

Ministry of agriculture and rural development
DIRECTORATE OF WATER RESOURCES

Disaster Management Center

APPLYING SPACE TECHNOLOGY FOR DISASTER MANAGEMENT IN VIETNAM



Hanoi, Mar 8th 2017

Content



Introduction



The initial result



Discussion and
Recommendation



INTRODUCTION

1. DMC had been established in 2010 by Prime Minister of Ministry of Agriculture and Rural Development (MARD).
2. DMC is under Water Resource Directorate (WRD) - MARD
 - At the Decision No.03/2010/QD-TTg dated 25/1/2010 of the Prime Minister.
 - At the Decision No.66/2014/ND-CP dated 04/7/2014 of the Prime Minister.
3. Jan 09th 2015, DMC have new function and duty at Decision no 16/QD – TCTL. The main function is technical supporting for WRD and Center Committee for Nature Disaster Prevention and Control (CCNDPC) for disaster management.

Law and strategy

1. Law on natural disaster prevention and control (May 2014).
2. National strategy for natural disaster prevention, response and mitigation to 2020.
3. Strategic research and application of space technology in 2020 approved in Decision 137 / QD-TTg 06/14/2006 Prime Minister.
4. Program on "Community Base Disaster Risk Management" according to Decision No.1002/QD-TTg dated 13/07/2009.



Organization structure



Mission

1. National Program on "Awareness raising and Community Base Disaster Risk Management" according to Decision No.1002/QD-TTg dated 13/07/2009.
2. Developing technical partnership for disaster risk management.
3. Technical supporting for Water Resources Directorate , CCNDPC on disaster management activities: technology, communication, space technology, decision support system...

Actions

1. Organization the 5 years plan for CBDRM in Vietnam and implementation the action as: Training, communication, building database, Monitoring and Evaluation the status,...
2. Implementation and support the Vietnam's pledge in Hyogo Framework, APEC, ASEAN, Sendai framework... Improve the cooperation with UNDP, USAID, ADRC, PDC, UNISDR...
3. Research and proposal the new technology, early warning,... to support for WRD, CCNDPC as: Developing Decision Support System (DSS) based on VINAWARE, Reservoir monitoring system, Web GIS Map on all structural measures for DRR, Drr project portal, quick assessment maps to response when disaster occur...

Activities in applying space technology in Vietnam

- **2013:** ○ **UN-SPIDER** Technical Advisory Mission to Vietnam (March 2013)
- **2014:** ○ **UNSPIDER** and **GITA'** technical Advisory Group to Vietnam (September 2014)
○ JAXA & Disaster Charter: 1st Request / activation: Collected Data, products from Sentinel Asia, Disaster Charter, Vietnamese DANs, AIT, Tokyo University
○ **JAXA&AIT** (GIC) in mini project activities (2014)
○ **DMC** Collaborated **STI** for processing, mapping, survey and report (BIG Flooding 2014, Quang Ninh province)
- **2015:** ○ **Sign MOU between JAXA, WRD, VAST** (September 2015); Building Implementation plans for 3 years of MOU
○ **JAXA&AIT** (GIC) in mini project activities (2015)
- **2016** ○ **2nd : Request / activation SA: DMC** Collaborated **STI** for processing, mapping, survey and report (BIG DROUGHT 2015-2016, Central Highland of Viet Nam)
○ **3rd: Request / activation SA: DMC** Collaborated **STI** for processing, mapping, survey and report (BIG DROUGHT 10-11/2016, Central Coastal province of Viet Nam)
- **Present & further** ○ **4th: Request/ activation SA:** for two flood event in October & November, 2016 in the central area of Vietnam.
○ Cooperation to organization the 10 years anniversary workshop and the 4th JPTM meeting in Hanoi (2017)

UN-SPIDER Technical Advisory Mission to Vietnam – Mar 2013



Memorandum of Understanding signing ceremony – Sep 2015

(WRD) – (MARD) & (VAST) & (JAXA)

