Drafting Committee for the '*Asia-Pacific Plan of Action for Space Applications for Sustainable Development (2018-2030)*

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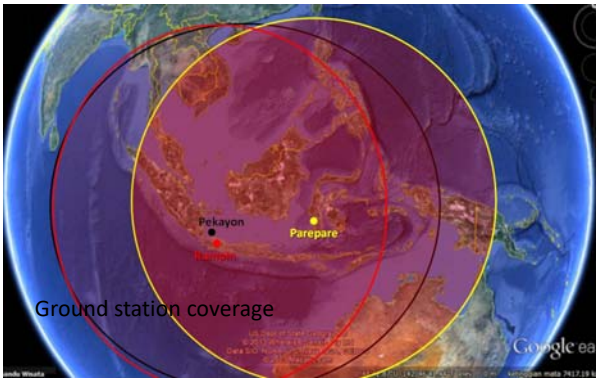
Indonesia

Bangkok, Thailand
31 May - 1 June 2018

Space Applications for Sustainable Development in Indonesia

- There are two main institutions in Indonesia responsible for geospatial information: (Indonesian National Institute of Aeronautics and Space (LAPAN) and Geospatial Information Agency);
- LAPAN provides multi resolutions earth observation data and GIA produces maps.

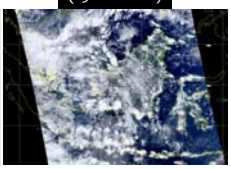
Modalities: Remote Sensing Data Facility



Modalities: Data received and archived

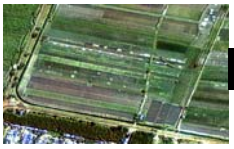
Himawari-8 (0.5 - 2 km)

Aqua/MODIS (250 m - 1 km)



Landsat-8 (15 – 30 m)

SPOT-6, 7 (1.5 m)



Pleiades (0.5 m)

Country Practices
based on Priority Themes and Targeted Actions

Provide examples of best practices and programmes using space applications for:

- *social development,*
- *disaster risk reduction and resilience,*
- *climate change,*
- *management of natural resources,*
- *connectivity, and*
- *energy*

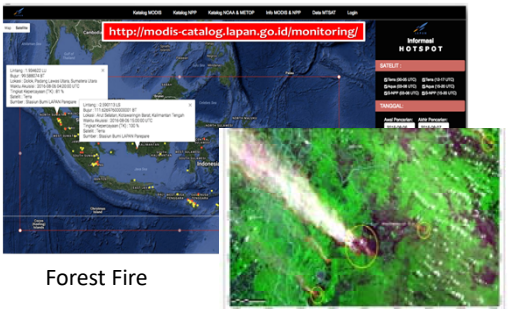
Social Development

- Priority Goal: SDG 3 (Good health and well being)
- Example of best practices and programs :
  - By using the available satellite communications and internets systems, Ministry of Health of Indonesia implements e-health;
  - E-Health: health management information systems, electronic medical record, surveillance system, health knowledge management, telemedicine, mobile health, consumer health informatics, e-learning in health sciences and medical research.

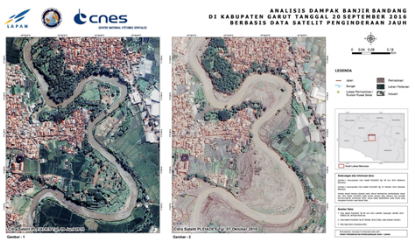
DRR Resilience

- Priority Goals: SFDRR Monitoring, SDG 2 (Zero hunger), SDG 3 (Good Health and well being), SDG 11 (Cities), and SDG 13 (Climate Action)
- Example of best practices and programs: disaster management support.

