaboration with the Secretariat and NC for EANET. The meeting was attended by staff from MOE, other relevant governmental agencies, private sectors, academe, worker unions, non organization, media, civil society, provincial environmental department (24 provinces of Cambodia) as well as representatives from the Secretariat and NC. Presentations on overview of EANET, NC activities from scientific and technical viewpoints including wet and dry deposition monitoring were made. Various air quality issues such as effect of acid deposition on human health and ecosystem, importance of reduction of air pollutants, etc. were discussed.

XI-3. Development of e-Learning program

72. NC also has been developing an e-Learning program on acid deposition problems for environmental education in collaboration with Institute for Global Environmental Strategies (IGES) since 2002. Its English version was finalized in March 2006 and issued on EANET web site. NC also distributed the CDs of the program in July 2006 considering the situation on the circumstances of internet access in the participating countries. After issuing on EANET website, NC has been managing the program on the EANET website.

XI-4. Joint public awareness project with Thailand

73. In JFY 2007, NC undertakes the joint project with Thailand to support their environmental education activities on acid deposition in schools, and a project on support of an in-country workshop in Myanmar. The outcomes from the environmental

education will be presented by school children at the session of Internet meeting in the workshop on public awareness to be held in Thailand in January, 2008.

XII. CHALLENGES/PROBLEMS/SOLUTIONS IN EANET IMPLEMENTATION

74. At the present stage we haven't encountered problems and challenges in EANET, as we recognized that in the implementation of EANET, participating countries are in consensus of a step-by-step approach and all countries have different situations and conditions.

Annex

Results of Technical Missions of NC since SAC6/IG8

Country	Period	Main Purposes	Results of Mission
Lao PDR	9 - 12 November 2006	<p>(i) to attend Public Awareness Workshop on Acid Deposition and make presentations on EANET activities in Lao PDR and exchange information and views on progress of EANET; and</p> <p>(ii) to visit the laboratory concerned and make technical discussion with the relevant staff members and to exchange information and views on institutional and technical arrangements for the activities of EANET.</p>	<p>(i) Mission participated in the workshop on “Public Awareness Workshop on Acid Deposition” held in Vientiane and made presentations on EANET activities and exchanged information and views on progress of EANET; and</p> <p>(ii) Mission visited Science Technology and Environment Agency (STEA), Lao PDR and had a meeting with STEA staffs discussing the recent EANET activities and also visited Environment Research Institute (ERI) of STEA and confirmed that new IC system installed by using EANET Secretariat Saving can be operated without any problems. The ERI staff requested NC to provide some kinds of consumables for IC operation.</p>
Cambodia	12 - 16 November 2006	<p>(i) to attend Public Awareness Workshop on Acid Deposition and make presentations on EANET activities in Cambodia and exchange information and views on progress of EANET; and</p> <p>(ii) to visit the laboratory concerned and make technical discussion with the relevant staff members and to exchange information and views on institutional and technical arrangements for the activities of EANET.</p>	<p>(i) Mission participated in the workshop on “Public Awareness Workshop on Acid Deposition” held in Phnom Penh, Cambodia and made presentations on EANET activities and exchanged information and views on progress of EANET; and</p> <p>(ii) Mission visited Ministry of Environment (MOE), Cambodia and exchanged information and views with the staffs of MOE in Cambodia and also visited the lab of MOE, Cambodia and confirmed that new IC system installed by using EANET Secretariat Saving can be operated without any problems. MOE staff requested NC to support some kinds of consumables for IC operation.</p>

Country	Period	Main Purposes	Results of Mission
Thailand	26 November -1 December 2006	<ul style="list-style-type: none"> (i) to exchange information on EANET activities in Thailand; (ii) to discuss the progress of the Joint Research Project on the Catchment Analysis in Thailand; and (iii) to carry out the intensive surveys on streams/rivers in Nakhon Ratchasima Province. 	<ul style="list-style-type: none"> (i) Mission visited Pollution Control Department (PCD) with Royal Forest Department (RFD) and discussed EANET activities in Thailand and exchanged information for the joint project; (ii) Mission visited Environmental Research and Training Center (ERTC) and discussed the progress of chemical analysis and exchanged technical information on this project; and (iii) Mission members with the staff of RFD and ERTC visited Sakaerat Silvicultural Research Station to check the progress of sampling and to carry out the intensive surveys on this project.
Malaysia	10-16 December 2006	<ul style="list-style-type: none"> (i) to exchange information and views on the progress of the monitoring activities on EANET in Malaysia; (ii) to discuss and exchange information on technical issues, especially QA/QC activities and data reporting, including condition of analytical instruments; and (iii) to visit the candidate monitoring site on inland aquatic environment and discuss site selection. 	<ul style="list-style-type: none"> (i) Mission visited Ministry of Natural Resources and Environment (NRE), Malaysian Meteorological Department (MMD) and Department of Chemistry (DOC) and explained the progress of EANET activities, and discussed monitoring activities in Malaysia and so on. (ii) In the meeting, mission also discussed and exchanged information on technical issues and it was clarified that the monitoring data of Semenyih Dam in 2005 and 2006 would be submitted to NC; and (iii) Mission visited a monitoring station on wet/dry deposition in Danum Valley and new monitoring sites on inland aquatic environment. There are two candidate points/places for sampling of the inland aquatic environment monitoring.

Country	Period	Main Purposes	Results of Mission
<p>Republic of Korea</p>	<p>20-22 February 2007</p>	<p>(i) to exchange information and views on progress of the monitoring activity on EANET in Republic of Korea;</p> <p>(ii) to exchange information and views in detail on the progress of wet & dry deposition and the soil & vegetation monitoring of EANET in Republic of Korea; and</p> <p>(iii) to hold a Workshop on Joint Research Project for the Measurement of Aerosol.</p>	<p>(i) Mission visited Air Quality Policy Division, Ministry of Environment, Republic of Korea and had a meeting with National Focal Point, and other staff. Mission discussed recent progress of EANET including draft schedule of EANET activities in 2007 and monitoring activities of Republic of Korea;</p> <p>(ii) Mission visited National Institute of Environmental Research (NIER) and had a meeting so as to exchange information and views on progress of the monitoring activities on EANET with NIER staff members; and</p> <p>(iii) A workshop on Joint Research Project for the Measurement of Aerosol was held, and NC and NIER gave presentations for the result of the intensive monitoring which was conducted at Jeju, Kanghwa in R. of Korea and Niigata-Maki in Japan in October 2006. Aerosol was observed by parallel measurement of the following 4 kinds of methods. Finally it was agreed that further intensive monitoring should be implemented.</p>

Country	Period	Main Purposes	Results of Mission
Indonesia	6 - 10 August, 2007	<ul style="list-style-type: none"> (i) to exchange views and information on the institutional arrangement on the acid deposition monitoring of EANET in the Indonesia; (ii) to discuss and exchange information on technical issues, especially QA/QC activities and data reporting, including check on condition of analytical instruments; (iii) to visit the wet and dry deposition monitoring site and discuss about the maintenance of sampling instruments; and (iv) to discuss and exchange information on inland aquatic environment at RIWR. 	<ul style="list-style-type: none"> (i) Mission visited Ministry of Environment Republic of Indonesia (KLH), Environmental Management Center (EMC), Bureau of Meteorology and Geophysics (BMG), National Institute of Aeronautics and Space(LAPAN) , Research Institute For Water Resources (RIWR), and Research Center for Limnology and explained the progress of EANET activities, and discussed monitoring activities in Indonesia and so on. (ii) In the meeting, mission also discussed and exchanged information on technical issues and it was clarified that the monitoring sites on inland aquatic environment will increase to two sites; and (iii) Mission visited three candidate monitoring sites on inland aquatic environment, Sangiag Lake, Cicerem Lake and Gunung Lake.
Russia	16 - 23 September, 2007	<ul style="list-style-type: none"> (i) to finalize MOA of the Cooperative Research Project in 2007 by using the Global Environment Research Fund of Ministry of the Environment (MOE), Japan; (ii) to exchange views and information concerning EANET activities; (iii) to visit three atmospheric monitoring stations, Irkutsk and Listvyanka in East Siberia and Primorskaya in Primorsky Region, and the two monitoring sites for inland aquatic environment, Pereyomnaya River and Komarovka River; (iv) to discuss the invitation plan of Russian scientist to Japan by using the Global 	<ul style="list-style-type: none"> (i) The mission discussed the joint research project funded by using the Global Environment Research Fund of Ministry of the Environment (MOE), Japan. The MOA of the Cooperative Research Project. The MOA was contacted by ADORC and Limnological Institute (LIN). (ii) The Mission visited LIN and Primorsky Center for Environmental Monitoring (PCEM) and discussed EANET activities in Russia. (iii) The Mission visited three atmospheric monitoring stations, Irkutsk and Listvyanka in East Siberia and Primorskaya in Primorsky Region, and the two monitoring sites for inland aquatic environment, Pereyomnaya River and Komarovka River. The mission exchanged information on technical

Country	Period	Main Purposes	Results of Mission
		Environment Research Fund.	issues for wet/dry deposition or inland aquatic Environment monitoring in these monitoring sites with the staffs. Detailed schedule of the plan to invite Russian Scientist to Japan by using the Global Environment Research Fund was discussed.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

FINANCIAL REPORT OF THE SECRETARIAT AND THE NETWORK CENTER IN 2006

I. INTRODUCTION

1. The Secretariat and the Network Center (NC) for the Acid Deposition Monitoring Network in East Asia (EANET) were requested at the Fifth Session of the Intergovernmental Meeting (IG5) held in Pattaya, Thailand in November 2003 to submit their annual financial reports to the participating countries of EANET to increase transparency and accountability of the EANET activities. This report was discussed at the Fifth Session of the Working Group on Future Development of EANET (WGFD5) held on 12-14 September 2007 in Thailand. Based on the discussion at the Seventh Session of the Scientific Advisory Committee (SAC7) on 10-12 October 2007 in Manila, Philippines, this document will be submitted to the Ninth Session of the Intergovernmental Meeting (IG9) to be held in November 2007 in Vientiane, Lao PDR for its consideration and endorsement.

II. FINANCIAL REPORT OF THE SECRETARIAT

II-1 Use of Regular budget

2. This section presents the financial report of the Secretariat in 2006. The total budget of the Secretariat in the said year was US \$ 267,698 and the total expenditures was US \$261,325. The details are presented in Annex 1, Table 1.

3. The expenditures for the year 2006 using the regular budget were broken down into different items, such as: personnel costs, rental of premises (office space), operating cost (cost of meetings and DSA, reporting and publications, stationeries, communication, cost of staff's travel) and overhead.

II-2 Use of the Savings

4. Regarding the implementation of the approved Proposal on the Possible Use of the Previous Savings, the Secretariat's expenses in 2006 was US \$151,776. Please refer to Annex 1, Table 2 for details of the expenses.

II-3 Contributions of the Participating Countries in 2006

5. This financial report also contains the cash-contributions from the participating countries of EANET in 2006 which include: China (15,000), Japan (\$ 220,000), Malaysia (\$1,888), Republic of Korea (\$15,025) and Thailand (\$ 2,389) as shown in Table 3 of Annex 1. There were also in-kind contributions provided to EANET by some participating countries, such as hosting of meetings in 2006, as described in Table 4, Annex 1.

III. FINANCIAL REPORT OF THE NETWORK CENTER

6. The total revenue was spent for various activities of EANET without any balance as shown in Table 1 of Annex 2.

7. The actual total revenue was US \$ 1,540,189 including financial contribution from municipalities in Japan and non-reimbursable personnel contribution from other sources. It is consist of US \$ 1,251,577 for the fund contribution, US \$ 187,091 for the host municipalities contribution and US \$ 101,521 for the other non-reimbursable personnel contribution. (See Table 2, Table 3 and Table 4 in Annex 2.)

8. Actual expenditures of NC in 2006 with regard to the core and additional budget activities are shown in Table 5 and 6 of Annex 2. The amounts of expenditure were US \$ 428,547 for the core budget activities and US \$ 823,030 for the additional budget activities. Table 7 shows a breakdown of the expenditures by categories such as salary of staff members, travel costs, meeting costs, etc. NC expenditure for core and additional budget activities was US \$ 1,251,577. In Table 8, expenditures of NC in 2006 for some specific costs such as maintenance of ADORC building, additional personnel cost and non-reimbursable personnel expenditure of host municipality staff (US \$ 187,091) are shown.

9. Total expenditures for NC in 2006 (US \$ 1,540,189) as shown in Table 9 of Annex 2 has included an excess of US \$ 295,189 to the estimated budget of US \$ 1,245,000 shown in Table 7. The reason for the difference between estimated budget and actual expenditure in 2006 is that NC conducted additional activities with appropriate extra revenues to each activities as follows:

- The Ministry of the Environment, Japan provided additional funds for the Third Session of the Working Group on Future Development of EANET (WGFD3).
- The Ministry of the Environment, Japan made other additional contributions with regard to the cost of NC technical missions, research activities and so on.
- NC received non-reimbursable personnel contribution of US \$ 101,521 from relevant organizations, and also financial contribution from research funds in Japan.

The budget for the activities of NC is divided into two parts, i.e. core budget and additional budget.

The core budget: The cost indispensable for promoting the Network activities in the participating countries under the framework of EANET and which are approved by the Intergovernmental Meeting.

The additional budget: The cost for strengthening the Network activities by providing technical assistance to the participating countries and by promoting further research activities.

Annex 1

Table 1- Financial Statement - Regular budget
EANET Secretariat
January – December 2006

Details	Budget 2006 (A)	Actual Expenditure (B)	Commitment for 2006 (C)	Total Expenditure (D) = (B+C)
1. Personnel Costs (Salary, Social Security, Provident Fund, Tax, etc.)	103,065	79,722	-	79,722
2. Rental of premises (as per Contract)	30,000	30,000	-	30,000
3. Operating Costs	121,885	125,375	13,784	139,159
3.1 Reporting Costs	4,000	2,878	1,748	4,626
3.2 Office Supplies	1,000	836	-	836
3.3 Communication	2,000	14,724	-	14,724
- Telephone/Fax/Network	-	6,135	-	6,135
- Postage/DHL	-	8,589	-	8,589
3.4 Travel of Staff for meetings (Expenses include airfare and DSA)	6,200	5,402	-	5,402
3.5 Meetings (including PTA tickets and DSA, venue, food, accommodation, logistics, etc.)	108,685	101,535	12,036	113,571
• Second special session of the Working Group on Future Development of EANET -WGFD-S2	26,626	25,438	-	25,438
• Sixth Session of the Scientific Advisory Committee (SAC6)	31,290	30,218	-	30,218
• Eight Session of the Intergovernmental Meeting (IG8)	50,769	37,115	12,036	49,151
• Postage/DHL	-	2,720	-	2,720
• Proceedings	-	7,168	-	7,168
• Miscellaneous	-	313	-	313
• Air ticket refund for SAC4/IG6	-	(1,437)	-	(1,437)
Sub-total	254,950	235,097	13,784	248,881
4. Overhead (5% of sub-total)	12,748	-	-	12,444
TOTAL for regular activities (Sub-total + overhead)	267,698	235,097	13,784	261,325

Table 2 - Financial Statement Saving Money
EANET Secretariat
January- December 2006

Details	Amount (USD)
1) Saving in 2002 and 2003	465,391
2) Total Expenses in 2004	39,530
3) Total Expenses in 2005	50,889
4) Total Expenses in 2006	151,776
• Travel	1,758
• Meetings	
- National Workshop - Cambodia, Philippines, Lao PDR	16,411
- Scientific Workshop (RSWSWS3)	18,648
• Consultant fee (Dr. Biswas)	5,028
• Fellowship Programme	20,037
• Reporting (RPM)	2,371
• Equipment *	87,523
5) BALANCE on SAVINGS	223,196

* Commitment of 2006

Table 3 - Financial Contributions of the Participating Countries in 2006

	Name of Country	Contribution in US \$
1.	China	15,000
2.	Japan	220,000
3.	Malaysia	1,888
4.	Republic of Korea	15,025
5..	Thailand	2,389
	Total	254,302

**Table 4 – In-kind Contributions of the Participating Countries in 2006
(Hosting of EANET meetings, etc.)**

	Name of Country	Meeting	Date/Venue
1.	Japan*	Third Session of the Working Group on Future Development of EANET (WGFD3)	17-18 May 2006, Pathumthani, Thailand
2.	Myanmar	Seventh Senior Technical Managers' Meeting (STM7)	1-3 August 2006 Yangon, Myanmar
3.	Vietnam	Eight Session of the Intergovernmental Meeting (IG8)	29-30 November 2006 Hanoi, Vietnam

* Japan provided additional funds thru NC

Annex 2

**FINANCIAL STATEMENT OF THE NETWORK CENTER
JANUARY TO DECEMBER 2006**

Table 1. Balance between revenue and expenditures including additional contributions of the Network Center in 2006

Items	Total (US\$)
1. Total revenue	1,540,189
2. Actual expenditures	1,540,189
Balance	0

Table 2. Revenue of the Network Center in 2006 (for Core and additional budget activities only)

Organizations / Activities	Fund Contribution (US\$)		
	Core (US\$)	Add. (US\$)	Total (US\$)
- Ministry of the Environment, Japan (through the contracts with UNEP RRC.AP)	415,349	439,876	855,225
- Ministry of the Environment, Japan (direct supports)	5,296	122,256	127,552
4. Strengthening technical capacity in participating countries			
- Dispatch of technical missions		70,297	70,297
- Communication/coordination with donor agencies		8,136	8,136
7. Research activities			
- Research for improving monitoring methodologies		7,108	7,108
- Other research		5,266	5,266
8. Technical support for EANET meetings			
- Attendance to the EANET meetings	5,296		5,296
9. Other activities			
- Organization of meetings etc.		31,449	31,449
- National Institute for Environmental Studies, etc.		157,053	157,053
7. Research activities			
- Research for improving monitoring methodologies (NIAES)		91,544	91,544
- Joint research with Russia (NIES)		65,509	65,509
- Environmental Restoration and Conservation Agency of Japan		80,973	80,973
9. Other activities - Raising of public awareness on acid deposition problems		80,973	80,973
- AEON Environmental Fund		22,872	22,872
7. Research activities			
- Joint research with Thailand		22,872	22,872
- Niigata Prefecture	5,268		5,268
4. Strengthening technical capacity in participating countries			
- Fifth STM meeting	5,268		5,268
- Niigata City	2,634		2,634
4. Strengthening technical capacity in participating countries			
- Fifth STM meeting	2,634		2,634
Total	428,547	823,030	1,251,577

Note: NC was supported financially for the activities of EANET by Niigata Prefecture and subsidized for STM and IG meetings by courtesy of Niigata Prefecture and Niigata City.

Table 3. Revenue of the Network Center in 2006 (for some specific costs from the host municipalities of the Network Center)

Organizations / Items	(US\$)
- Niigata Prefecture	
Maintenance of ADORC building cost	62,311
Financial support for NC activities	109,660
- Niigata City	
Non-reimbursable personnel contribution	15,120
Total	187,091

Note: Non-reimbursable personnel contribution was for a staff from a municipality.

Table 4. Total revenue of the Network Center in 2006

Items	Core (US\$)	Add. (US\$)	Others(US\$)	Total (US\$)
1. For NC core and additional budget activities	428,547	823,030		1,251,577
2. For some specific costs, e.g. maintenance of ADORC building costs			187,091	187,091
3. Other non-reimbursable personnel contribution			101,521	101,521
Total	428,547	823,030	288,612	1,540,189

Note:

- 1) Other non-reimbursable personnel contribution: This refers to personnel contribution from Environmental Science Research Niigata (ESRN), Joetsu Environmental Science Center (JOESC), HORIBA Ltd and SHIMADZU Corporation. These organizations are voluntarily contributing to EANET activities. The amount is the total of salaries of the staff members dispatched from those organizations.

Table 5. Expenditures of the Network Center in 2006 (Core budget activities)

Activities	Budget in 2006			Expenditures in 2006		
	Direct Exp. (US\$)	Personnel Exp. (US\$)	Total (US\$)	Direct Exp. (US\$)	Personnel Exp. (US\$)	Total (US\$)
1. Central compilation, evaluation and storage of data etc.	12,000	72,000	84,000	47,074	27,917	74,991
- Data verification	9,000	70,000	79,000	45,391	24,428	69,819
- Maintenance of database	3,000	2,000	5,000	1,683	3,489	5,172
2. Preparation of data report	13,000	12,000	25,000	9,594	13,958	23,552
3. Dissemination of data and relevant information	11,000	14,000	25,000	7,428	17,447	24,875
- Analysis on the state of acid deposition in the region	5,000	10,000	15,000	5,942	13,958	19,900
- Development and updating of EANET website	6,000	4,000	10,000	1,486	3,489	4,975
4. Strengthening technical capacity in participating countries	54,000	36,000	90,000	63,283	20,938	84,221
- Fifth STM meeting	54,000	36,000	90,000	63,283	20,938	84,221
5. Implementation and coordination of QA/QC activities	46,000	26,000	72,000	33,014	27,917	60,931
- Inter-laboratory comparison surveys	44,000	23,000	67,000	31,528	24,428	55,956
- Individual questions and answers	2,000	3,000	5,000	1,486	3,489	4,975
6. Implementation of training activities	2,000	3,000	5,000	1,486	3,489	4,975
- Development of annual training program	2,000	3,000	5,000	1,486	3,489	4,975
8. Technical support to EANET meetings	61,000	51,000	112,000	60,244	56,056	116,300
- Preparation of technical documents	5,000	10,000	15,000	5,941	13,958	19,899
- Attendance at the EANET meetings	28,000	12,000	40,000	31,143	3,713	34,856
- Support for Task Forces						
(1) Task Force on Dry Deposition Monitoring	8,000	5,000	13,000	5,402	10,469	15,871
(2) Task Force on Soil and Vegetation	10,000	8,000	18,000	6,058	13,958	20,016
- Management of the network on soil/vegetation specialists	2,000	4,000	6,000	1,486	3,489	4,975
- Other follow-up activities of the meetings	8,000	12,000	20,000	10,214	10,469	20,683
10. Administrative works	3,000	16,000	19,000	14,275	24,427	38,702
- Communication/coordination	1,000	7,000	8,000	6,652	10,469	17,121
- Management of budget and personnel	1,000	7,000	8,000	6,137	10,469	16,606
- Miscellaneous	1,000	2,000	3,000	1,486	3,489	4,975
Total	202,000	230,000	432,000	236,398	192,149	428,547

- Note: 1) The number of each activity is the same with the number described in the Attachment 2 of “The Work Program and Budget in 2006 for EANET” (EANET/IG 7/11.rev).
- 2) The revenue balances with the expenditures in 2006.
- 3) Core budget: Refer to the column in page 3.

Table 6. Expenditures of the Network Center in 2006 (Additional budget activities)

Activities	Budget in 2006			Expenditures in 2006		
	Direct Exp. (US\$)	Personnel Exp. (US\$)	Total (US\$)	Direct Exp. (US\$)	Personnel Exp. (US\$)	Total (US\$)
4. Strengthening technical capacity in participating countries	32,000	65,000	97,000	77,287	22,939	100,226
- Dispatch of technical missions	10,000	40,000	50,000	60,071	9,831	69,902
- Assistance and technical support to individual countries	22,000	15,000	37,000	12,489	9,831	22,320
- Communication/coordination with donor agencies	0	10,000	10,000	4,727	3,277	8,004
6. Implementation of training activities	50,000	73,000	123,000	35,865	62,267	98,132
- Development of training materials, technical documents	15,000	15,000	30,000	7,019	16,386	23,405
- Assistance for national training activities	5,000	15,000	20,000	5,615	13,109	18,724
- Coordination with and support to other training programs	5,000	10,000	15,000	6,997	13,109	20,106
- Individual training at NC	25,000	25,000	50,000	14,830	16,386	31,216
- Communication/coordination with donor agencies	0	8,000	8,000	1,404	3,277	4,681
7. Research activities	114,000	107,000	221,000	276,528	49,160	325,688
- Research for improving monitoring methodologies	36,000	54,000	90,000	153,602	19,663	173,265
- Fellowship	13,000	7,000	20,000	30,720	3,278	33,998
- Joint research with Russia	24,000	20,000	44,000	58,955	6,555	65,510
- Joint research with Thailand	20,000	6,000	26,000	16,318	6,555	22,873
- Other research	21,000	20,000	41,000	16,933	13,109	30,042
9. Other activities	56,000	34,000	90,000	174,513	29,236	203,749
- Raising of public awareness on acid deposition problems	56,000	34,000	90,000	88,068	22,940	111,008
- Organization of meetings etc.	0	0	0	86,444	6,295	92,739
10. Administrative works	3,000	49,000	52,000	32,965	62,270	95,235
- Communication/coordination	1,000	20,000	21,000	16,113	26,219	42,332
- Management of budget and personnel	1,000	20,000	21,000	12,640	26,219	38,859
- Miscellaneous	1,000	9,000	10,000	4,212	9,832	14,044
Total	255,000	328,000	583,000	597,158	225,872	823,030

- Note: 1) The number of each activity is the same with the number described in the “The Work Program and Budget in 2006 for EANET” (EANET/IG 7/11.rev).
- 2) The revenue balances with the expenditures in 2006.
- 3) Additional budget: Refer to the column in page 3.

Table 7. Expenditures of the Network Center in 2006 (by each expenditure item for core and additional budget activities)

Items	Budget (US\$)			Expenditures (US\$)		
	Core	Additional	Total	Core	Additional	Total
- Salary of staff members	230,000	328,000	558,000	192,160	225,872	418,032
- External consultants/assistants	19,500	64,000	83,500	13,092	123,029	136,121
- Travel costs	32,000	64,000	96,000	8,262	184,637	192,899
- Meetings	79,000	27,000	106,000	119,513	92,696	212,209
- Communication	18,000	26,000	44,000	31,479	42,385	73,864
- Reporting (publication)	10,500	12,500	23,000	8,242	26,607	34,849
- Equipment	17,500	12,000	29,500	40,137	51,407	91,544
- Consumables	22,500	46,500	69,000	12,087	72,189	84,276
- Miscellaneous	3,000	3,000	6,000	3,575	4,208	7,783
(Sub) Total	432,000	583,000	1,015,000	428,547	823,030	1,251,577
- Other specific costs*	100,000	130,000	230,000	86,001	101,090	187,091*
- Other non-reimbursable personnel expenditures	0	0	0	46,667	54,854	101,521
Total	532,000	713,000	1,245,000	561,215	978,974	1,540,189

Note: * See Table 8 below.

Table 8. Expenditures of the Network Center in 2006 (for some specific costs, e.g. maintenance of ADORC building)

Organizations / Items	(US\$)
Maintenance of ADORC building cost	62,311
Additional personnel cost	109,660
Non-reimbursable personnel expenditure	15,120
Total	187,091

Note: 1) Core and additional expenditures for the maintenance of ADORC building were allocated based on the ratio of each expenditure in the total.

2) Non-reimbursable personnel expenditure was for a staff from a municipality.

Table 9. Total expenditures of the Network Center in 2006

Items	Core (US\$)	Add. (US\$)	Others(US\$)	Total (US\$)
1. NC core and additional budget activities	428,547	823,030		1,251,577
2. Some specific costs, e.g. maintenance of ADORC building			187,091	187,091
3. Other non-reimbursable personnel expenditures			101,521	101,521
Total	428,547	823,030	288,612	1,540,189

Note: Other non-reimbursable personnel expenditures were for staff members from Japanese private companies.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration of recommendations for improvement of QA/QC activities

1. Introduction

Quality Assurance and Quality Control (QA/QC) plays a critical role in acid deposition monitoring as well as for other environmental measurements and it is especially important to know that through QA/QC activities monitoring data satisfy to specified levels of reliability with necessary information on measurement methods.

