The 5th Joint Project Team Meeting for Sentinel Asia STEP3 (JPTM2018)

(Draft Summary)

Venue: Howard Civil Service International House, Taipei, Taiwan

Number of Participants: 66

Agenda: Attached Appendix 1

[Day 1] 23rd January, 2018

Opening Session (9:00-9:15)

- **Welcome Remarks by NARL**
- **Remarks by JAXA**
- **Adoption of Agenda and Self-introduction of Participants**

➢ **Welcome Remarks by NARLabs Vice President Dr. Kuang-Chong Wu**

- We would like to express our appreciation to the Sentinel Asia committee, especially Japan, Thailand, India for the great supports we received for natural disasters suffered in Taiwan such as the earthquake in southern Taiwan in 2016.
- We joined the SA as DPN and DAN in 2010 and the activity involved in the steering committee started from 2015.
- Through joining SA, we could strength and contribute our capacity disaster management for the domestic and international affairs. The satellite images of Formosat series with Formosat-2 could help decision making by satellite disaster images including Tohoku earthquake and south Asia Tsunami in 2011.
- This year we have invited our partner Center for Space and Remote Sensing Research of National Central University here in Taiwan become DAN.
- We have 10 research centers in total focusing on 4 major areas including earth science disaster management, ICT, medical technology, science and technology policy. There are 5 directly related to Sentinel Asia. They are a national space foundation of NSPO; Taiwan Ocean Research Institute (TORI), Taiwan Typhoon and Flood Research Institute (TTFRI), National Center for Research on Earthquake Engineering (NCREE) and National Center for High-Performance Computing (NCHC).
- Formosat-5, Taiwan first business satellite will start operation soon and NSPO will contribute to Sentinel Asia with its high resolution images. TORI, TTFRI and NCREE have also implemented observation facilities, analysis and capabilities for Tsunami, Taiwan flood and Earthquake. NCHC has been providing information support in the integration of big data and any operation of cloud system.
- In the future, Taiwan wishes to join international communities such as Sentinel Asia to continuously contribute sustainable development.

Session 1: Status Report (9:30-11:30)

1.1 Overview of Sentinel Asia Status: JAXA

➢ Dr. Kawakita explained briefly about the current status of Sentinel Asia and Step 3. He also introduced other member's activities and new EOR system.

1.2 Introduction of New Members

- NDMI, MBRSC, EOS

1. National Disaster Management Research Institute (NDMI South Korea)

- NDMI's History
- Mission and Roles

- Organization Chart
- Disaster Situation Analysis Center
- Satellite Applications
- Historical Earthquakes over South Korea
- Future Plans

Q: EOS Singapore
About earthquake occurrence, it is curious about increasing earthquake.
Is it due to the intercity monitoring of south area? Is it real phenomena?
A: Yes

2. Mohammed Bin Rashid Space Centre (MBRSC UAE)
- Space Operations Management
- Long-term Earth Observation Program
- Added Value Products and Services

3. Earth Observatory of Singapore (EOS Singapore)
- EOS Mission
- New collaboration with JPL and Caltech – ARIA
  - ・Space based remote sensing in volcanology
  - ・Product Example
- EOS Vision

Q: ADB: You have a good interferometry analysis tool of SAR data for coastal monitoring. Is the tool (software) available to third parties (open to the public)?
A: Yes, the GIAnT (software) is the tool of SAR interferometry analysis. You can use it through internet.
C: JAXA: Your tech (automatic data analysis) is very nice and the automatic data analysis and producing the products are the goal of Sentinel Asia. We hope EOS will develop the tools and open them to support Sentinel Asia for future.
Q: IWMI: Your automatic data analysis system is very good. But I think that the data access is one of problem. Please give us your experience for data availability.
A: My understanding of your question is about latency. The data availability depends on satellite path. The repeat cycle of ALOS is 46 days. I am expecting JAXA to launch ALOS-3, ALOS-4 sustainably. One of other issues is data downloading.
If the data is acquired in the night like ALOS-2, the data downloading is not automatic. This is one of issues.
Q: ADPC: Is the source code for InSAR application for mapping published (open)? A: Yes. The processing tools of InSAR are GIAnT, ISCE. ISCE V. 2.1.0 incorporates spectrum-split ionosphere correction for ALOS stripmaps. This is not automatic processing but it is also published. The PyAPS is the atmospheric correction application which is embedded in GIAnT.

