

Applying Space-based Technology and ICT to Strengthen Disaster Resilience

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ASIAN DEVELOPMENT BANK

JPTM Sentinel Asia

Hanoi, Viet Nam on 9 March 2017

The logo of the Asian Development Bank (ADB), consisting of the letters "ADB" in white serif font on a dark blue square background.

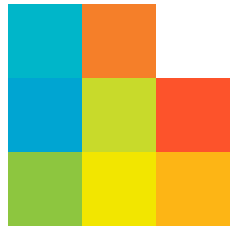
ADB



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Joint Project Team Meeting – Sentinel Asia

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1. ADB AT A GLANCE



ADB AT A GLANCE

What is Asian Development Bank?

ABOUT ADB

ADB is an international development finance institution. We provide loans, grants, and expertise to our developing member countries to help them alleviate poverty and create a world in which everyone can share in the benefits of growth.

President
Takehiko Nakao

Headquarters
Manila, Philippines

Founded
1966

67

Members

48

Regional
members

19

Nonregional
members

31

Field offices

3,105

Total employees



ADB's Local Character

Focus on Asia and the Pacific

- Promoting regional and sub-regional cooperation
- 5 Regional Departments – Leading roles in the bank



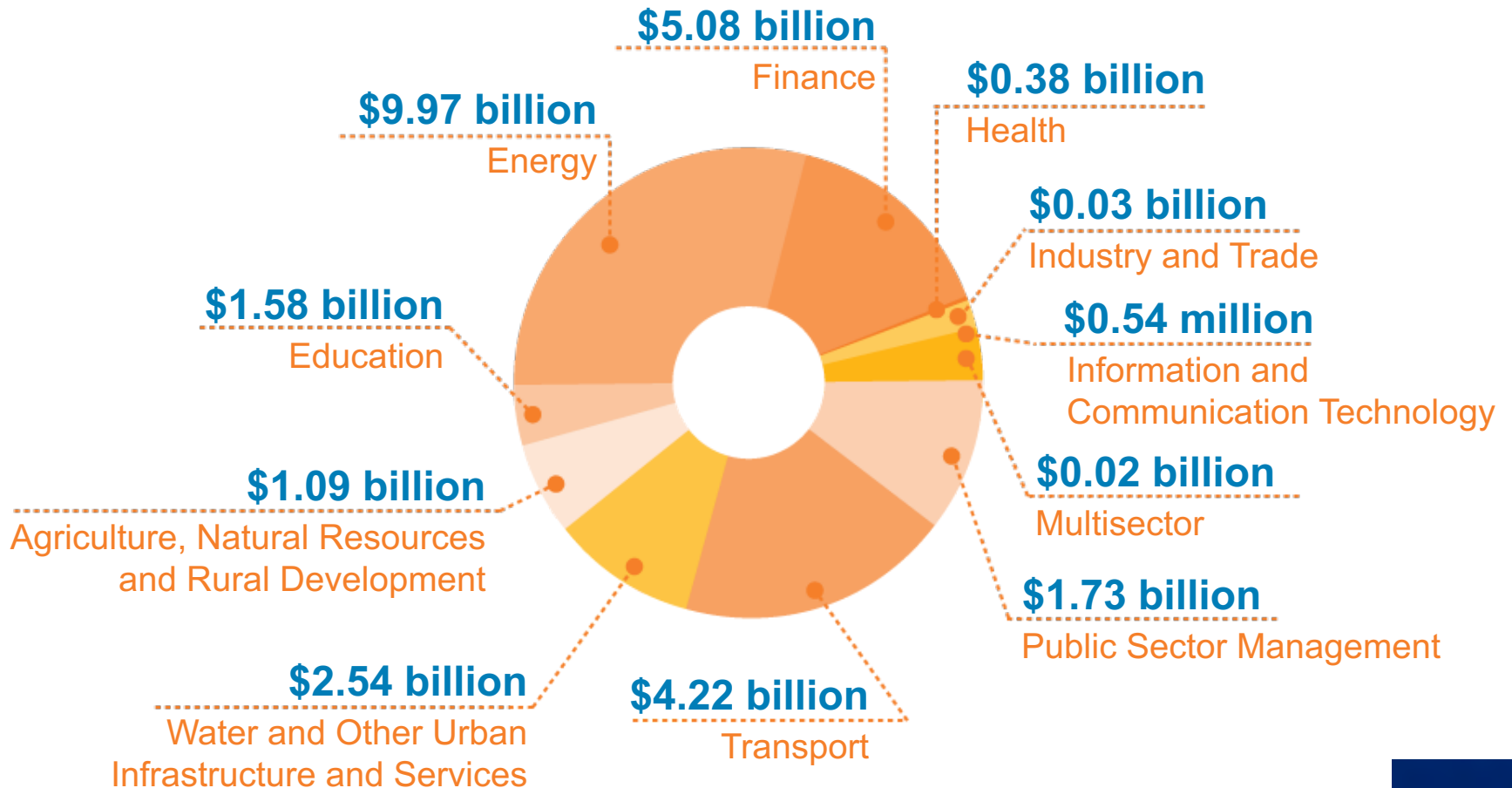


ADB Assistance by Sector

Focus on Asia and the Pacific

TOTAL ASSISTANCE

**\$27.17
BILLION**





ADB RENDEZVOUS WITH JAXA

How does ADB link with space?