QA/QC Programs were adopted at the First Session of the Interim Scientific Advisory Group (ISAG) in October 1998 and revised at the Second Session of ISAG in March 2000. There are some documents on QA/QC programs for EANET, and they cover all QA/QC activities for all the components of the measurement/analysis system, i.e. the field (sampling sites), laboratory, data management and data reporting processes.

According to the QA/QC Programs, the National Center in each participating country is required to prepare and implement the national QA/QC programs including appointment of the national QA/QC manager, guide for the preparation of SOPs at relevant organizations/laboratories. The activities for QA/QC of sampling organizations and chemical analysis laboratories include preparation of SOPs and participation in QA/QC activities should be conducted by the National Center.

The "Strategy on EANET Development(2006-2010)"(EANET/IG 8/7/1 rev), which was adopted by the Intergovernmental Meeting at its 8th Session in November 2006, proposed the some activities on evaluation of QA/QC activities. This report summarized the current status of QA/QC activities and suggested possible recommendations for improvement of QA/QC activities in EANET.

2. QA/QC Activities in EANET

QA/QC programs cover all QA/QC activities of NC, the National Centers and the sampling/chemical analysis organizations. The National Centers and the sampling/chemical analysis organizations need to execute various QA/QC activities. The fundamental matters including the national QA/QC programs are as follows;

- Development of national QA/QC programs
- Clear assignment of responsibility
- Standard operating procedures(SOPs)
- Data quality objectives(DQOs)
- Inter-laboratory comparison projects
- Audit to sites and laboratories

(1) Development of national QA/QC programs

Each participating country should develop its own QA/QC programs, taking into consideration national conditions. The items to be covered in the national QA/QC programs are listed in Technical Documents.

Most of the laboratories didn't meet whole sets of requirements in other activities provided QA/QC programs. To refine EANET activities in participating countries, it is quite important to establish special QA/QC programs for promoting these activities at the national level, including proper documentation on the QA/QC procedures and regulation of each relevant entity.

(2) Clear assignment of responsibility

In the National Center of each participating country, one or two (Malaysia) national QA/QC manager were appointed and their name were reported to the Secretariat.

In the sampling and/or chemical analysis organizations, personnel in charge of data management and reporting and their supervisor were appointed. Their names have been reported through the national monitoring plan of each country.

(3) SOPs

SOPs are the procedures used in all the processes of the monitoring system, i.e. in the field, laboratory, and data management area. Each sampling and chemical analysis organization (laboratory) should make effort to prepare SOPs that meet the actual conditions of respective organizations, taking into account of the Technical Manuals and the national QA/QC programs. Major items that should be included in SOPs are listed in the Technical Document.

Through the inter-laboratory comparison project on wet deposition in 2006, questionnaire on data report including SOPs was submitted to NC. There were 22 answers out of 31 laboratories participating the project on wet deposition. The result are presented in Figure 1. Half of the laboratories have already prepared SOPs for chemical analysis.

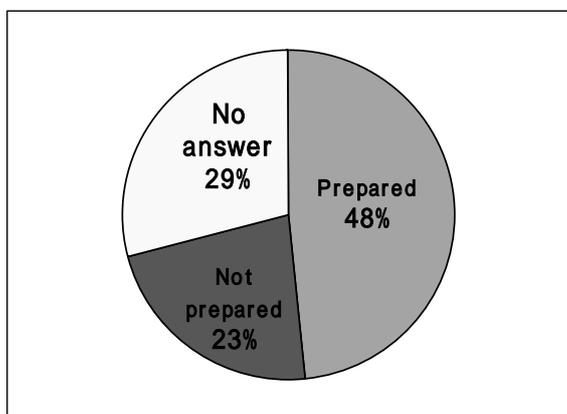


Figure 1
The result of questionnaire on SOPs

(4) Data Quality Objectives (DQOs)

In EANET the required DQO values on accuracy, precision, precipitation and completeness are defined as shown in Table 1. The participating countries are expected to make efforts to meet these DQOs.

Table 1 Data quality objective values (Required accuracy, precision, precipitation and completeness)

Accuracy	Precision	Precipitation	Completeness
±15%	15%	>90%	>80%

For reviewing the accuracy of chemical analysis, inter-laboratory comparison project has been conducted once a year. The results of the present project were evaluated in terms of the excess of the DQOs value. The flag "E" was put to the data that exceed DQOs by a factor of 2 ($\pm 15\% \sim \pm 30\%$), and the flag "X" to the data exceeding DQOs by a factor of over 2 ($< -30\%$ or $> 30\%$). The inter-laboratory comparison surveys were carried out 7 times, and the overall percentages of flagged data, "E" and "X" respectively, are shown in Figure 2.

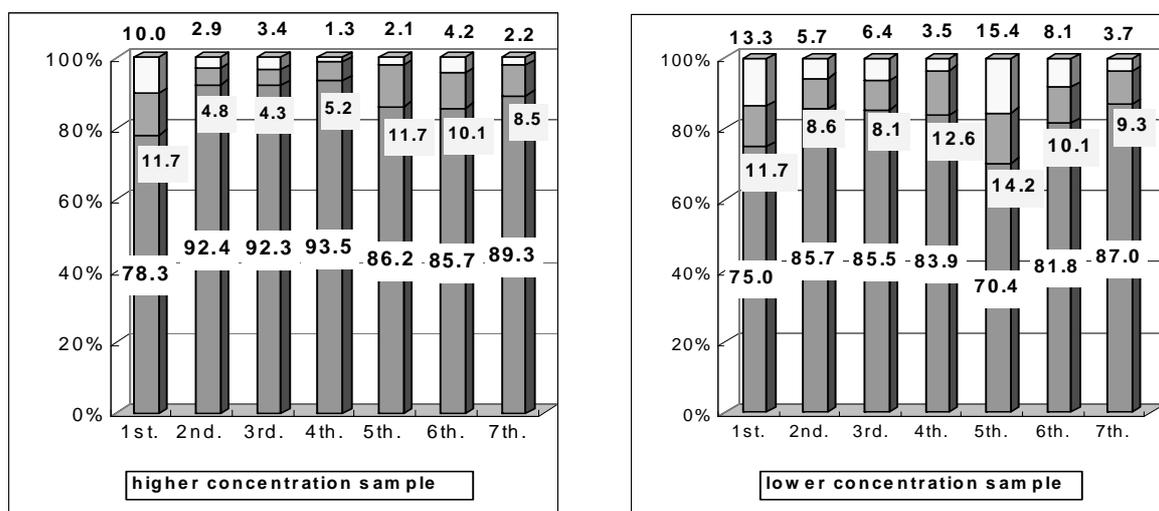


Figure 2 Overall comparisons of 1st to 7th inter-laboratory comparison projects

DQOs on detection limits and determination limits are also defined in EANET. Maximum, average and minimum values of determination limits in each participating laboratory are shown in Figure 3, based on the results of the inter-laboratory comparison project 2006. Dotted line indicates DQOs on determination limits. Average values are almost the same as the values of DQOs, however this results shows some laboratories could not achieve the determination limits of DQOs.

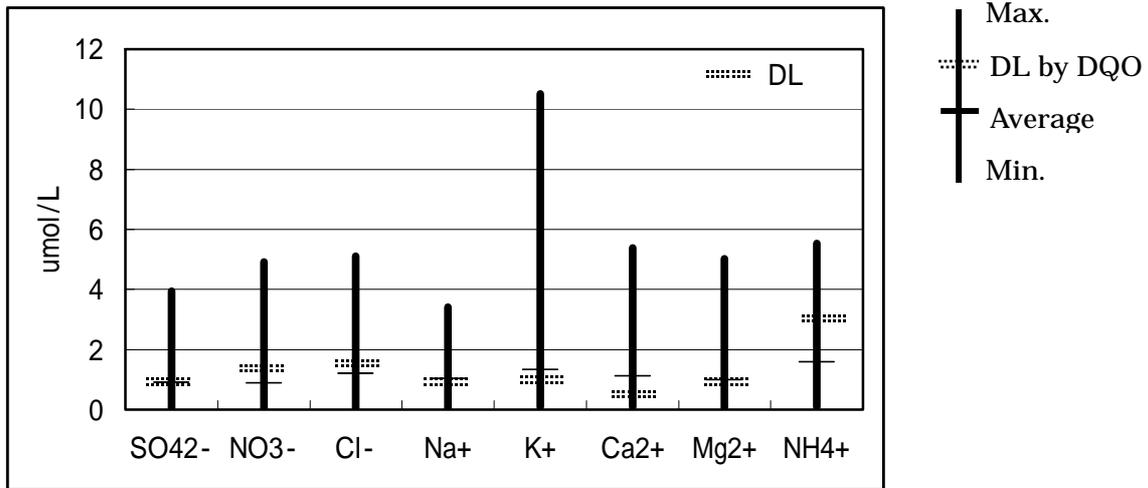


Figure 3 Ranges of the determination limits of each laboratories

(5) Inter-laboratory comparison project

The inter-laboratory comparison project is a round-robin test of common lots of simulated rainwater, which involves all analytical laboratories for the EANET monitoring. The purposes of this project are to evaluate the analytical systems through the evaluation of analytical results, analytical instruments and their operating condition and other relevant and appropriate practices. The inter-laboratory comparison surveys on wet deposition were carried out 9 times from 1998 to 2006 with participating of 24 to 31 laboratories in the thirteen countries. The surveys on dry deposition were 2 times from 2005, that on soil were 8 times from 1999, and that on inland aquatic environment were 7 times from 2000 to 2006. Figure 4 shows the number of participating laboratories in each year.

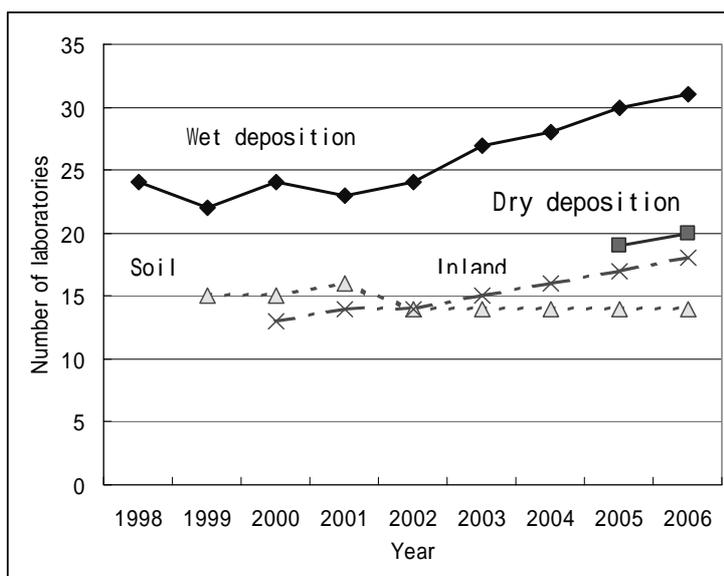


Figure 4 The number of participating laboratories

Some international monitoring programs and networks (WMO, EMEP, and ICP-Waters) conducted their intercomparison projects in opened manner to provide the opportunity for other laboratories to evaluate their own performance. Some laboratories in EANET joined these programs and NC has encouraged participating laboratories to join them.

(6) Audit to sites and laboratories

Audit to sites and laboratories has been conducted in Japan once/two years, but there are no reports on audit system in other EANET countries.

However, some laboratories in Indonesia, Philippines and Viet Nam have already been certified by ISO 9000(Quality Management Systems) or ISO/IEC 17025(The Competence of Testing and Calibration Laboratories) and some are now constructing these systems. These systems have not only the audit system of all the procedures including in site and laboratories, but also SOPs and other documentation.

3. Improvement of QA/QC activities in EANET

Considerable developments have been made in the first five years of the regular operation. In previous chapter, only fundamental matters were discussed. It is indeed important to encourage these fundamental activities.

- i) Each participating country should develop its own QA/QC programs with the documents in accordance with the improvement of QA/QC activities.
- ii) In order to improve DQOs on inter-laboratory comparison project, some recommendations for improvements have been proposed and described in the reports. Each participating laboratory is expected to refer these recommendations in daily analysis.
- iii) Preparation of SOPs is the first step for constructing QA/QC programs and the most important activities to obtain the stable analytical precision and accuracy of the measurement in each laboratory. NC distributed the SOPs of ADORC written in English at STM8 for the reference of preparation of SOPs in each laboratory. Each participating laboratory is expected to prepare it's own SOPs with reference of this materials.
- iv) Audit system to sites and laboratories conducted by National Center or respective organization is very effective to check the sampling and analysis procedures based on the technical manuals and this system means check cycle of PDCA cycle on QA/QC activities. Recently some participating laboratories have been certified by the management system, ISO 9000 or ISO/IEC 17025. These management systems are very useful tools for understanding the audit and documentation system.

However, there are many other detail items for QA/QC activities, e.g. sampling and analytical procedures, data managing, and this kinds of information were not reported and not clear to network, and so more efforts are encouraged to be made to settle the remaining problems in EANET region.

For more clarification of QA/QC activities, it is important to exchange information between NC and

participating countries through technical missions etc. and to consider the appropriate procedures for improvement of QA/QC activities in EANET.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

**Overview of the national monitoring plans of the participating countries
(The summary table)**

The Network Center of EANET

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Cambodia>	Wet deposition	Phnom Penh	Urban	Weekly	All required items		✓
<China>	Wet deposition	Chongqing -Guanyinqiao	Urban	daily	All required items + F ⁻	April '99	✓
		Chongqing -Jinyunshan	Rural	daily	All required items + F ⁻	January. '01	✓
		Xi'an -shizhan	Urban	daily	All required items	April '99	✓
		Xi'an-Weishuiyuan	Rural	daily	All required items	April '99	✓
		Xi'an-Jiwozi	Remote	daily	All required items	January. '01	✓
		Xiamen-Hongwen	Urban	daily	All required items	April '99	✓
		Xiamen-Xiaoping	Remote	daily	All required items+PO ₄ ³⁻	April '99	✓
		Zhuhai-Xiang Zhou	Urban	daily	All required items	May '99	✓
		Zhuhai-Zhuxiandong	Urban	daily	All required items	December '99	✓
	Dry deposition	Chongqing -Jinyunshan	Rural	AT	SO ₂ , NO ₂ , PM ₁₀		✓
		Xi'an-Weishuiyuan	Rural	AT	SO ₂ , NO ₂ , PM ₁₀		✓
		Xiamen-Hongwen	Urban	AT+FP	SO ₂ ,NO ₂ ,PM ₁₀ ,HNO ₃ ,HCl,NH ₃ ,PM		✓
		Zhuhai-Xiang Zhou	Urban	AT	SO ₂ ,NO ₂ , PM ₁₀		✓
	Soil and vegetation	Chongqing -Jinyunshan	Rural	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		✓
		Xi'an-Jiwozi	Remote	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		✓
		Xiamen-Xiaoping	Remote	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		✓
		Zhuhai-Zhuxiandong	Urban	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		✓
	Inland aquatic environment	Chongqing-Jinyunshan Lake	Rural	4times/years	Water quality of Jinyunshan Lake		✓
		Xi'an-Jiwozi River	Remote	4times/years	Water quality of Jiwozi River		✓
		Xiamen-Xiaoping Dam	Remote	4times/years	Water quality of Xiaoping Dam		✓
Zhuhai-Zhuxiandong Stream		Urban	4times/years.	Water quality of Zhuxiandong Stream	From 2004	✓	

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Indonesia>	Wet deposition	Jakarta (BMG)	Urban	weekly*	All required items	April '98	✓
		Serpong (EMC)	Rural	daily	All required items	April '98	✓
		Kototabang (BMG)	Remote	weekly*	All required items	April '98	✓
		Bandung (LAPAN)	Urban	daily	All required items	January '99	✓
	Dry deposition	Serpong (EMC)	Rural	FP (Weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
	Soil and vegetation	Serpong (Dramaga Experimental Forest)	Rural	once/3years	Decline, K etc. in leaves & ions in soil	From 2003	✓
	Inland aquatic environment	Patenggang Lake	Rural	3times/yr.	Water quality of Patenggang Lake		✓
<Japan>	Wet deposition	Rishiri	Remote	daily	All required items	April'98	✓
		Ochiishi	Remote	daily	All required items	April'03	✓
		Tappi	Remote	daily	All required items	April'98	✓
		Ogasawara	Remote	daily	All required items	May'99	✓
		Sado/Sado-seki	Remote	daily	All required items	April'99	✓
		Happo	Remote	daily	All required items	April'98	✓
		Oki	Remote	daily	All required items	April'98	✓
		Yusuhara	Remote	daily	All required items	December'99	✓
		Hedo	Remote	daily	All required items	December'99	✓
		Ijira	Rural	weekly(daily composite sample)	All required items	June'99	✓
		Banryu	Urban	weekly	All required items	May'99	✓
		Tokyo	Urban	daily	All required items	April'07	

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Japan>	Dry deposition	Rishiri	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM _{10/2.5} ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2002	✓
		Tappi	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Ogasawara	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Sado/Sado-seki	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Happo	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Oki	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM _{10/2.5} ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2002	✓
		Yusuhara	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Hedo	Remote	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Ijira	Rural.	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
		Banryu	Urban	AT+ FP(biweekly)	SO ₂ ,NO,NO _x *,O ₃ ,PM ₁₀ ,HNO ₃ , HCl,NH ₃ ,PMC	FP from 2003	✓
	Tokyo	Urban	FP(biweekly)	SO ₂ ,NO ₂ ,HNO ₃ ,NH ₃ , PMC	FP from 2007		
	Soil and vegetation	Ijira	Rural/Ecolog.	Once in 5 years	All required items		✓
		Banryu	Urban/Ecolog.	Once in 5 years	All required items		✓
Inland aquatic environment	Ijira Lake	Rural/Ecolog.	4times/yr.	Water quality of Ijira Lake		✓	
	Banryu Lake	Urban/Ecolog	4times/yr.	Water quality of Banryu Lake		✓	
<Lao PDR>	Wet deposition	Vientiane	Urban	daily	All required items	October '03	✓

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Malaysia>	Wet deposition	Petaling Jaya	Urban	weekly*	All required items+Organic acid	April '98	✓
		Tanah Rata	Remote	weekly*	All required items+Organic acid	January '99	✓
		Danum Valley	Remote	weekly*	All required items+Organic acid		
	Dry deposition	Petaling Jaya	Urban	FP (weekly)	SO ₂ ,NO ₂ ,HNO ₃ ,NH ₃ , PMC		✓
		Tanah Rata	Remote	FP (weekly)	SO ₂ ,NO ₂ ,HNO ₃ ,NH ₃ , PMC	FP from 2001	✓
		Danum Valley	Remote	FP (biweekly)	SO ₂ ,NO ₂ ,HNO ₃ ,NH ₃ , PMC		
	Soil and	Pasoh Reserve Forest	Remote	Every 3 years		From 2001	
Petaling Jaya		Remote	Every 3 years		From 2002		
	Inland aquatic environment	Semenyih Dam	Urban	4 times/yr.	Water quality of Semeynyih Dam	February '05	✓
<Mongolia>	Wet deposition	Ulaanbaatar	Urban	daily	All required items+F ⁻	August '98	✓
		Terej	Remote	daily	All required items+F ⁻	September '98	✓
	Dry deposition	Ulaanbaatar	Urban	FP (weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
		Terej	Remote	FP (weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
	Soil and vegetation	Ulaanbaatar (Bogdkhan mountain)	Urban/Ecolog	Every 3-5 years	PH(H ₂ O),pH(KCl),Exchangeable acidity, Tree decline, description tree	From 2002	
	Inland aquatic environment	Terej River	Remote/Ecolog	4 times/yr.	Water quality of Terej River	From 2002	✓
<Myanmar>	Wet deposition	Kaha-Aya, Yangon	Urban	daily	pH,EC		
<Philippines>	Wet deposition	Metro Manila	Urban	weekly	All required items	April '99	✓
		Los Banos	Rural	weekly	All required items	April '99	✓
		Mt. St. Tomas	Remote	weekly	All required items	October '06	✓
	Dry deposition	Metro Manila	Urban	FP (Weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
		Los Banos	Rural	FP (Weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
		Mt. St. Tomas	Remote	FP (Weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC	October '06	✓
	Soil and vegetation	Los Banos	Rural	Once in 3 years	(Tree decline, description tree & ions in soil etc.)	From 2001	
	Inland aquatic environment	Pandin Lake	Rural	4 times a year	Water quality of Pandin Lake	From 2004	✓
Ambulalakao River			1times/yr	Water quality of Ambulalakao River	From 2005	✓	

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Republic of Korea>	Wet deposition	Kanghwa	Rural	daily	All required items	March '99	✓
		Cheju(Kosan)	Remote	daily	All required items	April '99	✓
		Imsil	Rural	daily	All required items	January '01	✓
	Dry deposition	Kanghwa	Rural	FP(Twice a month)	SO ₂ , O ₃ , PM ₁₀ , Ions in PM _{2.5}	From 2001	✓
		Cheju(Kosan)	Remote	FP(Twice a month)	SO ₂ , O ₃ , PM ₁₀ , Ions in PM _{2.5}	From 2001	✓
		Imsil	Rural	FP(Twice a month)	SO ₂ , O ₃ , PM ₁₀ , Ions in PM _{2.5}	From 2001	✓
	Soil and vegetation	Imsil (Mt.Naejang)	Rural	Every 3 years	(Tree decline, description tree & ions in soil)	From 2001	
<Russia>	Wet deposition	Mondy	Remote	daily	All required items (+F ⁻ , Br ⁻ , HCO ₃ ⁻)	May '99	✓
		Listvyanka	Rural	daily	All required items (+F ⁻ , Br ⁻ , HCO ₃ ⁻)	January '00	✓
		Primorskaya	Rural	daily	All required items (+F ⁻ , Br ⁻ , HCO ₃ ⁻)	February '02	✓
		Irkutsk	Urban	daily	All required items (+F ⁻ , Br ⁻ , HCO ₃ ⁻)	January '01	✓
	Dry deposition	Mondy	Remote	AT+ FP(weekly)	SO ₂ ,O ₃ ,HNO ₃ ,HCl,NH ₃ ,PMC	From 2001	✓
		Listvyanka	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC	From 2001	✓
		Primorskaya	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC	From 2001	✓
		Irkutsk	Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC	From 2001	✓
	Soil and vegetation	Mondy	Remote	Once/3-5 years	Tree decline, description tree & ions in soil	From 2001	
		Bolshie Koty	Rural	Once/3-5 years	Tree decline, description tree & ions in soil	From 2001	
		Irkutsk	Urban	Once/3-5 years	Tree decline, description tree & ions in soil	From 2001	
		Primorskaya	Rural	Once/3-5 years	Tree decline, description tree & ions in soil	From2002	✓
	Inland aquatic environment	Pereemnaya River	Rural	4times/yr	Water quality of Pereemnaya River	From 2004	✓
		Krestovka River	Rural	5times/yr	Water quality of Krestovka River	From 2005	✓

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Thailand>	Wet deposition	Bangkok	Urban	daily	All required items+Organic acid, Phosphate	April '99	✓
		Samutprakarn	Urban	daily	All required items+Organic acid, Phosphate	January '00	✓
		Patumthani	Rural	daily	All required items+Organic acid, Phosphate	March '99	✓
		Khanchnaburi (Vachiralongkorn Dam)	Remote	daily	All required items+Organic acid, Phosphate	April '99	✓
		Chiang Mai(Mae Hia)	Rural	daily	All required items+Organic acid, Phosphate	January '01	✓
		Nakhon Ratchasima	Remote	daily	All required items+Organic acid, Phosphate	January '06	✓
	Dry deposition	Bangkok	Urban	AT+ FP(weekly)	SO ₂ ,NO,NO ₂ ,NO _x ,O ₃ ,HNO ₃ ,HCl, NH ₃ ,PMC		✓
		Samutprakarn	Urban	AT	SO ₂ ,NO,NO ₂ ,NO _x ,O ₃		✓
		Patumthani	Remote	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
		Khanchnaburi (Vachiralongkorn Dam)	Remote	AT+ FP(weekly)	SO ₂ ,NO,NO _x ,PM ₁₀ ,O ₃ ,HNO ₃ ,HCl, NH ₃ ,PMC		✓
		Chiang Mai(Mae Hia)	Rural	AT+ FP(weekly)	SO ₂ ,NO,NO _x ,PM ₁₀ ,O ₃ ,HNO ₃ ,HCl, NH ₃ ,PMC		✓
		Nakhon Ratchasima	Remote	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC	January '06	✓
	Soil and	Vachiralongkorn Dam	Remote	Once/3 years	Tree Decline, Ions in soil		✓
	Inland aquatic environment	Vachiralongkorn Dam	Remote	4 times/year	Water quality of Vachiralongkorn Dam		✓

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2006)
<Viet nam>	Wet deposition	Hanoi	urban	daily**	All required items	August '99	✓
		Hoa Binh	rural	daily**	All required items	August '99	✓
	Dry deposition	Hanoi	urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
		Hoa Binh	rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCl,NH ₃ ,PMC		✓
	Soil and	Hoa Binh	rural	Once a year	Decline, & ions in soil		
	Inland aquatic environment	Hoa Binh Reservoir	rural	4 times/year	Water quality of Hoa Bin Reservoir		✓

Note)*: Biocides are added to precipitation samples, **Chemical analysis is carried out for weekly composite
 PMC; Particulate matter components

The monitoring situations in each participating countries for mandatory items

1. Introduction

Based on the results of the First Expert Meeting, the guidelines have been adopted at the Second Expert Meeting on Acid Precipitation Monitoring Network in East Asia, which was held in March 1995 in Tokyo.

During the preparatory-phase (April 1998-December 2000) the participating countries made effort to comply with these guidelines to the extent possible. Based on the experience gained, and the latest scientific/technical information, the guidelines were revised and adopted as a technical manual “Technical Documents for Acid Deposition Monitoring in EAST Asia “ at the Second Interim Scientific Advisory Group (ISAG) Meeting of EANET held in March 2000 in Jakarta, Indonesia.

The monitoring in the regular-phase (January 2001-present) of acid deposition consists of measurements on wet deposition, dry deposition, soil and vegetation, and inland aquatic environment has been carried out in accordance with the technical documents with some modification according to the strategy paper, “Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET” (November 2002) and “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET”(September 2005)”, prepared by Task Force on Soil and Vegetation Monitoring and Dry Deposition Monitoring.

2. Basic matters on acid deposition monitoring

2.1. Objectives

The objectives of the Acid Deposition Monitoring Network are:

- (1) to create a common understanding of the state of the acid deposition problems in East Asia; and
- (2) to provide useful inputs for decision-making at local, national and regional levels aimed at preventing or reducing adverse impacts on human health and the environment due to acid deposition.

2.2. Outline of the manual for monitoring

In the technical documents, standard suggested items concerning, sampling methodology, analytical methods, data control and data reporting, and quality assurance and quality control (QA/QC) aspects on monitoring in EANET are described. For the majority of the methods, the necessary quality assurance is facilitated by a combination of simple and robust sampling techniques with well-described sampling equipment, and use of synthetic control samples for the chemical analyses.

3. Fundamental items concerning monitoring on acid deposition

3.1. Monitoring sites

Selection of sampling sites is a critical factor in the monitoring of wet deposition. Therefore, sampling sites should be located in areas suitable for the purpose of the survey, and should properly represent the area in question. In addition, coordination is required with dry deposition monitoring, and the closest meteorological station.

