



Overview of Sentinel Asia Status



1st JPTM for Sentinel Asia Step3
27-29 November 2013, Bangkok

Kazuya Kaku
JPT Secretariat
Japan Aerospace Exploration Agency

Asia-Pacific Regional Space Agency Forum



Established in 1993 after the Asia-Pacific International Space Year Conference (APIC) in 1992.

Enhance the development of space programs in the Asia-Pacific region and promote regional cooperation in the field of space technology and its applications.

[Participation] Space agencies, related governments, regional and international organizations, institutions responsible for applying space technology.

[Organizers] MEXT, JAXA and co-host organizations



Sentinel Asia

Working Groups



**Earth
Observation**



**Communication Satellite
Applications**



ISS



**Space Education &
Awareness**

APRSAF-20



**20TH
APRSAF**
ASIA-PACIFIC REGIONAL
SPACE AGENCY FORUM
VIETNAM

**The 20th Session of the Asia-Pacific Regional Space Agency Forum
(APRSAF-20), Hanoi, Vietnam, December 3-6, 2013**

Meeting Details

Meeting Details



Date: December 3-6, 2013

Place: Hanoi, Vietnam

Theme: Values From Space : 20 Years of Asia-Pacific Experiences

Sentinel Asia

Sentinel Asia is a 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.

NB: JAXA's Sentinel Asia server has been shutdown in order to solve the serious security problem in Sentinel Asia System !



<http://sentinel.tksc.jaxa.jp/>

History of Sentinel Asia

- Nov 2004: APRSAF-11 in Canberra

Pilot projects among APRSAF members for rapid response to disasters in the Asia-Pacific region was proposed

- Oct 2005: APRSAF-12 in Kitakyushu

Implementation of “Sentinel Asia” pilot project was decided

Step1

- Feb 2006: 1st JPTM of Sentinel Asia Step1 in Hanoi, hosted by VAST
Sentinel Asia Step1 was launched
- June 2006: 2nd JPTM in Bangkok, hosted by GISTDA
- Oct 2006: Operation was started, website opened
- March 2007: 3rd JPTM in Singapore, hosted by CRISP
- September 2007: 4th JPTM in Manila, hosted by STCC-COSTA, DOST, OCD, NDCC, NAMRIA, DENR

History of Sentinel Asia

Step2

- Nov 2007: APRSAF-14 in Bangalore

Transition to Sentinel Asia Step2 (2008-2012) was decided

- June 2008: 1st JPTM of Sentinel Asia Step2 in Kobe, hosted by ADRC
Sentinel Asia Step2 has started

- July 2009: 2nd JPTM in Bali, hosted by LAPAN

- July 2010: 3rd JPTM in Manila, hosted by PCASTRD, DOST

- July 2011: 4th JPTM in Putrajaya, hosted by ANGKASA and MKN

- Nov 2012: 5th JPTM in Daejeon

- Dec 2012: APRSAF-19 in Kuala Lumpur

Recommendation on the launch of Step3 starting from 2013 was adopted

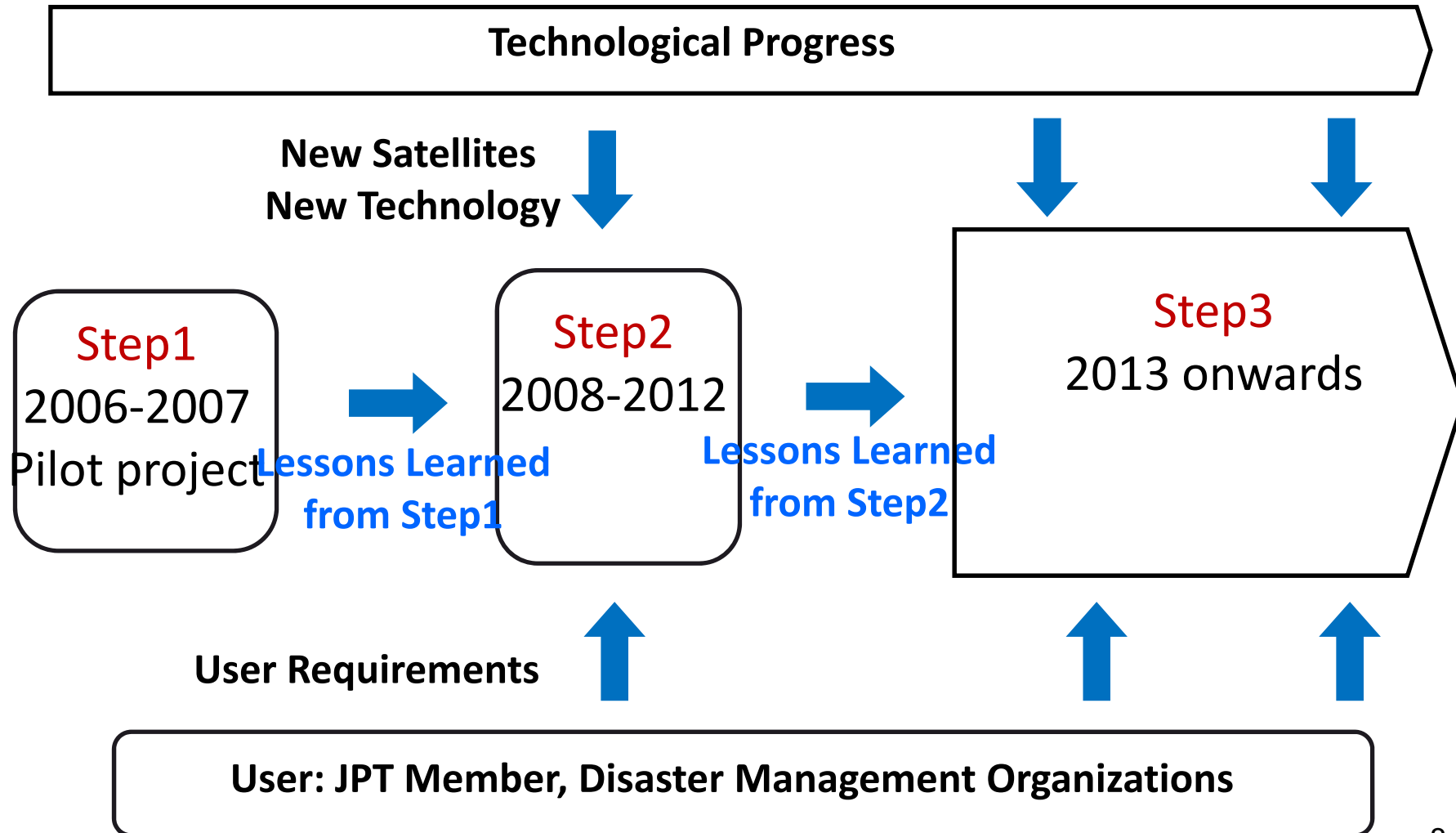
Step3

- Jan 2013: Step3 has started

APRSAF-19 Recommendations on Sentinel Asia

1. **Declare the completion of the Sentinel Asia Step2 successfully** with achieving its goal by participation of additional satellites such as KOMPSAT-1 (KARI), THEOS (GISTDA), FORMOSAT-2 (NARL), XSAT (CRISP) in addition to ALOS (JAXA) and IRS (ISRO) in Step1; utilizing WINDS satellite communications to improve accessibility to information; organizing a new framework “Data Analysis Node (DAN)” to provide value-added products; initiating new working group of Glacial Lake Outburst Flood (GLOF) and Tsunami in addition to Wildfire and Flood in Step1; and collaboration with the International Charter starting from October 2010.
2. **Declare the launch of the final phase of Sentinel Asia starting from 2013** with the goal to expand activities to cover all the disaster management cycle—mitigation/preparedness phase, response phase and recovery phase—utilizing various and many satellites such as earth observation, communication and navigation satellite, under further collaboration for operation and human networking by Join Project Team.

