UN / India Workshop on the Use of EO Data for Disaster Management and Risk Reduction: Asian Experience

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International Cooperation in Laos through Synergy in Space

by
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Outlines

1. Lao Scenario
2. Major Disaster in 2015
3. International Cooperation
4. Way Forward

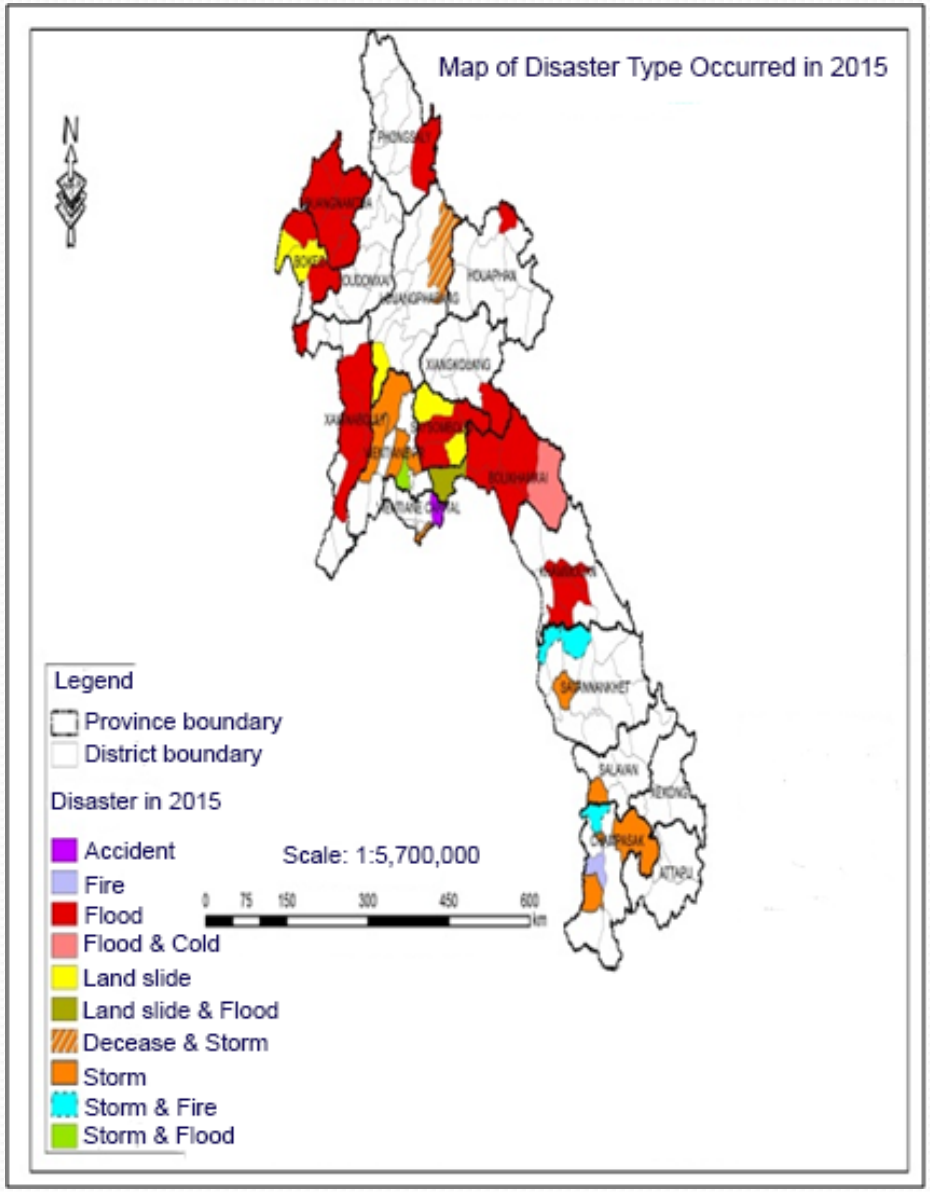
Lao Scenario

- Lao is one of the disaster prone country in the region. It has been increasingly affected by natural hazards such as floods, droughts, and storms. These often trigger secondary hazards such as landslides, forest fires, insect infestations. outbreaks of animal diseases, droughts, under the threat of earthquake and man-made hazards with specific degree of severity. Each year, it caused severe damages and losses of lives, livelihoods and infrastructure. These hazards are likely to increase in frequency and intensity. This creates an additional challenge for reaching the 8th National Strategic Development Plan (NSDP) 2016-2020, the National Socio-Economic Development Plan (NSEDP) 2016-2025 and the National Vision 2030 and the Sustainable Development Goals.