EANET monitoring sites are classified into two basic categories, namely deposition monitoring sites and ecological survey sites. Deposition monitoring sites are sampling sites to collect fundamental data on the temporal and spatial distribution of acid deposition, and are further classified into three sub-categories: remote sites, rural sites, and urban sites for the objectives of the monitoring. Ecological survey sites are those to provide basic data for assessing the effects of acidification on terrestrial ecosystems, and further classified into two sub-categories: basic survey sites, and ecosystem analysis sites. All sites in each country should be classified according to these categories. Regarding the deposition monitoring sites, at least one or more remote or rural sites should be established in a country participating in the EANET activities.

3.2 Fundamental items of each monitoring

Fundamental items of each monitoring are described below.

<Wet Deposition>

1) monitoring sites

(1) general information

- ✓ represent the area in question
- ✓ coordination with dry deposition monitoring & the closest meteorological station

- ✓ At least one or more remote or rural sites should be established

(2) siting of the sampling equipment

- ✓ to remain in almost the same conditions for several decades
- ✓ sites which don't receive local wind effect (mountain top, cols, coastal, valley basins are not suitable)
- ✓ considerations of the effects of immediate surrounding and emission within the nearest 20km

(3) minimum distance to emission and contamination sources

- ✓ Regions within 50km of large pollution source should be excluded as remote sites and ecological sites
- ✓ Regions within 20km of large pollution source should be excluded as rural
- ✓ Regions within 500m of main roads should be excluded as remote and rural sites

(4) Local criteria

- ✓ An open, flat, grassy area far enough from trees, no objects
- ✓ At least twice the objection height and less than 30 degree above the horizon
- ✓ Regions within 100 m of these emission and contamination sources should be excluded.
- ✓ The horizontal distance between collector and rain gauge should be greater than 2 meters

The rain gauge and the wet deposition collector should cross the direction of the prevailing wind

2) Monitoring frequency and measurement parameters

(1) Monitoring frequency

- ✓ samples should be collected every 24 hours in principal
- ✓ combining daily samples for weekly (7 days) composite or sampling for a week can be acceptable
- ✓ collection can be conducted for each precipitation event.
- ✓ The starting time of a day should be at 9:00 local time as a general rule.
- ✓ If a refrigerator is not in use, biocide should be used for preserving the samples.

(2) Measurement parameters

a) Precipitation chemistry parameters

Mandatory items:

- ✓ pH, EC, SO_4^{2-} , NO_3^- , Cl^- , NH_4^+ , Na^+ , K^+ , Ca^{2+} , Mg^{2+}

Optional items:

- ✓ F, HCO_3^- , NO_2^- , Organic acid (HCOO^- , CH_3COO^-), (Br^- , PO_4^{3-})

b) Meteorological Measurements

- ✓ Wind direction/speed, temperature, humidity, precipitation amount, solar radiation

(3) laboratory treatment of samples

- ✓ all samples should be filtered with clean membrane filters (pore size: $0.45\mu\text{m}$)
- ✓ After filtration, samples should be refrigerated at 4 degree.
- ✓ Analysis should be carried out within a week of sample arrival in the laboratory.

<Dry deposition>

Priority of the chemical species for dry deposition monitoring in EANET is as follows.

(First priority):

- ✓ SO_2 , O_3 , NO , NO_2 (urban), HNO_3 , HCl , NH_3
- ✓ Particulate component (SO_4^{2-} , NO_3^- , Cl^- , NH_4^+ , Na^+ , Mg^{2+} , K^+ , and Ca^{2+}), PM_{10}

(Second priority):

- ✓ NO_2 (rural and remote), $\text{PM}_{2.5}$

<Soil & Vegetation>

(1) Selection of basic survey site

- Survey sites should preferably be located within a radius of approximately 50 km of (Dry and Wet) deposition monitoring sites.

(2) Site selection criteria

- Two forests, whose soils have different sensitivities to acid deposition, are recommended to be selected.
- Each sites should be established in a continuous forest area of more than one hectare.
- (If the area is surrounded with a suitable shelter belt, 0.2 hectare is sufficient.)
- Site must be accessible for surveying over a long period(decades).

(3) Selection of plots for soil monitoring

- Several plots, at least two plots, occupying areas from 5m*5m to 10m*10m, should be selected randomly at each soil type

(4) Selection of subplots for soil sampling

- In the plot, five subplots, each occupying 1m*1m, are selected in principle at the center and the diagonal lines of the plot

(5) Monitoring parameters and frequency of analysis

1) Monitoring parameter for soil (Every 3-5 years)

Mandatory items:

- ✓ Moisture content/pH(H₂O) and pH(KCl)/Exchangeable Base cations(Ca, Mg, K, and Na)/Exchangeable acidity
- ✓ Effective cation exchangeable capacity(ECEC)/Carbon contents (for only calcareous soil)

Optional items:

- ✓ Exchangeable AL, H/Total Carbon content/ Total Nitrogen content/

Voluntary items:

- ✓ Available phosphate/Sulfate

2) Selection of plots for general description of the forest

- ✓ Two forest areas of more than 0.2 hectare are selected.
- ✓ a measuring plot should be subdivided to three coaxial circles of 1000, 400, and 200 square meters for the detailed survey.

3) Monitoring items and frequency of monitoring for general description of the forest.

Mandatory items: (Every 3-5 years)

- ✓ Description of trees; Name of species/ Diameter at Breast Height/Height of tree
- ✓ Understory vegetation survey

4) Survey of tree decline

Mandatory items: (Every 3-5 years)

- ✓ Observation of tree decline

Optional items: (Every 3-5 years)

- ✓ Photographic record of tree decline/Estimation of decline causes

<Inland aquatic environment>

Measurement parameters and frequency of monitoring

1) 4 times/year**Mandatory items:**

- ✓ W.T,pH,EC,Alkalinity, SO_4^{2-} , NO_3^- , Cl^- , NH_4^+ , Na^+ , K^+ , Ca^{2+} , Mg^{2+}

Optional Parameters:

- ✓ Phytoplankton(diatom species; for lakes), Epilithic algae (for springs,headwaters,rivers)

2)once/year

Mandatory items:

- ✓ Transparency,water color,DOC (if possible COD), NO_2^- ,and PO_4^{3-}

Optional Parameters:

- ✓ Total Al

3)once/in 3-5year

Mandatory items:

- ✓ Sediment(SO_4^{2-} , NO_3^- ,and NH_4^+ in pore water)

Optional Parameters:

- ✓ living organisms other than phytoplankton,
Sediment(Pb,Pb210,and stable isotope of S; for lake)

4. Monitoring situations in each participating countries.

The monitoring situations in each participating countries are described in Table 1-4.

Table2. Dry deposition(Air concentration) monitoring

Country/items	City	Monitoring sites	Classification	Monitoring method	Priority of the chemical species											
					SO ₂	O ₃	NO	NO ₂	PM ₁₀	HNO ₃	HCl	NH ₃	SO ₄ ²⁻	NO ₃ ⁻	NH ₄ ⁺	Ca ²⁺
													(Particulate Component)			
<China>	Chongqing	Jinyunshan	Rural	AT	x			x	x							
		Xi'an	Weishuiyuan	Rural	AT	x			x	x						
		Xiamen	Hongwen	Urban	AT	x			x	x						
		Zhuhai	Xiang Zhou	Urban	AT	x			x	x						
<Indonesia>		Serpong(EMC)	Rural	FP	x						x	x	x	x	x	x
<Japan>		Rishiri	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Ochiishi	Remote	FP	x					x	x	x	x	x	x	x
		Tappi	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Ogasawara	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Sado/(Sado-seki)	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Happo	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Oki	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Yusuhara	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Hedo	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Ijira	Rural	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x
		Banryu	Urban	AT,FP	x	x	x		x	x	x	x	x	x	x	x
	Tokyo	Urban	FP	x					x	x	x	x	x	x	x	
<Malaysia>		Petaling Jaya	Urban	FP	x				x	x	x	x	x	x	x	x
		Tanah Rata	Remote	FP	x				x	x	x	x	x	x	x	x
		Danum Valley	Remote	FP	x				x	x	x	x	x	x	x	x
<Mongolia>		Ulaanbaatar	Urban	FP	x					x	x	x	x	x	x	x
		Tereelj	Remote	FP	x					x	x	x	x	x	x	x
<Philippines>		Metro Manila	Urban	FP	x					x	x	x	x	x	x	x
		Los Banos	Rural	FP	x					x	x	x	x	x	x	x
<Republic of Korea>		Kanghwa	Rural	AT,FP	x	x			x	x	x	x	x	x	x	x
		Cheju(Kosan)	Remote	AT,FP	x	x			x	x	x	x	x	x	x	x
		Imsil	Rural	AT,FP	x	x			x	x	x	x	x	x	x	x
<Russia>		Mondy	Remote	AT,FP	x	x				x	x	x	x	x	x	x
		Listvyanka	Rural	FP	x					x	x	x	x	x	x	x
		Irkutsk	Urban	FP	x					x	x	x	x	x	x	x
		Primorskaya	Rural	FP	x					x	x	x	x	x	x	x
<Thailand>		Bangkok	Urban	AT,FP	x		x	x	x	x	x	x	x	x	x	x
		Samutprakarn	Urban	AT	x	x	x	x								
		Patumthani	Rural	FP	x					x	x	x	x	x	x	x
		Khanchanaburi(Vachralo ngkorn Dam)	Remote	AT,FP	x	x	x		x	x	x	x	x	x	x	x
		Chiang Mai(Mae-Hia)	Rural	AT,FP	x	x	x		x	x	x	x	x	x	x	x
	Nakhon Ratchasima	Remote	FP	x					x	x	x	x	x	x	x	
<Viet nam>		Hanoi	Urban	FP	x					x	x	x	x	x	x	x
		Hoa Binh	Rural	FP	x					x	x	x	x	x	x	x

AT:Automatic Monitor,FP:Filter pack,

Table3. Soil & Vegetation monitoring

Country/items	City	Monitoring sites	Classification	Monitoring interval (Soil)	Monitoring interval (Forest)	Soil							Optional items		
						Mandatory items:							Exchangeable (AL,H)	Total carbon content	Total nitrogen content
Moisture Contents	pH(H2O)	pH(KCl)	Exchangeable Base Cations(Ca,M g,K,and Mg)	Exchangeabl e Acidity	Effective cation exchngeable Capacity (ECEC)	Carbonate contents									
<China>	Chongqing	Jinyunshan	Rural	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x	x
		Xi'an	Dabagou	Remote	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x
		Xiamen	Xiaoping	Remote	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x
		Zhuhai	Zhuxian dong	Urban	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x
<Indonesia>		Serpong	Rural	Once/3years	Once/3years		x	x	x	x	x	x	x	x	x
<Japan>		Ijira	Rural	Once/5years	Once/5year	x	x	x	x	x	x		x		
		Banryu	Urban	Once/5years	Once/5year	x	x	x	x	x	x		x	x	x
<Malaysia>		Pasoh Reserve Forest	Remote			x	x	x		x					
		Petaling Jaya	Remote												
<Mongolia>		Ulaanbaatar (Bogdkhan mountain)	Urban	Once/3-5years	Once/3-5years		x	x		x					
<Philippines>		Los Banos Laguna (Makiling Forest Reserve)	Rural	Once/3years	Once/3years	x	x	x	x	x			x	x	x
<Republic of Korea>		Imsil (Mt.Naejang)	Rural	Once/3years	Once/3years	x	x	x	x	x			x		
<Russia>		Mondy	Remote	Once/3-5years	Once/3-5years		x	x	x		CEC	x	AL	x	x
		Listvyanka	Rural	Once/3-5years	Once/3-5years	x	x	x	x	x	x	x	x	x	x
		Primorskaya	Rural	Once/3-5years	Once/3-5years	x	x	x	x	x	x	x	x	x	x
		Irkutsk	Urban	Once/3-5years	Once/3-5years	x	x	x	x	x	x	x	x	x	x
<Thailand>		Vachralongkorn Dam	Remote	Once/3years	Once/3years	x	x	x	x	x					
<Viet nam>		Hoa Binh	Rural	Once/year	Once/year		x	x	x		CEC				

x*)Monitoring plan shows.

Table3. Soil & Vegetation monitoring

Country/items	City	Monitoring sites	Forest monitoring							
			Voluntary item	mandatory item(3-5years)					Optional items	
				Available phosphate/Sulfate	Name of species	Diameter at Breast Height	Height of tree	Understory vegetation survey	Observation of tree decline	Photographic record of tree decline
<China>	Chongqing	Jinyunshan	x	x	x	x	x	x		
		Xi'an	x	x	x	x				
		Xiamen	x	x	x	x				
		Zhuhai	x	x	x	x	x	x		
<Indonesia>		Serpong	x	x	x	x		x		
<Japan>		Ijira	Sulfate	x	x	x	x	x	x	x
		Banryu		x	x	x	x	x	x	x
<Malaysia>		Pasoh Reserve Forest								
		Petaling Jaya								
<Mongolia>		Ulaanbaatar (Bogdkhan mountain)		x	x	x	x	x		
<Philippines>		Los Banos Laguna (Makiling Forest Reserve)		x	x	x	x	x		x*
<Republic of Korea>		Imsil (Mt.Naejang)		x	x	x	x	x		x*
<Russia>		Mondy	x							
		Listvyanka	x	x	x	x		x	x	x
		Primorskaya	x	x	x	x		x	x	x
		Irkutsk	x	x	x	x	x	x	x	
<Thailand>		Vachralongkorn Dam								
<Viet nam>		Hoa Binh						x		

x*)Monitoring plan shows.

Table. Summary of sampling plan/schedule in the individual monitoring sites 2006-2011

Country	Organization	Area (Name of nearest deposition monitoring site)	Name of individual monitoring site	Soil type by FAO/Unesco or ISRIC	Forest type (major species)	Monitoring records ^{*4}	Next sampling schedule and items	Interval
China	S, F) Chongqing Institute of Environmental Science	Jinyunshan (Chongqing)	Jinyunshan	(Acidic-Udic Argosols) ^{*1}	<i>Castanopsis carlesii</i> var. <i>spinulosa</i> , <i>Symplocos setchuenensis</i> , etc.	2000 (S), 2003; 2006 (S, F)	2009 (S, F)	3 years
	S, F) Xi'an Environmental Science	Jiwozi (Xi'an)	Dabagou	(Brown soil) ^{*1}	<i>Pinus armandi</i> , <i>Larix gmelini</i> , etc.	2001 (S), 2003; 2006 (S, F)	2009 (S, F)	
	S, F) Xiamen Environmental Monitoring Central Station	Xiaoping (Xiamen)	Xiaoping	(Red soil) ^{*1}	Man-made forest (<i>Michelianmacclurei dandyrar</i> , <i>Fokienia hodginsii</i> , <i>Pinus massoniana</i>)	2000; 2003; 2006 (S, F)	2009 (S, F)	
	S, F) Zhuhai Environmental Monitoring Station	Zhuxiandong (Zhuhai)	Zhuxiandong	(Ochinic Udic Ferrosols) ^{*1}	<i>Acacia auriculiformis</i> , <i>A. confusa</i> , <i>Pinus</i>	2001 (S), 2000; 2003; 2006 (S, F)	2009 (S, F)	
Indonesia	S) Soil and Agro Climate Research Development Center (Puslitanak) Environmental Management Center (EMC) F)	EMC	Bogor Research Forest (Dramaga Experimental Forest)	(Typic Dystrudepts) ^{*1}	Man-made forest (<i>Hopea mengarawan</i> , <i>Khaya anthotheca</i> etc.)	2001 (S)	2007 (S, F)	3 years
Japan	S) Gifu Prefectural Research Institute of Health and Environmental Science F) Forest Science Research Institute, Gifu Prefecture	Ijira	Ijira	Dystric Cambisols	Man-made forest (<i>Cryptomeria japonica</i> , <i>Chamaecyparis obtuse</i> etc.)	2000; 2006 (S, F) 2003; 2004; 2005 (F) ^{*6}	2011 (S, F)	5 years ^{*8}
			Yamato	Andosols	Man-made forest (<i>Chamaecyparis obtuse</i>)	2003; 2004; 2005 (F) 2006 (S, F)	2011 (S, F)	

	(S) Agricultural Experimental Station, Shimane Prefecture (F) Forestry Technology Cener, Shimane Prefecture	Banryu	Banryu-2 ^{*2}	Cambisols	Secondary forest (<i>Symplocos lucida</i> , etc.)	2000; 2003; 2004; 2005 (F) 2001; 2006 (S, F)	2011 (S, F)	
		Iwami "rinku" Factory Park ^{*2}	Acrisols	Secondary forest (<i>Castanopsis cuspidate</i> , etc.)	2001; 2006 (S, F) 2003; 2004; 2005 (F)	2011 (S, F)		
Malaysia	(S) Universiti Putra Malaysia (F)	-	Pasoh Reserve Forest	Dystric Nitosols/ Rhodic Ferralsols	Natural forest	2000 (S)	2007 August (S) 2007 November (S)	3 years
		Petaling Jaya	Sungai Lalang Reserve Forest	Dystric Nitosols/ Rhodic Ferralsols	Secondary forest		2007 August (S) 2007 November (S)	
Mongolia	(S) Central Laboratory for Environmental Monitoring (F) National University of Mongolia (NUM).	Ulaanbaatar	Bogdkhan Mountain	Not reported	Natural forest (<i>Larix sibirica</i>)	2005 (S, F)		3-5 years
Philippines	(S) University of the Philippine Los Banos (UPLB), Environmental Management Bureau (F) UPLB	Los Banos	Mt. Makiling	Eutric Cambisols	Secondary forest (<i>Celtis luzonica</i> , etc.)	2000 (F) 2002 (S) 2001, 2005 ^{*5} (S, F)	2008 (S, F)	3 years
			UP Quezon, Land Grant	Dystric Nitosols	Secondary forest	(2000(s)) 2001, 2005 ^{*5} (S, F)	2008 (S, F)	
Republic of Korea	(S, F) National Institute of Environmental Research	Imsil	Mt. Naejang	Not reported	Secondary forest (<i>Pinus densiflora</i> , <i>Pinus rigida</i> , <i>Styrax japonica</i> , <i>Prunus maximowiczii</i>)	2001, 2004 (S, F)		3 years
Russia	(S) Laboratory of Hydrochemistry and Atmospheric Chemistry, Limnological Institute of RAS/SD (Irkutsk) (F) Siberian Institute of	Irkutsk	Irkutsk	Eutric Regosols/ Calcaric Luvisols	Man-made forest (<i>Pinus sylvestris</i> , <i>Betula pendula</i>)	2001 (S, (F)) 2003 (F)	-	3-5 years
		Listvyanka	Bolshie Koty	Mollic Leptosols/ Umbric Leptosols	Natural forest (<i>Pinus sylvestris</i> , <i>Populus tremula</i> , etc.)	2000 (S) 2002 (F)	-	

	Plant Physiology and Biochemistry, RAS/SD (Irkutsk)		Pereemnaya river catchment	Gelic Podzols/ Dystric Leptosols	Natural forest (<i>Betula pendula</i> , <i>Picea obovata</i> , etc.)	2005 (S, F)	-	
		Mondy	Ilchir Lake	Gelic Podzols/ Gelic Gleysols	Not reported	1999 (S)	-	
			Okinskoe Lake	Gelic Podzols	Not reported	1999 (S)	-	
			Solar Observatory	Calcic Gleysols	Natural forest (<i>Larix sibirica</i>)	1999 (S) 2004 (F)	-	
		Primorskaya	Primorskaya	Mollic Leptosols/ Umbric Leptosols	Natural forest (<i>Quercus mongolica</i> , <i>Betula daurica</i> , etc.)	<u>2006 (S, F)</u>	-	
Thailand	S) Department of Agriculture, King Mongkut's University of Technology Thonburi F) Royal Forest Department	Vachiralongkorn Dam (old name: Kao Lam Dam) *3	Vachiralongkorn Dam	Ferric Acrisols	Secondary forest (<i>Xylia xylocarpa</i> , etc.)	2000 (S, F) 2001, 2002 (S) 2003; <u>2006 (S, F)</u>	2009 April and August (S, F)	3 years
			Vachiralongkorn Puyea	Luvisols	Secondary forest (<i>Dipterocarpus turbinatus</i>)	2002, 2003; <u>2006 (S, F)</u>	2009 April and August (S, F)	
Viet Nam	S) Institute of Meteorology and Hydrology (IMH), and National University of Hanoi	Hoa Binh	Cave of Heaven	Ferric Acrisols	Man-made forest (<i>Pinus</i> sp.)	1999 (S, F)	-	3-5 years
			Thang Ranh	Ferric Acrisols	Man-made forest (<i>Acacia auriculiformis</i>)	1999 (S, F)	-	

Note: S, Soil monitoring; F, Forest monitoring; *1. Classification by FAO/UNESCO has not been reported; *2. The sites around Banryu deposition site were relocated in 2001; *3. Kao Lam Dam was renamed to Vachiralongkorn Dam; *4. Underlined data will be published in Data Report 2006; *5. The surveys were carried out in February 2005 due to postponement of surveys in autumn 2004 in the Philippines. The data was included in the Data Report 2004; *6. Tree decline will be surveyed every year in Japan.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration of improvement of data completeness and recommendation for improvement of equipment and their maintenance

Network Center for EANET

I. Introduction

1. The monitoring network of EANET consists of wet deposition monitoring, Dry deposition (air concentration) monitoring, soil and vegetation monitoring, and monitoring on inland aquatic environment. These monitoring activities are carried out continuously considering the latest scientific discussions, such as new monitoring techniques, increase of monitoring parameters, and so on. However, each monitoring has still some problems to be improved in the current activities.
2. As for wet deposition monitoring, data completeness is one of the most important problems. If the data completeness is low, it is difficult to calculate precise monthly/annual wet deposition amounts. Maintenance and management of equipments may be one of key factors to solve this problem. In addition, in some countries, unanalyzed parameters may confuse the data quality and interpretation of the monitoring data. As for dry deposition monitoring, the Filter Pack method is commonly used in EANET as a less expensive method for air concentration measurement. However, the data of several parameters such as O₃ and NO_x, which cannot be measured by the Filter Pack method, are limited. Use of another less expensive method, such as passive samplers, should be discussed to solve this problem.
3. As for monitoring on soil, vegetation, and inland aquatic environment, several problems can also be considered for the current regular monitoring. However, most problems can be solved by efforts of relevant organizations.
4. The “Strategy on EANET Development (2006-2010) (EANET/IG 8/7/1 rev)”, which was adopted by the Intergovernmental Meeting at its 8th Session in November 2006, proposed the following activity on this issue:
 - Improvement of implementation of all required monitoring items with necessary data completeness and accuracy: No. (1)

Consequently, this document summarized the current problems on wet and dry deposition monitoring, especially for improvement of data completeness and monitoring parameters. Moreover, as possible solutions for the problems, maintenance and management of equipments, use of new techniques, and a new function for such works, were discussed.

II. Current problems and possible actions

II-1. Wet deposition monitoring

➤ Data completeness

5. Wet deposition flux can be estimated from the precipitation amount and concentration of ions in the collected rain/snow samples. Data completeness should be evaluated in terms of the precipitation amount ratio of that by precipitation collector to rain gauge. Data completeness describes the fraction of valid data in a certain monitoring period. Two kinds of data completeness measures are used, that is percent precipitation coverage length (%PCL) and percent total precipitation (%TP). Only data with $\%PCL \geq 80\%$, and $\%TP \geq 80\%$ is accepted in the EANET QA/QC program. In order to keep high value of those and obtain reliable monitoring data, it should be ensured that Wet-only sampler is operating continuously and the precipitation is collected properly during the monitoring period, and obtained measurement data of a sample have reliability. In addition, the maintenance of the instrument and monitoring sites and management of staffs conducting the analysis in laboratory are important.
6. As an example of the maintenance and management on the sampler for collecting of wet deposition, the current conditions of EANET sites in Japan are described here. **Table 1** shows a ratio of each reason for measurement missing in 2005. The reasons of the missing are occurred by natural disaster or failure by itself.

Table 1. A ratio of each reason for measurement missing at Japanese EANET sites in 2005

Reason	%
Electric system	12
Rain gauge	0
Open/Close motion of lid	18
Turn table	8
Other sampler's troubles	45
Mixture of rinse water	5
Mixture of unidentified substance	7
Others	5
Unidentified	0

7. In other countries, several troubles on the wet-only samplers have been reported. The East Asian region is latitudinally wide and covers various climatic zones from frigid zone to tropical zone. Therefore, types of the troubles were also varied. In case of the frigid zone including Russia and Mongolia, frozen of the lid caused the missing data or changed to bulk sampling. In case of the tropical zone including Indonesia and some countries, a leak and a rust of a metal department in the sampler by heat and high

humidity caused some troubles. The change of voltage of a power unit had caused many troubles on the wet-only sampler. When the open/close sensor and motor part of a lid could not move together by them, load had been applied and damaged in an actuator of lid. In this case, installation of the stabilizer of voltage will be needed for this problem.

8. Moreover, types of the samplers used in the respective monitoring sites were different depending on situations, such as climatic conditions and financial/organizational situations. The manufacturers of sampler may be different to the site also in the same country. For example, the sampler with larger diameter (350 mm) funnel is used in Russia to correct small amount of precipitation effectively. In Indonesia, the sampler with smaller diameter (107mm) funnel is used. The information of the samplers has been reported to NC by the National Centers and is not enough utilized for improvement of the data completeness.
9. Since instrument failures caused by natural disasters are unavoidable, appropriate action must be taken promptly to rectify the problem. Moreover, it is necessary to consider periodic checks, maintenance and replacement of old and outdated instruments with new ones.
10. In addition to the efforts in the respective monitoring sites, more systematic guidance and solutions should be considered as the network. Therefore, it can be suggested that information of the troubles in the respective monitoring sites and the type of the samplers used in the respective monitoring sites should be compiled and referred.

II-2. Dry deposition monitoring

➤ Development of air concentration monitoring

11. Air concentration monitoring has been conducted by Filter Pack method and Automatic monitor. Automatic monitor can measure SO₂, O₃, NO_x, PM₁₀ and PM_{2.5} in high time resolution, but its installation needs high cost and skilled maintenance system. On the other hand, Filter Pack measurement can cover SO₂, HNO₃, HCl, NH₃ and particle components without expensive cost. In this context, Filter Pack method has been mainly installed in the EANET sites.
12. Moreover, the monitoring data of O₃, NO_x, PM₁₀ and PM_{2.5} are really limited in EANET because the Filter Pack method cannot cover these components. In order to cover the priority chemical species recommended in “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET”, new monitoring methodology should be considered and passive sampler can be recommended as another less expensive monitoring method.
13. As discussed above, EANET covers various climatic zones. Especially in tropical countries, experience on the Filter Pack method as well as the passive sampler is still limited because these methods were

developed mainly in temperate or frigid zones in Europe, Japan and the United States. In case of the Filter Pack method, effects of artifact under high temperature have been pointed out for ammonia sampling. For passive samplers also, effects of sunlight and high temperatures were suggested for NO_x measurement.

14. Therefore it can be suggested that information on these less expensive monitoring methods should be accumulated through relevant research activities with clearer strategy. NC has planned and conducted research activities regarding the evaluation of monitoring methodologies as joint project with participating countries such as Thailand and Republic of Korea.

15. Less expensive monitoring methods, and joint research activities with participating countries on the monitoring methodologies are discussed in the other documents, “Consideration on use of less expensive monitoring methods (EANET/SAC 7/8/3)”, and “Consideration of Research Activities for Further Development of EANET (EANET/SAC 7/9/3)”.

➤ Discussion on the system of calibration method for Automatic monitor in EANET

16. Automatic instruments are suitable to obtain one-hour averaged values of these species for air quality monitoring. However, the frequency and the methods for the calibration should be unified in EANET. Especially, calibration method of the O₃ monitoring equipment (UV photometric method) is a pending issue to be discusses because there is several calibration method.