Disaster Management Support

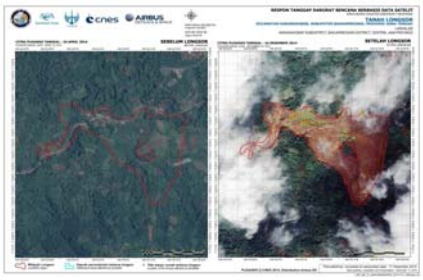


Forest Fire



Flood

Volcano Eruption



Landslide

Satellite Based Disaster Early Warning

Strengthen resilience and adaptive capacity to climate-related hazards (extreme weather)

NATIONAL COLLABORATION

- Nationally, LAPAN has a close collaboration with Indonesian National Board for Disaster Management (NBDM).
- We built a direct link between LAPAN and NBDM in order to give access to earth observation data acquired and archived by LAPAN.

Regional and International Collaborations

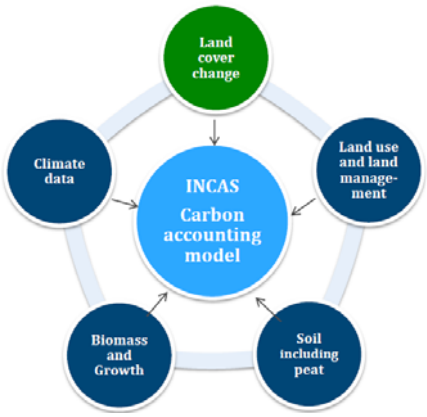
Indonesia (LAPAN) is a member of Sentinel Asia

Indonesia (LAPAN) is one of Regional Support Office of UNSPIDER

Climate Change

- Priority Goals: SDG 11 (Cities), SDG 13 (Climate Action), SDG 14 (live below water) and SDG 15 (life on land)
- Example of best practices and programs : national carbon accounting system.

INDONESIAN NATIONAL CARBON ACCOUNTING SYSTEMS (INCAS)



Australia Indonesia Partnership
Kemitraan Australia Indonesia

INCAS Modules

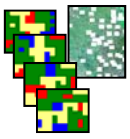
A Biomass Classification

Classification of forests into groups (biomass classes) that best explain the variation of biomass in undisturbed forest condition

B Land Cover Change Analysis

Annual time-series defining areas of:

- Deforestation (permanent loss of forest cover)
- Degradation (forest clearance and regeneration or partial removal)



E Carbon Accounting and Reporting Model (ICARM)

C Forest Disturbance Class Mapping

Map forest disturbance classes at known date

- Minimal disturbance
- Moderate disturbance
- Heavy disturbance

D Carbon Stock Estimation

Carbon stock estimates for each biomass class (incl. growth/loss rate):

- Aboveground biomass
- Belowground biomass
- Litter
- Debris
- Soil

National Forest Monitoring System Platform based on Remote Sensing Data

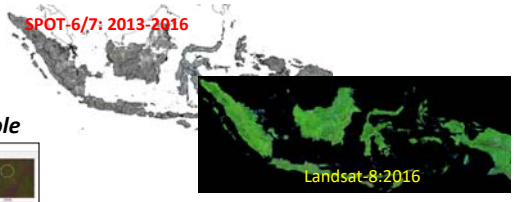
(LAPAN-WRI-University of Maryland collaboration)

Target:

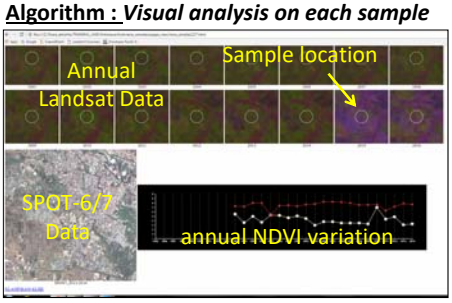
- Fast deforestation and forest degradation monitoring from 1990 - 2016
- Identify drivers of forest change

Data:

