

Concept Note

Expert Group Meeting on space-derived data for air pollution monitoring

9:00-12:30 (UTC+7), 7 August 2020

Virtual meeting via MS Teams

1. Background

According to a recent study by UNEP, air pollution is the fifth leading risk factor for mortality and was estimated to be responsible for around 3.4 million deaths in Asia-Pacific in 2017¹. Though countries and cities have implemented various air pollution management policies, these will only offset the additional pollution produced by a growing population and urbanization². Between 1990 and 2015, the population-weighted PM 2.5 concentrations grew by 19 per cent in Asia-Pacific³, exceeding the global increase of 10 per cent. In 2018, Asia-Pacific was home to 96 of the 100 cities most polluted with fine particles (PM2.5)⁴. Exposure to particulate matter pollution tends to be greater in least developed countries, whereas tropospheric ozone concentrations grew faster in more developed or rapidly developing countries and regions, such as South Asia, where O3 pollution grew at a much faster rate than the global growth rate.⁵

Air quality monitoring has been mainly based upon in-situ measurements by Governments using ground-based air quality monitoring networks within their territories. However, ground-based monitoring has limitations since monitoring stations are mostly concentrated in densely populated cities with rigid installation requirements and very narrow spatial coverage. Furthermore, air pollution monitoring stations are often based in urban areas, and yet pollutants can be generated or travel great distances and affect not only rural areas but other countries. Satellite observations complement the ground-based networks by providing data over wider areas, which is particularly useful for regions where no surface monitors are installed, such as rural areas or countries with limited air pollution monitoring equipment or capacity. This satellite information will help evaluate and improve air quality and chemical transportation models, emissions inventories and allow the better production of hourly air pollution forecasts which are accessible to public through a broad range of platforms and applications. Over the long term, the effectiveness of policy interventions can be monitored. For the short-term, pollution hotspots missed by emission inventories or ground monitoring stations can be identified and addressed. This data can fill in information gaps left by ground-data collected through monitoring stations to help evidence-based policy making to address not only national and local air quality, but transboundary pollution issues.

Member States of Asia-Pacific recognized the urgency of this issue by adopting resolution 75/4 in 2019 on “Strengthening regional cooperation to tackle air pollution challenges in Asia and the Pacific” in 2019. This resolution encourages the sharing of experiences and information relating to air pollution and the means

¹<https://www.healtheffects.org/announcements/state-global-air-2019-air-pollution-significant-risk-factor-worldwide>

² UN Environment (2019) Air pollution in Asia and the Pacific: Science-based solutions

³ HEI 2018

⁴ <https://www.airvisual.com/world-most-polluted-cities>

⁵ State of Global Air, 2019

to tackle this problem and is in line with priority actions under the Regional Roadmap for implementing the 2030 Agenda for Sustainable Development in Asia and the Pacific. In addition, the UN General Assembly adopted resolution A/RES/74/212 on “International Day of Clean Air for blue skies” in 2019 to strengthen international cooperation at the global, regional and subregional levels in various areas related to improving air quality, including the collection and utilization of data, joint research and development, and the sharing of best practices.

The Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018 – 2030)⁶, which was adopted by ESCAP resolution 75/67, requests ESCAP and member States to “develop the capacity to use space applications to monitor air pollution including dust, smog and other pollutants from hazardous chemicals, pollutants and contaminants”. In addition, the project will contribute to the Regional Roadmap for Implementing the 2030 Agenda for Sustainable Development in Asia and the Pacific, and the thematic area on “Sustainable Management of Natural Resources” in the UN-ASEAN Plan of Action on Complementarities Roadmap (2020-2025), specifically paragraph 3.6 on “Promoting policy dialogue and enhancing capacity for monitoring air pollution (PM2.5 and PM10) and air quality management”.

In this regard, opportunities exist for countries in this region, particularly in Asia, to fill the data and information gap in the nation-wide monitoring of air quality by better utilizing space applications. By integrating satellite data calibrated to monitor air pollution, with reliable ground monitoring information, policy makers will have a better understanding of air pollution and will be able to improve model simulations of air quality, including its forecasting and warning service. This may require governments to enhance their capacity to undertake the comprehensive analysis of data derived from space and ground networks which can be achieved through regional cooperation. The aim would be to promote policy dialogue, partnership and enhance the capacity for monitoring and managing air pollution at the regional level.

