Sentinel Asia Overview

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Sentinel Asia

Sentinel Asia is a JAXA’s leading voluntary initiative by a collaboration between space agencies and disaster management agencies, applying remote sensing and Web-GIS technologies to assist disaster management in the Asia-Pacific region.

In Oct 2005, APRSAF-12, in Kitakyushu, Japan, approved the plan to initiate the pilot project.
In Feb 2006, Joint Project Team (JPT) was organized and Sentinel Asia has started.

http://sentinel.tksc.jaxa.jp/2
Feature of Sentinel Asia (SA)

- Integrated Community with Space/Disaster/Int’l related orgs in Asia-Pacific region

**Sentinel Asia**

- Space Community
- Disaster Management Community
- International Community

Sentinel Asia is the world’s biggest integrated community!

Sentinel Asia consists of 102 JPT members including 87 agencies from 25 countries and 15 international organizations (as of Oct. 2016) and ADRC members.

Platform to discuss about cross-cutting issues

**Sentinel Asia Constellation**

- ISRO
- GISTDA
- NARL
- CRISP
- JAXA
- KARI

VAST with VNRedSat from Nov 2015
Data Analysis Node (DAN)
Framework of satellite data analysis to provide analyzed products

2 P-DAN
43 DAN (incl. 7 DPN)
Coordination Hierarchy of Sentinel Asia under APRSAF

Asia-Pacific Regional Space Agency Forum (APRSAF)

- Plenary Session
  - held once a year

  Space Applications WG

  Report

  Recommendation

  Sentinel Asia

  Program level
  - Steering Committee (SC)
    - held once a year plus as necessary

  Project level
  - Joint Project Team Meeting (JPTM)
    - once a year

  Node (DPN/DAN) Meeting
    - once a year plus as necessary

  Wildfire WG
  Flood WG
  GLOF WG
  Tsunami WG

  held as necessary
The Concept of Sentinel Asia Step 3 (2013 onwards) focuses on the integration of various satellite systems for comprehensive disaster management. The diagram outlines three main phases: Pre-disaster, Just after disaster, and Post-disaster.

**Pre-disaster**:
- **Mitigation**: Community education
- **Preparedness**: Hazard map, Early warning system

**Just after disaster**:
- **Response**: Emergency observation

**Post-disaster**:
- **Recovery**: Monitoring

Information sharing is facilitated through a web-based Geographic Information System (Web-GIS) and a human network for capacity building and outreach.

Key components include:
- **Positioning satellites**
- **Earth observation satellites**
- **Communication satellites**

Information is delivered to personal terminals, monitored for real-time updates, and shared through a Web-GIS interface.
Emergency Observation Flow

**Demanding Organization (RO)**
- ADRC members
- JPT members

**Emergency Observation Request, Disaster Info**

**Communication on status of disaster, observation, etc.**

**ADRC**

**Disaster Info**

**Disaster Occurrence**

**Support**
- JAXA (JPT Secretariat)
- JAXA

**Satellite Images & Disaster Info**

**Disaster Info**

**Disaster Management Agencies in Asia**

**International Disaster Charter**

**Data Provider Node (DPN)**

**Data Analysis Node (DAN)**

**Sentinel Asia Step 2 System**

**http://sentinel.tksc.jaxa.jp/**

**Analyzeable Data**

**Archive Images**

**Images by Emergency Observation**

**Analyzed Products**

**Own Data**
Background of SA Evolution

- Sentinel Asia has been operated from 2006 and reached Step 3 from 2013, which was originally planned as Sentinel Asia long-term plan adopted at APRSAF-12 in 2005. [Link to the document](http://www.aprsaf.org/data/aprsaf12_data/day3/5_sswg%20sumrepo.pdf)
- **(A)** It is now on the stage to phase Step 3 by activating and reinforcing its activities through increasing contribution of each participating organization by each role and contributing furthermore to the community.
- **(B)** At the same time, the next long-term plan following the first one is requested, in order to promote Sentinel Asia strategically.
Sentinel Asia Evolution Plan
(Recommendation of APRSAF-21)

Considering issues, Step 3 (2015-2019) should be pushed forward by:

1. **Joint drive of activity**
   - to increase contribution of each participating organization by each role
   - for example, to utilize programs of each participating organization
   - particularly, in collaboration with funding organizations (ADB, WB, JICA, etc.), to conduct Success Story to solve regional issues finally aiming at a community-operated system
   - to collaborate with international initiatives (the International Charter, GEO, CEOS, etc.)

2. **End user-oriented activity (For end users)**
   - to utilize SA data and information not only to the government level but also to community level.
   - Need to establish projects which matches the needs of each country.

