

## **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 held 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 revisions 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)

## **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 members are listed below. Besides the Chair, one member from each EANET Participating Country has been nominated as a TFMDD member.

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|-----|-------------------------------|--|
| 1.  | Prof. Fan Meng<br>(Chair)     | Chinese Research Academy of Environmental Sciences,<br>China   |
| 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<br>Climate Change, Ministry of Natural Resources and<br>Environment, Vietnam |

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

6. According to the SAC15's decision, 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)

- |    |  |  |
|----|--|--|
| 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. | TBD                                      | 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 2nd meeting of EGRTM

7. Taking into account the discussions at the 1st meeting of the EGRTM (EGRTM1) that was held on 23 April 2020, the Secretariat of the EGRTM 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 EGRTM (EGRTM) was held by web conference on 11 May 2021. The minutes of EGRTM2 are attached as **Annex 1**. In the EGRTM2, the 2nd draft of the revised Technical Manual is attached as **Annexes 2 and, 3** was reviewed. The Secretariat of the EGRTM explained revision points, and then the EGRTM members gave comments and suggestions for each Chapter. The major discussions were as follows.

(Technical Manual for Air Concentration Monitoring in East Asia)

- The reason and method of monitoring NO needs to be described in the Manual. It was clarified that that the monitoring data of NO is submitted to EANET from some Participating Countries and NO is included in the EANET monitoring Guideline too.
- The EG suggested that the section of Chapter 3 will be considered for reorganization, and it was recommended to separate the meteorological section in another chapter, and also recommended to show the detailed information of DOAS in the appendix.
- One suggestion from EG about the section of the denuder method is that the denuder can be introduced as one device connected to the filter pack to avoid the artifact. In this case, the information of the denuder device can be introduced in the artifact discussion in the filter pack section.
- The EG suggested that the DQO and data completeness should be shown for automatic methods and manual methods respectively. The data completeness also depends on the objective of monitoring such as estimation of long-term trend. If the requirement value of data completeness is too high, it may be very difficult for some Participating Countries to conduct monitoring and submit data.

(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.
- The EG recommended to include the minimum necessary parameters for dry deposition estimation in the manual. The wind direction and cloud coverage are not necessary. Solar radiation data is useful for dry deposition estimation and at least one site from one country is recommended to submit the solar radiation data. The Manual mentions recommendations to submit hourly meteorological data. It is also recommended to use the data from a nearby meteorological station.

- 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. It was also suggested that the direct measurement method of dry deposition flux will remain to provide the advanced techniques even though no direct measurement is conducted in the EANET monitoring sites.

### III. Schedule in 2020/2021

8. The work plan of the TFMDD and EGRTM in 2021/2022 is shown as the following table. The Secretariat of the EGRTM will prepare the 3rd revisions of the Technical Manuals and circulate them to the EGRTM members for comments at the 3rd meeting of EGRTM to be held in November/December 2021. The final draft of the Technical Manuals will be prepared according to the discussion in the 3rd EGRTM meeting and it will be reviewed at the 4th EGRTM meeting to be held in May/June 2022. After feedback of the final draft by TFMDD at the 6th meeting to be held in July/August 2022, the final draft of the revised Technical Manuals will be submitted to the 22th Session of Scientific Advisory Committee for adoption.

<u>11 May 2021</u>	<b><u>2<sup>nd</sup> meeting of the Expert Group</u></b> to review the 2nd draft of revised Technical Manuals and discuss on elaborated methods of dry deposition flux estimation and air concentration monitoring methods in East Asia
<u>September/October 2021</u>	Report the outcome of the 2nd meeting of the Expert Group to the TFMDD by e-mail and the 21st Session of Scientific Advisory Committee (SAC21)
<u>November/December 2021</u>	<b><u>3<sup>rd</sup> meeting of the Expert Group</u></b> to review the 3rd draft of revised Technical Manuals
<u>May/June 2022</u>	<b><u>4<sup>th</sup> meeting of the Expert Group</u></b> to finalize draft of the revised Technical Manuals
<u>July/August 2022</u>	<b><u>6<sup>th</sup> meeting of the TFMDD</u></b> to review final draft of the revised Technical Manuals and the current status of dry deposition flux estimation and air concentration monitoring in EANET
<u>September/October 2022</u>	Submitted the final draft of the revised Technical Manuals to the 22th Session of Scientific Advisory Committee for adoption

**IV. Recommendations to SAC21**

9. The 21<sup>st</sup> Session of the Scientific Advisory Committee of the EANET (SAC21) 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.