1.3 Overview of Emergency Observation: ADRC
- Trend of Emergency Observation Requests
  - ・Sentinel Asia and its Contributions
  - ・Member and Framework of Sentinel Asia
  - ・DAN and DPN
  - ・Concept of Sentinel Asia Step 3
  - ・Emergency Observation Request

C: AHA Center : AHA center will make a presentation tomorrow about Observation Timing in South Asia and How users can use.

1.4 Data Provider Node (DPN) Report

JAXA, VAST

1. JAXA

- ALOS-2 Observation Execution in 2017
- Disaster Occurrence in 2017
- Time taken for EO
- To shorten time for disaster response activities
- Next Sentinel Asia system

Q: EOS Singapore: Are these processed data published?
A: Yes.
Q: EOS Singapore: I think that the (original) data are uploaded onto the cloud server. Who can use and process the data.
A: The data are uploaded onto the server and DANs use and analyze the data.

2. VAST

- Sentinel Asia EOR Response of the Space Technology Institute
  - ・STI Organization
  - ・VNREDSat-1
  - ・Imaging Capability
  - ・VNREDSat-1 responses to SA EOR

1.5 JPTM2017 Report : VAST, Vietnam

- 4th Joint Project Team Meeting for Sentinel Asia Step 3 (JPTM2017)
  - ・JPTM2017 General Information
  - ・JPTM2017 Summary

1.6 Asia-Pacific Regional Space Agency Forum (APRSAF) - 24 Report : JAXA

- Major Results of APRSAF-24
- Key points recognized and shared during APRSAF-24
- Space Applications Working Group (SAWG)
- Discussion Items of SAWG
- Sentinel Asia Session
- Summary
- APRSAF-25

1.7 SA Related Documents Revision

- Terms of Reference (TOR) on the Joint Project Team for Sentinel Asia Step-3
- Terms of Reference (TOR) of the Sentinel Asia Steering Committee (SC)
- Sentinel Asia Emergency Observation Request (EOR) Form
- TORs will be uploaded on the SA Web site for members' review later.

<u>Session 2: Sentinel Asia Strategic Plan for the next 10 years (11:30-12:25)</u>

2.1 Report from SA Steering Committee: SC (Co-chair, Dr. Lal)

- Vision of SA: Sentinel Asia Evolution Plan (Recommendation of APRSAF-21)
- The establishment and the role of Steering Committee
- Steering Committee Meetings
  - ・Satellite Data Provisions and Systems
  - ・Value Added Product (VAP)
  - ・End User Enhancement

・Step-3 Activities (for covering entire DRR cycle)
・Communication, collaboration and cooperation
・Sentinel Asia Strategic Plan
・Current Status of The Plan
・Session 2: Sentinel Asia Strategic Plan for the next 10 Years

2.2 New Satellite Data Provision and System (JAXA)
- Revise EOR document
- Satellite Operation supporting Tool (including Web-EOR)
- Satellite Observation Scenario in Each type of disaster for EOR order desk and users
- Data Sharing System through Cloud Server
- Portal Web Site for Sharing Observations and Activities
- Web-GIS for Users
- Procedure of DPN and DAN (Revise), particularly to Realize Step-3 by New Frame

2.3 Value Added Product (R&D) (Yamaguchi University)
- Satellite Data Provisions and Systems
- Value Added Product (VAP)
- End-user Enhancement
- Step-3 Activities (Complete DRR cycle)
- Communication, Collaboration and Cooperation

2.4 End-User Enhancement (GIC-AIT)
- Goal
  ・to enhance the capacity of end-users for effective disaster response and relief activites
- Action Plan
  ・Assessment of User Needs and Requirements
  ・Empower Local Agencies by Providing user friendly Tools
  ・Increasing skills of DRR Agencies to the Use of VAP
  ・Capacity Building through e-Learning system
- Activities
  ・Providing DRR Agencies at Platform to Use VAPs
  ・Capacity Building through e-Leaning