- Lol with JAXA in 2010
 - Disaster Management
 - Climate Change Mitigation and Adaptation
 - Forest Monitoring
 - Water Resources Management
 - Agriculture
 - Urban Management



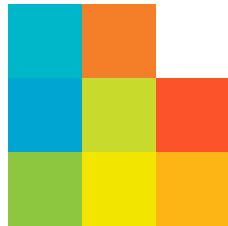
ADB PROJECTS WITH JAXA

Using Space-based Technology

- **Flood management** using satellite rainfall data and mobile phone in Bangladesh, Viet Nam and Philippines (TA8074-REG)
- **Drought and flood monitoring, and crop outlook** development for subregional food security in GMS (TA6521-REG)
- Satellite-based **drought monitoring** in ASEAN (TA8693-REG)
- Satellite-based **agricultural statistics data collection** in Lao P.D.R, Philippines, Thailand and Viet Nam (TA8369-REG)
- Satellite and ICT based information collection for **DRM** in Armenia, Bangladesh, Fiji and Philippines (TA8884-REG)
- Satellite-rainfall application for **weather-index based crop insurance** in Bangladesh (Grant9172-BAN)
- Satellite-based **water resource information system** in Pakistan (TA8800-PAK)
- **Flood inundation map** for PDNA in Pakistan (TA7579-PAK)
- Satellite-based **urban land coverage map for water resources management** in Indonesia (TA7189-INO)

Sector

- N/A
- Disaster Risk Management
- Water Resources Management
- Agriculture and Natural Resources
- Urban Development



2. APPLYING SPACE- BASED TECHNOLOGY TO STRENGTHEN DISASTER RESILIENCE



Project at a Glance

Applying Space-Based Technology and ICT to Strengthen Disaster Resilience

Budget	2 million USD financed by Japan Fund for Poverty Reduction
Duration	2 years (– June 2017)
Impact	More information-based DRM
Outcome	Improve quality and timeliness of information for disaster preparedness and response using SBT and ICT
Output	<ol style="list-style-type: none">1) Enhanced disaster-related information collection, sharing, and utilization of applying SBT and ICT in selected communities2) Expanded knowledge on SBT and ICT applications for DRM in each country and the region3) Policy guidelines developed regarding sustainable SBT and ICT applications for DRM in each country



Pilot Countries

Applying Space-Based Technology and ICT
to Strengthen Disaster Resilience





PHI Inception Workshop

ADB HQ, Manila on 22-23 February 2016

IA: Department of Social Welfare and Development (DSWD)





BAN Inception Workshop

Dhaka on 29 February – 3 March 2016

IA: Department of Disaster Management (DDM)





ARM Inception Workshop

Dilijan on 11-14 April 2016

IA: Ministry of Emergency Situation (MES)





FIJ Inception Workshop

Nadi on 25-28 April 2016

IA: National Disaster Management Office (NDMO)





Overall Approach

(i) Community-based OpenStreetMap base map development



(ii) Community-based hazard risk and evacuation mapping



(iii) Crisis mapping



(v) Data Mgt. using GIS at the local government

Other available maps, data and hazard maps



(iv) Utilization of satellite-based damage assessment



(vi) Utilization of data at community level for disaster risk reduction, response and recovery



The data can be used to support the rescuing activities during the disaster response



Overall Approach

Applying Space-Based Technology and ICT to Strengthen Disaster Resilience

- i. OpenStreetMap base map development
- ii. Field validation using mobile application
- iii. Community-based hazard mapping
- iv. Crisis mapping (not conducted yet)
- v. Data management system



OpenStreetMap Base Mapping

Mapping Party in Nadi, Fiji in Q3-2016

- Mapping with local government, community
- Contribution of high-resolution satellite data