17. As for also the automatic instruments, information on types of the samplers and calibration methods used in the respective monitoring sites should be compiled.

18. “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” recommends traceability to the international standard of National Institute for Standard and Technology (NIST), USA.

3. Recommendations for further improvement

19. As described above, there are several tasks and problems to be discussed regarding improvement of monitoring data completeness and development of the monitoring network in EANET. In order to deal with the tasks and problems with enough transparency among participating countries, it can be proposed by SAC to IG that **Task Force on Monitoring Instrumentation** should be formed as a new function under SAC and the following activities are expected for the Task Force;

- i) to review the types of instruments existing in the EANET and identify the existing problems,
- ii) to make recommendations on monitoring instrumentation, including the maintenance, calibration, development of instrumentation/technical manual based on the request from SAC,

- iii) to coordinate feasibility studies and inter-comparison studies in advance of the application to EANET, particularly involving new instruments.
20. It can be expected for Task Force on Monitoring Instrumentation to make an effort together with NC to promote the improvement and development of EANET monitoring network. In addition, it is required that all of function under SAC, such as Task Forces and Ad Hoc groups and Expert groups, should create close relationship and be harmonized to promote each tasks efficiently.

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10-12 October 2007, Manila, Philippines

Consideration for establishment of new EANET sites

Network Center for EANET

I. Introduction

1. Acid Deposition Monitoring Network in East Asia (EANET) started its regular-phase activities in 2001. The monitoring data on wet deposition, dry deposition, soil and vegetation, and inland aquatic environment, have been accumulated year by year, and the number of the monitoring sites increased step by step. However, the East Asian region is latitudinally and longitudinally wide area, and distribution of the monitoring sites in the region may not be enough spread.
2. The “Strategy on EANET Development (2006-2010) (EANET/IG 8/7/1 rev)”, which was adopted by the Intergovernmental Meeting at its 8th Session in November 2006, proposed the following activity on this issue:
 - Consideration and efforts on achieving appropriate distribution of monitoring sites: No. (2)
Consequently, to discuss practical solution on this issue, this paper summarized the current status and suggested possible strategies for establishment of new EANET site.

II. Current status of the monitoring sites

3. Monitoring data of the atmospheric deposition monitoring (wet deposition and air concentration) will be submitted from all of 13 EANET countries in 2007. The number of the acid deposition monitoring sites is 51 including 20 remote, 12 rural and 19 urban sites. However, air concentration monitoring has not been conducted at 12 monitoring sites.
4. Ecological survey sites established for soil and vegetation monitoring and inland aquatic monitoring are basically located in the vicinity of the acid deposition monitoring sites. Monitoring data of the ecological impact survey will be submitted from of 10 EANET countries in 2007. The number of the sites which conduct the monitoring of Soil, Forest and Inland aquatic (S/F/I) is 11. The number of the sites which conduct the monitoring of Soil and Forest (S/F) is 4. The number of the sites which conduct the monitoring of Soil (S) is 1. The number of the sites which conduct the monitoring of Inland aquatic (I) is 3.
5. Location of monitoring sites in 2007 is described in Figure 1. It seems that the number of

monitoring sites in EANET is not enough to cover whole of East Asian region. Moreover, in the current states of EANET, sampling parameters for air concentration monitoring and ecological impact survey have not satisfied the recommendation described in the Strategy Paper for future direction of “Dry deposition monitoring” and “Soil and Vegetation monitoring” of EANET. It is obvious that the monitoring sites should be increased in order to evaluate the acid deposition in detail. However, the new monitoring sites should be established according to their necessity and circumstances of each participating countries that would maintain the new monitoring sites.

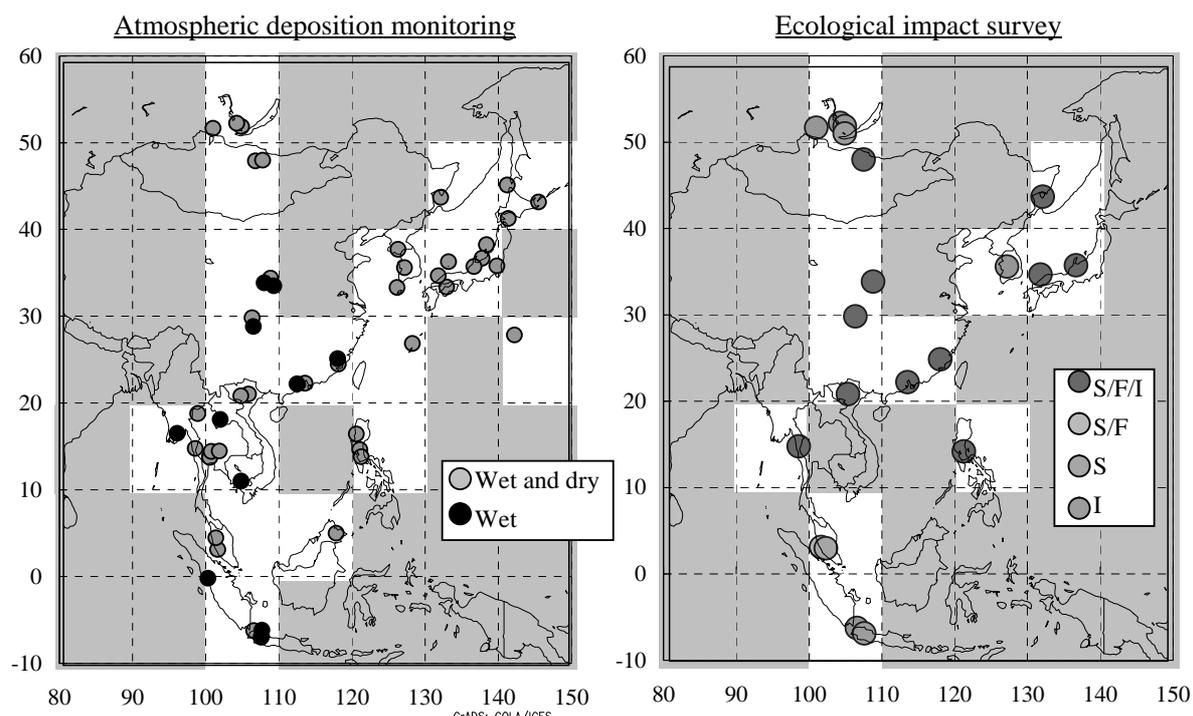


Figure 1 Location of EANET monitoring sites in 2007. (S: Soil, F: Forest, I: Inland aquatic)

III. Necessity of the denser monitoring network

6. Model validation regarding time variation and spatial distribution should be undertaken by monitoring data obtained at lots of sites in various regions. The present network is not sufficient for the evaluation of spatial distribution. One site in the area of 10x10 degree can be suggested for the evaluation of spatial distribution.
7. Since East Asia consists of various seasonal and land use categories, there are various vegetations and their tolerance and characteristics must be different each other. Many kinds of vegetation and ecological system should be monitored and the relationship with the acid deposition should be investigated.

IV. Ongoing plans on the new site establishment

8. Indonesia and Cambodia have plans to establish new monitoring site on wet deposition. In the case of Indonesia they plan to choose a site in Borneo Island. Also it was informed at STM8 that new monitoring sites, Sapa, Cuc Phuong National Park, Da Nang, Nhabe, would be nominated in Viet Nam.
9. Some participating countries have own national monitoring sites on wet deposition, and these sites can be nominated as EANET sites. In this respect Malaysia is considering adding a site in Kuching, Sarawak to the EANET network.
10. Indonesia, Malaysia and Mongolia are now considering to establish new monitoring sites on soil and vegetation. The location of the new site in Malaysia will be at Danum Valley and Telelj in Mongolia.
11. Indonesia and Lao PDR have plans to establish new monitoring on inland aquatic environment. Malaysia has started conducting inland aquatic monitoring at Danum Valley since beginning of 2007.

V. Strategies for the increase sites and selection of the location for new site establishment

12. The participating countries are encouraged to make efforts to increase the EANET sites considering the following points:
 - The existing sites for the national monitoring network can be utilized as EANET sites with minimal cost and equipments.
 - Use of less expensive instruments can allow the countries to lessen financial burden in establishing new monitoring sites.
 - Monitoring on inland aquatic environment, soil and/or vegetation can be started near/at existing wet and dry deposition monitoring sites.
13. Some countries may not have enough capacity (human and financial) to establish new sites. To assist such countries, NC will consider requesting donations from companies/donor agencies to supply equipment to the countries Moreover, the Secretariat and NC are preparing the bigger proposals to possible donor agencies for regional/international financial support to increase the number of EANET sites. The concept paper on establishment of monitoring sites in EANET has been prepared and will be submitted to the possible donor agencies.
14. Collaboration with the other initiatives such as WMO-GAW, LTP, JICA project in China should be considered to complement EANET network. Harmonization of the monitoring procedures, comparison of the relevant data, and exchange of relevant information should be promoted.

15. Scientific Advisory Committee (SAC) is invited to give some guidance to increase the number of the EANET monitoring sites.

16. NC will fully support the all the efforts by the participating countries, receiving trainees, dispatching the technical missions, providing technical information, and so on. Moreover, NC will make efforts to obtain financial support from possible donor agencies.

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Consideration on use of less expensive monitoring methods

Network Center for EANET

1. Introduction

According to the framework described in the second edition of “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” which was endorsed in SAC5 (2005, Niigata), the following activities are included in “Strategy on EANET Development (2006-2010)” which was endorsed in IG8 (2006, Viet Nam) as expected outcomes for air concentration monitoring. This report is a discussion paper for the following expected outcomes.

- *Consideration and efforts on appropriate distribution of monitoring sites*
 - Establishment of new EANET sites (**2007-2010**)

- *Consideration on possible application of less expensive methods of monitoring including passive sampler*
 - Recommendation on use of less expensive methods to reduce monitoring cost and increase numbers of monitoring (**2007-2008**)

- *Establishment of the framework for reviewing substances to be monitored including other air pollution and monitoring parameters*
 - Recommendation on monitoring parameters, measurements and equipment (**2006-2007**)

2. Typical less expensive methods and their effectiveness for EANET monitoring

Three kinds of outcomes mentioned in first chapter are expected for air concentration monitoring. The purposes of the consideration of less expensive methods are reducing costs and the expansion of monitoring network. In addition, one of the purposes of the recommendation on monitoring parameter, measurements and equipment is also the expansion of monitoring network. Since the establishment of new EANET sites is included in the expansion of monitoring network, these three expected outcomes are closely related to each other. As a first step, this paper focuses on the possibility of less expensive methods to deal with the expected outcomes.

In 2006, the number of sites for air concentration monitoring was 38 and it was less than that for wet

deposition monitoring sites (49 sites). Also the priority chemical species for EANET dry deposition monitoring, which are recommended in the second edition of Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET, are not covered at several sites. The priority chemical species are as follows;

First priority: SO₂, O₃, NO, NO₂ (urban), HNO₃, HCl, NH₃,
Particulate components (SO₄²⁻, NO₃⁻, Cl⁻, NH₄⁺, Na⁺, Mg²⁺, K⁺, and Ca²⁺), PM₁₀

Second priority: NO₂ (rural and remote), PM_{2.5}

Automatic monitor (AT), diffusion denuder sampling method (DD), filter pack sampling method (FP), and passive sampler (PS) can be suggested as the major methodology for air concentration monitoring. AT can measure SO₂, O₃, NO_x, PM₁₀ and PM_{2.5} in high time resolution, but its installation needs high cost and skilled maintenance system.

DD and FP can measure gases (e.g. SO₂, HNO₃, HCl, and NH₃) and particulate components at the same time. DD can measure gases and particulate components separately without sampling artifact, which is the over estimation of NH₃ and under estimation of ammonium salts caused by the volatilization of ammonium salts on the sampling filter. However, since expensive equipments and skilled works are required for DD, it has not come into wide use recently. Though the artifact is worried for ammonia measurement for FP, it can be recommended as one of the most appropriate methods in EANET because it is less expensive method. However, since FP cannot monitor NO_x and O₃, those monitoring data are limited in EANET.

In this context, PS can be recommended as another less expensive monitoring method. Since PS can be applied for the monitoring of SO₂, O₃, NO_x and NH₃, the parallel use of FP and PS can cover every priority species except for PM₁₀ and PM_{2.5}. In addition, the quantity of artifact in FP can be evaluated and determined by the difference of NH₃ concentration between FP and PS.

3. Discussion on the procedure for application of passive sampler to EANET

The implementation of PS monitoring does not require high cost as well as electricity and special maintenance works. Table 1 summarizes merits and demerits of PS. Though it seems that PS can be installed at many sites easily, time resolution of the monitoring data is long (2-4 weeks) and appropriate concentration conversion coefficient should be examined for NO_x monitoring at each site. In addition, the parallel use with can be recommended because other priority species can be monitored at the same time. Table 2 summarizes experiences and studies for PS in EANET.

Table 1 Merit and demerit of passive sampler

<i>Merit</i>	<i>Demerit</i>
- low cost	- long time resolution data
- easy establishment (no electricity, no special equipments)	- uncertainty for low concentration species (SO ₂ , NH ₃)
- good agreement with Automatic monitor (O ₃ , NO _x)	- need more consideration for concentration conversion coefficient (NO _x)
- wide use in the world	- need information of temperature, humidity and pressure

Table 2 Past and ongoing activities using passive sampler in EANET

<i>Project</i>	<i>Targets</i>
➤ Monitoring data from Malaysia in 2001-2003	- SO ₂ , NO ₂ , HNO ₃ and NH ₃ as monitoring data
➤ Joint research project with Mongolia on plant sensitivity (2001-)	- O ₃ and SO ₂ for plants sensitivity in forest
➤ Joint research project with Thailand on catchment analysis (2005-)	- SO ₂ , O ₃ , NO _x and NH ₃ for plants sensitivity in forest and deposition analysis
➤ Joint research project with Thailand on dry deposition (gas concentration) monitoring methodology (2006-)	- SO ₂ , O ₃ , NO _x and NH ₃ for the comparison among automatic monitor, filter pack and passive sampler
➤ Sub-Manual on forest vegetation monitoring (endorsed in 2006)	- SO ₂ , O ₃ , NO _x and NH ₃ for plants sensitivity in forest

AT should be installed if hourly data is necessary in order to conduct a detailed research like AOT40 and a validation of simulation model. However preparation of high cost and maintenance system are required for its installation. On the other hand, PS is useful to complement the monitoring network, increase of monitoring sites, and selection of hot spots to be monitored by AT. “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” recommends PS for the monitoring of O₃ and NO_x from the technical view point. However, regarding the introduction of new monitoring system into EANET, feasibility study for its implementation should be considered in **Task Force on Monitoring Instrumentation**. The followings are issues on the introduction of PS to be discussed in SAC and Task Force on Monitoring Instrumentation for the present;

1. Discussion on the action plan and data reporting for passive sampler monitoring in EANET
2. Review of existing researches of passive sampler and its performance tests in different regions
3. Performance tests of passive sampler in different regions
4. Enhancement of air concentration monitoring network based on the introduction of passive sampler at existing or new sites
5. Evaluation of the relationship between spatial distribution of air concentrations and ecological impacts
6. Select of important sites based on the results of Step 3 and installation of automatic monitors to selected sites

4. Example of performance test for passive sampler conducted in Japan

As an example of existing research of PS, Figure 1 shows the comparison of NO₂, NO_x and O₃ concentrations measured by PS and AT. These results are provided by *Japan Environmental Laboratories Association (JELA)*. Two kinds of concentration conversion coefficients were applied to calculate air concentration of NO₂ and NO_x. Original coefficient (white dots) was derived by using temperature, relative humidity and pressure and improved coefficient (gray dots) was derived by using only temperature. The improved coefficient shows better agreement with AT at both of high and low concentration sites. Since concentration conversion coefficients for O₃ is not affected by humidity and pressure, just one coefficient was applied. It is found that PS shows a good agreement with AT in O₃ monitoring.

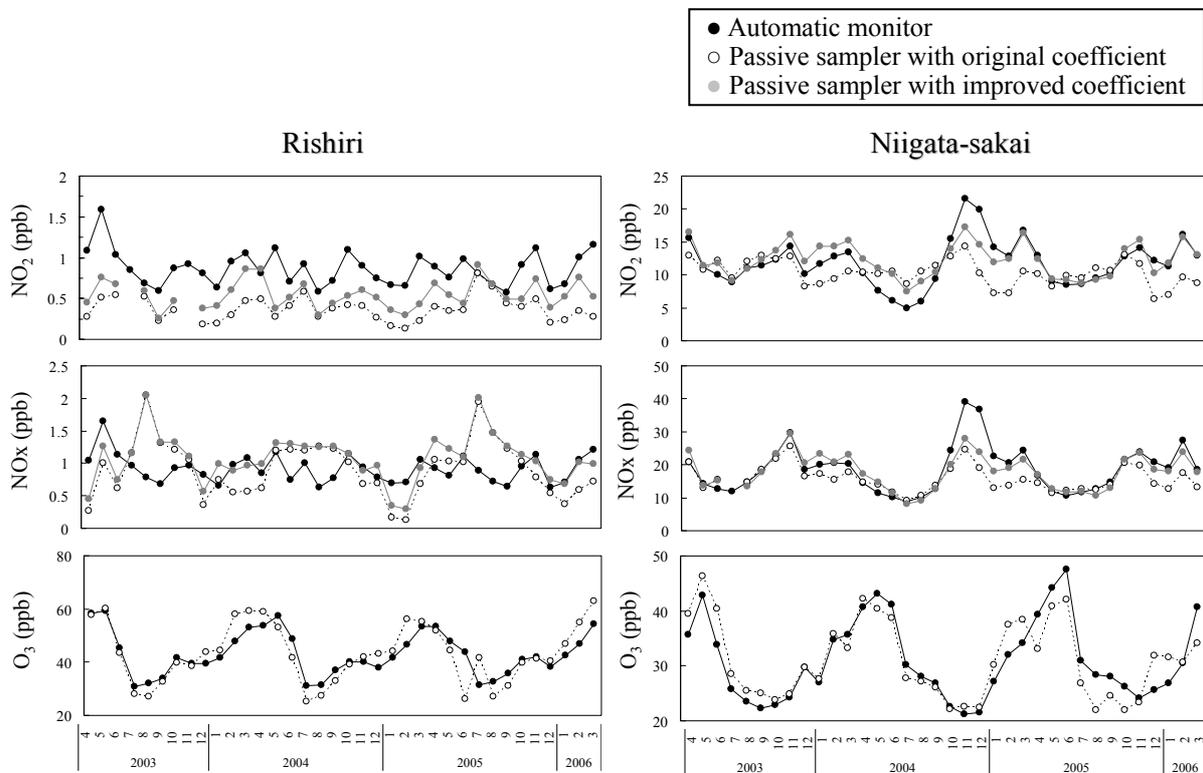


Figure 1 Comparison of NO₂, NO_x and O₃ concentrations measured by passive sampler and automatic monitor. (provided by *Japan Environmental Laboratories Association*)

The Seventh Session of the Scientific Advisory Committee
of Acid Deposition Monitoring Network in East Asia
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**Review of
The Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET**

Network Center for EANET

I. Background

1. The Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET was endorsed by the Scientific Advisory Committee at its Second Session (SAC2) in November 2002 in Bangkok, Thailand, with a few modifications for the final draft developed by the Task Force on Soil and Vegetation Monitoring.
2. The Strategy Paper described that the following four items would be implemented as the milestones, which are reflected to the specific work plan for coming five years:
 - Joint Workshop by ICP Forests and EANET: 2002
 - Implementation of the next monitoring: 2002-2005
 - Start of case studies in selected reference catchments: 2006
 - Preparation of sub-manual on forest monitoring: 2005 (*actually completed in 2006*)
3. Task Force has been promoting the above activities in line with the Strategy Paper, and the Network Center for EANET (NC) has been supporting their activities as the secretariat of the Task Force. The milestones above have mostly been implemented with relevant activities in line with the Strategy Paper, although the schedules were a little behind and some more still remained to be done.
4. Review and revision of the Strategy Paper were planned in 2006, but the schedule was behind. As the last item of the milestones, the Sub-Manual on Forest Vegetation Monitoring in EANET has just endorsed by the Scientific Advisory Committee at its 6th Session in October 2006. Therefore, it is time for starting discussion on review and revision of the Strategy Paper.

II. Review of the Strategy Paper

5. The current Strategy Paper may mostly cover important issues on ecological impacts of acid deposition. However, it was established in 2002, and some information is out of date. Several activities described in the Strategy Paper have already been finished as milestones of the last five years. New milestones should be considered for coming years.

6. Moreover, the "Strategy on EANET Development (2006-2010) (EANET/IG 8/7/1 rev)" was adopted by the Intergovernmental Meeting at its 8th Session in November 2006, as the overall strategy of EANET activities. The Strategy on EANET Development included several activities related to ecological impacts. Description of the Strategy Paper should be modified in line with directions of the Strategy on EANET Development.
7. As one of the current topics on atmospheric environment, tropospheric ozone and its precursors (such as NO_x and VOC) have become the important issue also in East Asia. In Europe, it was suggested that high concentration and dose (concentration multiplied by time) of tropospheric ozone might be harmful for growth of trees and crops, and specific visible injuries of plant leaves by ozone have been identified for observation. Directions of the monitoring on effects of ozone should be considered in EANET.
8. Taking the situation above into account, it can be proposed that **revision of the Strategy Paper should be discussed practically within a few years.** As a benefit of the revision, more clear directions with wider vision can be shown in the Strategy Paper reflecting the current situation of EANET and the latest scientific information. Moreover, this revision will probably allow the Strategy Paper to show some milestones for implementation of activities described in the Strategy on EANET Development.

III. Points to be discussed in the reviewing process

9. The following activities described in the Strategy on EANET Development are directly connected to the Strategy Paper:
 - Review of Strategy Paper for future directions of soil and vegetation monitoring: No. (8)
 - Promotion of the future catchment monitoring in line with the Strategy Paper: No. (7)
 - Evaluation of monitoring data with application of approach for assessment of impact (e.g. critical load analysis, catchment analysis, etc): No. (8)
10. Additionally, the following activities described in the Strategy on EANET Development may be related to future directions on assessments of ecological impacts:
 - Discussion on promotion of modeling activities and emission inventory: No. (23)
 - Establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters: No. (25)
 - Investigation on environmental/human effects of priority substances and their monitoring requirements such as monitoring equipment, sampling and analytical methods: No. (26)

Promotion of modeling activities and effects of other air pollutants such as ozone on vegetation

should be discussed in the reviewing process.

11. The current Strategy Paper described historical descriptions and information on the monitoring activities including the site name, in addition to future activities. Some descriptions overlapped with other documents. Moreover, the Strategy on EANET Development has described the basic policies and overall strategy of EANET activities. Therefore, the revised Strategy Paper should be simplified with minimized introduction and clear descriptions on future directions.

IV. Contents to be included in the revised Strategy Paper (refer the Annex)

12. Taking the discussion points above into account, the following (sub-) chapters should be majorly modified or deleted:

- **1. Introduction:** This chapter is very long with historical descriptions, and therefore, the introduction can be shortened with minimal background descriptions in the last five years.
- **3. Present status of soil and vegetation monitoring:** This chapter is fully overlapped with other documents, such as the Technical Manual and the National Monitoring Plan, and the information is out of date. All the contents of this chapter can be deleted.
- **4.3. General matters to be elaborated:** This sub-chapter included very general descriptions on capacity building and compilation of monitoring data. Such general descriptions can be shortened and described in other parts, and the sub-chapter can be changed into the specific chapter for collaboration with relevant networks/organizations.
- **5. Specific work plan:** This chapter should be updated based on the new milestones, and the descriptions should follow the Strategy on EANET Development. The milestones can be moved to this chapter.

13. The following (sub-) chapters should basically be kept but some descriptions should be modified:

- **2. Objectives of soil and vegetation monitoring of EANET**
- **4.1. Issues for achievement of initial objectives:** The contents of this chapter should basically be kept but descriptions on “early detection of possible impacts (4.1.2)” should be updated; e.g. The Sub-Manual on Forest Vegetation Monitoring was finished in 2006; directions on effects of ozone should be discussed specifically.
- **4.2. Issues to achieve the ultimate objective:** The contents of this chapter, such as promotion of catchment analysis, should basically be kept but descriptions should be modified in line with the Strategy on EANET Development. Some additional descriptions on assessment of acid deposition impacts should be described according to the Strategy on EANET Development.
- **4.4. Overall strategy and milestones:** Overall strategy should basically be kept but

milestones should be updated. Probably, the milestones can be moved to another chapter as proposed above, the sub-chapter can be just for overall strategy.

14. As mentioned above, inclusion of the following new topics should be considered in the revised strategy paper:

- Tropospheric ozone and its precursors (including the monitoring and assessment on effects of ozone)
- Approach on assessment of acid deposition impacts (including ideas of assessment indices, such as acid neutralizing capacity, critical loads, catchment analysis (input-output budget analysis), etc.)

V. Procedures and schedule of the revision

15. The Task Force on Soil and Vegetation Monitoring will be a main body to promote this task.

16. NC as the Secretariat of the Task Force will draft the revised Strategy Paper by the end of 2007, taking discussion points above into account. The draft will be circulated among the Task Force members as well as the SAC members.

17. The final draft will be presented hopefully in the 8th Session of SAC in autumn of 2008.

18. Possible schedule of the drafting process is as follows:

- December 2007: Preliminary draft of the revision will be sent to the Task Force members as well as SAC members for their consideration.
- March 2008: Deadline for receiving comments and suggestions, especially for topics to be included
- June 2008: Draft of the revision will be sent to the Task Force members as well as SAC members.
- End of July (or beginning of August) 2008: Introduction of the progress on the revision in the Ninth Senior Technical Managers Meeting (STM9)
- End of August 2008: Deadline for receiving comments and suggestions
- October 2008: Revised draft will be presented at SAC8 as the final draft.

Annex.

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The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration on revision of Technical Manual for Wet Deposition Monitoring in East Asia and Technical Manual for Monitoring of Inland Aquatic Environment in East Asia

I. Background

1. The preparatory-phase activities of the Acid Deposition Monitoring Network in East Asia (EANET) was conducted by ten countries in East Asia – China, Indonesia, Japan, Malaysia, Mongolia, the Philippines, Republic of Korea, Russia, Thailand and Viet Nam from April 1998 – December 2000. The countries followed a set of monitoring guidelines adopted at the Second Expert Meeting on Acid Precipitation Monitoring Network in East Asia held in March 1995 as well as three technical manuals for wet deposition monitoring, soil and vegetation monitoring, and monitoring on inland aquatic environment, adopted at the Fourth Expert Meeting held in February 1997.
2. To supplement the guidelines and technical manuals, a set of three quality assurance and quality control (QA/QC) programs for EANET monitoring were developed for wet deposition monitoring, soil and vegetation monitoring, and monitoring of inland aquatic environment in the first year of the preparatory phase. It was emphasized that the guidelines, technical manuals and QA/QC programs need to be flexibly applied, taking account of diversities in different sub-regions in East Asia.
3. Based on the experience gained from the monitoring activities and the latest scientific/technical information, the guidelines were revised during the preparatory-phase activities. The Second Interim Scientific Advisory Group Meeting of EANET held in March 2000 in Jakarta, Indonesia adopted a revised set of the documents consisting of:
 - Guidelines for Acid Deposition Monitoring
 - Technical Documents for Wet Deposition Monitoring in East Asia
 - Technical Documents for Monitoring on Inland Aquatic Environment in East Asia
 - Technical Documents for Soil and Vegetation Monitoring in East Asia
 - Data Reporting Procedures and Formats for Acid Deposition Monitoring in East Asia

II. Issues to be considered

4. It has been almost ten years since the technical manuals were first produced and revised for the regular-phase activities of EANET in 2000. The membership of EANET is now more complete with the recent addition of Cambodia, Lao PDR and Myanmar. A review and revision of the monitoring manuals including the operation manuals of the monitoring equipment used in EANET may be necessary in view of recent progress in environmental

monitoring techniques, experiences on acid deposition monitoring accumulated by participating countries, and recent plans to expand the scope of monitoring and assessments due to emerging regional pollution issues.

