Item 13. "Use of space technology in the United Nations system" ESCAP

ESCAP secretariat, in collaboration with UNU, has developed operational tools in using Big Earth Data, Cloud Computing and AI for Disaster, and organized online training course with the United Nations University Institute for Water, Environment and Health.

In December 2023, the secretariat collaborated with the United Nations University Institute for Water, Environment and Health (UNU/IWEH) and started the online course entitled "Introduction to Geospatial Data Analysis with ChatGPT and Google Earth Engine", attracting over 3000 enrolments from over 33 countries in Asia and the Pacific.

Co-developed by UNU/IWEH and the ESCAP secretariat, the historical flood mapping tools aims to support efforts to enhance resilience to flood disasters using artificial intelligence, cloud computing, and open Earth Observation datasets. The tool uses AI models to generate current and future flood risk maps for three climate change scenarios at the city, district, and river basin levels. The AI models are trained using the inundation maps generated by the tool and open datasets, including land use land cover, precipitation, temperature, gender, and age-disaggregated socio-economic data. As of 2024, it has been validated for three countries in the region in cooperation with academic institutions and respective space agencies. The tool will be customized for other countries upon request.

For the implementation of the Jakarta Ministerial Declaration on Space Applications for Sustainable Development in Asia and the Pacific, the secretariat, in collaboration with partners such as UNU, is demonstrating the operational applications of digital innovation such as Large Language Models (LLMs) to enhance the accuracy and timeliness of flood risk assessment and early warning. Web-based tools and training materials were developed to integrate LLMs into geospatial data analysis and Earth observation.

The secretariat has developed SATGPT, an innovative solution that leverages the current capabilities of LLMs and integrates them with cloud computing platforms and EO data. SATGPT represents a fully functional, innovative spatial decision support system designed for rapid deployment, particularly in resource-limited contexts. The secretariat's current efforts to develop SATGPT focus on flood hotspot mapping, simplifying the process with a user-friendly interface. The only action required from the user is to specify flood duration and location. SATGPT leverages LLMs to generate Google Earth Engine (GEE) code dynamically, access historical databases, or perform unsupervised classification to detect flooded areas. This innovative integration of LLMs with GEE enhances the speed, accessibility, and real-time capabilities of flood mapping, making it more accessible to non-specialists and supporting resilient disaster management practices.

With continued financial and technical support from China, India, Indonesia, Japan, the Republic of Korea, the Russian Federation, and Thailand, to whom the secretariat expresses deep appreciation, in 2023-24, the secretariat is working with countries in the Lower Mekong Basin to integrate geospatial information for resilient agriculture and crop monitoring. The project implemented extensive training programs in Cambodia, Thailand, and Lao PDR, equipping government officials and local stakeholders with the skills to use the cloud crop monitoring platform effectively. Additionally, on-job training has provided in-depth learning and practical experience with advanced agricultural monitoring technologies.

ESCAP has recently initiated a project to promote crop diversity in selected South-East Asia countries through innovative use of space applications. The project will enhance knowledge and data availability in three sub-national locations in three target countries, namely Indonesia, Malaysia and the Philippines, to assess and monitor the state of crop diversity and enhance the capacity of space agencies and partner universities in the three target countries to develop satellite-derived tools to assess and monitor the state of crop diversity.

ESCAP has strengthened the capacity of Central Asian countries to use satellite data and geospatial information for effective drought monitoring and early warning by building a pilot Central Asia drought information system (CADIS) at the Kyrgyz Ministry of Emergency Situations (MES). CADIS provides geospatial information services and products to MES by integrating satellite-derived data, ground georeferenced data, and statistical data.

The pan-Asia partnership for geospatial air pollution information has been strengthened. In 2023-2024, the secretariat has provided technical support to experts and data users of GEMS (the Geostationary Environmental Monitoring Spectrometer) and Pandora instruments by organising capacity-building training and workshops in Bangkok, Thailand in January and Ulaanbaatar, Mongolia in May 2024.

ESCAP and the Geo-Informatics and Space Technology Development Agency or GISTDA of Thailand have been working closely to ensure regional food security. Both sides strive for expansion of the use of space technologies and geospatial information for the agriculture sector such as Thailand's Dragonfly application to equip farmers with insights from space for their effective resource management from seeding to distributing their products as well as building greater resilience and improving the productivity of agriculture in the region.