



# **“TOWARD FUTURE PRECIPITATION MEASUREMENT IN ASIA”**

Halimurrahman

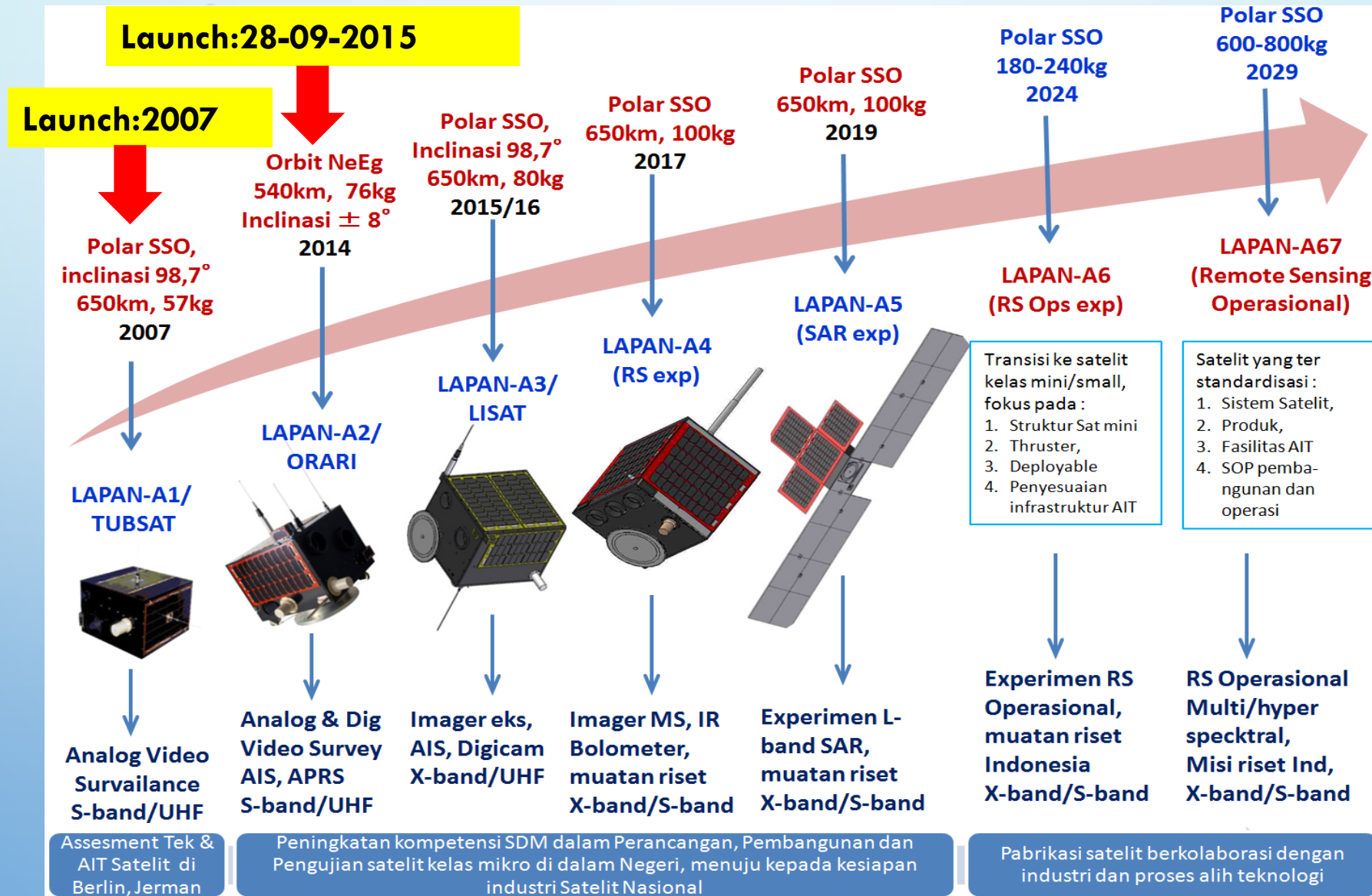
Center For Atmospheric Science And Technology