5. With regard to soil and vegetation monitoring, the Task Force on Soil and Vegetation Monitoring has, in 2006, completed a Sub-Manual on Forest Vegetation Monitoring and discussions will take place soon to revise the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET to clarify particular objectives, ways, and milestones for ecological monitoring. The Sub-Manual is being distributed to the participating countries. In order to provide scientific data on effects of acidification on terrestrial ecosystem based on the elemental budget calculations, the Task Force will also prepare a set of guidelines/methodologies for the future catchment monitoring during the period 2007-2010.
6. Concerning dry deposition monitoring, a document titled Future Direction of Dry Deposition Monitoring of EANET was first produced to elaborate the strategy on dry deposition monitoring. A Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET was later produced in 1999. The second edition of the Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET was produced by the Task Force on Dry Deposition Monitoring in September 2005 to clarify pending issues on dry deposition monitoring such the use of the Filter Pack method.
7. One of the activities proposed in the Strategy on EANET Development (2006-2010) is a decision on whether there is a need to revise the Technical Documents for Wet Deposition Monitoring in East Asia and Technical Documents for Monitoring on Inland Aquatic Environment in East Asia. Although the existing Technical Documents for Wet Deposition Monitoring in East Asia is regarded as a comprehensive document, it does not contain detailed standard methodologies for analysis of fluoride, bicarbonate, nitrite and organic acids (carbonic, formic and acetic), which are required in some cases to achieve ion balance. Several countries are already conducting these measurements on their own. The World Meteorological Organization has produced a new edition of the Manual for the GAW Precipitation Chemistry Programme in November 2004 which provides the latest guidelines, Data Quality Objectives and Standard Operating Procedures. STM7 had recommended the WMO Manual be used as a reference for selection of monitoring sites. The EANET manual should therefore be updated to ensure international harmonization of monitoring practices.
8. The existing Technical Document for Monitoring on Inland Aquatic Environment in East Asia, focuses mainly on sampling and analysis of water samples collected from lakes. Some countries are sampling water from rivers and streams and there may be a need to update this document to include the new methodologies involved. In addition, if the other Technical Documents are updated it is appropriate that this document be updated in line with the plan for an integrated approach for monitoring ecological impacts in the EANET region.

9. Some EANET scientists are of the opinion that both the Technical Documents for Wet Deposition Monitoring in East Asia and Technical Documents for Monitoring on Inland Aquatic Environment in East Asia are still applicable for the period 2006-2010 without any changes and therefore they need not be revised at this stage. Changing the procedures and reporting formats significantly may create confusion among the technical staff of the participating countries who are already accustomed to the current system. Therefore sufficient training must be given to the staff if the manuals are revised substantially.
10. At the Eighth Senior Technical Managers' Meeting held in Bogor, Indonesia on 1 – 3 August 2007, the senior technical managers representing the countries participating in EANET discussed this issue and suggested that updates/revisions of the existing manuals should be considered according to the current situation, possibility and necessity of some requirements that would arise in EANET. It was also recommended that the schedule for the updates should be decided as a first step taking the circumstances of experts into account. It was pointed out that significance and meaning of the respective monitoring parameters should be clarified in the process of reviewing the current Technical Manuals.

III. Action Required

11. The Seventh Session of the Scientific Advisory Committee on Acid Deposition Monitoring Network in East Asia (SAC7) is invited to consider the current situation and deliberate on the necessity for a revision of the Technical Document for Wet Deposition Monitoring in East Asia and the Technical Document for Monitoring on Inland Aquatic Environment in East Asia in view of the following reasons:
 - i) progress in environmental monitoring techniques
 - ii) experiences in conducting monitoring of wet deposition and inland aquatic environment monitoring accumulated by participating countries during the regular phase monitoring during these 7 years
 - iii) possibility of new monitoring parameters
12. IG8 decided that the establishment of sub-groups or ad hoc meetings would be decided by IG. Therefore, if it is considered necessary to review the two documents, it is proposed that SAC7 recommend to IG9 the establishment of the following Ad hoc Expert Working Groups to carry out the tasks:
 - i) Ad hoc Expert Working Group on Revision of Technical Manual on Wet Deposition Monitoring
 - ii) Ad hoc Expert Working Group on Revision of Technical Manual on Inland Aquatic Monitoring

It is suggested that NC be the Secretariat of the two Ad hoc Expert Working Groups.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration of recommendation on the estimation methods for dry deposition flux in EANET

Network Center for EANET

1. Background

The deposition process of gaseous and particulate matters in the atmosphere is divided into “wet deposition” and “dry deposition”. In order to evaluate the ecological impact caused by the acid deposition, it is required to monitor both of the wet and dry depositions for the same period. The wet deposition can be observed easily by collecting and analyzing rain and snow fall. On the other hand, further verification is still required for the measurement methods of the dry deposition because the dry deposition process is affected by a character of the depositing matters, surface properties and the meteorological conditions. In this context, the method for routine monitoring of the dry deposition has not been established yet in EANET. In the present state for the dry deposition monitoring in EANET, the measurement of gases and particles concentrations in the atmosphere which are necessary parameters for the estimation of the dry depositions has been implemented in advance.

2. Expected outcomes for dry deposition fluxes in the Strategy on EANET Development

According to the framework described in the second edition of “Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET” which was endorsed in SAC5 (2005, Niigata), the following activities are included in “Strategy on EANET Development (2006-2010)” which was endorsed in IG8 (2006, Viet Nam) as expected outcomes for the estimation of dry deposition flux;

- *Development and application of monitoring methods for dry deposition considering current country-specific monitoring methodology*
 - Technical Manual for dry deposition fluxes estimation prepared by Task Force on Dry Deposition Monitoring (2008-2010)
 - Estimation of dry deposition fluxes at the selected monitoring sites (2009-2010)

3. Estimation methods for dry deposition fluxes

Further verification is still required for the measurement methods of dry deposition flux because the dry deposition process is affected by a character of the depositing matters, surface properties and the

meteorological conditions. Measurement technique for dry deposition flux can be divided mainly into direct measurement and inferential method. The direct measurement represented by the Gradient Method is not appropriate for a routine monitoring in the network because it requires prohibitive cost and skilled works. On the other hand, the inferential method does not require the special equipments but can calculate the flux from the multiplication between air concentration and dry deposition velocity (V_d) which is calculated by some parameters like meteorological factors, land use types and seasonal categories.

Inferential method can output dry deposition flux without high cost and skilled measurements and the second edition of Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET recommends its application in EANET. However, inferential methods have been mainly developed in U.S. and Europe and validation survey should be undertaken in advance of Asian application. In addition, every necessary meteorological factor has not been monitored at many sites in the current states of EANET. Thus, as a case study, NC presented example estimation of dry deposition flux of SO_2 at SAC6 by means of a meteorological simulation model outputs. Figure 2 shows the estimated annual amount of SO_2 dry deposition, annual amount of $nss-SO_4^{2-}$ wet deposition and annual precipitation in 2004 at EANET sites.

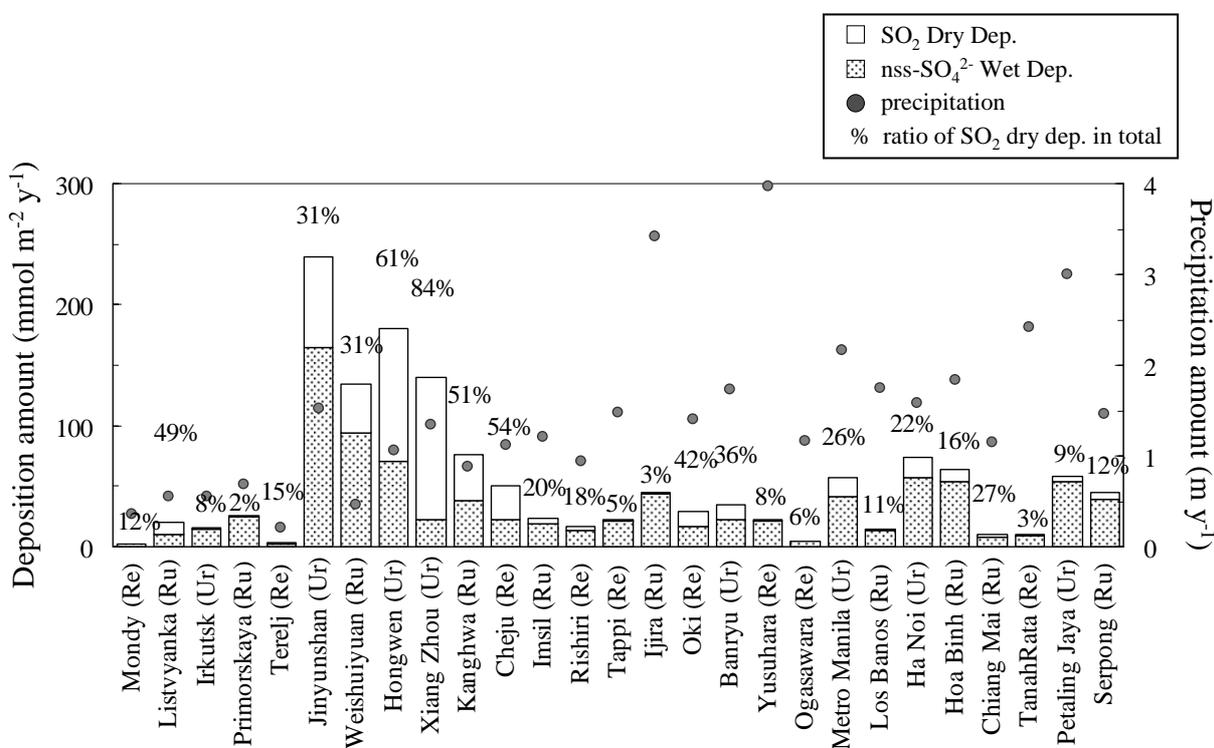


Figure 2 Estimated annual amount of SO_2 dry deposition, annual amount of $nss-SO_4^{2-}$ wet deposition and annual precipitation in 2004 at EANET sites.

In order to evaluate the ecological impact caused by the acid deposition, it is essential to estimate both of the wet and dry depositions. Though each country recognizes that dry deposition flux must be evaluated in EANET, there are various opinion among countries. For example, (1) dry deposition flux should be estimated by each country freely, (2) we want to use dry deposition velocity (V_d) that was obtained by our direct measurement survey, and (3) simple direct measurements like throughfall measurement and surrogate surface measurement method can also be applied. At this moment, it seems to be important to grasp the approximate amount of dry deposition and its estimation should be implemented in a hurry by using any kinds of estimation method. If we get different results of estimated dry deposition amount, comparison study can be suggested and ecological impact should be evaluated according to minimum/ensemble/maximum deposition amount.

4. Issues to be discussed in SAC and Task Force on Dry Deposition Monitoring

Enhancement of meteorological measurement (temperature, wind speed and direction, relative humidity and solar radiation) should be required for every site. Also followings are issues to be discussed in SAC and Task Force on Dry Deposition Monitoring for the present;

1. Clarification of the member of Task Force on Dry Deposition Monitoring
2. Discussion on publication method of dry deposition fluxes
 - every year by Data Report by each country
 - every 5-year by Periodic Report by experts
3. Review of existing researches of direct measurement and inferential method
4. Selection of monitoring sites where the estimation by inferential method or direct measurements should be implemented
5. Validation of inferential method by using direct measurement results obtained in and outside of EANET
6. Consideration of the contents of Technical Manual for dry deposition fluxes estimation
7. Discussion on the future direction for the estimation of dry deposition flux after 2010
8. Consideration of the establishment of **Ad Hoc Expert Group under TF** to conduct above tasks

The Seventh Session of the Scientific Advisory Committee
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Consideration on promotion of emission inventories

1. Introduction

In the Strategy on EANET Development (2006-2010), “Discussion on promotion of modeling activities and emission inventories” is put on as one of the activities to be undertaken under the category “Modeling activities and emission inventories”. The targets of this activity are described as follows:

- Clarification of future direction on modeling activities and emission inventories in EANET
- Clarification of necessary measures to implement modeling activities and to develop emission inventories

Emission inventories are now regarded widely as indispensable tools for a wide range of environmental measures such as the effective management of air quality. Emission inventory can be utilized for a better understanding of actual emissions and help to raise the awareness of both policy makers and the general public, input data for atmospheric transport and deposition modeling, setting emissions targets based on scientific and technical knowledge, a consideration of possible and cost-effective emission reduction measures including regulations, economic measures or technical measures, an evaluation of policies on air quality control measures in each country.

However, many countries in EANET have not developed a national emission inventory on air pollutants, so that such countries don't have sufficient understandings and experiences to create their national emission inventories. Therefore, it is needed to promote emission inventories in EANET due to obtain the benefits from emission inventories and to contribute to improve the air quality management in EANET countries. In order to promote emission inventories in EANET, it is useful to enhance the understanding on emission inventories by learning the knowledge and the experiences of existing emission inventories.

2. Consideration on promotion of emission inventories

Regarding promotion of emission inventories, Ministry of the Environment of Japan has supported the Workshop on Emission Inventory, which was held back to back the seventh meeting of SAC, in order to provide the clear understanding on emission inventories.

As one of the priority projects for submission to potential funding agencies, “Pilot project on emission inventories for interested participating countries” in the document of “PRIORITY PROJECTS FOR SUBMISSION TO POTENTIAL FUNDING AGENCIES” (EANET/WGFD5/5) was considered at WGFD5 in last September, and it is expected to propose the project to potential funding agencies after the endorsement of the concept paper of the project by the NFPs.

It is important to continue to promote awareness on emission inventories and to consider an emission inventory which participating countries of EANET will be able to implement practically with understanding on the current situation of the capability to develop an emission inventory in each country. The consideration of promotion on emission inventories may require discussions of various issues including following items:

- Exchange of information on the current situation of the capability to compile an emission inventory in each country. The capability may include the availability of some statistical data for social and economic activities to estimate emissions such as the amount of each kind of fuel burning and the average distance of each type of vehicle traveled.
- The possible outline of emission inventory in EANET and the method to develop an emission inventory by each country, based on enough understanding on the current situation on EANET countries. It is also important to consider the actual utilization of emission inventory and needs of EANET countries.
- The further and appropriate measures to build the capacity to develop an emission inventory in each country.

This discussion will need wide knowledge concerning air pollution management and the various social and economic activities emitting air pollutants from various emission sources, because there are so many kind of activities emitting air pollutants and it is essential to get their detailed information such as their activities data and their emission factors. In order to discuss these issues, it is important that researchers and experts on emission inventories and air pollution management will participate in the discussion. Researchers on modeling will be also invited the discussion to extend the utilization of emission inventories.

Therefore, it is necessary to consider how the discussion of emission inventories will be carried on. The items to be discussed, participants in discussion and a place of the discussion should be made clear before beginning the discussion.

3. Action Required

The session is invited to discuss to establish “**Ad Hoc Group on the promotion of modeling activities and emission inventories**”. The ad hoc group will be expected to discuss the future activities and its targets on promotion on emission inventories and an adequately form to continue the discussion on emission inventories for example an establishment of a taskforce.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration on establishment of a transparent framework for reviewing substances to be monitored including other air pollutants and their monitoring parameters

1. Introduction

1. Since the Acid Deposition Monitoring Network in East Asia (EANET) started its regular-phase activities in January 2001, it had focused on monitoring acid deposition and assessing its impacts. However, acid deposition is interlinked with other air pollutants, and in order to comprehensively assess the state of acid deposition and impacts of regional air pollution including acid deposition in the East Asian region, it is necessary to adopt a more comprehensive approach on monitoring the atmospheric and ecological environment, taking other chemical species into account besides acidic and basic substances. Such an approach will provide more beneficial information for enhancing regional management of the atmospheric environment in East Asia.
2. It is perhaps timely that EANET consider other important monitoring parameters that are informative for air quality assessment in the EANET framework. Recent initiatives to address regional environmental health challenges, such as the Regional Forum on Environment and Health led by WHO-UNEP, and current concerns on effects of transboundary photochemical smog (ground level ozone) on health, look towards EANET to play a leading role in gathering relevant data that can ably support the health assessments.
3. On the basis of the above, the necessity to review the list of priority substances has been raised by member countries at discussions during previous Senior Technical Managers' meetings and sessions of the Scientific Advisory Committee. An activity proposing the establishment of a framework for reviewing substances to be monitored including other air pollutants and monitoring parameters was introduced in the Strategy for EANET Development (2006-2010) under the category of "Other relevant activities including those for future development and new researches of EANET".
4. This activity should be implemented during the period 2006 – 2007 with two outputs:
 - i) A transparent framework for reviewing substances to be monitored
 - ii) Recommendations on monitoring parameters, measurements and equipment for EANET sites

II. Current Status of Monitoring in EANET Countries

5. The Guidelines for Acid Deposition Monitoring in East Asia, adopted at the Second Interim Scientific Advisory Group Meeting in March 2000 recommended a range of monitoring parameters of which some are mandatory and others are optional parameters. The recommended parameters for wet deposition monitoring, dry deposition (air concentration) monitoring, soil and vegetation monitoring and monitoring of inland and aquatic environments, as described in the Guidelines are summarized in Annex 1.

6. In the second edition of the Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET endorsed by the Fifth Session of the Scientific Advisory Committee in September 2005, the recommended chemical species for EANET dry deposition monitoring were further prioritized as followed:
First priority: SO₂, O₃, NO, NO₂ (urban), HNO₃, HCl, NH₃
Particulate component (SO₄²⁻, NO₃⁻, Cl⁻, NH₄⁺, Na⁺, Mg²⁺, K⁺, and Ca²⁺),
PM10
Second priority: NO₂ (rural and remote), PM2.5

7. At present there are 50 EANET sites sampling rainwater and conducting analysis for the mandatory precipitation chemistry parameters stated in Annex 1. Not all the sites are analyzing the optional parameters for wet deposition monitoring which are: HCO₃⁻, F⁻, PO₄³⁻, heavy metals, Al, Hg, and organic acids. In the case when ion balance as required by the QA/QC program is not systematically attained by measuring the major ions, the measurement of some additional ions such as HCO₃⁻, F⁻, PO₄³⁻ and organic acids may be required. Heavy metals may also be measured to characterize precipitation.

8. With regard to dry deposition (air concentration) monitoring, there are only 37 sites in the EANET region monitoring dry deposition (Annex 2) and not all the recommended parameters are monitored at all the sites. Japan, Republic of Korea and some sites in Thailand are monitoring the parameters using both automatic instruments and filter packs while some other sites are using automatic instruments for some parameters only and others are using filter packs only. One of the reasons for the limited number of sites using automatic instruments is the high cost of purchase and maintenance of the automatic instruments.

9. There are two types of automatic instruments for measurement of gaseous nitrogen oxide compounds which uses different methods: Differential Optical Absorption Spectroscopy method (DOAS) and ChemiLuminescence Detection method (CLD). In addition to its use for

SO₂ measurements, the DOAS type is used for monitoring NO₂ while the CLD type is used to monitor NO_x (urban), NO_{x*} (Rural/Remote), NO and NO₂ (NO_x-NO).

10. There is also a need to unify the measurements of gaseous nitrogen oxide compounds monitored and reported in the participating countries of EANET. It is suggested that NO₂ be measured and either NO_x, NO_{x*} or NO_y. Because of non-unified reporting on these monitored data, their behaviors on the regional-scale have not been assessed in the first Periodic Report on State of Acid Deposition in East Asia (PR SAD). Comparison of these chemical species with SO_x is essential to understand the regional status of acid deposition in East Asia.
11. Although the concentration of heavy metals in the atmosphere has been on a declining trend in Europe, there have been no coordinated regional efforts to monitor trends of heavy metals in East Asia. In view of the relationship between mercury and atmospheric acidification, EANET may wish to consider recommending the monitoring of selected heavy metals as second priority parameters.
12. The serious impacts of high concentrations of ozone and fine particulate matter on human health and vegetation have been well documented in many countries and is an issue of current concern in the Northeast and Southeast Asian countries in view of increasing emissions of NO_x and VOCs from industries, motor vehicles and from biomass burning activities. Transboundary transport of the resulting ground level ozone in the atmosphere on hemispheric scale affecting the Northeast Asian countries, and affecting the Southeast Asian countries during the dry months, is an emerging environmental issue. EANET may wish to consider placing higher priority to the monitoring of ozone and PM_{2.5}. More comprehensive measurements of particulate matter in various size ranges will also provide additional input for regional/hemispheric studies on the impacts of yellow sand transport from central Asia. Additional chemical species such as VOCs and NMHCs could also be considered as their effects are interlinked.
13. As for monitoring on soil, vegetation, and inland aquatic environment, the need to carry out monitoring of the optional parameters depend on the respective monitoring plots. The future direction of ecological monitoring will be discussed in the review of the Strategy Paper for Future Directions of Soil and Vegetation monitoring of EANET.

III. Other Considerations

14. In order to decide on new substances to be monitored in EANET countries and the priorities, it

may be necessary to consider the parameters monitored in other regional air quality networks which are similar to the circumstances in EANET. In the case of some networks, countries are requested to make some mandatory measurements to support regional agreements/protocols but other measurements that would permit more detailed assessments are encouraged. The situation in EMEP for the CLRTAP and CASTNET are mentioned below as examples:

Convention on Long-range Transboundary Air Pollution (CLRTAP), UNECE

15. The measurement program of Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) under CLRTAP includes measurements of acidifying and eutrophying compounds, ozone, heavy metals, persistent organic pollutants, particulate matter and VOC. As for acidifying and eutrophying compounds (such as S, H⁺ and nutrient N) and heavy metals, critical loads approach was applied in cooperation of Working Group on Effects (WGE) and its International Cooperative Programmes (ICPs: ICP Forests, ICP Mapping and Modeling, etc.). As for ozone, effects of its direct exposure on plants are assessed in ICP Forests and ICP Vegetations. Based on these scientific evaluations, several protocols were adopted under CLRTAP (e.g. Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone in 1999; Oslo Protocol on Further Reduction of Sulphur Emissions in 1994).

CASTNET (US)

16. CATNET focuses on the monitoring of ground-level ozone and total acid deposition using both wet and dry deposition measurements. The chemical components measured in wet deposition include sulfate, nitrate, and ammonium. The dry chemical components of acid deposition monitored include particulate matter (sulfate (SO₄²⁻) and nitrate (NO₃⁻)), gaseous nitric acid (HNO₃), sulfur dioxide (SO₂), and ammonium (NH₄⁺).
17. At the Eighth Senior Technical Managers' Meeting held in Bogor, Indonesia on 1 – 3 August 2007, the senior technical managers representing the countries participating in EANET discussed this issue and noted that the Monitoring Guidelines had already proposed a very comprehensive list of monitoring parameters, especially for monitoring of inland aquatic environment. It was pointed out that the expansion of monitoring activities should be advanced step by step in line with the suggestions and decisions by STM, SAC and other EANET bodies. There are several important considerations including the determination of priority of new substances to be monitored and the establishment of Task Force to carry out the review in a transparent manner.
18. It was suggested by an expert that chemical species related to climate change such as black

carbon, elemental carbon and CO₂ should be taken into account. Some monitoring sites could be identified for conducting the monitoring of the additional parameters.

IV. Actions Required

19. The Seventh Session of the Scientific Advisory Committee on Acid Deposition Monitoring Network in East Asia (SAC7) is invited to take note of the status of monitoring in the current EANET program and deliberate on the following:
 - i) the need to review the current priorities
 - ii) the need to include additional parameters to the current monitoring list
 - iii) the necessity to establish an Ad Hoc Expert Working Group to carry out the above tasks

20. IG8 decided that the establishment of sub-groups or ad hoc meetings would be decided by IG. Therefore, SAC7 may wish to recommend to IG9 the establishment of an Ad hoc Expert Working Group to Review the Priority Substances to be monitored in the EANET network. SAC7 may also wish to recommend that NC functions as the Secretariat of the Ad Hoc Expert Working Group.

Recommended Parameters for EANET Monitoring

➤ Wet deposition (Rainwater):

Rainwater acidity and concentrations of ions due to acids and bases.

