

The Twelfth Session of the Working Group  
on Future Development of the EANET  
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## **Review on the Future Development of the EANET : Future Expansion of the Scope of the EANET**

### **I. INTRODUCTION**

1. “The Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia (EANET)” was adopted at the Twelfth Session of the Intergovernmental Meeting (IG12) on the EANET held in November 2010, and was signed by twelve participating countries of the EANET during and after the IG12. In accordance with the “Decision 1/IG.12” adopted at the IG12, it has been operational since 1<sup>st</sup> January 2012 although one country still has not signed yet.
2. At the Fourteenth Session of the Intergovernmental Meeting (IG14) on the EANET, the IG14 adopted the Terms of Reference of the Working Group on Future Development of the Acid Deposition Monitoring Network in East Asia (EANET) (hereinafter referred to as the “WGFD”), in which the WGFD is requested to carry out, among others, the following tasks:
  - Review and discuss the issues of the future development of the EANET, including the following:
    - i. the institutional arrangement of the EANET Secretariat, and
    - ii. the future expansion of the scope of the EANET
3. Since the issue of the institutional arrangement is discussed in the separate document (EANET/WGFD 12/8/1), this document focuses on the issue of the future expansion of the scope of the EANET.

### **II. THE FUTURE EXPANSION OF THE SCOPE OF THE EANET**

4. The Instrument stipulates the possibility of the expansion of the scope of the EANET in the Item 2 “Objectives and Scope”, which states that “the scope of this Instrument may be extended, as decided by the Intergovernmental Meeting (IG)”.
5. This issue was taken at the Fourth Meeting of the Task Force on Research Coordination (TFRC4) and the Eleventh Session of the Scientific Advisory Committee (SAC11) held respectively in October 2011. The SAC11 agreed to refer the review of the status of air pollution in East Asia to the Task Force on Research Coordination (TFRC). The Fifth Meeting of the Task Force on Research Coordination (TFRC5) held in 2012 in Yangon, Myanmar set up a Reviewing Committee for drafting the Review on the Status of Air Pollution in East Asia. The

Twelfth Session of the Scientific Advisory Committee (SAC12) held in November 2012 in Yangon, Myanmar approved the Report of the TFRC on the Reviewing Committee and the schedule of the preparation of the Review.

6. The Second Periodic Report on the State of Acid Deposition in East Asia (PRPAD2) which was approved by the SAC11, endorsed by the IG13 and issued in March 2012, provided several points for promotion of the future development of the EANET in “Summary of Key Points” included in Summary for Policy Makers, and in “General Recommendations” included in Chapter 8 of the Executive Summary.
7. According to the above discussion, several action plans were suggested under the present scope of the EANET at the SAC12 and thereafter the IG14.
8. The major discussions at the IG14 include:
  - It was reconfirmed that the enhanced activities within the present scope and the future expansion of the scope of the EANET should be done in a stepwise manner.
  - It was noted that the present scope of the EANET can cover a broad range of activities as presented by the NC.
  - It was pointed out that monitoring of ozone and PM<sub>2.5</sub> is important to improve understanding of acid deposition and human health impacts.
  - One country suggested that impacts of air pollutants on climate change should be also considered as the future activities of the EANET.
  - It was also noted that it is important to distinguish the activities which can be implemented within the present scope and the activities which require scope expansion in the discussion of this issue.
  - Some countries supported the inclusion of monitoring of some additional air pollutants, i.e. ozone and particulate matter (PM), while others pointed out there will be technical and financial difficulties in monitoring of such pollutants in the near future.
  - Some countries expressed their concern that expansion of the scope will increase the financial burden of the participating countries and the EANET should still focus on monitoring of acid deposition and its capacity building.
  - One country expressed its views that the following points should be included in the future document on the future expansion of the scope of the EANET,
    - In order to make sure that participating countries could seek tangible supports from the network, efforts should be made to implement the activities within the present scope.
    - The direction of the expansion could be discussed based on the common beneficial principle considering the different stages of development of the participating countries in order to achieve major objectives of the EANET to contribute to avail

acid deposition issues in East Asia.

- The promotion of technology cooperation, information exchange, and experiences sharing on air pollution control in the region utilizing the network for such a platform, will be considered as one of the options on the future expansion of the scope.
9. According to the initiative of the Scientific Advisory Committee (SAC), and following the guidance of the IG, the preparation of “Review on the Status of Air Pollution in East Asia” is now on going. The preliminary draft report was discussed at the Thirteenth Session of the Scientific Advisory Committee (SAC13) in 2013, and the final draft will be submitted to the Fourteenth Session of the Scientific Advisory Committee (SAC14) in 2014. After the submission of the Review, discussion of the expansion of the scope will be made at the Sixteenth Session of the Intergovernmental Meeting (IG16) on the EANET in 2014 as it was suggested that the scientific evidence will be regarded as an important basis to consider the future priorities.
  10. Based on the document on the “Future Development and Expansion of the Scope of the EANET (Draft)” (EANET/SAC13/12-2), the SAC13 discussed the issue and is reporting to the WGFD12 its major discussions and conclusions. Scientific consideration of the past EANET monitoring, among others, is highlighted under the Annex attached to this document.
  11. Although the expansion of the scope will be discussed at the IG16 in 2014, it would be worthwhile to start discussions and provide preliminary views and guidance on the following scientific findings for the future development of the EANET within the present scope, with modifications, as appropriate, by reflecting the discussions of the SAC13.
    - i) PM<sub>2.5</sub> might be upshifted to the first priority chemical species from the second priority items. Discussion of feasible plan of monitoring ozone and PM<sub>2.5</sub> at selected EANET sites of each country could be started.
    - ii) As for ozone, relatively low cost automatic monitoring instruments are recommended at least for urban and rural sites where strong diurnal variation is presumed. Passive sampler with longer time resolution could provide useful data in remote sites because of weak diurnal variation. It could be particularly useful for monitoring ozone over forest where electricity is not available. Necessary financial support would be explored to promote the plan and give incentives for some counties.
    - iii) As for PM<sub>2.5</sub>, it may be necessary to start from evaluation of appropriate automatic mass concentration monitoring instruments including international inter-comparison studies among several countries with experiences.
    - iv) Capacity building for air concentration monitoring should be enhanced both on technical as well as scientific background more focusing on the link of urban/rural air pollution of each country with regional air pollution in East Asia.

