

The Twenty-second Session of the Scientific Advisory Committee  
on the Acid Deposition Monitoring Network in East Asia  
18-20 October 2022, Virtual Meeting

## **Progress Report on the activities of the Task Force on Monitoring for Dry Deposition**

**Chair and Secretariat of the Task Force  
on Monitoring for Dry Deposition**

### **I. Background**

1. The Task Force on Dry Deposition Monitoring for the Acid Deposition Monitoring Network in East Asia (EANET) was first established in 1998 by the First Session of the Interim Scientific Advisory Group (ISAG1) of EANET to carry out the following functions:
  - i) to prepare a draft QA/QC program for the first priority chemicals and particles during the preparatory phase, for consideration and adoption by ISAG, and
  - ii) to develop a strategy paper for future direction of dry deposition monitoring of EANET, for consideration of ISAG.
  
2. The Task Force subsequently produced the 5 Strategy Papers as follows. These documents describe the future direction on air concentration monitoring methodologies and dry deposition flux estimation.
  - *Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET*, endorsed by ISAG in September 1999
  - *Strategy Paper for Future Direction of Dry Deposition Monitoring of EANET (Second Edition)* endorsed by the Fifth Session of the Scientific Advisory Committee (SAC5) of EANET in September 2005
  - *Strategy Paper on Future Direction of Monitoring for Dry Deposition of EANET (2011-2015)* endorsed by the Tenth Session of the Scientific Advisory Committee (SAC10) of EANET in October 2010
  - *Strategy Paper on Future Direction of Monitoring for Dry Deposition of EANET (2016-2020)* endorsed by the Fifteenth Session of the Scientific Advisory Committee (SAC15) of EANET in October 2015
  - *Strategy Paper on Future Direction of Monitoring for Dry Deposition of the EANET (2021-2025)* endorsed by the Twentieth Session of the Scientific Advisory Committee (SAC20) of EANET in September 2020

3. The Task Force previously hold 4 meetings. The major issues of the previous meetings are summarized as follows.
- i) 1st meeting held in Hanoi, Vietnam, October 2008
    - Consideration of the new Terms of Reference (TOR) for the Task Force
    - Change the name of the Task Force to “Task Force on Monitoring for Dry Deposition”
  - ii) 2nd meeting held in Tsukuba, Japan, October 2009
    - Consideration on the first draft of the Strategy Paper on Future Direction of Monitoring for Dry Deposition of EANET (2011-2015)
  - iii) 3rd meeting held in Niigata, Japan, July 2010
    - Consideration on the final draft of the Strategy Paper on Future Direction of Monitoring for Dry Deposition of EANET (2011-2015) that was adopted by the Tenth Session Scientific Advisory Committee (SAC10)
  - iv) 4th meeting held in Niigata, Japan, August 2015
    - Review on the current status of dry deposition flux estimation and air concentration monitoring in EANET
    - Consideration on the draft of the Strategy Paper on Future Direction of Monitoring for Dry Deposition of EANET (2016-2020)
    - Consideration on the revisions of TOR of the Task Force
    - Proposal on the establishment of Expert Groups which will consider revision of the Technical Manual on Dry Deposition Flux Estimation in East Asia and the Technical Manual for Air Concentration Monitoring in East Asia.
  - v) 5th meeting held by Web conference, July 2020
    - Review of activities of monitoring for dry deposition
    - Consideration on the draft of the Strategy Paper on Future Direction of Monitoring for Dry Deposition of the EANET (2021-2025)
    - Review the outcomes of the Expert Group on Revision of the Technical Manuals for Dry Deposition Flux Estimation and Air Concentration Monitoring in East Asia (EGRTM)
  - vi) 6th meeting held by Web conference, October 2022
    - Report on the progress of the Task Force activities of monitoring for dry deposition in EANET
    - Review on the final draft of Technical Manual for Air Concentration Monitoring in East Asia
    - Review on the final draft of Technical Manual on Dry Deposition Flux Estimation in East Asia

## **II. Activities**

### **II-1. Terms of reference (TOR) and the membership of the Task Force (TFMDD)**

4. The TFMDD will conduct activities under the following revised Terms of Reference (TOR) of the Task Force adopted by SAC15 in 2015. The TFMDD is promoting activities according to the TOR.
- i) To further develop and elaborate the strategy for dry deposition evaluation in the region
  - ii) To discuss on future direction of dry deposition evaluation and provide guidance on relevant activities based on the strategy
  - iii) To improve the Technical Manuals for Air Concentration Monitoring and Dry Deposition Flux Estimation
5. The current member was listed below. Besides the Chair, one member from each EANET participating country has been nominated as the TFMDD member.