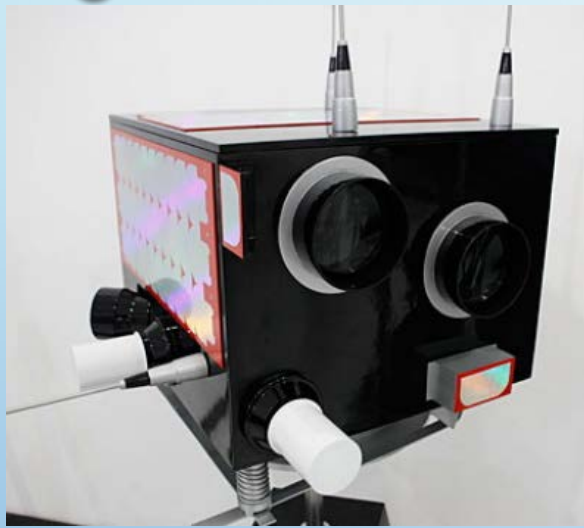
LAPAN

# OBJECTIVES

1. TO INTRODUCE POSSIBLE OPTIONS FOR THE FUTURE SATELLITE PRECIPITATION MEASUREMENTS
2. TO SHARE EXPECTATIONS FROM USERS FOR THE FUTURE SATELLITE PRECIPITATION MEASUREMENTS
3. DISCUSS ABOUT THE PRESENTED OPTIONS AND HOW TO COLLABORATE TO REALIZE BETTER UTILIZATIONS OF SATELLITE PRECIPITATION MEASUREMENTS IN ASIA AND THE PACIFIC.

# ROAD MAP LAPAN's Satellite Development

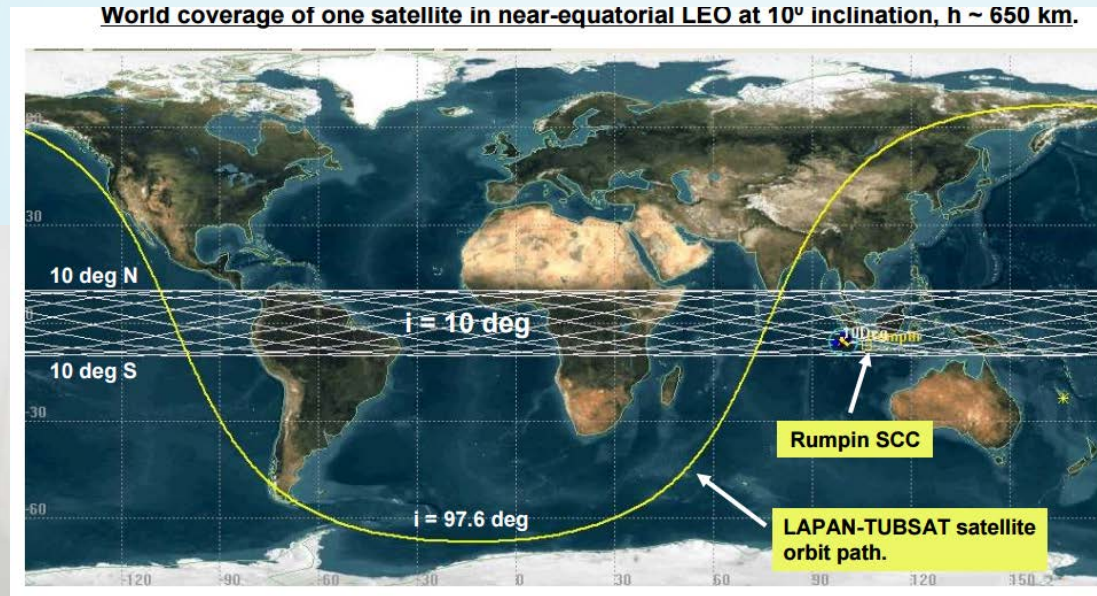




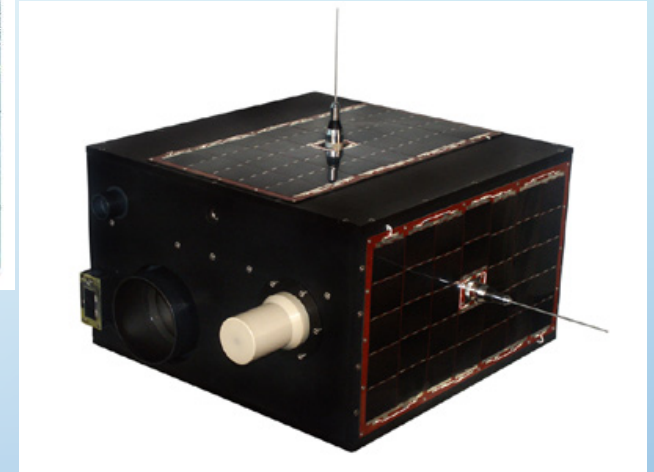
LAPAN/ORARI-A2 72 kg  
28 September 2015  
LEO: Equatorial

