

Summary of the Eighth Meeting of Working Group I for Joint Research on Dust and Sand Storms Fukuoka, 9-10 December 2015

1. The eighth meeting of the Working Group I (WG I) for Joint Research on Dust and Sand Storms (DSS) under the Tripartite Environment Ministers Meeting (TEMM) was held in ACROS Fukuoka, Fukuoka City, Japan on 9th and 10th of December, 2015. Representatives from China, Korea, Mongolia and Japan participated in this meeting (Annex1 : List of participants).
2. Mr. Tatsuya YANASE, Deputy Director of Air Environment Division, Ministry of the Environment Japan (MOEJ) delivered opening remarks and warmly welcomed the experts from China, Korea and Mongolia. Upon his request, all participants took a moment to officially introduce with each other. He introduced the provisional agenda of the meeting and the agenda was adopted by all participants (Annex 2 : Meeting agenda).
3. In Session One chaired by Mr. Masayoshi FUTAMI, Overseas Environmental Cooperation Center (OECC), the overviews of the last WG I meeting, the 9th SCM, the 10th TDGM and the 17th TEMM were reported by Mr. Tatsuya YANASE. Dr. Sang Boom RYOO, National Institute of Meteorological Sciences (NIMS), Korea reviewed and summarized the mid-term Action Plan (2015-2019) of WG I.
4. Dr. Sang Sam LEE, NIMS, made a presentation on current status of DSS 2013 data sharing. According to his report, China provided with hourly average PM10 (10 sites), Korea with hourly average PM10 (36 sites), PM2.5 (1 site), LIDAR (2 sites), RH and visibility (6 sites) and AOT and angstrom exponent (1 site), and Japan with hourly average SPM (21 sites), PM10 (11 sites), PM2.5 (3 sites), LIDAR (17 sites), RH and visibility (60 sites) and AOT and angstrom exponent (1 site). Mongolia submitted hourly average PM10, PM2.5, RH and visibility (5sites) of DSS 2012 and 2013.
5. Mr. PAN Benfeng, China National Environmental Monitoring Center (CNEMC) made a presentation on the progress of joint research journal. He reported that five research papers have been submitted to the Particuology from WG I experts up to now, two of them have been accepted and others are being reviewed. He mentioned that, when the papers are accepted, he will collect all the papers and bind them in one volume for the WG I.
6. In Session Two chaired by Dr. Masataka NISHIKAWA, Tokyo University of Science, several results of studies on DSS events (2013-2014) were reported from China, Korea and Japan.
7. Mr. Li Liang, CNEMC, made a presentation on DSS monitoring in China 2014. He showed the number of days that DSS occurred and pointed out that the accumulative number of days that air quality exceeded the standard was 270 days in 161 key cities in 2014. He explained the technical requirements for dust weather classification that were established and promulgated by CNEMC on a trial basis.
8. Dr. Sang Sam LEE, NIMS, made a presentation on dust monitoring results of DSS 2013 events in Korea. He highlighted the weather conditions and signals of dusts in each of two events (DSS-2013-1; 5th to 22nd March, 2013 and DSS-2013-2; 26th December, 2013 to 6th January, 2014). He summarized that in

2013 there occurred only five DSS events in Korea and all of them were not severe mainly due to heavy rain and snow. He mentioned that regarding DSS-2013-1 event the duration was relatively short and chemically similar with haze in Korea, while DSS-2013-2 event affected all over Korea mainly caused by no snow in source regions.

