

The Eleventh Session of the Scientific Advisory Committee
on Acid Deposition Monitoring Network in East Asia
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Final Report on the Implementation of the Strategy on EANET Development (2006-2010) (Draft)

INTRODUCTION

1. The Strategy on EANET Development (2006-2010) (hereinafter referred to as the Strategy) was adopted at the Eighth Session of the Intergovernmental Meeting (IG8) of the Acid Deposition Monitoring Network for East Asia (EANET) held on 29-30 November 2006 in Hanoi, Vietnam.
2. The preparation and development of the Strategy on EANET Development (2006-2010) was conducted for a period of two-years (2005-2006), in full consultation, discussion and review with the relevant institutional bodies of EANET which include the Working Group on Future Development (WGFD), Scientific Advisory Committee (SAC), National Focal Points (NFPs) and ultimately adopted by the IG8 in 2006.
3. Mid Term Report on the Implementation of the Strategy was submitted to the Eleventh Session of the Intergovernmental Meeting (IG11) of EANET held in November 2009 in Bangkok, Thailand and endorsed with some modifications. Since the target period of the Strategy was finished, this final report will be submitted to review the status of the implementation of the listed activities.
4. This document was prepared by the Secretariat and the Network Center (NC) for EANET to report on the activities since the start of implementation of the Strategy, for discussion and further comments at the Tenth Session of the Working Group on Future Development of EANET (WGFD10) in August 2011 and at the Eleventh Session of the Scientific Advisory Committee (SAC11) in October 2011, and for endorsement at the Thirteenth Session of the Intergovernmental Meeting (IG13) in November 2011.
5. The main goals and objectives to be achieved through the implementation of the activities of the Strategy are stated below:
 - Improvement of current acid deposition monitoring in terms of the data quality, completeness of monitoring items, distribution of monitoring sites and data management;
 - Extended assessment of the state of acid deposition in East Asia based on the analysis of the EANET monitoring data;
 - Development of scientific researches on the atmospheric environment in East Asia;

- Common understanding on environmental, social and economic issues of atmospheric pollution in East Asia through the establishment of epistemic community and promotion of public awareness;
 - Providing a sound basis for financial contribution and future development of EANET;
 - Increasing transparency of EANET;
 - Enhancement of cooperative efforts among participating countries and with outside organizations; and
 - Strengthening policy relevance of EANET activities.
6. The Secretariat and the NC made their best efforts to implement all the activities listed in the Strategy within the manpower and funding resources available and according to the priorities as decided by the Intergovernmental Meeting (IG):

Activities supported by the Core Budget of EANET

- i) Improvement of implementation of all required monitoring items with necessary data completeness and accuracy
- ii) Evaluation of national QA/QC programs and their implementation
- iii) Preparation of periodic assessment reports on the state of acid deposition
- iv) Studies on the establishment of a sound financial basis and the further development of EANET following the outcomes of the feasibility study on an appropriate instrument

Activities supported by the Additional Budget

- i) Discussion on promotion of modeling activities and emission inventories
 - ii) Promotion of capacity building for model application on urban, national and regional scales
 - iii) Establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters
7. Research activities on improvement of acid deposition monitoring, listed as one of the priorities to be undertaken and to be supported from the voluntary contributions of the participating countries, research foundations and international organizations and international organizations are in the pipeline. A list of potential research activities was prepared by the Task Force on Research Coordination and presented to the SAC in 2008. Three priority research projects were identified by the SAC and approved by the Tenth Session of the Intergovernmental Meeting (IG10) for implementation using EANET budget.
8. However, new developments in EANET and recent decisions of the IG as well as other economic factors have influenced and/or delayed the implementation of some of the above activities.

STATUS OF IMPLEMENTATION OF THE ACTIVITIES OF THE STRATEGY

9. In November 2007 and 2009, the IGs approved the establishment of several new task forces and expert groups under the SAC to enable more efficient and transparent implementation of the activities of the Strategy. All the task forces and expert groups are presently involved in the implementation of the Strategy activities.
10. In order to implement the activities of EANET more transparently and efficiently, the Tenth Session of the Intergovernmental Meeting (IG10) held in November 2008 approved the “Procedures for Establishing Task Forces and Expert Groups Under the Scientific Advisory Committee of EANET (DRAFT)” (Annex 2 of EANET/IG 10/7), and the “Terms of Reference of the Task Forces and Expert Groups (Draft)” (Annex 4 of IG10 Report of the Session).
11. Several activities of the Strategy were also implemented through three (3) high priority research projects approved at the IG10 and to be funded by EANET budget. The 3 projects are as follows:
 - i) Analysis of existing data for improving the understanding of the status of acidification in East Asia;
 - ii) Aerosol deposition studies in forests for improvement of estimation method for dry deposition, and
 - iii) Feasibility study on low cost methodologies for monitoring air concentrations.
12. The status of implementation of the activities of the Strategy is summarized in the table in Annex 1 which shows the 30 activities, the targets, the planned implementation dates and the 43 expected results and outputs. Annex 2 shows the progress made and some of the achievements since the start of the regular phase activities of EANET in 2001 in tabular and graphical format.
13. It could be noted that intensive discussion on the Text of the Instrument to Provide a Sound Basis for Contribution to EANET had made a great progress from the period 2006-2010. The Report of the WGFD on Text of the Instrument to Provide a Sound Basis for Contribution to EANET was submitted to IG10 in 2008 for consideration. The Session decided to task the WGFD to further develop the Instrument in accordance with the conclusions of the meeting, and to consider and suggest any procedures necessary to obtain the said signatures.
14. The Twelfth Session of the Intergovernmental Meeting (IG12) held in November 2010 adopted the Decision 1/IG.12, including adoption of the “Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia (EANET)” and its operational date. During the High Level Segment of IG12, the representatives of the seven countries among thirteen participating countries signed the Instrument. It is expected for other six countries to sign the Instrument within the year 2011 due to the operational date at the latest from 1 January 2011. To date, nine countries already signed the Instrument.

EVALUATION

15. Table 1 below shows the number of outputs from implementing the Strategy and other existing activities of the Secretariat and the NC in each year compared with the expected number outputs. A tally of the total number of manuals, reports, procedures, proceedings, etc. each year indicated that between 91% to 100% of the expected number of outputs had been achieved. The publication of the EANET Science Bulletin (Volume 1-2) and Development of the Strategy Paper Future Direction of Monitoring for Dry Deposition of EANET were additional outputs of EANET. A few activities could not be implemented by the NC under the current Strategy due to unexpected increase in cost of equipment, change of staff at the NC, and decisions made by the IG related to recent developments in EANET. It was proposed that these activities be deferred to the next Medium Term Plan for EANET (2011-2015).

Note: Some plans (such as development of the EANET Science Bulletin, Strategy Paper on Monitoring for Dry Deposition) which were not included in the original plan (of the Strategy and other existing activities) were achieved.

16. One of the most significant achievements of the Strategy on EANET Development was the conclusion of the EANET Instrument, titled “Decision 1/IG12” which adopted the “Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia”.

Table 1: Outputs from implementing of the Strategy and other existing activities

| Outputs | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | |
|--|-----------|-----------------|-----------|-----------------|-----------|-----------------|-----------|-----------------|-----------|------------------|
| | Expected | Actual | Expected | Actual | Expected | Actual | Expected | Actual | Expected | Actual |
| Strategy Papers | - | - | - | - | 1 | 1 | - | - | - | 1 |
| Plans | - | - | - | - | - | - | | | 2 | 2 |
| Technical Manuals | 1 | 1 | 2 | 3 | 2 | - | 1 | 1 | 1 | 2 |
| Scientific and Technical Reports | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 6 | 11 | 12 |
| Recommendations/ Decision on Instrument | - | - | 1 | - | 1 | 1 | 1 | - | 1 | 1 |
| Procedures | - | - | 2 | 1 | - | 1 | - | - | - | - |
| Proceedings | 9 | 9 | 9 | 9 | 9 | 8 | 7 | 7 | 7 | 6 |
| Public Awareness Materials and EANET Newsletters, Scientific Bulletins | 8 | 7 | 3 | 3 | 7 | 7 | 7 | 7 | 6 | 7 |
| Others | 2 | 1 | 2 | 2 | - | - | - | - | 3 | 2 |
| Total | 28 | 26 (93%) | 27 | 26 (96%) | 27 | 25 (93%) | 23 | 21 (91%) | 31 | 31 (100%) |