**Mission:**

- Automatic Identification System (AIS)
- Radio communication Amateur/ORARI to disaster support
- Earth observation using camera



## LAPAN Satellit

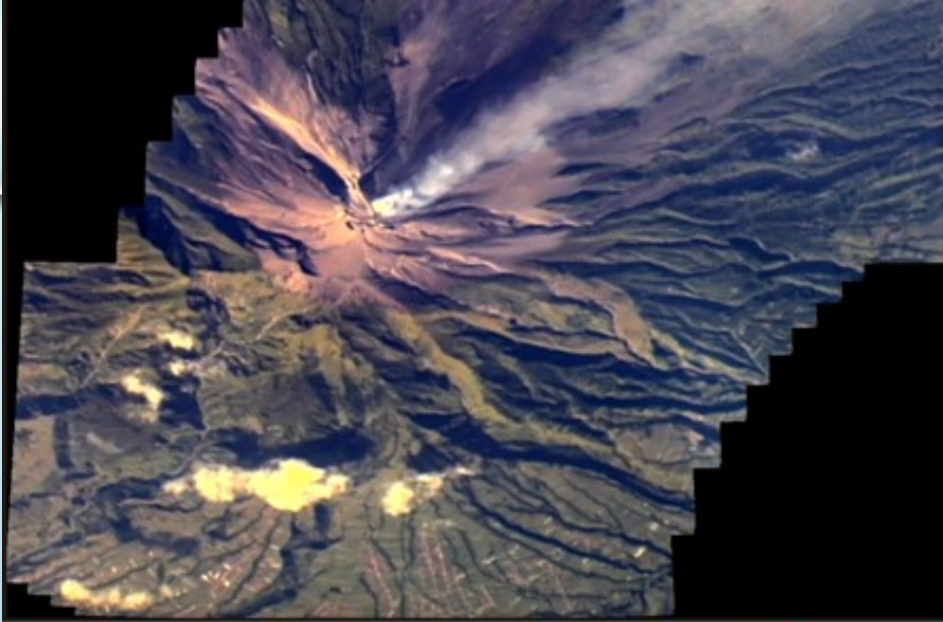


LAPAN/TUBSat-A1 57 kg/2007  
LEO: Equatorial

**Mission:**

- Earth observation using camera

# LAPAN A1 Satellite Product



MERAPI VOLCANO  
MAY 24, 2007



BROMO VOLCANO ERUPTION  
NOPEMBER 28, 2010



FRANSKAISEPO AIR PORT  
BIAK ISLAND, PAPUA  
AUGUST 29, 2010



**Aerial Search Area**  
(Batam)

**Video camera capture (lunar)**

A large, detailed image of the Moon's surface, showing numerous craters and maria, set against a black background. The image is a close-up, showing the texture of the lunar surface with various shades of gray and yellowish-brown. The craters are of various sizes, and the maria are darker, flatter areas. The overall appearance is that of a celestial body with a complex, cratered surface.

[illegible]

The screenshot displays a maritime tracking application. The main map shows the Indian Ocean and surrounding regions. Two ship details pop-ups are shown:

- WOO YEON** (South Korea):
 

Time:	2010-01-01 22:24:45
Country:	South_Korea
MMSI:	441922000
IMO:	9558816
Call Sign:	DSRN4
Type:	Tanker
Destination:	HIGH SEA
- GRAND VEGA** (Panama):
 

Time:	2010-01-02 18:05:10
Country:	Panama
MMSI:	356909000
IMO:	9355252
Call Sign:	3FWB5
Type:	Cargo shipA
Destination:	JP YOK

Both pop-ups include a 'Show Route' button. The interface also features a search bar at the top and a yellow banner at the bottom with the text 'Tracking System'.