9. Mr. Hee Choon LEE, NIMS, made a presentation on simulation results of DSS 2013 events with the Asian Dust Aerosol Model (ADAM). He explained the development of ADAM-Haze Model, and showed the difference between simulation and observation in the above two DSS-2013 events. In so doing, he suggested the necessity of applying optimal interpolation.
10. Dr. Takashi MAKI, Meteorological Research Institute (MRI), Japan, made a presentation on modeling study in Japan Meteorology Agency (JMA) / MRI. He pointed out that MASINGER mk-2 could simulate a dust event at 9-10th and 19-20th March 2013, meanwhile it overestimated DSS-2013-2 event. He mentioned that surface condition (vegetation, soil wetness, snow cover and soil temperature) of dust source regions should be confirmed. He also stated that JMA upgraded the dust prediction model from MASINGER to MASINGAR mk-2 in November 2014. Also, JMA has a plan to introduce higher resolution (40km) version of the model from 2016, and to introduce satellite data assimilation system for prediction from 2018.
11. Dr. Nobuo SUGIMOTO, National Institute for Environmental Studies, Japan, made a presentation titled “Analysis of the DSS events in 2013 using the LIDAR network and surface PM data”. After briefly introducing his report submitted to Particuology titled “A Method for Estimating the Fraction of Mineral Dust in Particulate Matter Using PM2.5-to-PM10 Ratios”, he explained that dust PM2.5 could be estimated using the PM2.5-to-PM10 ratio method, and that the consistency with the result of using LIDAR data method was validated. He demonstrated the similar consistency in the two events of DSS 2013. He stressed the importance of sharing both hourly PM2.5/10 data.
12. Every presentation in Session Two was followed by question and answer session. The questions raised were mainly clarification and about the features and operability of the simulation models, as well as interpretation of data shown in the presentations.
13. In Session Three chaired by Mr. Masayoshi FUTAMI, results of studies on DSS were reported from Mongolia and Japan. Dr. Munkhtsetseg ERDENEBAYAR presented “A Livestock Trampling Function for Emission Rate of Wind-blown Dust in Mongolia”. She pointed out the necessity of considering livestock disturbance effects on dust emission; particularly in Mongolia, and proposed a livestock trampling function for dust flux.
14. Dr. Sonomdagva CHONOKHUU, National University of Mongolia, demonstrated the analysis of the PM2.5 and PM10 in Ulaanbaatar, Mongolia. He stated that the PM10 and PM2.5 particle pollution had a same source and mass concentrations of PM2.5 and PM10 were higher in winter than in summer. He explained the reason being the abundant precipitation in summer and the pollution from coal burning in winter, being typical microclimate in Ulaanbaatar.
15. Dr. Itsushi UNO, Kyushu University, made a presentation titled “Analysis of long-range transport of Yellow Sand and Dust-Nitrate over East Asia”. He observed a long-lasting dust event from 25th May to 2nd June, 2014, using a polarization optical particle counter (POPC), aerosol chemical speciation analyzer (ACSA), and compared these data with the outputs from the updated version of GEOS-Chem

transport model with dust acid uptake. He concluded that high time resolution measurement of nitrate and PM10 (mostly dust) showed a high correlation during the yellow sand episode in Fukuoka (May-June 2014). He estimated that more than 70% of dust-nitrate originated NO_x emission from Beijing-Shanghai wide area.

16. Session Four began with the announcement made by Dr. Takashi MAKI, a chairperson. For the comparison of monitoring methods for particulate matters among four countries, Dr. Masataka NISHIKAWA, Dr. Sunyoung KIM, NIMS, Mr. PAN Benfeng, and Dr. Munkhtsetseg ERDENEBAIYAR made presentations on current monitoring methods of each country. They reported the progress of compiling the Report on the current monitoring methods for PM_{2.5} and other particulate matters using automatic sampler.

17. The current status of activities of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) Asia Node was introduced by Dr. Takashi MAKI. He reported current activities of WMO SDS-WAS Regional Steering Group for Asia and introduced SDS observation data sharing list approved among Korea Meteorological Administration (KMA), JMA and China Meteorological Administration (CMA). Regarding SDS forecasting system, SDS-WAS is assembling forecasts from North-East Asian countries, and preparing a website to share the information of activities in three countries, as well as the outcome of the operational forecast models and real-time observations. (http://eng.nmc.cn/sds_was.asian_rc/)

18. In Session Five chaired by Dr. Masao MIKAMI, Japan Meteorological Business Support Center, all participants were invited to discuss on “the detailed milestones for mid-term action plan (2015-2019)”. Participants discussed on each item below.

