The Fifth Session of the Scientific Advisory Committee
on the Acid Deposition Monitoring Network in East Asia
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Proposal for Future Research Activities of Highest Priority

(Draft)

Network Center for EANET

1. Introduction

According to "Tentative Design of the Acid Deposition Monitoring Network in East Asia (EANET) " (EANET/IG 2/5/3) approved by the 1st Intergovernmental Meeting (IG1), the 1st Scientific Advisory Committee (SAC1) started to discuss about the future research activities to be implemented by participating countries and Network Center (NC).

As a basis for discussion in SAC2, 3 and 4, NC prepared a draft on the future direction of research activities. Last year NC prepared a draft titled by "Proposal for Future Research Activities of Highest Priority". Further elaboration of proposals is presented below based on decision of SAC4 and latest discussions.

2. Proposed future direction of research activities

2.1 Highest priority researches

2.1.1 Researches on monitoring methodologies, QA/QC and data reporting

The highest priority should be given to the research that contributes to the improvement of monitoring. It includes monitoring methodologies, QA/QC program and data reporting procedure/formats.

Since the EANET countries extend geographically from tropical to boreal zones with different characteristics of climate and vegetation, applicability of the existing methodologies should be examined carefully, and their refinement or development of advanced methodologies should be accomplished.

NC has been implementing joint researches
1) on dry deposition flux in tropical regions with Thailand,
2) on monitoring methodologies in boreal region with Russia,
3) on sensitivity of plants in arid zone with Mongolia,

4) on filter-pack method for gas and aerosol sampling with Rep. of Korea, and
5) on catchment analysis with Thailand.

In addition, experiences of the monitoring in participating countries and NC have been accumulated during these 6 years after the start of the preparatory phase. Based on these researches and experiences, inadequate points and shortcomings of the present version of the technical manuals, QA/QC programs and data reporting procedures/formats have been revealed. Thus, a working group should be launched for listing up these inadequate points and shortcomings and for revising the technical manuals, QA/QC programs and data reporting procedures/formats.

2.1.2 Researches on present state and trend of acid deposition on regional-, national- and urban-scales in East Asia, on the basis of the previously monitored data

In line with the "Tentative Design of the EANET", the SAC3 organized a discussion on necessity to prepare the first periodic report on the present state and trend of acid deposition in East Asia and then the SAC4 launched the Drafting Committee for the first periodic report. As the first step, the 1st Scientific Workshop on Evaluation of the State of Acid Deposition in East Asia had been organized by NC on October 1, 2004 in Niigata, Japan. The 1st Drafting Committee was held on 14 and 15 April in this year and the 2nd Drafting Committee will be held on 29-31 in the coming August. It is expected to bear fruitful accomplishments from the SAC members' research activities, in particular, environmental assessment on the regional scale in East Asia being the first extensive analysis and being valuable not only from policy maker side but from scientific point of view.

However, in order to complete theses researches not only on the regional scale but also on the national and urban scales, more extensive research group should be established since continuous research work is necessary. For that purpose NC should take this role.

2.2 Important researches

2.2.1 Modeling and emission inventory

In the1960s environmental management was worked out on the basis of monitoring. More than 2000 air quality monitoring stations have been constructed in Japan and required a huge amount of cost. After 40 years experience and brush up, in the next generation the environmental management should be based both on the monitoring and numerical model. Of course the monitoring is essential in all ages but numerical model technique has advanced drastically in those two decades and can be applied to atmospheric transport, diffusion, chemistry and deposition processes but also to the effects on soil and land aquatic environments. Moreover the numerical model can be executed by means of a low-cost personal computer PC or parallel processor consisted of PCs. At present emission inventories of air pollutants has been compiled for SOx, NOx, VOC, NH3, PM10 and elemental carbon at 0.5 by 0.5 degree (50km x 50km) on the global scale and thus combined

execution of the emission inventories and numerical model present us reasonable overview on the acid deposition, atmospheric, soil and inland-aquatic environments and their interactions. Since there exists uncertainties, continuous refinements and sophisticated modeling works are required. Particularly, emission inventory methodology in East Asia should be established as early as possible and continuous emission inventories by means of it are required for adequate decision making of emission control and for environment management, e.g., in the global warming problem since maximum contribution of CO2 emission of about 20% comes from electric power plant, its detailed examination part by part based on the emission inventories may suggest us the most reasonable abatement strategy.

Communication/collaboration with existing initiatives have been started on the emission inventories and numerical modeling. These include

1)LTP project (Long-range Transboundary Air Pollutants in Northeast Asia project) among Rep.of Korea, China and Japan, leaded by Rep. of Korea,
2)Model Inter-Comparison Study MICS-Asia among China, Hong Kong, Rep.of Korea, China, USA, Sweden, France, Austria and Japan
3)Development Study on the Acid Deposition Control Strategy in Thailand by JICA and Thailand.

2.2.2 Researches on methodologies for early detection of impacts of acid deposition on soil, vegetation and inland aquatic environment

The following research activities should be promoted.

- Study on buffering capacity of soil in different climate conditions
- Development of methodologies for catchments analysis of atmospheric pollution impacts on forest ecosystems
- Quantitative studies on the plant sensitivity to acid deposition
- Evaluation of forest tree growth by hemi-spherical photography
- Development of indicators for the early detection of acidification of inland aquatic environment

2.2.3 Researches on methodologies on environment management

The following research activities should be explored/promoted.

- Development of statistical methodologies for interpreting monitoring data sets including trend analysis
- Studies of effects-based approaches to understand the resulting environmental benefits and to provide quantitative targets linked to environmental goal
- Development of integrated modeling to explore the most appropriate solution based on cost-effective analysis

2.3 Timetable

The research activities of the highest priority should be implemented to attain results in short term (three to five years).
The other important research activities are to be implemented step by step and their results will be attained in midterm or long term (five to ten years).

3. Funding and human resources

Funding is substantial for promoting the research activities. Efforts should be done to mobilize existing and new funding source 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 (World Bank, ADB, UNDP etc.). Linkage with other science communities is effective to know latest scientific concerns and possible financial resource.

Human resources are essential for promoting research activities. Research fellowship of EANET secretariat office allow us to support two researchers in this year. Application to JSPS (Japan Society for Promoting Science and Technology) and other fellowships are also possibility.

The research activities of NC are indicated in the Work Program for EANET that is approved by the participating countries, and should be conducted, taking the budget into account.

If this Proposal for the Future Direction is considered by the Scientific Advisory Committee as appropriate, with possible modification, NC will prepare more specific themes on research activities in line with the Proposal and present these themes to the participating countries.