|     |                               |   |
|-----|-------------------------------|---|
| 1.  | TBD<br>(Chair)                | TBD   |
| 2.  | Ms. Loch Sokleang             | Ministry of Environment, Cambodia   |
| 3.  | Dr. Li Jianjun                | China National Environmental Monitoring Center,<br>China  |
| 4.  | Ms. Rina Aprishanty           | Environment Management Center, Ministry of<br>Environment, Forest and Climate Change, Indonesia                   |
| 5.  | Dr. Shiro Hatakeyama          | Asia Center for Air Pollution Research, Japan   |
| 6.  | Mr. Thilakone Sisouphanh      | Natural resource and environment Research institute,<br>Ministry of Natural Resources and Environment, Lao<br>PDR |
| 7.  | Dr. Ahmad Fairudz Jamaluddin  | Malaysian Meteorological Department (MMD),<br>Malaysia  |
| 8.  | Ms. Bold Altantuya            | Central Laboratory for Environment and Metrology<br>(CLEM), Mongolia  |
| 9.  | Dr. Kyu Kyu Sein              | Department of Meteorology and Hydrology, Ministry of<br>Transport and Communications, Myanmar                     |
| 10. | Engr. Jundy del Socorro       | Environmental Management Bureau, Department of<br>Environment and Natural Resources, Philippines                  |
| 11. | Prof. Taehyoung Lee           | Hankuk University of Foreign Studies, Republic of<br>Korea  |
| 12. | Dr. Sergey A. Gromov          | Institute of Global Climate and Ecology of Roshydromet<br>and Russian Academy of Sciences, Russia                 |
| 13. | Dr. Patcharawadee Suwanathada | Pollution Control Department, Ministry of Natural<br>Resources and Environment, Thailand                          |

14. Dr. Le Ngoc Cau Vietnam Institute of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment, Vietnam

## **II-2. Terms of reference (TOR) and membership of the Expert Group on revision of the Technical Manuals for Dry Deposition Flux Estimation and Air Concentration Monitoring (EGRTM)**

6. According to the decision by SAC15, the TFMDD considered the TOR and the membership of the Expert Group on revision of the Technical Manuals for Dry Deposition Flux Estimation and Air Concentration Monitoring (EGRTM) as follows. The below TOR and the membership of the EGRTM was approved by the Sixteenth Session of the Scientific Advisory Committee (SAC16).

(TOR of the EGRTM)

- i) To review the current Technical Manual on Dry Deposition Flux Estimation in East Asia and Technical Manual for Air Concentration Monitoring in East Asia
- ii) Identification of elaborated methods of dry deposition flux estimation and air concentration monitoring methods in East Asia
- iii) Preparation of the revised version of Technical Manual on Dry Deposition Flux Estimation in East Asia and Technical Manual for Air Concentration Monitoring in East Asia

(Membership of the EGRTM)

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|----|--|--|
| 1. | Dr. Patcharawadee Suwanathada<br>(Chair) | Director, Ambient Air Quality Division, Air Quality and Noise Management Bureau, Pollution Control Department, Thailand                            |
| 2. | Prof. Min Hu                             | Professor, College of Environmental Sciences, Peking University, China   |
| 3. | Prof. Kazuhide Matsuda                   | Professor, Department of Environmental Science on Biosphere, Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Japan |
| 4. | Mr. Jundy del Socorro                    | Chief, Air Quality Management Section, Environmental Management Bureau, Philippines  |
| 5. | Prof. Cho Seog-Yeon                      | Professor, Department of Environmental Engineering, Inha University, Republic of Korea   |
| 6. | Dr. Le Ngoc Cau                          | Director, Center for Environmental Research, Vietnam Institute of Meteorology, Hydrology, and Environment, Vietnam                                 |

## **II-3. Results of the 3rd meeting of EGRTM**

7. Taking into account of the discussions at the previous meetings of the EGRTM, the Secretariat of the EGRTM prepared the 3rd 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 3rd meeting of the EGRTM was held by Web conference on 21 June 2022. The Secretariat of the EGRTM explained revision points, and then the EGRTM members gave comments and suggestions for each Chapter. The major discussions are shown as follows.

(Technical Manual for Air Concentration Monitoring in East Asia)

- The structure of Chapter 2 should be modified for example, Principle of the method would be the specific monitoring methods (Chemiluminescence method for NO<sub>x</sub>, UV absorption method for O<sub>3</sub> etc.).
- Advanced techniques are recommended to describe or introduce in the paragraph or new section in Chapter 3, for example the cavity attenuated phase shift spectroscopy (CAPS) which obtains NO<sub>2</sub> concentrations directly.
- The human skills and costs for the analysis, time resolution, and detection limit are also added in the advantage and disadvantage of the manual method in Chapter 4.
- The sentence like “The maintenance items and schedule should be based on the manuals provided from the manufacturer” would be added in Chapter 6. The maintenance is recommended to implement after the extremely weather such as the sand storm, heavy rain, typhoon etc.
- In Chapter 8, The data completeness mentioned about the monthly and annual averaged data. In the case of daily data will be added. The methodology to calculate the detection limits of the automatic monitors will be described as well as those of the manual air concentration monitoring.