17. Some of the activities that were originally planned to start implementation in 2006 could only begin in 2007 due to the late adoption of the Strategy. The implementation period for the expected results and outputs was therefore adjusted taking into consideration various factors. Whenever a change of the dates is required, the new implementation dates are inserted in brackets below the original implementation period in Annex 1. A summary of the implementation status is shown in Table 2 below:

Table 2: Implementation status of the activities of the Strategy

| Implementation status of the activities | Number |
|--|-----------|
| Number of activities ahead of schedule | 1 |
| Number of activities on schedule | 27 |
| Number of activities with adjusted implementation dates | 14 |
| Number of activities deferred for implementation under the next Medium Term Plan | 1 |
| Total | 43 |

18. The Secretariat and the NC had successfully sourced for external funds from local, regional and international donor agencies, research foundations and other organizations for the implementation of the Strategy activities, in particularly those that are to be supported by the Additional Budget of EANET. Several scientists and experts from participating countries also contributed their services voluntarily through the activities of the task forces and expert groups of the SAC.
19. It was not possible to separate the costs for carrying out the activities of the Strategy from the total budget of the Secretariat and the NC as the cost for carrying out other important regular tasks not mentioned in the Strategy was also included in the original estimation of the total budget. However, for the purpose of transparency, the actual expenditure of the Secretariat and the NC was compared to the estimated total costs mentioned in the document Workload and Cost for Implementing the Strategy on EANET Development (2006-2010) (EANET/IG 8/7/2 rev). Table 3 below shows that there was a large difference in the expenditure and estimated budget of the Secretariat in 2006 as one of the posts was vacant in that year. However, the actual expenditures in 2007- 2010 were close to the estimated cost.
20. In the case of the NC, the actual expenditure for the core budget activities did not differ much from the estimated amount from year to year but there were some differences in the estimated cost and the actual expenditures of the additional budget activities, which depend on the availability of external funds.

Table 3: Estimated Cost and Actual Expenditure of the Secretariat and the NC (1,000 USD)

| Estimated cost and Actual expenditures | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | |
|---|------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| | | Estimated cost | Actual expenditure | Estimated cost | Actual expenditure | Estimated cost | Actual expenditure | Estimated cost | Actual expenditure | Estimated cost | Actual expenditure |
| Secretariat | Regular | 425.2 | 261.3 | 352.9 | 309.9 | 435.8 | 448.3 | 473.3 | 423.1 | 473.3 | 411.2 |
| NC | Core | 432.0 | 428.5 | 432.0 | 433.5 | 369.6 | 369.5 | 411.1 | 415.0 | 407.3 | 432.0 |
| | Additional | 583.0 | 823.0 | 721.0 | 749.7 | 800.8 | 809.6 | 803.0 | 795.6 | 753.0 | 825.0 |
| | NC Total | 1015.0 | 1251.5 | 1153.0 | 1183.2 | 1170.4 | 1,179.1 | 1,214.1 | 1210.6 | 1,160.3 | 1,257 |
| Total budget and Expenditures (Secretariat + NC core) | | 857.2 | 689.8 | 784.9 | 743.4 | 805.4 | 817.8 | 884.4 | 838.1 | 880.6 | 843.2 |

20. A comparison of the estimated workload and the actual manpower resources (in man-months) available at the Secretariat and the NC during the 3 years is shown in Table 4. There were no significant differences between the estimated work load and the actual manpower resources (in man-months) available in both agencies.

Table 4: Estimated and actual workload of the Secretariat and the NC (in man-months)

| Manpower | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | |
|--|------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | | Estimated | Actual | Estimated | Actual | Estimated | Actual | Estimated | Actual | Estimated | Actual |
| Secretariat | Regular | 37 | 27 | 33 | 24 | 35 | 31.5 | 32 | 37 | 30 | 26 |
| NC | Core | 57 | 57 | 61 | 61 | 51.7 | 44.4 | 61.9 | 48.4 | 63.9 | 49.4 |
| | Additional | 67 | 67 | 86 | 86 | 78 | 90.3 | 74 | 87 | 72 | 86.5 |
| | Total | 124 | 124 | 147 | 147 | 129.7 | 134.7 | 135.9 | 135.4 | 135.9 | 135.9 |
| Total Manpower (Secretariat + NC core) | | 94 | 84 | 94 | 85 | 86.7 | 75.9 | 93.9 | 85.4 | 93.9 | 75.4 |

21. The tables and figures in Annex 2 show that significant progress has been made towards achieving the goals and objectives of the Strategy in the past three years in terms of the following:
- Improvement in number of monitoring sites
 - Improvement in data quality
 - Development of scientific research on atmospheric environment in East Asia
 - Promotion of public awareness in participating countries
 - Promotion of technical support in participating countries
- A more detailed report will be made after 2010 when most of the activities are expected to be completed.

ACTION REQUIRED

22. The IG13 is invited to review and endorse Report on the Implementation of the Strategy on EANET Development (2006-2010).

Annex 1

Targets, Expected Results and Outputs, and Status of Implementation of the Activities of the Strategy on EANET Development (2006-2010)

i. Promotion of acid deposition monitoring

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|-----|--|--|------------------------------|---|----------------------------|--|
| (1) | Improvement of implementation of all required monitoring items with necessary data completeness and accuracy | To provide complete sets of high quality monitoring data in terms of accuracy, complete (up to 100%) coverage of all mandatory parameters and appropriate application of sampling/ analytical equipment in all the participating countries | [1] | Report on improvement of data completeness and on application of sampling/analytical equipment at the EANET monitoring sites (including recommendation for improvement of equipment and proposal on cooperation with equipment makers for technical support and maintenance of equipment) | 2007-2008 (2007-2010) | A report on activities to improve data completeness in EANET has been prepared by NC and was submitted to SAC9 in 2009. Discussions with equipment manufacturers to provide more technical support to countries using their brand of equipment are on-going. |
| | | | [2] | A set of Standard Operating Procedures (SOPs) for operational monitoring | 2006-2008 (2006-2007) | A manual and CD containing a set of SOPs were prepared by NC in 2007 and distributed to participating countries to provide guidance on preparation of national SOPs. |
| | | | [3] | 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.) | 2006-2010 | Data on wet and air concentration, soil and vegetation and inland aquatic environment monitoring from all EANET sites are compiled annually by NC and stored in the EANET database. |
| (2) | Consideration and efforts on appropriate distribution of monitoring sites | To increase the density of monitoring sites | [4] | Establishment of new EANET sites | 2007-2010 | The number of EANET sites has increased from 49 wet, 38 dry, 26 soil and vegetation, 15 inland aquatic environment at beginning of 2006 to 54 wet, 46 dry, 26 soil and vegetation, 17 inland aquatic environment as of 2010. (Annex 2) |

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|-----|--|---|------------------------------|---|----------------------------|--|
| (3) | Development and application of monitoring methods for dry deposition considering current country-specific monitoring methodology | To ensure the implementation of improved/ modern methods for dry deposition (especially in tropical region) including estimation of dry deposition fluxes in at least three EANET countries (as research studies) | [5] | Technical Manual for dry deposition fluxes estimation prepared by Task Force on Dry Deposition Monitoring | 2008-2010 | The Technical Manual was prepared by the Expert Group on Dry Deposition Flux Estimation and submitted to SAC10 and endorsed. After that, the document was submitted to IG12 in 2010, and adopted. |
| | | | [6] | Estimation of dry deposition fluxes at the selected monitoring sites in selected EANET countries | 2009-2010 | The software to calculate dry deposition flux at selected sites in EANET countries was prepared by NC following the recommended procedures. |
| (4) | Consideration on possible application of less expensive methods of monitoring including passive samplers | To provide more extensive data sets on acid deposition in EANET | [1] | Recommendation on use of less expensive methods to reduce monitoring cost and increase numbers of monitoring sites | 2007-2008 (2009-2010) | A high priority research project on “Feasibility study on low cost methodologies for monitoring air concentrations” was proposed by SAC in 2008 and endorsed by IG for implementation in 2009-2010. A report with recommendations will be prepared after 2010. |
| (5) | Review and revision of the monitoring Manuals including operation manuals of monitoring equipment | To provide participating countries with revised guidelines for monitoring | [7] | A decision on the revision of Technical Manuals: for Wet Deposition Monitoring of EANET, and for Monitoring on Inland Aquatic Environment | 2007 (2007-2010) | A decision to revise the technical manuals was made in 2007 and SAC established 2 expert groups to carry out the tasks. A first draft of the revised technical manuals was submitted to SAC10 in 2010 for endorsement. After that, the document was submitted to IG12 in 2010 and adopted. |
| (6) | Review of Strategy Paper for future directions of soil and vegetation monitoring | To clarify particular objectives, ways, and milestones for ecological monitoring | [8] | A revised Strategy Paper for Future Direction of Soil and Vegetation Monitoring of EANET | 2007-2008 | The Strategy Paper for Future Direction of Soil, Vegetation and related Ecosystem Monitoring of EANET (2009-2014) was prepared by the Task Force on Soil and Vegetation Monitoring and adopted by SAC in 2008. |