OpenStreetMap Base Mapping

Mapping Results in Nadi, Fiji

OpenStreetMap Analytics *beta*

Analysis Map

About

nadi fiji



or

Outline Custom Area

Buildings

Map Legend

- Buildings
- Highlighted buildings

Last Data Update: 2 hours ago

Leaflet | © Mapbox © OpenStreetMap contributors

2016
217
Buildings

5,232
Buildings
now

Close Comparison View

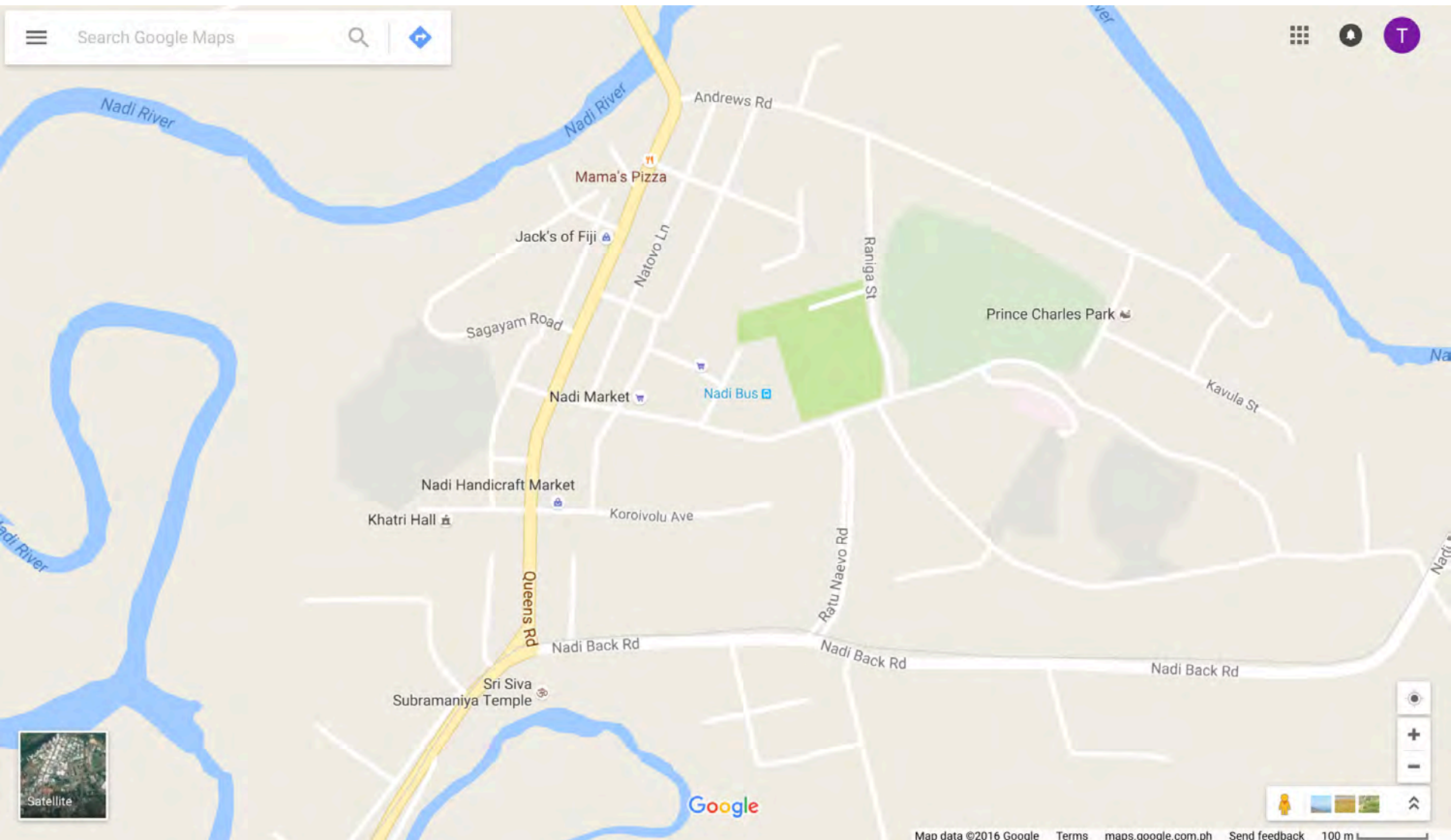
5000+ buildings digitized





