

The Twenty-first Session of the Scientific Advisory Committee
on the Acid Deposition Monitoring Network in East Asia
26-28 October 2021, Virtual Meeting

REPORT OF THE SESSION (ADOPTED)

I. Introduction

1. The Scientific Advisory Committee (SAC) of the Acid Deposition Monitoring Network in East Asia (EANET) held its Twenty-first Session of the SAC (SAC21) from 26-28 October 2021, virtually. The Session was organized by the Secretariat and the Network Center (NC) for the EANET.
2. The Session was attended by the members of the SAC and/or their alternates and other nominated persons from the Participating Countries of the EANET, namely: Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Russia, Thailand, Viet Nam, the Secretariat, and the NC. The List of Participants is attached as Annex.

II. Opening of the Session (Agenda Item 1)

3. Mr. Tomi Haryadi, Coordinator, Secretariat for the EANET, delivered the Welcome Remarks. He mentioned that the role of SAC21 in preparing detailed arrangements for the expansion scope of the EANET is crucial. The Session is tasked to provide scientific and technical viewpoints on some documents as part of the expansion of the scope of the EANET, such as the Supplementary Document to EANET Instrument and the Project Fund and Project Guideline, among others, the Attachment of the draft Supplementary Document to EANET Instrument. Mr. Haryadi hoped the SAC21 meeting could provide considerations and suggestions that will be beneficial for the Twenty-third Session of the Intergovernmental Meeting (IG23) in November 2021.
4. Dr. Shiro Hatakeyama, Director General of Asia Center for Air Pollution Research (ACAP), delivered the Introductory Remarks. In his speech, Dr. Hatakeyama appreciated all participants who attended the SAC21, which was held online like last year because of the still serious spread of COVID-19. He mentioned a commemorative event of 20 years of EANET, acid deposition monitoring activities, including the Data Report, QA/QC activities, capacity building, and the Fourth Periodic Report on the State of Acid Deposition in East Asia (PRSAD4), were ongoing. Regarding the Expansion of the scope of the EANET and Project Fund, the discussion has not yet concluded, and an extended Working Group Meeting will be held soon. It is hoped that this meeting (SAC21) will provide advice from a

scientific point of view toward Work Program and Budget 2022 and the Expansion of the scope and Project Fund.

III. Election of the Officers (Agenda Item 2)

5. The Secretariat and the NC introduced the system of a 3-year fixed-term bureau of officers and re-election of the officers of the SAC. The Session decided a 3-year (2021-2023) fixed-term appointment for the SAC bureau of officers composed of one Chairperson, two Vice-chairpersons, and a Rapporteur. The elected bureau members were as follows: Mr. Mohan Kumar Sammathuria, Principal Assistant Director, Atmospheric Sciences and Cloud Seeding Division, Malaysian Meteorological Department, Ministry of Environment and Water, Malaysia as the Chairperson, Prof. Atsushi Kume, Professor, Department of Agro-environmental Sciences, Faculty of Agriculture, Kyushu University, Japan and Mr. Virasack Chundara, Director General, Natural Resources and Environment Institute, Ministry of Natural Resources and Environment, Lao PDR as the Vice-Chairpersons, and Dr. Hu Jingnan, Director of the Institute of Atmospheric Environment, Chinese Research Academy of Environmental Sciences, China as the Rapporteur of the Session.

IV. Adoption of the Agenda (Agenda Item 3)

6. The Session considered and adopted the Draft Provisional Agenda (EANET/SAC 21/3/1), Draft Annotated Provisional Agenda (EANET/SAC 21/3/2), as well as the Draft Program (EANET/SAC 21/3/3) of the Session. The Agenda was adopted as proposed.

V. Review on the Draft Report on the Progress of the EANET since the Twentieth Session of the Scientific Advisory Committee (SAC20) and the Draft Financial Report in 2020 (Agenda Item 4)

7. The Secretariat and the NC presented the Draft Report on the Progress of the EANET since the Twentieth Session of the Scientific Advisory Committee (SAC20) (EANET/SAC 21/4/1), including the Draft Financial Report of the Secretariat and the NC for 2020 (EANET/SAC 21/4/2).
8. The key points of the presentation of the Secretariat included:
 - The Secretariat highlighted the implementation of the EANET's activities since SAC20, including the organization of EANET meetings (IG22 and SAC20), Working Group Meetings, and National Awareness Workshops in Myanmar and Malaysia, as well as various communication activities. On administration, the Secretariat developed the Small-Scale Funding Agreement (SSFA) with the RRC.AP/AIT as well as with the NC.