(Technical Manual on Dry Deposition Flux Estimation in East Asia)

- It was suggested that the methodology calculating the dry deposition flux of the fine and coarse particulate matter will be added in annex, if the deposition velocity of size classified particulate matter is available.
- It was suggested that the inferential method will be applied estimating the dry deposition flux, because of the feasibility and usability. The advanced methodologies using weather forecast model or resistance model will be described in appendix.
- The EG suggested that the inferential method will be applied for all East Asian countries in the future direction. It was also suggested that the direct measurement method of dry deposition flux will be remained to provide the advanced techniques even though no direct measurement is conducted in the EANET monitoring site.

### **II-3. Results of the 6th meeting of TFMDD**

8. Taking into account of the discussions at the 3rd meeting of the EGRTM, the Secretariat of the

EGRM prepared the final 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 6th meeting of the TFMDD was held by Web conference on 12 October 2022. First, the Secretariat reported the progress of the Task Force activities of monitoring for dry deposition in EANET. Then, the Secretariat of the TFMDD explained the final draft of the Revised Technical Manuals, and the TFMDD members gave comments and suggestions for each Chapter. The major discussions are shown as follows.

(The progress of the Task Force activities of monitoring for dry deposition in EANET)

- The NC will report the Task Force activities to SAC, mainly the second edition of two technical manuals, and ask SAC for adoption and necessary revision after adoption. NC invites the Task Force members to send other comments to NC after the meeting if any.

(Technical Manual for Air Concentration Monitoring in East Asia)

- It was pointed out that the cloud coverage was not included in the monitoring item. The NC explained the Technical Manual for Air Concentration Monitoring describes the meteorological parameters used for analysis of air concentrations, which include but not limited to the parameters used for dry deposition flux estimation.

(Technical Manual on Dry Deposition Flux Estimation in East Asia)

- The Technical Manual on Dry Deposition Flux Estimation describes the parameters only used for dry deposition flux estimation, and also the recommended monitoring frequency. The NC and the Task Force members discussed the Inferential method in the revised manual, such as use of hourly/monthly meteorological parameters and comparison with the model results.
- The NC invited other participating countries to submit the results of dry deposition flux which can be included in the data report.
- The contents in Technical Manual on Dry Deposition Flux Estimation should be consistent with the Technical Manual for Air Concentration Monitoring, such as the priority of monitoring species needs to be revised. The duplicated contents, especially the description about the air concentration monitoring should be simplified.

### **III. Schedule in 2022/2023**

9. The work plan of the TFMDD and EGRM in 2022/2023 is shown as the following table. After feedback of the draft by the 3rd EGRM meeting in June 2022 and the 6th TFMDD meeting in October 2022, the final draft of the revised Technical Manuals will be submitted to the 22nd Session of Scientific Advisory Committee for adoption. The 7th TFMDD meeting will be held in July/August 2023 to review the current status of dry deposition flux estimation and air concentration monitoring in EANET.

|                              |  |
|------------------------------|--|
| <u>21 June 2022</u>          | 3rd meeting of the Expert Group to review the revisions of the Technical Manuals   |
| <u>By end of July 2022</u>   | Circulation of the 3rd revisions of the Technical Manuals in the Expert Group for comments.  |
| <u>September 28-29, 2022</u> | Report the outcomes of the 3rd meeting of the Expert Group and revision of the Technical Manuals to the 23th Senior Technical Managers' Meeting.                                     |
| <u>October 12, 2022</u>      | Report the outcomes of the 3rd meeting of the Expert Group and revision of the Technical Manuals to <b><u>the 6th meeting of the Task Force on Monitoring for Dry Deposition</u></b> |
| <u>October 18-20, 2022</u>   | Finalize and submit the revised Technical Manuals to the 22th Session of Scientific Advisory Committee for adoption  |
| <u>July/August 2023</u>      | <b><u>7th meeting of the TFMDD</u></b> to review the current status of dry deposition flux estimation and air concentration monitoring in EANET                                      |

#### IV. Recommendations to SAC22

10. The 22nd Session of the Scientific Advisory Committee of the EANET (SAC22) is invited to consider the report on the activities of the Task Force on Monitoring for Dry Deposition of the EANET by the Chair and Secretariat of the Task Force and the following decisions.
- To adopt the Revised Technical Manual for Air Concentration Monitoring in East Asia attached as **Annex 1** and the Revised Technical Manual on Dry Deposition Flux Estimation in East Asia attached as **Annex 2**.