



WMO GOOD PRACTICE OF MHEWS WITHIN THE PERSPECTIVE OF INDONESIA

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Strengthening Multi-Hazard Risk Assessment and Early Warning System with Applications of Space and Geographic Information Systems in Pacific Islands Countries, Nuku'alofa, Tonga, 26-27 April 2018

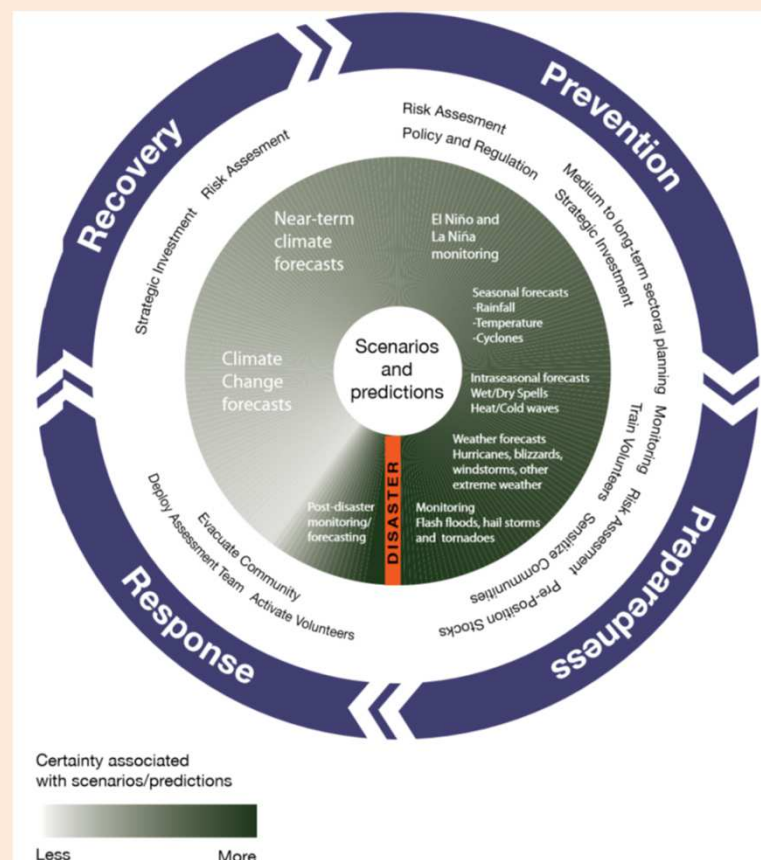
- 1. WMO DRR STRATEGIC PLAN 2019 – 2023;**
- 2. GOOD PRACTICES;**
- 3. GAP ASSESSMENT;**
- 4. INDONESIA'S APPROACH;**
- 5. SUMMARY.**



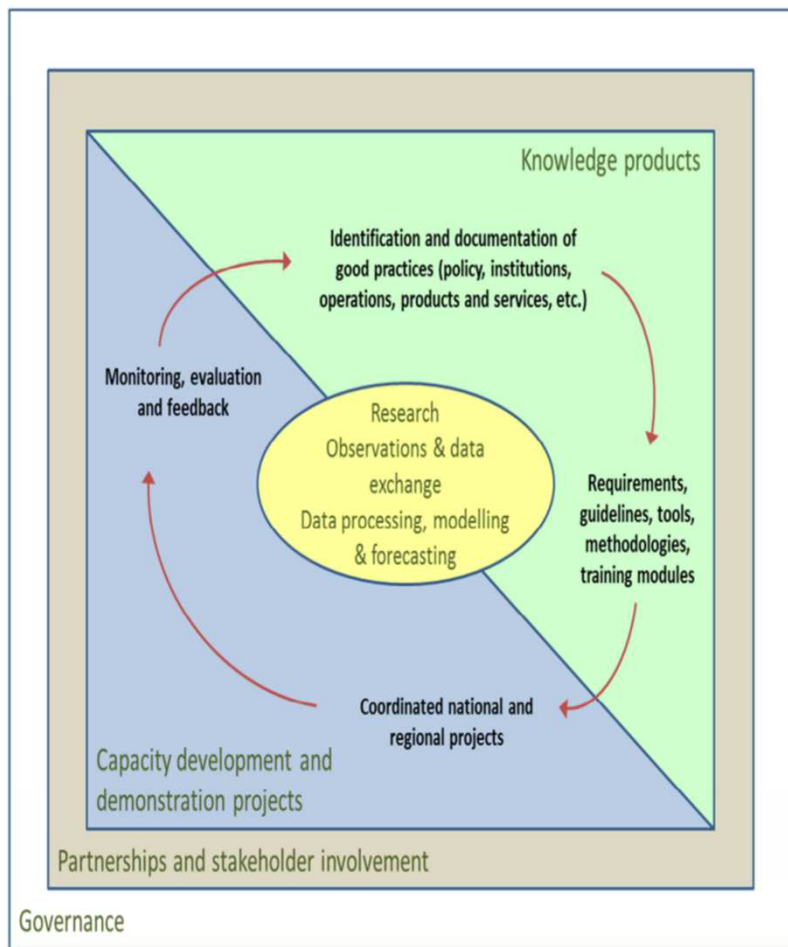
WMO DRR STRATEGIC PLAN 2019 – 2023

- Disaster Risk Management → Increase resilience;
- Risk Assessment → past, existing and potential future risk;
- Risk Reduction and Adaptation Strategies:
 - **Prevention** and **Mitigation**;
 - **Preparedness**;
 - Response;
 - Recovery