- The total voluntary financial contribution received by the Secretariat in 2020 was US\$ 498,797. In addition, the total expenditures and commitments of the Secretariat in 2020 were US\$ 568,062. The grand-total expenditure of the Secretariat, including the expenses for a 1-year technical consultant (China in-kind contribution), was US\$ 576,446.
9. The key points of the presentation of the NC included:
- The NC's activities have been conducted in 2021, and some are still ongoing. The presentation included 17 core activities and 9 non-core activities under 5 EANET objectives. The implementation status, accomplished outputs and expected outputs were delivered to SAC participants for each activity.
 - The total voluntary financial contribution received by the NC in 2020 was US\$ 403,940, and additional revenues were US\$ 430,521. The total expenditures were US\$ 965,288, including the expenditures for core activities which were US\$ 398,244; for additional activities, they were US\$ 436,095, and for others, they were US\$ 130,949. The balance in 2020 was US\$ 122.
10. The Session was invited to make comments on the reports from scientific and technical viewpoints.
11. Major discussions included:
- The NC has been offering technical support to the Participating Countries, which included support for repairing the monitoring instruments, such as ozone monitor, ion chromatography, and PM monitors, through discussion and instruction with the manufacturer and Participating Countries, and providing necessary consumables, etc. It was pointed out that the NC and countries had big limitations for solving the problems under COVID-19.
12. The Session acknowledged the Draft Report on the Progress of the EANET since the SAC20 and the Draft Financial Reports in 2020.

VI. Adoption of the EANET Data Report 2020 [Agenda Item 5]

13. The NC presented the Draft EANET Data Report 2020 (EANET/SAC 21/5).
14. The key points of the presentations included:
- (i) Wet and dry deposition:
- As for wet deposition monitoring, data from 59 sites were expected to be submitted to the Data Report 2020. It was informed that Mae Hia and Sakaerat had been closed. As for pH, Japan, part of Russia, and part of China had low pH sites. As for acidic substances, many sites demonstrate decreasing trends, while some sites demonstrate rapidly increasing trends.

- As for dry deposition (air concentration) monitoring, monitoring results in 41 sites by filter-pack method, 34 sites by automatic monitoring, and six sites by passive sampler were compiled in the Data Report 2020. Overall, air concentrations at many sites decreased due to the COVID 19 outbreak, particularly in 2020.
- (ii) Soil and vegetation, inland aquatic environment, and catchment-scale:
- As for soil and vegetation monitoring, observation of tree decline was conducted in China and Japan in 2020. No pronounced change has been observed in the forests' condition.
 - There were many spelling errors and scientific name inconsistencies in the past Data Reports. The NC unified those scientific names and made the corrigenda lists shown in Appendix 3 of the Data Report 2020 according to the Global Biodiversity Information Facility rules.
 - As for inland aquatic environment monitoring, the data of 12 sites from 6 countries were submitted in 2020. In addition to the pH 4.8 endpoint method according to the new technical manual (2020), using gran's titration method should be encouraged to determine alkalinity.
 - As for catchment-scale monitoring, data from new regular monitoring sites in La Mesa Watershed, Philippines, has been continuously submitted. Recovery from acidification/nitrogen saturation seemed to be clear as the long-term trend in the Lake Ijira catchment.
15. The Session was to review the monitoring data of the Participating Countries in 2020 for consideration and adoption at the Session.
16. Major discussion included:
- (i) Wet and dry deposition:
- The Republic of Korea informed that monitoring data on wet deposition and dry deposition would be submitted to the NC by the end of October 2021.
 - Malaysia informed that deposition monitoring at two stations, Danum Valley and Petaling Jaya, have restarted in 2021, although the monitoring was stopped in 2020 due to the strict lockdown because of COVID-19.
- (ii) Soil and vegetation, inland aquatic environment, and catchment-scale:
- Malaysia informed that the new site for inland aquatic monitoring in Kuala Tahan was identified with the assistance of the NC Technical Mission in early 2020. However, the monitoring has not been started because of COVID-19. The monitoring site at Semenyih Dam has been discontinued.
17. The Session, in principle, adopted the Data Report 2020. Nevertheless, the Participating Countries which have not done it so far can still submit their data to the NC.

VII. Adoption of the Report on the Inter-laboratory Comparison Projects 2020
[Agenda Item 6]

18. The NC presented the Draft Report on the Inter-laboratory Comparison (ILC) Projects 2020 (EANET/SAC 21/6), which included the results of the wet deposition, dry deposition (filter pack method), soil and vegetation, and inland aquatic environment ILC Projects carried out in 2020.
19. The key points of the presentations included:
 - For ILC on wet deposition, 32 participating laboratories submitted their analytical results of the artificial rainwater samples to the NC. 93.1% and 88.7% of submitted data met the Data Quality Objective (DQO) of EANET for high and low concentration samples. The percentage of data within the DQO of each participating laboratory from 1998 to 2020 was introduced. After disclosing the setting values of artificial samples, the NC will request a re-analysis of flagged parameters to confirm the validity of the analytical procedure in the laboratory.
 - For ILC on dry deposition, 23 participating laboratories submitted their analytical results of the filter samples to the NC. 75.0% and 60.0% of submitted data met the DQO of EANET for large and small quantity samples. To draw the calibration curve, the standard solution must be chosen and plotted correctly according to each value of the sample concentration.
 - For ILC on soil, 14 laboratories from 7 countries participated. Although the ratio of outliers was within the usual range, there were both random and systematic errors for factors of variabilities in measurements. Soil extraction, dilution of extracts, instrumental analyses, and calculation of data should be conducted carefully.
 - For ILC on the inland aquatic environment, 23 participating laboratories submitted their analytical results of the artificial inland water samples to the NC. 80.0% of submitted data met the DQO of EANET. Compared to the wet sample No. 202w to the inland sample No. 202i, the flagged percentage of No. 202i was much more than No. 202w. As one of the reasons, the peak of NH_4^+ might be too close to the peak of Na^+ when quantifying with ion chromatography. Thus, special care should be considered.
20. The Session was invited to review, make comments and provide guidance for consideration and adoption.
21. Major discussion included:
 - No comments were made.
22. The Session adopted the Report on the Inter-laboratory Comparison Projects 2020.