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|-----|--|--|------------------------------|--|----------------------------|--|
| (7) | Promotion of the future catchment monitoring in line with Strategy Paper | To provide the scientific data on effects of acidification on terrestrial ecosystem based on the elemental budget calculations | [9] | Guidelines/methodologies for the future catchment monitoring | 2007-2010 | The guidelines was prepared by the Task Force on Soil and Vegetation Monitoring and endorsed at SAC10 in 2010 according to the revised strategy paper. The guidelines were based on information obtained from studies conducted in Japan, Thailand and Malaysia funded by the Global Environment Research Funded for the Ministry of Environment, Japan. |
| (8) | Evaluation of monitoring data with application of approach for assessment of impacts (e.g. critical load analysis, catchment analysis, etc.) | To identify areas which has potential for damage by acid deposition | [10] | Identification of area or regions susceptible to acid deposition damages | 2008-2010 | A literature studies was carried out by the Task Force on Soil and Vegetation Monitoring. An initial map showing the hotspots will be prepared by the Task Force after 2010. This activity is expected to continue after 2010 with further updates and improvements of the initial map. |

ii. Compilation, evaluation, storage and provision of data

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|---|------------------------------|---|----------------------------|--|
| (9) | Compilation and storage of monitoring data including assistance to participating countries on developing their national databases | To maintain the EANET database of monitoring data for support to reporting and scientific studies on acid deposition in East Asia | [11] | Databases of EANET monitoring data in NC and some participating countries | 2006-2010 (2009-2010) | NC is being communicated with participating countries to identify the individual country's needs. |
| (10) | Evaluation of appropriateness of monitoring data | Improvement of data quality by data verification | [12] | Establishment of data verification system | 2007 (2007-2008) | The procedures have been established in NC. An update of the members of the verification groups was carried out in 2007-2008. |
| (11) | Promotion of access to monitoring data for data users | Provision of EANET data through Internet | [13] | Website for data downloads system and communication system. | 2006-2010 (2009-2010) | NC provided the downloadable monthly data in excel format in the EANET web site. The download system of hourly data was also prepared by the NC in 2010. |

iii. Promotion of quality assurance and quality control (QA/QC) activities

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|--|------------------------------|---|----------------------------|--|
| (12) | Evaluation of national QA/QC programs and their implementation | To review and develop national QA/QC programs of EANET | [14] | Progress report on performance of EANET monitoring in participating countries (including recommendation for QA/QC activities) | 2008-2010 (2010) | A report with recommendations will be prepared by NC in 2011. |
| (13) | 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 | To introduce measures for improvement of regular measurements by evaluating the results of inter-laboratory comparison projects on the regular phase | [15] | Report on the evaluation of inter-laboratory comparison tests in 2001-2005 and improvement of laboratory analysis | 2007 | An evaluation report of the inter-laboratory comparison projects from 2001 to 2005 with recommendations was prepared by NC and presented to SAC in 2007. |

iv. Implementation of technical support and capacity building

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implementation period | Status as of end of 2010 |
|------|--|--|------------------------------|--|-----------------------|--|
| (14) | Promotion of systematic training and education, and cooperation in training activities implemented by the participating countries and other relevant organizations | To improve training activities by considering feedback of trainees and using better training materials | [16] | Report on results of questionnaires on implementation of training initiatives in participating countries and by other relevant organizations | 2006-2010 | The questionnaire was revised in 2008 to obtain more comprehensive information from the participating countries and efforts have been made by NC to fulfill the training requirements of the countries. A summary of the questionnaire results are reported annually at STM, SAC and IG sessions. |
| | | | [17] | A set of training materials (textbooks, reviews of basic knowledge with exercises, special topic brochures) | 2006-2010 | A Textbook on Fundamental Methodology for Monitoring Wet Deposition in EANET was published in 2006. A set of environmental education tools was provided to the relevant schools in 2008-2010. |
| (15) | Promotion of technical support for monitoring in the participating countries | Improvement of capability for EANET monitoring in participating countries | [18] | Support to current EANET monitoring activities in participating countries | 2006-2010 | Technical missions to participating countries are made annually/ biennially by NC. Equipment spares and consumables were provided as necessary. Two IC systems were provided to Cambodia and Lao PDR in 2006. The NC also made communications with countries to assist with instrument problems and monitoring issues. (Annex 2) |
| (16) | Promotion of technical assistance by other relevant organizations | Improvement of capability for EANET monitoring and policy making of the participating countries | [19] | Providing necessary equipment for national EANET monitoring by means of projects supported by external resources | 2006-2010 | An IC and pure water systems were provided to Myanmar in 2009 by JICA at the request of NC. Capacity building workshops for policy makers of the participating countries were convened in 2007, 2008 and 2009 respectively by the Secretariat in cooperation with NC. |

v. Producing periodic reports on the state of acid deposition in East Asia

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implementation period | Status as of end of 2010 |
|------|---|---|------------------------------|---|---|---|
| (17) | Preparation of periodic assessment reports on the state of acid deposition | To provide scientific assessment for the public, scientists and policy makers | [20] | The first periodic report (end of 2006) | 2006 | The first Periodic Report on the state of acid deposition in East Asia (PR SAD1) was prepared by SAC and adopted by IG in 2006. |
| | | | [21] | Preparation of the next periodic report | 2009-2010 (2009-) | The Implementation Plan for the second Periodic Report was prepared by the Expert Group on Preparation for the second Periodic Report and it was adopted by SAC8 in 2008. The Drafting Committee (DC) was established in 2009 to start the tasks. DC1 was held in April 2010. |
| (18) | Studies for supporting assessment on the state of acid deposition by means of trend analysis, assessment indicators, numerical modeling, etc. | To provide scientific instruments for assessment of monitoring data such as trend analysis, assessment indicators, numerical modeling, etc. | [22] | Guidance on monitoring data application for assessment reports such as trend analysis, assessment indicators, numerical modeling and data presentation design | 2007-2008 (before start of preparation of next periodic report) (2008-2010) | A high priority research project on “Analysis of existing data for improving the understanding of status of acid deposition in East Asia” was proposed by SAC in 2008 and endorsed by IG for implementation in 2009. Reports of the project were prepared in March 2010. |

vi. Promotion of research activities related to acid deposition problems

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|--|------------------------------|--|----------------------------|--|
| (19) | Consideration on general directions of research activities by SAC | Consideration and preparation of general directions of research activities in a transparent manner | [23] | Recommendation on general direction for research activities related to acid deposition problems in East Asia | 2006-2008 | A list of potential research activities was prepared by the Task Force on Research Coordination and presented to SAC in 2008. Three priority research projects were identified by SAC8 and approved by IG10 for implementation using EANET budget. |
| (20) | Promotion of inter-comparison studies and validation of existing models on acid deposition in East Asia | Clarification of the differences among related models and recommendations on the harmonization of models | [24] | Recommendation on improvement of regional atmospheric transport/chemistry/deposition models | 2007-2010 | The MICS-Asia project was initiated by NC and IIASA to develop a better understanding of the performance and uncertainties of CTMs applied in East Asia. The scientific papers on the studies are published in a special issue of Atmospheric Environment. A report was submitted to SAC9 in 2009 and SAC10 in 2010. |
| | | | [25] | Support to initiatives of participating countries on atmospheric modeling and its application | 2007-2010 | The NC participated in the activities of the Long-range Transboundary Air Pollutants in Northeast Asia Project (LTP) initiated by Republic of Korea. |