2.5 Step-3 Activities (Complete DRR cycle) (NIED)
- Concept of Sentinel Asia Strategic Plan
- Five Pillar Components
- Step-3 Activities for covering entire DRR cycle
- Contribution, planned and expected
- Collaboration from others (partners, local agencies and etc.)
- What has been done and what comes next

2.6 Communication, Collaboration and Cooperation (ADRC)
- Sentinel Asia Strategic Plan for the next 10 years
  ・Sentinel Asia Action Plan 2017-2027
  ・Communication, Collaboration and Cooperation for the second decade of Sentinel Asia
  ・ADRC member countries
  ・Identifying potential DRR needs

<u>Session 3: Local Hosts' Special Session (13:15-14:45)</u>
3.1 Natural Disaster Prevention and Management - Taiwan Experience
- National Science and Technology Center for Disaster Reduction

- National Central University
- Academia Sinica
- National Taipei University
- Feng Chia University

- National Science and Technology Center for Disaster Reduction
- Disaster Risks in Taiwan
- Disaster Response in Taiwan
  - ・Central Emergency Operation Center
    How NCDR applies science and technology for disaster reduction and management

- National Central University
- Disaster/Hazard Monitoring in CSRSR
  - ・Disaster/hazard monitoring and data processing
    Domestic cases
    Foreign cases
    Disaster information service platform

- Academia Sinica
- Disaster Mitigation by Deeper Understanding Approach
  - ・Building Tsunami Early Warning System for Taiwan
    COMCOT Tunami Model
    iCOMCOT Cloud Computing Service at ASGC
  - ・How good can we simulate (predict) typhoon?
  - ・Deeper Understanding on Multi-Hazards

- National Taipei University
- Technology Innovations in Agricultural Risk Management
  - ・Steps in Agricultural Risk Management Progress
  - ・Technology Adapted in Agricultural Insurance Contract
  - ・Technologies & Tools
  - ・Advantages of Adapting Smart Technologies
  - ・Political Influence

- Feng Chia University
- Disaster Industry
- To introduce some experiences of disaster prevention scenario
- OGC Standard
- Introduction of Disaster Industry on web application

  Q: AIT: About Disaster management mechanism in Taiwan, business and government integrated.

  How to work together with government and related institutes (business and government integration)?

  Does the Government support projects?

  A: (It is scenario base.) It is not single source and single organization (integrated sources). The Government funded project is involved in 5-6 centers. In addition, we need personal resources and we ask several resources like Academia Sinica to join the project. Needs of Close expertise are growing not only in disaster area but also all areas.

  Q: AIT: How to coordinate and manage together to have for the society?

  A: Takes a time to manage these groups in one. We set up the group for disaster management 10 years ago and grew experts.

Session 4: WGs Activity & Member reports (15:00-17:00)

4.1 Water related disaster WG (ICHARM, IWMI)

- Global events on natural disasters
- Statistics on weather related insured losses
- IWMI's interventions and contribution to SA Water-related hazards WG
- Strengthening SA Water related hazard WG to promote Step3 Strategy

Tsunami WG (Tohoku Univ., MMAF)

The MMAF could not make a time to join the 5th JPTM due to emergency event.
Their presentation document will be uploaded onto the SA Website.

WildFire WG (JAXA)

- Wildfie monitoring system
- Available satellite sensors for wildfire monitoring
- Future Activity

Q: EOS Singapore: Is the GCOM-C data available to Sentinel Asia sooner or later?
A: GCOM-C is not of Sentinel Asia emergency data. It is open to users on JAXA website.
Q: EOS Singapore: When is the data of GCOM-C available?
A: In this year.
Q: EOS Singapore: Does GCOM-C make a constellation with Terra/Aqua (MODIS)?
A: I hope so.