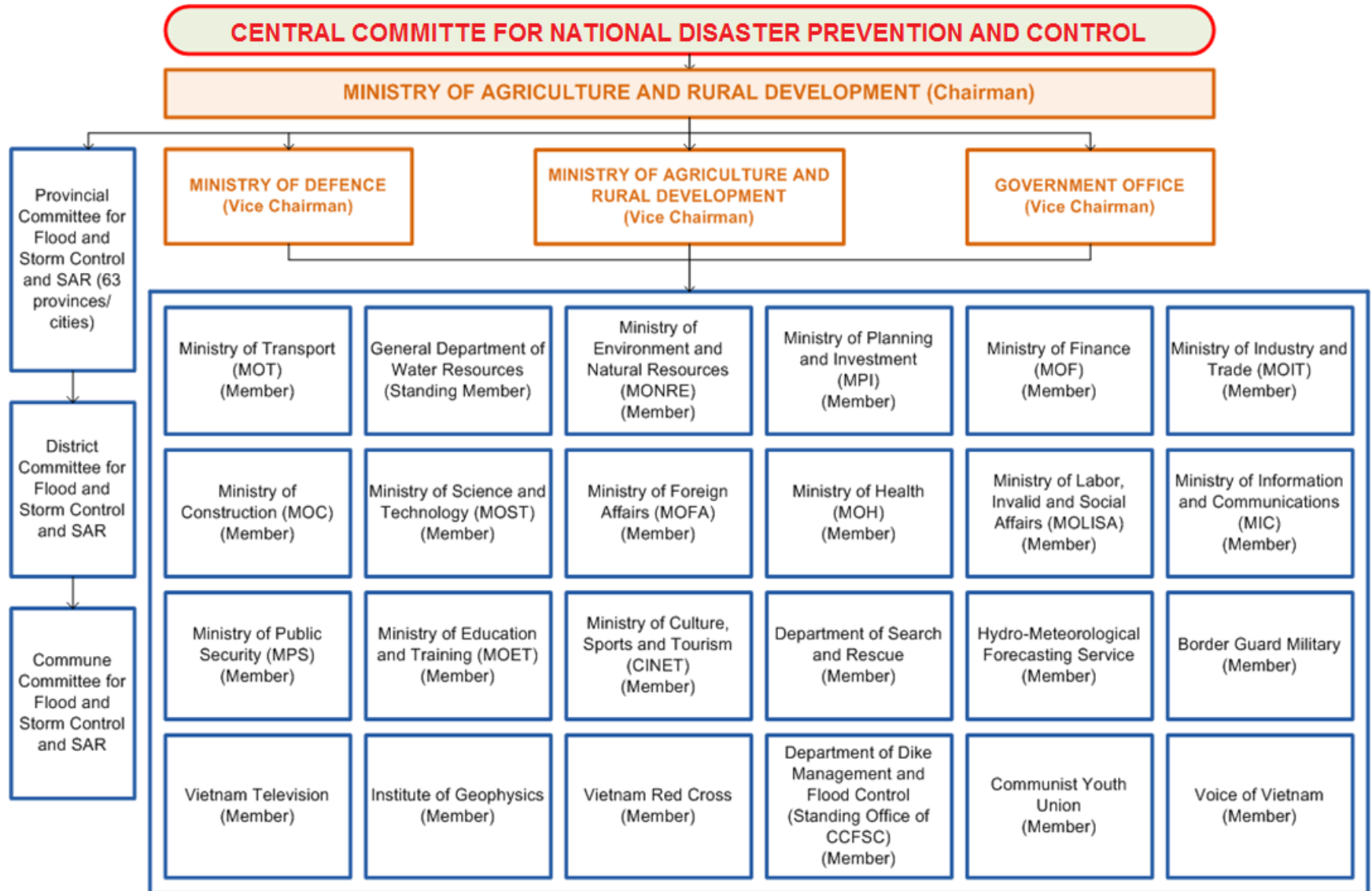
The Parties cooperate and make efforts on the following activities;

- Development of a database system by past satellite imageries of Vietnam for disaster prevention.
- Exchange of satellite data when disaster happens. *(JAXA will provide satellite data owned by JAXA, such as, including but not limited to, ALOS-2 data for WRD and/or VAST upon request of WRD and/or VAST through Sentinel Asia. VAST will provide satellite data owned by VAST, such as, including but not limited to, VNREDSat, for Sentinel Asia Step 3 Activities..)*
- Strengthening the capacity of application of remote sensing and GIS technology for disaster prevention in Vietnam.
- Development of programs and projects on application of remote sensing and GIS technologies for disaster prevention.