OpenStreetMap Base Mapping

Google Maps in Nadi, Fiji





OpenStreetMap Base Mapping

OpenStreetMap in Nadi, Fiji

 OpenStreetMap

編集

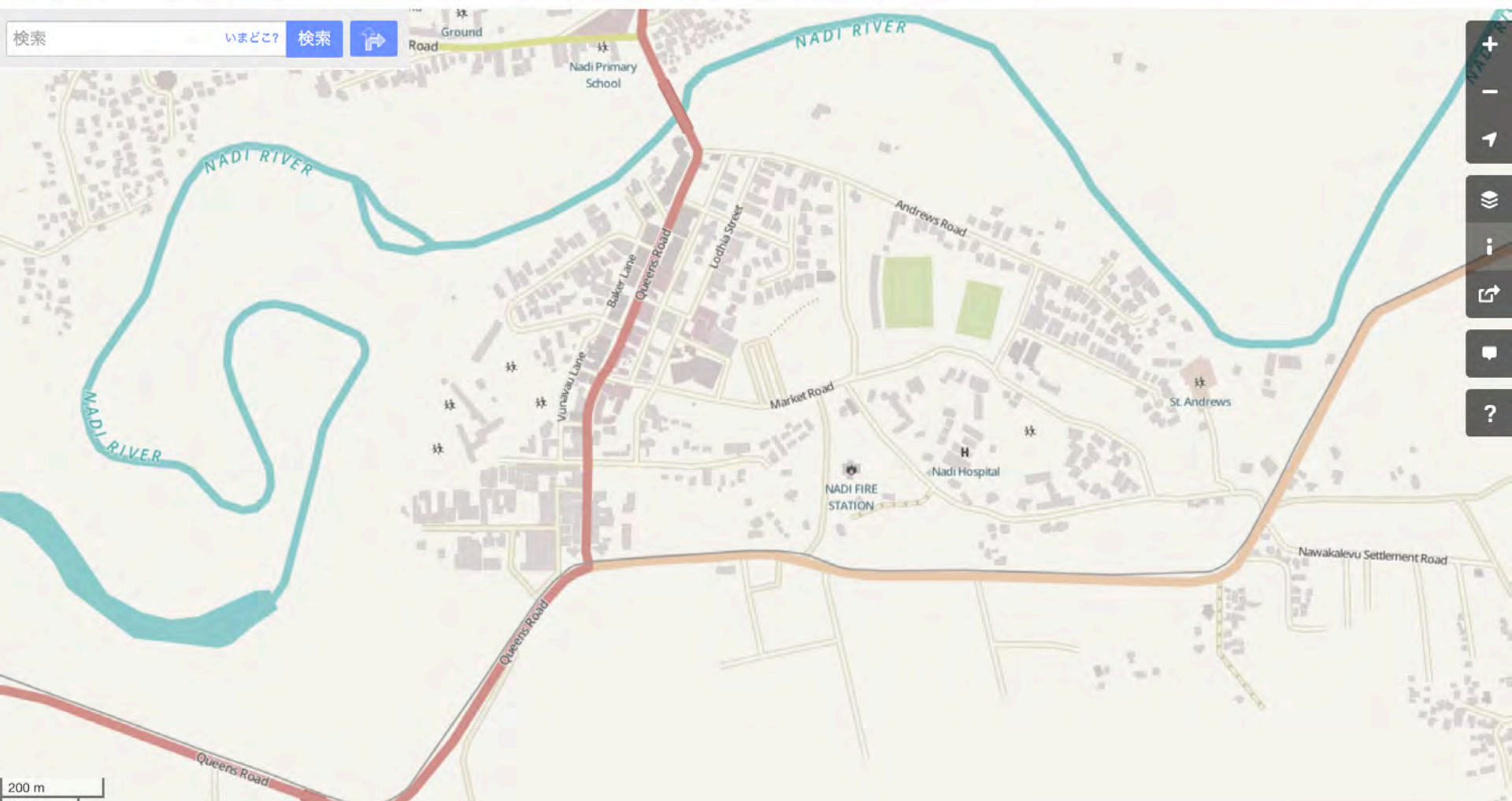
履歴

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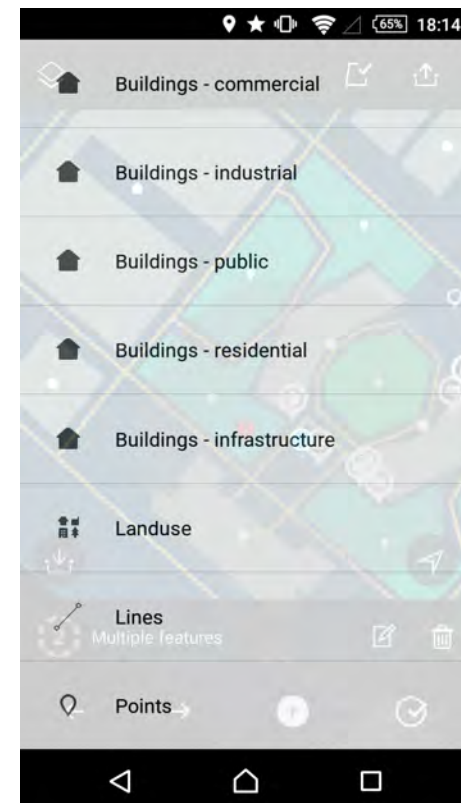
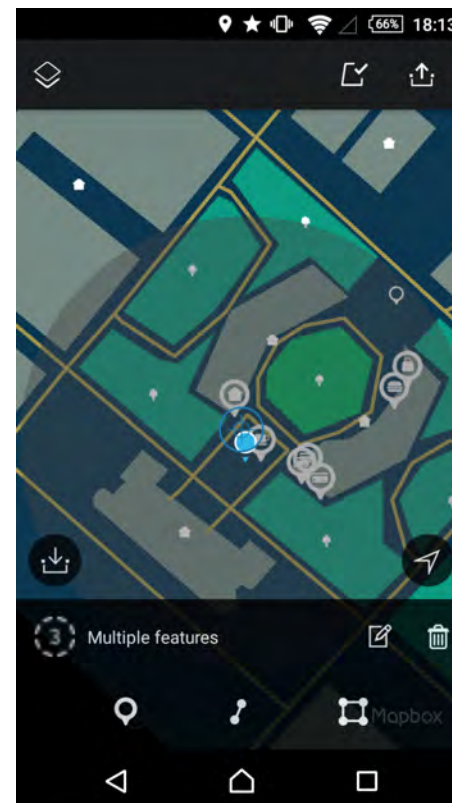
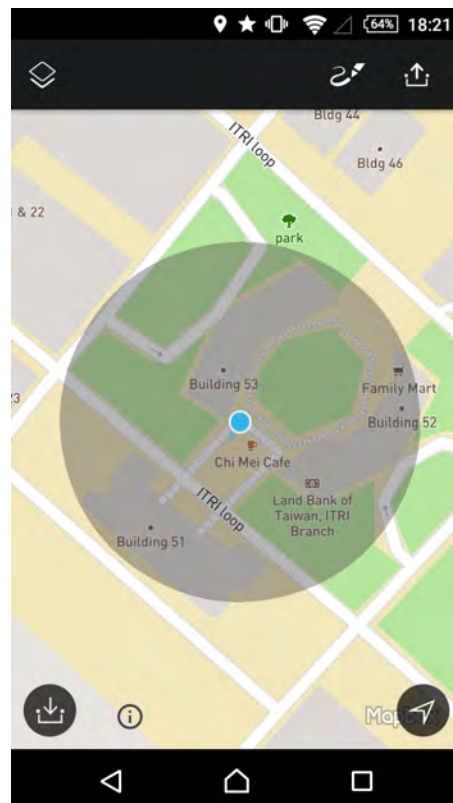
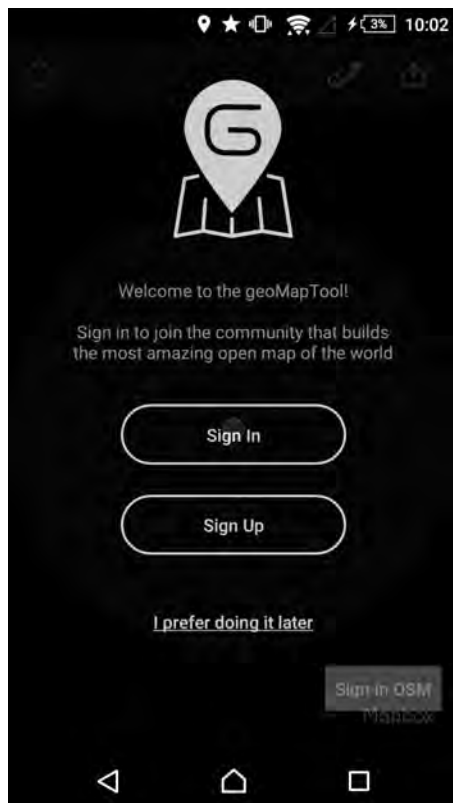