vii. Promotion of public awareness

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|--|------------------------------|--|----------------------------|---|
| (21) | Promotion of public awareness for EANET among the general public, policy makers, private sectors and local governments on acid deposition and its effects | To increase understanding and knowledge level of the general public, etc on acid deposition and its effects | [26] | Printed public awareness materials and updated e-Learning courses and Web-pages and provision of national workshops for the participating countries of EANET | 2006-2010 | A video and brochures on acid deposition were developed together with Myanmar in 2006. A guidebook on environmental education will be produced in 2011. The e-Learning course was updated in 2009 and the EANET homepage was improved in 2008-2010. National workshops on public awareness for acid deposition monitoring issues and problems were conducted in Cambodia, Lao PDR and Philippines in 2006, and Indonesia and Mongolia in 2009. In-country workshop on acid deposition issues was also held in Lao PDR and Myanmar in 2006 and 2007, respectively. |
| (22) | Efforts to help high-level policy makers to understand the importance of acid deposition problems in East Asia and EANET activities | To make high-level policy makers understand the importance of acid deposition problems in East Asia and EANET activities | [27] | Dissemination of information at a special session in high level meetings | 2006 (2009-2010) | This event was held at the High Level Segment during IG12 in 2010. |
| | | | [28] | Dissemination of information at other regional meetings | 2006-2010 | Information on EANET is disseminated at all the regional/international meetings attended by the Secretariat and NC. |
| | | | [29] | Second Report for Policy Makers “Clean Air for A Sustainable Future”, November 2009 | 2008-2009 | The Second Report for Policy Makers (RPM2) was prepared by the Secretariat and NC and was launched at IG11 in 2009. |

viii. Other relevant activities including those for future development and new researches

viii-1. Modeling activities and emission inventories

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|--|------------------------------|--|-------------------------------------|---|
| (23) | Discussion on promotion of modeling activities and emission inventories | 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 | [30] | Proposals on promotion of modeling activities and emission inventories | 2007-2008 (propose for next MTP) | A proposal from SAC to establish an expert group for promotion of modeling activities and emission inventories was not approved by IG in 2007. It is proposed to implement this activity in the next Medium Term Plan (MTP). |
| (24) | Promotion of capacity building for model application on urban, national and regional scales | To enable interested participating countries to use existing models for their own objectives | [31] | Designation of suitable standard models of each scale for research/training application | 2007 (2009-2010) | The NC consulted with relevant experts on the designation of suitable models through international workshop on atmospheric modeling research. |
| | | | [32] | Promotion of the training courses on application of the standard models including cooperation with other organizations | 2006-2010 | The NC provided training on the application of air pollution models during the JICA Training Course on EANET and JICA Third Country Training Course, to the EANET research fellows in 2007, and at the Individual Training Course in ADORC in 2009 based on the request from participating countries. |

viii-2. Selection and review of priority substances to be assessed

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|---|------------------------------|---|----------------------------|---|
| (25) | Establishment of the framework for reviewing substances to be monitored including other air pollutants and monitoring parameters | To establish the framework for reviewing substances to be monitored and necessary parameters for regular monitoring as well as equipment for that purpose | [33] | Transparent framework for reviewing substances to be monitored | 2006-2007 (2008) | In 2008, IG decided that the Task Force on Monitoring for Dry Deposition is the appropriate body to perform this activity. |
| | | | [34] | Recommendation on monitoring parameters, measurements and equipment for EANET sites | 2006-2007 (2009-2010) | This activity was implemented by the Task Force on Monitoring for Dry Deposition in collaboration with the Task Force on Monitoring Instrumentation in 2009-2010. |
| (26) | Investigation on environmental/human effects of priority substances and their monitoring requirements such as monitoring equipment, sampling and analytical methods | To clarify the necessity, monitoring approaches and necessary activities to organize the monitoring of priority substances | [35] | Reports on environmental/human effects of priority substances and their monitoring requirements with available information such as good practices and results of case studies in EANET region | 2008-2009 (2009-2010) | NC prepared reports on the environment/human health effects of ozone and PM from 2010 and completed in 2011. |
| | | | [36] | Action plans for monitoring priority substances | 2010 | A report to promote ozone monitoring activities in East Asia was prepared by NC and submitted to SAC in 2010. |

viii-3. Promotion of formation of an “Epistemic Community”

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implement- ation period | Status as of end of 2010 |
|------|---|---|------------------------------|--|----------------------------|---|
| (27) | Improvement of communication and sharing common understanding on a wide range of issues on the atmospheric environment in East Asia among the scientists, researchers and government officials of the participating countries | To support formation of the Epistemic Community by EANET scientists, researchers and government officials | [37] | Creating a network of experts concerning a wide range of issues of the atmospheric environment within EANET | 2006-2010 | All the activities of EANET are expected to contribute to efforts to creating a network of experts on issues related to the atmospheric environment in East Asia. |
| | | | [38] | Periodic issue of Newsletter | 2006-2010 | The EANET Newsletter is published biannually from 2007. |
| | | | [39] | Regional Workshop on Acid Deposition in one of the participating countries of EANET for scientific community, national governments, civil society, academia, private sector and other international experts and agencies | 2006 | This activity was implemented in 2006. |

viii-4. Improvement and development of institutional arrangement

| No. | Activities to be undertaken | Targets | Expected results and Outputs | | Implementation period | Status as of end of 2010 |
|------|---|--|------------------------------|---|--------------------------|---|
| (28) | Further improvement of the guidelines for transparency and efficiency of EANET | To strengthen EANET activities. To promote efficiency and transparency of EANET | [40] | More transparent and efficient activities of EANET bodies including SAC, Task Forces and other sub-bodies | 2006-2010 | A report on the activities of the Secretariat and NC to promote more transparent and efficient activities of EANET bodies will be prepared and submitted to WGFD and IG in 2011. |
| (29) | Studies on the establishment of a sound financial basis and the further development of EANET following the outcome of the feasibility study on an appropriate instrument | To support a process of development of an appropriate instrument | [41] | Report on future development of EANET to establish a sound financial basis | 2006-2008 (2006-2010) | A Report of the WGFD on the Instrument to provide a sound basis for contribution to EANET was submitted to IG10. The text of the Instrument was finalized without any brackets at IG11 in 2009. It was adopted at IG12 in 2010, and several countries signed to the Instrument at the High Level Segment during IG12. |
| (30) | Consideration on future activities with discussions on possibilities of future development of EANET including a possibility to establish additional institutional structures, if necessary. | Improvement of structures of EANET to promote active participation. Preparation of the Medium Term Plan for next period | [42] | Second Report on Future Development of EANET | 2009-2010 | The Draft Second Report on Future Development of EANET was discussed at WGFD8 and IG11 in 2009, and WGFD9 in 2010. The report was submitted to IG12 in 2010 and adopted. This activity is considered after finalization of the Instrument to provide a sound basis for contribution to EANET. |
| | | | [43] | Medium Term Plan (MTP) for EANET (2011-2015) | 2009-2010 | Discussions on the Draft Medium Term Plan started at the WGFD8, SAC9 and IG11 in 2009, and at WGFD9/SAC10 in 2010. Draft MTP was submitted to IG12 in 2010 and adopted. |

Note: The dates in brackets () in the column of the “Implementation period” show the revised implementation period for the activity

Annex 2

i) Improvement of EANET monitoring

Table: Wet Deposition Monitoring Sites

| Country | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Cambodia | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| China | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 |
| Indonesia | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| Japan | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 |
| Lao PDR | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malaysia | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 4 |
| Mongolia | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Myanmar | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Philippines | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| R. of Korea | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Russia | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Thailand | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| Vietnam | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 |
| Total | 41 | 42 | 44 | 46 | 47 | 49 | 50 | 52 | 54 | 54 |

Table: Air Concentration (Dry Deposition) Monitoring Sites

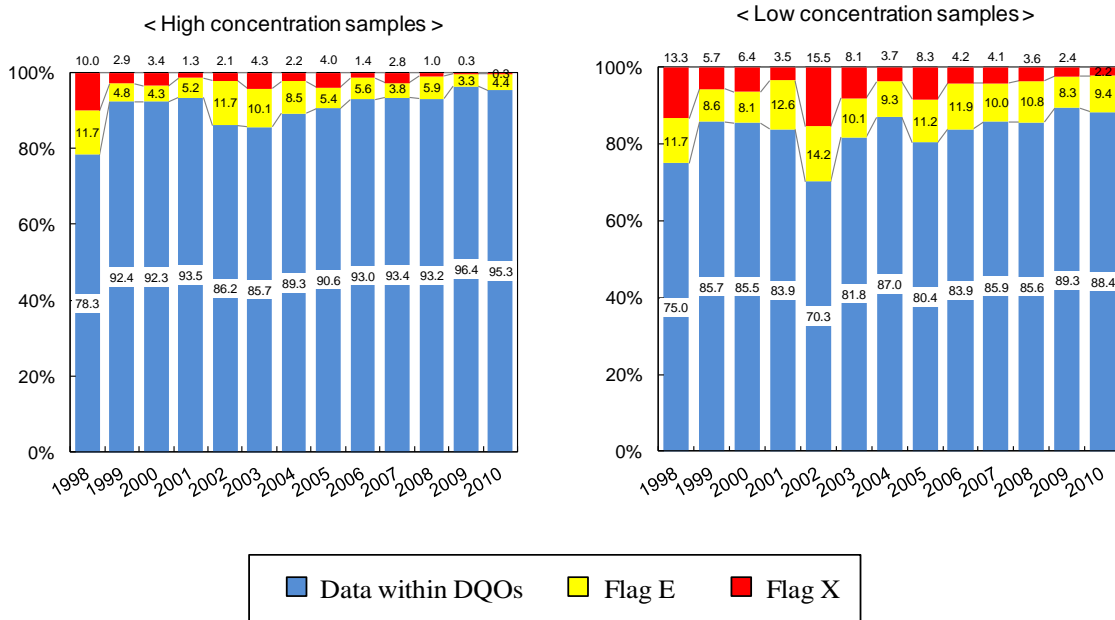
| Country | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Cambodia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| China | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| Indonesia | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 4 | 4 | 4 |
| Japan | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 12 | 12 | 12 |
| Lao PDR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Malaysia | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| Mongolia | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Myanmar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Philippines | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| R. of Korea | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Russia | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Thailand | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| Vietnam | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| Total | 31 | 34 | 34 | 35 | 35 | 38 | 40 | 42 | 44 | 46 |