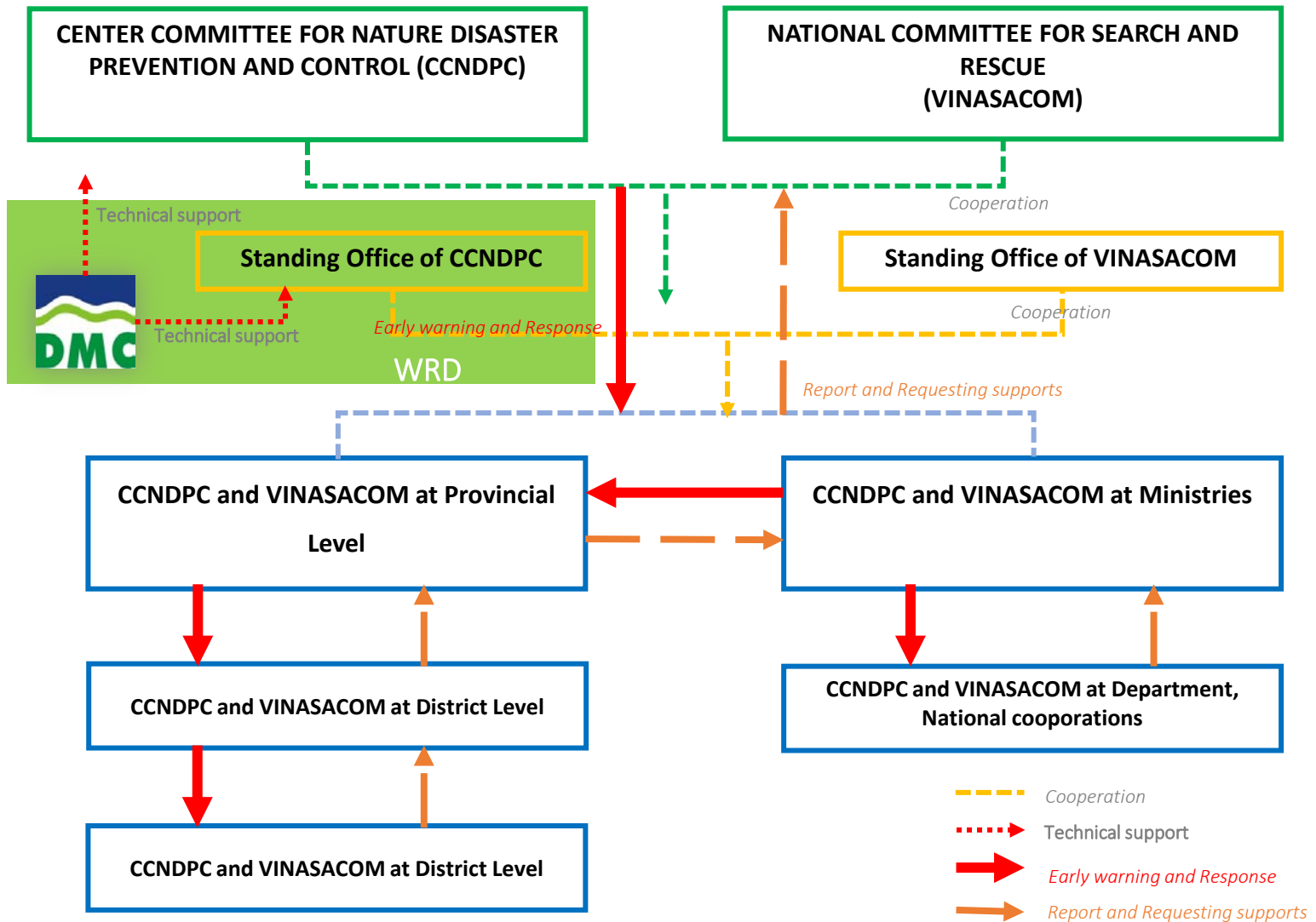


According to the MoU, DMC will be the focal point of WRD in this activities and STI will be the focal point of VAST.