The Expert Group Meeting (EGM) outlined in this concept will introduce the opportunities and experiences of better utilizing space applications for monitoring air pollution and discuss the needs and challenges of participating countries in doing this. The EGM is expected to be an open and informative discussion on the opportunities and next steps in building a longer-term project for air pollution monitoring and management in Asia-Pacific.

2. Expected outcomes:

- 1) Understanding the country’s capacity, needs and contribution to use of geospatial information for air pollution
- 2) Enhance knowledge on use of satellite-derived data for air pollution monitoring
- 3) Enhance regional cooperation on implementation of the space Plan of Action and environment protection
- 4) Integration space and ground data for better monitoring air pollution

⁶ <https://www.unescap.org/resources/asia-pacific-plan-action-space-applications-sustainable-development-2018-2030>

⁷ https://www.unescap.org/commission/75/document/E75_Res6E.pdf

3. Programme

9:00 – 9:10	Opening session <ul style="list-style-type: none"> • Opening by Mr. Young Woo Kim, Director General of the National Institute of Environmental Research (NIER), Republic of Korea • Welcome by Mr. Keran Wang, Chief of Space Applications Section, Information and Communications Technology and Disaster Risk Reduction Division (IDD), on behalf of Ms. Tiziana Bonapace, Director, IDD, ESCAP
9:10 – 10:20	Introduction to air pollution monitoring using space applications (10 min each) <ul style="list-style-type: none"> • Introduction to air pollution under the Asia-Pacific Plan of Action on Space Applications and the partnership project by Ms. Kelly Hayden, Economic Affairs Officer, IDD, ESCAP • Air pollution monitoring in Asia-Pacific, by Mr. Matthew Perkins, Economic Affairs Officer, Environment and Development Division (EDD), ESCAP • Introduction to Geostationary Environment Monitoring Spectrometer (GEMS) and Pandora Asia Network (PAN) by Mr. Limseok Chang, NIER, Republic of Korea • GEMS application plans by Ms. Kyunghwa Lee, NIER • Experience with Pandora by the Japan Agency for Marine-Earth Science and Technology Mr. Yugo Kanaya, JAMSTEC • Pandora Global Network (PGN) status and future plans by Thomas F. Hanisco, NASA Goddard Space Flight Center
10:20 – 10:30	Break
10:30 – 12:00	Country presentations (10 min + 2 min Q&A. Moderated by Mr. Keran Wang, Chief, Space Applications Section, IDD, ESCAP) <ul style="list-style-type: none"> • Presentation by Mr. Thudchai Sansena, Chief of Environmental and Disaster Division, Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand • Presentation by Mr. Didi Satiadi, Director, Atmospheric Science and Technology Center, LAPAN, Indonesia • Presentation by Ms. Batchuluun Ganaa, Information & Research Institute of Meteorology, Hydrology and Environment (IRIMHE), Mongolia • Presentation by Prof. Gay Jane Perez, Philippine Space Agency, Philippines • Presentation by Ms. Kyu Kyu Sein, Assistant Director, Department of Meteorology and Hydrology, Myanmar • Presentation by Mr. Chea Nara, Director, Department of Air Quality and Noise Management, General Directorate of Environmental Protection, Ministry of Environment, Cambodia
12:00 – 12:25	<ul style="list-style-type: none"> • Discussion on next step (25 min)
12:25 – 12:30	Closing

4. Guide for country presentations:

- What satellite-derived data is used for air pollution monitoring and the future plan?
- What ground equipment/system is using for air pollution monitoring? What kind of air quality monitoring networks are in operation by your government? Does data link to space-derived data?
- Capacity of teams in space agency on interpretation of the satellite-data and processing system, ICT capacity (internet, computing, etc.)
- Need assessment for 2020-2025, including policy related to air pollution

In addition, attached to this concept note is a questionnaire for you to complete prior to joining the meeting (see attachment A).

5. Contact:

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