4.2 Member Reports:

- 1. Myanmar Earthquake Committee
- 2. Ministry of Emergency Situation (Armenia)
- 3. LAPAN
- 4. MONRE (Vietnam)
- 5. JAXA

- 1. Myanmar Earthquake Committee

- Remote Sensing: Enormous Breakthrough for Active Fault Studies
  - ・Morphotectonic Map of Myanmar Region
  - ・shaded-relief map

- 2. Ministry of Emergency Situation (Armenia)

- Disaster Risk Reduction in Survey for Seismic Protection of MES
  - ・The disasters in Armenia
  - ・Disaster Response and Management
  - ・Laws and regulations
  - ・The Armenian SSP Task Force members
  - ・Seismic risk reduction Strategy
  - ・Seismic network in Armenia
  - ・Disaster Management Strategy based on the Hyogo Framework of Action (HFA) and Sendai Framework for DRR
  - ・Disaster Education and Human Resource Development

- 3. LAPAN

- LAPAN As JPT Member
- Remote Sensing Data Availability
- Disaster Emergency Response Products
- How to Distribute The Products
- Report on WINDS Antenna

Q: JAXA
SOP on disaster emergency response has been implemented.
Could you tell me how Sentinel Asia defines the SOP and if not, there will be possibility of Sentinel Asia feasibility included and get ready to include SOP.
How does LAPAN implement the international cooperation like Sentinel Asia to provide SOP in emergency case?
A: You can use our data and if there is no data, you have to make a request to Sentinel Asia or check the request of data through ADRC.
In addition, if there is no data, we are considering to use drone (UAV) for Emergency Response.
Aero Space Center is developing the usage of drone to observe the disaster area in emergency case.
We had 4 workshops for developing the mechanism of SOP for emergency response.
Q: AIT
About Internal Data Sharing System
Is there possibility to share the successful application of Indonesian products (value added products) for disaster mitigation response? If you have user community, can you help our community downloading the application?
A: Yes, LAPAN can support Sentinel Asia to download the application concerning such emergency response.

-4 MONRE /Vietnam

- Utilization of Space Technology on Disaster Risk Management in Vietnam
  - ・About Vietnam National Remote Sensing Department
  - ・Natural Disaster in Vietnam
  - ・Flood and storm control organizations in Vietnam
  - ・Use Satellite images for disaster management

-5 JAXA

- Activities of Domestic Disaster Response by ALOS-2 in JAXA
  - ・Introduction of Rapid Disaster Response using ALOS-2 to Japanese Government
  - ・Disaster response based on the framework of the collaboration with disaster prevention agencies in Japan under the agreement with the national governments such as cabinet office, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Geospatial Information Authority of Japan (GSI), Japan Meteorological Agency (JMA) and some local governments. Under this agreement, a government can request satellite emergency observation to JAXA and the data is quickly processed and delivered to the agencies.
  - ・Time Line of ALOS-2 Emergency Observation only for Disaster in Japan
  - ・Introduction of Agency Activity
    1) JMA
    2) GSI
    3) MLIT

[Day 2] 24th January, 2018

<u>Session 5: Sentinel Asia Step3 to Sendai Framework for DRR (9:00-9:20)</u>

5.1 Proposal on how to proceed Step 3 activities (SC member : Dr. Giriraj)

- Concept of Sentinel Asia Step 3
- Sendai Framework for Disaster Risk Reduction
- How SAS Step3 and Sendai Framework addresses the learnings?
  - ・Strategic focus
  - ・Proposal to strengthen SA Step3 implementation
  - ・Understanding disaster risk – National level

・SAS Step3 Theory of Change

Q: EOS Singapore: About capacity building
Is it possible to come up with DAN showing volcano accident first stage and how many members through DAN have particularly feedback? We can get the data easily on the second and third phases. How many members do outreach activities to share?
A: I think it is unable to come to a solution because we don't know each country working activities in the standard of Sendai Framework. JPT members have own activities for disaster management and members can join and make alignment with Sendai Framework members in the Step 3.
C: ADRC: Many questions and answers about the activities. ADRC is a good channel and Sendai Framework meeting is a good opportunity to share and exchange the opinion with members.
C: ADPC: UNSCAP had activities of a similar survey for the member status about what they have capacity. I think Sentinel Asia can use these information as a reference. That is useful I think.
C: Giriaja: They are doing different kind of survey and it is important for JPTM to get feedbacks from them.
C: JAXA: JPTM meeting is sharing your report with Sentinel Asia all members and then ask members to answer the questionnaires. Their answers are very important for the next step.
C: AIT: We have many projects such as ADPC funded project.
We need to get and put local data and regional data into the platform because Sentinel Asia does not always cover all areas. We should put these information together in Sentinel Asia site because we have many researchers and industries in the Step 3 meeting.
C: We can have different surveys but we can do risk management by ourselves with space technology. Then maybe we need to have a limited adjusting of changing the survey form from many ways and circulate the information between the community and come up with the new source.