Table: Inland Aquatic Environment Monitoring Sites

| Country | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Cambodia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| China | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Indonesia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| Japan | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Lao PDR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Malaysia | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| Mongolia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myanmar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Philippines | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| R. of Korea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Russia | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| Thailand | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vietnam | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Total | 11 | 12 | 12 | 12 | 13 | 15 | 16 | 18 | 18 | 18 |

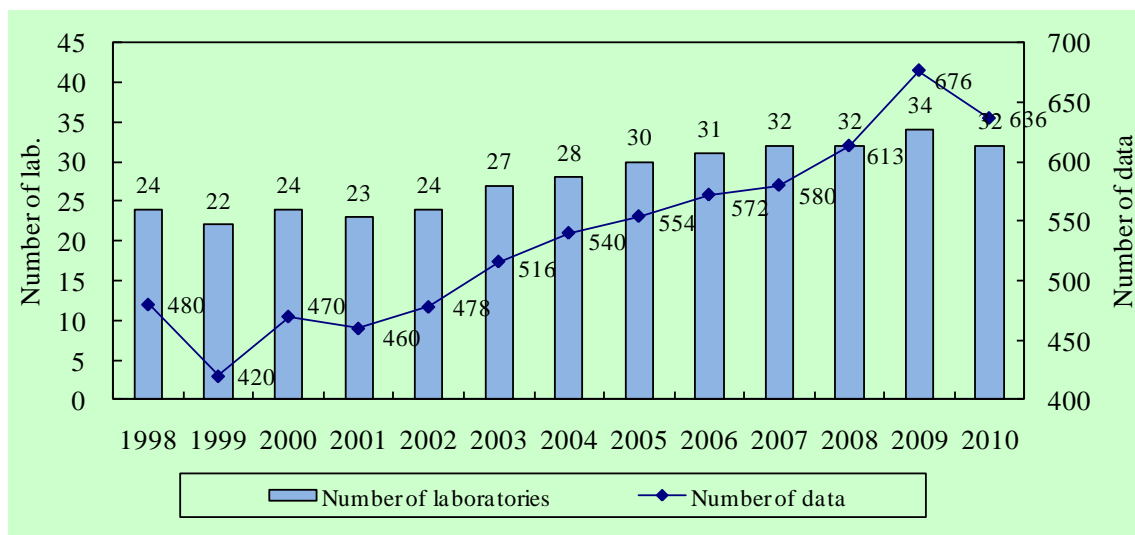
ii) Improvement in data quality

Figure: Results from the inter-laboratory comparison projects for wet deposition



Flag "E" was applied to data that exceeded the DQO by a factor less than 2 ($\pm 15\% \sim \pm 30\%$)
 Flag "X" was applied to data that exceeded the DQO by more than a factor of 2 ($< -30\%$ or $> 30\%$).

Figure: Number of participating laboratories and data received



iii) Providing technical support to participating countries

Table: Equipment Provided to Participating Countries for Monitoring Activities

| Year | Country Assisted | Equipment Provided |
|-------------|--|--|
| 1998 | Mongolia Russia | IC, Wet-Only Sampler, Filter pack Sampler Kit Wet-Only Sampler |
| 1999 | China Philippines Vietnam | Wet-Only Sampler, Filter pack Sampler Kit Wet-Only Sampler, Refrigerator Wet-Only Sampler, Filter pack Sampler Kit |
| 2000 | Indonesia Malaysia Vietnam | Wet-Only Sampler Filter pack Sampler Kit Filter pack Sampler Kit, Flow meter |
| 2001 | - | - |
| 2002 | Cambodia Lao PDR Mongolia Vietnam | Wet-Only Sampler, Power Stabilizer Wet-Only Sampler, Power Stabilizer Pure Water Generator Boiler Flow meter |
| 2003 | Cambodia Lao PDR Mongolia Philippines Russia | pH and EC meter pH and EC meter Digital pipette, Flowmeter Filter pack Sampler Kit, Computer, Digital Camera AAS (used) |
| 2004 | Philippines Vietnam | Filter pack Sampler Kit, Refrigerator Filter pack pump |
| 2005 | Lao PDR Vietnam | Refrigerator Refrigerator |
| 2006 | Cambodia China Lao PDR Myanmar Philippines | IC (purchased using Secretariat's savings) Filter pack Sampler Kit IC (purchased using Secretariat's savings) Wet-Only Sampler , pH and EC meter Rain sensor |
| 2007 | Cambodia Lao PDR | Filter pack Sampler Kit Filter pack Sampler Kit |
| 2008 | Cambodia Philippines | Refrigerator of Wet-Only Sampler Refrigerator of Wet-Only Sampler |
| 2009 | Myanmar Lao PDR Vietnam | IC (donated by JICA) IC suppressor Filter pack pump |
| 2010 | China Lao PDR Mongolia Myanmar Vietnam | Filter pack sampler kit pH meter and EC meter electrode pH meter electrode Refrigerator Gas meter, etc. |

Table: Spares and Consumables Provided to Participating Countries for Monitoring Activities

| Year (JFY) | Participating Countries | | | | | | | | | | | |
|-------------|-------------------------|-------|-----------|-------|---------|----------|----------|----------|-------------|--------|----------|---------|
| | Cambodia | China | Indonesia | Japan | Lao PDR | Malaysia | Mongolia | Myanmar | Philippines | Russia | Thailand | Vietnam |
| 1998 | | | | | | | E, C | | | E | | |
| 1999 | | E, C | | | | | | | E | | | E,C |
| 2000 | | | E | | | E,C | C | | | | | E,C |
| 2001 | | | C | | | | | | | | | E |
| 2002 | E | | | | E | | E | | | | | E |
| 2003 | E | E | | | E | | E | | E,C | E | | |
| 2004 | E | | C, S | | | | E, C | | E, C | | | E |
| 2005 | S | | S | | S, E | | E, C | S | C, E | | | E, C,S |
| 2006 | E, C, S | E, C | | | S, C, E | | E, C | E, S | E, C, S | | | S |
| 2007 | E, C, S | S | | | E, C | | | E | | | | C |
| 2008 | E, S | S | | | S | | C, S | | E | C, S | | S |
| 2009 | C | C | | | E | | S | E (JICA) | | C, S | | |
| 2010 | C | E | | | E, C | | E | E | | | | E |

Note: E: equipment, spare parts, C: consumable, S: standard solution, reagent

Table: NC Technical Missions to Participating Countries (2005-2010)

| Country Name | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------|--------------------------|--------------------|-------------|------------------------|--------------|----------------------------|
| Cambodia | 23-25 Jun | 12-16 Nov | 5-8 Dec | 14-16 Dec | | 9-13 Feb (10-13 Jan 11) |
| China | 5-14 Jan 25 Sep-1 Oct | 11-18 Oct | 17-21 Dec | - | 23-28 Mar | - |
| Indonesia | 6-12 Feb | 12-18 Mar | 8-11 Aug | - | 24-29 May | - |
| Japan | | | | | | |
| Lao PDR | 26-28 Jun | 9-12 Nov | 9-12 Dec | 10-14 Dec | | 21-25 Mar 7-11 Nov |
| Malaysia | - | 10-16 Dec | - | 4-10 Jan | 31 Aug-7 Sep | 20-25 Sep |
| Mongolia | - | 11-15 Sep | - | 10-14 Nov | - | - |
| Myanmar | - | 20-24 Mar 4 Aug | 18-22 Dec | - | 23-27 Nov | 24-29 Oct |
| Philippines | 16-22 Jan | 2-7 Oct | - | 14-18 Jan | | 16-21 Jan |
| Republic of Korea | 21-24 Feb | 6-9 Feb | 20-22 Feb | 18-20 Mar | 9-11 Mar | - |
| Russia | 25 Sep-2 Oct | 26 Aug-3 Sep | 16-23 Sep | 21-28 Sep | 6-11 Sep | 15-21 Aug |
| Thailand | 27 Feb-4 Mar | 26 Nov-1 Dec | 16-21 Dec | 15-20 Dec | - | 17-21 Oct |
| Vietnam | 7-15 Mar 31 Jul-3 Aug | 4-10 Aug | - | 17-21 Mar 18-24 Oct | - | - |
| Total | 11 | 13 | 8 | 10 | 6 | 8 |