- v) After more than ten years of monitoring, evaluation of the risk of acid deposition in East Asia should be made referring to the reviews in Europe and North America, which have a longer record of experience and scientific studies.
- vi) It would be worth starting discussion on reorganization of the structure of the EANET monitoring under the present Instrument. The present wet deposition and dry deposition monitoring may be better to be organized under rainwater composition monitoring (or precipitation chemistry monitoring) and air concentration monitoring (or atmospheric composition monitoring) from scientific point of view, respectively. Air concentration monitoring covers gases and particulate matters (mass concentration and chemical composition).

## SCIENTIFIC CONSIDERATION OF THE PAST EANET MONITORING

1. The EANET is a science-based monitoring network for acid deposition and related species so that scientific transparency is of fundamental importance in discussing its future development. The discussion on scientific transparency on the EANET has started at the SAC11 in 2011 as documented in “Report on Transparency of Monitoring Methodology and Scientific Discussion” (EANET/SAC 11/13/1).
2. Present structure of the EANET monitoring consists of wet deposition, dry deposition, soil and vegetation and inland aquatic environment. Under the wet deposition monitoring, chemical analysis of rainwater and precipitation amount measurement are made to obtain the chemical composition of rainwater and to evaluate wet deposition amount of each ion. Under the dry deposition monitoring, air concentration monitoring of gases and aerosols (mass concentration and chemical composition) are made. It is recognized that air concentration data is used for evaluation of dry deposition amount when real-time meteorological data is available according to the methodology approved in the Technical Manual on Dry Deposition Flux Estimation at the Tenth Session of the Scientific Advisory Committee (SAC10) in 2010. However, since most countries other than Japan have not submitted real-time meteorological data in the past years, the dry deposition flux was estimated only for Japan as reported in the PRSAD2. Air concentration monitoring data of the EANET without real-time meteorological data, however, have been used for evaluating air quality per se, and also for validation of chemical transport models for acid deposition and air quality.
3. As for PM (aerosols) data, chemical composition data can be used for evaluating dry deposition amount when real-time meteorological data is provided. Mass concentration data of PM<sub>10</sub> and PM<sub>2.5</sub> are not used for the evaluation of dry deposition amount, but has been used as information on air quality. The chemical composition data are also useful for the discussion on source apportionment of particulate matters.
4. Ozone concentration data is not used for evaluation of dry deposition flux of acid deposition since ozone is not an acidic species. Air concentration of ozone can be used for evaluating oxidation rate of SO<sub>2</sub> in cloud water since it is one of major oxidizing agent of SO<sub>2</sub> to SO<sub>4</sub><sup>2-</sup> together with H<sub>2</sub>O<sub>2</sub>. Ozone concentration data have been much concerned from the point of air quality, and the EANET data have been utilized for trend analysis as well as for validation of chemical transport models in scientific journal papers.
5. Under the soil and vegetation monitoring, soil chemical properties, tree growth, species composition and tree decline symptoms have been surveyed in forest area, and chemical properties of lake/river water have been surveyed under the inland aquatic environment monitoring. The data accumulated in the last decade showed certain indication of acidification and/or nitrogen saturation in several sites, where deposition loads of S and N were significantly

high, as reported in the PRSAD2. However, no clear link with atmospheric deposition was identified, since the respective surveys were conducted individually. Therefore, it is recognized that integrated monitoring such as catchment-scale analysis is more useful to clarify the relationship between atmospheric deposition and observed indication and to elucidate the related mechanisms.

6. Direct effects of air pollutants on tree physiology have not been investigated enough in the EANET monitoring. Air concentration data in mountainous area is useful to evaluate possible direct effects of air pollutants, such as ozone, while most of the air concentration monitoring sites in the EANET are located in urban and suburban sites.
7. Inclusion of urban sites as well as rural and remote sites is one of the characteristics of the EANET. Rural and remote sites are generally thought to be more important for acid deposition evaluation considering ecosystem impact and long-range transport. Although the importance of urban sites for acid deposition is limited to possible damages for cultural heritage and some materials, the urban site data has recently been more concerned from the point of air pollution typified by rainwater composition and air concentration.