Field Validation

Mobile Application Available to Validate and Add Information

- Allow user to map with smart phone just like working with iD
- Work for either online or offline, cached basemap with Mapbox SDK
- Pre-set tags for mapper to contribute easily for disaster resilience





Field Validation

Field validation in Padre Burgos, Philippines in Q3-2016



← DONE

🏠 Buildings ✎

⊗ name	empty
⊗ addr:city	Brgy. Burgos Padre Bur
⊗ building	commercial
⊗ landscape	not selected
⊗ building:material	not selected
⊗ building:form	not selected
⊗ visual:condition	not selected
⊗ addr:street	

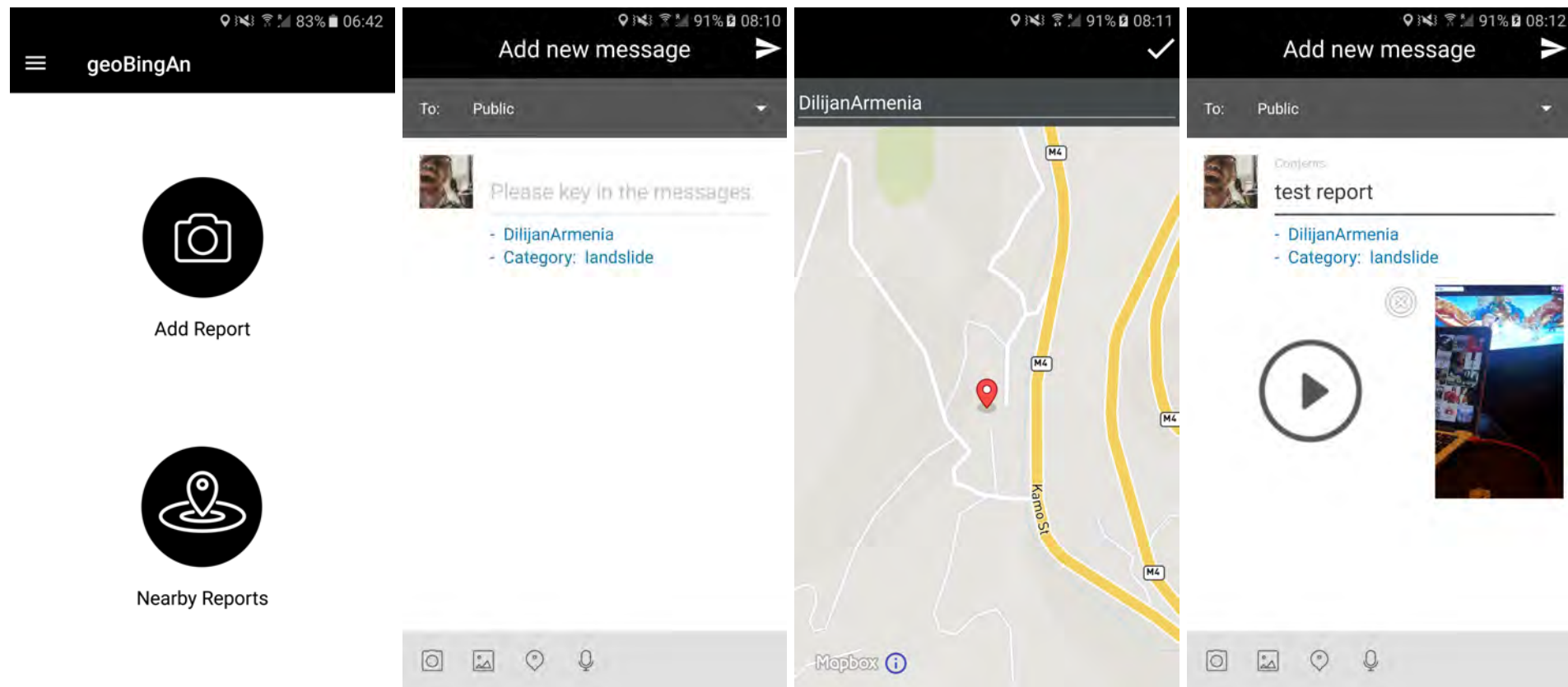
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Community-based Hazard Mapping

