The 4th Joint Project Team Meeting
for Sentinel Asia STEP 3 (JPTM2017)
7th to 9th March 2017
at VAST, Hanoi, Vietnam

Status of Space Technology
Application for DRR in Lao PDR

Virany SENGTIANTHR
Remote Sensing Center (RSC)
Natural Resources and Environment Institute (NREI)
Ministry of Natural Resources and Environment (MoNRE)
Outline

1. Introduce to RSC;
2. The status of Space Technology Application for DRR & Sentinel Asia activities;
3. Suggestions /Discussion and
Introduce to RSC

• Remote Sensing Center (RSC), Natural Resources and Environment Institute (NREI), under the Ministry of Natural Resources and Environment (MONRE).

• One of the main duties of RSC is to be the main coordinator and manager of the Space Technology Applications, focusing on the RS and GIS at the national level.
Vision

To be a center of the national focal point on the applications of Remote Sensing and GIS in natural resources and environment as well as natural disaster research.
Type of disaster in Laos

- **Natural Disaster:**
  - **Flood** (river flood and flash flood)
  - **Drought**
  - Local Storm,
  - Hail
  - Tropical Cyclone, Southwest Monsoon,
  - Landslide
  - Earthquake

- **Man-made**
  - UXO
  - Fire

The main hazards in Lao PDR are flood and drought. Both are dependent on the amount of rainfall.
## Disaster Statistics from 1999-2015

<table>
<thead>
<tr>
<th>No</th>
<th>Year</th>
<th>Types of Damage</th>
<th>Damage Cost (USD)</th>
<th>Place of Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1999</td>
<td>Flood</td>
<td>7,450,000</td>
<td>Central</td>
</tr>
<tr>
<td>2</td>
<td>2000</td>
<td>Flood</td>
<td>12,500,000</td>
<td>Central and southern</td>
</tr>
<tr>
<td>3</td>
<td>2001</td>
<td>Flash flood</td>
<td>8,000,000</td>
<td>Central and southern</td>
</tr>
<tr>
<td>4</td>
<td>2002</td>
<td>Large flood, flash flood and landslide</td>
<td>24,454,546</td>
<td>Northern, Central and southern</td>
</tr>
<tr>
<td>5</td>
<td>2003</td>
<td>Drought</td>
<td>16,500,000</td>
<td>Northern and Central</td>
</tr>
<tr>
<td>6</td>
<td>2004</td>
<td>Flood</td>
<td>20,750,000</td>
<td>Southern</td>
</tr>
<tr>
<td>7</td>
<td>2005</td>
<td>Flash flood and landslide</td>
<td>218,304,000</td>
<td>Central and southern</td>
</tr>
<tr>
<td>8</td>
<td>2006</td>
<td>Flood and strong wind</td>
<td>3,207,968</td>
<td>Northern, central and southern</td>
</tr>
<tr>
<td>9</td>
<td>2007</td>
<td>Flood and drought</td>
<td>997,960</td>
<td>Central</td>
</tr>
<tr>
<td>10</td>
<td>2008</td>
<td>Large flood</td>
<td>485,902,186</td>
<td>Northern and Central</td>
</tr>
<tr>
<td>11</td>
<td>2009</td>
<td>Flash flood and Typhoon</td>
<td>58 million</td>
<td>Southern</td>
</tr>
<tr>
<td>12</td>
<td>2011</td>
<td>Flood / Tropical storms Haima, (June) and Nok-Ten, (August)</td>
<td>12 million, (Xayaboury province) or 174 million in Laos</td>
<td>Northern, Central and southern</td>
</tr>
<tr>
<td>13</td>
<td>2013</td>
<td>Large flood</td>
<td>280 million</td>
<td>Southern</td>
</tr>
<tr>
<td>14</td>
<td>2015</td>
<td>Winter storm</td>
<td></td>
<td>Hatxayphong district, Vientiane capital city (18/02/2015)</td>
</tr>
<tr>
<td>15</td>
<td>2015</td>
<td>Flood</td>
<td></td>
<td>Bolikhhamxay province, 2-6 August 2015</td>
</tr>
</tbody>
</table>
The status of Space Technology Application for DRR & Sentinel Asia activities
Sentinel Asia in Lao PDR

