The Second Meeting of the Drafting Committee
for the Third Periodic Report on the State
of Acid Deposition in East Asia
26-27 April 2016, Niigata, Japan

MINUTES
of the Second Meeting of the Drafting Committee for the Third Periodic Report on the State of Acid Deposition in East Asia (Draft)

1. The Second Meeting of the Drafting Committee (DC) for the Third Periodic Report on the State of Acid Deposition in East Asia (PRSAD3) was held 26-27 April, 2016 in Niigata, Japan. Meeting was attended by DC members and some alternatives from 12 participating countries, namely, Cambodia, China, Indonesia, Japan, Lao PDR, Mongolia, Myanmar, Philippines, Republic of Korea, Russia, Thailand, and Vietnam. Four resource persons and the relevant staff of the Network Center for the EANET (NC) also took part in the meeting. The list of participants is attached as Annex 1.

(Agenda 1: Opening of the Meeting)

2. Dr. Kazuhiko Sakamoto, the Director General of Asian Center for Air Pollution Research (ACAP), delivered the opening remark.

3. Dr. Sukjo Lee, the Deputy Director General of ACAP, made the introductory remark. The new participants to the DC meeting were introduced by themselves.

(Agenda 2: Adoption of the Agenda)

4. The Provisional Agenda, attached as Annex 2, was adopted with appropriate change of the order of the Program.

(Agenda 3: Review of the progress of the PRSAD3 preparation since First Drafting Committee and Lead Authors' Meeting)

5. The NC presented overview of the progress of the PRSAD3 preparation since First DC and Lead Authors' Meeting. The overview included the outcome of the First DC and Lead Authors' Meeting, organization of the DC, the outline of the PRSAD3.

(Agenda 4: Consideration on the first draft of the regional assessment report of Periodic Report)

6. The Lead Authors introduced the first draft of each chapter. Major discussions included the following:

Chapter 1: Introduction

- Regarding the Section 1.2 Global Perspectives, the haze episode can be included in the

National Assessment.

Chapter 2: Data Quality

- Many data of R1 and R2 in Southeast Asian region are out of criteria.
- In NADP, bi-carbonate is calculated assuming rain samples are in equilibrium with the global mean atmospheric carbon dioxide concentration. Bicarbonate is included in the R1 and R2 calculations. When R1 or R2 violate the control limits, samples are re-analyzed. Re-analysis measurements replace the original measurements only if the re-analysis results reveal an error in the original measurements.
- It is important to review and acknowledge the contents of this Chapter in the next Senior Technical Managers' Meeting (STM).
- It is important to analyze the relationship between R1 and R2 for determination of analytical accuracy.

Chapter 3: Precipitation chemistry in East Asia

- Non-seasalt K^+ should be considered to check concentration level of K^+ in precipitation samples.
- Site information at Mt. Saint Tomas in Philippines is necessary to consider high concentration of Ca^{2+}. Relationship with wind direction and seasonal trend will be considered for further analysis.

Chapter 4: Trace gas and aerosol concentrations affecting acid deposition in East Asia

- Peaks of PM10 concentration in spring is caused by dust storm, construction, or meteorology.
- Description of high and large should be clarified.
- It was noted that similar trend analysis has been conducted by WMO GAW program.
- For trend analysis, data of significance should be clearly shown.

Chapter 5: Wet and dry deposition in East Asia

- Integrated analysis of long-term trend should be considered.
- Because pH is determined by ionic balance, the word of H^+ deposition should be carefully considered.
- The reason of high deposition at the remote sites should be considered.
- Linear regression analysis should be evaluated by significant test. Interannual variations look increasing or decreasing trend.
- It is necessary to compare the dry deposition data in Chapter 4 and the data shown in annual data report.

Chapter 6: Impact of atmospheric deposition on ecosystems in East Asia

- Some of the EANET sites showed the trends of soil chemical properties for the last decade. In Europe, soil monitoring is conducted every 10 years. In the EANET, the technical manual recommended to conduct sampling every 3 - 5 years.
- It was suggested that frequent soil sampling might disturb the sites.
- It was also pointed out that soil chemical properties might fluctuate depending on meteorological events and/or outbreak of insects. Therefore, trend analysis should carefully be conducted with accumulation of the data.