- 1) Continuation of previous WG I activities
- 2) Expansion of data sharing
- 3) Comparison of monitoring methods for particulate matters
- 4) Linking of WMO SDS-WAS web portal to share DSS model outputs
- 5) Enhancement of the cooperation between the two working groups
- 6) Encouragement of the participation of outreach research groups

The main outcome of the discussion was following;

19. Regarding 1), it was decided that DSS event data (2014.3.13 ~ 3.23 and 2014.5.22 ~ 6.4) will be shared by the participating countries to study these DSS events by each researcher. Korea will provide hourly average PM₁₀ (36 sites), PM_{2.5} (hourly data, number of sites to be determined later), LIDAR (3 sites), visibility and RH (6 sites), AOT (COMS, KMA skyradiometer). Japan was willing to share hourly average SPM (21 sites), PM₁₀ (11 sites), PM_{2.5} (3 sites), LIDAR (17 sites), visibility and RH (60 sites), AOT (3 sites (JMA), SKYNET) and MTSAT. China will offer hourly average PM₁₀ (10 sites). Any additional data will be welcomed.

The countries will upload these data to the data sharing website by 31st August 2016.

Regarding journal publication, it was decided that all articles which have been submitted to Particuology to date, accepted as well as under review, should be forwarded to Chinese focal person by 1st February 2016. The papers will be combined in one volume and presented to SCM in February.

Next international journal to be submitted for publication will be Scientific Online Letters on the

Atmosphere (SOLA), Meteorological Society of Japan. The authors will submit their papers to SOLA by the end of March 2017, and the submission will be managed by a Japanese focal point (to be confirmed).

20. Regarding 2), it was recognized that, in order to achieve an increased accuracy for the models, PM_{2.5}/PM₁₀ hourly data sharing be strongly encouraged. Korea suggested to share its Optical Particle Counter (OPC) or POPC data set, and discussed the possibility to share the OPC data set for the joint research 1).

China stated that it does not have any OPC data yet. WG I stressed the importance of sharing both PM₁₀ and PM_{2.5} hourly data at same sites, because the PM_{2.5} to PM₁₀ ratio is an effective dust indicator.

21. Regarding 3), focal points were designated for revising the “Report on the current monitoring methods for PM_{2.5} and other particulate matters” as below;

China: Mr. PAN Benfeng, CNEMC

Japan: Ms Ayako INOUE, OECC

Korea: Dr. Sang Sam LEE, NIMS

Mongolia: Dr. Sonomdagva CHONOKHUU, NUM

In December 2015, OECC will share the combined draft report among China and Korea. After each country will finalize it and cross review by country’s experts, the country’s focal point will send the final version to OECC by the end of January. Mongolia will send its draft to OECC by the end of January. WG I will report the final version to the SCM in February 2016.

22. Regarding 4) and 6), WG I agreed with linking with WMO SDS-WAS. WG I recommended to invite Dr. ZHANG Xiaoye, the Chair of Regional Steering Group (RSG) of SDS-WAS Asian node, for the joint WG I and II workshop in February 2016, to discuss future collaboration between two bodies.

23. Regarding 5), Mr. Masayoshi FUTAMI presented the activities of WG II and possible collaboration menu between WG I and II. Dr. Masao MIKAMI stated that the collaboration would start by organizing a joint workshop to share experience and knowledge. He also suggested this workshop be in an academic and open manner, with participation of external experts. WG I welcomed his additional proposal to share the data with WGs from his continuous observation from 2012 in Tsogt-Ovoo in Mongolia.

24. In Session Six chaired by Mr. Tatsuya YANASE, all participants checked and confirmed summary of the meeting and Mr. Tatsuya YANASE announced that the next DSS SCM will be held in Tokyo, Japan on 26 February 2016, and the results of the discussion at this meeting will be reported to the SCM. He also announced the joint workshop between WG I and WG II will be held in Tokyo, Japan on 27 February 2016.

25. Before closing, it was announced that the ninth meeting of WG I will be held in Jeju, Korea in November or December, 2016 based on the decision of the TOR of WG I. The detail of the ninth meeting will be confirmed at a later date.