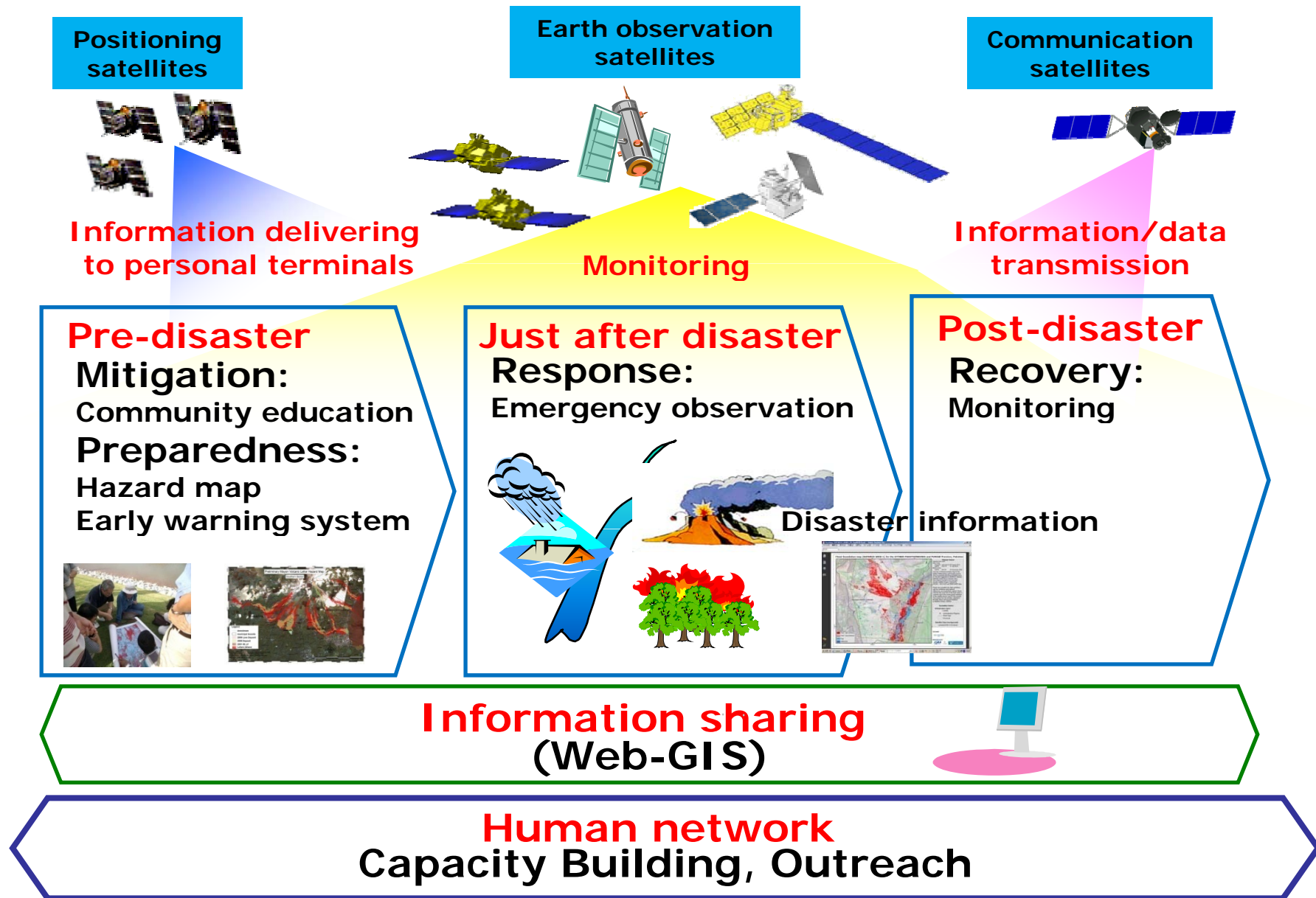
Step-by-step Approach



Vision of Sentinel Asia

- Sentinel Asia is an initiative proposed and supported by APRSAF
- Contribution from space community (APRSAF) to disaster management in the Asia-Pacific region by applying space and ICT technologies
- Collaboration between space agencies and disaster management agencies
- Voluntary initiative by participating organizations for humanitarian purposes

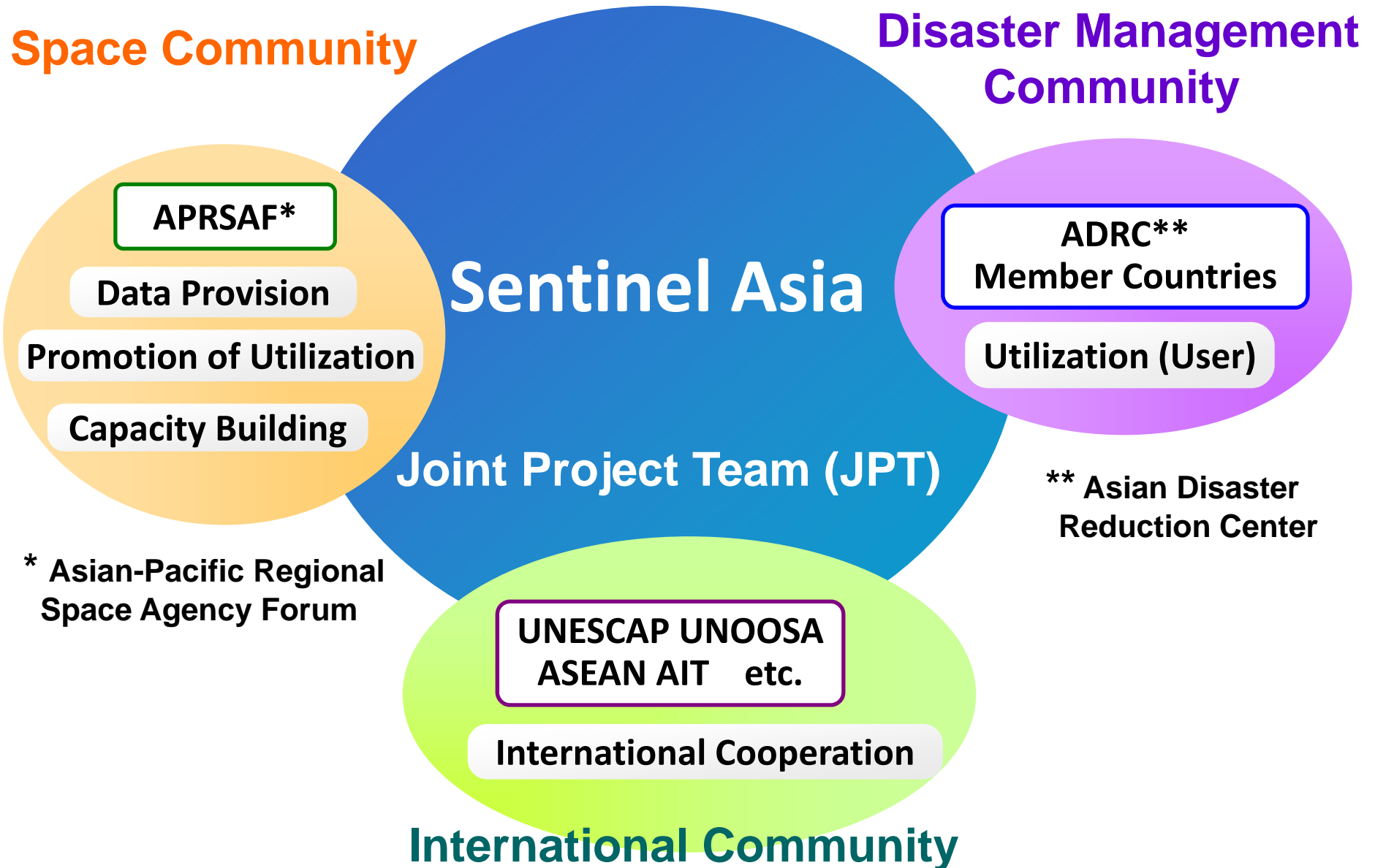
Concept of Sentinel Asia Step3 (2013 onwards)