Chapter 7: Conclusion and Recommendations for Future Activities

- No discussions

(Agenda 5: Consideration on the draft national assessment reports of the participating countries)

7. The DC members or the alternative participants introduced the draft national assessment reports. Major discussions included the following:

i) Cambodia
- It was clarified that analysis of bi-carbonate and organic acids was newly described in the EANET manual. Those data at some stations are included in annual data report.

ii) China
- There was no presentation. It was noted that Mr. Zheng Haohao at China National Environmental Monitoring Center (CNEMC) will prepare the national report in China.

iii) Indonesia
- pH value at Baai station is higher than other stations. It would be caused by local emission sources.

iv) Japan
- Classification of sub-region is made by seasonal precipitation pattern.
- Map of AOT40 is prepared by using gridded ozone concentration by atmospheric model. It was clarified that white area of ozone risk map means no plant.

v) Lao PDR
- The monitoring results should be checked with support of the NC.

vi) Malaysia
- No presentation.

vii) Mongolia
- Large variations of temperature and precipitation were remarkable in recent years.
- The number of pages of the national assessment report is determined by each country.
- Since 2010 in Mongolian Gobi are going on a lot of mining activities and also

Mongolia has getting transboundary pollution from the industrial area of China and Russia (Siberia). Therefore, we need to have 1 or 2 more EANET sites in Mongolian Gobi in the near future.

viii) Myanmar
- PM2.5 monitoring started in April 2015. The results in 2015 will not be included in the national assessment report.
- High concentration of Cl^- in wet deposition may be originated by seasalt.
- It was clarified that accumulated values are shown for wet deposition.

ix) Philippines
- High ratio of PM2.5/PM10 is remarkable in Philippines.
- Low data completeness results should be carefully considered for data analysis.
- The results of ecological monitoring will be included in the national assessment report.
- Emission inventory in Philippines is prepared every 3 years.

x) Republic of Korea
- No presentation

xi) Russia
- No presentation. It was noted that the draft will be submitted by middle May.

xii) Thailand
- No comments

xiii) Vietnam
- No presentation

xiv) General comments
- It is necessary to consider how to unify the format of national assessment reports.
- It is recommended that the format of national assessment report is distributed to member countries.
- The national assessment is not necessarily focusing on only the EANET activities. Additional information on air pollution, such as emission inventory, can be included by the decision of the respective countries.
- 5 countries has not been submitted the draft national assessment reports. It is encouraged to submit as early as possible.

(Agenda 6: Workshop presentations on related topics)

8. Mr. Van Curtis Bowersox, Manager of Global Atmosphere Watch, Quality Assurance Science Activity Centre – Americas, presented Monitoring Our Changing Chemical Climate. Major discussions included the following:
   - It was pointed out that the representativeness of monitoring sites are checked in every five years based on allotted budget.
   - Over the last 30 years, sulfate, nitrate, and hydrogen ion concentrations in precipitation

have decreased by 50% or more over much of the central and eastern United States. At the same time, ammonium concentrations have increased in these same areas. While sulfur and nitrogen emission inventories are well known, ammonia emissions are only poorly quantified. Major sources of ammonia include emissions from animal waste at feeding operations (beef, pork and poultry) and from agricultural fertilizer applications. These sources have not been quantified with sufficient accuracy to know how they are affecting air and precipitation concentrations of ammonia/ammonium

- Reductions in sulfur dioxide emissions have lowered the concentrations of airborne sulfur dioxide and secondary sulfur aerosols (ammonium sulfate, ammonium bisulfate, letovicite). Sulfate aerosols are stable, long-lived, and can be transported 1000s of kilometers before being scavenged from the atmosphere. The lower gaseous and aerosol sulfur compounds means that ammonium nitrate, a labile aerosol, forms in the atmosphere. Ammonium nitrate is in a temperature-dependent, quasi-equilibrium with gaseous ammonia and nitric acid vapor concentrations. Ammonia and nitric acid are efficiently scavenged either as dry or wet deposition. The reduction in sulfur has changed the chemical climate to one more dominated by ammonia, nitric acid, and ammonium nitrate.
- Monitoring stations of mercury are distributed considering the spatial analysis.
- Ozone, a secondary air pollutant, is the target for reductions in NOx emissions.
- The relationship between the US and Canada is good in the monitoring of air pollution though transboundary air pollution was an issue decades ago.
- The NADP budget consists of support from federal government agencies, state government agencies, and local and tribal agencies, as well as a few private companies. In the past, some states operated their own monitoring networks, but these have largely been replaced by NADP sites. Support for the NADP requires approval on a year-by-year basis.

9. Dr. Marco Ferretti, Technical Director of Terra Data environmetrics, presented Monitoring and modeling the long-term impact of air pollution on forests in Europe - results from the ICP Forests. Major discussions included the following:
   - The average ozone concentrations in summer exceed 50 ppb in hot spots including North Italy, which is considerably high.
   - Increase of nitrogen deposition may cause nitrogen saturation, but it depends on the buffering capacity of soil.
   - Defoliation levels increased significantly for the last decades, which might be attributed to several reasons including worsening of climate conditions, such as increasing episodes of summer drought, increasing temperature, etc.
   - Several studies in Central and North Europe detected improvement of chemical conditions in forest ecosystems, which indicated the recovery from acidification reflecting reduction of the deposition levels in the region.

