

Research Activities towards Relatively Short-Term Objectives of EANET

(Draft Discussion Paper)

1. Introduction

Joint Announcement on the Implementation of the Acid Deposition Monitoring Network in East Asia (EANET) agreed by the Second Session of the Intergovernmental Meeting (IG2) in October 2000 indicates that the “participating countries will discuss future EANET activities in order to contribute to development of international cooperative efforts for preventing or reducing adverse environmental impacts of acid deposition.”

“Tentative Design of the Acid Deposition Monitoring Network in East Asia” which was also discussed at IG2 suggested that “participating countries will promote studies of other scientific issues in order to improve understanding of the risks of acid deposition.” (Subparagraph 6 of paragraph 3)

To reflecting the necessity to introduce certain clarification in that kind of EANET activities the “Proposal for Future Research Activities in EANET” were suggested by the Network Center (NC) to be presented for discussion at the Second Senior Technical Managers' Meeting (STM2) and the First Session of Scientific Advisory Committee (SAC1) in 2001. Because the proposal was prepared in rather comprehensive manner, the participants of SAC1 generally felt that clear prioritization for future research activities was needed.

As a response for further elaboration of the proposal NC prepared draft Proposal for Future Direction of Research Activities in EANET to consider the general direction of investigations concerning acid deposition problems at STM3 (October 2002) and SAC2 (November 2002) before the proposition for more determined future research activities would be elaborated. Due to real complexity of this topic the SAC2 recommend to continue discussion among the SAC members.

However, the development of EANET activity in the fields of monitoring and data application should be supported correspondent researches to ensure appropriate quality and assurance of EANET data as well as the effectiveness of measurement network at the national and international levels.

2. Objectives of EANET activities.

The long-term objectives of the EANET activities were specified in the “Joint Announcement on the Implementation of the Acid Deposition Monitoring Network in East Asia (EANET)” as discussed and agreed by IG2 in November 2000:

- to create a common understanding of the state of the acid deposition problems in East Asia;
- to provide useful inputs for decision-making at local, national and regional levels with goals to prevent or reduce adverse impacts on the environment caused by acid deposition; and
- to promote the mutual cooperation on the issues related to acid deposition among the participating countries.

Based on current development of EANET and review of urgent problems the following Relatively Short-Term Objectives of EANET should be proposed to discuss by participants:

- to provide the high quality measurement data;
- to expand the monitoring network in the proper way of spatial resolution and effectiveness;
- to apply existed data to current evaluation of environmental state and tendencies.

3. Proposed future direction of research activities

According to mentioned draft Proposal for Future Direction of Research Activities in EANET the most of investigation could be classified for two parts: highest priority researches and other important ones.

The first part should include the research activities that contribute to the improvement of monitoring activities including QA/QC activities. These research activities should be implemented to attain results in shorter term (three to five years).

The research activities of second part are also important to be implemented step by step towards prevention and reduction of adverse impacts of acid deposition on ecosystems with results after mid- or long term periods (five to ten years or more). In general, they cover a variety of multi-disciplinary studies including emission inventories and modeling, methodologies for early detection of impacts of acid deposition on the environment, problems on interpretation and evaluation results to decision makers, etc.

According to discussion at SAC2 this classification and assumed time scales are relatively uncertain but useful for consideration. The number of researches could be re-assessed for their importance or time scales based on evaluation of correspondent scientific progress or/and the correspondent requirements from decision-makers and public.

4. Researches towards Relatively Short-Term Objectives of EANET

The countries in East Asia extend geographically from tropical to boreal zones with different characteristics of climate and vegetation. Taking into account the considerable variety of monitoring condition in EANET the development and improvement of monitoring methodology could be established as the high priority tasks for research activities. According to opinion of SAC2 members the results of them should be incorporated into revision of manuals and QA/QC programs. The following researches could be promoted in improvement of current monitoring technologies and data assurance:

- Investigation and evaluation of current monitoring practice for updating and standardizing of sampling and analytical methods for wet deposition;
- Investigation and development of sampling techniques and procedures for dry deposition;
- Studies on implementation of low-cost methods to monitor air concentration of chemical species such as passive samplers;
- Studies on consideration and evaluation of imbalanced data on wet deposition taking into account different reasons and conditions of their appearance as well as different tasks of research activities that data might be used.

The researches on development of monitoring methodologies should be carried out to provide the basic information on acid deposition impact on environmental objects;

- Development of methodology for assessing plant sensitivity to acid deposition;
- To implement approaches of key species sensitivity to air pollution as the methods for detection of forest ecosystem change due to acid deposition;
- Development of sub-manual for forest monitoring in EANET;
- Investigation of catchment study approach to develop the methodology of environmental indicators of acid deposition impact on ecosystems;
- Promote studies on evaluation of required network density in accordance with EANET objectives to utilize monitoring data;

The following themes of researches on EANET data application should be discussed:

- Analysis and evaluation of data for previous years with the aims to create a mechanism of multi-level creditability of data using classification of measurement conditions, difference of ranks, tasks to use data taking into account that data on sulfur and nitrogen species are most important for acid deposition;
- Evaluation of acid deposition fluxes from the atmosphere within EANET region based on monitoring data;

- Providing the support and validation of the atmospheric transport modeling studies for EANET region;
- Research on identification and evaluation of trends in atmospheric pollution as well as their possible sensitivity to changes of emissions.
- Studies on development of assessment indicators (thresholds, exposure levels, etc) for evaluation of impact on the environment based on monitoring data.

As a part of these studies NC has been implementing joint researches on dry deposition flux in tropical regions with Thailand and on monitoring methodologies in boreal region with Russia. NC and Mongolia also started a joint research on plant sensitivity to air pollution in arid zone. These projects are expected to bear fruit for the improvement of monitoring activities.

5. Actualization of the future researches

NC prepares these specific themes on research activities towards relatively short-term objectives of EANET in line with the "Proposal for future direction of research activities in EANET". NC expected the comments from participants to include possible modifications before consideration of them by the Third Session of Scientific Advisory Committee.

The closer cooperation should be promoted to implement and conduct research studies both within EANET and with other international programs. NC will make efforts to develop and realize the mechanism of EANET Data Disclosure Procedure under the contact with participating countries to ensure more effectiveness for measurement data investigation and application.

Due to importance of funding problem for promoting the investigations many efforts should be done to mobilize existing and new resource for financing of the research activities. Participating countries may wish to take the initiative in implementing some of the themes. Each country should be explored to find various research funds domestically as well as internationally.

It should be emphasized that not only financial resources but also human resources are essential for promoting research activities. Linkage with other science communities and programs is useful to know latest scientific concerns and to explore possible existed resource.