Main Activities



Framework of Sentinel Asia



3 Recent Activities

Status of JPT

- JPT Members: 91 organizations including 14 international organizations
- New JPT members
 - World Wide Fund for Nature (WWF) - Pakistan
 - Prince of Songkla University (PSU)
 - Myanmar Earthquake Committee (MEC), Myanmar Engineering Society (MES)
 - Institute of Mountain Hazards and Environment (IMHE), Chinese Academy of Sciences (CAS)
 - Myanmar Geospatial and Resources Center (MGRC), Myanmar Peace Center (MPC)

Status of JPT

- Data Provider Node (DPN): **6 organizations**

JAXA, ISRO, GISTDA, KARI, NARL, CRISP

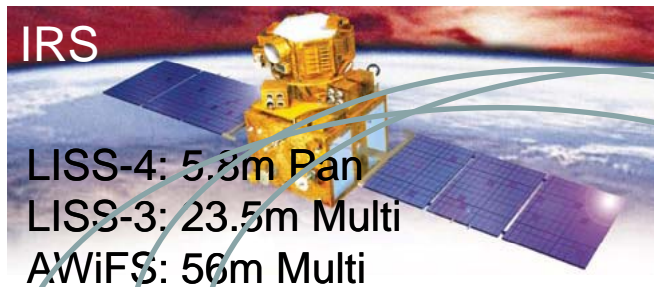
- Data Analysis Node (DAN): **36 organizations**

DPN (6 organizations), AIT, ADRC, CAIAG, LAPAN, SD of Sri Lanka, MONRE, ICIMOD, Sri Lanka MoDM, CEA, NCSRT, IWMI, SD of Brunei, BPPT, SOPAC, ANGKASA, Sichuan University, National Central University, PHIVOLCS, Manila Observatory, Chinese University of Hong Kong, ADB, Yamaguchi University, Chubu University, University of the Philippines, Chiba University, Hiroshima Institute of Technology, **Prince of Songkla University (PSU), PAGASA, Institute of Mountain Hazards and Environment (IMHE)CAS, Myanmar Geospatial and Resources Center (MGRC)MPC**

Data Provider Node (DPN) Sentinel Asia Constellation contributing to Emergency Observations

ISRO

**RESOURCESAT, OCEANSAT-2 OCM,
IMS-1, CARTOSAT-1&2, RISAT-1**



GISTDA

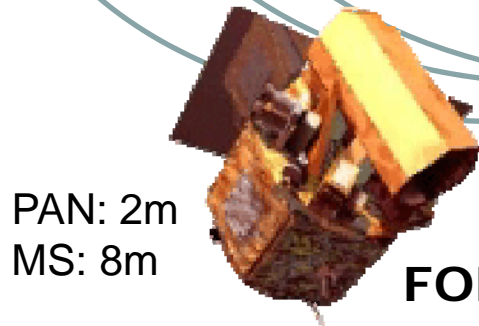


JAXA **ALOS-2 & 3**

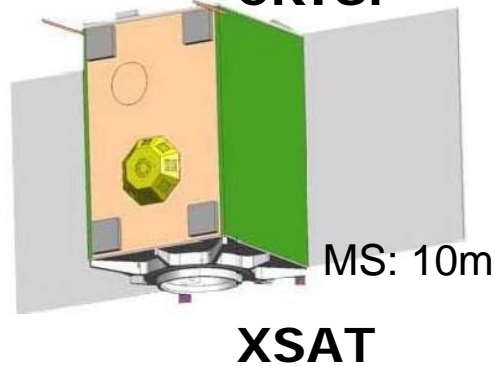


Sentinel Asia Constellation

NARL



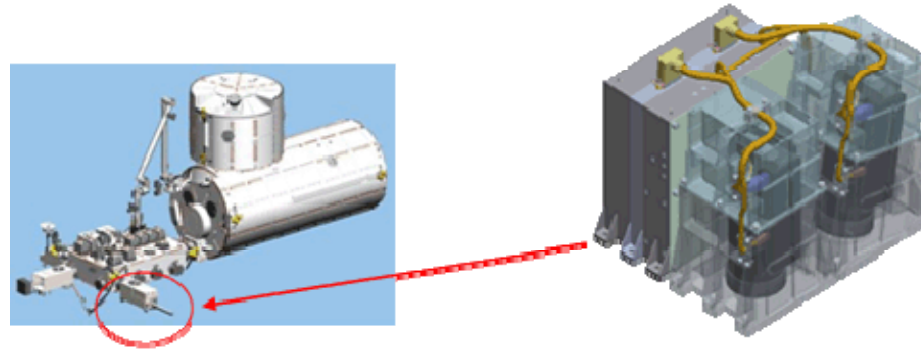
CRISP



KARI



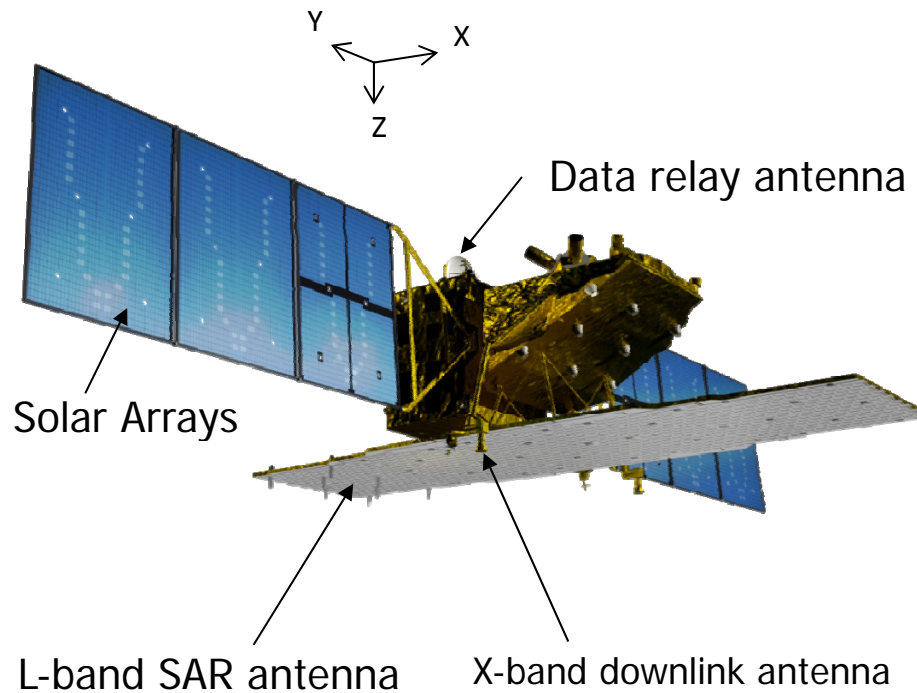
KIBO HDTV-EF (high definition TV camera on ISS)



