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on the Acid Deposition Monitoring Network in East Asia
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**Progress Report on the Activities of
the Task Force on Soil and Vegetation Monitoring**

**Chair of the Task Force
Secretariat of the Task Force**

I. Introduction

1. The Task Force on Soil and Vegetation Monitoring of the EANET and the Network Center for EANET (NC) as the Secretariat of the Task Force have been making efforts to implement activities in line with The “*Strategy Paper for Future Direction of EANET on Monitoring of Effects on Agricultural Crops, Forest and Inland Water by Acidifying Species and Related Chemical Substances*”, which was adopted by the Scientific Advisory Committee at its Fourteenth Session (SAC14) held on 2-4 September 2014 in Incheon, Republic of Korea.
2. The Task Force members and the Secretariat of the Task Force have been communicating by utilizing e-mails and occasions of relevant scientific meetings as well as EANET meetings, although the Task Force meeting was not held over the last two years. Implementation plans for the specific activities described in the strategy paper have been made gradually by the communications above. In this paper, we would like to report the progress on the specific activities, including the implementation plans and roles of the members.

II. Specific Activities for the coming years, from 2015 to 2020

3. For the period from 2015 to 2020, the following specific activities were identified:
 - i. Promotion of continuous monitoring of existing sites
 - ii. Improvement of monitoring system
 - iii. Promotion of capacity building activities
 - iv. Identification of the areas susceptible to acid deposition
 - v. Regional review of tree decline symptoms
 - vi. Trial campaign for ozone effects in forest area and agricultural field
 - vii. Promotion of catchment analysis and simulation modeling on soil and inland water
 - viii. Accumulation of the information on flux of particulate matters in forest area and its potential effects
 - ix. Evaluation of the ecological monitoring data for the Third Periodic Report on the State of Acid Deposition in East Asia (PRSAD3)
4. The activities iv) to viii) should be implemented as intensive works for the corresponded period,

while the activities i) to iii) may need continuous efforts for the regular monitoring. As for the activity ix), some of the Task Force members have already contributed to Chapter 6 of PRSAD3, as lead/contributing authors. Some new actions have been made for the following activities:

Activity iv) Identification of the areas susceptible to acid deposition

5. The NC as the Secretariat of the Task Force has been making efforts to promote the relevant studies. Dr. Naoyuki Yamashita, Senior Researcher, Forestry and Forest Product Research Institute, Japan, who was the former staff of the NC, has been conducting the project entitled “*Regional-scale risk map for the impact of air pollution on terrestrial ecosystems in East Asia*” since JFY 2015, which was supported by the Grant-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan. The research outcomes will be informative for the captioned activity.
6. Dr. N. Yamashita has published the paper on risk map for acidification in Japan (Yamashita et al. 2016). Dr. H. Sase, Task Force member, and Dr. Toshimasa Ohara, SAC member of Japan, are involved in the work and listed as coauthors of the paper. The study is still continued for assessment of the EANET region. Dr. N. Yamashita is going to attend the Sixteenth Session of the SAC (SAC16) as a resource person and introduce the progress of the regional assessment (Agenda item 14).

Activity v) Regional review of tree decline symptoms

7. General information of “tree decline symptoms should be accumulated prior to discussion of air pollution/acid deposition impacts. Literature surveys for scientific publications should be adopted to collect reliable information. The relevant literature written in native languages in local scientific journals should be compiled in addition to English ones. The Task Force members are expected to compile the literature on tree decline symptoms and possible effects of air pollution/acid deposition on the symptoms in their countries.
8. The Task Force on Research Coordination of the EANET published the “*Review on the State of Air Pollution in East Asia (RSAP)*”. This compiled the current air pollution issues including possible impacts of air pollution on forest trees based on “English” scientific literature. Two Task Force members, Prof. ZZ. Feng, China and Dr. H. Sase, are involved in preparation of the book “*Air Pollution Impacts on Plants in East Asia (edited by Prof. Takeshi Izuta, Tokyo University of Agriculture and Technology, TUAT, Japan)*”, which will be published by Springer (October/November 2016). It is expected that effects of air pollutants/acid deposition on plants including forest trees will be well compiled, especially for Japan and China. Therefore, the relevant information has already been compiled partly mainly based on “English” literature.
9. It is expected that not only the English literature but also the literature written in native languages can be compiled especially in China, Japan, and Siberian part of Russia, although

additional information might be found in other countries. To date, information on effects of air pollutants/acid deposition on forest trees has been relatively limited in Southeast Asian countries, although possible effects of haze have been suggested (e.g. Philip and Rizal 1997).