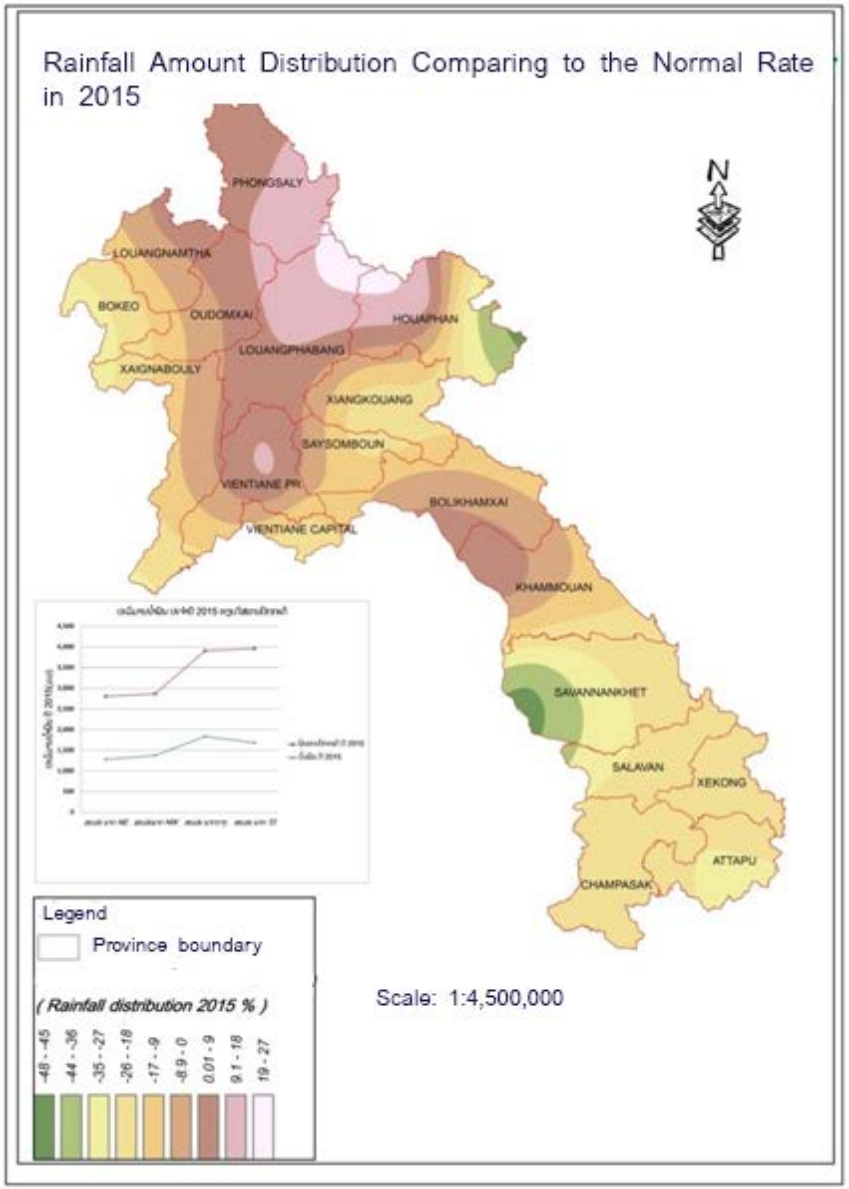
Lao Scenario (Cont'd)

- The country is also vulnerable to Climate Change which affected for livelihood and food security. Climate change may also intensify the severity of Snow and Hail.
- Lao is one of the countries frequently affected by river floods and drought. It is estimated that the south and central regions, where about two thirds of the country's population live, face on an average of 1.5 serious floods or droughts every year.

Map of Disaster Occurred in 2015



Rainfall Distribution comparing to an average rate in 2015



Flood occurred in 15 Provinces in 2015

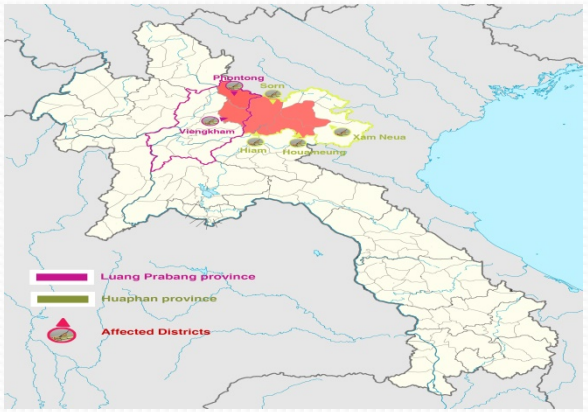


Nan District, Luangprabang Province



Borikhamxay Province

Insect Infestation in the North Region



Grasshopper in Luangprabang and Houaphanh Province

Damage: It affected 8 Districts, 51 Villages, 2,609 households, 15,065 people, 2,957 ha. of productivity area, 168 ha of rice area, 458 ha of corn area.