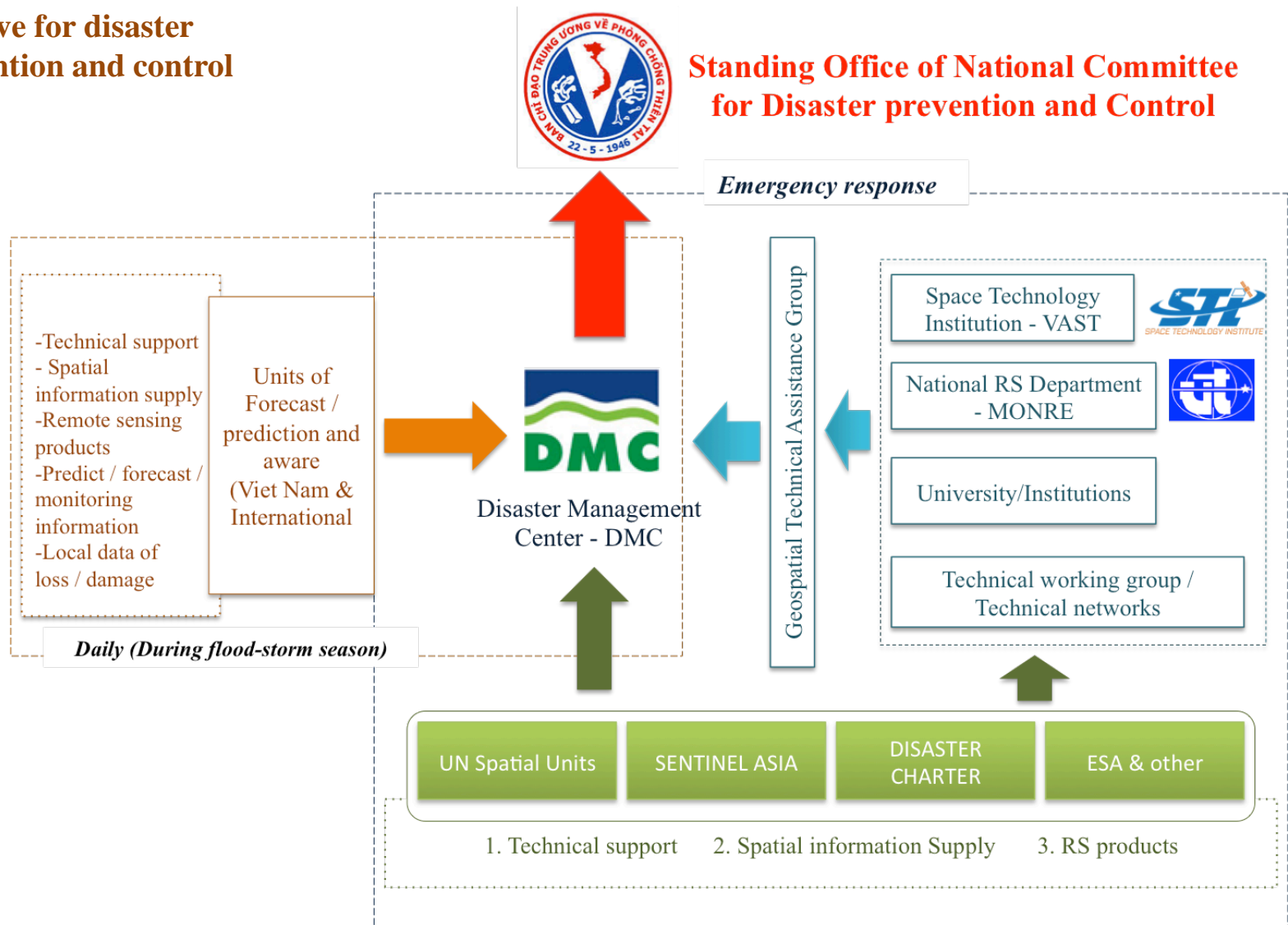
Disaster management structure



DMC role in Disaster management systems



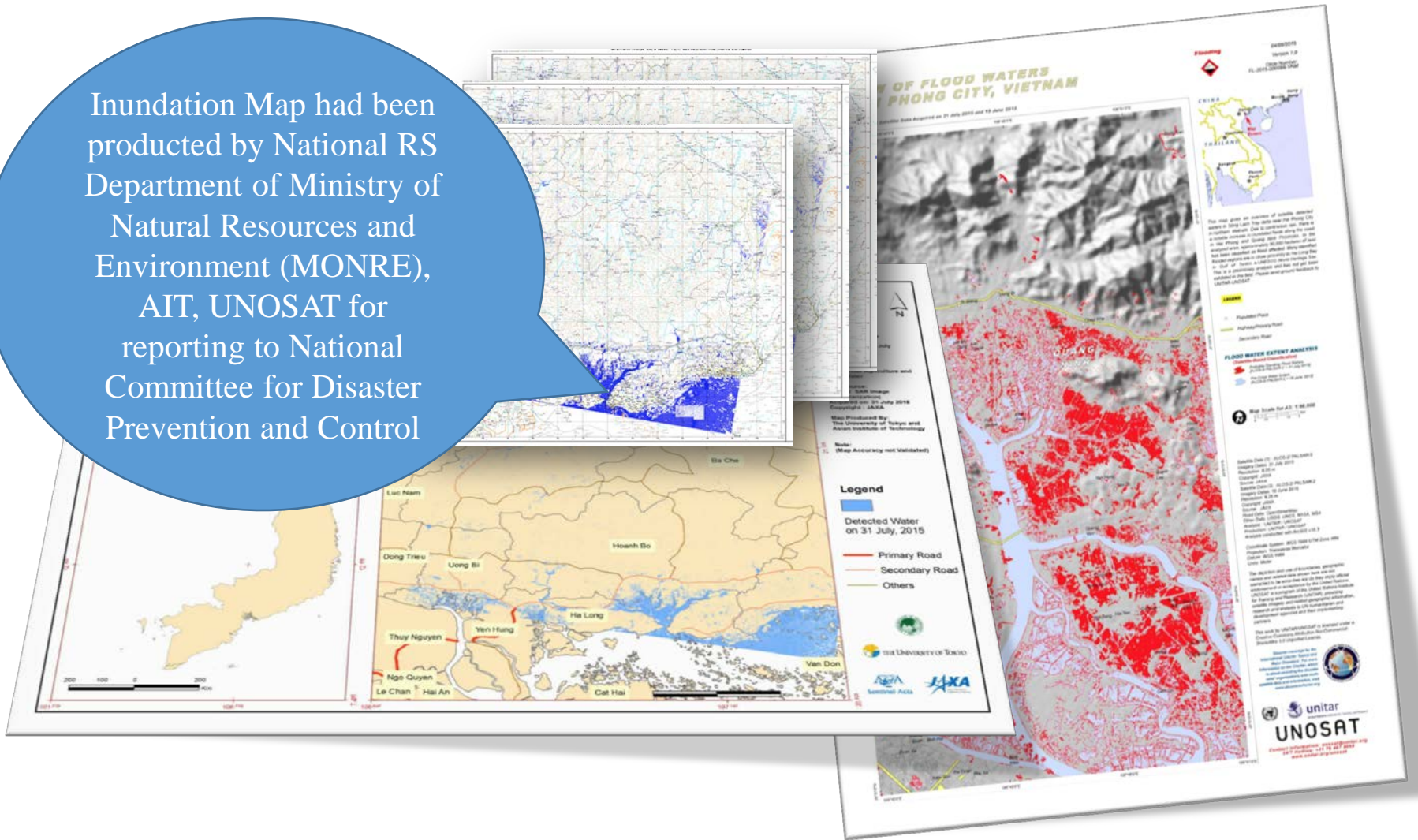
The structure for receipt RS and GIS to serve for disaster prevention and control



THE INNITIAL RESULT

- Emergency response for Flood disaster on 2015

Inundation Map had been produced by National RS Department of Ministry of Natural Resources and Environment (MONRE), AIT, UNOSAT for reporting to National Committee for Disaster Prevention and Control