10. Therefore, as a kick-off of this activity, the following Task Force members has started compiling the relevant information for China, Japan, Siberian part of Russia and haze in Southeast Asian countries:
 - Prof. ZZ. Feng: for China
 - Dr. M. Takahashi: for Japan
 - Dr. H. Sase: for Japan
 - Dr. T. Mikhailova: for Siberian part of Russia
 - Prof. Nik Majid, Malaysia: for haze in Southeast Asian countries
11. The point of the activity above is that scientific reports/papers "written in native language" should be compiled in addition to English ones. The latest ones, such as publications in the recent 10 years, will be compiled mainly in addition to brief historical information. It is expected that the compiled information above will be published as a review paper in an international journal. This will be a clear scientific deliverable of this activity, which can be shared in the EANET community.

Activity vi) Trial campaign for ozone effects in forest area and agricultural field

12. Expertise of the Task Force members is mostly soil science or relevant study fields. To implement the activity smoothly, Prof. ZZ. Feng, Research Center for Eco-Environmental Sciences (RCEES), Chinese Academy of Sciences (CAS), was newly nominated as the Task Force member in 2015. Actually, in China, his research group has successfully compiled the visible ozone injury on plants in Beijing City (Feng et al. 2014). This activity should be implemented in consultation with Prof. ZZ. Feng.
13. Field measurement of ozone by using the passive sampler has been implemented in forest area in Japan, Thailand and Malaysia, and relatively high concentrations of ozone were detected in Japan and Thailand. However, effects of the high ozone concentrations on plants have not been assessed enough in the actual fields.
14. Forest areas in the countries mentioned above will be the candidate locations for a trial campaign. To implement the trial campaign, external research fund(s) are necessary. Prof. ZZ. Feng and Dr. H. Sase have started discussion on possibility of obtaining external funds. The Asia-Pacific Network for Global Change Research (APN) is one of the candidate donor organizations. Detailed implementation plan of the campaign will be discussed in cooperation with Mr. B. Kietvuttinon, Thailand and Prof. Nik Majid.

Activity vii) Promotion of catchment analysis and simulation modeling on soil and inland water

15. Scientists from the NC and the EANET community conducted the catchment studies in Japan, Thailand and Malaysia since 2002, 2005 and 2008, respectively. In particular, from 2012 to 2015, sulfur dynamics in forest ecosystems was studied intensively with the support of the APN. Dr. H. Sase, Mr. B. Kietvuttinon, and Prof. Nik Majid implemented the project above. However, the external research grant from the APN was expired since 2015. Only the minimum-level of surveys can be done in Japan and Thailand at the national level.
16. Scientists in Japan have been accumulating comprehensive information on catchment analysis in Lake Ijira and other relevant sites. Dr. M. Takahashi and Dr. H. Sase have been involved in the catchment analysis in Lake Ijira since 2003. Finally, Lake Ijira catchment was registered as the regular monitoring site in 2011 and the monitoring data since 2007 has been submitted to the EANET.
17. The Philippines has the plan for the regular catchment-scale monitoring in La Mesa Watershed, Metro Manila. The NC ecological mission was dispatched in December 2015 to assist them to start the regular monitoring. Prof. W.M. Carandang, the Chair of the Task Force, assists the Environmental Management Bureau, National Center of the Philippines as a forest scientist. It is expected that the regular catchment monitoring will start from 2016.
18. Efforts should be made to promote catchment analysis/monitoring in the respective countries above. Dr. H. Sase, Dr. M. Takahashi, Prof. W.M. Carandang, Mr. B. Kietvuttinon, and Prof. Nik Majid may contribute to the activity. Moreover, in addition to the national-level activities, a multilateral project like the previous APN project is effective to study some common topics in the EANET region. Efforts should also be made to obtain external research funds.