Snow and Hail in the North and the South

Ban Paksong, Champasack

Ban Houahieng, Huaphanh

Ban Hongkham, Huaphanh

Phongsaly Province

International Cooperation

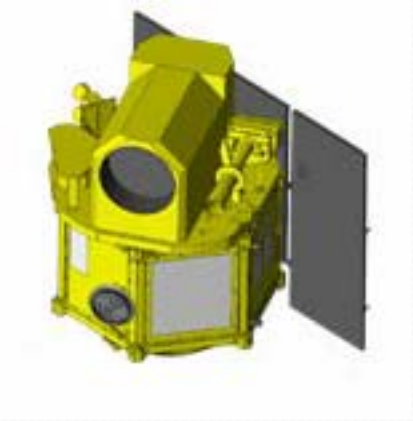
- GISTDA on Youth Capacity Building and Using Map from THEOS to monitor Agriculture Productions and Tourist Service.
- ASEAN-Sub Committee on Space Technology Application (SCOSA).
- Group on Earth Observations–GEO, GEOSS.
- UNOOSA, UN-ESCAP, JAXA/AIT.
- Asia Pacific Regional Space Agency Forum (APRSAF).
- Committee on Earth Observation Satellite–CEOS
- NARIT on Astronomy Activities.
- BELS (Building European Links Towards South East Asia) on GNSS Technology

Evaluation of Rice Plantation and Crop Volume Productivity Using Map from THEOS (GISTDA).

- Site survey started from February – August 2015 in 5 provinces (Luangprabang, Vientiane, Vientiane Capital, Saravan and Savannakhet) from day of rice plantation.
- Results of crop volume productivity splitting up by day in 5 provinces (Luangprabang, Vientiane, Vientiane Capital, Saravan and Savannakhet) and collected from October 2015 – January 2016.
- Satellite Map on route and road survey.
- The results of rice assessment were submitted to the Minister of Science and Technology as a member of the government.

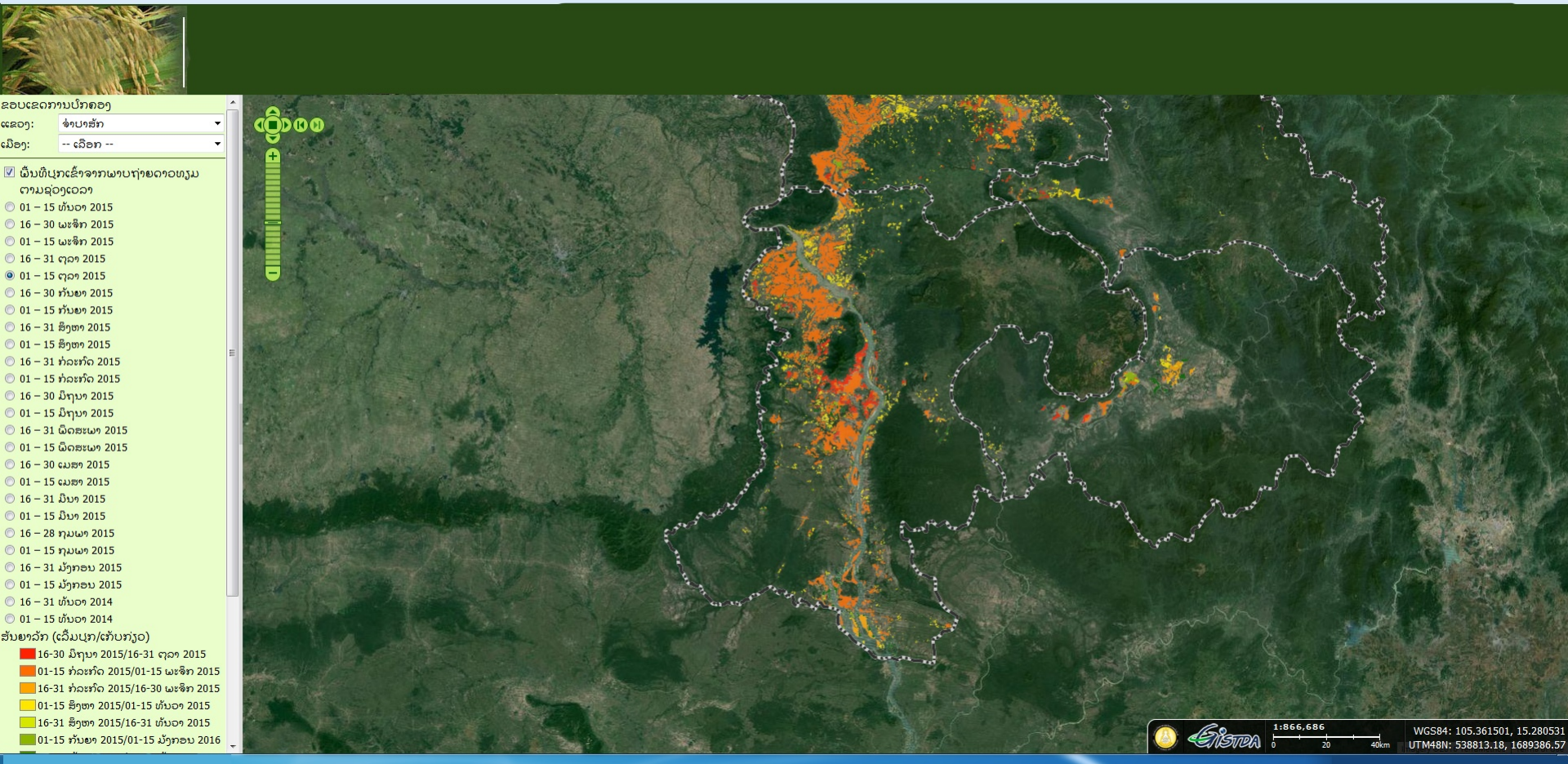
Thai Earth Observation System (THEOS) Characteristic