- pH, electric conductivity (EC), Cl⁻, NO₃⁻, SO₄²⁻, NH₄⁺, Na⁺, K⁺, Ca²⁺, Mg²⁺, NO₂⁻, HCO₃⁻, F⁻, PO₄³⁻, heavy metals, Al, Hg, and organic acids

➤ Dry deposition (Air concentration):

Air concentrations of gaseous and particulate forms of acidic and basic compounds as well as ozone

- **Gases:** SO₂, O₃, NO, NO₂, HNO₃, and NH₃,
- **Aerosols:** particulate mass concentration (PM) and concentrations of ions (SO₄²⁻, NO₃⁻, NH₄⁺, and Ca²⁺)

➤ Soil and vegetation (in forest area):

Chemical and physical properties of soil, forest vegetation characteristics, and condition of tree decline

- **Soil:** moisture content, pH (H₂O), pH (KCl), exchangeable base cations (Ca, Mg, K and Na), exchangeable acidity, exchangeable Al, exchangeable H, effective cation exchange capacity (ECEC), carbonate content (for calcareous soil), total carbon content, total nitrogen content, fine earth bulk density, penetration resistance, available phosphate, sulfate
- **Forest vegetation:** description of trees (name of species, diameter at breast height, and height of tree), understory vegetation survey, survey of tree decline (observation of tree decline, photographic record of tree decline, and estimation of decline causes)

➤ Inland aquatic environment (lake and river water):

Concentrations of ions due to acids and bases, and some chemical and biological parameters

- Water temperature, pH, EC, alkalinity (at pH 4.8 baseline), NH₄⁺, Ca²⁺, Mg²⁺, Na⁺, K⁺, SO₄²⁻, NO₃⁻, Cl⁻, NO₂⁻, PO₄³⁻, transparency, water color, DOC (if impossible, COD), pore water of sediment (SO₄²⁻, NO₃⁻ and NH₄⁺), total Al, phytoplankton (diatom species), living organisms other than phytoplankton, epilithic algae, sediment (Pb, Pb-210 and stable isotope of S)

Based on the Guidelines for Acid Deposition Monitoring in East Asia (2000)

Note: Underline indicates optional parameters; Italic indicates voluntary parameters for soil monitoring

Status of Air Concentration Measurements at Dry Deposition Monitoring Sites

Country	Name of sites	Characteristics of sites	Automatic			Filter Pack	Other Method
			SO ₂ ,NO _x	O ₃	PM		
China	Chongqing-Jinyunshan	Rural	✓	None	✓	None	None
	Xi ' an	Rural	✓	None	✓	None	None
	Weishuiyua	Urban	✓	None	✓	None	None
	Hongwen	Urban	✓	None	✓	None	None
	Zhuhai	Urban	✓	None	✓	None	None
	Xiang Zhou						
Indonesia	Serpong	Rural	None	None	None	✓	None
Japan	Rishiri	Remote	✓	✓	✓	✓	None
	Tappi	Remote	✓	✓	✓	✓	None
	Ogasawara	Remote	✓	✓	✓	✓	None
	Sado-seki	Remote	✓	✓	✓	✓	None
	Happo	Remote	✓	✓	✓	✓	None
	Oki	Remote	✓	✓	✓	✓	None
	Yusuhara	Remote	✓	✓	✓	✓	None
	Hedo	Remote	✓	✓	✓	✓	None
	Ijira	Rural	✓	✓	✓	✓	None
	Banryu	Urban	✓	✓	✓	✓	None
Malaysia	Petaling Jaya	Urban	None	None	None	✓	LV,PS
	Tanah Rata	Remote	None	None	None	✓	LV,PS
Mongolia	Ulaanbaatar	Urban	None	None	None	✓	None
	Terelj	Remote	None	None	None	✓	None
Philippines	Metro Manila	Urban	None	None	None	✓	None
	Los Banos	Rural	None	None	None	✓	None
Republic of Korea	Kanghwa	Rural	✓	✓	✓	✓	None
	Cheju(Koson)	Remote	✓	✓	✓	✓	None
	Imsil	Rural	✓	✓	✓	✓	None
Russia	Mondy	Remote	None	✓	None	✓	None
	Listvyanka	Rural	None	None	None	✓	None
	Irkutsk	Urban	None	None	None	✓	None
	Primorskaya	Rural	None	None	None	✓	None
Thailand	Bangkok	Urban	✓	None	✓	✓	AS
	Samutprakarn	Urban	✓	✓	None	None	AS
	Patumthani	Rural	None	None	None	✓	None
	Khanchanaburi	Remote	✓	✓	✓	✓	None
	Chiang Mai (Mae Hia)	Rural	✓	✓	✓	✓	None
Vietnam	Hanoi	Urban	None	None	None	✓	None
	Hoa Binh	Rural	None	None	None	✓	None

(Note) LV: Low Volume Air Sampler, PS: Passive Sampler, AS: Aerosol Sampler

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration of Research Activities for Further Development of EANET

Network Center for EANET

I. Introduction

1. Promotion and implementation of research activities on acid deposition and related scientific issues are one of the major activities of EANET to be conducted by the Network Center (NC) and the participating countries, according to the “Tentative Design of the Acid Deposition Monitoring Network in East Asia (EANET) (EANET/IG 2/5/3)”. NC elaborated directions of research activities several times (EANET/SAC 2/9/3; EANET/SAC 3/9/2; EANET/SAC 4/12/2; EANET/SAC 5/11/2; EANET/SAC 6/12/3) based on discussions in previous SAC meetings, and research needs on the existing activities as well as activities in new directions have been clarified. Some important related issues were also pointed out to support discussion how to promote research activities by SAC and NC.
2. To strengthen the existing activities including monitoring on acid deposition and ecological effects, the following research needs were clarified:
 - Prospective investigation how to extend the monitoring network
 - Estimation of dry deposition fluxes by the direct measurement method as well as the indirect measurement method (inferential method)
 - Long-term evaluation of O₃ and its precursors
 - Assessment of atmospheric depositions and biogeochemical flow/budget in forested catchments
 - Development of monitoring procedures to detect sensitivity and capacity of soil to acid deposition
 - Assessment of O₃ impacts on trees and crops
3. As activities in new directions, necessity of emission inventories, necessity of modeling works and extension of the EANET scope to impacts on human health were also discussed. Moreover, the following important related issues were also pointed out:
 - Cooperation with other regional activities for inter-regional and global pollution issues
 - Establishment of ad hoc groups: Group for data analysis and Group for research coordination
 - Procurement of research funding
4. “Strategy on EANET Development (2006-2010) (EANET/IG 8/7/1 rev)”, which was adopted by the Intergovernmental Meeting at its 8th Session (IG8), discussed the whole activities of EANET based on the tentative design above. In the Strategy, “Promotion of research activities related to acid deposition problems” was included as one of important major categories, and the following two activities were

proposed for this purpose:

- Consideration on general directions of research activities by SAC: (No. 19)
- Promotion of inter-comparison studies and validation of existing models on acid deposition in East Asia (No. 20)

Several research topics were also clarified for promotion of existing monitoring activities in the Strategy.

5. Research needs discussed in the previous SAC meeting mostly covered the research topics in the Strategy. SAC may have an important role as a scientific body of EANET to implement the activities in the Strategy. In this document, based on the “Strategy on EANET Development (2006-2010)”, research activities and related issues will be considered for further development of EANET. Moreover, new functions in SAC will be discussed for promotion of the research activities and related issues.

II. Current situation of research activities in EANET

6. NC has implemented several research activities in cooperation with organizations relevant to EANET in the participating countries or independently. All the following ongoing research activities are related to the research needs above directly or indirectly. Outcomes of the following research activities will contribute to implementation of the activities in the Strategy on EANET Development.

a. Joint research project with Republic of Korea on aerosol monitoring methodology

In the discussion at SAC4 for the improvement of dry deposition monitoring methodologies, it was suggested that a study on PM10, PM2.5 and their components in special sites should be considered. In line with the suggestion, the project on aerosol monitoring was planned as a joint research between National Institute of Environmental Research (NIER), Ministry of the Environment, Republic of Korea and NC. Preliminary research was implemented in October 2005 and the workshop to be discussed the results was held in February 2006 in Republic of Korea. In order to evaluate aerosol sampling methodology and behavior of fine particles in Japan and Republic of Korea, intensive monitoring was performing at both of Korean site and Japanese site on 12-27 October 2006 and 16-31 May 2007. Several methods for aerosol monitoring including PM2.5 (PM10) collection are implementing simultaneously in both sites. The results of the intensive monitoring have been analyzed and discussed in small workshops held at NIER on a day during NC technical mission every year since 2005.

b. Joint research project with Russia on evaluation of East Siberian atmospheric environment

NC has implemented the joint research project Phase III with the Limnological Institute, Russian Academy of Science, Siberian Branch (RAS/SB) in cooperation with National Institute for Environmental Studies, Japan. Annual acid deposition as well as heavy metals (mercury and lead) and lead isotope ratio in rain and snow have been determined at four sites in East Siberia and Primorsky Region in Russia. The monitoring data are expected to be important for evaluation of long-range

transportation of air pollutants from Europe and industrial regions of Russia to East Asia. The methodologies on data analysis used in the project are expected to be useful for evaluation of EANET monitoring data.

c. Joint research project with Thailand on dry deposition (gas concentration) monitoring

Following the termination of the Joint Research on dry deposition flux (Phase I) from January 2000 to December 2005, NC and PCD agreed to establish Phase II of the Joint Research Project focusing on QA/QC of gas concentration monitoring method in tropical region in August 2005. The difference of gas concentrations among some different types of monitoring methods (automatic monitor, filter-pack method, and passive sampling method) in Bangkok EANET site will be evaluated through the joint research between both organizations in cooperation with Asian Center for Environmental Research, Meisei University, Japan. The observation was started in December 2006.

d. Joint research project with Thailand on catchment analysis

NC started the joint research project on catchment analysis in Thailand in 2005 with Royal Forest Department (RFD) and Environmental Research and Training Center (ERTC) in cooperation with Kyoto University (Japan) as a part of the Global Environment Research Fund (C-052: Project Leader, Dr. Junko Shindo, NIAES), the Ministry of the Environment of Japan. Monitoring on input (deposition) and output (stream water) fluxes in/from a small catchment area, and analyses on other biogeochemical aspects have been carried out continuously, and nutrient dynamics related to acid deposition in the area would be discussed. The project will be informative for the future catchment monitoring as one of activities in line with the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET.

e. Other research activities (Independent and multilateral research activities)

Catchment analysis is one of the issues described in the Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET. For obtaining basic data on this issue, research activities are implemented in a small catchment area in Shibata City, Niigata Prefecture, Japan. The data will be informative for development of guidelines or manual on catchment monitoring as well as implementation of the joint research project on catchment analysis with Thailand.

In order to investigate the differences among the long-range transport models developed for East Asian region, NC has been collaborating with the Model Inter-Comparison Study in Asia (MICS-Asia) Phase II. The overview of the collaboration activities with MICS-Asia are summarized in the other document, "Consideration on collaboration with other initiatives on emission inventories and numerical modeling (EANET/SAC 7/9/4)".

7. In order to promote evaluation of the monitoring data effectively and studies on relevant research topics, and encourage young researchers in the EANET participating countries to join the research

activities, NC has carried out the research fellowship program in 2005 and 2006 in cooperation with the Secretariat. Two researchers were invited in each year, and the fellowship researches were carried out for approximately two months in late autumn in both years.

In 2005, two researchers of China and Philippines were invited to NC. The researcher from China studied the theme entitled “Assessment of ozone variability in East Asia during recent years”. The variability of ozone concentration observed at sixteen sites in East Asia during recent years (from 2000 to 2004) was analyzed by using EANET monitoring data. The researcher from the Philippines studied the theme entitled “Determination of unanalyzed components in rainwater”. In order to obtain good quality data on wet deposition monitoring, unanalyzed components on routine analysis, such as HCO_3^- , F^- , Br^- , NO_2^- , PO_4^{3-} , H_2PO_4^- , HCOO^- and CH_3COO^- were determined in addition to the ten major parameters in rainwater samples collected at EANET wet deposition monitoring sites in the Philippines.

In 2006, two researchers of Mongolia and Russia were invited to NC. The researcher from Mongolia studied the theme entitled “Determination of unanalyzed components in rain water”. Unanalyzed components in rainwater samples collected in Mongolia were determined. The researcher from Russia studied the theme entitled “Application of scientific climatological approach and statistical methods for optimization of EANET network”. In order to determine the areas for disposition “optimal” EANET network’s station, the precipitation chemistry (nss-SO_4^{2-} , NO_3^- , NH_4^+ , nss-Ca^{2+} , H^+) data obtained for 2000-2005 were calculated by using the statistical method.

III. New planned activities to support the Strategy objectives

8. In addition to the ongoing research activities above, new catchment study in tropical rain forests in cooperation with the OP3 Project in Malaysia is now planned. The OP3 Project (Oxidant and Particle Photochemical Processes above a South-East Asian tropical rain forest) is a three-year scientific research project conducted by eight groups from UK universities, Malaysian institutions (including the Malaysian Meteorological Department) and a combined group from USA. The project will be based in the Danum Valley in Sabah, Malaysia which is also one of the EANET monitoring sites. A BAe 146 research aircraft will be deployed for 3 weeks in Malaysia during the intensive measurement periods: 31 March-4 May 2008 and 23 June-27 July 2008. The overall goal of the project is to lead to a better understanding of the interactions that exist between natural forests and the Earth’s climate system.

ADORC discussed the possibility of collaboration with scientists of Lancaster University, who were leading the sub-project, “Forest fluxes and atmospheric chemistry” in the Project. Based on preliminary discussions with the UK researchers and Malaysian colleagues, several scientists of ADORC will start the activity on “Atmospheric deposition impacts on soil and stream hydrochemistry” under this sub-project. Experience in Thailand can be utilized for this work. ADORC’s involvement in the other

sub-projects which focuses on regional air quality and climate change may be considered. ADORC is now trying to obtain research grants for this new activity. The outputs will be informative for future activities of EANET, especially for the catchment-scale monitoring/modeling, which is one of activities proposed in the Strategy, and also the regional ozone issue.

9. New directions, such as “necessity of emission inventories”, “necessity of modeling works” and “extension of the EANET scope to impacts on human health” are closely related to activities described in the Strategy on EANET Development.

10. As for “necessity of emission inventories” and “necessity of modeling works”, the following activities in the Strategy may be closely related:

- Discussion on promotion of modeling activities and emission inventories (No. 23)
- Promotion of capacity building for model application (No. 24)

Implementation of these activities are discussed in other documents, “Consideration on promotion of emission inventories (EANET/SAC 7/9/1)” and “Consideration on collaboration with other initiatives on emission inventories and numerical modeling (EANET/SAC 7/9/4)”. Especially for modeling works, the latter document discusses also the activity No.20 as mentioned above.

11. As for “extension of the EANET scope to impacts on human health”, the following activity in the Strategy may be related:

- Investigation on environmental/human effects of priority substances and their monitoring requirements such as monitoring equipment, sampling and analytical methods (Activity No.26)

Discussion on implementation of the activity will be started in another document, “Consideration on establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters (EANET/SAC 7/9/2)”, which is to support the activity No.25 in the Strategy.

IV. Issues for promotion of research activities

12. To promote research activities in EANET effectively, it is necessary to consider directions on further development of EANET as well as needs of the participating countries taking into account activities proposed in the Strategy on EANET Development. NC tried to promote research activities according to previous discussions in SAC meetings as well as recommendations in the technical documents of EANET, such as the “Strategy Paper on Future Direction of Dry Deposition Monitoring in EANET” and the “Strategy Paper on Future Direction of Soil and Vegetation Monitoring in EANET.” The discussions and recommendations have already been mostly reflected to the Strategy. Therefore, it can be considered that the current ongoing research activities are carried out in line with the Strategy.

13. The interest of transboundary air pollutions has been increasing in global scale. It is important to have a

common understanding among regions and inter-regional cooperation programs should be created to treat pollution issues in global scale. EANET has been taking initiative for the evaluation of acid deposition in East Asian region, and it is necessary to conduct data analysis for regional and national environment assessments to contribute to cooperation activities with other programs, such as EMEP, CASTNET, WMO, Regional Forum on Environment and Health, TF HTAP, etc. Therefore NC will establish a special data-assessment group to conduct data analysis and coordination with the other programs to support these activities.

14. However, the current activities may not be able to cover all the relevant research activities proposed in the Strategy. Moreover, needs of the participating countries cannot be enough considered since the manpower and budget of NC are very limited. On the other hand, the EANET community may have many human resources for various scientific fields. Researchers in the EANET community are encouraged to promote research activities by their funds taking further development of EANET into account, while the EANET budget will be used only for research activities mentioned in the Strategy.
15. As mentioned above, NC may need support of researchers in the EANET community to promote research activities in EANET effectively. Moreover, discussions on research project proposals may need more transparency, and all the participating countries should have some possibility of joining research projects. Some projects which will involve all the participating countries may be considered. Such projects may need input of idea from the participating countries and their strong commitment to participate in the projects and support works.

V. Establishment of new functions

16. For coordination of the above works effectively, new functions must be necessary in EANET. The Strategy on EANET Development proposed also “Consideration on general directions of research activities by SAC”. In the last session of SAC, it was suggested that “Ad hoc Group for research coordination” would be formed. However, research directions should be considered with wide and long-term vision. Therefore, more concrete functions than “Ad hoc Group” may be necessary. Consequently, it can be proposed that **Task Force on Research Coordination should be newly formed under SAC** with the following functions:
 - i) To coordinate all EANET research activities and their results
 - ii) To decide on new directions of research in EANET in 2006-2010 and beyond
 - iii) To assist NC in the review of new research applications/requests from participating countries, from the scientific aspect
17. Task Force on Research Coordination should make efforts together with NC to promote both on-going researches and new short-term studies and to procure national or international research funds for their support. Not only proposals on research directions but also recommendations how to obtain the

financial support for research from funding agencies are expected for their activities.

18. In addition to coordination of new research activities, analysis of the monitoring data obtained in EANET is also an important scientific work with research aspects. In the last session of SAC, it was suggested that “Ad hoc Group for data analysis” would be formed. Results of the data analysis should be compiled as the “Periodic Report”. According to the Strategy on EANET Development, preparation of the next Periodic Report is one of major categories. The following activities were proposed:

- Preparation of periodic assessment reports on the state of acid deposition (No.17)
- Studies for support to the assessment on the state of acid deposition by means of trend analysis, assessment indicators, numerical modeling and so on (No. 18)

19. The first actions for preparation of the next Periodic Report should be started soon. However, it may be too early to form the Drafting Committee. The first Periodic Report has just finished, and therefore, problems encountered and tools/software acquired in the last drafting process should be reviewed for the next work. Preliminary data analysis may also be necessary before starting drafting process. Moreover, NC should update members in charge of this work. Therefore, before forming a concrete Drafting Committee, more flexible function may be appropriate at this stage. Consequently, it can be proposed that **Ad hoc Expert Group on Preparation of the Second Periodic Report on State of Acid Deposition in East Asia should be formed under SAC** with the following function:

- To coordinate all activities relating to the preparation of the next Periodic Report prior to the formation of the Drafting Committee

The Ad hoc Group will be dissolved when the Drafting Committee is established by SAC. The participating countries may nominate the same members to be in the Drafting Committee.

20. For the proposed Task Force and Ad hoc Expert Group, the selection of the Heads of these sub-bodies should be considered among the SAC members with request on special status for coordination of their work (with support of NC) and responsibility to present the results for SAC meetings. The communication and coordination with respective international activities could be also done on the scope of addressed research and activities.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Consideration on collaboration with other initiatives on emission inventories and numerical modeling

Network Center for EANET

1. Introduction

The interest of transboundary air pollutions in Asia has been increasing on scientific and political concern, because countries receive clear amount of pollutants which originate from neighboring and even distant countries. Chemical transport models (CTMs) have become a critical tool in the analysis of the fate and transport of emissions in each scale. In addition, it is expected for CTMs to provide the evaluation of the transboundary air pollutions which is acceptable for the related countries and to help the development of the regional environmental policy. For example, RAINS (Regional Acidification Information and Simulation Models) which was developed by International Institute for Applied System Analysis (IIASA) contributed for the conclusion of the 1994 Oslo Protocol.

The transboundary air pollutions is the issue to be treated as not a local but a regional problem. Moreover, it is important to have a common understanding and discuss the solution for transboundary air pollution among related countries. Since EANET has been taking initiative for the evaluation of the acid deposition in East Asian region, it can be considered as most appropriate body to undertake the evaluation based on the modeling analysis in cooperation with the monitoring analysis in East Asia.

2. Collaboration with MICS-Asia Phase II

In line with “collaboration with existing initiatives on developing emission inventories and numerical modeling” included in the Work Program and Budget of EANET in 2003 through 2007, NC has been making collaboration with MICS-Asia (Model InterComparison Study in Asia) Phase II by establishing its website (<http://www.adorc.gr.jp/adorc/mics.html>) and providing EANET monitoring data for the model validations following the data disclosure of EANET.

Main purpose of MICS-Asia is not a grading test of models but the making of a common understanding of model performance and uncertainties for model development. In addition, participants in MICS-Asia can make good use of the knowledge obtained through the activities to their model development. MICS-Asia Phase I had been carried out during the period from 1998 to 2000 and sulfur compounds were mainly analyzed in its intercomparison study.

Based on discussions and outcome in Phase I, further model intercomparison study was considered as useful to improve the understanding of the long-range transport of air pollutants in Asia. While the Phase I focused exclusively on sulfur compounds, it was recognized that a wider perspective could yield important insights including nitrogen compounds, ozone and aerosols to be critical for effective control of various environmental problems. Through the interpolation of Phase I activities and discussions among participants, MICS-Asia Phase II has been conducted since 2003. Participating modeling teams were requested to use standard input data and to provide their model results in common domain and periods shown in Table 1 to undertake the following analyses;

[Analytical framework]

- Spatial distribution of monthly averaged concentrations for 13 species: SO₂, NO, NO₂, HNO₃, PAN, NH₃, O₃, sulfate, nitrate, ammonium, SO₄²⁻ in precipitation, NO₃⁻ in precipitation and NH₄⁺ in precipitation, in the layer including the height of near surface, 300, 1500, 3000 and 6000 meters above ground level.
- Horizontal distribution of monthly averaged dry and wet depositions. 7 species: SO₂, HNO₃, NH₃, O₃, sulfate, nitrate and ammonium were selected as targets for dry deposition analysis including the discussion on deposition velocities. And 3 species: SO₄²⁻, NO₃⁻ and NH₄⁺ were selected as targets for wet deposition analysis.
- Spatial distribution of monthly averaged meteorological fields in the 5 layers.
- Comparison between model results and EANET monitoring data for 7 species: SO₂, NO, NO₂, HNO₃, O₃, sulfate and nitrate. Detailed comparison between simulation and monitoring was made at selected sites on monthly and daily basis.
- Comparisons with special events, which were Trace-P and other monitoring activities.

EANET monitoring data were used for the model validation. Finally, 9 modeling groups shown in Table 2 submitted their model results in the Phase II project. It was decided at the 6th workshop (February 2004, IIASA) that the outcomes of Phase II activities would be summarized as 5 kinds of topics by Working Group members as follows;

- Over view : Prof. Carmichael (Iowa Univ., U.S.)
- Ozone and its relevant gases : Dr. Z. Han (ADORC, Japan)
- Aerosols : Dr. H. Hayami (CRIEPI, Japan)
- Depositions : Prof. Z. Wang (IAP, China)
- Relationship with global model : Dr. T. Holloway (Univ. of Wisconsin-Madison, U.S.)

In the 8th workshop (January 2006, IIASA), working group members gave presentations about their progress, and fruitful discussions were made with useful comments and suggestions from other MICS participants in order to develop the contents of the papers. In addition to the five papers above, it was decided at the workshop that further scientific papers would be prepared by cooperation of MICS participants. New topics of analysis and the persons in charge were as follows:

- Emission Intercomparison : Dr. A. Kannari (Freelance, Japan)
- Sensitivity to aerosol modules : Dr. K. Saltelet (CEREA, France)
- CMAQ comparison : Prof. J. Fu (Univ. of Tennessee, U.S.)

As a result, a special section contained by eight kinds of scientific papers will be published within 2007 in the journal of Atmospheric Environment. Further details of the activities in MICS-Asia Phase II are described in its web site.

Table 1 Framework for the simulation in MICS-Asia Phase II

Conditions for simulation	
Domain	15S-60N, 75E-160E
Grid size	0.5 by 0.5 degree
Prepared emission data	SO ₂ , NO _x , CO, CO ₂ , PM10, PM2.5, BC, OC, NH ₃ , CH ₄ , isoprene, terpene, VOCs (anthropogenic, biomass, natural and volcano sources)
Boundary conditions	Calculated by MOZART-2 ⁽¹⁾
Meteorological fields	Calculated by MM5 ⁽²⁾
Period	March, July and December 2001 and March 2002

(1) Model for OZone And Related chemical Tracers version 2

(2) the fifth-generation Mesoscale Model of non-hydrostatic version

Table 2 Participating modeling teams of MICS-Asia Phase II

Modeling teams	
Prof. G. Carmichael and Dr. N. Thongboonchoo	CGRER ⁽¹⁾ , Iowa Univ., USA
Dr. M. Engardt and Dr. C. Bennet	SMHI ⁽²⁾ , Sweden
Prof. J. Fu	Tennessee Univ., USA
Dr. C. Fung and Dr. A. Chang	Hong Kong EPD ⁽³⁾ , China
Dr. Z. Han and Dr. Sakurai	ADORC, Japan
Dr. H. Hayami	CRIEPI ⁽⁴⁾ , Japan
Dr. M. Kajino and Prof. H. Ueda	DPRI ⁽⁵⁾ , Kyoto Univ., Japan
Dr. K. Sartelet	CEREA ⁽⁶⁾ , France
Prof. Soon-Ung Park	Seoul National Univ., Korea

(1) Center for Global and Regional Environmental Research

(2) Swedish Meteorological and Hydrological Institute

(3) Hong Kong Environmental Protection Department

(4) Central Research Institute of Electric Power Industry

(5) Disaster Prevention Research Institute

(6) Centre d'Enseignement et de Recherche en Environnement Atmospherique

3. Expected outcomes for modeling in the Strategy on EANET Development

As is evident from the activities in MICS-Asia, CTMs can evaluate various outcomes, such as (i) spatial distribution analysis, (ii) episode analysis of high concentration phenomenon, (iii) trace analysis, (iv) source-receptor relationship analysis, and (v) future forecast based on scenario analysis for key species for acid deposition, regional health and ecosystem protection. However, feasibility studies are important to develop a better common understanding of the performance and uncertainties of CTMs in Asian applications as a first step. In this context, the Strategy on EANET Development includes the following activities to be under taken for the present;

- *Promotion of inter-comparison studies and validation of existing models on acid deposition in East Asia*
 - Recommendation on improvement of regional atmospheric transport/chemistry/deposition models (2007-2010)
 - Support to initiatives of participating countries on atmospheric modeling and its application (2007-2010)

- *Discussion on promotion of modeling activities and emission inventories*
 - Proposals on promotion of modeling activities and emission inventories (2007-2008)

- *Promotion of capacity building for model application on urban, national and regional scale*
 - Designation of suitable standard models of each scale for research/training application (2007)
 - Promotion of the training courses on application of the standard models including cooperation with other organizations (2006-2010)

4. Discussion on the procedure for the promotion of modeling activities in EANET

The expected outcomes in the Strategy on EANET Development are regarded as a promotion of feasibility study or capacity building to be undertaken in advance of the concrete researches by CTMs within EANET. In conclusion, the following procedure can be proposed to achieve the expected outcomes;

1. Preparation of opportunities to have a discussion for model intercomparison and improvement of models,
2. Designation of suitable standard models for research/training application,
3. Support of participating countries regarding their initiatives and promotion of the training courses,
4. Discussion on necessary researches by means of CTMs in EANET.

The experiences obtained in MICS-Asia can be applied to the execution of above procedure. In addition, if the emission inventories are developed in EANET, emission comparison study can be planned between EANET and MICS-Asia. Also evaluation based on the plural models and emission data can be persuasive for the development of the environmental policy. Thus, it is important to continue to support MICS-Asia and obtain contributions from its activities by a closer collaboration.

There are various activities regarding modeling conducted by participating countries, such as LTP Project coordinated by Republic of Korea, JICA third country training on emission and model in Thailand, and modeling and emission studies in Viet Nam. It is also important to support and create closer collaboration with those activities to consider the promotion of modeling activities in EANET. Thus, as a body to have discussions on the promotion of modeling activities and emission inventories, NC suggests establishing “**Ad Hoc Group on the promotion of modeling activities and emission inventories**” in order to enable SAC members to be informed and consulted regarding activities related to the promotion within EANET.

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

Report on cooperation with other international programmes and initiatives

I. Introduction

1. EANET as a regional intergovernmental network participated by thirteen member countries in East Asia encourages close cooperation among its members and also with other regional and international programmes and initiatives to jointly address regional and global air pollution issues. Collaboration with international and regional programmes is essential to ensure the sustainability and future growth of the network.
2. Since its establishment, EANET has continued to build and strengthen links with some international programmes and initiatives such as the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMEP) under the Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the World Meteorological Organization (WMO).
3. Many of the activities identified in the Strategy on EANET Development (2006-2010) will benefit from enhancing existing linkages and establishing new partnerships with the international and regional programmes involved in air quality monitoring and assessment. Currently, some of the areas that NC is pursuing cooperation includes:
 - joint research studies in the EANET region involving researchers from NC, participating countries and interested external scientists
 - participating in activities organized by other international/regional initiatives
 - coordinating investigations on global or inter-regional transport of air pollutant which threaten human health and ecosystems
 - learning the good practices for addressing regional and transboundary air pollution problems, including application of modeling and emission inventories, evaluation of long-term effects, control and mitigation measures, etc.
4. Building partnerships with potential donor agencies and contributors have been identified as one of the means of obtaining financial resources and support for research activities. The Network Center (NC) and the Secretariat of EANET will continue to seek opportunities to inform and update the international and regional scientific programs and potential funding agencies on EANET activities, highlighting the significance and achievements since the start of its regular activities, and the need to continue efforts to promote a comprehensive approach

to relevant environmental problems. Materials such as recent publications, the Strategy on EANET Development (2006-2010), Periodic Report on the State of Acid Deposition in East Asia, and Report for Policy Makers will be used to promote EANET activities.