Emergency Request:

1. The observation request User Name (UN) and Password (PW), by Sentinel Asia website and submit EOR completed form as well as request to the ADRC/JAXA;

2. Sharing information between line agency and research node such as AIT, JAXA, ADRC, etc;

3. Report to the Ministry of Natural Resources and Environment-MoNRE.
Request Sentinel Asia in case emergency: Coordinate, Pictures, sharing data information...

Flooded area detected from ALOS PALSAR ScanSAR

RGB color composite image of PALSAR ScanSAR
(R.G.B=pre : post : post-disaster)

Enlarged view of area 1-A
Flooded area can be estimated as red colored area.
RSC/JAXA/ADRC: Field survey on flood area in Vientiane Capital City and Vientiane Province
Flood in Laos

Legend
- Village
- River
- Road
- District Boundary

Satellite: ALOS
Sensor: PALSAR ScanSAR
© JAXA, METI

RGB Color Composite Image

Flooded area can be visualized from red to blackish red color patches

Datum: WGS84
Projection: UTM Zone 48N
Scale: 1 : 500,000

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

JAXA
Geoinformatics Center

THAILAND
Capacity building

JAXA/AIT/Mini-project/Research, Result, 2009-2010

Hatsayphong District, Vientiane
11-15 August 2008
Building map and Road map from ALOS/PRISM
The 4th Sentinel Asia System Operation Training was held on 10-12 February 2009 in Vientiane.
- Sponsor by JAXA
- Organized by RSC/WERI/WREA
- Attended by 13 Asia Pacific countries including 6 ASEAN Member States namely Indonesia, Lao PDR, Malaysia, Philippines, Thailand and Viet Nam.

The 5th Sentinel Asia System Operation Training was held in Colombo, Sri Lanka in 22 – 26 February 2010.

The 6th SAS Operation Training was held in July, 2010, Bangkok, Thailand.

Lao PDR would like to participate the next SA training.
Field Survey on Ketsana Tropical Storm-Flooded in Attapu Province, Lao PDR, September 30, 2009.
Flood in Bolikhamxay
2-6 August 2015
Vientiane times newspaper:

- Hadkhay village in Thaphabath district, Borikhamxay province, has shut down its activities after the road into the village was flooded when the Mang River overflowed.
- More than 1,400 families and 4,200 hectares of rice fields have been affected by flooding in the districts of Thaphabath, Borikhan, Pakxan and Pakkading.

Flood depth 1.5 metre
Flood in Saravanh Province
Lao PDR, 2013.

Lat: 18° 24"
Long: 103° 40

The heavy rain in Saravan province during 18-24 September, 2013 caused flood in to three district such as Vapi district, Khongsedone district and Saravan district around Xedone basin area. About 187 villages and 10,683 household affected by flooded. (Vientiane May newspaper dated 06 November 2013)
Suggestions

1. Lack of national policy and regulation of the application of space technology (especially Remote Sensing technology). The Assistance from the international organization is required.
2. Enhancement of National staffs capacity building.
3. Joint Project Research between SA Members/JAXA/ADRC/AIT: Flood, drought, wildfire monitoring and climate change by using satellite data;
RSC/NREI/MONRE: Future Work Plan 2014-2020
On Natural Resources and Disaster Monitoring using the Space Data.

1. Emergency Request by using ER form;
2. Flood Risk Mapping Bolikhamxay province, Lao PDR;
4. Research/Training/: (RS/GIS/GPS), on soil erosion in Saravan province and Luangnumtha province.
5. Fire Monitoring in Lao PDR.
7. RSC, NREI, MoNRE would like to continue support Sentinel Asia STEP3 and promotion related to the utilization on space for disaster reduction.
Thank you very much
For your kind attention!