CLIMATE INFORMATION INTO THE DISASTER RISK MANAGEMENT CYCLE



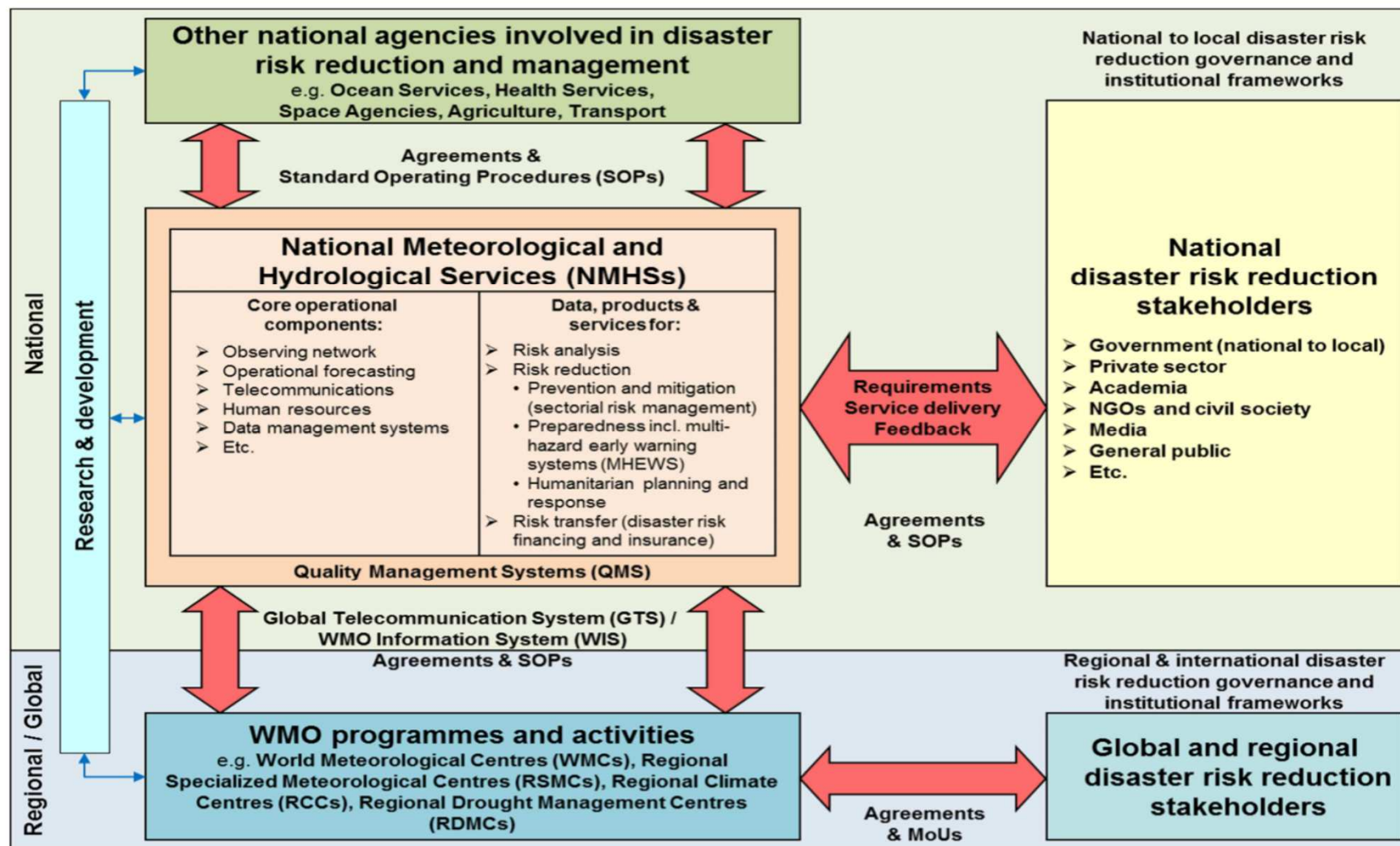
6 ACTIVITY PILLARS



1. Governance (incl. **internal linkages and coordination**);
2. Service **delivery** and stakeholder **engagement**;
3. Development of **knowledge products**;
4. Capacity development and **demonstration projects** (incl. training);
5. Partnership and collaboration (incl. **external linkages and coordination**); and
6. **Research and development**