Characteristic	Value
Nominal altitude	822 km
Inclination	98.7^0
Orbit full cycle	26 days
Weight	715 kg
Dimension	2.1 m x 2.1.m x 2 .4m
Power and capacity	840 watts, 75 AP/h
Life	>5 years
Data compression	2.80 or 3.75 for PAN system
Transmitted image data rate	120 MGB/second (X-band)
Capability of camera inclination	$+/-30^0$ for quality of data $+/-50^0$ for speed access to data
Localization	300 m RMS
Accessiibility	Global



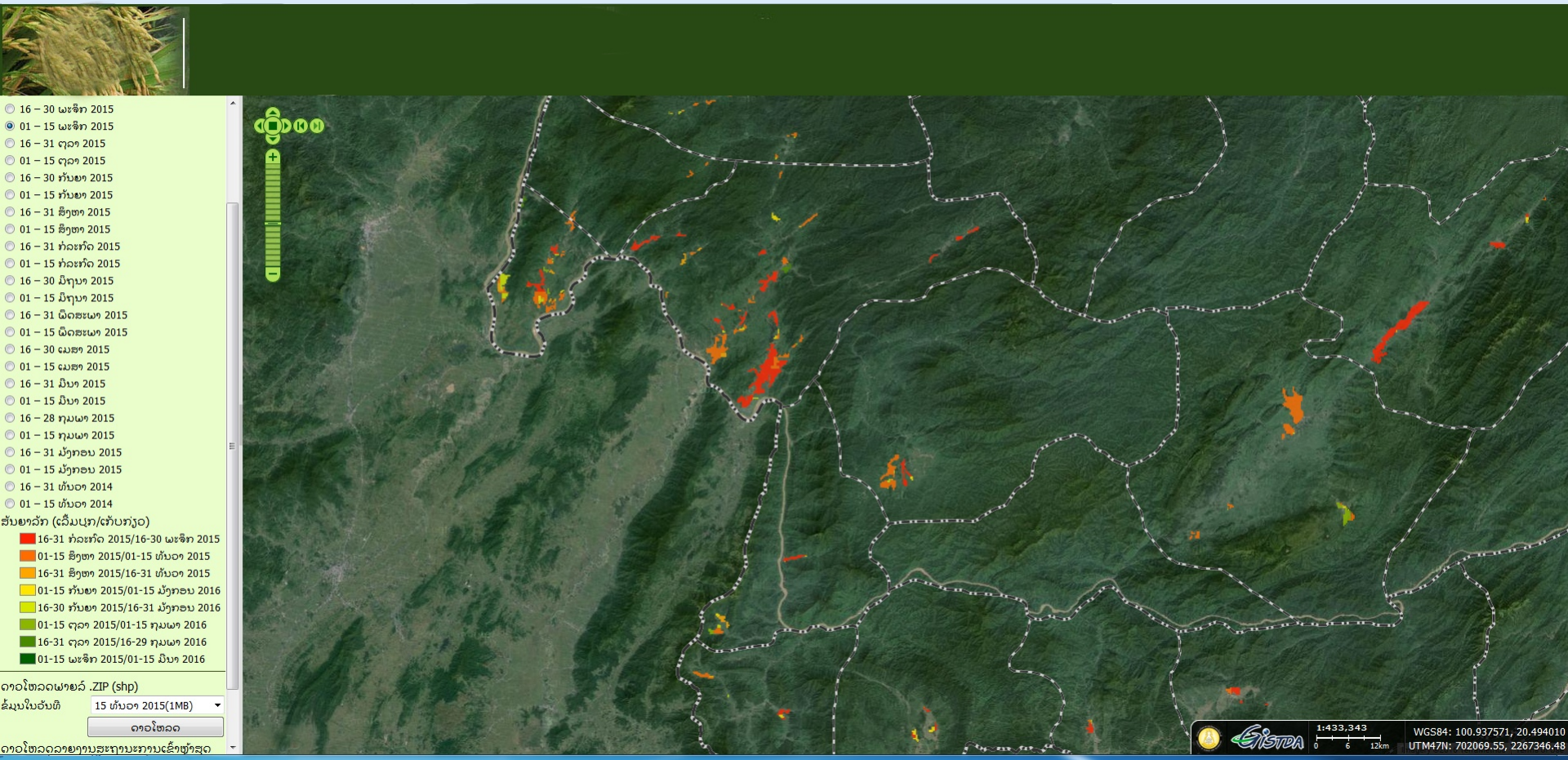
Start in mid July 2004

Rice Crop Map in Champasack Province

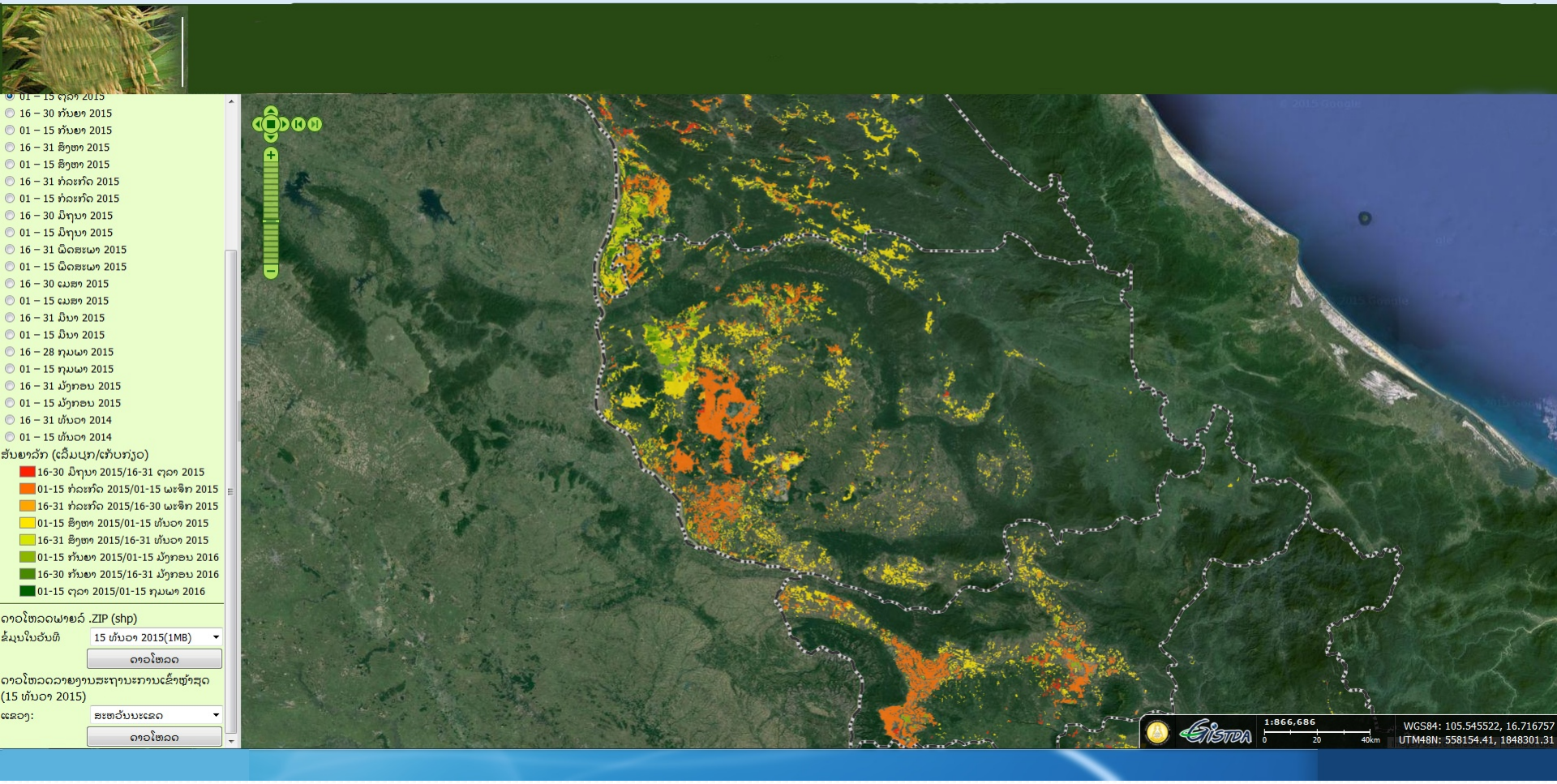


Rice Crop Map in Khammouane Province

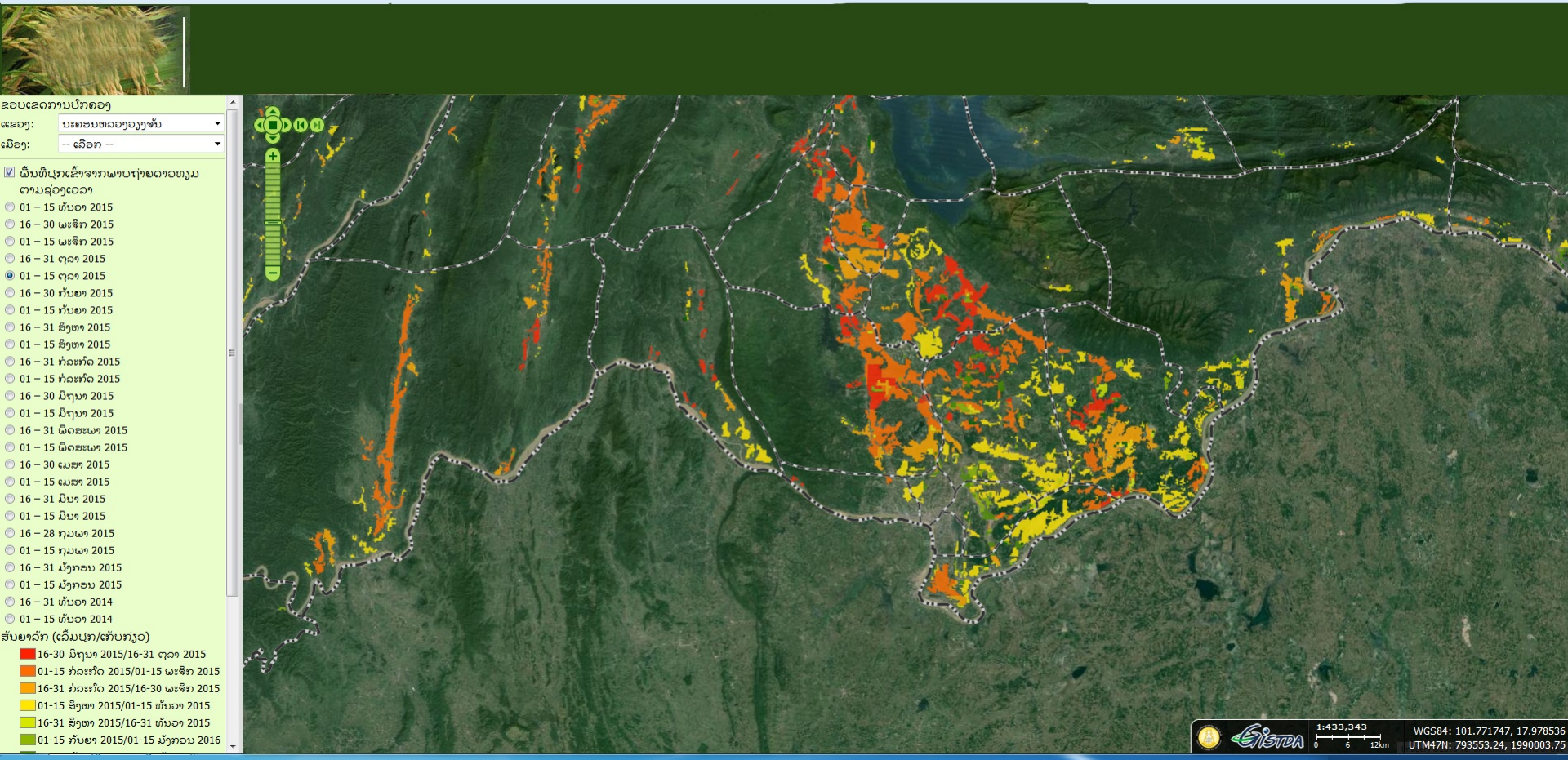
Rice Crop Map in Luangprabang Province



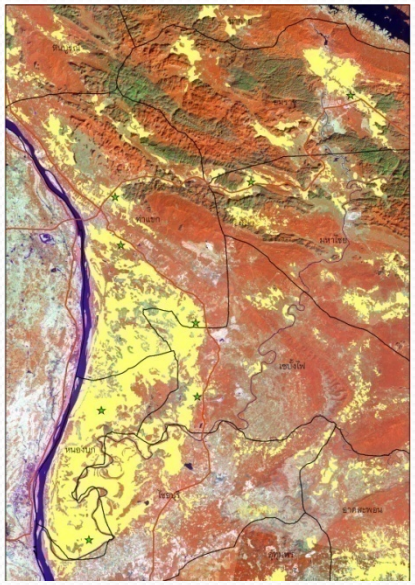
Rice Crop Map in Savannakhet Province



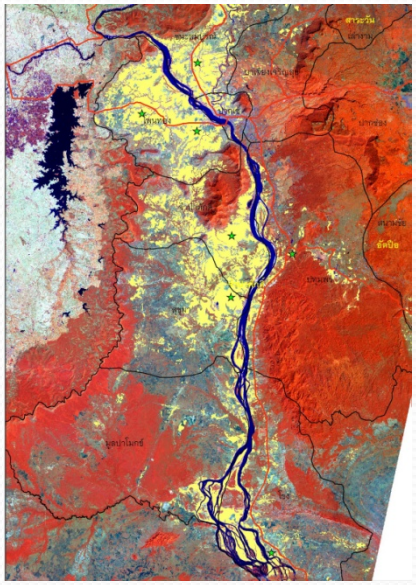
Rice Crop Map in Vientiane Capital