Session 6: Project Management (IP sec4.1) (9:20-10:05)

6.1 Primary Data Analysis Node (P-DAN)/DAN Report

- GIC/AIT P-DAN
- UT, Japan, P-DAN
- Yamaguchi Univ. VAP leader

- GIC/AIT P-DAN

- Summary of AIT P-DAN activities in 2017
- Lesson learned about our approaches for improving the use of SA VAPs
  - ・Activations
  - ・Data collection
    - Satellite image
    - Other GIS data
  - ・VAPs creation
  - ・VAPs sharing and usage at local level

Data Sharing, Security (Important)
Q: EOS Singapore: Do you a plan to share the results and publications on the web GIS?
A: JAXA: Yes, we will share the information with all Sentinel Asia members.
Web GIS on line is very helpful for members to understand the result. We are now developing this service and we want to receive the comments and advise from members about the Web GIS service.
Q: EOS Singapore: Can users download the data to use for their purpose?
A: AIT: The original data cannot always be permitted to use. It depends on the original data.

C: ADPC: We have an experience of Web GIS in Myanmar and can share our knowledge with Sentinel Asia.
C: JAXA: Thank you and we would like to collaborate with ADPC.
C: AIT: We are developing the Web GIS and will hold the workshop in Vietnam. I can discuss with you about this matter.

- UT, Japan, P-DAN

- Solutions
  - ・Global Very High-Res. Satellite Data Resources for Volunteer-based Mappings
  - ・Deep Learning for Building Detection from Very High-Res. Satellite Images
  - ・Open Data of Building Maps using Global Satellite Resources and Deep Leaning
  - ・Overview of Experimental System Development
  - ・Small-scale satellite constellations – A vision of global snapshots every day
  - ・Historical archives for better preparedness
  - ・Remained issues/problems

Q: EOS Singapore: How many trainings do you need for Myanmar, Yangon case?
How long does it take to finish the training sets?
A: For the human individually to make applications, it took mostly for 1 tile 1 day.
Because it needs very details for interpretation.
We have data processing management issue. There is some limitation of the data availability.
When we make a training of multiple areas, there is the case the data is not available to the other area.
Q: In that case, do you use same satellite data or similar other satellite data in your training?
A: We use similar satellite data. We make True color composite for example to use in the training. Then if we can get almost same result as the original, we will use it.

- Yamaguchi Univ. VAP leader

- Remote Sensing Analysis Instructions for Disasters
- Free software and operation system
- Examples of value added products

<u>Session 7: Mitigation and Preparation (IP sec4.2) (10:20-11:20)</u>

7.1 Sentinel Asia Success Story Project: PHIVOLCS – cancelled

ADB Disaster Project (ADB）
ADPC's contribution to SA (ADPC）
AHA Cnetre's contribution to SA (AHA Centre）

ADB Disaster Project (ADB）

- Applying Space-based Technology and ICT to Strengthen Disaster Resilience
  - ・ADB AT A GLANCE
  - ・APPLYING SPACE-BASED TECHNOLOGY TO STRENGTHEN DISASTER RESILIENCE
  - ・CONNECTING SENTINEL ASIA TO NATIONAL DRM SYSTEM IN PHILIPPINES

ADPC's contribution to SA (ADPC）

- Space-based applications to support sustainable solutions for risk reduction and risk management
  - ・Flood Mapping Tool for Effective DRM
  - ・Exposure Database for Better Response and Preparedness
  - ・InSAR Application for land subsidence mapping/monitoring

Q: AIT: Can you mark the height of flooding?
A: Yes, person in local did.
Q: EOS Singapore: Did you get the fund of Government or UN for the pilot project?
A: Fund from Government
C: AIT: This is appealing to Sentinel Asia. I think Sentinel Asia is looking for the information of local agencies and in Sendai Framework. The local agencies are required to join the framework and I think this information is good to develop the Web GIS system.
C: AIT: SA can obtain/get various information from many agencies, countries and put these information in order in the web site and then I think Sentinel Asia will be able to make a good Web GIS system.

