

# Indonesia/Asia-Oceania

There are four main activities in Indonesia to support Earth Observation, i. e.: (1) Space Law and Policy; (2) Space Science; (3) Satellite, and (4) Remote Sensing. Indonesia has finally issued Government Regulation No. 7 of 2023 on Space Technology Acquisition. The main objectives are control on dual use technologies; mastering and development of rocket technology, satellite technology, aeronautical technology etc; technology safeguard provision and mandatory standard on design, production, test, and operation of space vehicle, facility and personnel handling of space technologies; and people participation in mastering space technologies.

Indonesia has been supporting in space science such as (1) Participation in KIBO-ABC (Asian Beneficial Collaboration) Programs through the Space Research Center, BRIN, actively encourages the participation of young people in space activities with the collaboration with the Japanese space agency, JAXA, within the KIBO-ABC programs: Asian Herb in Space (AHIS) and Asian Try Zero-G; (2) Popular Scientific Facts Chat Dialogue in Space Science (Dofida) is a public communication activity related to space education. It has been broadcasted since 2021; (3) Development of Observatory (Progress Report) Timau National Observatory and Dark Sky National Park. The New Astronomy Observatory in Indonesia as a solicitation for International Collaboration on Space Science Research  
The observatory is expected to be part of

Dark Sky Park, to conserve the environment by designing a unique education & tourism area for Astrotourism, and to boost economic development for society; etc.

Indonesia has Indonesian Space Program to support Earth Observation. The current development plans are to develop 2 VHR satellites, 2 SAR satellite in near equatorial orbit, and 10 IoT satellites in equatorial orbit. Indonesia also has a plan to launch A4/NEO-1 Satellite in 2024. The missions are for Earth observation, maritime surveillance, and Earth magnetic field measurement. Beside that, Indonesia has also been developing A5/NEI-1 Satellite. The missions are supporting disaster early warning, maritime surveillance, and Machine to Machine (M2M) & Internet of Thing (IoT) Comm. Another satellite development is Surya Satellite-1 (SS-1). It is a 10 cm x 10 cm x 10 cm nanosatellite that designed and produced by Surya University's college student in cooperation with LAPAN/BRIN, ORARI, PT. Pasific Satelit Nusantara, PT. Pudak Scientific, and stakeholders. It was Launched on November 26<sup>th</sup>, 2022.

In Collaboration with International Organization, Indonesia has been participating In Crop-Bio Project (Promoting Crop Biodiversity Through Innovative Space Applications). This project aims to promote crop diversity in selected South-East Asia countries through innovative space applications. To achieve this objective, it will enhance the availability and accessibility of data on crop biodiversity in selected

subnational locations in Indonesia, Malaysia, and Philippines by building geospatial crop databases and conducting a crop diversity assessment that could become a model for conducting future assessments in other locations. This project was initiated by ESCAP and AIRCAS in line with the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030). Indonesia has also been participating in Space Applications for Environment (SAFE) CH4Rice Project. The project title is Assessment of Methane Emission from Rice Paddies and Water Management. The countries involved are VNSC Vietnam (Project Leader), BRIN Indonesia, GISTDA Thailand, ISRO India, JAXA Japan, and PUST Bangladesh. The outcomes are climate change mitigation such as carbon credit through CH4 MRV, water management by efficient irrigation with lower CH4 emission), and regional and global sustainable agriculture-related initiatives/activities.

Indonesia also participates in remote sensing activities for SDG's. For instance, Indonesia has supported SDG's #2 Zero Hunger by developing innovations for agriculture and fishery. In agriculture, Indonesia has developed satellite-based technology innovation that produces Precision Agriculture in determining planting area, harvest area, productivity, and national rice production estimates. The potential fishing ground derived from remote sensing technology has developed. The information is

distributed to user through startup company. Another example is supporting SDGs #11 Sustainable Cities and Communities. BRIN in collaborating with other institutions in Indonesia and supported by UN ESCAP, has been developing a model for slum area detection using machine learning. Indonesia has also been supporting disaster response using remote sensing, in collaboration with UNSPIDER and Data Analysis Node Sentinel Asia.

To distribute the data and information of Earth Observations, BRIN has been developing a platform for multi-input and multi-output called Geoinformatics for Multi-input and Multi-output (GEOMIMO). This platform uses multi-input from remote sensing data and geospatial data to be processed for many needs, such as food security (crop, fishing ground), environment and disasters, carbon accounting, and strategic issues. etc. This platform developed by collaboration with internal BRIN, domestic and foreign partners. This platform produces digital services, so that the users can access the data easily and use the information quick and near-real time.