II. Existing Cooperation with International and Regional Programmes

II-1 Cooperation with CLRTAP

5. EANET has maintained close contact with CLRTAP in particular the Task Force on Hemispheric Transport of Air Pollutants (TF HTAP) since the start of the regular phase activities and has gained from sharing experiences in the implementation of the UNECE Convention on Long-Range Transboundary Air Pollution. Existing cooperation with EMEP includes:

- participation at TF HTAP meetings by EANET representatives
- participation in EANET meetings by CLRTAP staff, such as in recent WGFD4 and STM8
- cooperation with the International Cooperative Programmes (ICPs) under the Working Group on Effects (WGE):
 - i. participation in each other's meetings
 - ii. review of the Sub-Manual on Forest Vegetation
 - iii. participation in inter-laboratory comparison projects

6. Possible cooperation with EMEP in the future is being explored in the following areas:

- participation in preparation of Assessment Report on Hemispheric Transport by TF HTAP
- holding scientific meetings in Asia jointly with TF HTAP
- exchange of air pollution monitoring data
- participation in cooperative modeling and assessment activities
- monitoring activities in Central Asia
- participation in ACCENT Workshop in January 2008

7. The Co-chairs for TF HTAP, Mr. Terry Keating of US EPA and Mr. Andre Zuber of the European Commission, have approached EANET on the possibility of holding a workshop in conjunction with one of the EANET meetings to promote cooperation with regional air pollution networks in Asia on the work of TF HTAP. They have proposed that the joint workshop be held in the fall of 2008. The Secretariat in collaboration with the Network Centre is considering the possibility of holding the workshop back-to-back with the Eighth Session of the Scientific Advisory Committee (SAC8) in 2008. The 2-day workshop to be organized by TF HTAP will have linkage with the SAC and TF HTAP is considering distributing their

Interim Report on Hemispheric Air Pollution as input to the SAC Session.

8. EANET has participated in some joint activities with the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). NC sent a mission to the 23rd Task Force Meeting of International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) held in Zvolen, Slovak Republic in May 2007. Possibility of further collaboration between EANET and ICP Forests were discussed.
9. The TF HTAP has an objective to prepare an assessment report by 2009 to inform CLRTAP about its findings on HTAP and particularly on the source-receptor for transcontinental transport of air pollution. An interim report on its findings in 2007 which addresses tropospheric ozone, acidification, and eutrophication will also be prepared. The reports rely on already existing evidence and studies of hemispheric transport of air pollution. Stronger involvement of scientists from the EANET countries in the preparation of the 2007 TF HTAP Interim Report could be explored in the future.

II-2 Cooperation with WMO

10. EANET has also collaborated closely with WMO in monitoring and assessment of acid deposition, in particular the implementation of QA/QC activities. It is important for the various regional and national networks to harmonize their measurement systems to ensure that high quality comparable data are available for global assessments. The technical manuals produced by the GAW Precipitation Chemistry Programme have been very useful for this purpose. Closer collaboration with the WMO particularly in understanding atmospheric process in tropical areas, involvement in GURME activities which addresses pollution in urban areas and closer interactions with the World Climate Research Program (WCRP) to further study the relationship between air pollution and climate change could be considered in the future.
11. During the WMO Expert Meeting on Precipitation Chemistry Data Synthesis and Community Products held in Geneva, Switzerland on 23 January 2007, the representatives of NC provided information on accumulated monitoring data for the period of regular phase of EANET and the procedure for data dissemination. WMO, through its Global Atmosphere Watch (GAW) Programme, has proposed to establish a coordinated work on a scientific assessment of precipitation chemistry by combining GAW data, data from cooperating regional networks and data from simulation models. In view of the benefits of the products, EANET has agreed to

participate and contribute monitoring data from 2001-2005 to the common data set that will include data from EMEP, DEBITS, CAPMoN, NADP and GAW. The EANET dataset has been prepared according to the requirements set, and NC will keep countries informed on the progress of the data integration and assessment process which is expected to start in late 2007.

II-3 Cooperation with Ministerial Regional Forum on Environment and Health

12. The Ministerial Forum on Environment and Health jointly organized by the United Nations Environment Programme (UNEP) Regional Office for Asia and the Pacific and the World Health Organization (WHO) Regional Offices for the Western Pacific and South-East Asia is held every three years involving ministers and high level officials responsible for environment and health from countries in the region. The First Ministerial Regional Forum on Environment and Health in South-East Asia and East Asian countries held in Bangkok, Thailand on 9 August adopted the Charter of the Regional Forum on Environment and Health and established the Regional Forum on Environment and Health.
13. EANET participated in the Conference for Environment and Health in Asia and the First Regional Meeting of the Thematic Working Group on Air Quality held in Seoul, Republic of Korea on 7 May 2007 and also in the Ministerial Regional Forum on Environment and Health held in Bangkok. EANET as a regional and international partner of the Thematic Working Group on Air Quality is supporting the regional initiative through our involvement in the activities of one of the three sub-groups; the Sub-Group on Transboundary Air Pollution. Closer interactions with the health community in countries of the region would be required during the implementation of the Work Plan activities for this sub-group in the period 2007-2009. EANET has been identified as a source of regional air quality data and information for the health impact assessments. The activities and outputs of the Sub-Group on Transboundary Air Pollution are:
 - Development of methodologies for conducting health impact assessment of PM and ozone in the region
 - Assessment of health impact of PM and ozone
 - Assessment of impact of Atmospheric Brown Cloud, dust and sandstorm and transboundary haze on human health

III Cooperation with other scientific and research programs/initiatives related to acid deposition in the region

14. EANET could explore building partnerships with other regional air pollution initiatives that

are active in the East Asian region and Asian region which share many common objectives. They include the DEBITS (Deposition of Biogeochemically Important Trace Species) programme under IGBP-IGAC which has implemented a Composition of Asian Deposition (CAD) network that considers wet and dry deposition in the Asian region. Many of the IGAC activities are supported by SIDA. Several committees and sub-committees within ASEAN also address regional air pollution issues that prevail in the South-East Asian region. Countries in South Asia under the Malé Declaration have also been very active in promoting monitoring, assessments and measures to control air pollution in their region, including preparation of emissions inventories. Among the advantages of forming partnerships with these programmes are sharing of experiences, exchange of data, sharing resources in training and capacity building etc.

IV Actions Proposed

15. The session is invited take note of the strong cooperation ties between EANET and other international programmes such as CLRTAP and WMO. The Session may wish to deliberate on the following:
 - i) Ways to strengthen the existing cooperation with EMEP, WMO, Regional Forum on Environment and Health
 - ii) Building partnerships and linkages with other programs in the region such as IGBP-DEBITS, Malé Declaration and ASEAN.

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WORK PROGRAM AND BUDGET OF EANET IN 2008 (DRAFT)

I. INTRODUCTION

1. In order to discuss the activities and budget of the Acid Deposition Monitoring Network in East Asia (EANET) at the Fifth Session of the Working Group on Future Development of EANET (WGFD5) and the Seventh Session of the Scientific Advisory Committee (SAC7) of EANET, the Secretariat and the Network Center (NC) developed the Draft Work Program and Budget of EANET in 2008. This document will be revised based on the outcomes of WGFD5 and SAC7, and will be submitted for consideration and approval of the Ninth Session of the Intergovernmental Meeting (IG9) to be held in November 2007 in Lao P.D.R.

2. The Secretariat budget is to be spent for the activities of the Secretariat, e.g. holding of EANET meetings such as the Intergovernmental Meeting (IG), the sessions of Scientific Advisory Committee (SAC) and the Working Group on Future Development of EANET (WGFD), communication with the participating countries and NC, etc. and development of public awareness materials, publications of proceedings and so on. The Secretariat budget are covered by the regular budget of the Secretariat in 2008 and new activities as per approved Strategy on EANET Development (2006-2010) herein referred as "EANET Strategy" that is to be voluntarily contributed by the participating countries.

3. NC budget is for the activities of NC, e.g. core budget activities such as compilation, evaluation and storage of data, preparation of data report, dissemination of data and relevant information, implementation and coordination of quality assurance and quality control (QA/QC) activities and technical support for EANET meetings, and additional budget activities such as assistance and technical support to individual countries, implementation of training activities, research and public awareness activities.

4. In accordance with the suggestion at the Eighth Session of the Intergovernmental Meeting (IG8) held in November 2006 in Hanoi, Viet Nam, and based on the discussions and decision at the Fourth Session of the Working Group on Future Development of EANET (WGFD4) and WGFD5 held in June and September 2007 respectively, in Thailand, the definition of "NC Core Budget" and "NC Additional Budget" was slightly revised.

5. Since the start of preparatory-phase activities of EANET, NC budget has been directly contributed voluntarily from the Government of Japan and some other organizations in Japan, e.g. host municipalities of NC, and through non-reimbursable

personnel contribution. In accordance with the decisions made and discussions that took place during the sessions of IG and WGFD, voluntary financial contribution to NC core budget from the participating countries of EANET should be considered from 2008.

6. The list of priority activities have been updated based on the EANET Strategy adopted at IG8. Some new activities such as “Evaluation of monitoring data with application of approach for assessment of impact (e.g. critical load analysis, catchment analysis, etc)” were added in the draft work program in 2008.

II. WORK PROGRAM IN 2008

7. Toward the achievement of the General Objectives and Basic Policy of EANET Strategy, the priority activities of EANET are as follows:

- Improvement of implementation of all required monitoring items with necessary data completeness and accuracy;
- Evaluation of national QA/QC programs and their implementation;
- Preparation of periodic assessment reports on the state of acid deposition;
- Continue discussions on appropriate instrument and its legal status to provide a sound basis for financial contribution to EANET;
- Discussion on promotion of modeling activities and emission inventories;
- Promotion of capacity building for model application on urban, national and regional scales;
- Establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters; and
- Promotion of public awareness on acid deposition problems including development of a new “Report for Policy Makers (RPM)”

In the year 2008, EANET will also focus on the following important activities subject to availability of resources:

- Development of appropriate monitoring methodologies, particularly for dry deposition and impacts on soil and vegetation to be applicable and appropriate for East Asia through the subsidiary bodies of EANET;
- Evaluation of monitoring data with application of approach for assessment of impacts through the subsidiary bodies of EANET;
- Promotion of capacity building for model application and share experiences and information on emission inventory and research results in numerical modeling
- Continuation of studies and researches on relevant scientific issues; and
- Explore the possibility of obtaining financial support from international funding

agencies

-
II-1. RESPONSIBILITIES OF IG, SAC AND OTHER SUBSIDIARY BODIES OF EANET

Intergovernmental Meeting (IG)

8. IG, composed of representatives of the participating countries, will continue to serve as the decision making body for EANET.

Scientific Advisory Committee (SAC)

9. SAC, composed of scientific and technical experts from the participating countries, will continue to serve as a subsidiary body of IG to advise and assist IG with various scientific and technical expertise related to EANET. Any changes and nominations of SAC members should be communicated to the Secretariat in written form.

Working Group on Future Development (WGFD)

10. WGFD established by IG on ad-hoc basis was directed to continue their works as per approved Terms of Reference for the period 2007- 2008. The WGFD will be in operation under the guidance of IG.

Task Forces

11. The Task Force on Dry Deposition Monitoring, the Task Force on Soil and Vegetation Monitoring, and the Network of Soil and Vegetation Specialists are in operation under the guidance of SAC as subgroups to develop monitoring methodologies and discuss important technical issues for EANET. Participating countries should inform NC of any changes or additional nomination of members for these subgroups in written form.

Secretariat

12. The UNEP will continue to serve as the Secretariat for EANET.

Network Center (NC)

13. Acid Deposition and Oxidant Research Center (ADORC) will continue to serve as NC of EANET.

National Focal Points (NFPs)

14. The National Focal Points (NFPs) of the participating countries will represent their countries in communication with the Secretariat, other participating countries and relevant bodies, and coordinate EANET activities in their countries. Any changes and nominations should be sent to the Secretariat in a written form.

National Centers and National QA/QC Managers

15. The National Centers and National QA/QC Managers will continue to perform their duties in close cooperation with NC. If a country wishes to change the center or the manager, it should be notified to the Secretariat in a written form.

II-2. ACTIVITIES OF THE SECRETARIAT

Using the regular budget

16. UNEP will continue to implement the Secretariat functions. The Secretariat will make necessary arrangement for the important meetings of EANET (IG10, SAC8, and Sessions of WGFD) in cooperation with NC and the participating countries. Such arrangement includes preparation and coordination of meeting documents, communication with the host country, reporting, publication of proceedings, logistic service such as preparation for conference facilities and so on.

17. The Secretariat will make administrative and financial arrangement for EANET, such as regular communication with NFPs, contracting with the donor agencies and ADORC for NC activities and prepare the progress report and financial report in 2007 for submission to donor agencies and the participating countries.

18. The Secretariat as well as NC will promote further communication and cooperation with relevant organizations and programs relating to acid deposition such as the United Nations Economic Commission for Europe, Convention on Long-range Transboundary Air Pollution (UNECE CLRTAP) and its programmes including the Cooperative Programme for Monitoring and Evaluation of the Long Range Transmission of Air Pollutant in Europe (EMEP), International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP-Forest) and their Centers (EMEP/CCC, ICP-Forest/PCC); World Meteorological Organization (WMO) Global Atmospheric Watch Programme (WMO-GAW); Malé Declaration; Clean Air Initiative for Asia (CAI-Asia); National Atmospheric Deposition Program (NADP), etc.

19. The Secretariat will coordinate with NC and participating countries in developing materials for public awareness including EANET newsletter and the second Report for Policy Makers (RPM) on EANET. An expert will be engaged to draft the report. A review workshop on RPM will be convened back to back with the WGFD session.

II-3. ACTIVITIES OF THE NETWORK CENTER (NC)

i) Monitoring

20. The participating countries are requested to revise their national monitoring plans where appropriate based on the experiences in the previous years and correspondent scientific advice at the Sessions of SAC. Revised plans will be submitted to NC with the necessary information in accordance with Technical Documents for EANET to be presented at the Ninth Senior Technical Managers' Meeting (STM9). The participating countries will continue the acid deposition monitoring based on their national monitoring plans with guidance from NC.

21. The participating countries are requested to submit their data and information obtained through the EANET monitoring activities for the calendar year 2007 to NC as soon as they have been approved according to the national procedures, but not later than 30 April 2008. NC will communicate with the countries to ensure timely submission of data.

22. The following activities should be carried out in participating countries in collaboration with NC based on the relevant tasks of the EANET Strategy:

- to improve implementation of all required monitoring items with necessary data completeness and accuracy;
- to consider and make efforts on appropriate distribution of monitoring sites;
- to develop and apply methods for monitoring dry deposition considering current country-specific monitoring methodology;
- to consider possible application of less expensive methods of monitoring including passive samplers.
- to consider establishment of new monitoring sites

ii) Central compilation, evaluation and storage of data

23. NC will compile, evaluate and store the monitoring data obtained through the EANET activities in 2007. Special attention will be paid to the QA/QC activities in the participating countries as well as data verification. For this purpose, the data verification system will be established by NC and SAC to improve data quality.

24. Based on the EANET Strategy, NC will study on support to the assessment on the state of acid deposition by means of trend analysis, assessment indicators, numerical modeling and so on.

iii) Preparation of data report

25. NC will prepare the data report for 2007, based on the data submitted by the participating countries.

iv) Dissemination of data and relevant information

26. The data submitted to NC will be provided to the participating countries in accordance with the "Procedure on Data and Information Disclosure for EANET". Relevant scientific and technical information will be also disseminated among the participating countries, as well as to other countries, relevant organizations and individuals, through technical documents, the EANET website or other means in accordance with the mentioned procedures. Periodic updating and improvement of EANET website will be undertaken to include the latest records of the EANET activities as appropriate.

27. The verified EANET monitoring data will be made available for dissemination through EANET website in accordance with the "Detailed Mechanism of Article 4 of the Procedures on Data and Information Disclosure for EANET" adopted at the Third Session of the Scientific Advisory Committee (SAC3) and endorsed at the Fifth Session of the Intergovernmental Meeting (IG5). Based on the EANET Strategy, NC will further promote access to monitoring data for data users.

28. Based on the EANET Strategy, NC in cooperation with the Secretariat will disseminate to NFPs and experts in the participating countries the relevant information on other regional organizations and initiatives as well as on other regional meetings.

v) Strengthening of technical capacity in the participating countries

29. Within financial limitation, NC will continue to dispatch technical missions to participating countries to exchange information and experiences with National Centers, National QA/QC managers and local experts, to provide technical advice and to disseminate the latest technical information. Participating countries are encouraged to organize in-country technical workshops during these technical missions.

30. NC will organize STM9 in summer/autumn 2008 in collaboration with the relevant organizations. The major objectives of this meeting are to exchange information between NC and the National Center of each country, to disseminate latest scientific and technical information, to review EANET activities of the participating countries, to clarify some important technical issues and to identify necessary activities to be carried out by the participating countries.

31. Depending on the availability of the resources and situation of operation/monitoring in the participating countries, NC will continue to provide assistance and technical support to individual participating countries. In this connection, close cooperation and coordination will be undertaken with relevant international and bilateral organizations or funding agencies.

vi) Implementation and coordination of QA/QC activities

32. NC in cooperation with National Centers and QA/QC Managers of participating countries will proceed with the analysis of the data from the inter-laboratory comparison 2007 projects (the tenth one on wet deposition, the ninth one on soil, the eighth one on artificial surface water and the third one on dry deposition (filter-pack method)) in the same manner as the previous years. The analytical results of these projects should be submitted by the participating laboratories through national QA/QC managers as soon as they are prepared but not later than 29 February 2008. NC will prepare reports on the inter-laboratory comparison surveys in 2007, based on the submitted data with correspondent review and comments by SAC members.

33. Following the series of inter-laboratory comparison surveys, NC will undertake the 2008 inter-laboratory comparison surveys in November/December 2008. The 2008 surveys will cover four items of sample analysis, namely wet deposition, soil, inland aquatic environment and filter-pack method.

34. Based on the EANET Strategy, NC will develop the report on the data sets of all the mandatory items to analyze spatial distribution and trends, and to estimate acid deposition fluxes for assessment of impact (e.g. critical load analysis, catchment analysis, etc.).

35. NC will continue to update and disseminate technical information on the QA/QC programs of EANET and other technical documents, to provide technical advice for the participating countries in developing national QA/QC programs and standard operating procedures for all the monitoring activities, etc.

36. Based on the EANET Strategy, NC will undertake a research on evaluation of inter-laboratory comparison project results to clarify and solve problems of laboratory analysis in the participating countries as well as for data quality assurance.

37. NC will continue to participate in the international inter-laboratory comparison projects coordinated by the United State Geological Survey (USGS), WMO, European Monitoring and Evaluation Program (EMEP) and International Cooperative Programme on Assessment and Monitoring of Rivers and Lakes (ICP Waters). The advices on participation

in the international inter- laboratory comparison projects will be sent to QA/QC managers and EANET laboratories in participating countries.

vii) Implementation of training activities

38. NC will promote systematic training and education, and cooperation in training activities implemented by the participating countries and other relevant organizations. NC will implement the following training activities in 2008.

- Survey for implementation status of national training activities in the participating countries in 2007;
- Continuation of the development of detailed training materials, technical documents for monitoring wet deposition, dry deposition, soil and vegetation and inland aquatic environment;
- Assistance for national training activities by providing technical materials, dispatching of technical experts, etc.;
- Individual training at NC (tentatively planned for four or five trainees from participating countries); and
- Capacity building activities for model application on urban, national and regional scale based on the EANET Strategy.

39. Various training programs and other technical assistance activities implemented by donor agencies will be utilized to a maximum extent for the promotion of EANET. NC will closely communicate and coordinate with donor agencies to obtain information on relevant trainings and other activities, and support their activities such as Japan International Cooperation Agency (JICA) training course entitled “Country Focused Training Course on the Acid Deposition Monitoring Network in East Asia” to be held in autumn-winter 2008. NC will also assist for carrying out the JICA Third Country Training Course on Control Strategy and Mitigation Measures of Acid Deposition to be held in January-February 2008 in Environmental Research and Training Center (ERTC), Thailand.

viii) Research activities

40. NC will continue research activities to improve monitoring methodologies with particular emphasis on dry deposition and soil/vegetation monitoring.

41. The following research activities will be undertaken in 2008, depending on availability of necessary financial resources. Other research activities will be also promoted under the cooperation with the participating countries by exploring the use of the fellowship schemes for joint studies and to invite researchers to NC for several weeks/several months for a joint study.

- Joint research project on dry deposition monitoring with Thailand will be continued in

order to evaluate the difference of gas concentration monitoring methods in tropical sites in EANET region;

- Joint research project on catchment study with Thailand will be continued in order to evaluate the elemental budget in a tropical seasonal forest and develop monitoring methodologies in forested catchments and to promote future catchment monitoring in line with the Strategy Paper;
- Joint research with Republic of Korea will be implemented to improve dry deposition monitoring methodologies. In order to evaluate aerosol sampling method and PM_{2.5} behavior in Japan and Republic of Korea, intensive monitoring will be performed;
- In order to improve understanding of the risks of acid deposition, NC will collaborate with initiatives on emission inventory studies and numerical modeling for instance the Model Inter-comparison Study in Asia (MICS-Asia) Phase II and will promote inter-comparison and validation of existing models on acid deposition in East Asia; and
- Other research activities as appropriate including the activities in line with the EANET Strategy.

ix) Supporting Task Forces

42. NC will continue to provide support to the Task Force on Dry Deposition Monitoring, the Task Force on Soil and Vegetation Monitoring, and the Network of Soil and Vegetation Specialists, being as their Secretariat.

x) Public Awareness Activities

43. NC will undertake the following activities, depending on availability of necessary financial resources:

- Promotion of public awareness in selected participating countries through joint projects for supporting their environmental education activities on acid deposition in schools, supporting to hold their in-country workshops, etc, and by organization of a workshop including session of Internet meeting of school children to exchange experiences on public awareness among participating countries;
- Based on the EANET Strategy, NC in cooperation with the Secretariat will start accumulating the information related to acid deposition and regional air pollution issues so as to develop new RPM in the future.
- Maintenance e-learning course on acid deposition and operating other educational materials for internet use.

xi) Other activities

44. NC will promote close communication and coordination with regional environmental monitoring networks in other regions, relevant international/bilateral organizations and research programs, etc. on scientific and technical issues. The collaboration will be promoted with Task Force on Hemispheric Transport of Air Pollution

(TF HTAP) on preparation of Assessment Report on hemispheric transport and with initiative of WMO-GAW on global precipitation chemistry assessment.

45. Based on the EANET Strategy, NC in cooperation with the Secretariat will undertake an improvement of communication and sharing of common understanding on a wide range of issues of the atmospheric environment in East Asia among the scientists, researchers and government officials of the participating countries.

II-4. ACTIVITIES OF NATIONAL CENTERS OF PARTICIPATING COUNTRIES

46. The National Centers of participating countries under the close communication with NFPs will make necessary efforts for collecting, checking and proceeding of monitoring data to submit them to NC by the end of April 2008 for common compilation and preparing of the Data Report 2007.

47. The National Centers of participating countries will also promote the activities described in the EANET Strategy such as improvement of implementation of all required monitoring items with necessary data completeness and accuracy, and consideration and efforts on appropriate distribution of monitoring sites.

48. The National QA/QC Managers and National Centers will promote QA/QC activities in their countries including active participation of national laboratories in Inter-laboratory comparison 2007 projects of EANET and submission of the results by 28 February 2008, communication with national laboratories and NC on the data assurance and other related issues.

II-5. ACTIVITIES OF THE TASK FORCES UNDER SAC

49. The Task Force on Soil and Vegetation Monitoring will implement its activities in line with the “Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET” endorsed at the Second Session of SAC (SAC2) in November 2002. The Network of Soil and Vegetation Specialists will promote dissemination and exchange of technical information on methodologies to support the Task Force activities on soil and vegetation monitoring.

50. The Task Force on Soil and Vegetation Monitoring will also consider review of Strategy Paper for future directions of soil and vegetation monitoring, promotion of the future catchment monitoring in line with the Strategy Paper and other related issues described in the EANET Strategy.

51. The Task Force on Dry Deposition Monitoring will consider development and application of monitoring methods for dry deposition including current country-specific monitoring methodology and other related issues described in the EANET Strategy.

II-6. SESSIONS OF IG, SAC AND WGFD IN 2008

i) Tenth Session of the Intergovernmental Meeting (IG10)

52. The Tenth Session of the Intergovernmental Meeting (IG10) will be held in autumn 2008. Participating countries willing to host IG10 are invited to express their intention to the Secretariat. The Secretariat will discuss the date and venue of IG10 with the host country. High level meeting may be convened at IG10.

53. IG10 may wish to consider the following agenda items, which will be elaborated later by the Secretariat in communication with the participating countries:

- consideration on the final text of the instrument to provide a sound basis for financial contribution to EANET;
- review of the progress of EANET activities and financial report in 2007;
- review and endorsement of the outcomes of the Eighth Session of SAC (SAC8);
- consideration on future development of EANET through outcomes of the WGFD;
- consideration on the work program and budget of EANET in 2009;
- consideration on review of the performance of the Secretariat and NC; and
- any other important issues described in the EANET Strategy and raised by participating countries.

ii) Sixth and Seventh Sessions of the Working Group on Future Development of EANET (WGFD6/7)

54. The Sixth Session of the Working Group on Future Development of EANET (WGFD6) will be held in spring 2008 in accordance with the Terms of Reference (TOR) of the WGFD for 2007-2008 adopted at IG8. The Seventh Session of the Working Group on Future Development of EANET (WGFD7) will be held in summer or autumn 2008. The outcomes of the WGFD Sessions will be reported and considered at IG10.

iii) Eighth Session of the Scientific Advisory Committee (SAC8)

55. SAC8 will be held about one month before IG10 in autumn 2008. Participating countries willing to host SAC8 to be organized in the same manner as IG10 are invited to express their intention to the Secretariat.

56. SAC8 may wish to consider the following agenda items, which will be elaborated later by the Secretariat and NC in communication with the participating countries:

- review of the EANET activities since SAC7/IG9 from scientific and technical viewpoints;
- review of the Data Report on the acid deposition monitoring in 2007;
- consideration on improvement of the monitoring methodologies including review and revision of the monitoring Manuals;
- consideration on promotion of modeling activities and emission inventories;
- consideration on establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters;
- consideration on general directions of research activities and implementation of other scientific and technical issues of the EANET Strategy;
- review of the EANET Strategy for future directions of soil and vegetation monitoring;
- consideration on research activities on acid deposition including collaboration with initiatives on emission inventory and numerical modeling;
- consideration of future development of EANET from scientific and technical viewpoints through outcomes of WGFD;
- consideration on the work program and budget of EANET in 2009 from scientific and technical viewpoints;
- update of activities by other international programs on acid deposition; and
- any other issues raised by SAC members and/or participating countries.

III. PROPOSED BUDGET IN 2008

III-1. Budget of the Secretariat

57. The amount to be directly spent by the Secretariat for the organization of key EANET meetings such as IG10, SAC8 and Sessions of the WGFD and in the implementation of Secretariat functions is US \$473,359. It is expected that the total contribution of the participating countries in 2008 is \$473,359 for the Secretariat budget

58. The Secretariat regular budget in 2008 is itemized in the following categories: personnel cost; rental of premises; operating cost, which includes reporting cost, office supplies, communication, travel of staff, and meetings; and overhead. The details are provided in Table 1. Based on the EANET Strategy, the Secretariat will carry out new activities in 2008. Regarding the cost of the new activities, the participating countries are expected to contribute to the new activities to be implemented for the promotion of EANET. The estimated budget for the new activities of the Secretariat based on the EANET Strategy is described in Table 2.

59. IG8 agreed that the voluntary financial contribution to the Secretariat budget from the participating countries in 2008-2010 will be a flat rate amount calculated from the projected budget for consecutive 3 years period (2008-2010) as reported in the document, "Workload and Cost for Implementing the Strategy on EANET Development". Further, the average cost was re-calculated to accommodate the decision of IG8 on increasing the salary of the Coordinator.