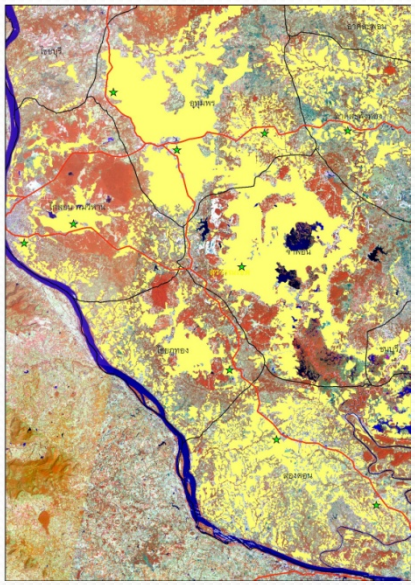
Route Map in Four Selected Provinces



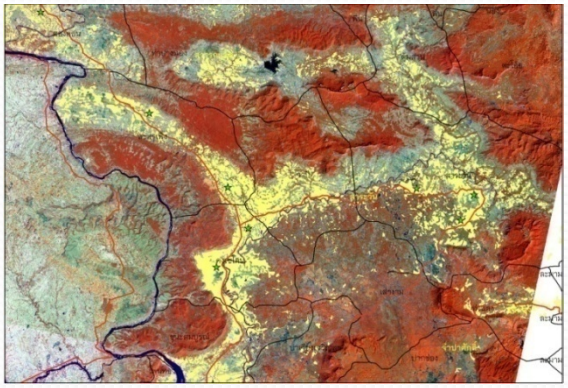
Khammouane



Champasack

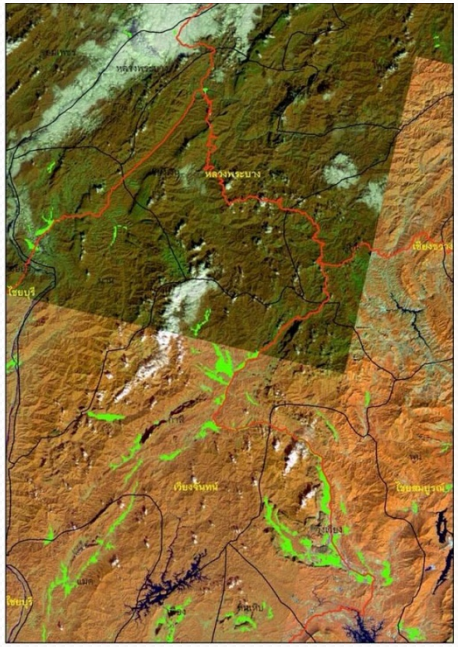


Savannakhet

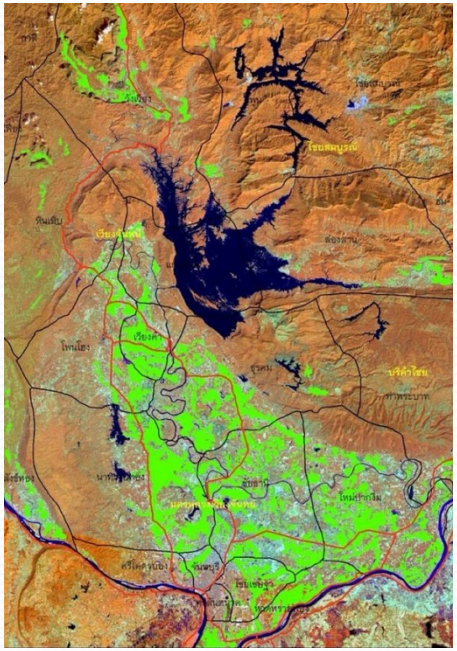


Saravan

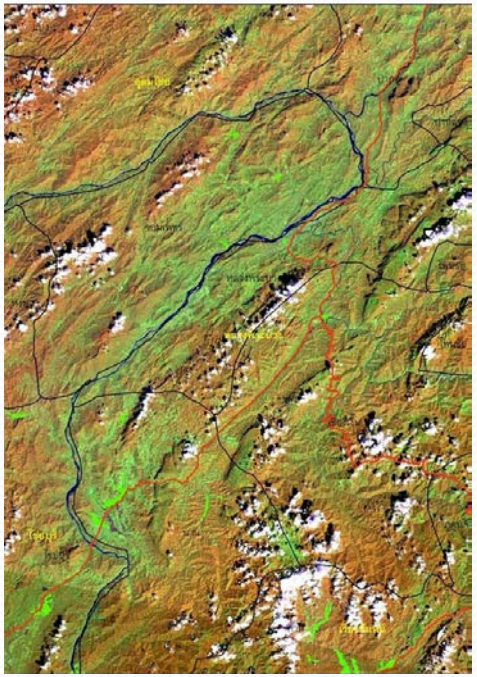
Site Survey Map



Kasi-Luangprabang



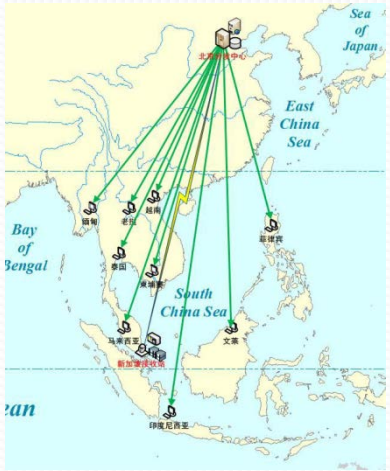
Vientiane Capital-Vangvieng



Nan-Luangprabang

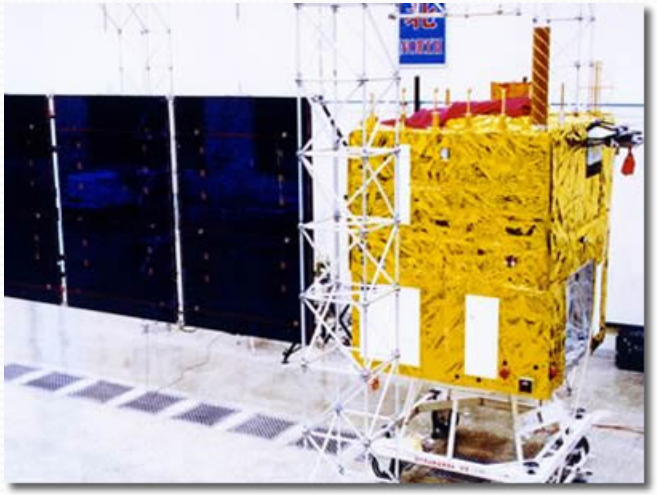
ASEAN-Sub Committee on Space Technology Application (SCOSA)

- First project under “China-ASEAN STEP” jointly was jointly launched by S&T Ministers of China and ASEAN on September 22th, 2012, in Nanning City, P.R. China, which include the ASEAN-China Remote Sensing Satellite Data Information Sharing Service Platform.