- Landsat Annual Mosaic 1990:2016
- SPOT-6/7 Mosaic : 2013-2016



Algorithm : ***Visual analysis on each sample***

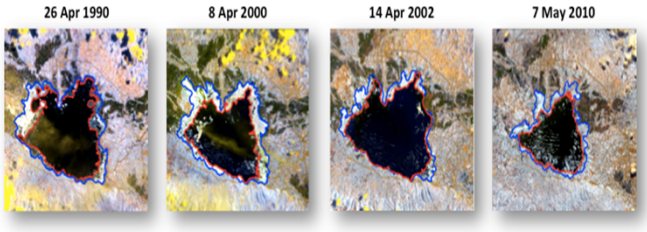


Sample location

Management of Natural Resources

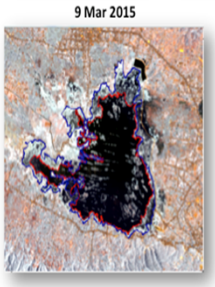
- Priority Goals: SDG 6 (Clean water), SDG 12 (Responsible Consumption), SDG 14 (live below water), and SDG 15 (life on land)
- Example of best practices and programs natural resources management: *fresh water management* (surface water mapping and monitoring, irrigation management); *land use and ecosystem services* (forestry, land cover mapping, biomass and carbon stock management); oceans (fisheries monitoring and fish catch, coral reef monitoring, coastal development, and illegal fishing).

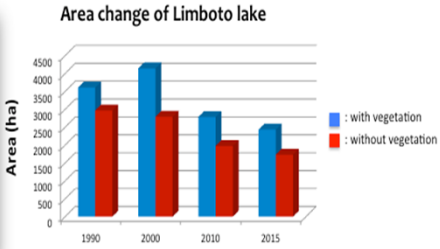
Surface water mapping and monitoring



Limboto lake (Gorontalo Province)

SPOT-7 data (24 Jan 2015)

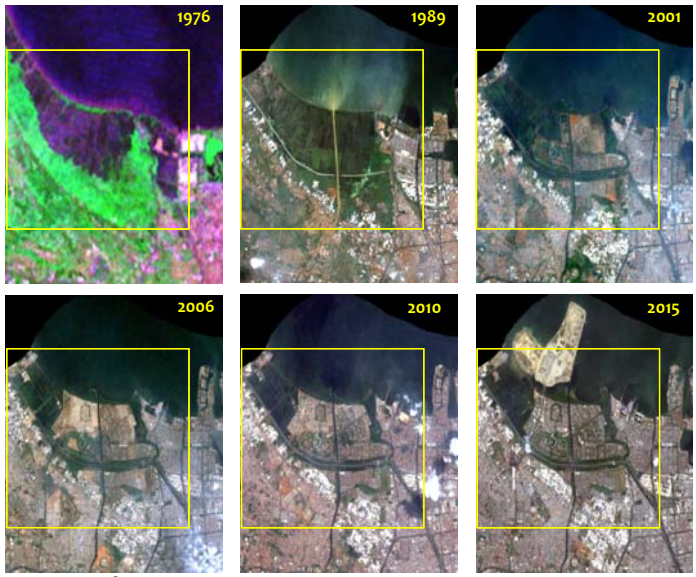




Source: Landsat data (1990 – 2015)

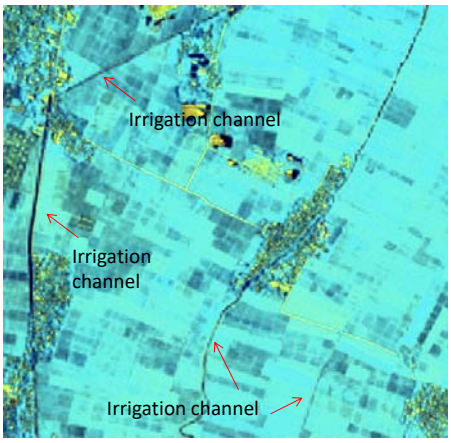
Water Sedimentation Monitoring

(Penjaringan District, North Jakarta)