Table: Major Activities/Outcomes of NC Technical Missions in 2006

| Country | Period | Major Activities/Outcomes |
|----------------------|------------------------------|--|
| Republic of Korea | 6-9 February 2006 | There are 2 kinds of Filter Pack monitoring method in this region. Sampling period and flow rate, etc. between Japan and R. of Korea are different. Taking into account the present situation, it was decided that an intensive monitoring for method inter-comparison would be conducted at Jeju, Kanghwa or NIER in Korea and Sado-seki or Niigata-maki in Japan in October 2006. |
| Indonesia | 12-18 March 2006 | The mission visited the candidate monitoring site for the inland aquatic environment, Lake Sicikeh Cikeh, in North Sumatra and confirmed that the location is appropriate, EC value is low and there is no anthropogenic water pollution. However, it has a possibility of disharmonic lake*, the decision for EANET site should be made after one year investigation. |
| Myanmar | 20-24 March 2006 | After the discussion, the mission visited candidate monitoring sites and DMH laboratory, and recommended to select a place where isn't far from the laboratory. The mission agreed with Myanmar to start EANET monitoring within the ground of the lab (DMH). |
| Myanmar | 4 August 2006 | The mission discussed Draft Memorandum of Understanding (MOU) for provision of wet only sampler to DMH. The mission confirmed that NC could send the equipment to DMH after MOU entering into force. |
| Vietnam | 4-10 August 2006 | The mission explained an application from ADORC to Japanese Fund for a study to develop emission inventory in East Asian region and requested IMH of clear understanding on importance of development of emission inventory in East Asian region. IMH fundamentally agreed with the idea of NC, and expressed their willingness to carry out the study with ADORC. |
| Russia | 26 August - 3 September 2006 | The mission discussed invitation of Russian researcher to Niigata and agreed to invite Russian researcher of the Limnological Institute to Niigata at the end of February 2007. And, two MOAs (Memorandum of Agreements) of joint research projects were contracted between ADORC and LIN. |
| Mongolia | 11-15 September 2006 | Filter pack sampling unit in Uraanbaatar hasn't worked due to the broken pump. The mission installed a new pump brought to Mongolia in the filter pack sampler and confirmed that the dry deposition monitoring restarted smoothly. The mission suggested setting of filter pack at higher position than present situation (40-50 cm from the surface of top of the building). |
| China | 11-18 October 2006 | The mission attended "China National Workshop (WS) on EANET in 2006" and made presentations on "Recent Progress of EANET Activities", "Wet and dry deposition monitoring of EANET", and exchanged information and views of EANET including technical issues of inter-lab projects. China requested NC to attend the WS every year, if possible. |
| Cambodia and Lao PDR | 9-16 November 2006 | 1) The mission participated in the "Public Awareness Workshop on Acid Deposition" held in both countries and made presentations on progress of EANET and technical issues, and exchanged information and views. 2) The mission confirmed that two sets each of IC systems in Cambodia and Lao PDR installed by using the EANET Secretariat saving could be operated without any problems. |
| Thailand | 26 November -1 December 2006 | The mission held the First Workshop on Joint Research on Dry Deposition Monitoring in cooperation with PCD. Comparative studies among automatic monitor, filter-pack method and passive sampler were introduced. The air quality monitoring data in Bangkok were also introduced by Thai side. |
| Malaysia | 10-16 December 2006 | The mission visited monitoring stations for wet/dry deposition and inland aquatic environment in Danum Valley and confirmed that the sites are suitable for EANET monitoring, and monitoring on wet deposition in Danum Valley has been carried out since 2005. |

Table: Major Activities/Outcomes of NC Technical Missions in 2007

| Country | Period | Major Activities/Outcomes |
|----------------------|----------------------|--|
| Republic of Korea | 20-22 February 2007 | The Workshop on Joint Research Project for the Measurement of Aerosol was held in NIER. In the workshop, NC and NIER gave presentations for the result of the intensive monitoring which was conducted at Jeju, Kanghwa and Niigata-maki in October 2006. It was decided that the results would be summarized and reported during coming a few month. |
| Indonesia | 8-11 August 2007 | The mission visited three candidate sites of inland aquatic environment monitoring. One of the sites, Gunung Lake, located near Skabumi city, seemed to be no influence of land use or human activity and there were no inlet river. The mission suggested that Gunung Lake is the most suitable site and requested to analyze the surface water. |
| Russia | 16-23 September 2007 | Two MOAs of joint research projects were contracted between ADORC and LIN. The mission provided the some suppliers for atmospheric monitoring to Russia. The mission agreed to recommend DG to invite Russian researcher of the Limnological Institute to Niigata, but detailed schedule would be informed by ADORC after discussion with relevant researcher in Japan. |
| Cambodia and Lao PDR | 5-12 December 2007 | The mission confirmed that IC systems in Cambodia and Lao PDR installed by using EANET Secretariat savings in 2006 have been operated without any problems. And the mission provided some consumables and apparatus for IC operation to both countries during/after the mission. The mission decided to recommend DG of ADORC to support filter-pack monitoring kits ASAP to the both countries. |
| Thailand | 16-21 December 2007 | The mission and Thai side agreed that outcomes of the project on the catchment study should be shared among the EANET participating countries. The outcomes of the project will be reported at the next session of the Scientific Advisory Committee. It was announced that development of a simulation modeling on the catchment scale would be a main target. |
| China | 17-21 December 2007 | The mission confirmed that Dry deposition monitoring was conducted in the site of Xiamen with a filter-pack sampler since May 2007 and the filter-pack sampler works properly (Flow rate is 1 L/min). And SO ₂ concentration of the filter pack and a gas monitor has been compared by Xiamen City, The mission suggested Xiamen City to assemble the filter-pack holder correctly. |
| Myanmar | 18-22 December 2007 | At the “Workshop on Dissemination of Public Awareness Brochure on Acid Deposition” 30 people attended, the mission disseminated information on acid deposition issues and EANET activities. Regarding installation of equipment, the mission was informed that JICA might offer some equipment to DMH as one of the following-up activities of JICA. |

Table: Major Activities/Outcomes of NC Technical Missions in 2008

| Country | Duration | Major Activities/Outcomes of the Mission |
|-------------------|----------------------------|---|
| Malaysia | 4-10 January 2008 | The mission confirmed that monitoring activities have been managed very well by MMD and DOC in cooperation with MNRE, NFPs. The mission visited the candidate study site for the joint research project on the catchment analysis, Danum Valley Conservation Area, and discussed the detailed plan. |
| Philippines | 14-18 January 2008 | The mission discussed flagged concentrations of Inter-lab project in 2006 with EMB. As for NH_4^+ , the mission advised that it could be easy for them to use IC rather than spectrophotometer to solve this problem. The mission provided some consumables for wet/dry deposition monitoring. |
| Vietnam | 17-21 March 2008 | The mission confirmed that the “Master plan of the monitoring network of Vietnam up to 2020” was approved by the Prime Minister. It includes the monitoring network of VEPA and NCHM. |
| Republic of Korea | 18-20 March 2008 | In the Workshop on Joint Research Project, the results of NIER and ADORC were introduced. The results of the monitoring at Niigata showed close values among four kinds of methods. Future plan of the was also discussed. |
| Russia | 21-28 September 2008 | The mission discussed the MOA of the Joint Research Project. It was contracted by ADORC and Limnological Institute (LIN). The mission visited LIN and Primorsky Center for Environmental Monitoring (PCEM) and discussed EANET activities in Russia. The Mission also visited three atmospheric monitoring stations and a monitoring site for inland aquatic environment. |
| Vietnam | 18-24 October 2008 | The mission visited relevant agencies and (candidate) monitoring sites in Hanoi, Danang and Hochiminh, and discussed how to improve QA/QC, etc. The mission also visited JICA office and asked support from JICA to the “Capacity building project for air quality monitoring using passive sampling method” to proceed by Vietnam. |
| Mongolia | 10-14 November 2008 | The mission visited relevant agencies and exchanged information on the views and progress of EANET including QA/QC activities. The Mission also visited the EANET sites in Ulaanbaatar and Terej. |
| Lao PDR | 10-14 December 2008 | The mission confirmed that the monitoring site in Vientiane was moved to the Department of Meteorology and Hydrology near the Wattay International Airport, whose environmental location was much better than the former location. Since the wet only sampler and IC systems in the lab had some problems, NC decided to support repairing of the equipment as soon as possible. And the mission provided some consumables and apparatus for IC operation and filter-pack monitoring. |
| Cambodia | 14-16 December 2008 | The mission confirmed that IC systems in Cambodia have been operated without any problems. But, the mission was requested to provide an opportunity of training course for IC maintenance in order to maintain the equipment appropriately. The mission replaced one of micro photo sensors of wet only sampler in Phnom Penh to new one and repaired it. And the mission provided some consumables and apparatus for IC and filter-pack monitoring. |
| Thailand | 15-20 December 2008 | The mission demonstrated the leak check method of Filter-pack holder, and explained the procedure of the comparison test for Filter-pack method. The mission and the staffs of Pollution Control Department (PCD) agreed to re-analyze the samples of the comparison test for passive analysis again to confirm the results of NO_2 . Regarding new research projects between NC and PCD, the mission was requested to submit the draft working plan of the project in 2009. |