THE INNITIAL RESULT

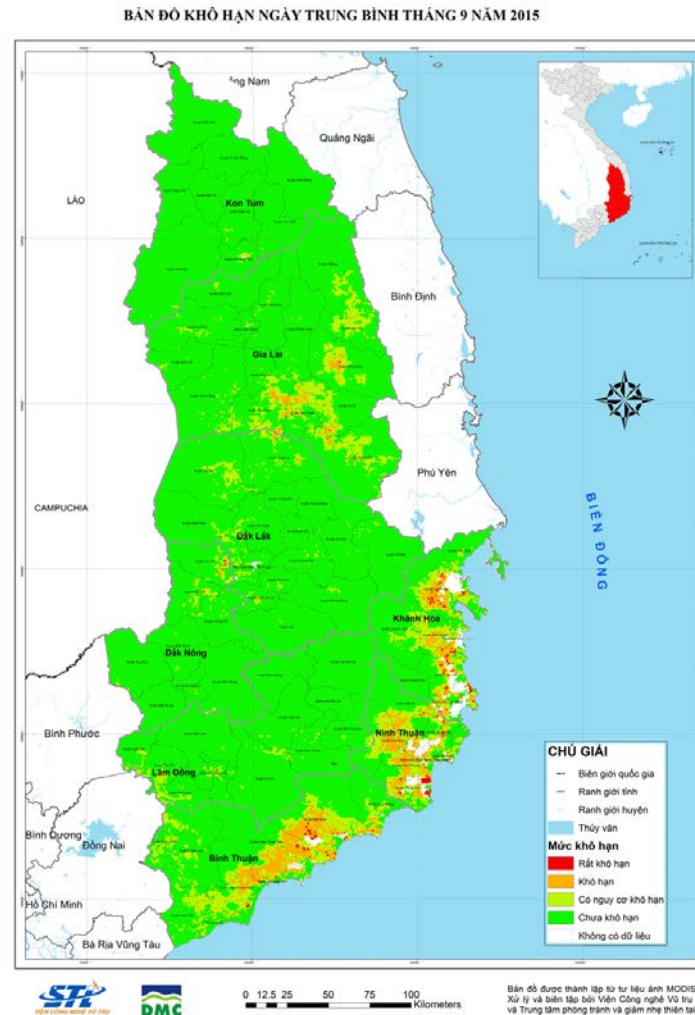
- Response for drought disaster on 2016

Results

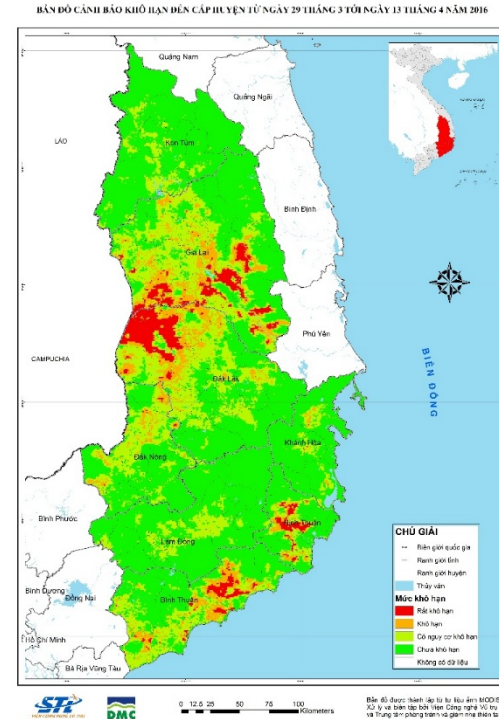
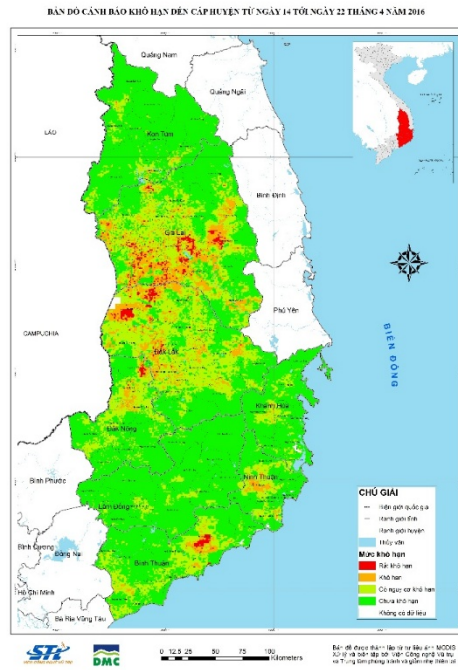
MODIS satellite

(adapted from Mauro E. Holzman và Raúl E. Rivas, 2015)

Mức độ cảnh báo khô hạn	Ngưỡng giá trị TVDI	Thang màu cảnh báo
Rất khô hạn	0,7 – 1	
Khô hạn	0,55 – 0,7	
Có nguy cơ khô hạn	0,4 – 0,55	
Chưa khô hạn	< 0,4	



Drought map of Highland area and South Central area on 2015.