Another Mobile Application Available for Town Watching

- Allow user to make a short report with geo-tagged photo of at-risk areas
- Work for either online or offline





Data Management System

Integral point of SBT and ICT

- Data sharing and management system among stakeholders
- Simple analysis functions for disaster risk

fiji

fiji01 2016-04-28 06:46

Nawaka Village River Soil Erosion

Address : NadiFiji

Condition Good condition Good condition Ground level ground level 2

Building foundation < possible at-risk area for flooding

- Visual condition
- Building material
- Roof material
- Landscape etc



Data Management System

OSM Basemaps X Cloud-sourcing Reports X RS Application

≡ Reports

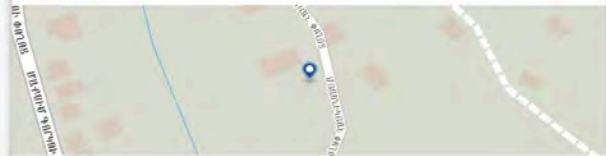
NEW REPORT

All Report



man***

2016-11-03 19:36



Old House

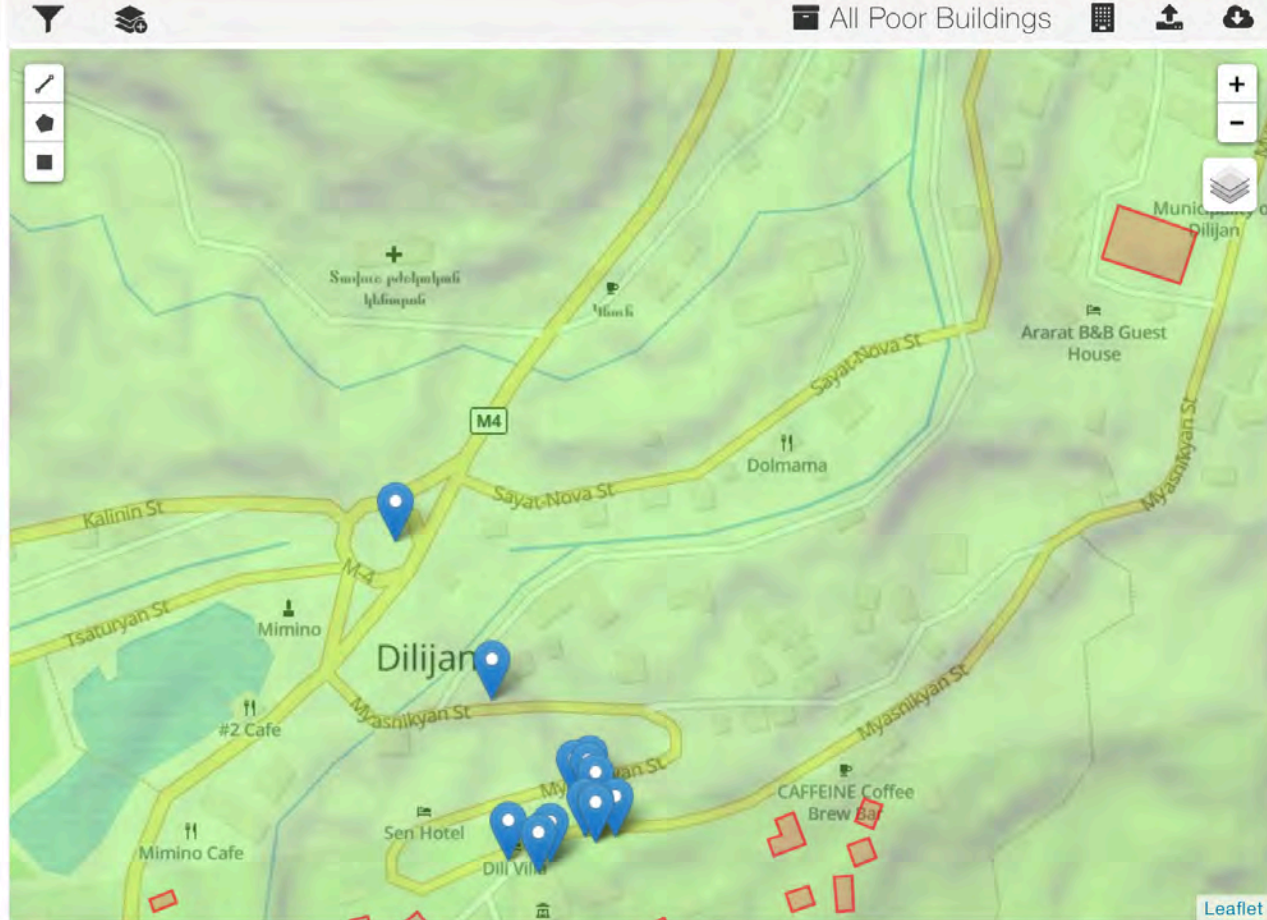
Address : Maxim Gorky St, Dilijan, Armenia



