3-3. Transmitting Space Image of areas affected by Disaster and Offering Image Analysis Technique

3-3-1. Sentinel Asia

(1) Objective

The Asian Disaster Reduction Center (ADRC) continues to participate in the Sentinel Asia project. The project was launched in 2006 with an objective of establishing a disaster risk management system by making the use of satellite images in Asia. ADRC functions as the focal point to receive emergency observation request in the framework of the Sentinel Asia. Upon receiving a request, ADRC decides whether the request is appropriate and whether the emergency observation should be implemented mainly for the assessment of damages and casualties. Based on its own judgment, ADRC will forward the request to five space agencies, namely, the ISRO (India), the JAXA (Japan), the GISTDA (Thailand), the KARI (Korea), NARL (Taiwan), CRISP (Singapore) participating in the Sentinel Asia Project.

In accordance with the Cooperation Agreement between the United Nations Office for Outer Space Affairs (UNOOSA) and ADRC signed on 4 June 2009 on the establishment of the ADRC UN-SPIDER Regional Support Office, the ADRC UN-SPIDER Regional Support Office has been established and operated by ADRC staff members as coordinators of the ADRC UN-SPIDER RSO.

Against this backdrop, ADRC should work towards facilitating countries in Asia to have access to and develop the capacity to use space-based information to support the full disaster management cycle.

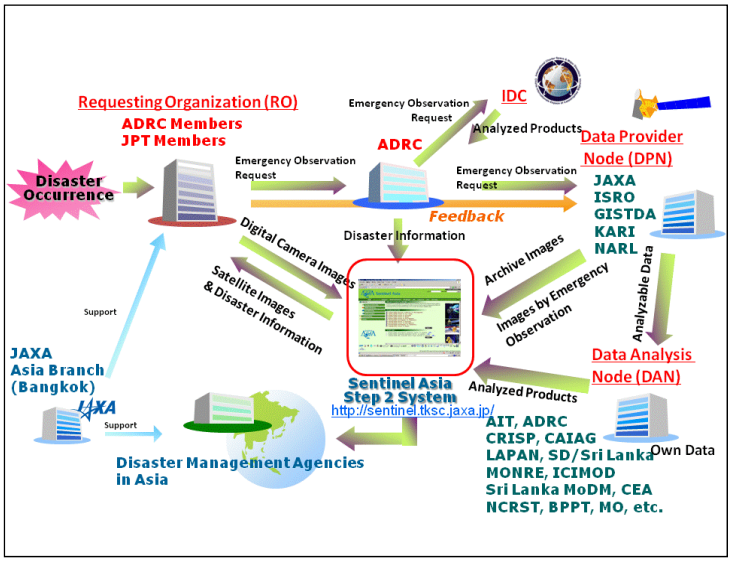

Fig. 3-3-1-1 Flow of emergency observation

(2)Implementation of Sentinel Asia Step3

A step-by-step approach for the implementation of Sentinel Asia was adopted as follows:

Step1: Implementation of the backbone Sentinel Asia data dissemination system

Step2: Expansion of the dissemination backbone with new satellite communication systems

Step3: Establishment of a comprehensive disaster management support system

At APRSAF-19 (Asia-Pacific Regional Space Agency Forum, APRSAF) held in Kuala Lumpur in December 2012, it is declared the successful completion of Sentinel Asia Step2. Sentinel Asia Step3 has the following concept, based on experiences in Step2 and user requirements.

- A basic continuation of Step2 activities
- Expansion from response (in Step1 and Step2) to cover the mitigation/preparedness and recovery phases in the disaster management cycle (Fig. 3-3-1-2)
- Participation of various satellites: earth observation satellites, communication satellites, and navigation satellites
- Further collaboration for operation
- Further utilization of human networking through capacity building and outreach