STI and DMC cooperation to produced the drought map for 5 provinces in Highland area and Ninh Thuan, Binh Thuan, Binh Dinh provinces.

Trung tâm Phòng tránh và Giảm nhẹ thiên tai – Disaster Management Center

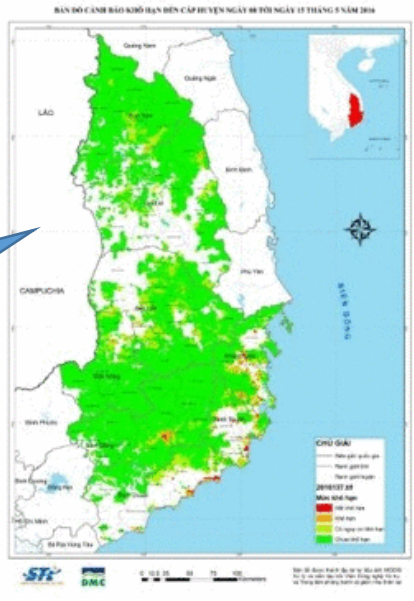


Drought map of Highland area and South Central area on 2015.

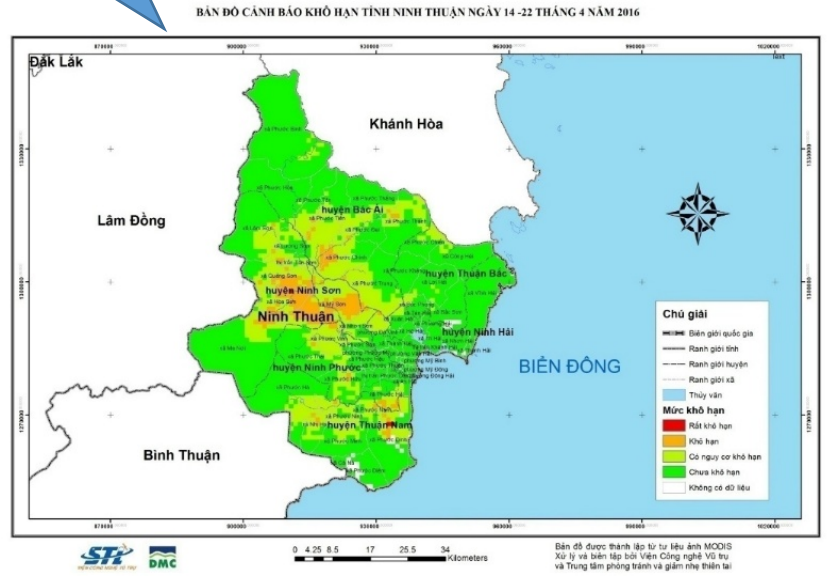
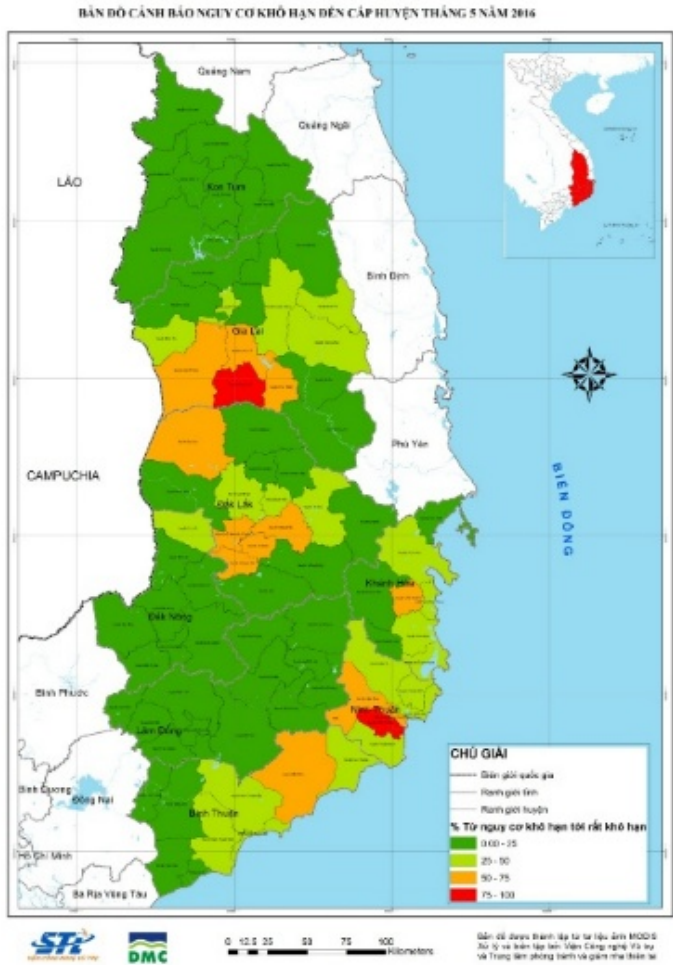
Drought on May and June, 2016

