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Proposal for future research activities in EANET

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1. Outlines of research activities performed in EANET

The objectives of the EANET should be, 1) to create a common understanding of the state of the acid deposition among countries and organizations of the East Asian region, 2) to provide useful inputs for decision-making at local, national and regional levels aimed at preventing or reducing adverse impacts of acid deposition on human health and the environment, and 3) to promote the cooperative relationships among participating countries with respect to acid deposition issues.

In order to attain the mentioned objectives of EANET, it is required to evaluate appropriately the actual situations of environmental impacts of acid deposition and to obtain reliable data of acid deposition.

Moreover, in order to provide the useful information for policy-decision making for preventing environmental impacts, it is important, 1) to increase the common understanding about the situation of acid rain issues, 2) to know the actual situations of emission sources, and 3) to clarify the effect on the reduction of acid deposition by the effective countermeasures for reducing the emission of air pollutants and the effects on the environment by the reduction of acid deposition.

The countries in East Asia extend from tropical to boreal zones including quite different characteristics of climate and vegetation. For progressing the monitoring and modeling activities of acid deposition in EANET participating countries with those various geographical features, the development of methodologies and evaluation techniques suitable for the East Asian regions are indispensable.

So far, research activities have been performed in EANET under considerations of the regional characteristics. For example, a joint research project between Network Center of EANET (NC) and the Government of Thailand has been started in 1999 with respect to the measurements of dry deposition flux in tropical regions using the method already proposed. On the other hand, between NC and the Russian Academy of Sciences, research projects of the monitoring of acid deposition, ecological impact monitoring in soil and vegetation and in inland aquatic environment and developments of those monitoring methodologies have been performed in boreal regions. In Mongolia, a joint research project with NC has started to survey the sensitivity of plants growing near the power plants in arid region.

Other than the research activities as EANET described above, LTP project (Long –range Transboudary Air Pollutants in Northeast Asia) has started in 1999 for 5 years

among China, Japan and Korea, for collecting monitoring data of air pollutants in relevant regions and collaborative works for emission inventory and modeling. In the project the expert meeting is held every year with respect to the simulation modeling of long-range transboundary air pollutants. In Thailand, a JICA Development Study has been in preparation to develop an acid deposition control strategy based on long-range transport model simulation study.

The above mentioned research projects have in progress successfully with useful results. Moreover, research activities in various fields should be encouraged for the further development of EANET activities.

In developing future research activities, research projects should be based on the following fundamental viewpoints and on the local feature of EANET, as shown in the next section.

2. Fundamental viewpoints for developing future research activities

It is necessary to keep in mind about the following points in promoting the research activities under consideration of the geographical features of the East Asian regions, in order to achieve the objectives of EANET:

(1) The target of the research should be set up for every individual problem, studying in step-by-step approach. The role of each study should be clarified among the target, which should be attained in EANET activities as a whole. Each research should be classified into short-term issues (two to three years) and mid- and long-term issues (five to ten years), depending on the difficulties to be analyzed.

(2) For promoting the research activities in EANET, efforts should be continued to seek linkages with existing international network of environmental programmes in Europe and America and with WMO Precipitation Chemistry Network, which have long experience in relevant research. The research activities should be performed under the consideration of the geographic characteristics in East Asia regions.

(3) In addition to the researches based on natural science, social scientific approach is necessary. Impacts of acid deposition on human environment and its countermeasure should also be evaluated from the economical viewpoint. The development of the methodology of acid deposition monitoring is indispensable, which shows intelligibly the necessity and validity of the countermeasure to the acid deposition issues.

(4) The problem of funding is very important for promoting the research activities. Efforts should be made to mobilize existing and new funding source for financing the research activities. Each country should be explored to find various research funds domestically as well as internationally.

3. Research activities progressing in Task force of EANET

(1) Task force of dry deposition monitoring

- QA/QC program for air concentration monitoring (automatic monitor)
- Improvement of filter-pack method
- Research on dry deposition velocity in Thailand and Japan

(2) Task force of soil and vegetation monitoring

- Compilation of strategy paper of soil and vegetation monitoring
- Researches on plant sensitivity to acid deposition

4. Future problems to be discussed

(1) Identification of research projects to be progressed in short- and long term period.

Future research program should be discussed at the Scientific Advisory Committee for coming two years, which will be performed in short term period of 2 to 3 years and also in long-term period of 5 to 10 years. Expected research projects are shown as examples in Annex.

(2) Present issues which should be clarified

To proceed an acid deposition monitoring and modeling, following projects should be in progress effectively at the present time.

a) Development of emission inventory and simulation modeling of long-range transboundary air pollutants, which are progressing in LTP project menitoned before and JICA/ Thailand joint project for survey of the development of strategy for acid deposition issues.

b) Improvement of the methodology of wet deposition monitoring in boreal zones

c) Improvement of the methodology of dry deposition monitoring, which is studying in Dry Deposition Task Force.

As for the monitoring of ecological impacts of acid deposition, quantitative studies of plant sensitivity in arid zone of Mongolia have just started between Network Center of EANET and Mongolia. Those studies should be performed in tropical to boreal zones. Preliminary studies for the development of the methodology for catchment analyses have been in process in NC. Further progress of these researches will be expected in EANET.

Annex

Examples of research projects, which should be performed in short-term (2-3 years) and in long-term (5-10 years) periods

1) Research on acid deposition monitoring and modeling

a) Projects in short-term target

(1) Establishment and evaluation of the methodology of wet deposition monitoring

(2) Establishment and evaluation of the methodology of air concentration monitoring

(3) Mapping of emission inventory.

(4) Development of the modeling of long-range transboudary air pollutants

(5) Establishment of the methodology of scientific analysis of monitoring data

b) Projects in long-term target

(1) Establishment and evaluation of the methodology of dry deposition monitoring

(2) Estimating matrix of the amount of acid deposition

2) Research on monitoring and modeling in soil, vegetation and inland aquatic environment

a) Projects in short-term target

(1) Development of the methodology for early detection of the impacts of acid deposition on soil, vegetation and inland aquatic environment

① Evaluation of the change of element concentration of foliage

② Evaluation of forest tree growth by hemi-spherical photography

③ Evaluation of soil acidity by the elemental change of soil solution and by the composition change of soil micro organism

④ Development of the methodology of early detection of inland aquatic environment

(2) Quantitative studies of the plant sensitivity to acid deposition

(3) Development of bioindicator for detecting the acidification of inland waters

(4) Evaluation of the impacts of acid deposition on cultural properties

b) Projects in long-term target

(1) Quantitative evaluation of the impacts of acid deposition on forests and inland aquatic environment

(2) Development of model simulation for evaluating the impacts of acid deposition on ecosystem as a whole including forests and rivers

(3) Evaluation of impacts of acid deposition on yield of agricultural crops

(4) Development of the methodology based on remote sensing technique for evaluating the impacts of acid deposition on forest ecosystems