Examples of snapshots captured from movie over the Philippines

ALOS-2 satellite

ALOS-2 in-orbit configuration



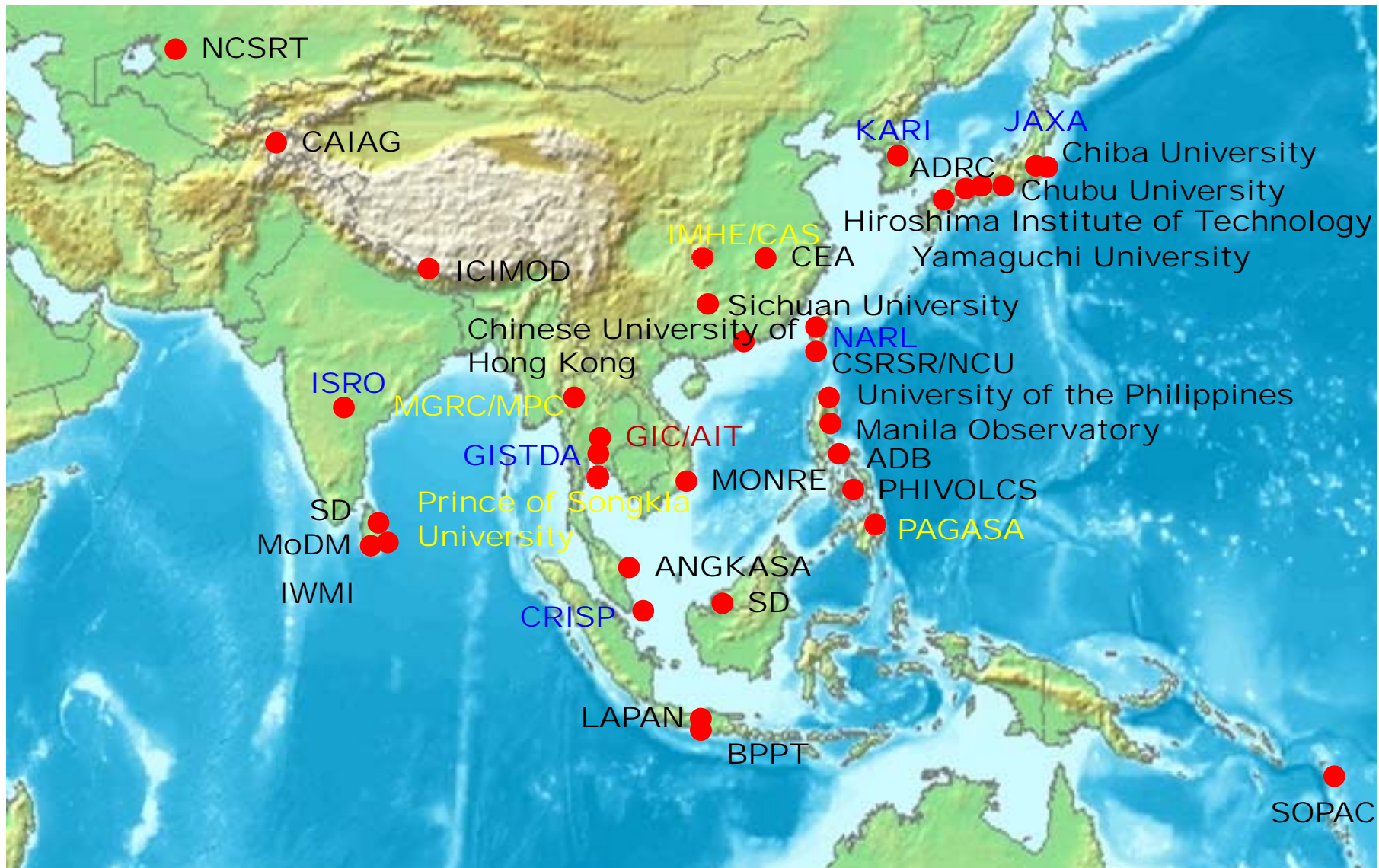
Specification

L-band SAR (PALSAR-2) Observation mode	Stripmap: 3 to 10m res., 50 to 70 km swath ScanSAR: 100m res., 350km/490km swath Spotlight: 1 × 3m res., 25km swath
Orbit	Sun-synchronous orbit Altitude: 628km Local sun time : 12:00 +/- 15min Revisit: 14days Orbit control: \leq +/-500m
Life time	5 years (target: 7 years)
Launch	JFY2013 , H-IIA launch vehicle
Downlink	X-band: 800Mbps(16QAM) 400/200Mbps(QPSK) Ka-band: 278Mbps (QPSK)

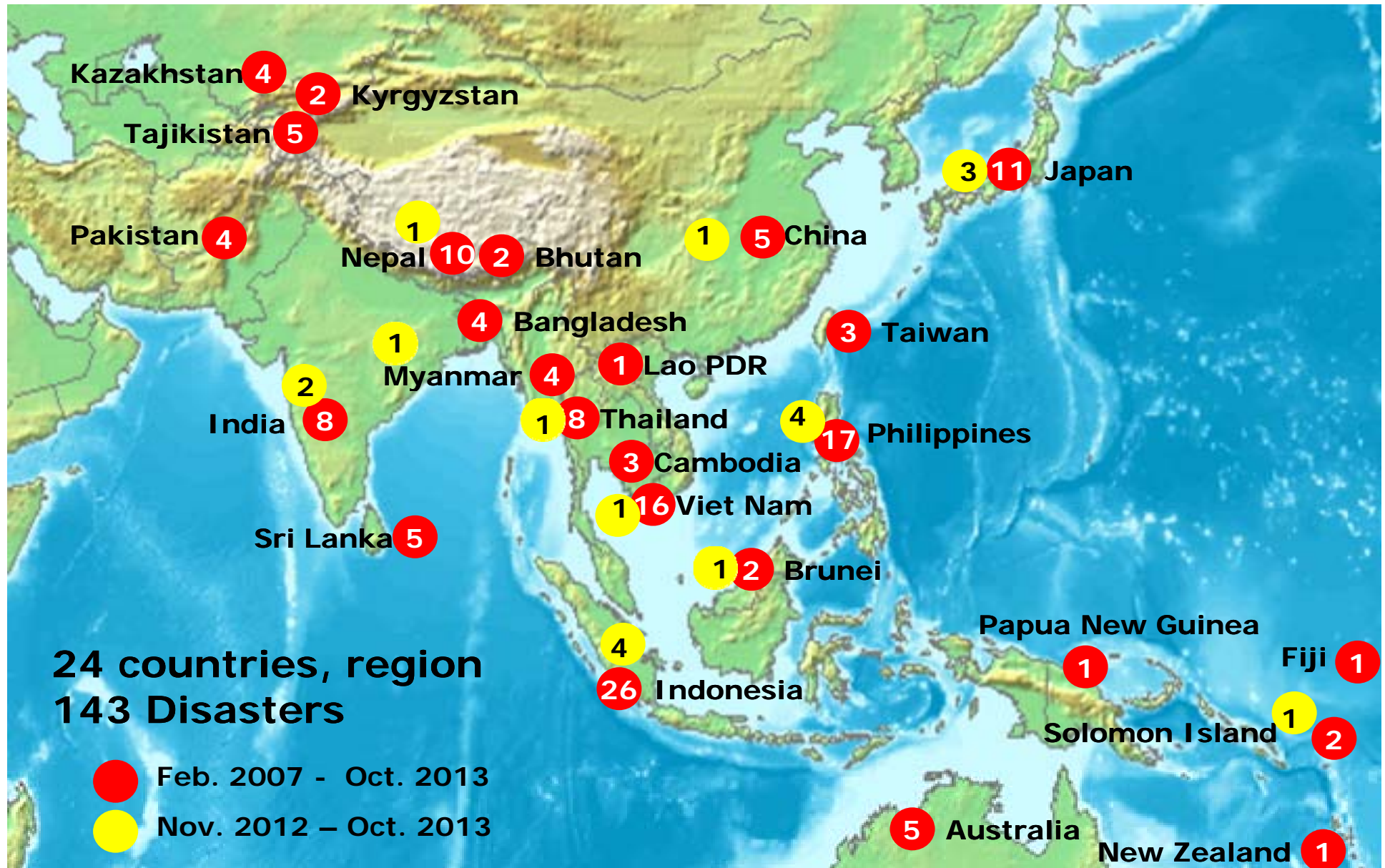
Experimental [Compact InfraRed Camera \(CIRC\)](#)
[SPace based Automatic Identification System Experiment\(SPAISE2\)](#)

