

Sentinel Asia Initiative- an Overview of Disaster Management Support System in Asia Pacific

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Asia-Pacific Regional Space Agency Forum (APRSAF) is an international cooperation platform for space agencies and related academic institutions, research organizations, and industries in Asia Pacific region since 1993. APRSAF promotes innovative applications using space technology for sustainable development challenges we all are facing today. With this background, in APRSAF, a disaster management support system initiative, called ‘Sentinel Asia,’ was proposed in 2005. The system focuses on specific disasters and showcases the value and impact of Earth observation technologies, combined with near-real-time internet dissemination and Web-GIS mapping tools for disaster management support.

Sentinel Asia takes a step-by-step approach to accelerate the system development. STEP 1 (2006 - 2007) focused on implementation of the backbone ‘Sentinel Asia’ data dissemination system and associated Nodes, and to showcase the value and impact of the technology using standard internet dissemination systems; STEP 2 (2008 - 2012) on expansion of the dissemination backbone with new Satellite Communication Systems; while STEP 3 (2013 and onwards) on establishment of a comprehensive Disaster Management Support System.

Sentinel Asia is voluntary and best-efforts-basis initiative. To promote participation, Joint Project Team (JPT) was organized. JPT is open to space community, disaster management organizations and regional/international organizations who wish to participate in disaster information sharing activities. Data Provider Node (DPN) provides their satellite imagery and/or data upon the emergency observation request to the extent permitted by the data policy of each DPN when disaster happens. Data Analysis Node (DAN) analyzes the satellite data provided by DPN, makes damage assessment maps and discloses the result through the system within the domestic legislation of each DAN permits.

Currently, Sentinel Asia has 115 JPT members, including 98 organizations from 29 countries/regions and 17 international organizations. When emergency observation requests are accepted, subject to each DPN availability, the following satellite data will be acquired and provided: Resourcesat-2, Cartosat-3 (ISRO, India), ALOS-2 (JAXA, Japan), DIWATA-2, NovaSAR-1 (PhilSA, the Philippines), TeLEOS-1 (CRISP, Singapore), FORMOSAT-5 (TASA, Taiwan), Thaichote (GISTDA, Thailand), VNREDSat-1A (VAST, Vietnam), and KhalifaSat (MBRSC, United Arab Emirates).

Sentinel Asia provides various kinds of disaster assessment maps. The Secretariat launched the Web-GIS service for its members in November 2019 and continues to operate the service. When Emergency Observation Requests (EORs) are received, most of the satellite observation data from DPN and all the processed products from DAN are displayed on Web-GIS. From February 2007 to July 2023, Sentinel Asia has responded to 415 disasters in 36 countries/regions. Disasters include flood, earthquake, volcano eruption, landslides, glacier lake outbursts and oil spills.

As Sentinel Asia evolves, in current STEP 3, it is expected to implement not only emergency observation but activities covering entire disaster management cycle including mitigation/preparedness and recovery phase so that the space-based technology would contribute to Asia and the Pacific region. To achieve these goals, Steering Committee is formed to review previous activities, identify problems, propose solutions and lead to implement those suggested ideas and proposals.

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