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TAKE



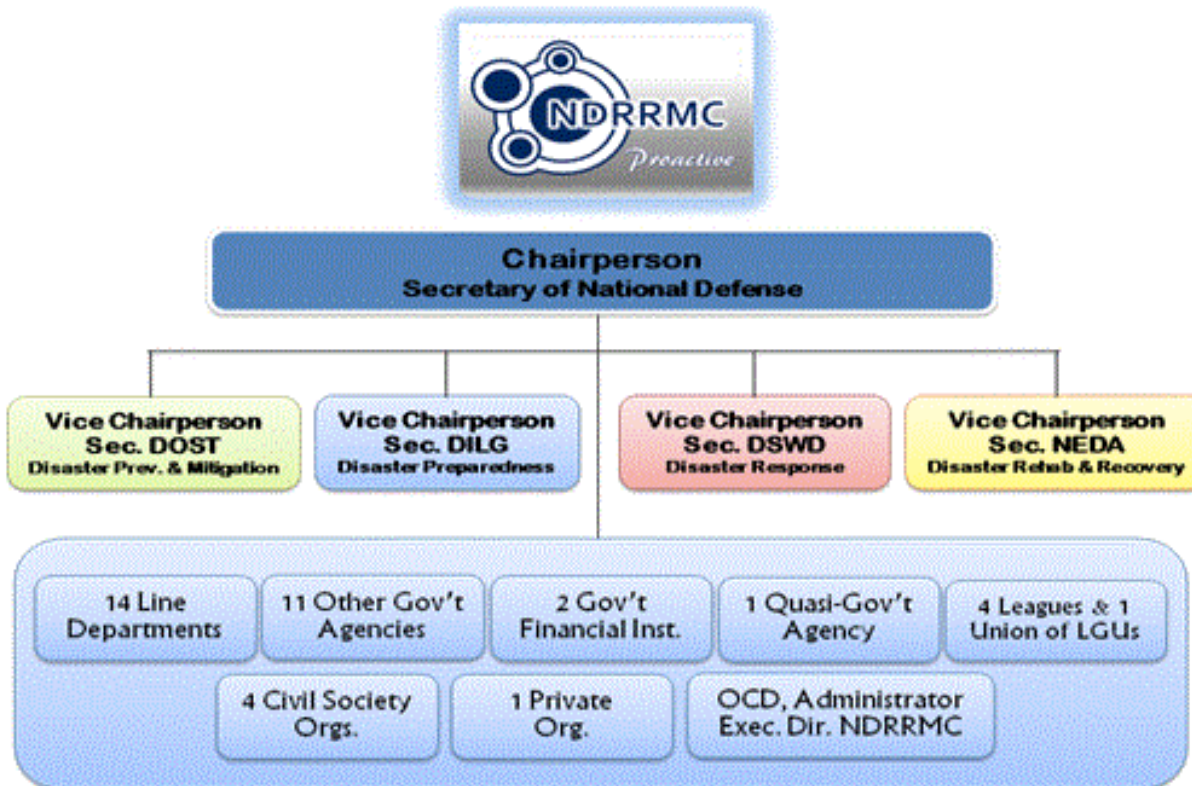


Connecting Sentinel Asia to National Disaster Management System in the Philippines



Background

National Disaster Risk Reduction and Management System in the Philippines



4 Pillars of DRRM

- Prevention and Mitigation: **DOST**
- Preparedness: **DILG**
- Response: **DSWD**
- Relief and Recovery: **NEDA**