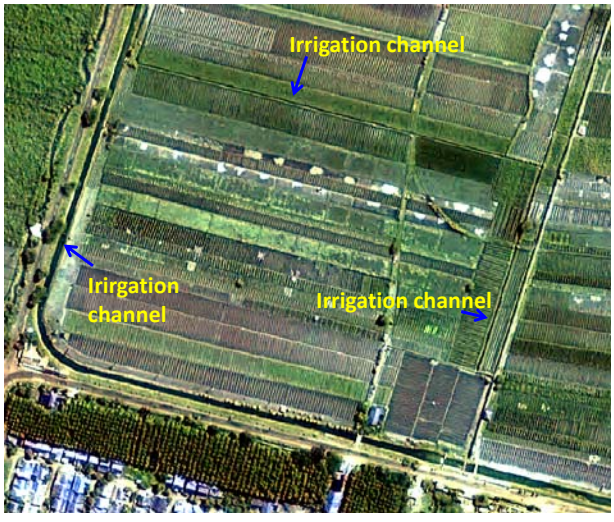
Data: Landsat

Irrigation Management



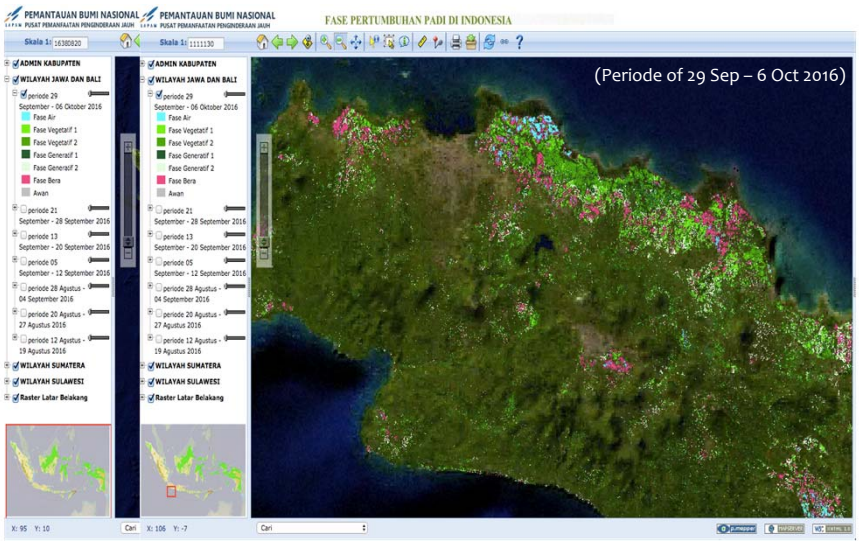
Data: SPOT-6 (3 Oct 2014)