**The 8th Meeting of Working Group I Joint Research on Dust and Sand Storms among
Mongolia, China, Korea and Japan**

Fukuoka, Japan
(9-10 December, 2015)

List of Participants

China

Mr. PAN Benfeng
Senior engineer
Ambient Air Quality Monitoring Dept
China National Environmental Monitoring Center

Mr. LI Liang
Senior engineer
Ambient Air Quality Monitoring Dept
China National Environmental Monitoring Center

Korea

Dr. RYOO Sang Boom
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Mr. LEE Hee Choon
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Observation Policy Division
Korea Meteorological Administration

Dr. KIM Sunyoung
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Japan

Mr. YANASE Tatsuya
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Air Environment Division
Environmental Management Bureau
Ministry of the Environment, Government of Japan

Dr. NISHIKAWA Masataka
Director
Environmental Safety Center
Tokyo University of Science,

Dr. SUGIMOTO Nobuo
Fellow
Center for Environmental Measurement and Analysis,
National Institute for Environmental Studies (NIES)

Dr. MIKAMI Masao
Japan Meteorological Business Support Center (JMBSC)

Dr. MAKI Takashi
Head, 1st laboratory
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Meteorological Research Institute (MRI)

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Mr. IWAMOTO Shinji
Senior Technical Adviser
Japan Environmental Sanitation Center (JESC)

Mongolia

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National University of Mongolia

Dr. Sonomdagva CHONOKHUU
Associate Professor
Department of Environmental Sciences and Chemical Engineering
School of Engineering and Applied Sciences
National University of Mongolia

OBSERBER

Mr. NISHI Takayuki
Japan Environmental Sanitation Center (JESC)

Mr. YAMAMOTO Shigekazu
Fukuoka Institute of Health and Environmental Sciences

SECRETARIAT

**Overseas Environmental
Cooperation Center,
Japan (OECC)**

Mr. FUTAMI Masayoshi
Senior Researcher

Mr. HIEDA Yasushi
Senior Researcher

Ms. HAYASHI Yayoi
Researcher

Ms. INOUE Ayako
Researcher

Meeting agenda

The 8th meeting of Working Group I for Joint Research on DSS

9-10 December, 2015

ACROS Fukuoka, Fukuoka, Japan

Day 1 (9, December)

8:30-9:00 Registration of participants

Opening

Chair: Mr. Tatsuya YANASE (Ministry of the Environment, Government of Japan)

9:00-9:05 Opening remarks
Mr. Tatsuya YANASE (Ministry of the Environment, Government of Japan)

9:05-9:15 Introduction of participants

9:15-9:20 Adoption of the agenda

Session I Looking back at discussion and activities

Chair: Mr. Masayoshi Futami (Overseas Environmental Cooperation Center, Japan)

【Japan's presentation】

9:20-9:30 Overviews of the last DSS-WG1 meeting, SCM, TDGM and TEMM
Mr. Tatsuya YANASE (Ministry of the Environment, Government of Japan)

【Korea's presentation】

9:30-9:40 Review on contents of the mid-term Action Plan (2015-2019)
Dr. Sang Boom RYOO (National Institute of Meteorological Sciences, Korea)

9:40-9:45 Questions and answers

【Korea's presentation】

9:45-9:55 Current status of DSS data sharing
Dr. Sang Sam LEE (National Institute of Meteorological Sciences, Korea)

9:55-10:00 Questions and answers

【China's presentation】

10:00-10:10 Progress of joint research journal
Mr. PAN Benfeng (China National Environmental Monitoring Center)

10:10-10:15 Questions and answers

10:15-10:25 Coffee break

Session II Report from the countries on DSS events (2013 3.5-3.22 and 2013 12.26-2014 01.06)

Chair: Dr. Masataka NISHIKAWA (Tokyo University of Science)

【China's presentation】

10:25-10:40 DSS monitoring in China 2014

Mr. Li Liang (China National Environmental Monitoring Center)

10:40-10:45 Questions and answers

【Korea's presentation】

10:45-11:00 Dust Monitoring results of DSS2013 cases in KMA

Dr. Sang Sam LEE (National Institute of Meteorological Sciences, Korea)

11:00-11:05 Questions and answers

11:05-11:20 Simulation Results of DSS2013 cases with ADAM

Mr. Hee Choon LEE (National Institute of Meteorological Sciences, Korea)