Activity viii) Accumulation of the information on flux of particulate matters in forest area and its potential effects

19. The NC and the scientists from the EANET community have been making efforts to obtain research grants on this topic. Since 2015, the following relevant research projects have started:
 - *“The Effects of Ozone and Aerosols on Physiological Characteristics of Urban and Suburban Forests in Malaysia (Project Leader: Dr. Roland Kueh Jui Heng, UPM)”* was approved by the Malaysian Government’s Fundamental Research Grant Scheme (FRGS). Two Task Force members, namely Prof. Nik Majid and Dr. H. Sase, are involved in the project as main collaborators. Particulate matters (PM) deposited on leaf surface are studied in addition to passive sampling of ozone.
 - *“Possible reduction of air pollution due to PM removal functions of park and green area in local city (Project Leader: Dr. Tsuyoshi Ohizumi, ACAP Guest Researcher)”* was approved by the Grant-in-Aid for Scientific Research, MEXT, Japan. Dr. H. Sase is involved in the project as a main collaborator. Removal (deposition) process of PM is studied in a city park and urban trees.

20. In Thailand, PM flux to forest canopy was studied in cooperation with Dr. K. Matsuda (TUAT, Japan). Dr. H. Sase and Mr. B. Kietvuttion were involved in the study. Although the project was completed in 2012, a part of the work is still carried out by Dr. K. Matsuda. His work will be informative for us.
21. Prof. ZZ Feng may accumulate relevant information. He is one of the organizer for the session of “The role of urban forests in improving air quality” in the IUFRO Regional Congress for Asia and Oceania 2016 to be held in 24-27 October 2016.
22. Efforts should be made to accumulate the relevant information on fluxes of PM in forest area. Dr. H. Sase, Prof. Nik Majid, Mr. B. Kietvuttinon, and Prof. ZZ. Feng may contribute to the activity. Efforts should also be made to obtain external research funds in order to accumulate the observational data in actual forest areas.

III. Summary

23. The Task Force started the activities in line with the new strategy paper. Roles of the Task Force members and implementation plans have been clarified gradually for each activity, as summarized in Table 1. If necessary, one or two more new member(s) may be nominated to implement the activities smoothly in the near future.

Table 1. Expected contributors for the specific activities and their possible roles

	Specific activities	Expected contributors	Possible roles
iv.	Identification of the areas susceptible to acid deposition	H. Sase	To collaborate/communicate with the relevant scientist, including N. Yamashita, FFPRI
v.	Regional review of tree decline symptoms	ZZ. Feng M. Takahashi H. Sase T. Mikhailova Nik Majid	To compile the relevant information, in particular the literature written in native language To prepare a review paper to be submitted to an international journal for publication
vi.	Trial campaign for ozone effects in forest area and agricultural field	ZZ. Feng H. Sase B. Kietvuttinon Nik Majid	To consider the detailed implementation plan of the campaign To make effort to obtain external research funds for the campaign
vii.	Promotion of catchment analysis and simulation modeling on soil and	H. Sase M. Takahashi W.M. Carandang	To make efforts to promote catchment analysis/monitoring at the national levels To make efforts to obtain external research funds

	inland water	B. Kietvuttinon Nik Majid	for multilateral project(s) on catchment analysis
viii.	Accumulation of the information on flux of particulate matters in forest area and its potential effects	H. Sase B. Kietvuttinon Nik Majid ZZ. Feng	To make efforts to accumulate the relevant information on fluxes of PM in forest area To make efforts to obtain external research funds to accumulate the observational data in actual forest areas

24. To review progress of the activities, the next meeting of the Task Force may be held in 2017 or 2018.

References:

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