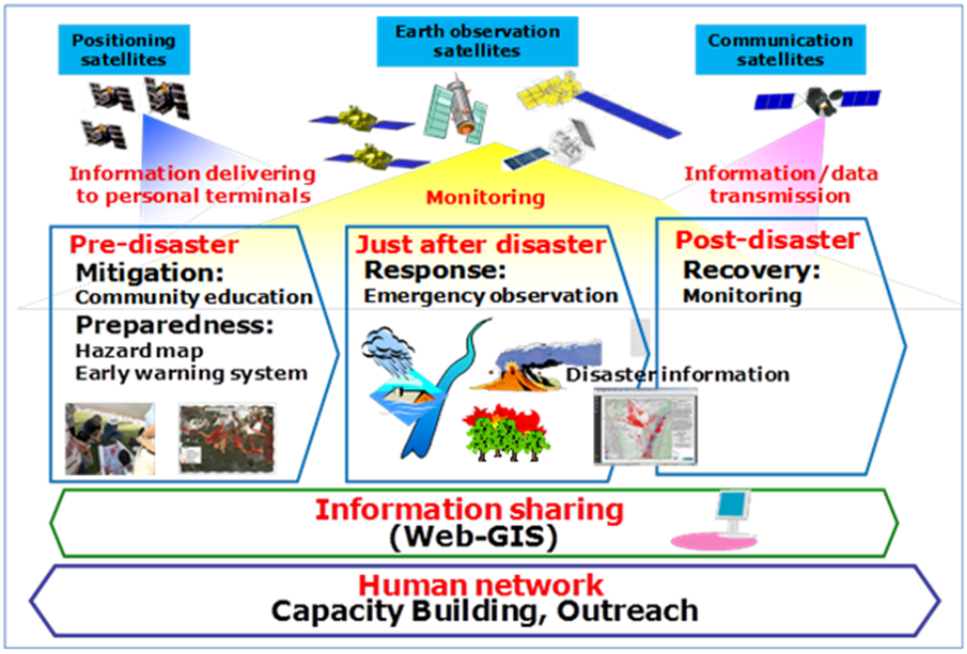

Fig. 3-3-1-2 Concept of Sentinel Asia Step3

(3) Emergency Observation Activities for this year

Number of requests is changing from year to year, but the ratio of activated numbers is sable and around 80%. Number of requests has been reduced after a peak of 2010-2011. By ALOS has stopped in May 2011, a laser sensor that can be provided in Sentinel Asia is gone. It seems that demand for laser data is related. From January to December 2013, twenty emergency observations were requested, and eighteen undertaken.

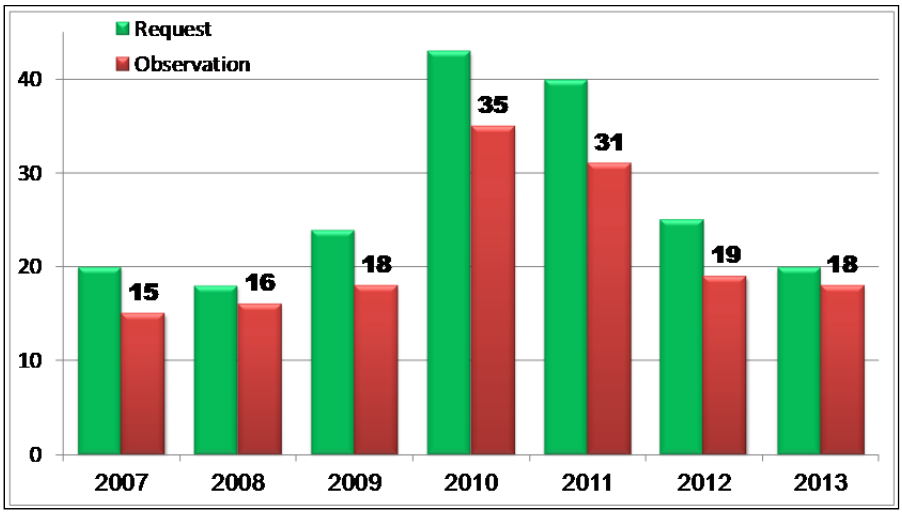

Fig. 3-3-1-3 Changes in the number of emergency observation 2007-2013

Looking at the breakdown of type of disaster in 2013, the ratio of flood occupies for more than half of the total (Fig. 3-3-1-4). In the status implementation of emergency observation for each country, top five countries (Indonesia, Philippines, Japan, India, and Malaysia) occupy more half of the total.