Irrigation Management

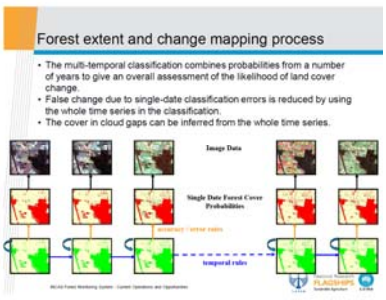


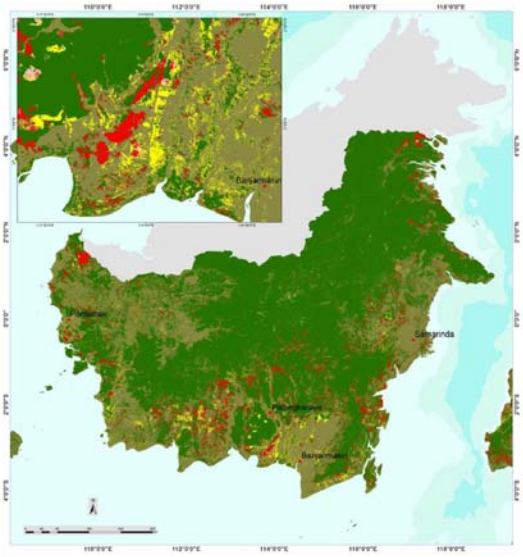
Data: Pleiades

Paddy's growth phase monitoring



Forest Cover Change Monitoring

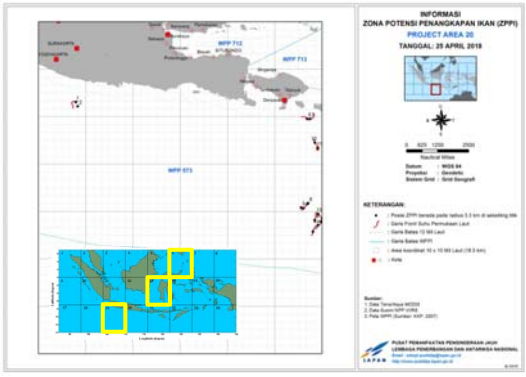




Forest Cover Change Monitoring (2000-2012)

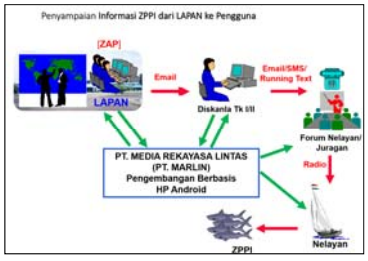
Fisheries Monitoring and Fish Catch

The potential fishing zone

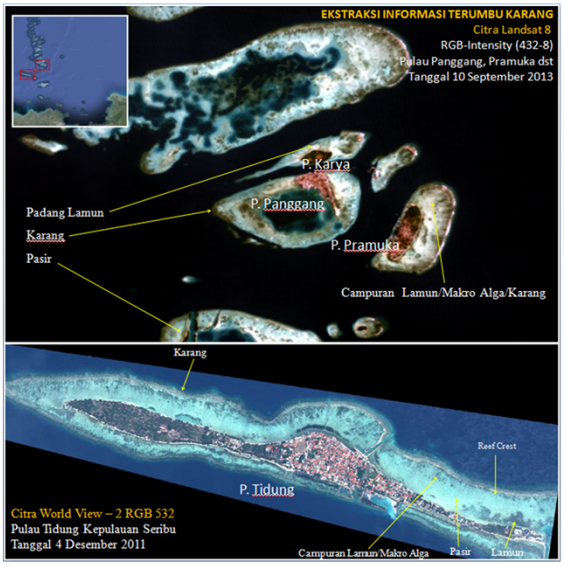


DAFTAR KOORDINAT ZPPI TANGGAL 25 APRIL 2018

POSISI ZPPI	BUJUR	LINTANG	POSISI ZPPI	BUJUR	LINTANG
1	110°47'36.05" BT	08°41'40.94" LS	8	115°48'29.18" BT	11°25'36.30" LS
2	110°50'00.33" BT	08°47'05.74" LS	9	115°50'52.40" BT	11°10'58.21" LS
3	115°33'27.98" BT	10°55'20.70" LS	10	115°51'04.41" BT	09°33'06.04" LS
4	115°36'35.99" BT	10°55'59.42" LS	11	115°54'24.96" BT	09°39'43.97" LS
5	115°40'53.69" BT	09°02'47.57" LS	12	115°54'54.12" BT	11°17'24.50" LS
6	115°42'22.97" BT	10°49'52.12" LS	13	115°54'55.27" BT	11°03'19.82" LS
7	115°44'47.28" BT	09°03'04.53" LS	14	115°58'36.91" BT	11°13'00.79" LS