11:20-11:25 Questions and answers

【Japan's presentation】

11:25-11:40 Modeling Study in JMA/MRI

Dr. Takashi MAKI (Meteorological Research Institute, Japan)

11:40-11:45 Questions and answers

11:45-12:00 Analysis of the DSS events in 2013 using the lidar network and surface PM data

Dr. Nobuo SUGIMOTO (National Institute for Environmental Studies, Japan)

12:00-12:05 Questions and answers

Session III Reports of studies from Mongolian and Japanese experts

Chair: Mr. Masayoshi Futami (Overseas Environmental Cooperation Center, Japan)

【Mongolia's presentation】

12:05-12:15 A Livestock Trampling Function for Emission Rate of Wind-blown Dust in Mongolia

Dr. Munkhtsetseg ERDENEBAIYAR (National University of Mongolia)

12:15-12:25 Analysis of the PM_{2.5} and PM₁₀ in Ulaanbaatar, Mongolia

Dr. Sonomdagva CHONOKHUU (National University of Mongolia)

12:25-12:30 Questions and answers

12:30-14:00 Lunch

【Japan's presentation】

14:00-14:15 Analysis of long-range transport of Yellow Sand and Dust-Nitrate over East Asia
Dr. Itsushi UNO (Kyushu University)

14:15-14:20 Questions and answers

Session IV Conducted activities in 2014-2015 for each goal of the mid-term action plan (2015-2019)

Dr. Takashi MAKI (Meteorological Research Institute)

1. Comparison of monitoring methods for particulate matters

【Japan's presentation】

14:20-14:30 Current monitoring methods for PM2.5 and other particulate matters
Dr. Masataka NISHIKAWA (Tokyo University of Science, Japan)

14:30-14:35 Questions and answers

【Korea's presentation】

14:35-14:45 Current monitoring methods and QC algorithm for particulate matters
Dr. Sunyoung KIM (National Institute of Meteorological Sciences, Korea)

14:45-14:50 Questions and answers

【China's presentation】

14:50-15:00 Current monitoring methods for PM2.5 and other particulate matters
Mr. PAN Benfeng (China National Environmental Monitoring Center)

15:00-15:05 Questions and answers

【Mongolia's presentation】

15:05-15:15 Current monitoring methods for PM2.5 and other particulate matters
Dr. Munkhtsetseg ERDENEBAIYAR (National University of Mongolia)

15:15-15:20 Questions and answers

2. Linking of WMO SDS-WAS web portal to share DSS model outputs

15:20-15:30 Current state of WMO SDS-WAS Asia node
Dr. Takashi MAKI (Meteorological Research Institute, Japan)

15:30-15:35 Questions and answers

15:35-15:45 Coffee break

Session V Discussion on the detailed milestones for mid-term action plan (2015-2019)

Chair: Dr. Masao MIKAMI (Japan Meteorological Business Support Center)

15:45-17:05 **【Discussion 1~4】**

1. Continuation of previous WG I activities

- Next target event for the next year's study
- Milestone of booklet making process (submitted papers to Particuology)
- Next publication of the research results in a scientific journal

2. Expansion of data sharing

- Additional data to share among the countries (e.g., PM2.5)

3. Comparison of monitoring methods for particulate matters

- Finalizing plan to edit the monitoring method report to submit to the next Steering Committee Meeting

4. Linking of WMO SDS-WAS web portal to share DSS model outputs

5. Enhancement of the cooperation between the two working groups

- Collaboration menu with the WG 2

17:05-17:15 **【presentation】**

Possible collaboration menu between WGI and II

Mr. Masayoshi Futami (Overseas Environmental Cooperation Center, Japan)

17:15-17:20 Questions and answers

17:20-18:00 **【Discussion 5~6】**

6. Encouragement of the participation of outreach research groups

- EANET
- CMA
- WMO

18:45- Reception

Day 2 (10, December)

Session VI Summary

Chair: Mr. Tatsuya YANASE (Ministry of the Environment, Government of Japan)

【Discussion】

9:30-11:55 Discussion and adoption of meeting summary

【Closing】

11:55-12:00 Closing remarks

Mr. Tatsuya YANASE (Ministry of the Environment, Government of Japan)