Data Analysis Node (DAN)

Framework of satellite data analysis to provide analyzed products

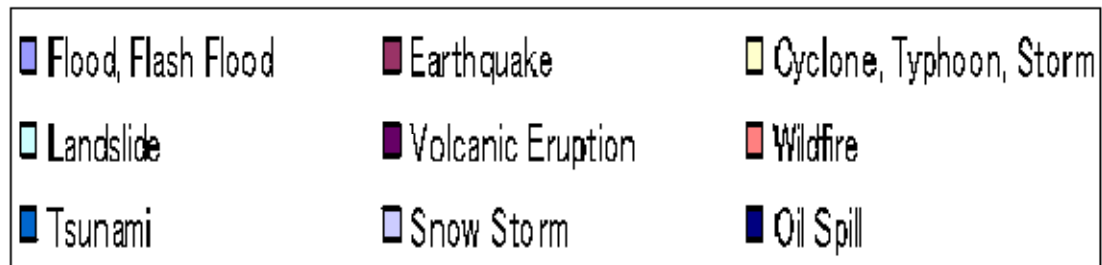
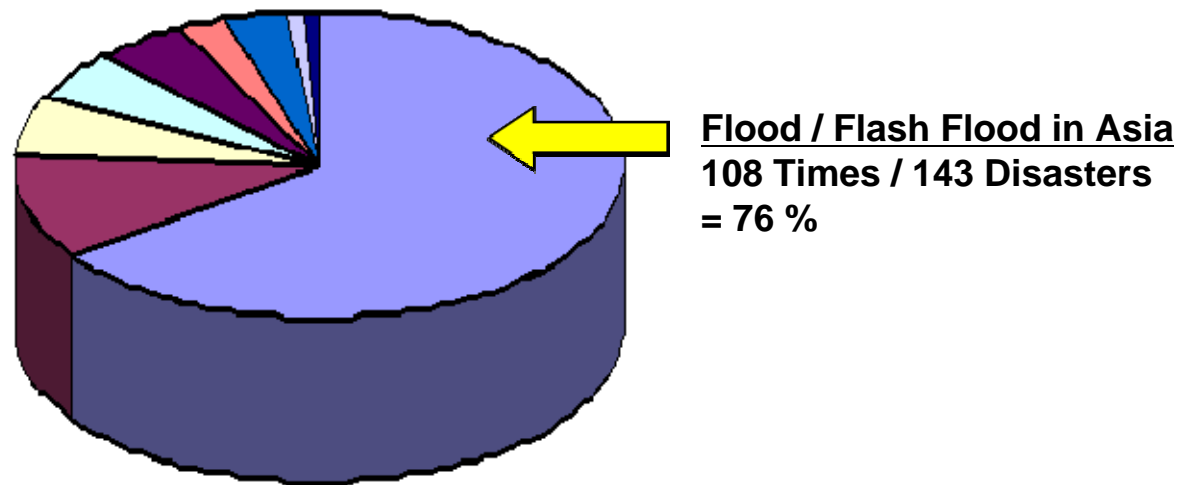


Geographical Distribution of Emergency Observation Request (EOR)



EOR Disaster types

Feb. 2007 - Oct. 2013



Recent Activities

- 27 Dec. 2012: JAXA (JPT Secretariat) sent a letter “Announcement of Transfer to and Request for Cooperation on Sentinel Asia Step3” to JPT members
- 3 April 2013: 1st version of “Sentinel Asia Step3 Implementation Plan (IP)” was established
- 20-21 June 2013: The International Charter PM training in Manila, for PHIVOLCS, PAGASA, MO, LAPAN, hosted by PAGASA
- 11-15 Nov. 2013: Sentinel Asia System Operation Training by JAXA for ASEAN countries at AHA center, in collaboration with JICA
- 25-26 Nov. 2013: The International Charter PM training in Bangkok, for MO etc.
- JAXA’s Sentinel Asia server has been shut down in order to solve the serious security problem in Sentinel Asia System.



**SENTINEL ASIA STEP3
IMPLEMENTATION PLAN**

FIRST VERSION

SENTINEL ASIA STEP3 JOINT PROJECT TEAM
April 2013

Sentinel Asia Step3
Implementation Plan
(First Version)

IP Issues

(1) Support for all disaster management cycle:
pre-disaster, response, recovery support

- Data Policy

JAXA supports this within a certain limit, under condition that other DP members support this.