VIII. Overview of the Updated National Monitoring Plans of the Participating Countries [Agenda Item 7]

23. The NC presented an overview of the National Monitoring Plans of the Participating Countries (EANET/SAC 21/7) based on the latest information submitted by the Participating Countries.
24. The key points of the presentation included:
- The NMP has been prepared every year by the National QA/QC Managers in the Participating Countries using the electronic template available from the QA/QC Guidebook 2016.
 - The NMPs 2021 were submitted from almost all countries and finalized at the STM22. The NC will verify monitoring data for 2021 next year by referring to the 2021 NMP of each Participating Country.
 - According to the NMPs 2021, the number of EANET monitoring sites is stable for each monitoring parameter. The Participating Countries are expected to nominate existing national sites to EANET.
25. The Session was invited to discuss the National Monitoring Plans of the Participating Countries and provide necessary comments and guidance as appropriate.
26. Major discussion included:
- Wet deposition monitoring is conducted basically on a daily or weekly basis. It was clarified that one site with event-based sampling was classified as “other sampling frequency” in Attachment 2.
 - It was pointed out that monitoring activities on PM_{2.5} and ozone would be important to evaluate, given the region's current situation, and should be extended to other countries. The possibility of expanding the monitoring sites for the particulate matter in the EANET was confirmed.
 - It was clarified that the number of sites for PM_{2.5} monitoring has increased since 2015 due to support through the Integrated Programme for Better Air Quality in Asia (IBAQ Programme) of the Clean Air Asia (CAA). Both EANET and Clean Air Asia are currently using the data from these sites.
27. The Session acknowledged the updates on the overview of the National Monitoring Plans of the Participating Countries.

IX. Consideration of the Preliminary Fourth Draft Text for Supplementary Document (Annex) to the Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia (EANET) from scientific and technical viewpoints [Agenda Item 8]

28. The Secretariat presented the Preliminary Fourth Draft Text for Supplementary Document (Annex) to the Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia (EANET) (EANET/SAC 21/8).
29. The key points of the presentation included:
 - The Preliminary Fourth Draft Text for Supplementary Document (Annex) to EANET the Instrument for Strengthening the Acid Deposition Monitoring Network in East Asia (EANET)” accommodates and reflects the views of Participating Countries. The report has been prepared for discussion at the Twenty-first Session of the Scientific Advisory Committee Meeting of EANET (SAC21) and the Continued Session of the WG2021-2.
30. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the Twenty-third Session of the Intergovernmental Meeting (IG23) of EANET.
31. Major discussion included:
 - Some comments were addressed on the necessity of preambles and possible modification of Item 5.
 - It was pointed out that different types of PM, including PM_{2.5}, DSS (PM₁₀), TSP, and PM components, should be included in the scope.
 - It was suggested that GHGs and species related to climate change, including CH₄ and BC, should not be included as new items because they are not priority air pollutants.
 - NC clarified that methane has a function in controlling atmospheric OH radicals and ozone concentration levels, and therefore, methane would be closely related to air pollution.
 - NC suggested that NMVOC be changed into VOCs to include methane.
 - It was suggested that elemental carbon and organic carbon could be included as targets of PM. BC, as SLCP, should be added. The adding of the scope is to address related air pollution problems which may bring co-benefits to reduce climate substance, rather than to expand to GHG.
 - It was suggested that the definition of research activities in the attachment table was too narrow. Therefore, it should not be narrowed down from original activities.
 - On Item 3, it was suggested that “and research activities should be added after “data reports” in paragraph 2 of Item 5 of the Instrument because the research activities should be used to get more scientific assessments.
 - It was suggested that “ozone” should be shown in the table because “atmospheric environment-related substances” are defined as chemical substances, and all the monitoring items have been monitored at the surface. In the note, “surface” ozone or “tropospheric” ozone could be added.

- A concern was raised that not many countries have the available infrastructure for tropospheric ozone measurements.
 - The Continued Working Group Meeting Session 2, to be held on 2 November 2021, will discuss further the comments shared by the SAC members.
32. The Session considered and acknowledged this Agenda item and provided comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.