Province scale

District scale



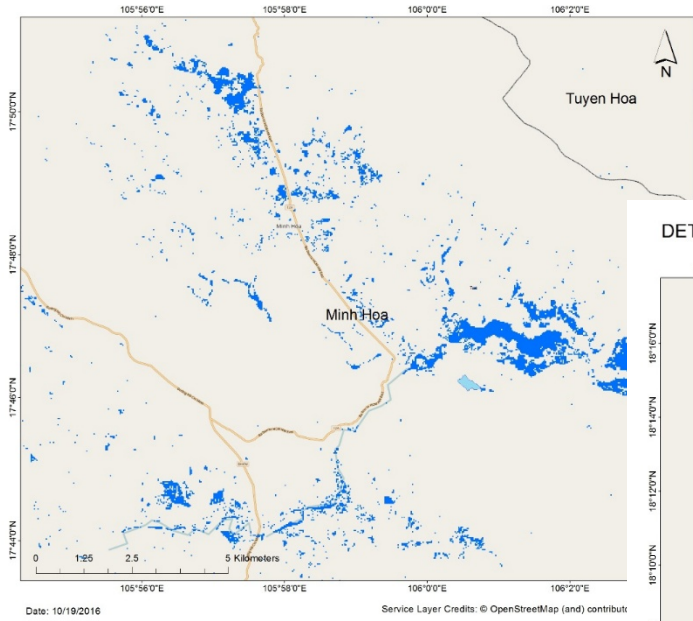
Drought risk maps (5 levels)



THE INNITIAL RESULT

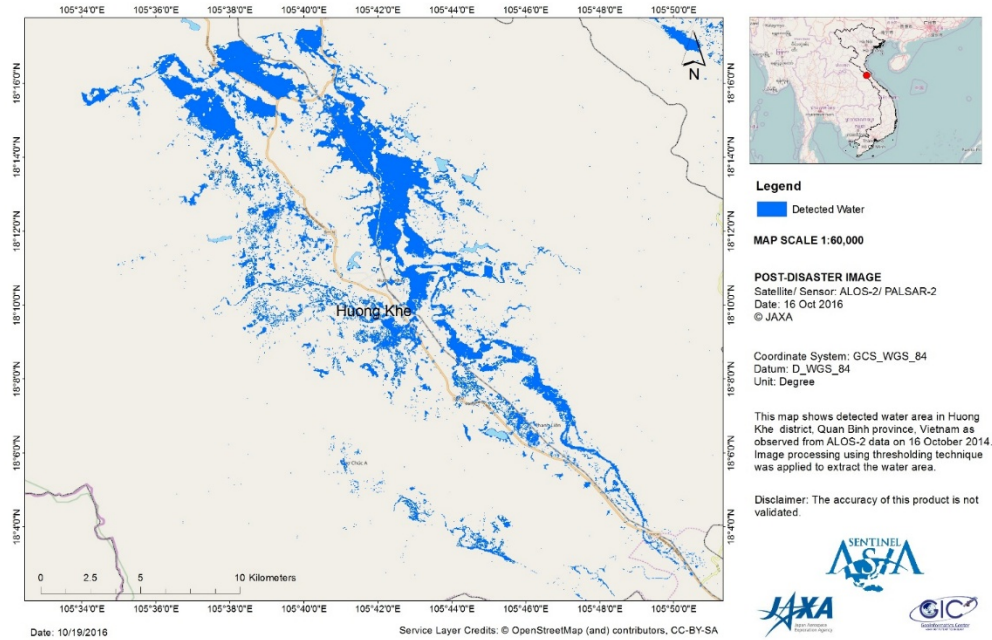
- Emergency response for Flood disaster on 2016

DETECTED WATER IN MINH HOA DISTRICT, QUAN BINH PROVINCE, VIETNAM (16 OCT 2016)



October 2016 DMC & STI requested Sentinel Asia AIT processed

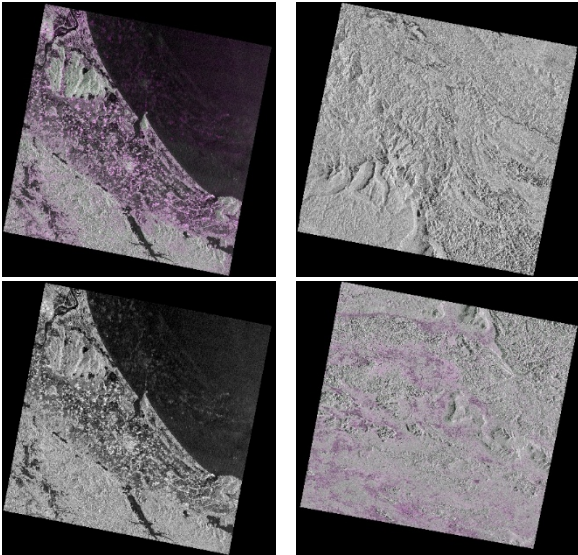
DETECTED WATER IN HUONG KHE DISTRICT, HA TINH PROVINCE, VIETNAM (16 OCT 2016)