(2) JPT secretariat rotation

It should be studied by TFT of SA Evolution

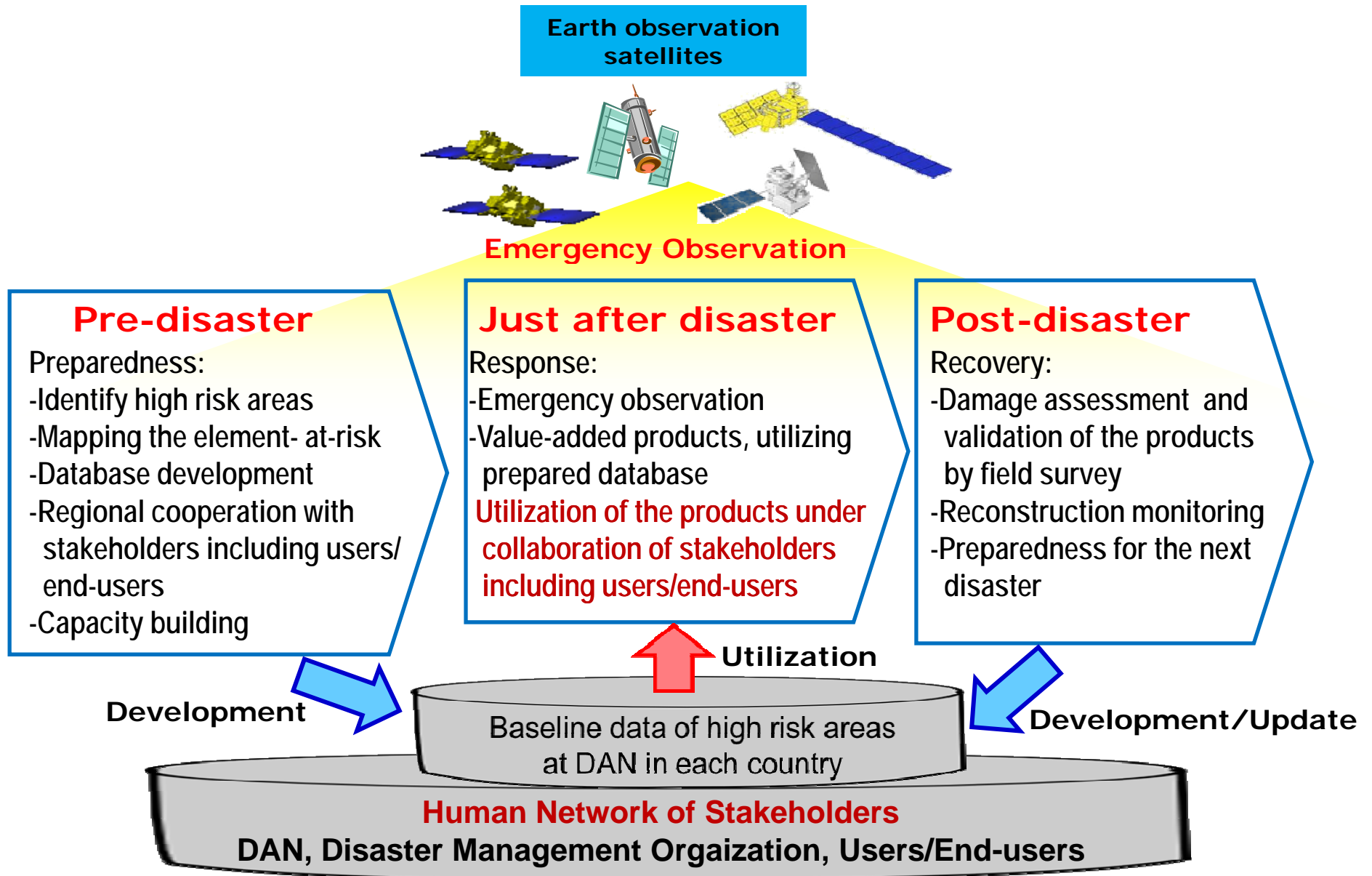
IP New Activities

(1) Step3 Showcase by FS-2/NARL

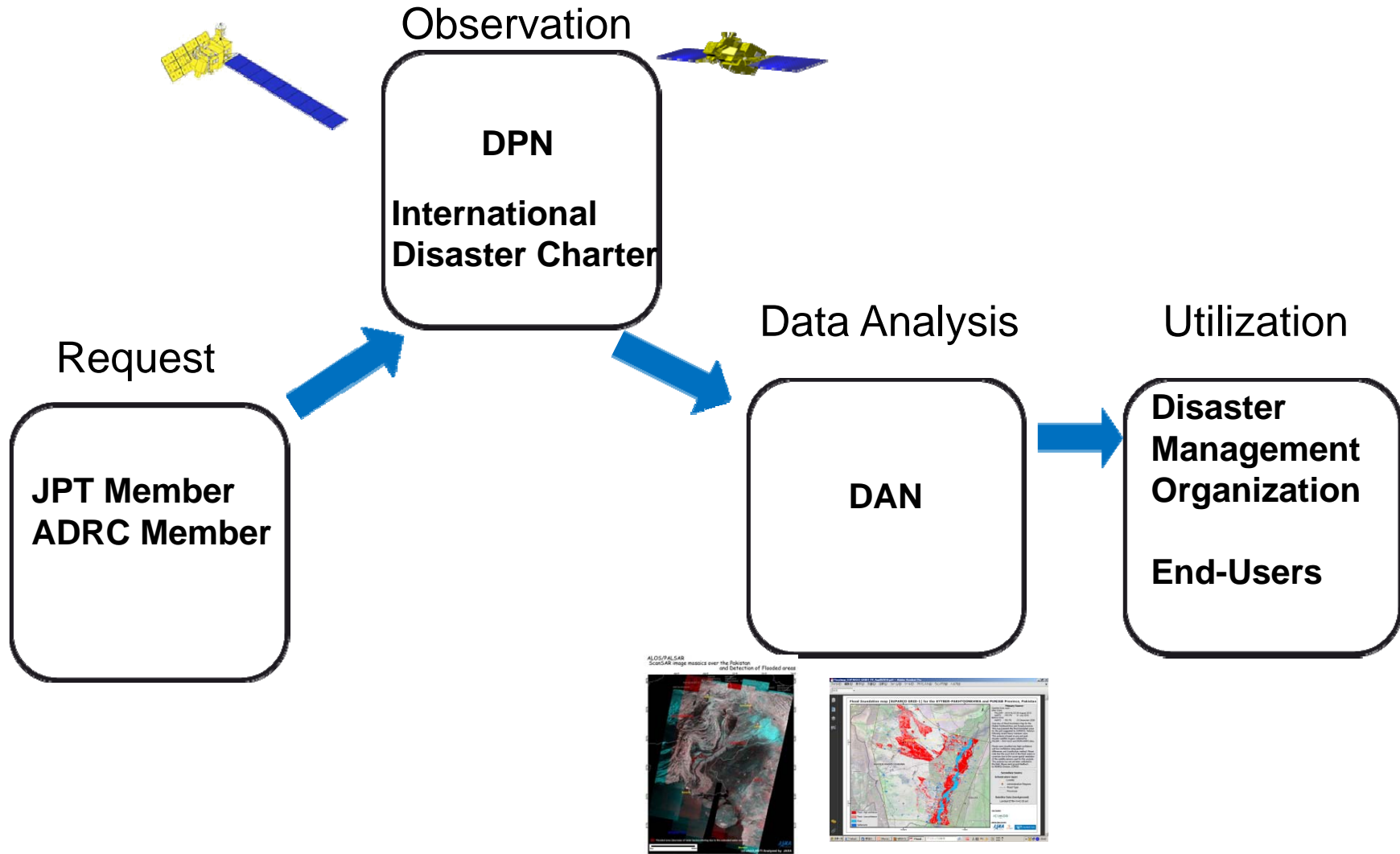
(2) Success Story

- Regional cooperation to promote utilization of Sentinel Asia by end-users
 - Local awareness and knowledge transfer through capacity building
 - Human resources and human network development
-
- Success Story in the Philippines (PHSS) from 2009
 - Emergency Observation (EO) Success Story by Mini-Project in Sri Lanka, the Philippines, Bangladesh, and Myanmar from 2013