X. Consideration of EANET Project Fund and Project Guideline from scientific and technical viewpoints [Agenda Item 9]

33. The Secretariat and the NC presented the EANET Project Fund and Project Guideline (EANET/SAC 21/9).
34. The key points of the presentation included:
- The updated information regarding the Project Fund and Project Guideline of the EANET to the version presented at the Working Group Meeting in 2021 Session 2 (WG2021-2) was shared.
 - It was suggested to designate the ACAP to function as EANET Project Fund Holder during the transition period (1-2 years) after the approval of the Project Fund and Project Guideline by the IG.
 - The Guideline will be implemented right after the approval of the IG23.
35. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.
36. Major discussion included:
- No comments were made.
37. The Session acknowledged this Agenda item from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.

XI. Consideration of the Draft Work Programme and Budget of the EANET in 2022 from scientific and technical viewpoints [Agenda Item 10]

38. The Secretariat and the NC presented the Draft Work Programme and Budget of the EANET in 2022 (EANET/SAC 21/10).
39. The key points of the presentation included:
- The activities consist of Core and Non-Core (Project) activities in the Draft Work Programme and Budget of the EANET in 2021. The core activities and budget are in line with MTP (2021-2025).

- The non-core activities are candidates to be discussed at IG23 considering comments from Participating Countries and the budget for non-core activities as a reference.
 - If IG23 approves the project mechanism, the contribution of Participating Countries in terms of financial and/or in-kind is important.
 - It was mentioned that the Participating Countries were expected to express their pledge for non-core activities in terms of financial and/or in-kind contributions and draft ideas for non-core activities.
40. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.
41. Major discussion included:
- It was informed that the Project Fund mechanism would start once approved by the IG23. The year 2022 will be considered a transition period requiring time for new proposed projects to be approved first.
 - It was mentioned that there is a lack of support for non-core activities in 2022, and Participating Countries were invited to consider contributing voluntarily to the non-core activities the soonest before IG23 in November 2021.
42. The Session acknowledged this Agenda item from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.

XII. Consideration of the Progress of Development of the Fourth Periodic Report on the State of Acid Deposition in East Asia (PRSAD4) [Agenda Item 11]

43. The NC presented the Draft Fourth Periodic Report on the State of Acid Deposition in East Asia (PRSAD4) (EANET/SAC 21/11).
44. The key points of the presentation included:
- The Fourth Periodic Report consists of three parts. The first part is on regional assessment; the second part includes national assessments presented by Participating Countries; the third part is Executive Summary.
 - The Regional Assessment Report has seven chapters, namely 1) Introduction; 2) Data Quality; Wet and Dry Deposition of Acidic Substances in East Asia; 3) Gas and Aerosol Pollution in East Asia; 4) Impacts on Ecosystems in East Asia; 5) Relevant Studies of Atmospheric Environment Assessment in EANET Region; and 6) Conclusion and Recommendations for Future Activities.
 - The suggested period of monitoring data analyzed in the Fourth Periodic Report is from 2000 to 2019 (twenty years). However, the data from 2015 to 2019 were also analyzed to evaluate the region's current status of acid deposition.

- The suggestion was made that the Fourth Periodic Report should be prepared to focus on trend analysis and, possibly, impact assessment of acid deposition in the region.
 - Each country prepared the National Assessment Report according to a format of national assessments, which the drafting committee had prepared. The EANET and other domestic data of each country were used for the national assessment.
45. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.
46. Major discussion included:
- It was pointed out that descriptions and conclusions on health impact studies in the PRSAD4 Draft, such as country-specific mortality for PM_{2.5}, have been controversial. Therefore, those expressions should be removed, in particular, their actual number of burden diseases, mortality rates should not be shown. It was pointed out that the health risk assessment shown in the PRSAD4 is not only related to air pollution but also other pollutants.
 - It was clarified that the estimated premature mortality for PM_{2.5} was cited from the Global Burden of Disease Study (GBD), which has been conducted with the World Health Organization (WHO) and is considered as the most authorized risk assessment. It was also emphasized that the methodologies used in GBD have already been authorized in the relevant scientific fields. The results from GBD have been mentioned in WHO and news of media.
 - It was informed that the Drafting Committee (DC) discussed this issue and finally removed each number of premature mortalities in each country from the draft PRSAD4. According to the discussion, it was agreed that country-specific data should not be included, so the total number of premature mortalities for the whole region was included. Currently, only the total numbers of premature mortalities for ozone and PM_{2.5} were introduced, citing GBD in the draft. Thus, the current version has already been improved as appropriate according to the discussion at the DC and Lead Authors Meeting.
47. The Session acknowledged this Agenda item from scientific and technical viewpoints with modification according to comments and proposed actions of the Session for consideration and approval at the IG23 of EANET.