Table: Major Activities/Outcomes of NC Technical Missions in 2009

| Country | Duration | Major Activities/Outcomes of the Mission |
|-------------------|------------------------------|--|
| Republic of Korea | 9-11 March 2009 | The mission requested National Institute of Environmental Research, R. of Korea to provide air concentration monitoring data on hourly basis, and NO and NO _x data in addition to the NO ₂ data for NC. The draft implementation plan on the “Joint research project on aerosol monitoring” in 2009 was discussed, and after the mission it was decided to implement intensive monitoring in October 2009. |
| China | 23-28 March 2009 | The mission visited two monitoring sites in Chongqing. The mission and China National Environmental Monitoring Center (CNEMC) fundamentally agreed to implement comparative study of air concentration monitoring on ozone at two cities (Chongqing and one another city) in China in 2009. The mission and China discussed future development of EANET including future institutional arrangement. China requested NC training of data analysis at NC. |
| Indonesia | 24-30 May 2009 | The mission attended the Workshop on Public Awareness on Acid Deposition held in Jakarta on 27-28 May 2009 and made presentations on the environmental study project, the scientific background of acid deposition and its impacts management, etc. The mission visited the Environmental Management Center (EMC) and discussed and exchanged information on technical issues, especially QA/QC activities and data reporting, including check on condition of analytical instruments. |
| Malaysia | 31 August - 7 September 2009 | The mission visited the organizations relevant to EANET and discussed possibility of future research collaboration. The mission also visited the EANET monitoring site at Danum Valley (DV), Sabah and exchanged information and views on EANET activities with the staff in charge. |
| Russia | 6-11 September 2009 | The mission discussed the MOA of the Joint Research Project. It was contracted by ADORC and Limnological Institute (LIN). The mission visited LIN and discussed EANET activities in Russia. The Mission also visited two atmospheric monitoring stations and a monitoring site for inland aquatic environment. |
| Myanmar | 23-27 November 2009 | The mission visited Department of Meteorology and Hydrology (DMH) to exchange information and views with the staffs of DMH, and visited the lab of DMH to hold a seminar of IC and pure water apparatus. The mission confirmed that new IC system installed by JICA can be operated without any problems. |

Table: Major Activities/Outcomes of NC Technical Missions in 2010

| Country | Duration | Major Activities/Outcomes of the Mission |
|-------------|--------------------------|---|
| Philippines | 16-21 January 2010 | The mission requested moving positions of the wet-only sampler and the rain gauge of Mt. Sto Tomas site in order to remove obstruction to collection of the sample based on the site criteria because the distance between those instruments and the fence of 2 meters in height was less 2 meters. Regarding results of Inter-laboratory comparison projects 2008, the mission requested to select appropriate concentration range of standard solutions for every ion to measure. Although ozone monitor in Metro-Manila site has been broken, the data will be submitted as EANET data after it is repaired. |
| Cambodia | 9-13 February 2010 | The mission requested to start filter-pack monitoring as soon as possible because almost one year has passed since they received necessary equipment and so on from the NC, and the monitoring equipment was installed appropriately to the Phnom Penh monitoring site. Cambodia decided to start filter-pack monitoring from 12 February 2010. The mission instructed all of necessary technical matters of the monitoring to the staff in charge again during the mission. |
| Lao PDR | 21-25 March 2010 | The filter-pack monitoring has not been implemented yet though long time has passed since Lao PDR received necessary equipment and so on from the NC. The mission instructed all of necessary technical matters of the monitoring to the staff in charge again during the mission. With regard to the Inter-laboratory comparison projects 2008, since there are many flagged data, the mission confirmed the reasons including the contamination of pure water for the projects. |
| Russia | 15-20 August 2010 | The mission discussed the MOA of the Joint Research Project. It was contracted by ACAP and Limnological Institute (LIN). The mission visited LIN and Primorsky Center for Environmental Monitoring (PCEM) and discussed EANET activities in Russia. The Mission also visited three atmospheric monitoring stations and a monitoring site for inland aquatic environment. |
| Malaysia | 20-25 Sep. 2010 | The mission visited the organizations relevant to EANET and exchange information and views on QA/QC activities on acid deposition monitoring including calibration of the automatic ozone monitors in Malaysia. The mission visited monitoring sites, Kuching and Bintulu (candidate) to know onsite information as EANET monitoring sites. |
| Thailand | 18-21 Oct. 2010 | The mission visited the organizations relevant to EANET (PCD, Thai Meteorological Department and Chiang Mai Univ.) exchange information and views on QA/QC activities on acid deposition monitoring including calibration of the automatic ozone monitors in Thailand. The mission visited monitoring sites, Bangkok, Samut Prakan and Chiang Mai to know onsite information as EANET monitoring sites. |
| Myanmar | 25-29 Oct. 2010 | The mission visited Department of Meteorology and Hydrology (DMH) to exchange information and views with the staffs of DMH, and visited the lab of DMH to hold a seminar of EANET activities including analytical instrument such as IC and so on. |

Table: Individual Training Program at ADORC

| Year | Number of Participants | Countries | Training Provided |
|--------------|-------------------------------|--|--|
| 1998 | 2 | Thailand, Russia | Filter-pack monitoring |
| 1999 | 10 | China (9), Indonesia | Training on EANET activities |
| 2000 | 4 | Philippines, Russia, Thailand (2) | Training on EANET/ Wet and dry deposition monitoring, data management |
| 2001 | 6 | Indonesia(3), Malaysia, Philippines, Vietnam | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2002 | 6 | China (2), Indonesia, Mongolia, Philippines, Thailand | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2003 | 6 | Cambodia, China, Lao PDR, Thailand (2), Vietnam | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management/EANET activities |
| 2004 | 5 | Cambodia, China, Lao PDR, Malaysia, Philippines | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2005 | 6 | Cambodia, China, Indonesia, Lao PDR, Thailand, Vietnam | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2006 | 2 | Cambodia, Lao PDR | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2007 | 5 | Cambodia, China, Indonesia, Lao PDR, Myanmar | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2008 | 5 | Cambodia, China, Lao PDR, Myanmar, Vietnam | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2009 | 6 | Indonesia, Malaysia (2), Mongolia, Russia, Thailand | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring, data management and atmospheric transport modeling |
| 2010 | 6 | Cambodia, China, Indonesia, Lao PDR, Myanmar, Vietnam | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| 2011 | 3 | China, Malaysia, Russia | Wet and dry deposition, soil and vegetation, inland aquatic environment monitoring and data management |
| Total | 72 | | |

Table: JICA Training Course on EANET (NC collaboration with JICA)

| Year | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | Total |
|--------------|----------|-----------|----------|----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|--------------|
| Cambodia | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 13 |
| China | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 12 |
| Indonesia | 2 | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | | | | 10 |
| Japan | | | | | | | | | | | | | | | 0 |
| Lao PDR | | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 13 |
| Malaysia | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | | | | 14 |
| Mongolia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | 11 |
| Myanmar | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 8 |
| Philippines | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | 11 |
| R. of Korea | 1 | 1 | | | | | | | | | | | | | 2 |
| Russia | | | | | | | | | | | | | | | 0 |
| Thailand | 1 | 1 | | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | | 1 | 1 | 13 |
| Vietnam | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 12 |
| Total | 9 | 9* | 8 | 8 | 10 | 9 | 10 | 10 | 10 | 10 | 10 | 5 | 6 | 7 | 121* |

* Note: These figures included one trainee from India.