## Possible options for the future satellite precipitation measurements

### Consideration of developing small/micro-satellite program: Indonesia

#### Acquisition Technology

Focus on knowledge, skill and experience on integration, test, launch and operation

#### Development of Mission and Technology

Focus on application

Design & Cost Estimate

Performance Satellite

Known and Proven Mission

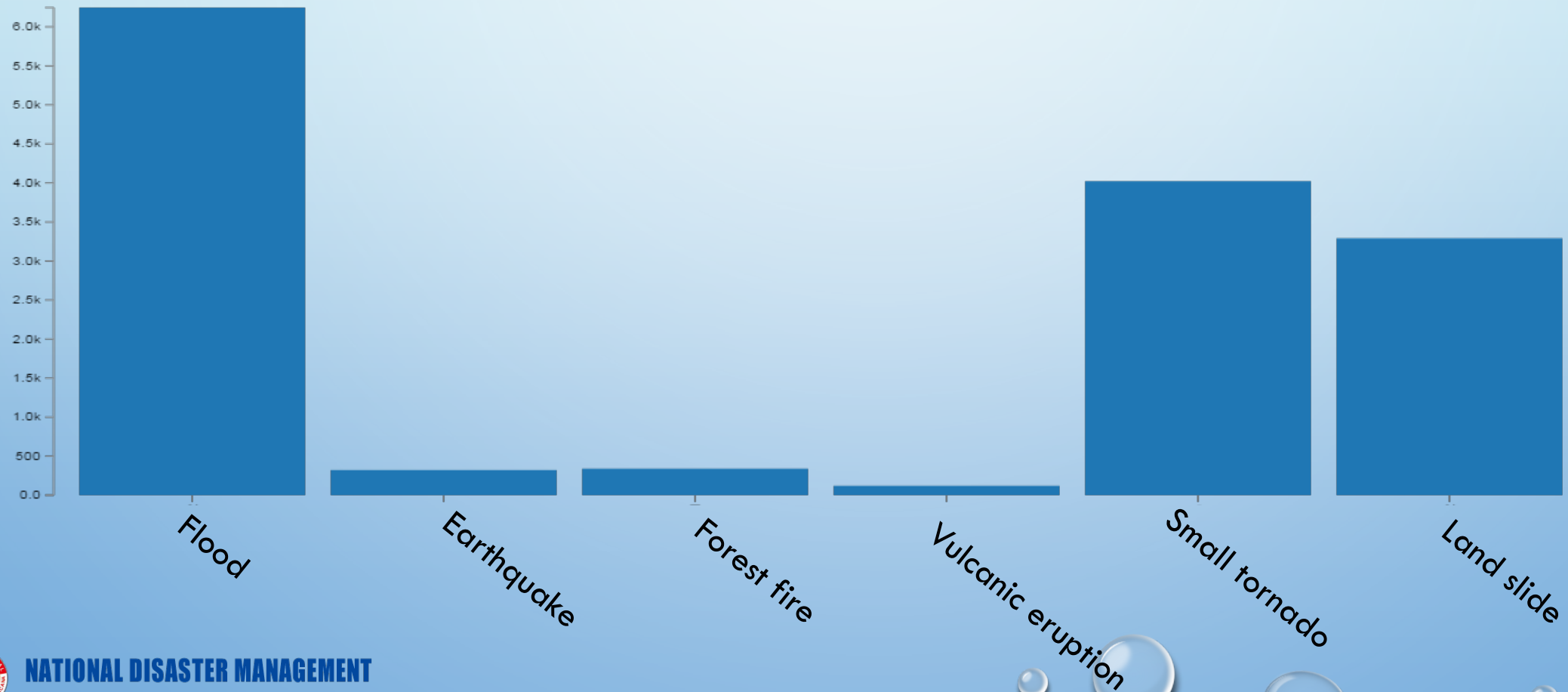
Dedicated and New mission



# EXPECTATIONS FROM USERS FOR THE FUTURE SATELLITE “PRECIPITATION” MEASUREMENTS

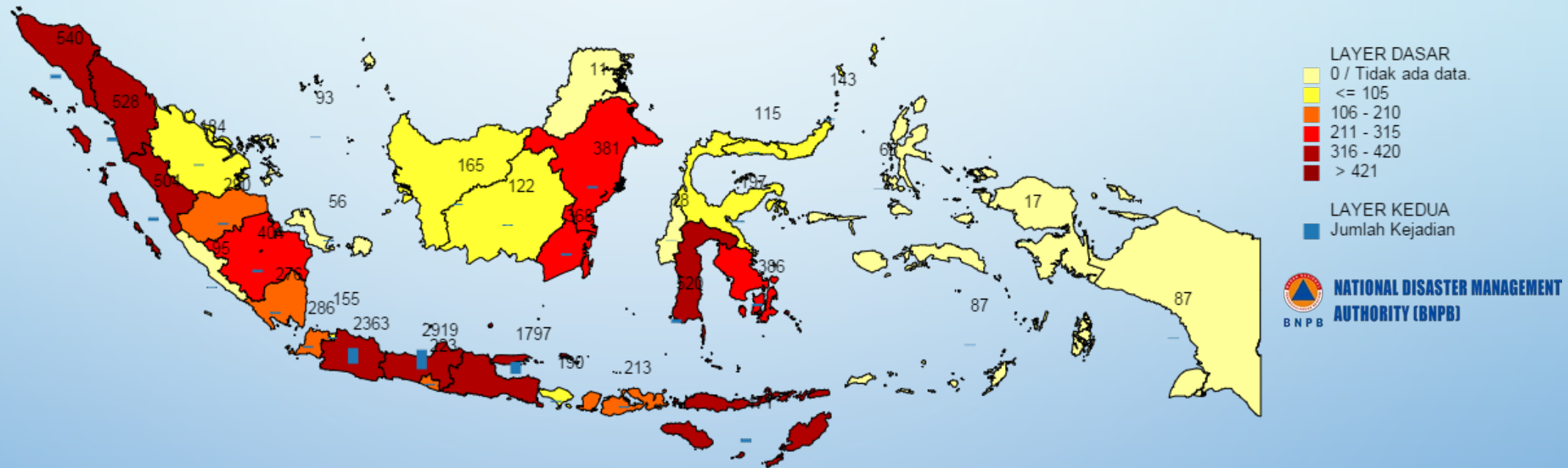


# Indonesia Hazard 1900-2015



- Flood
- Earthquake
- Forest fire
- Volcanic eruption
- Small tornado
- Land slide

# Indonesia Hazard 1900-2015



Jakarta, Jan-2013



Banjar negara, 2014



Kalimantan, 2015



# MISSION APPLICATION (MAPPING AND SURVEILLANCE)

## 1. FOOD SECURITY APPLICATION

- CROP GROWTH CYCLE
- MARINE FOOD RESOURCE
- AGRICULTURE LAND USE AND FARM ESTATES

## 2. MARINE APPLICATION

- POTENTIAL FISHING GROUND;
- COASTAL ZONE AND ENVIRONMENT;
- MARINE POLLUTION;
- MARINE VEHICLE MONITORING;

## 3. LAND APPLICATION





2.

**OPTIONS AND HOW TO COLLABORATE TO REALIZE  
BETTER UTILIZATIONS OF SATELLITE PRECIPITATION  
MEASUREMENTS IN ASIA AND THE PACIFIC**



# STEPS TOWARD SATELLITE “PRECIPITATION” MEASUREMENTS

## Indonesia (National) User Requirement

### Potential Users:

- BMKG
- Disaster Management Authority
- Agriculture Ministry
- Ministry of Forestry
- Marine Ministry