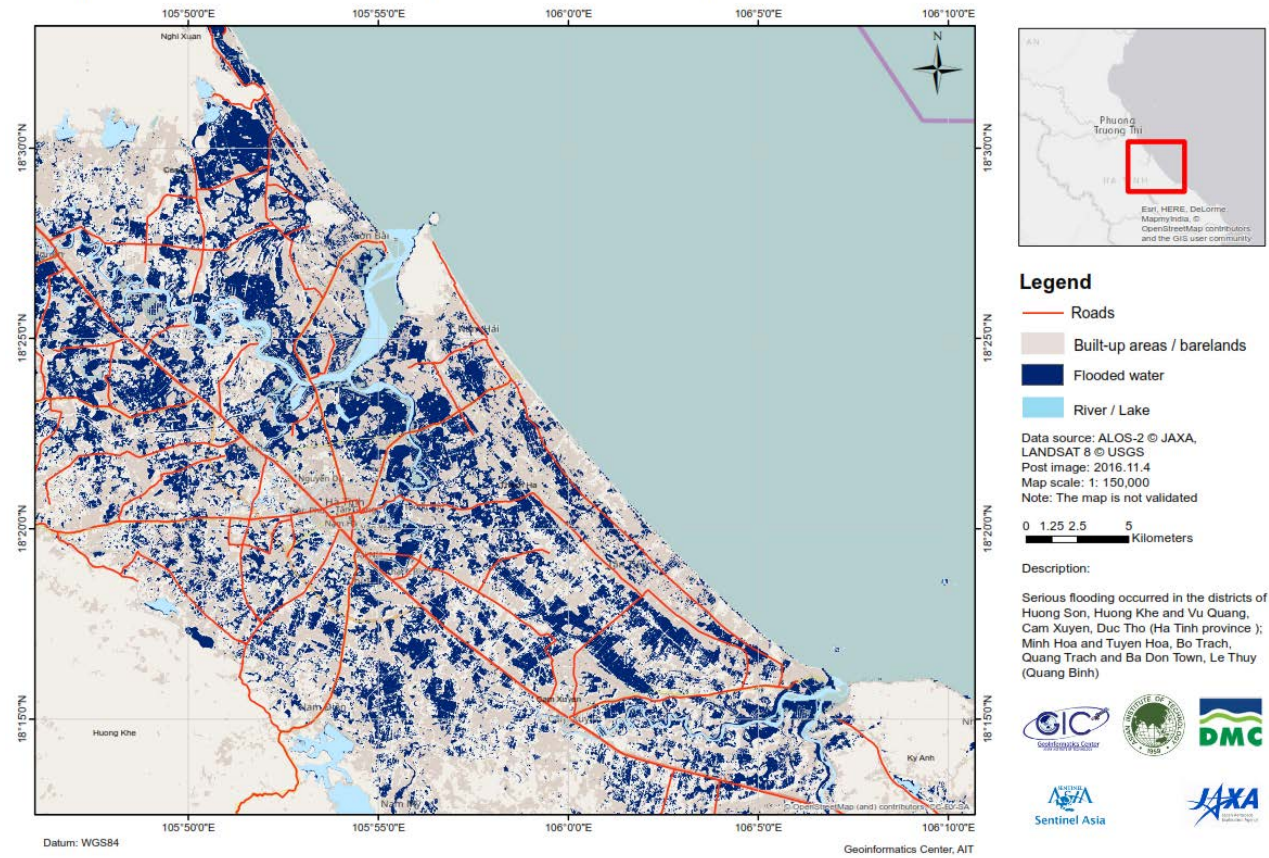
November 2016

DMC & STI requested Sentinel Asia

AIT processed



Map 1.1 : Existing Water Detected by ALOS-2/PALSAR-2 Images observed on 04/11/16 in Central of Vietnam



DISCUSSION AND RECOMMENDATIONS



Advantage and disadvantage

Advantage

- MARD and WRD would like to improve the applying of space technology in DRR
- Coordinate opportunity and connection are developing which is advantage for satellite images distribution.
- The strengthen capacity for technical and official staff who working in disaster management
- DMC had been connected to Sentinel Asia and International Charter system
- DMC had technical officer with the knowledge about DRR system and Remote Sensing and GIS
- Strongly supports from STI, AIT, Sentinel Asia; and UNspider

Disadvantage

- There are still have no SOP for applying space technology in DRR, especial in emergency response
- There are no infrastructure of applying space technology in DRR, including database and official agency
- Still have no pilot project , SOP for using space information in disaster management
- The officer need more technical training for space technology, advanced technique
- The information infrastructure for processing and storage database would be improve
- Need building the database that include base map and other geographical maps

GAPs

- ❑ Currently, there are no legal mechanism between national technical organizations which jointed DANs, NODE on technical cooperation, raw data and products sharing.
- ❑ Technical Working Groups are in the beginning but still have not been official and regulations. It also have no SOP and clear responsibilities for each participate site.
- ❑ There are have no annual budget for this kind of activities.
- ❑ The importal role of forcasting disasterdamage areas.



RECOMMENDATION

- Sharing the raw data and secondary data, original satellite images and products, so other organizations could increase processing and faster sharing.
- Research on building the cooperation mechanism, portal library to quick sharing product, raw data between Vietnam technical organization belong to DANs, PDANs, Node...
- Building Geospatial partnership through pilot project, cooperation project...