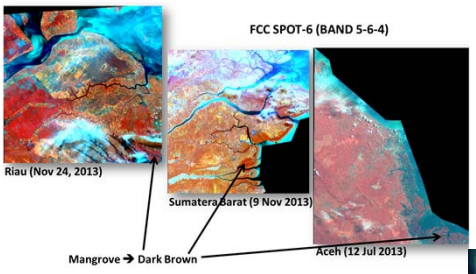


Coral Reef Monitoring and Management



Kondisi terumbu karang di P. Pramuka dan P. Panggang

Mangrove and Small Island Monitoring (Coastal Management)

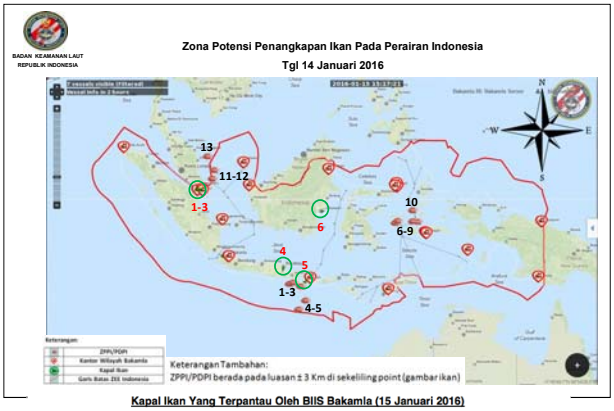


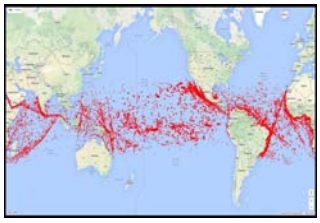
Mangrove

Small Island Monitoring

Illegal Fishing Monitoring

Cooperation between LAPAN and National Coast Guard





LAPAN A2 AIS

Kapal Ikan Yang Terpantau Oleh BIIS Bakamla (15 Januari 2016)

NO	NAMA KAPAL	IMO	MMSI	BENDERA	PJG (m)	POSISI TERAKHIR	WAKTU DETEKSI TERAKHIR	KETERANGAN
1	SAMWOH COURAGE	9503328	563011450	SINGAPORE	11	103° 18' 40" E 1° 3' 37" N	15-01-2016 14:56:19 GMT+7	Perairan Batam
2	GAS PACU	9139945	440071000	KOREA	105	103° 38' 6" E 1° 13' 31" N	15-01-2016 14:58:12 GMT+7	Di luar perairan Indonesia
3	E T HARBOUR 19	563003730	563003730	SINGAPORE	10	103° 44' 14" E 1° 13' 17" N	15-01-2016 14:44:47 GMT+7	Di luar perairan Indonesia
4	BIMA 306	9559913	525000002	INDONESIA	19	112° 43' 22" E 7° 11' 52" S	15-01-2016 13:19:34 GMT+7	Perairan Gresik
5	SHOEI MARU NO.123		432918000	JAPAN	33	115° 12' 43" E 8° 44' 40" S	15-01-2016 14:47:32 GMT+7	Bali
6	ZHONGSHUI609	9460229	222222222	-	13	116° 48' 40" E 1° 12' 10" S	15-01-2016 15:09:01 GMT+7	Perairan Balikpapan

Energy

- Priority Goals: SDG 7 (Affordable and clean energy)
- Example of best practices and programs : renewable energy (geothermal), uneven distribution of energy resources.

Affordable and Clean Energy

Potential data for geothermal exploration

GEOCAP
Geothermal Capacity Building Program Indonesia - Netherlands

Proceedings World Geothermal Congress 2015
Melbourne, Australia, 19-25 April 2015

GEOCAP: Geothermal Capacity Building Program (Indonesia-Netherlands)

Freek van der Meer, Abedi Poernomo, Saansi Satar, Nenny Saptadji, Suryantini, Pri Utama, Yunus Daud, Chris Hecker, David Brahn, Fred Beekman, Gous Willemsen, Henny Cornelissen, Jan Diederik van Wees, Manfred van Bergen, Kees van den Ende

