

Concept Note

Young Scientists Forum on GEMS data applications for air pollution monitoring

Background

Air pollution is now considered the world's largest environmental health risk. Globally, 7 million deaths were attributable to the joint effects of household and ambient air pollution in 2016, and Asia-Pacific countries share more than 60% of the total death¹. The degradation of air quality associated with high levels of particulate matter, tropospheric ozone and other pollutants have impacts on agricultural productivity and natural ecosystems as well as human health and welfare. Tropospheric aerosols and ozone are also the primary short-lived climate forcers yet estimates of their radiative impacts remain subject to large uncertainty. Understanding air pollution, such as accurate knowledge of emissions, chemical transformation, and transport, is essential for pollution control.

When understanding the nature of air pollution, its sources can be from long range transport. Through long range transport pathways, air pollution can carry itself beyond borders and is of transboundary nature which affect entire regions not countries. The transboundary nature of air pollution requires coordination through regional and subregional cooperation and dialogue. The cooperation and dialogue can accelerate the search for regional solutions from sharing national experiences such as successful policies and innovative technologies. These efforts for dialogue can foster collective efforts to tackle the transboundary nature and reduce the impact of air pollution upon local populations.

¹ World health statistics 2019: monitoring health for the SDGs, <https://digitallibrary.un.org/record/3868814?ln=en>



In February 2020, the Geostationary Environment Monitoring Spectrometer (GEMS) was launched by the Republic of Korea. It is the first of the three-satellite constellation which enables the hourly monitoring of air pollution levels for almost 20 countries in Asia. This marks a significant leap forward in the ability of scientists to monitor air pollution from space.

In collaboration with the National Institute of Environmental Research (NIER), Korea International Cooperation Agency (KOICA), and Pusan National University (PNU), the ESCAP secretariat held a capacity-building training programme for 13 young government officials from 5 Asian countries in June 2022, in Incheon of the Republic of Korea. The training was for three weeks and was introductory but comprehensive in which 23 lecturers from academic, research, private, and public institutions were invited to give lectures.

This activity is a continuation of the previous training and organized as a side event for the Fourth session of the Committee on Information and Communications Technology, Science, Technology, and Innovation (CICTSTI4), to be held on 30 August to 1 September 2022 in Bangkok, Thailand which aims to leverage the STI and ICT to support achieving sustainable development in the region. It opens a forum for discussion on utilizing GEMS and is in line with the mandates from multiple plans of action. Within the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030), this activity is aligned with the theme Social Development and subtheme Contamination and Pollution and Action Area 3: Intergovernmental discussions and regional practices. Alternatively, within the ASEAN Plan of Action, this activity is aligned with the theme of Socio-cultural Cooperation and the subtheme Environment and Climate Change. Therefore, the discussions made in this forum will contribute to the progression of SDG goal 3.

Goals

To support regional and subregional level cooperative dialogue for evidence-based decisions in improving national and subregional air quality.

Objectives

1. To exchange experiences among the young scientists on innovative use of the GEMS data for monitoring air pollution in thematic areas such as aerosol, NO₂, O₃, PM_{2.5}, and other climate change issues.



2. To build the capacity of young scientists in Asian countries in utilizing satellite data for monitoring and management and transboundary issues on air pollution
3. To share the knowledge on integration of the space and ground data for effective air pollution monitoring and policy making.
4. To receive feedback and comments from the youth and partners on the future use of space and geospatial applications to support the implementation of the Plan of Action in its Phase II (2022 – 2026).

Expected Outcomes

1. Regional kick-off meeting to introduce the project to policymakers, international organizations, and other regional/subregional working groups.
2. Conduct a regional expert meeting involving participating countries to share tools, information and products for air pollution monitoring and modeling utilizing remote sensing information.
3. Establish a regional community of experts and technical operators of Pandora equipment.

Venue and Date/Time

Venue: United Nations Conference Centre and online (Hybrid), Bangkok, Thailand

Date/Time: 09:30-16:00 (UTC+7), 31 Aug – 1 Sept 2022

Organizers

- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)
- Republic of Korea's National Institute of Environmental Research (NIER)
- Korea International Cooperation Agency (KOICA)
- Geo-Informatics and Space Technology Development Agency (GISTDA)

Participating Countries

Young scientists and senior officials from space agencies will be invited from Asian countries (in particular under the field of view of GEMS):

- Bangladesh
- Cambodia
- Indonesia
- Laos, PDR



- Mongolia
- The Philippines
- Thailand, and
- Vietnam.

Senior experts from NIER and other countries will also join the discussion with the young scientists.

Draft Programme

The forum consists of three 60 minutes sessions. three to four presentations of 15-20 minutes will be held during each session. Session 1 summarizes activities and milestones to operationalize GEMS and Pandora. Session 2 highlights the innovative data applications of GEMS being developed by the youth and stakeholders. Session 3 is a panel discussion that discusses the challenges and opportunities of the GEMS project for the youth.

Day 1: Wednesday 31 August 2022	
Time (UTC+7)	Topics
09:00 – 09:30	Registration
09:30 – 09:45	<p>Opening session</p> <p>Welcome Remarks by ESCAP secretariat and NIER:</p> <ol style="list-style-type: none"> 1. Ms. Tiziana Bonapace, Director, ESCAP IDD 2. Mr. Dong-jin Kim, President, NIER
09:45 – 10:00	Photo session and tea break
10:00 – 11:00	<p>Session 1. Summary of activities and milestones for the PANGAPi project and select application cases of Pandora</p> <p>Presenters:</p> <ul style="list-style-type: none"> - Mr. Ji Yong KIM & Mr. Young Seop Shin, KOICA - Mr. Hyunkee HONG, NIER - Mr. Ukkyo JEONG, Pukyong National University (PKNU)



11:00 – 12:00	<p>Session 2. Observing the 4th session of the Committee on Information and Communications Technology, Science, Technology and Innovation</p> <p>Item 6: Use of Digital Technology and Geospatial Information Systems to Enhance Resilient and Sustainable Development</p> <p>Conference room 1 of UNCC</p>
12:00 – 13:30	Lunch break
13:30 – 14:30	<p>Session 3. Highlights of innovative GEMS data applications being developed by the youth and stakeholders</p> <p>Presenters:</p> <ul style="list-style-type: none"> - Ms. Nuntikorn Kitratporn, GISTDA, Thailand - Mr. Risyanto, BRIN, Indonesia - Mr. Archie Veloria, PhilSA, The Philippines
14:30 – 14:45	Tea break
14:45 – 15:45	<p>Session 4. Panel Discussion - Challenges and opportunities for youth to achieve SPACE+ goals using GEMS data in the Asia Pacific region</p> <p>Panelists:</p> <ul style="list-style-type: none"> - Ms. Gay Jane Perez, PhilSA, The Philippines - Ms. Sarantuya Ganjuur, IRIMHE, Mongolia - Mr. Chandath Him, Ministry of Environment, Cambodia - Mr. Matthew Perkins, ESCAP EDD - Ms. Linh Do Thi Thuy, MONRE, Vietnam <p>Moderator:</p> <ul style="list-style-type: none"> - Mr. Chul Min Lee, ESCAP IDD
15:45 – 16:00	Wrap up
Day 2: Thursday 1 September 2022	
Time (UTC+7)	Topics
10:00 – 12:00	<p>Technical visit to the Pollution Control Department (PCD)</p> <p>1. Visit the Pandora site</p>



2. Technical discussion

By NIER, KOICA, GISTDA, PKNU, Cambodia's Ministry of Environment experts only