Table: JICA Third Country Training Course on Acid Deposition Monitoring and Assessment in Thailand (NC collaboration with JICA and PCD, Thailand)

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | <u>Total</u> |
|--------------|-----------|-----------|-------------|-------------|-------------|-------------|---------------------|
| Cambodia | 2 | 3 | 2 | 2 | 3 | 2 | 14 |
| China | 2 | 2 | 2 | 1 | 1 | | 8 |
| Indonesia | | 1 | 3 | 3 | | | 7 |
| Japan | | | | | | | 0 |
| Lao PDR | 2 | 2 | 2 | | 3 | 2 | 11 |
| Malaysia | | 2 | 1 | 1 | | 2 | 6 |
| Mongolia | 2 | 2 | 3 | 1 | 2 | 2 | 12 |
| Myanmar | | 2 | 2 | 3 | 2 | 3 | 12 |
| Philippines | | 1 | 1 | | 2 | 2 | 6 |
| R. of Korea | | | | | | | 0 |
| Russia | | | | | | | 0 |
| Thailand | 6 | 4 | 6 | 6 | 6 | 8 | 36 |
| Vietnam | 4 | 3 | 2 | 2 | 3 | | 14 |
| Total | 18 | 22 | 24 | 19 | 22 | 21 | 126 |

iv) Development of scientific research on atmospheric environment in East Asia

Table: Joint research project carried out with participating countries

| Year | Country | Research Objectives | Funding Source |
|-----------|------------------------------|---|--|
| 1998- | Russia | To improve monitoring methodology and monitor acid deposition as well as heavy metals and lead isotope ratio in the frigid zone. | Ministry of the Environment, Japan |
| 1999-2005 | Thailand | To investigate the concentration of air pollutants and dry deposition velocities above specific surface of tropical zone. | ADORC/AEON Fund |
| 2001- | Mongolia | To investigate plant sensitivity to acid deposition in the (sub-) arid zone in Mongolia. Concentrations of the air pollutants have been also monitored. | ADORC (ACAP) /Ministry of the Environment, Japan |
| 2005- | Thailand, Malaysia and Japan | To estimate the ecological effects of acidic deposition on tropical seasonal forested catchment in Thailand, Malaysia and Japan based on the measurement of elemental budget, etc. | Ministry of the Environment, Japan |
| 2005- | Thailand | To study whether there are differences in concentration of air pollutants with use of different methods (automatic monitor, filter-pack method and passive sampling method) in the tropical zone. | ADORC (ACAP) /AEON Fund |
| 2005-2008 | Republic of Korea | To evaluate aerosol sampling methodology (There are two methods in this region.) and PM2.5 behavior in R. of Korea and Japan. | ADORC/NIER in R. of Korea |

Table: EANET Research Fellowship Program

| Year | Researchers | Country | Research Themes |
|--------------|--------------------------------|----------------|---|
| 2005 | Mr. Eyi Wang | China | Assessment of Ozone Variability in East Asia During Recent Years |
| | Ms. Arcely C. Viernes | Philippines | Determination of Unanalyzed Components in Rainwater |
| 2006 | Ms. Bulgan Tumendemberel | Mongolia | Determination of Unanalyzed Components in Precipitation Water |
| | Ms. Elena Gritsan | Russia | Application of scientific climatological approach and statistical methods for optimization of EANET network |
| 2007 | Dr. Yibing Lu | China | Comparison of Air Pollution and Acid Deposition between Two Mega-cities |
| | Mr. Son Anh Truong | Vietnam | Assessment of Ozone and Other Gaseous Concentrations in East Asia |
| 2008 | Ms. Yani Sumarriani Sutaryo | Indonesia | Studies on effect of acid deposition and related air pollutants on ecosystems/ inland water aquatic |
| | Ms. Soontree Khuntong | Thailand | Ion chromatographic determination of organic acids in rainwater |
| 2009 | Dr. Rattapon Onchang | Thailand | Effect of haze on wet and dry deposition at EANET sites in Thailand |
| 2010 | Ms. Sopittaporn Sillapapiromsu | Thailand | Effect of Biomass Burning on Atmospheric Acid Deposition in Chang Mai-Lamphun Basin, Thailand |
| | Mr. Sy Van Pham | Vietnam | Study on the Wet-and Dry-Deposition over the Southeast Asia by CMAQ model and EANET data |
| Total | 11 | | |

v) Promotion of public awareness

Table: Joint public awareness activities on acid deposition with participating countries

| Year | Target Audience | Activity | Number of participants |
|-------------|--|---|-------------------------------|
| 1998 | School children and general public | Development of public awareness brochure (To Protect Our Common Earth) and Videotape (Acid Deposition/To Protect our Beautiful Earth) | |
| 1999 | School children and general public | Development of national public awareness brochures (with China and Thailand) | |
| 2000 | School children and general public | Development of national public awareness brochures (with Malaysia and Philippines) | |
| 2001 | School children and general public | Development of national public awareness brochures (with Indonesia and Vietnam) | |
| 2001 | School children and general public | In-country workshop (Philippines) | 38 |
| 2002 | School children and general public | Development of national public awareness brochure (with Mongolia) | |
| 2002 | School children and general public | In-country workshop (Indonesia and Vietnam) | Indonesia 100 Vietnam 60 |
| 2003 | School children and general public | Development of national public awareness brochure (with Russia) | |
| 2003 | School children and general public | In-country workshop (Mongolia) | 80 |
| 2004 | School children and general public | Development of national public awareness brochures (with Cambodia) | |
| 2004 | School children and general public | In-country workshop (Russia) | 300 |
| 2005 | School children and general public | Development of national public awareness brochure (with Lao PDR) | |
| 2005 | School children and general public | In-country workshop (Cambodia) | 45 |
| 2006 | School teachers and NGO leaders | e-Learning Program on EANET website (Acid deposition and the Environment) | |
| 2006 | School children and general public | Development of national public awareness brochures (with Myanmar) | |
| 2006 | Government officials, private sector and NGOs | Public awareness workshop on acid deposition (Philippines) | 36 |
| 2006 | School children and general public | In-country workshop (Lao PDR) | 50 |
| 2006 | Government officials and general public | Public awareness workshop on acid deposition (Lao PDR) | 100 |
| 2006 | Government officials private sector and general public | Public awareness workshop on acid deposition (Cambodia) | 80 |
| 2007 | School children and general public | In-country workshop (Myanmar) | 30 |
| 2008 | Government officials private sector and NGOs, etc. | Public awareness workshop on acid deposition (Indonesia) | 65 |
| 2009 | Government officials NGOs, etc. | Public awareness workshop on acid deposition (Mongolia) | 60 |
| 2010 | School children and experts, NGOs, etc. | Environmental Conference of School Children (Japan) | 160 |

Table: EANET Workshop on Public Awareness concerning acid deposition problems

| Year | Target Audience | Activity | Number of participants |
|-------------|---|---|-------------------------------|
| 2001 | Participating countries | First Public Awareness Workshop on Acid Deposition Problems (Niigata) | 20 |
| 2002 | Participating countries, relevant officials, NGOs | Second Public Awareness Workshop on Acid Deposition Problems (Beijing) | 50 |
| 2003 (Feb) | Participating countries | Third Public Awareness Workshop on Acid Deposition Problems (Niigata) | 30 |
| 2003 (Dec) | Participating countries, school children and general public | Fourth Public Awareness Workshop on Acid Deposition Problems (Niigata) | 200 |
| 2005 | Participating countries, school children and general public | Fifth Public Awareness Workshop on Acid Deposition Problems (Niigata) | 300 |
| 2006 | Participating countries | Sixth Public Awareness Workshop on Acid Deposition Problems (Niigata) | 30 |
| 2007 | Participating countries, NGOs, private sectors, etc. | Seventh Public Awareness Workshop on Acid Deposition Problems (Niigata) | 60 |
| 2008 | Participating countries and school children, etc. | Eighth Public Awareness Workshop on Acid Deposition Problems (Internet Conference for School Children in Bangkok and Niigata) | 350 |
| 2009 | Participating countries and school children, etc. | Ninth Public Awareness Workshop on Acid Deposition Problems (in Niigata) | 150 |