Mailing address, University of Twente, Faculty ITC, Hengelosestraat 99, 7514AE Enschede, The Netherlands

E-mail address, f.d.vandermeer@utwente.nl

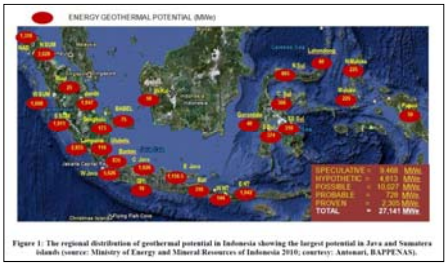
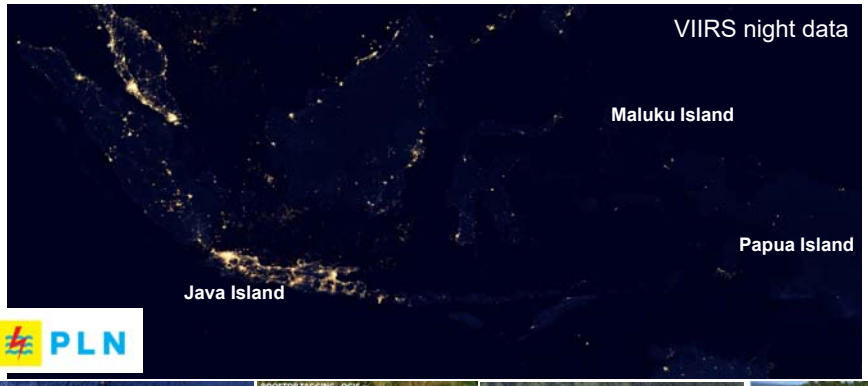


Figure 1: The regional distribution of geothermal potential in Indonesia showing the largest potential in Java and Sumatera islands (source: Ministry of Energy and Mineral Resources of Indonesia 2010; courtesy: Antonari, BAPPENAS).

GEOCAP

Electricity Network

Earth Observation Data in Indonesia have been used to develop electricity network in eastern part of Indonesia.



PLN

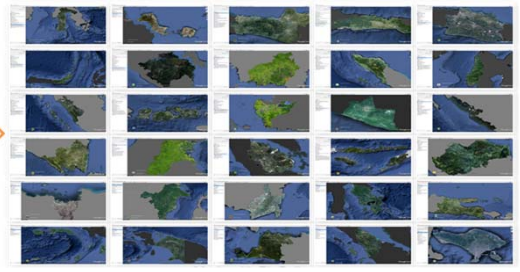
Country Needs based on Priority Themes and Targeted Actions

- **Research and knowledge sharing:**
- A Knowledge Portal could be developed to promote the use of space applications for the implementation of the SDGs (member countries can learn from other countries any best practices, methodologies, models, etc.).
- ESCAP could facilitate the development of such portal.
- *Example: UNSPIDER Knowledge Portal*

- **Capacity building and technical support:**
- The need of using geospatial information to support sustainable development is growing, but the capacity of using it is still lacking;
- Sometimes we do not know what kind of capacity building is required;
- ESCAP could facilitate the development of Training Need Analysis (TNA);
- TNA will consist of enabling environment (policies, legislations, etc.), organisational level (policies, procedures, frameworks, etc.), individual level (skills, knowledge and experience).

Country Challenges

Space Based Monitoring Systems for Provincial Govt.



- Until this year LAPAN has already collaborated with all provincial government to enable them to use remote sensing data to support sustainable development in each province;
- However they are still lacking of human resources, methodologies and facilities;
- Capacity buildings (training, workshop, knowledge sharing) are required;

Capacity Building


Manado, 18-19 Feb 2016


Palembang, 15-16 Mar 2016

Bengkulu, 1-2 Jun 2016


Jakarta, 4-8 Apr 2016


Jakarta, 30 May-3 Jun 2016

THANK YOU