AHA Cnetre's contribution to SA (AHA Centre）

- Space-based information utilization for Preparedness and Emergency Response in ASEAN
  - ・AHA Centre Information Products Flow
  - ・ASEAN Emergency Response & Assessment Team (ERAT)
  - ・Joint Operations and Coordination Centre of ASEAN (JOCCA)
  - ・Web-based Emergency Operations Center
  - ・Disaster Emergency Logistic System for ASEAN (DELSA)
  - ・ASEAN Joint Disaster Response Plan (AJDRP)
  - ・AHA Centre Executive (ACE)
  - ・Updates on and Outlook for AHA Centre and ASEAN disaster management regional mechanism with Sentinel Asia
  - ・ASEAN Risk Monitor & Disaster Management Review Report (ARMOR)

C: JAXA: SA wants to know how users utilize these data. SA wants to share your experience with our member and it is convenient for users to know the data analysis.
A: AHA wants to receive the data information from Sentinel Asia members. We process the data to metadata and it helps us our emergency response.

Session 8: Emergency Response (IP sec4.3) (11:20-12:00)

8.1 Emergency Observation and Response Procedure; ADRC

- Purpose of EOR
- Our role in Sentinel Asia
- EOR procedures
- Current EOR Form
- SA Web-site
- New EOR Form (Plan)
- Data Sharing on SA Website

8.2 Enforcement of DAN's activity

- OPTEMIS Training: GISTDA

- Emergency Observation Constellation Planning Platform
- Strategic and Operation Aerospace Research (SOAR)
- OPTEMIS (Operation Planning Tool for Earth-observation Mission)
  - ・Earth-Observation Satellite Operation
  - ・Emergency Observation Flow
  - ・Data Provision – Online Services Framework
  - ・SA Procedures and Modules
  - ・Overview Emergency Request Platform
  - ・Emerging Space Countries
  - ・Emergency Request User’s Interface
  - ・DPN Dashboard

・Workflow

Q: EOS Singapore: Is it possible to accept the request of polygon to OPTEMIS for future?
A: GISTDA: We will develop the system in near future to receive the request in AOI polygon from DPN through ADRC.
Q: ADPC: How about the rink to Web GIS?
A: Depending on the format of the Sentinel Asia product and ask us to link it to our system. It could be in index system of our information.
Q: ADPC: About Disaster Index. Is it possible to save not only the information but also path, data and AoI of research assessments for Sentinel Asia members?
A: You can save all histories in the Shopping cart.
JAXA: all data provided are kept in cloud system. You can use all data from the cloud server.
C: IWMI : To make sure the sustainability of OPTEMIS development and operation, set up a kind of framework, such as MOU, between GISTDA and JAXA is suggested. Otherwise, the SA's continuous operation is not ensured.

JAXA: We welcome the GISTDA sustainability of contribution to Sentinel Asia community and JAXA would like to sign as the secretariat of Sentinel Asia the MOU (agreement) between Sentinel Asia and GISTDA as a second area coordinator in the second step but we need acceptance of members for the MOU.

All participating members agreed this proposal and the MOU will be set up between JAXA and GSTDA later.

Session 9: Summary and Closing (12:00-12:15)

9.1 Summary of JPTM 2018

Mr. Ito of SA Secretariat summarized the JPTM2018. All presentation documents will be uploaded onto the Sentinel Asia website.

9.2 Next host organization

Next JPTM will be held on the occasion of ACDR which will be held in Awaji Island, Hyogo, Japan.

9.3 Closing Remarks by NARL

Dr. Ming-Chih Cheng of NARL thanked participants for their contribution to the JPTM2018 and closed the meeting.