60. The estimated revenue from the participating countries in 2008 is hereby presented in Table 3. The estimated amounts of contributions from the participating countries is also proposed as presented in Table 4, if burden sharing will be applied as correspondent to the latest UN assessment scale and based on the a flat rate amount calculated from the projected budget for consecutive 3 years period (2008-2010) .

61. The trend of the Secretariat budget and expenditures for 2002-2006 is presented in Table 5.

III-2. Budget of the Network Center

62. Based on the discussions and decision of WGFD4, the definitions of "NC Core Budget" and "NC Additional Budget" have been revised. The draft revised definitions as follows:

The core budget: The cost of all activities indispensable for promoting the Network activities in the participating countries under the framework of EANET and which are approved by IG.

The additional budget: The cost for strengthening the Network by providing technical assistance to the participating countries and by promoting further research activities and which are approved by IG.

1. Detailed items of the "NC Core Budget" includes the following:
 - (1) Central compilation, evaluation and storage of data etc.
 - Data verification
 - Maintenance of database
 - (2) Preparation of data report
 - (3) Dissemination of data and relevant information
 - (4) Strengthening technical capacity in participating countries
 - STM Meeting
 - (5) Implementation and coordination of QA/QC activities
 - Inter-laboratory comparison surveys
 - Individual questions and answers

- (6) Implementation of training activities
 - Development of annual training program
 - (7) Technical support for EANET meetings
 - Preparation of technical documents
 - Attendance from NC to the EANET meetings (IG, SAC, WGFD, etc)
 - Support for Task Force on Dry Deposition Monitoring
 - Support for Task Force on Soil and Vegetation
 - Management of the network on soil/vegetation specialists
 - (8) Administrative works
 - Miscellaneous (discussions on Instrument, next MTP, etc.)
2. Detailed items of the “NC Additional Budget” include the following:
- (1) Strengthening technical capacity in participating countries
 - Dispatch of technical missions
 - Assistance and technical support to individual countries
 - Communication/coordination with donor agencies
 - (2) Implementation of training activities
 - Development of training materials and technical documents
 - Assistance for national training activities
 - Coordination with and support for other training programs which are relevant to EANET activities
 - Individual training at NC
 - Communication/coordination with donor agencies
 - (3) Research activities
 - Research for improving monitoring methodologies
 - Other fellowship research (EANET fellowship: Secretariat budget)
 - Joint research with Russia and Thailand
 - Modeling activities and Emission inventories
 - Other researches
 - (4) Technical support for EANET meetings
 - Other follow-up activities of the meetings
 - (5) Other activities
 - Raising of public awareness (brochures, workshop on public awareness)
 - (6) Administrative works
 - Communication and coordination with other organizations
 - Management of budget and personal affairs
 - Miscellaneous (excluding core budget activities)

63. NC budget by core and additional budget activity is described in Table 6. The budget is estimated with reference to the document “Workload and Cost for Implementing the Strategy on EANET Development” and based on the revised definition of NC core and

additional budget. The estimated annual budget of NC in 2008 is approximately US \$1,140,400 consisting of US \$339,600 required for the core budget activities and US \$800,800 required for the additional budget activities. Table 7 shows the estimated budget for 2008 compared to the estimated budget in the past two years according to each activity. Table 8 shows the breakdown of the budget for each expenditure item.

64. Table 9 shows the trend of the draft budget and actual expenditure of NC for core budget activities in the past three years (2004–2006) while Table 10 shows the trend of the draft budget and actual expenditure of NC for additional budget activities in the past three years (2004–2006). The tables were prepared by NC following a request made at the Fifth Session of the Scientific Advisory Committee (SAC5) held in September 2005, and the Second Special Session of the Working Group on Future Development of EANET (WGFD-S2) held in August 2006.

65. Table 11 shows the estimated expenditures for some additional items, such as “maintenance of ADORC building” and “additional personnel cost”, totaling US \$ 204,000 which will be included in the NC budget in 2008. Table 12 shows total budget of US \$ 1,344,400 for NC in 2008 consisting of the core and additional budget and the cost of these additional items.

66. The estimated revenue for NC in 2008 for core budget and additional budget activities is US \$ 1,196,800 as shown in Table 13. This comprises of contributions from participating countries, Ministry of Environment Japan, National Institute of Agro-Environmental Sciences (NIAES) of Japan, Environmental Restoration and Conservation Agency Japan and the host municipalities of NC. As was already mentioned, NC expects all the participating countries to contribute voluntarily to the core budget activities in 2008 in addition to the contribution from Ministry of the Environment, Japan through the contracts with UNEP RRC.AP and support from organizations in Japan.

67. Table 14 shows estimated contribution from the participating countries for 2008 to the NC core budget. The amount of voluntary contribution expected from participating countries totaling US \$ 396,000 is calculated using the latest UN scale of assessment (2007) and based on the estimated flat rate expenditure of NC for 3 years (2008-2010). The participating countries are also encouraged to support the additional budget of NC by providing cash and/or in-kind contributions .

68. In addition, NC has estimated revenue amounting to US \$204,000 from the host municipalities for specific items such as maintenance of ADORC building and personnel cost as shown in Table 15. Therefore, the total revenue for NC including voluntary contributions from participating countries, contributions from the Ministry of Environment, Japan, from organizations in Japan, host municipalities of NC and private companies

amounts to US \$ 1,400,800 as shown in Table 16.

69. Table 17 shows the balance between revenue and expenditures for NC in 2008. If the cash reserve of US \$56,400 remained at the final expenditure, then it can be carried over to the next year core budget as revenue of NC in 2009 from the participating countries.

Table 1: Estimated Budget of the Secretariat for Regular Activities in 2008 (US \$)

Items	Budget in 2007	Budget in 2008	Remarks
1. Personnel Costs (include Salary, Social Security funds, Provident Fund, Tax, etc.)	113,370	157,818	
2. Rental of premises (as per Contract)	30,000	30,000	
3. Operating Costs	170,739		
3.1 Reporting Costs (i.e., printing of Summary and Proceedings, Newsletter, etc)	3000	8,000	
3.2 Office Supplies	1000	2,000	
3.3 Communication	2000	11,000	
3.4 Travel of Staff for meetings (expenses include airfare and DSA	8,000	10,000	
3.5 Meetings (including PTA tickets and DSA, venue, food, accommodation, logistics, etc.)			
• Session of the Working Group on Future Development of EANET	54,000	55,000	Two meetings in Thailand
• Session of the Scientific Advisory Committee (SAC)	52,000	54,000	In any participating country
• Session of the Intergovernmental Meeting (IG)	50,739	51,000	In any participating country
Sub total	314,109	378,818	
4. Overhead (5% of sub-total)	15,705	18,940.9	
TOTAL	\$ 329,814	\$397,759	

Table 2 : Estimated Budget for New Activities in 2008 for the Secretariat

Items	Budget in US \$
Development of Public Awareness Materials, etc.	2,000
Participation in High Level Meeting	20,000
Fellowship Program at NC	20,000
Development of Report for Policy Makers	30,000
Sub-total	72,000
Overhead (5%)	3,600
Total Cost	75,600

Table 3: Estimated Revenue of the Secretariat in 2008

Source countries	Fund contribution in US \$
Participating countries for the Secretariat budget Additional budget of the Network Center	Regular activities: 397,759 New Activities: 75,600 Grand Total: 473,359 Total: 533,190 Additional: 507,800* (5% Sec. Overhead) : 25,390

Note:

* A total amount of US \$ 507,800 is the same as the total amount of the second line "Ministry of the Environment, Japan (through contracts with UNEP RRC. AP for NC additional budget)" in Table 13, Estimated Revenue for the Network Center in 2008, in page 27.

Table 4: Estimated amounts of contributions from the participating countries if burden sharing will be applied as correspondent to the latest UN assessment scale

Country	UN scale of assessment 2007 (%)*	Scale of burden sharing (%)	Estimated contribution (US \$) in 2008
Cambodia	0.001	0.004	19
China	2.667	11.441	54,157
Indonesia	0.161	0.691	3,271
Japan	16.624	71.314	337,571 + 99*
Lao PDR	0.001	0.004	19
Malaysia	0.190	0.815	3,858
Mongolia	0.001	0.004	19
Myanmar	0.005	0.021	(99)*
Philippines	0.078	0.335	1,586
Republic of Korea	2.173	9.322	44,127
Russia	1.200	5.148	24,368
Thailand	0.186	0.798	3,777
Viet Nam	0.024	0.103	488
Total	23.311	100	473,359

* Latest UN assessment scale (2007)

Table 5: Trend of the Secretariat budget and expenses in US \$ from 2002 to 2006

Item	2002		2003		2004		2005		2006	
	Budget	Expenses	Budget	Expenses	Budget	Expenses	Budget	Expenses	Budget	Expenses
Personnel cost	71,350.00	12,674.99	126,700.00	76,518	116,700	85,311	95,000	93,695	103,065	79,722
Rental of premises as per Contract	30,000.00	30,000.00	30,000.00	30,000.00	30,000	30,000	30,000	30,000	30,000	30,000
Operating Cost										
-Furniture and Fixtures	9,000.00	9,0732.82								
-Purchase equipment of Secretariat	31,000.00	30,583.11								
-Preparation of proceedings and reporting	5,000.00	29.42	5,000.00	4,204.00	8,000	3,927	8,000	6,157	4,000	4,626
-Purchase of office supplies	3,000.00	1,123.80	3,000.00	1,802.00	5,000	648	4,000	1,624	1,000	836
-.Communication	10,000.00	417.51	10,000.00	3,934.00	10,000	4,729	5,000	5,267	2,000	14,724
-Participation of EANET Staff to meetings	30,000.00	2,708.42	34,000.00	9,606.00	42,000	29,114	20,000	28,351	6,200	5,402
Meetings: Sub-total	149,760.00	32,828.92	150,000.00	56,696.00	120,000	151,307	110,000	108,078		
-Working Group Meeting		15,376.93		16,815.00		29,582	30,000	25,894	26,626	25,438
-ISAC and IG		17,451.99		39,881.00		121,725	45,000 40,000	46,887 35,297	31,290 50,769.4	30,218 49,151 9,888 (1,437)*
Contingency	33,911.00		35,870.00		33,170	10,955				313
Overhead (5%)	16,955.50	16,955.50	19,728.50	19,728.50	18,244		13,850	13,658.6	12,747.52	12,444
Total	389,976.5	136,395.4	414,298.5	202,488.5	383,114	329,814	290,850	286,830.6	267,698	261,327

*Air ticket refund for SAC4 and IG6

**Table 6: Estimated draft budget for the Network Center in 2008
(By core and additional budget activity)**

Activity item	Man/ Month	Total (US\$)	Core budget	Additional budget
1. Central compilation, evaluation and storage of data etc.	6.4	57,400	57,400	
Data verification	5.4	37,400	37,400	
Maintenance of database	1	20,000	20,000	
2. Preparation of data report	4	25,000	25,000	
3. Dissemination of data and relevant information	3	22,000	22,000	
Analysis on the state of acid deposition in the region	2	12,000	12,000	
Development and updating of EANET website	1	10,000	10,000	
4. Strengthening technical capacity in participating countries	16.5	207,000	90,000	117,000
Dispatch of technical missions	3	50,000		50,000
STM Meeting	6	90,000	90,000	
Assistance and technical support to individual countries	7	62,000		62,000
Communication/coordination with donor agencies	0.5	5,000		5,000
5. Implementation and coordination of QA/QC activities	6	43,000	43,000	
Inter-laboratory comparison surveys	4	31,000	31,000	
Individual questions and answers	2	12,000	12,000	
6. Implementation of training activities	18.5	125,000	5,000	120,000
Development of annual training program	1	5,000	5,000	
Development of training materials, technical documents	5	30,000		30,000
Assistance for national training activities	3	20,000		20,000
Coordination with and support for other training programs	4	15,000		15,000
Individual training at NC	5	50,000		50,000
Communication/coordination with donor agencies	0.5	5,000		5,000
7. Research activities	19	322,000		322,000
Research for improving monitoring methodologies	7	160,000		160,000
Fellowship	1	20,000		20,000
Joint research with Russia				
Joint research with Thailand	2	18,000		18,000
Modeling activities and emission inventories	9	124,000		124,000
Other research				
8. Technical support for EANET meetings	16	117,200	91,200	26,000
Preparation of technical documents	4	20,000	20,000	
Attendance to the EANET meetings	3	40,000	40,000	
Support for Task Force on Dry Deposition Monitoring	1	6,000	6,000	
Support for Task Force on Soil and Vegetation	4	25,200	19,200	6,000
Management of the network on soil/vegetation specialists	1	6,000	6,000	
Other follow-up activities of the meetings	3	20,000		20,000
9. Other activities (Raising public awareness)	11	134,000		134,000
Supporting environmental education etc.	3	86,000		86,000
Workshop on exchange of experiences	8	48,000		48,000
10. Administrative works	29.3	87,800	6,000	81,800
Communication/coordination	15.3	42,800		42,800
Management of budget and personal affairs	11	27,000		27,000
Miscellaneous including tasks on future development of EANET to establish a sound financial basis	3	18,000	6,000	12,000
Total	129.7	1,140,400	339,600	800,800

Table 7: Comparison of the Network Centre draft 2008 budget with the budget of the past 2 years (By each activity)

Activities	Estimate 2006(\$)	Estimate 2007(\$)	Estimate 2008(\$)
1. Central compilation, evaluation and storage of data etc.	84,000	61,400	57,400
Data verification	79,000	56,400	37,400
Maintenance of database	5,000	5,000	20,000
2. Preparation of data report	25,000	25,000	25,000
3. Dissemination of data and relevant information	25,000	22,000	22,000
Analysis on the state of acid deposition in the region	15,000	12,000	12,000
Development and updating of EANET website	10,000	10,000	10,000
4. Strengthening technical capacity in participating countries	187,000	207,000	207,000
Dispatch of technical missions	50,000	50,000	50,000
STM Meeting	90,000	90,000	90,000
Assistance and technical support to individual countries	37,000	62,000	62,000
Communication/coordination with donor agencies	10,000	5,000	5,000
5. Implementation and coordination of QA/QC activities	72,000	61,000	43,000
Inter-laboratory comparison surveys	67,000	49,000	31,000
Individual questions and answers	5,000	12,000	12,000
6. Implementation of training activities	128,000	125,000	125,000
Development of annual training program	5,000	5,000	5,000
Development of training materials, technical documents	30,000	30,000	30,000
Assistance for national training activities	20,000	20,000	20,000
Coordination with and support for other training programs	15,000	15,000	15,000
Individual training at NC	50,000	50,000	50,000
Communication/coordination with donor agencies	8,000	5,000	5,000
7. Research activities	221,000	342,000	322,000
Research for improving monitoring methodologies	90,000	121,000	160,000
Fellowship	20,000	20,000	20,000
Joint research with Russia	44,000	44,000	
Joint research with Thailand	26,000	26,000	18,000
Modeling activities and emission inventories		125,000	124,000
Other research	41,000	6,000	
8. Technical support for EANET meetings	112,000	129,200	117,200
Preparation of technical documents	15,000	20,000	20,000
Attendance to the EANET meetings	40,000	40,000	40,000
Support for Task Force on Dry Deposition Monitoring	13,000	18,000	6,000
Support for Task Force on Soil and Vegetation	18,000	25,200	25,200
Management of the network on soil/vegetation specialists	6,000	6,000	6,000
Other follow-up activities of the meetings	20,000	20,000	20,000
9. Other activities (Raising public awareness)	90,000	84,000	134,000
Development of brochures/supporting environmental education etc.	30,000	36,000	86,000
Workshop on exchange of experiences	60,000	48,000	48,000
10. Administrative works	71,000	96,400	87,800
Communication/coordination	29,000	38,400	42,800
Management of budget and personal affairs	29,000	34,000	27,000
Miscellaneous including tasks on future development of EANET to establish a sound financial basis	13,000	24,000	18,000
Total	1,015,000	1,153,000	1,140,400

(Note) 1) Several staff members are non-reimbursable experts. 2) Only budget in 2008 is draft.

Table 8: Estimated budget for the Network Center in 2008 for core and additional budget activities (By each expenditure item)

Expenditure item	Core (US\$)	Add. (US\$)	Total (US \$)
Salary of staff members	187,100	302,800	489,900
External consultants/assistants	15,000	85,000	100,000
Travel costs	3,000	119,500	122,500
Meetings	102,000	79,000	181,000
Communication	14,000	47,000	61,000
Reporting (publication)	6,500	21,000	27,500
Equipment	7,000	72,000	79,000
Consumables	5,000	68,500	73,500
Miscellaneous	0	6,000	6,000
TOTAL	339,600	800,800	1,140,400

**Table 9: Trend of the Network Center budget and expenditures in 2004 - 2006
- Present Core budget activities (US \$) -**

Activity item	2004		2005		2006	
	Bud. (\$)	Exp. (\$)	Bud. (\$)	Exp. (\$)	Bud. (\$)	Exp. (\$)
1. Central compilation, evaluation and storage of data etc.	33,000	32,669	99,000	63,192	84,000	74,991
Data verification	27,000	28,120	94,000	58,236	79,000	69,819
Maintenance of database	6,000	4,549	5,000	4,956	5,000	5,172
2. Preparation of data report	38,000	29,909	25,000	27,245	25,000	23,552
3. Dissemination of data and relevant information	20,000	15,503	20,000	24,785	25,000	24,875
Analysis on the state of acid deposition in the region	14,000	9,098	15,000	19,829	15,000	19,900
Development and updating of EANET website	6,000	6,405	5,000	4,956	10,000	4,975
4. Strengthening technical capacity in participating countries	103,000	86,601	90,000	100,831	90,000	84,221
STM Meeting	103,000	86,601	90,000	100,831	90,000	84,221
5. Implementation and coordination of QA/QC activities	87,000	69,461	52,000	43,606	72,000	60,931
Inter-laboratory comparison surveys	65,000	49,434	47,000	37,808	67,000	55,956
Individual questions and answers	22,000	20,027	5,000	5,798	5,000	4,975
6. Implementation of training activities	6,000	4,551	5,000	4,958	5,000	4,975
Development of annual training program	6,000	4,551	5,000	4,958	5,000	4,975
8. Technical support for EANET meetings	154,000	140,249	142,000	*250,751	112,000	116,300
Preparation of technical documents	53,000	40,944	15,000	19,829	15,000	19,899
Attendance to the EANET meetings	44,000	43,288	40,000	*145,453	40,000	34,856
Support for Task Force on Dry Deposition Monitoring	17,000	14,190	13,000	14,872	13,000	15,871
Support for Task Force on Soil and Vegetation	17,000	17,871	48,000	39,659	18,000	20,016
Management of the network on soil/vegetation specialists	7,000	7,050	6,000	4,957	6,000	4,975
Other follow-up activities of the meetings	16,000	16,906	20,000	25,981	20,000	20,683
10. Administrative works	84,000	54,958	35,000	54,542	19,000	38,702
Communication/coordination	36,000	23,111	15,000	24,797	8,000	17,121
Management of budget and personal affairs	36,000	22,748	15,000	24,788	8,000	16,606
Miscellaneous	12,000	9,099	5,000	4,957	3,000	4,975
Total	525,000	433,901	468,000	569,910	432,000	428,547

(Note) 1) Several staff members are non-reimbursable experts.

2) The revenue in three years balances with the expenditure of each year.

(*) These figures include the cost for organizing EANET meetings such as WGFD with direct support from Ministry of the Environment and other relevant organizations in Japan.

**Table 10: Trend of the Network Center budget and expenditures in 2004 - 2006
- Present Additional budget activities (US \$) -**

Activity item	2004		2005		2006	
	Bud. (\$)	Exp. (\$)	Bud. (\$)	Exp. (\$)	Bud. (\$)	Exp. (\$)
4.Strengthening technical capacity in participating countries	212,000	164,721	190,000	151,824	97,000	100,226
Dispatch of technical missions	127,000	91,486	110,000	92,609	50,000	69,902
Assistance and technical support to individual countries	70,000	51,969	60,000	49,788	37,000	22,320
Communication/coordination with donor agencies	15,000	21,266	20,000	9,427	10,000	8,004
6. Implementation of training activities	161,000	143,083	156,000	128,545	123,000	98,132
Development of training materials, technical documents	38,000	38,053	35,000	24,827	30,000	23,405
Assistance for national training activities	23,000	19,512	25,000	19,839	20,000	18,724
Coordination with and support for other training programs	23,000	23,998	20,000	20,842	15,000	20,106
Individual training at NC	65,000	52,421	60,000	53,116	50,000	31,216
Communication/coordination with donor agencies	12,000	9,099	16,000	9,921	8,000	4,681
7. Research activities	345,000	202,760	290,000	284,789	221,000	325,688
Research for improving monitoring methodologies	180,000	59,089	160,000	90,429	90,000	173,265
Fellowship	35,000	15,215	10,000	4,961	20,000	33,998
Joint research with Russia	58,000	59,322	44,000	45,703	44,000	65,510
Joint research with Thailand	38,000	37,266	26,000	24,902	26,000	22,873
Other research	34,000	31,868	50,000	118,794	41,000	30,042
9. Other activities	80,000	66,728	120,000	114,615	90,000	203,749
Raising of public awareness on acid deposition problems						
Development of brochures etc.	40,000	66,728	40,000	114,615	30,000	111,008
Workshop on exchange of experiences	40,000		80,000		60,000	
Organization of meetings etc.	0	0	0	0	0	92,739
10. Administrative works	147,000	98,241	75,000	115,890	52,000	95,235
Communication/coordination	61,000	41,936	30,000	51,410	21,000	42,332
Management of budget and personal affairs	61,000	42,657	30,000	44,639	21,000	38,859
Miscellaneous	25,000	13,648	2015,000	19,841	10,000	14,044
Total	945,000	675,533	831,000	795,663	583,000	823,030

(Note) 1) Several staff members are non-reimbursable experts.

2) The revenue in three years balances with the expenditure of each year.

Table 11: Estimated budget for the Network Center in 2008 (For some specific items, such as maintenance of ADORC building, etc.)

Items	(US\$)
1. Maintenance of ADORC building	73,000
2. Additional personnel cost	115,000
3. Non-reimbursable personnel cost	16,000
Total	204,000

Table 12: Total budget for the Network Center in 2008

Items	Core (US\$)	Add. (US\$)	Others(US\$)	Total (US\$)
1. NC core & additional budget activities	339,600	800,800		1,140,400
2. Maintenance of ADORC building, etc.			204,000	204,000
Total	339,600	800,800	204,000	1,344,400

Note: Total budget for the Network Center in 2007 is US \$1,382,000.

**Table 13: Estimated Revenue for the Network Center in 2008
(For NC core and additional budget activities)**

Organizations / Purpose	Fund Contribution (US\$)		
	Core (US\$)	Add. (US\$)	Total (US\$)
- Contribution from the participating countries for NC core budget activities	(? 1) 396,000		(? 1) 396,000
- Ministry of the Environment, Japan (through contracts with UNEP RRC. AP for NC additional budget)		(? 2) 507,800	(? 2) 507,800
- Ministry of the Environment, Japan (direct support for NC additional budget)		170,000	170,000
4. Strengthening technical capacity in participating countries			
- Dispatch of technical missions		28,000	28,000
- Communication/coordination with donor agencies		16,000	16,000
7. Research activities			
- Research for improving monitoring methodologies		42,000	42,000
- Modeling activities and emission inventories		84,000	84,000
- National Institute for Agro-Environmental Sciences		64,000	64,000
7. Research activities			
- Research for improving monitoring methodologies		64,000	64,000
- Environmental Restoration and Conservation Agency		53,000	53,000
9. Other activities			
- Raising of public awareness on acid deposition problems		53,000	53,000
-Niigata Prefecture		4,000	4,000
-Niigata City		2,000	2,000
Total	396,000	800,800	1,196,800

Note 1) If participating countries request NC to send their contribution through UNEP RRC.AP, "5% Secretariat overhead" is needed.

2) This amount does not include "5% Secretariat overhead."

3) Some items are subject to change based on available amount of resources in 2008.

**Table 14: Estimated contribution from the participating countries
in 2008 for Draft NC Core Budget**

<u>Country</u>	UN scale of assessment 2007 (%)	Scale of EANET burden sharing (%)	Estimated flat rate contribution for 2008-2010 (US \$)
Cambodia	0.001	0.004	17
China	2.667	11.441	45,306
Indonesia	0.161	0.691	2,735
Japan	16.624	71.314	282,403 +(85)*
Lao PDR	0.001	0.004	17
Malaysia	0.190	0.815	3,228
Mongolia	0.001	0.004	17
Myanmar	0.005	0.021	(85)*
Philippines	0.078	0.335	1,325
Republic of Korea	2.173	9.322	36,914
Russia	1.200	5.148	20,385
Thailand	0.186	0.798	3,160
Viet Nam	0.024	0.103	408
Total	23.311	100	396,000**

* Refer to the remarks (*) in Table 1, it is proposed that Japan also make an additional contribution in 2008 to enable a consistent set of figures throughout the period.

** Obtained from the average revised draft NC core budget for 3 years (2008-2010) based on the Strategy on EANET Development (2006-2010) and suggestion from IG8, WGFD4 and WGFD5.

Table 15: Estimated revenue for the Network Center in 2008
(For specific items such as maintenance of ADORC building, etc.)

Organizations / Items	(US\$)
- Niigata Prefecture	188,000
Maintenance of ADORC building	73,000
Additional personnel cost	115,000
- Niigata City	
Non-reimbursable personnel cost	16,000
Total	204,000

Table 16: Total revenue for the Network Center in 2008

Items	Core (US\$)	Add. (US\$)	Others (US\$)	Total (US\$)
1. From participating countries for NC core budget activities.	396,000			396,000
2. From MOE of Japan, NIES, ERCA, Niigata Prefecture, etc. for NC additional budget activities		800,800		800,800
3. Other specific contributions from host municipalities for maintenance of ADORC building, etc.			204,000	204,000
Total	396,000	800,800	204,000	1,400,800

Table 17: Balances between revenue and expenditures for the Network Center in 2008

Items	Revenue (US\$)	Expenditures (US\$)	Cash reserve (US\$)
1. NC core budget activities	396,000	339,600	56,400
2. NC Additional budget activities	800,800	800,800	0
3. Other specific items such as maintenance of ADORC building, etc.	204,000	204,000	0
Total	1,400,800	1,344,400	56,400

The Seventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
10-12 October 2007, Manila, Philippines

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EANET/SAC 7/4/2	Financial Report of the Secretariat and the Network Center in 2006
EANET/SAC 7/5*	Data Report 2006 on Acid Deposition Monitoring Network in East Asia
EANET/SAC 7/6/1*	Report on the Inter-laboratory Comparison Projects in 2006 (draft)
EANET/SAC 7/6/2	Consideration of recommendations for improvement of QA/QC activities
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EANET/SAC 7/8/3	Consideration on use of less expensive monitoring methods
EANET/SAC 7/8/4	Review of the Strategy Paper for Future Directions of Soil and Vegetation Monitoring
EANET/SAC 7/8/5	Revision of Technical Manual for Wet Deposition Monitoring in East Asia and Technical Manual for Monitoring of Inland Aquatic Environment in East Asia
EANET/SAC 7/8/6	Consideration of recommendation on the estimation methods for dry deposition flux in EANET
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EANET/SAC 7/9/2	Establishment of a transparent framework to select and review priority substances to be assessed including their monitoring requirements
EANET/SAC 7/9/3	Consideration of research activities for further development of EANET
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EANET/SAC 7/10	Cooperation with other international programs on transboundary air pollution
EANET/SAC 7/11	Work Program and Budget of EANET in 2008 (draft)
EANET/SAC 7/13	Report of the Session
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Note: * The draft meeting documents were approved at the Session of the Scientific Advisory Committee (SAC), and final versions were published and issued on the website are not included.