XIII. Adoption of the Third Revision of Summary of the Twentieth Anniversary of the EANET from scientific and technical viewpoints [Agenda Item 12]

48. The NC presented the Third Revision of Summary of the Twentieth Anniversary of the EANET (EANET/SAC 21/12).

49. The key points of the presentation of the Third Revision of Summary of the Twentieth Anniversary of the EANET, including the Summary's background, concept, structure, and progress.
50. The Session was invited to review and make comments, provide guidance for consideration and adoption.
51. Major discussion included:
 - No comments were made.
52. The Session considered and adopted the Third Revision of Summary of the Twentieth Anniversary of the EANET and recommended to submit to the IG23 for consideration and endorsement as appropriate.

XIV. Consideration of the Draft Report of Terminal Review of Medium Term Plan for the EANET (2016-2020) from scientific and technical viewpoints [Agenda Item 13]

53. The Reviewer presented the Draft Report of Terminal Review of Medium Term Plan for the EANET (2016-2020) (EANET/SAC 21/13).
54. The key points of the presentation included:
 - The Terminal Review provides evidence of results to meet accountability requirements and promote operational improvements, learnings, and knowledge sharing through results and lessons learned for the EANET.
55. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.
56. Major discussion included:
 - It was informed that the EANET would refer to the recommendations from this report to achieve EANET's future activities.
 - It was suggested that the EANET connect with the United Nations Economic Commission for Europe (UNECE), the Secretariat of CLRTAP, for further collaboration.
 - It was informed that the EANET had already started working on the recommendations from the last MTR (2019-2020), and some actions, such as the implementation of the Project Fund mechanism, should be reflected soon.
57. The Session considered and acknowledged the Draft Report of Terminal Review of Medium Term Plan for the EANET (2016-2020) and provided comments,

suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.

XV. Consideration of the Draft Revision of Medium Term Plan for the EANET (2021-2025) [Agenda Item 14]

58. The Secretariat presented the Draft Revision of Medium Term Plan for the EANET (2021-2025) (EANET/SAC 21/14).
59. The key points of the presentation included:
- The proposed revision of the MTP text (2021-2025) is provided in the Annex (in track changes mode), subject to the approval of IG23 on the expansion of the scope of the EANET Instrument (agenda item 4) and Project Fund and Project Guideline proposed (agenda item 5).
60. The Session was invited to make comments, suggestions, and recommendations from scientific and technical viewpoints for consideration and approval at the IG23 of EANET.
61. Major discussion included:
- No comments were made.
62. The Session considered and acknowledged the Draft Revision of Medium Term Plan for the EANET (2021-2025) for consideration and approval at the IG23 of EANET.

XVI. Consideration and Adoption of the Reports of the Task Forces of the Scientific Advisory Committee (SAC) [Agenda Item 15]

Task Force on Monitoring for Dry Deposition

63. The Chairperson of the Task Force on the Monitoring for Dry Deposition (TFMDD) presented the progress report of the Task Force on the Monitoring for Dry Deposition (EANET/SAC 21/15/1).
64. The key points of the presentation included:
- The Secretariat of the Expert Group on the revision of the Technical Manuals for Dry Deposition Flux Estimation and Air Concentration Monitoring (EGRM) prepared the 2nd draft of the revised Technical Manual for Air Concentration Monitoring in East Asia and the Technical Manual on Dry Deposition Flux Estimation in East Asia.
 - The 2nd meeting of the EGRM was held in May 2021 to review the 2nd draft of revised Technical Manuals and discuss elaborated methods of dry deposition flux estimation and air concentration monitoring methods in East Asia.

- After the finalization of the Technical Manuals by EGRM, the 6th meeting of the TFMDD will be held in July/August 2022 to review the final draft of the revised Technical Manuals, and it will be submitted to the 22nd Session of the Scientific Advisory Committee (SAC) for adoption.
65. The Session was invited to comment on the presentations and provide guidance to the Task Forces.
66. Major discussion included:
- No comments were made.

Task Force on Soil and Vegetation Monitoring

67. The Chairperson of the Task Force on Soil and Vegetation Monitoring (TFSV) presented the Progress Report on the Activities of the Task Force on Soil and Vegetation Monitoring (EANET/SAC 21/15/2).
68. The key points of the presentation included:
- The Task Force has been implementing activities related to the recovery of ecosystems from acidification, loads of atmospheric nitrogen to the ecosystem and its cycles, and effects of ozone and PM on trees/crops.
 - Task Force members and the NC shared information regarding the importance of the recovery process, regional impact assessment, and ozone effects.
 - The progress of the catchment analysis in Kajikawa catchment, Lake Ijira catchment, and La Mesa Watershed was introduced, which included scientific publications and contributions to PRSAD4.
 - The NC scientists collaborated with a scientist from Forestry and Forest Products Research Institute, Japan, to assess regional impact assessment of acidification and nitrogen saturation using the Critical Load Approach.
69. The Session was invited to make comments on the presentation and provide guidance.
70. Major discussion included:
- No comments were made.
71. The Session acknowledged the Report of the Task Forces of the SAC.