3. **Strategic management**
   - to establish “Steering Committee” in SA for strategic, quick decision making purpose, e.g., to discuss data policy, long-term strategy of SA.
Sentinel Asia Evolution Image

Technology Development

- New Satellites
- New Technologies

Step 1
2006-2007
Pilot Project

Step 2
2008-2012
Feedback

Step 3
2013 onwards
Feedback

User Requirement

User: JPT members, Disaster Management Org.

Voluntary initiative under APRSAF, led by JAXA

2015-2019
New Sentinel Asia

2020 onwards

Background (A)

- To push forward Step 3 by:
  - Joint Drive
  - For End Users
  - Strategic Management by Steering Committee

Background (B)

- To be studied in Steering Committee
- To aim at autonomously sustainable activity/management

More contribution from each participating institutions under APRSAF
2016 Sentinel Asia Steering Committee (SC)

• Roll of SC:
  The SC is a high-level organization of Sentinel Asia to study, discuss and make decision about various issues of Sentinel Asia.

• SC members(13):
  **DPN** - ISRO, GISTDA, NARLabs, CRISP, VAST, JAXA,
  **P-DAN** - AIT, University of Tokyo
  Disaster Management Organizations - ADRC, PHIVOLCS
  Persons who worked for initiation of Sentinel Asia.
    CSIRO, Dr. Alexander Held/Director,
    NIED, Mr. Koji Suzuki/Executive Director
  Representative from WGs(A) - IWMI, Dr. Giriraj Amarnath Co-chair of Water-related Disaster WG

• Secretariat of SC: JAXA

• How to work: e-mail, web-conference, physical meeting
Discussion Items by SC (1/2)

1. Active participation of users such as disaster management organizations (DMOs), end-users (disaster response institutions and community in each country) is essential but still few. -> More effective and/or coordinated approach to DMOs & end-users by SA is necessary.

2. Active participation of each satellite data provider (DPN) and each data analyzer (DAN) is essential. -> More coordinated emergency observation plan & data analysis should be implemented. Next Step 3 system is expected to improve the current procedures and shorten time.
3. DPN should coordinate how to support mitigation/preparedness, response and recovery activities including data policy. -> **Definitions of each phase shall be cleared and then DPNs discuss how they cover for each phase.**

4. Success story should be steadily conducted and enlarged to solve regional issues in each country. -> **Achievements of Philippines Success Story project and successful EOR events to be shared among members for their future activities.**

5. In the long term, autonomously sustainable activity/management is desired. -> **Long term milestone of SA to be drafted and planed to be presented to APRSAF-24.**
New Sentinel Asia Concept (2015-2019)

Observation
- Space Organization
  - EO Satellites
- Disaster-related Data • Info

Utilization
- COM Satellites
  - Data Transmission
- Data • Info Sharing (Web-GIS)

End Users
- Disaster Management Organization
  - Gov. Org. (ADRC members etc.)
  - Local Gov. etc.

For End Users
- Utilization for end users in each country
  - Projects matching the needs of each country

Joint Drive
- Increase contribution of each participating organization by each role
- Utilize programs of each participating organization, such as funding organizations
- Collaborate with international initiatives

Human Network
- Capacity Building • Outreach

Strategic Management
- Steering Committee
Expected Joint Plan (Example)

**Management**
- ADRC

**Activity**

**Response (Emergency Observation)**
- Management: ADRC
- Supply Satellite Data:
  - DPN: JAXA, ISRO
  - KARI, GISTDA
  - NARLabs, CRISP
  - VAST
- Data Analysis:
  - AIT, Univ of Tokyo (P-DAN)/DAN

**Capacity Building • Outreach**
- JAXA
- UNSPIDER (ADRC)
- JICA
- UNESCAP
- ADPC
- ISRO

**System (Web-GIS)**
- JAXA

**Mitigation • Preparedness/Recovery**

**Success Story**
- JAXA
- ADB
- JICA
- WB

**Working Group (WG)**
- Wildfire (Hokkaido Univ.), Flood (ICHARM, IWMI), GLOF (Chubu Univ., ICIMOD), Tsunami (JAMSTEC)
- Drought (ISRO)

**NB:** Red box indicates the expected organizations to be added.

JPT Meeting

DPN/DAN Meeting
Coming Events

• Steering Committee : Monthly Telecon/Face to Face meeting(Jan 2017:TBD)
• 10\textsuperscript{th} Anniversary Event: Early March 2017@Vietnam
• 4\textsuperscript{th} Meeting of Sentinel Asia Step 3: Early March 2017 @Vietnam
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