- Chinese government’s approval of CBERS-04 satellite to join this project.



Characteristic of CBERS-04

Payload	Band	Spectral Ranges (μm)	Spatial Resolution （nadir)	Swath (Km)	Return recycle (days)
PAN	1	0.51-0.85	5	60	55(3)
	2	0.52-0.59	10		
	3	0.63-0.69	10		
	4	0.77-0.89	10		
MUX	5	0.45～0.52	20	120	29
	6	0.52～0.59	20		
	7	0.63～0.69	20		
	8	0.77～0.89	20		
WFI	9	0.45～0.52	73	866	5
	10	0.52～0.59	73		
	11	0.63～0.69	73		
	12	0.77～0.89	73		



Launch on 7 December, 2014

UN-SPIDER Technical Advisory Mission (TAM)

- UN-SPIDER Technical Advisory Mission (TAM) held from 6-10 July 2015 in Vientiane Capital, Lao P.D.R.
- TAM generated a Final Report at the end of the mission.
- The Final Report elaborated a series of follow actions which are needed to be supported from UN-SPIDER in the implementation of actions in term of capacity building.

Disaster Statistic from 2014-2015

No.	Year	Type of Damage	Cost of Damage	Place of Damage
1	2015	Cold	5,821,440,000 Kips	8 Provinces
2	2015	Flood affected by Vamco Typhoon	455,364,900,000 Kips	15 Provinces
3	2014	Flood affected by Rammasun, Metmo and Khemiki Typhoon	99,385,747,000 Kips	12 Provinces

Damage: The flood caused an impact to the road interruption, rice plantation areas, land slide, school destruction, infectious decease, factory destruction, electricity infrastructure, etc….

Way Forward

- Engage UN agencies and other partners of UN-SPIDER to work and to drive a specific actions, program or project in the field of data analysis and modelling, data assessment, web map services, etc.
- Enhance the capacity building on flood monitoring and assessment with UN-SPIDER's support through IWMI's expertise.
- Handling satellite data and/or products for flood monitoring/evaluation with assistance of JAXA and AIT in May – June 2016.
- Holding a workshop on GNSS Technology in April 2016 with BELS (Building European Links

Way Forward (Cond't)

with South East Asia) coordinator.

- Raise understanding for young students and head of provinces on earth observation in disaster risk consistent with Sendai framework and on satellite communication system at the National University of Lao.
- Continue to actively promote the global/regional organization and initiatives in disaster management and risk reduction and good practices and lessons learnt.
- Foresee a single earth observation information data platform through the data center which will be set up by one of the Japanese company.

Way Forward (Cond't)

- Foresee a geo-informatics center in the future.

Thank you for your kind attention!