XVII. Updates on Research Activities of the EANET [Agenda Item 16]

(1) Progress of Catchment Studies in the EANET

72. The NC presented the Progress of the Catchment Studies in the EANET (EANET/SAC 20/16).

73. The key points of the presentation included:
- The EANET Non-Core budget and external research budgets/grants have been supporting the research activities above.
 - Changes in the balance between the atmospheric sulfur input and stream water output at the Kajikawa catchment site and Lake Ijira catchment site have been influenced by the emission trend and meteorological conditions.
 - The “recovery of ecosystems from acidification and nitrogen saturation” is not necessarily observed under the changing climate, even if atmospheric deposition has decreased.
 - As the necessity of further studies, climate change, including extreme weather events, may disturb the legacy pool and cause the sudden discharge of pollutants to stream water, reducing the resilience of forest ecosystems.
74. The Session was invited to make comments on the presentation and provide guidance.
75. Major discussion included:
- It was informed, the effects of climate change on the stream discharge for catchment study may differ between the various EANET countries. Changing discharge may affect the sulfur discharge. For example, in Thailand, increment, sulfur, and decrease of pH were observed in the stream. Therefore, EANET needs to study more to explore the impacts of climate change stream discharge for catchment studies.
 - It was informed that EANET does not have a strict manual for catchment studies but only has guidelines. The existing manuals for other monitoring items can be referred to. Using a strict manual is not relevant as the conditions vary in each country, and local climate and geographical specifications need to be considered.
76. The Session acknowledged the Progress of the Catchment Studies in the EANET.

XVIII. Updates on Relevant Scientific Activities [Agenda Item 17]

1) Observational Studies of PM_{2.5} Components and EC/OC in EANET Countries

77. The NC presented the Observational Studies of PM_{2.5} Components and EC/OC in the EANET Countries (EANET/SAC 21/17/1).
78. The key points of the presentation included:
- Seasonal intensive monitoring of PM_{2.5} components at Niigata-Maki was conducted from 2015 to 2021 to clarify characteristics of PM_{2.5} components in eastern Japan and estimate sources of PM_{2.5} from domestic and long range transportation from the Asian continent.

- Long-term monitoring of EC/OC in PM_{2.5} and precipitation at 3 sites in Japan have been conducted since 2011 to clarify time variation of EC/OC in PM and EC/OC wet deposition patterns.
 - Long-term weekly monitoring of PM_{2.5} and precipitation at 2 sites in Bangkok was jointly conducted by JICA Research Institute, Asian Institute of Technology, ACAP, and the Thailand PCD from 2015 to 2017 to clarify characteristics of PM_{2.5} components at central and suburb areas in the Bangkok metropolitan region (BMR).
 - Long-term daily monitoring of PM_{2.5} at 3 sites in Bangkok was conducted under Japan-Thailand Clean Air Partnership (JTCAP) from 2018 to 2019 to clarify major sources of PM_{2.5} during severe pollution periods.
79. The Session was invited to make comments on the presentation and provide guidance.
80. Major discussion included:
- In regard to higher PM_{2.5} concentrations at Niigata-Maki, there were four sources that dominated. It was informed that PMF is not good for episodic emission estimations of pollutants. Probably CMB can be a good method for source apportionment, including back trajectory analysis. SOA formation may also reason for high concentration.
 - It was informed that there was some in-kind contribution from some government. For example, Thailand supported monitoring facilities and chemical analysis in the study.
 - It was informed that emissions from motorcycles could also be included in the future estimation of sources.
 - It was pointed out that vehicle emission has highly contributed to the air quality in Thailand because the research was done before the lockdown of COVID.
81. The Session acknowledged the observational studies of PM_{2.5} Components and EC/OC in the EANET Countries.

2) Report of the EANET Emission Inventory Workshop in 2021

82. The NC presented the Report of the EANET Emission Inventory Workshop in 2021 (EANET/SAC 21/17/2).
83. The key points of the presentation included:
- Background and outline of the EANET Emission Inventory Workshop in 2021.
 - Introductions of five lectures from experts: Roles of emission inventory in air quality management, emission estimation for air pollutants emission inventory, Japan's National GHG inventory, development of biomass open burning

emission inventory in Thailand, and application of emission inventory to air quality simulation.

- Reports of short presentations of participants nominated by NFPs of each country focusing on major opinions from the participant for EANET related to emission inventory issues.
84. The Session was invited to make comments on the presentation and provide guidance.
85. Major discussion included:
- It was informed that capacity building, such as the Emission Inventory Workshop responds to high demands from Participating Countries, should be organized again in the future.
86. The Session acknowledged the Report of the EANET Emission Inventory Workshop in 2021.

