Sentinel Asia Handbook

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Preface

Due to the nature of the Sentinel Asia (SA) works which are related to disaster response, Value Added Products (VAPs) are expected to be produced as soon as the data are available. The book serves as a guidance for streamlining the process and techniques for data processing related to SA Activities. Hence, it is expected that the book will help in reaching the objective.

Chapter 1

Preparation

To conduct Sentinel Asia activities, there are several things that need to be prepared, (1) Hardware, (2) softwares and (3) Standard Operational Procedures.

1.1 Hardwares

There are three main computers used for Sentinel Asia works, (1) CentOS Linux , (2) Windows PC and (3) MacPro. CentOS Linux is used as Image Management System, activating scripts for PDAN website and serve as data storage downloaded from Sentinel Asia website. Since we will not continue to use PDAN website, CentOS Linux can be develop as the server for crowdsourcing or field validation by implementing DRMSurvey or Ushahidi for example. Windows PC is used to handle processing data related to flood, while MacPro is used to process data related to geological hazard such as volcano and earthquake.

1.2 Softwares

The main softwares for processing data can be divided to proprietary and open source sofwares. ArcGIS and ENVI are main proprietary sofwares used, while for open source softwares, QGIS, SNAP and GMT5SAR are utilized.

1.3 Standard Operational Procedures

Standard Operational Procedures (SOP) is the main procedure develop for each type of disasters. The main objective of writing this SOP is to standardize the process, so anyone can do the process with the same output or result.

Chapter 2

Introduction

Sentinel Asia is a voluntary initiative to provide satellite data at a time of a disaster, and to coordinate support in collaboration with data provider nodes (DPNs), data analysis nodes (DANs), and disaster management organizations (DMOs) in the Asia-Pacific region. Data analyses and value added product (VAP) generation is done through several agencies including the GIC/AIT, which is the Primary Data Analysis Node (P-DAN). Moreover, Sentinel Asia also supports activities on disaster risk reduction (DRR) to its member countries in the region. In this respect, technical and disaster management organizations are members of Sentinel Asia and are known as joint project team members (JPTM).

The time lapse of work-flow from a disaster occurrence to the product delivery stage is an important factor that has a high impact on DRR activities. The work-flow is a process chain consisting of various stages such as an emergency observation request (EOR), Sentinel Asia activation, satellite observations, image processing and analyses, value-added product (VAPs) generation, product delivery and sharing. It is important to reduce the time gaps in this process chain. The GIC/AIT has provided the service as the P-DAN during the contract period.

The main components of the works are (1) the Project Manager (PM) activities of the International Disaster Charter (IDC) and (2) generation, provision and evaluation of Value Added Products (VAPs).

All the service for Sentinel Asia activation is provided by effectively communicating with the Sentinel Asia Secretariat and collecting related information in order to identify the severity and to monitor the progress after an activation. Assistance is provided to the authorized users (AU) of the Asian Disaster Reduction Center (ADRC) member countries to receive data and products in a timely manner and to share VAPs with the ADRC and its member countries. After the VAPs are generated, close communication is maintained during the contract period with DAN members of the Sentinel Asia-activated countries.

2.1 Project Manager (PM) Activities of International Disaster Charter (IDC)

When a major disaster occurs, the Asian Disaster Reduction Center (ADRC) can escalate a Sentinel Asia emergency observation request to the International Disaster Charter (IDC). A project manager (PM), such as the GIC/AIT, will be nominated from relevant national agencies or international organizations. The PM role is to ensure effective communication between the data providers or partner agencies (PA), value added companies/resellers and authorized users (AU). The PM will coordinate the activation, ensuring that the acquisition of satellite images is under way, managing the generation of products or information, and making sure that the products are delivered to the users according to their needs and expectations. The Charter activation is considered closed 30 days after the initial activation date or when the end users have enough products for their requirements. The PM will then have to submit a report to the Charter Executive

Secretariat (the member of the PA that nominated the PM – in this case the JAXA) - within 45 days of the initial activation date through email or the COS-2 system. The PM report will conclude the PM's work for this Charter activation.

2.2 Sentinel Asia Activities

As the primary data analysis node (P-DAN) of Sentinel Asia, the GIC/AIT has been effectively communicating with the Sentinel Asia Secretariat/ADRC and coordinating the response of DAN members for each emergency observation request. The GIC/AIT analyzed satellite data which provided by the data provider nodes (DPNs), and then created VAPs and shared such satellite-based disaster information products to end users in timely manner.

Chapter 3

Sentinel Asia Activation Response Workflow

Here is a the general procedure that should be followed during the Sentinel Asia Activation.

3.1 Immediate Response

3.1.1 Work management

1. Create an activation folder in Kepler
2. Track the observation plan of satellite data

3.1.2 Initial communication with requestor/end user

1. Confirm the affected areas
2. Update the most recent ground situation
3. Identify the user needs of VAPs
4. Request the user to share ground information

3.1.3 Download/preparing vector data

The data for many of Asian countries have been prepared in ArcGIS Geodatabase. Please see Appendices to see how to connect to the Geodatabase.

3.1.4 Download other relevant data

1. Download SRTM
2. Download WorldPop

3.1.5 Initial data processing

1. Create project in ArcGIS Pro
2. Connect to the Country DataBase

3. Identify the affected admin area
4. Calculate slope from DEM

3.1.6 ArcGIS Online

1. Create a project for the activation
2. Create a rainfall monitoring tab
3. Create a tab for social media integration

3.1.7 PDAN System

1. Activate email notification
2. Update PDAN website (front page)
3. Create PDAN forum
4. Integrate ArcGIS Online

3.1.8 Prepare activation report (using template)

1. Write 'Overview'
2. Write 'Description of Disaster Situation'
3. Write 'Disaster Affected Areas'
4. Write 'Data Availability'
5. Write 'Communication'

3.2 Data provision and VAP generation

3.2.1 Work management

1. Call for a meeting, if necessary
2. Assign staffs available for data processing

3.2.2 Communication with requestor/end-user

3.2.2.1 Check and re-check

Check the draft of VAP by overlaying it with OpenStreetMap data or other GIS services (Google etc.)