### Technical Department

- LAPAN
- BPPT
- LIPI

1

YES

## Observing Principles and Standards

### Potential Users & Technical Users

- Sensor (Multi-spectral bands, Radar)
- Scanning
- resolution

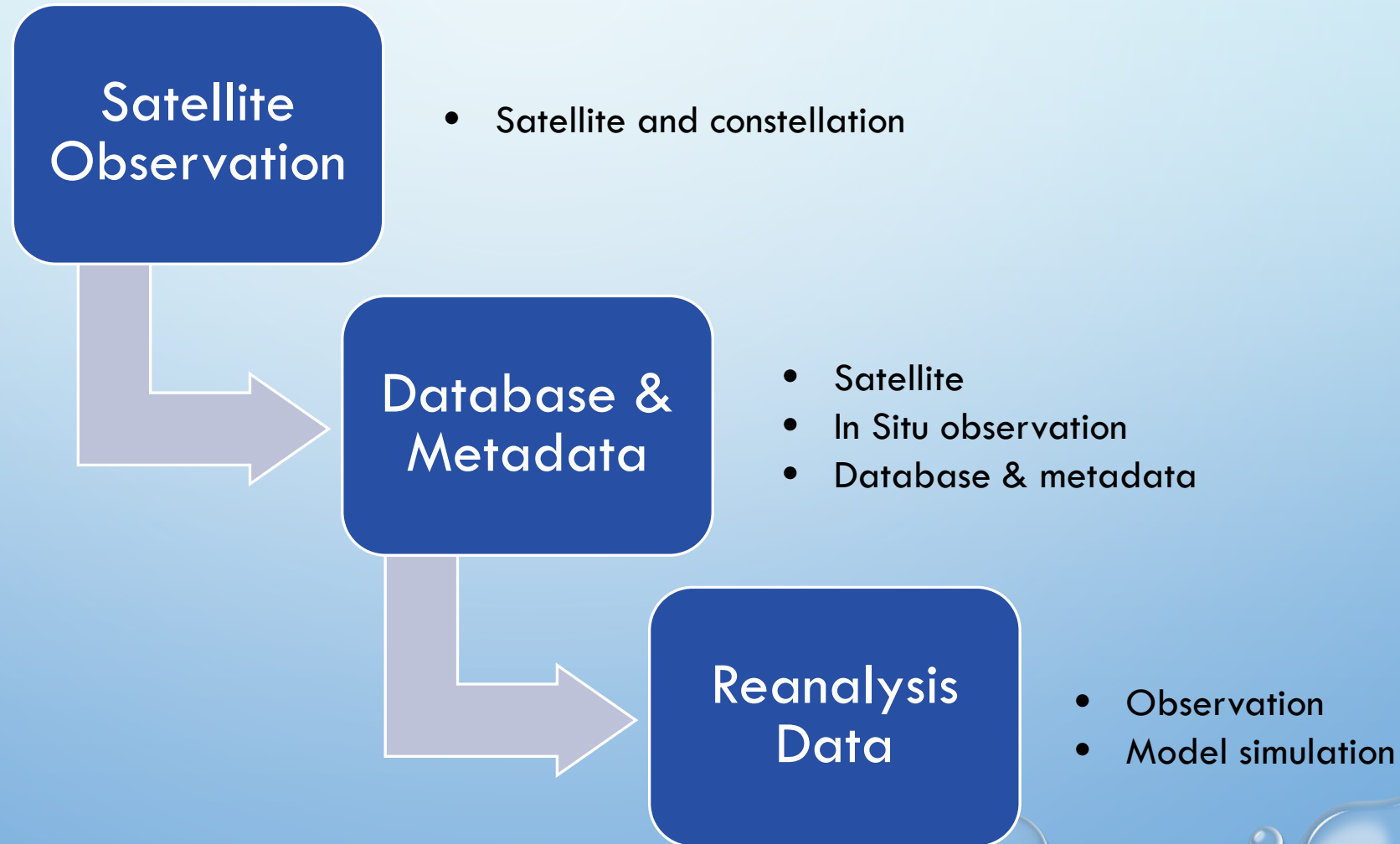
2

## Available/Existing Satellite Data

Indonesian National development planning

Advanced  
Country  
Japan, US

# SUSTAINED OBSERVING SATELLITE PROGRAM



# SUMMARY

- LAPAN have consideration on the potential use of equatorial and near-equatorial orbit EO satellites for indonesia;
- Micro-satellites are potential experimental satellites in the near-equator inclined orbit, to explore additional advantages and challenges;
- More study is needed to address Indonesia Nasional mission requirement
- National/International cooperation is significant to elaborate and utilize the optimum potential small satellite systems

The background of the slide is a light blue gradient. It is decorated with several realistic water droplets of various sizes. Some droplets are at the top left, some are at the bottom right, and others are scattered in the lower half. Each droplet has a highlight and a shadow, giving it a 3D effect.

THANK YOU FOR YOUR ATTENTION