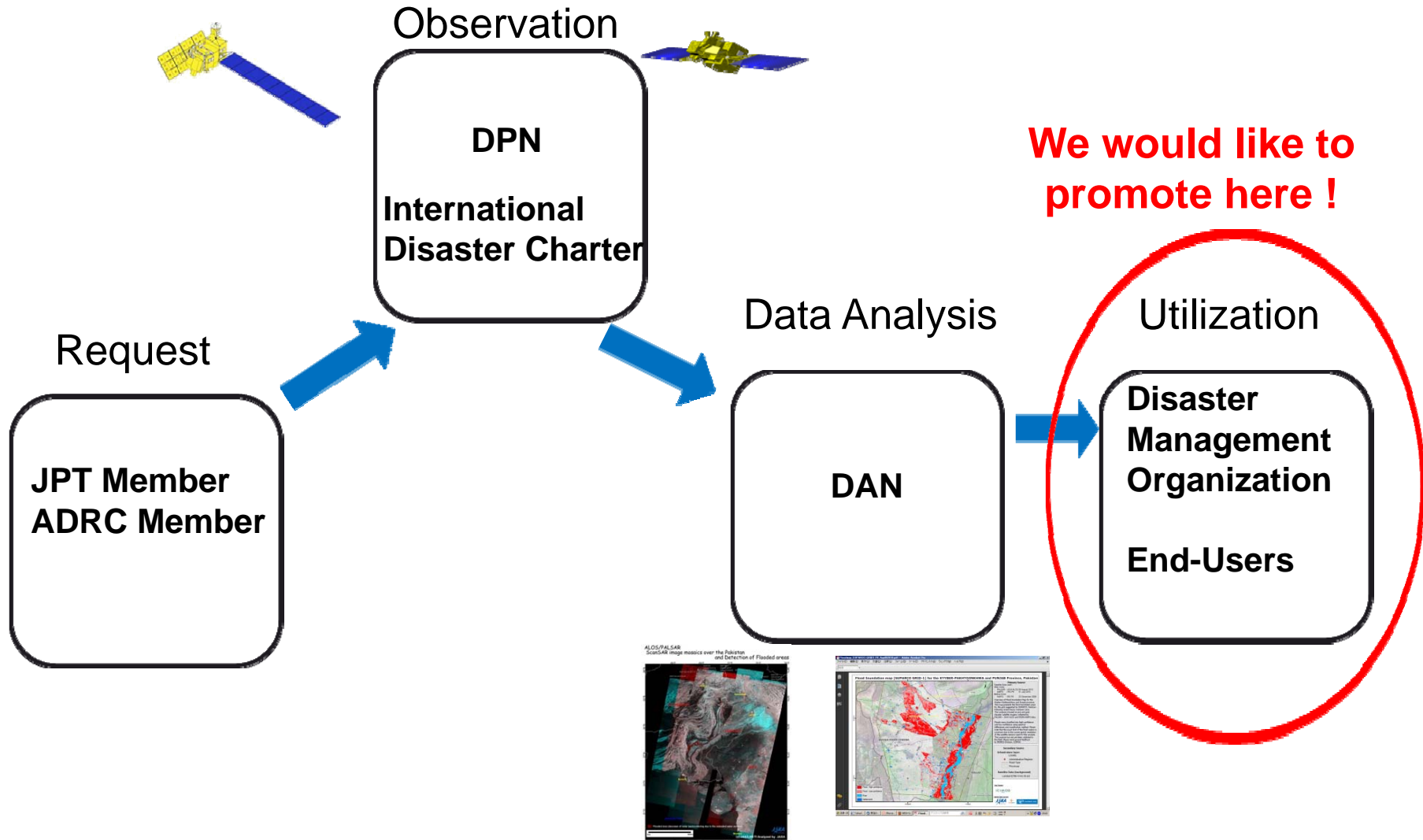
Emergency Observation Success Story



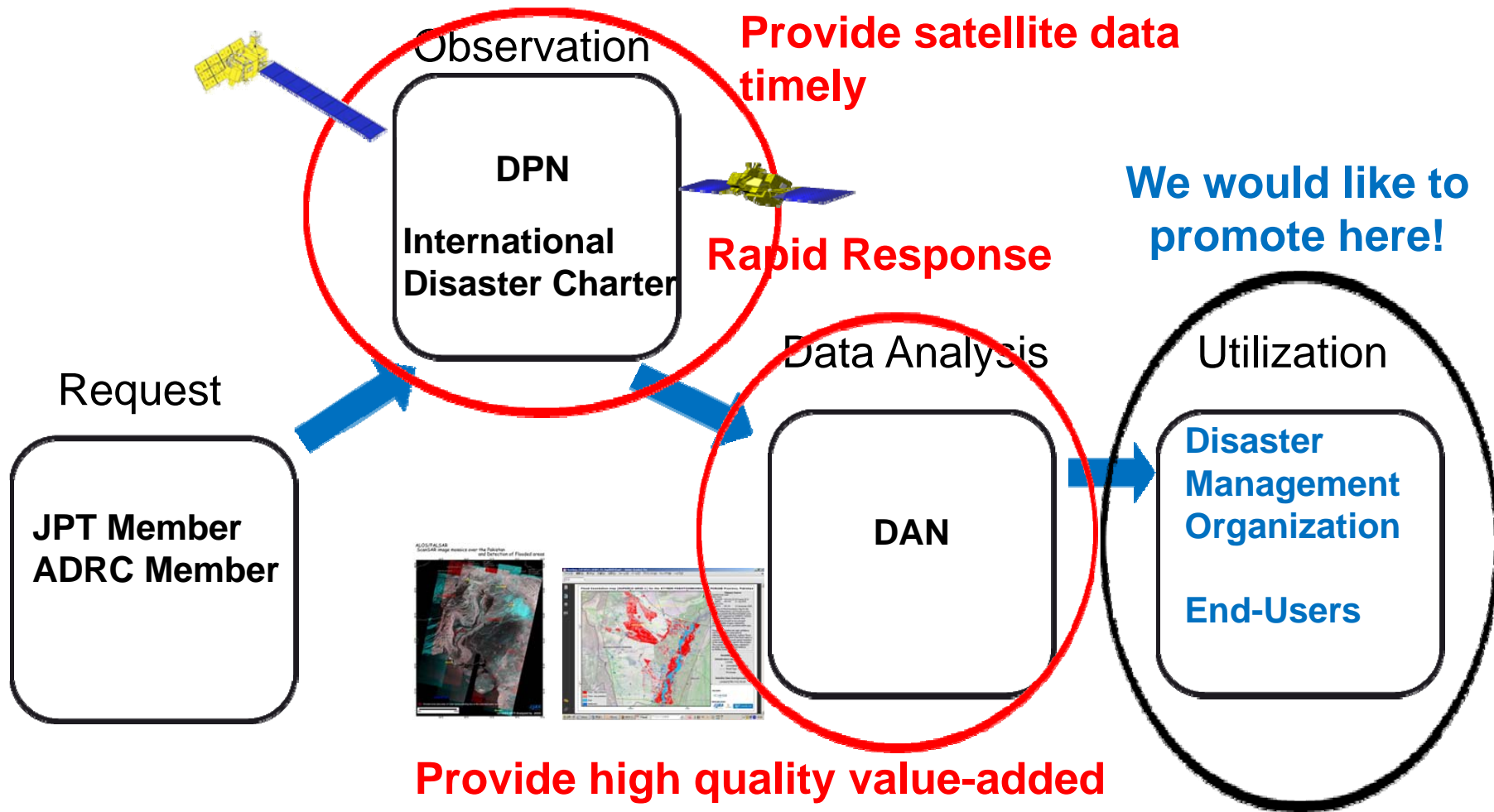
Emergency Observation Flow



Objective



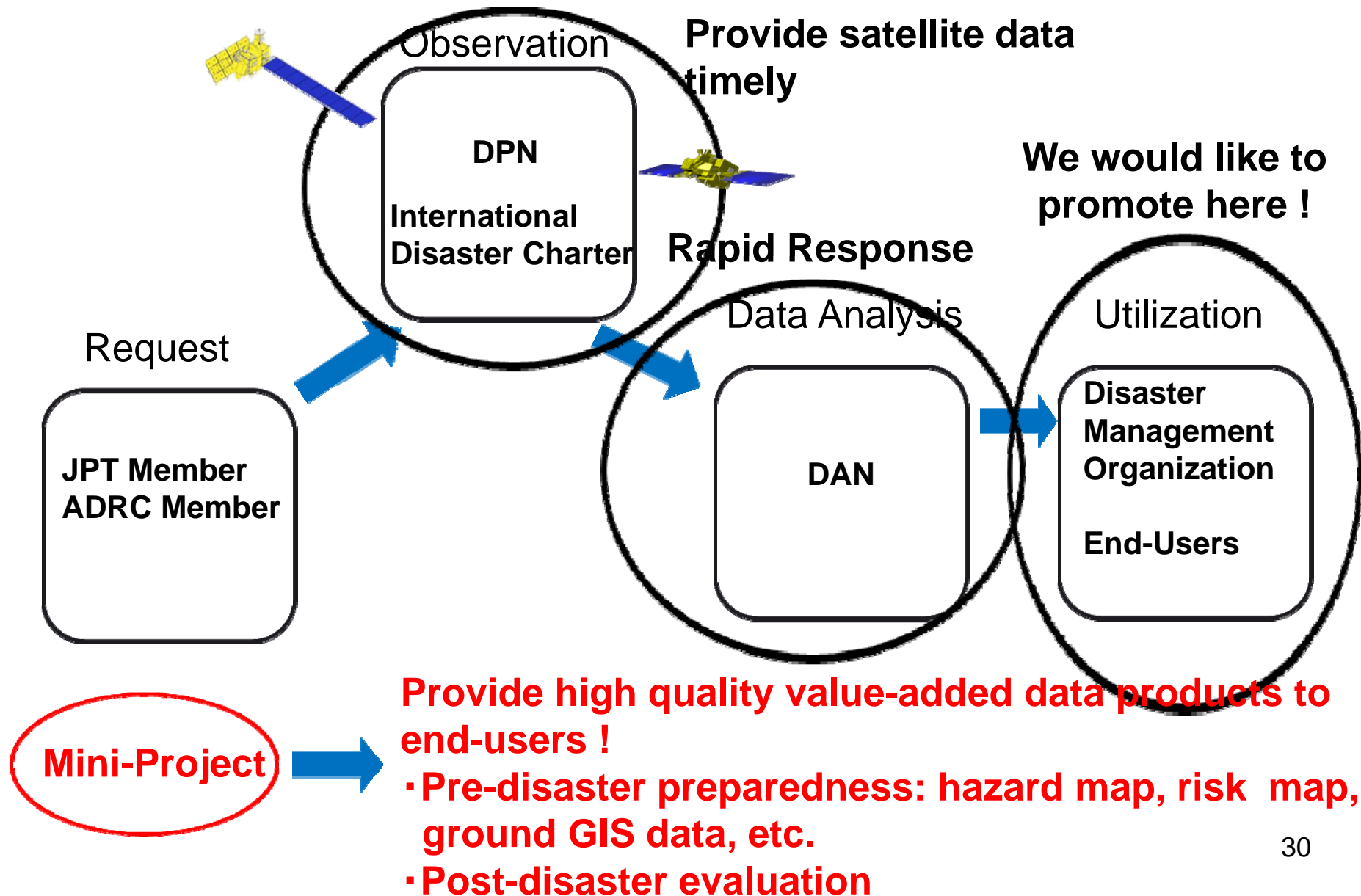
Evolution of Emergency Response



Provide high quality value-added data products !

- Pre-disaster preparedness
- Post-disaster evaluation

Approach by JAXA/AIT Mini-Project

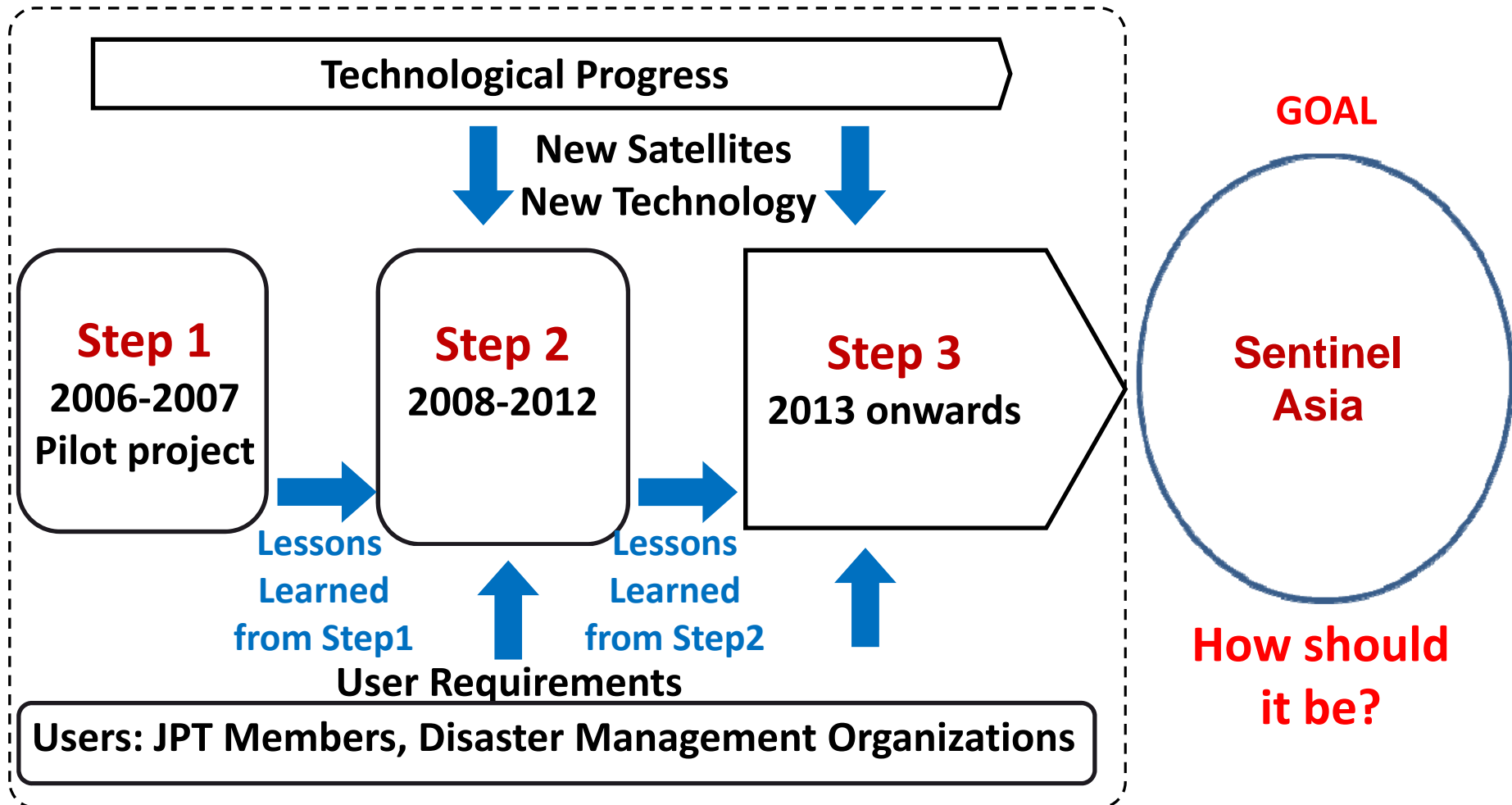


Sentinel Asia Evolution

Background

- Frequent catastrophic disasters, e.g. recent Typhoon Haiyan: enforce our desire to enhance our efforts in the risk and damage reduction in disasters
- The 3rd World Conference on Disaster Risk Reduction (WCDRR) in Sendai of Japan in March 2015, and post-Hyogo Framework for Action 2005-2015: how can Sentinel Asia contribute?
- ALOS-2 of JAXA will be launched soon, which will contribute to Sentinel Asia

“Sentinel Asia” as an Evolution of Step 3



**Initiative under APRSAF, led by JAXA,
for closed communities**

How should we proceed?

- Establish a Task Force Team (TFT) to study the Goal for Step 3
- Develop a plan of action and report it to JPTM2014 and APRSAF-21
- TFT Composition: People who participated in the development and initiation of Sentinel Asia and key disaster response agency partners
- TFT Secretariat: JAXA



Thank you for your attention

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