3) Progress of the Joint Research Activities on Model Inter-Comparison Study in Asia (MICS-Asia)

87. The NC presented the Progress of the Joint Research Activities on Model Inter-Comparison Study in Asia (MICS-Asia) (EANET/SAC 21/17/3).
88. The key points of the presentation included:
- Report of the 11th International Workshop on Atmospheric Modeling Research in East Asia on 8-9 March 2021 (virtual event).
 - Review of MICS-Asia Phase III about the framework, status of the Special Issue, and major scientific issues and points other than specific scientific issues.
 - Introductions of major topics of Phase IV and established working groups for inter-comparison studies for air quality models, inter-comparison studies for air quality and climate change models, development of emission inventory in Asia, collecting and analyzing observations in Asia.
 - Tentative plan for the 12th MICS-Asia Workshop during the second half of February 2022.
89. The Session was invited to make comments on the presentation and provide guidance.
90. Major discussion included:
- For the question about the online coupled meteorology-chemistry model participated in MICS-Asia, it was answered that WRF-Chem, WRF-CMAQ, and several other models participated in the inter-comparison in phase 3. Reference papers will be informed by NC if necessary.

91. The Session acknowledged the Progress of the Joint Research Activities on Model Inter-Comparison Study in Asia (MICS-Asia).

4) Development of the EANET Research Portal on the EANET Website

92. The NC presented the Development of the EANET Research Portal on the EANET website (EANET/SAC 21/17/4).

93. The key points of the presentation included:

- The EANET Research Portal was created, instead of EANET Science Bulletin, to promote research activities developed in the EANET community and enhance the usage of the EANET data by the scientific community globally. The main objectives of this page are to introduce research activities conducted by the EANET community, share scientific outputs from the EANET research activities, demonstrate the importance of the EANET data for scientific research activities, and provide opportunities for joint research activities with the EANET community.
- Researchers from EANET Participating Countries are invited to inform the EANET regarding their research activities that utilize the EANET data and/or implemented through the EANET monitoring scheme. The research activity will be published on EANET Research Portal and accessible to the public with their consent.
- The researchers are encouraged to notify the NC of any papers to be included in the list of research papers related to EANET.

94. The Session was invited to make comments on the presentation and provide guidance.

95. Major discussion included:

- No comments were made.

96. The Session acknowledged the Development of the EANET Research Portal on the EANET website.

XIX. Consideration and Adoption of the Report of the Session [Agenda item 18]

97. The Report of the Session (EANET/SAC 21/18) was considered and adopted.

XX. Closing of the Session [Agenda Item 19]

98. The Session also appreciated the efforts made by the Chairperson, Vice-Chairpersons, and the Rapporteur.

99. The Session was officially closed by the Chairperson, thanking all the participants for their exceptional contributions.

LIST OF PARTICIPANTS

CAMBODIA

Mr. Pak Vannly
Deputy Director
Department of Air Quality and Noise
Management
Ministry of Environment

Mr. Kong Savuth
Chief Officer
Office of Air Quality and Acid Deposition
Laboratory Department
Ministry of Environment

CHINA

Dr. Hu Jingnan
Director
Institute of Atmospheric Environment,
Chinese Research Academy of Environmental
Sciences

Prof. Meng Fan
Senior Research Fellow
Chinese Research Academy of Environmental
Sciences

Dr. Wang Shuai
Senior Engineer
Department of Ambient Air Quality
Monitoring
China National Environmental
Monitoring Center

INDONESIA

Dr. Dodo Gunawan
Director
Center for Climate Change Information
Agency for Meteorology, Climatology
and Geophysics (BMKG)

JAPAN

Dr. Toshimasa Ohara
Research Director
Research Institute
Center for Environmental Science in Saitama

Prof. Atsushi Kume
Professor
Department of Agro-environmental Sciences
Faculty of Agriculture, Kyushu University

LAO PDR

Mr. Virasack Chundara
Director-General
Natural Resources and Environment Institute
Ministry of Natural Resources and
Environment

Mr. Phongsavath Yingyong
Deputy Head, Environment Laboratory
Natural Resources and Environment Institute
Ministry of Natural Resources and Institute

MALAYSIA

Mr. Mohan Kumar Sammathuria
Principal Assistant Director
Atmospheric Sciences and Cloud Seeding
Division
Malaysian Meteorological Department
Ministry of Environment and Water

Dr. Jeyanny Vijayanathan
Research Officer
Forest Biotechnology Division
Soil Management Branch,
Forest Plantation Programme
Forest Research Institute Malaysia (FRIM)

MONGOLIA

Dr. Batbayar Jadamba
Director
Environmental Monitoring Division
National Agency for Meteorology and
Environmental Monitoring (NAMEM)
Ministry of Environment and Tourism

Dr. Gantuya Ganbat
Assistant Professor
Environmental Engineering
Engineering Department
German-Mongolian Institute for Resources and
Technology

MYANMAR

Ms. Htay Htay Than
Director
Hydrological Division
Department of Meteorology and Hydrology
Ministry of Transport and Communications