- Regarding the institutional arrangement CLATAP, ICP Forest is leaded by Germany, and one institute serves as the Programme Coordinating Centre.

10. Dr. Tsuyoshi Ohizumi, Director of Research Development Department, Niigata Prefectural Institute of Public Health and Environmental Sciences, presented Long-term variation of the source of sulfate deposition in view of sulfur isotopic composition. Major discussions included the following:
    - Isotopic samples of PM2.5 were collected by high-volume sampler, and the results of the isotopic analysis of TSP are consistent to PM2.5.
    - Contribution of the coal combustion from China is decreasing but concentration of SO2 does not decrease clearly because of effects of volcano in Japan.
    - Sulfur contents of coal in China is below 1% now, and less effects on emission.

11. Dr. Kazuhide Matsuda, Associate Professor of Faculty of Agriculture Field Science Center, Tokyo University of Agriculture and Technology, presented Dry deposition of reactive nitrogen in East Asia. Major discussions included the following:
    - The submitted meteorology data such as rain fall can be utilized to estimate the dry deposition flux.
    - The difference between the amount of emission and the total deposition are high, and that is studied.
    - Related to vertical distribution of concentration, the mechanism of deposition of ammonium nitrate and sulfate is quite different in inferential method.

(Agenda 7: Consideration on further process of report preparation)

12. The NC explained the time schedule of the development of the PRSAD3 including further steps of preparation of the PRSAD3 after the meeting. The committee considered and confirmed the schedule.

(Agenda 8: Other issues)

13. There was no other issue raised.

(Agenda 9: Wrap-up of the Meeting)

14. The meeting will consider the wrap-up report prepared by the meeting secretariat.

(Agenda 10: Closing of the Meeting)

15. The Chairperson closed the meeting.

Annex 1

List of Participants

Participating Countries

Cambodia

Mr. Savuth KONG
Chief Office
Air quality Analysis and Acid Deposition
Laboratory Dept
General Department of Environment Protection

China

Dr. Fan MENG
Director,
Atmospheric Environment Institute
Chinese Research Academy of Environmental Sciences

Indonesia

Prof. Edvin ALDRIAN
Director
Center for Research and Development
Meteorological Climatological and Geophysical Agency (BMKG)

Japan

Dr. Toshimasa OHARA
Fellow
Planning Department
National Institute for Environmental Studies

Lao PDR

Mr. Phongsavath YINGYONG
Technical Officer
Natural Resources and Environment Institute
Ministry of Natural Resources and Environment (MONRE)

Mongolia

Dr. Dolgorsuren AZZAYA
General Manager and Scientific secretary
Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE)

Myanmar

Ms. Htwe Htwe Win
Assistant Director
Department of Meteorology and Hydrology
Ministry of Transport

Philippines

Ms. Teresita PERALTA
Engineer IV,
Environmental Quality Division/Environmental Management Bureau/Department of Environment and Natural Resources
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Prof. SeogYeon CHO
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Department of Environmental Engineering
Inha University

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Dr. Sergey GROMOV
Deputy Director
Institute of Global Climate and Ecology
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Resource Person

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Dr. Marco FERRETTI
Technical Director
TerraData environmetrics
Italy

Dr. Tsuyoshi OHIZUMI
Director
Research Development Department
Japan

Mr. Van Curtis BOWERSOX
Manager,
Global Atmosphere Watch, Quality Assurance
Science Activity Centre – Americas
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Dr. Hiroaki MINOURA
Head
Atmospheric Research Dept.

Dr. Hiroyuki SASE
Head
Ecological Impact Research Department

Mr. Jiro SATO
Senior Fellow

Secretariat

Network Center for the EANET

Asia Center for Air Pollution Research (ACAP)

Dr. Kazuhiko SAKAMOTO
Director General

Dr. Sukjo LEE
Deputy Director General

Mr. Yusuke KUSAKAWA
Deputy Director General

Dr. Ken YAMASHITA
Head
Data Management Department
Planning and Training Department

Dr. Keiichi SATO
Chief Senior Researcher
Data Management Department

Annex 2

Provisional Agenda

(1) Opening of the Meeting.

(2) Adoption of the Agenda

(3) Review of the progress of PRSAD3 preparation since First Drafting Committee and Lead Authors' Meeting

(4) Consideration on the first draft of the regional assessment of Periodic Report

(5) Consideration on the draft national assessment report of the participating countries

(6) Workshop presentations on related topics

(7) Consideration on further process of report preparation

(8) Other issues

(9) Wrap-up of the Meeting

(10) Closing of the Meeting