Overview of the Sentinel Asia
Supporting Disaster Management in the Asia-Pacific Region by space technology

Asian Conference on Disaster Reduction (ACDR) 2011
June 13-15 2011
Kengo Aizawa
Disaster Management Support Systems Office
Japan Aerospace Exploration Agency

Background

- Number of Disasters
  - Asia: 3429
  - World: 9207
  - Asia: 37%
- Economical Damage
  - Asia: 594 Billion USD
  - World: 1333 Billion USD
  - Asia: 45%
- The Death Toll
  - Asia: 1,280,889
  - World: 2,218,319
  - Asia: 57%
- Victims
  - Asia: 50,484 Million
  - World: 56,764 Million

**Purpose**

In Oct 2005, APRSAF*-12 approved the plan to initiate the **Sentinel Asia** to assist disaster management in the Asia-Pacific region and it aims to:

> Improve safety in society by ICT and space technology
> Improve speed and accuracy of disaster preparedness and earlywarning
> Minimize the number of victims and social/economic losses.

* *:

**Sentinel Asia Project**

establishing Disaster Management Support System

---

**Concept of Sentinel Asia**

Collaboration between space agencies and disaster management agencies

- **Observation**
  - Space Agency
  - Earth Observation Satellite
  - Disaster Information
  - Value-added Information

- **Communication Satellite**

- **Utilization**
  - Disaster Management Organization
  - User Expansion
    - Governmental Organization (ADRC members)
    - Local Governmental Organization

- **Sharing (Web)**

- **Human Network**
  - Capacity Building
  - Outreach

End User
Main Activities

1. **Emergency observation**
   Member agency request emergency observation to data providers via ADRC

2. **Monitoring**
   Provide precipitation, hotspot data for Flood, Wildfire

3. **Outreach**
   Capacity building and human resource development for promotion of utilization

---

**Sentinel Asia**
Disaster Management Support System in the Asia-Pacific Region

---

**Emergency Observation**

- **Requesting Organization (RO)**
- ADRC Members JPT Members
- IDC
- Emergency Observation Request ADRC
- Emergency Observation Feedback
- JAXA Asia Branch (Bangkok)
- Disaster Management Agencies in Asia
- Disaster Occurrence
- JAXA Support
- Sentinel Asia Step 2 System
- Analyzed Products
- Support
- Archive images
- Image by Emergency Observation
- Analyzed Data
- Data Provider Node (DPN)
  - JAXA
  - ISRO
  - GISTDA
  - KARI
  - NARL
- Data Analysis Node (DAN)
  - AIT, ADRC
  - CRISP, CAIAG
  - LAPAN, SD/Sri Lanka
  - MONRE, ICIMOD
  - Sri Lanka MoDM, CEA
- Own Data

---

**Sentinel Asia**
Disaster Management Support System in the Asia-Pacific Region
Constellation for disaster observation

WINDS (Japan)  IRS (India)  THEOS (Thailand)  KOMPSAT (Korea)  FORMOSAT 2 (Taiwan)

Users  Tsunami  Earthquake  Flood  Wildfire  Volcano eruption

Sentinel Asia
Disaster Management Support System in the Asia-Pacific Region

Data Analysis Nodes (DAN)
A framework of satellite data analysis to provide analyzed products

NCSRT (Kazakhstan)  CAIGA (Kyrgyz)  ICIMOD (Nepal)  ADRC (Japan)
AIT (Thailand)  MONRE (Vietnam)  MO (Philippines)
SD (Sri Lanka)  MoDM (Sri Lanka)  CRISP (Singapore)
LAPAN (Indonesia)  BPPT (Indonesia)
Step 2 System Regional Servers

Kazakhstan RS
Kyrgyz RS
Mongolia RS
Nepal RS
Japan Central Server
Bangladesh RS
Thailand RS
Vietnam RS
Taiwan RS
Philippines RS
Indonesia RS
Sri Lanka RS
Fiji RS

RS: Regional Server

Sentinel Asia
Disaster Management Support System in the Asia-Pacific Region

Flood Monitoring

Observation & Flood Forecasting
- Rainfall Monitoring
- Flood Detection
- Situation Analysis
- Rainfall by Satellite
- Land Observation by Satellite

Processing
- Precipitation Map
- Downscaling in Time and Space
- Image Analysis

Integration
- Sentinel Asia Web-GIS
- Damage Evaluation Map

NB: *GFAS: Global Flood Alert System (by IFNet)
**IFAS: Integrated Flood Analysis System (by ICHARM)

Sentinel Asia
Disaster Management Support System in the Asia-Pacific Region
Monitoring by GSMap product

Monitoring by GFAS product
Flood case in Sri Lanka

On Feb. 3, 2011
Flood case in Sri Lanka

Capacity Building and Human Network

The 5th Training by JAXA, hosted by MoDM in Sri Lanka, in February 2010

Human Network

The 6th Training by JAXA, hosted by GISTDA in Thailand, in July 2010
Next Step

1. Contribution remote sensing and ICT in Asia-Pacific region by APRSAF.

2. Accumulating more contributions and strengthen role(function) sharing to promote Joint steering of SA project.

3. To cover all phases, add pre-disaster phase and recovery phase to our range of work, in addition to emergency observation.

4. Promote regionally or “bi” cooperation aiming to utilize SA more deeply.

Thank you for attention

Japan Aerospace Exploration Agency
Satellite Applications and Promotion Center
Sentinel-Asia Project Office
E-mail: z-sentinel.asia@jaxa.jp

https://sentinel.tksc.jaxa.jp/