Dr. Kyu Kyu Sein
Deputy Director, Hydrological Division
Department of Meteorology and Hydrology
(DMH), Ministry of Transport and
Communications

PHILIPPINES

Prof. Wilfredo M. Carandang
Professor
12 Silviculture and Resources Rehabilitation
Division
Institute of Renewable Natural Resources
College of Forestry and Natural Resources
University of the Philippines Los Baños

Dr. Marco Aragonés Galang
Associate Professor
Institute of Renewable Natural Resources
College of Forestry and Natural Resources
University of the Philippines Los Baños

Engr. Jundy T. del Rosario
Supervising Environmental Management
Specialist
Air Quality Management Section
Environmental Quality Management Division
Department of Environment and Natural
Resources Environmental Management Bureau

Ms. Ma. Fatima Anneglo R. Molina
Supervising Science Research Specialist
Environmental Research and Laboratory Services
Division Department of Environment and Natural
Resources Environmental Management Bureau

REPUBLIC OF KOREA

Dr. Joonyoung Ahn
Senior Researcher, Air Quality Research
Division, Climate and Air Quality Research
Department, National Institute of
Environmental Research (NIER)

Prof. Taehyoung Lee
Professor
Department of Environmental Science
Hankuk University of Foreign Studies

RUSSIA

Dr. Sergei Gromov
Deputy Director
Yu.A Izrael Institute of Global Climate and
Ecology (IGCE)

Prof. Tamara V. Khodzher
Head of Laboratory
Hydrochemistry and Atmospheric Chemistry
Russian Academy of Science - Siberian
Branch Limnological Institute (LIN)

Ms. Zhigacheva Ekaterina
Junior Researcher
Department of Background Chemical Pollution
Monitoring of Terrestrial Ecosystems
Yu.A Izrael Institute of Global Climate and
Ecology(IGCE)

THAILAND

Mr. Pichaid Atipakya
Environmentalist
Air Quality and Noise Management Division
Pollution Control Department
Ministry of Natural Resources and Environment

Ms. Sirirat Yensong
Environmentalist, Professional Level
Air Quality and Noise Management Division
Pollution Control Department
Ministry of Natural Resources and Environment

Dr. Patcharawadee Suwanathada
Expert on Air Quality and Noise Management
Pollution Control Department (PCD)
Ministry of Natural Resources and
Environment

Dr. Hathairatana Garivait
Senior Specialist on Environmental
Technology Research and Development
Environmental Research and Training Center
(ERTC)
Department of Environmental Quality
Promotion (DEQP)
Ministry of Natural Resources and
Environment

VIET NAM

Dr. Le Ngoc Cau
Director, Center for Environmental Research
Vietnam Institute of Meteorology, Hydrology
and Climate Change
Ministry of Natural Resources and
Environment

NETWORK CENTER FOR THE EANET

Asia Center for Air Pollution Research
(ACAP)

Dr. Shiro Hatakeyama
Director-General

Dr. Erdenebat Eldev-Ochir
Deputy Director-General

Mr. Kenichiro Fukunaga
Deputy Director-General

Dr. Ken Yamashita
Head, Planning and Training Department

Dr. Meihua Zhu
Senior Researcher

Dr. Keiichi Sato
Head, Atmospheric Research Department

Dr. Hiroyuki Sase
Head, Ecological Impact Research Department

Dr. Tsuyoshi Ohizumi
Head, Data Management Department

Dr. Junichi Kurokawa
Chief Senior Researcher
Data Management Department

Ms. Yao Dong
Assistant Deputy Director-General

Ms. Miho Tamura
Administrative Staff, General Affairs
Department

Dr. Mingqun Huo
Senior Researcher,
Atmospheric Research Department

Mr. Ryo Matsuya
Senior Researcher,
Atmospheric Research Department

Mr. Takuya Momoi
Senior Researcher, Atmospheric Research
Department

Dr. Akie Yuba
Senior Researcher, Atmospheric Research
Department

RRC.AP

Ms. Mari Futami
Researcher, Atmospheric Research
Department

Regional Resource Centre for Asia and the
Pacific

Dr. Rieko Urakawa
Senior Researcher, Ecological Impact
Research Department

Dr. Naoya Tsukamoto
Director

Mr. Hiroki Yotsuyanagi
Senior Researcher, Ecological Impact
Research Department

Dr. Ram Lal Verma
Programme Specialist

Mr. Masayuki Morohashi
Senior Researcher, Ecological Impact
Research Department

Ms. Charina May Lepiten
Programme Specialist

Mr. Hiroshi Machida
Senior Researcher, Data Management
Department

Dr. Yusuke Kiriya
Researcher, Data Management Department

Ms. Kumiko Nakamura
Researcher, Data Management Department

SECRETARIAT FOR THE EANET

United Nations Environment Programme
Asia and the Pacific Office

Mr. Tomi Haryadi
Coordinator

Ms. Aurélie Lemoine
Consultant

Ms. Sirinart Suanyam
Programme Assistant