

The Twenty-first Session of the Scientific Advisory Committee
on the Acid Deposition Monitoring Network in East Asia
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ANNUAL REPORT OF THE ACTIVITIES OF THE TASK FORCE ON SOIL AND VEGETATION MONITORING IN 2020/2021

**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 the 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) in 2014.
2. Scientific outputs from the activities for the previous term until 2020 were presented at the Scientific Advisory Committee at its Twentieth Session (SAC20) in 2020, which included:
 - The workshop on regional impact assessment jointly held with the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) under the Convention on Long-range Transboundary Air Pollution (CLRTAP), United Nations Economic Commission for Europe (UNECE) in 2019;
 - Publication of the review paper on tree decline symptoms in East Asia;
 - Progress of discussion on critical load approach to identify susceptible areas for acidification and nitrogen saturation;
 - Collaborations with relevant scientific communities, such as the International Union of Forest Research Organizations (IUFRO), and scientists involved in the Asian Air Pollution Workshop (AAPW).
3. Taking into account the outputs above and remaining subjects, the Strategy Paper was updated, including new specific activities for the next term from 2021 to 2025. The updated Strategy Paper was adopted formally at SAC20, and the Task Force

members and NC restarted the activities accordingly. As a follow-up, the EANET started a discussion on the reformation of the task forces in line with the expansion of scope.

4. The Chair and Secretariat of the Task Force compiled the progress of the respective activities and circulated it annually among the members for their confirmation. This document reviews major outputs from the activities the members and NC scientists implemented in 2020/2021.

II. MAJOR OUTPUTS

5. In the updated Strategy Paper, it was suggested that the activities be implemented taking into consideration the following subjects:

- Recovery of ecosystems from acidification
- Loads of atmospheric nitrogen to ecosystems and their cycle
- Effects of ozone and PM on trees/crops

6. Major outputs from the respective activities can be summarized as follows:

- i. Accumulation of information on air pollution effects in forest area and agricultural field
 - Task Force members and the NC have been sharing the latest scientific information, such as new publications, on relevant issues through e-mail communications.
 - The following publications suggesting the importance of the “recovery process”, the “regional impact assessment,” and “ozone effects” were shared among the members:
 - Alessandra De Marco et al. 2020. *High spatial resolution ozone risk assessment for Asian forests*. Environ. Res. Lett. 15: 104095.
 - Chikamasa T, Shibata H, Urakawa R et al. 2020. *Spatial distribution of mercury accumulation in the surface soil of Japanese forests*. Journal of Forest Research 26: 161-167.
 - Feng Z et al. 2021. *Emerging challenges of ozone impacts on Asian plants: Actions are needed to protect ecosystem health*, Ecosystem

Health and Sustainability 7: 1911602.

- Kinose Y et al. 2020. *Impact Assessment of Ozone Absorbed through Stomata on Photosynthetic Carbon Dioxide Uptake by Japanese Deciduous Forest Trees: Implications for Ozone Mitigation Policies*. *Forests* 11: 137.
 - Sase H et al. 2021a. *Transboundary air pollution reduction rapidly reflected in stream water chemistry in forested catchment on the Sea of Japan coast in central Japan*. *Atmospheric Environment* 248: 118223.
 - Xie D et al. 2020. *Benefit of China's reduction in nitrogen oxides emission to natural ecosystems in East Asia with respect to critical load exceedance*. *Environment International* 136: 105468.
 - Zhang, G. et al. 2021. *Ethylenediurea (EDU) protects inbred but not hybrid cultivars of rice from yield losses due to surface ozone*. *Environmental Science and Pollution Research*,
 - It is noted that the review paper by Feng et al. (2021) was a product of communications among IUFRO and AAPW. Two Task Force members also contributed as (co-)authors.
- ii. Promotion of catchment analysis
- The NC has been continuing field surveys at the Kajikawa catchment (KJK), Niigata, Japan, together with the data analysis of the Lake Ijira catchment (IJR), the regular monitoring site. Scientific outputs from the activities have been published in international journals:
 - Sase H et al. 2021a. *Atmospheric Environment*
 - Sase H et al. 2021b. *Nitrogen saturation of forested catchments in central Japan - Progress or recovery? Soil Science and Plant Nutrition (accepted)*
 - A researcher from the Institute of Global Climate and Ecology (IGCE), Russia, has been preparing a scientific paper on data assessment for the Komarovka River catchment, the regular monitoring site, as her doctoral research. The research will be conducted at Niigata University, Japan. One of the NC scientists will supervise the doctoral research as a visiting professor at the university.
 - Additional scientific papers are currently being prepared by NC researchers in collaboration with external grant projects, such as the KAKENHI projects in

Japan.

- The activities above contributed to the preparation of Chapter 5: Impacts on Ecosystems in East Asia, the Fourth Periodic Report on the State of Acid Deposition in East Asia (PRSAD4). The information of La Mesa Watershed, a new regular monitoring site, has also been included in PRSAD4.

iii. Promotion of regional impact assessment

- NC scientists have collaborated with a scientist from the Forestry and Forest Products Research Institute (FFPRI), Japan, to assess regional impact assessments of acidification and nitrogen saturation using the Critical Load Approach. The manuscript has just been drafted and will be submitted to an international journal within this year.

III. ACTIONS REQUIRED

7. The 21st Session of the Scientific Advisory Committee Meeting (SAC 21) is invited to review the outputs above.