Issues

Limited use of Sentinel Asia in the Philippines

Lack of coordination/ technical capacity

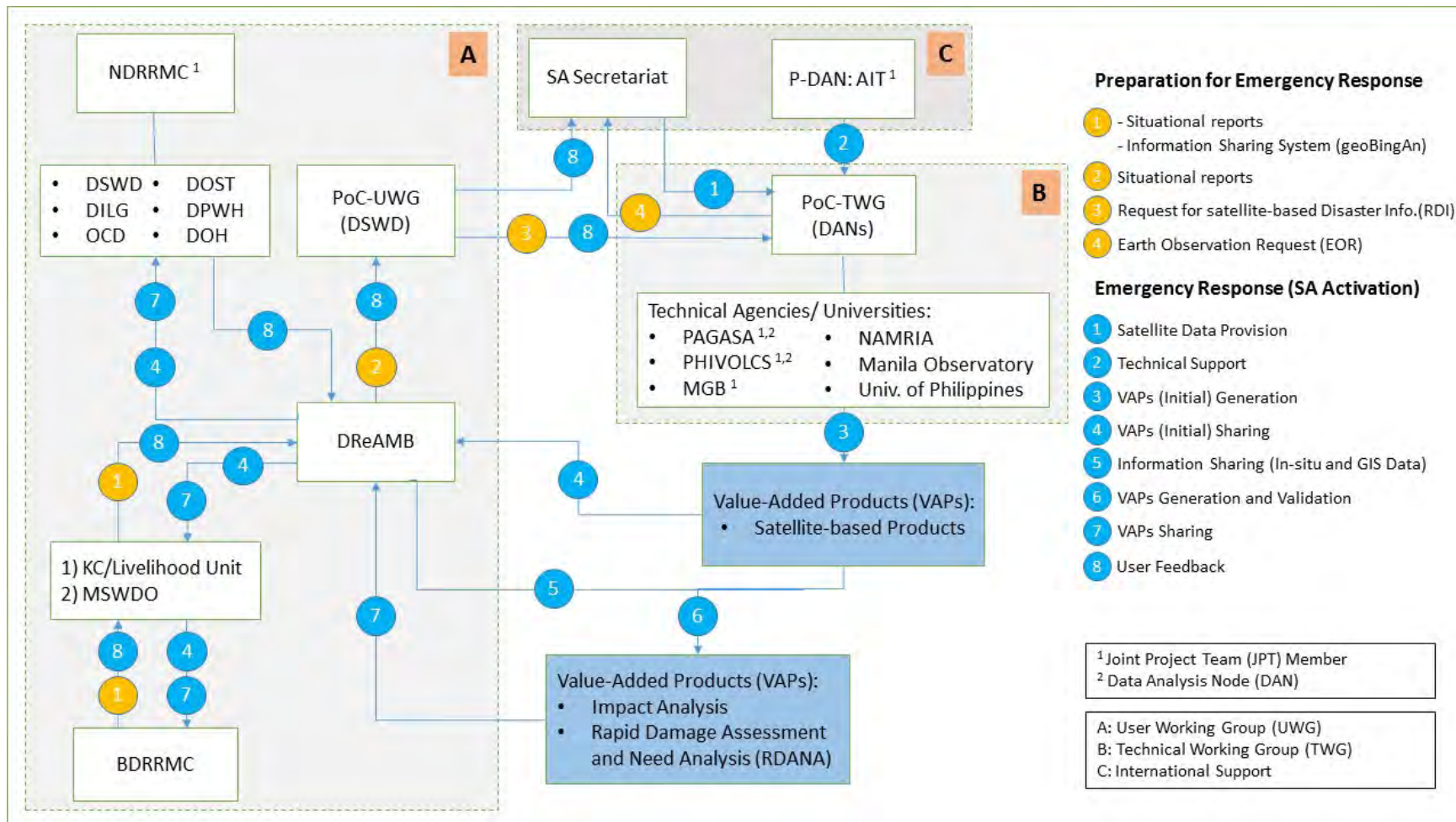
- Sentinel Asia active members: excellent technical capacity BUT not responsible for disaster response
- NDRRM (Response): responsible for disaster response and resource to field ground level activities BUT not enough technical capacity

As a result, Sentinel Asia has not been fully utilized in the national disaster response system



Proposed Framework

Connecting Sentinel Asia to the National DRRM System with the Support of ADB TA and JAXA

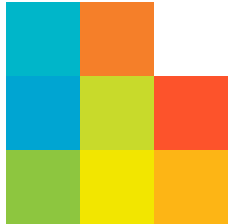




Current and Planned Activities

Connecting Sentinel Asia to the National DRRM System with the Support of ADB TA and JAXA

- ADB had preparatory meetings with stakeholder agencies such as OCD, DSWD, PHIVOLCS, PAGASA and got favorable feedback from them on the framework.
- ADB will hold a workshop to discuss the proposed framework intensively with the stakeholders and to establish the new framework for Sentinel Asia.



SUMMARY



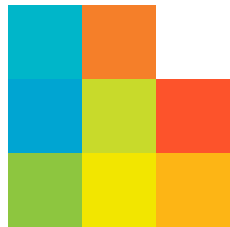
SUMMARY

ADB's efforts on DRM in the region with Sentinel Asia

- ADB is trying to incorporate high level technology such as space-based technology and ICT into its operations
- ADB TA is working with JAXA and Sentinel Asia on DRM in four countries, and the results of project will be ready for share with other Sentinel Asia members
- To fully leverage Sentinel Asia in national DRM system, filling the gap between Sentinel Asia members and national DRM system is essential.

Thank you.

Presentation by



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Sustainable Development and Climate Change Dpt.



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