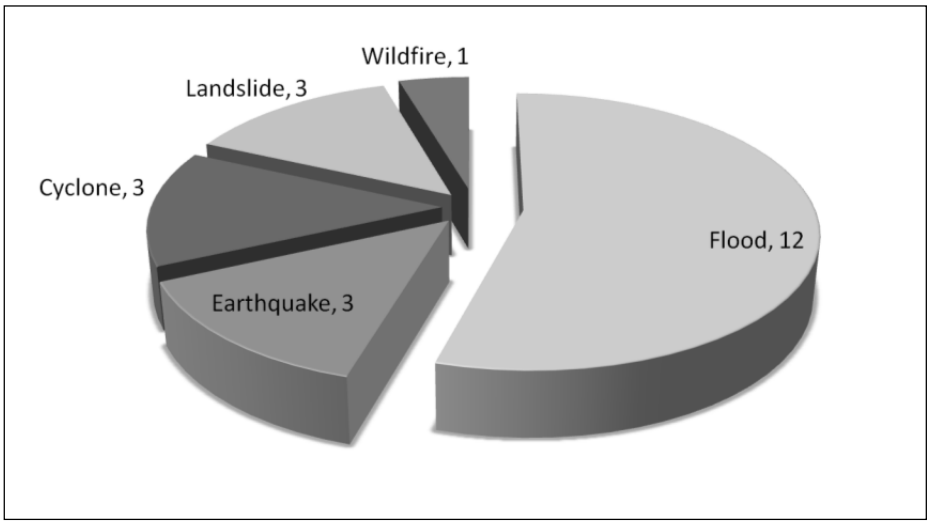

Fig. 3-3-1-4 Breakdown by type of disaster (2013)

3-3-2. Achievements of the Sentinel Asia in the HFA

(1) Objective

It has been more than seven years since the Sentinel Asia, an international cooperation project, began to operate a system in 2007 to provide satellite image data in the event of a disaster in the Asia-Pacific region. Participating disaster management/satellite agencies requested implementation of this activity a total of 213 times as of the end of March 2015.

Meanwhile, as the International Strategy for Disaster Reduction that succeeds the International Decade for National Disaster Reduction (IDNDR) proposed in the 1990s, the Hyogo Framework for Action (HFA) adopted in 2005 will serve as action guidelines until 2015. There are about one year left until the end of the HFA implementation. Review of the past activities based on the HFA and inputting work toward the formulation of a new framework (post-HFA) after 2015 are being performed by domestic and foreign agencies.

(2) Achievements of Sentinel Asia in terms of the HFA

① Achievements in the application of space and satellite technologies concerning Priority for Action 2: "To identify, assess, and monitor disaster risks and enhance early warning."

Sentinel Asia is currently working to realize effective utilization of earth observation satellites for regional disaster management using technologies such as remote sensing, Geographical Information System (GIS) and Information Communication Technologies (ICT.)

② Achievements in building regional partnership concerning Priority for Action 3: "Use knowledge, innovation and education."

Major characteristics of Sentinel Asia scheme are the provision of satellite data by member space agencies by requests of users (disaster management agencies of the affected area/country) and the additional value achieved by analyzed products of relevant data produced by specialist institutions when needed.

③ Achievements through application of space and satellite technologies in the area concerning knowledge, innovation and education as outlined in Priority for Action 3.

In order to continue and strengthen the network among space agencies, specialists and disaster management agencies, Sentinel Asia has so far carried out a total of nine operational training sessions inviting total 179 users from relevant fields of relevant countries.

④ Implementation as an international agency, provision of platform for follow-ups and achievements from the application of space & satellite technology

"Implementation of follow-up" for international agencies defined in the HFA states: "In close collaboration with existing networks and platforms, cooperate to support globally consistent data collection and forecasting on natural hazards, vulnerabilities and risks and disaster impacts at all scales." With its intended use in disaster risk reduction, the platform is required to be versatile and rapid. The latter part of the same section from the HFA states that "these initiatives should include the development of standards, the maintenance of databases, the development of indicators and indices, support to early warning systems, the full and open exchange of data and the use of in situ and remotely sensed observations" referring to the use of satellite imageries in networks and platforms.

(3) Recommendations for Post-HFA

Given the challenges yet to be fulfilled by Sentinel Asia as an international cooperation project for the HFA, this is one of good practices in Sentinel Asia (see fig. 3-3-2-1 below) and it makes recommendations such as "Utilization of space and satellite technology for monitoring in all disaster phases" in the Third UN World Conference on Disaster Risk Reduction which was held in Sendai in March 2015.

Fig. 3-3-2-1 Product related to wildfire in Kazakhstan (Sep 2008)