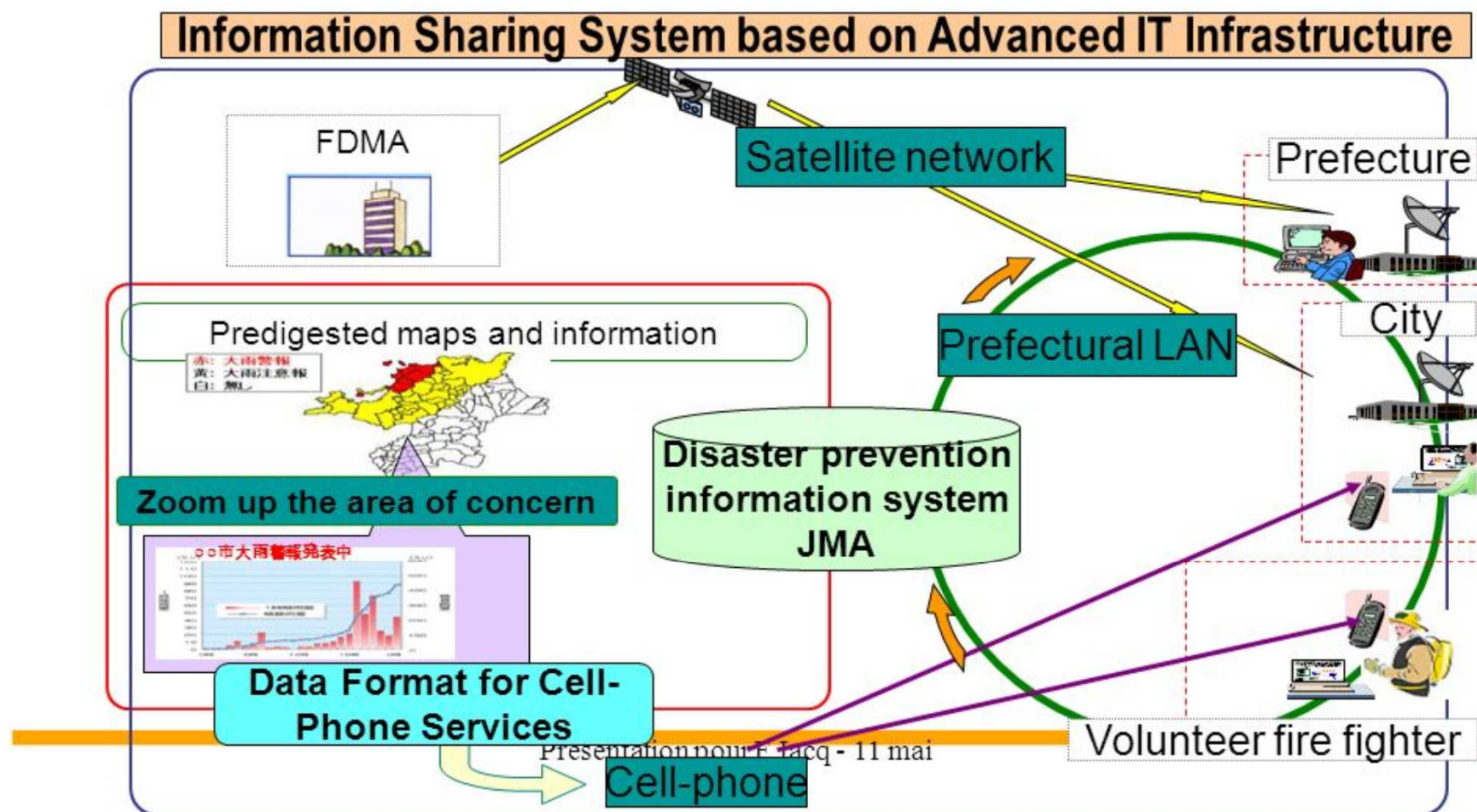
1. **Provide a single authoritative voice** for meteorological, hydrological and climate hazard information and warnings (and for other hazards under their individual mandates) to be **used in prevention, mitigation, preparedness (including early warning), response and recovery as well as for risk and loss/damage assessments and financial protection**;
2. **Provide advice and approaches** that could be taken to reduce exposure to hazards and vulnerabilities and **increase societal resilience, through both structural and non-structural measures** such as the provision of design data climate advice which highlights the potential vulnerability of particular areas to known or expected hazards;
3. **Inform, mobilize and partner** with academic institutions and other experts that can contribute to this information and advice; and,
4. **Educate and raise awareness** of the general public and **tactical and strategic decision making** authorities (governmental and non-governmental entities) to understand hazards and related risks, warnings and associated uncertainties.

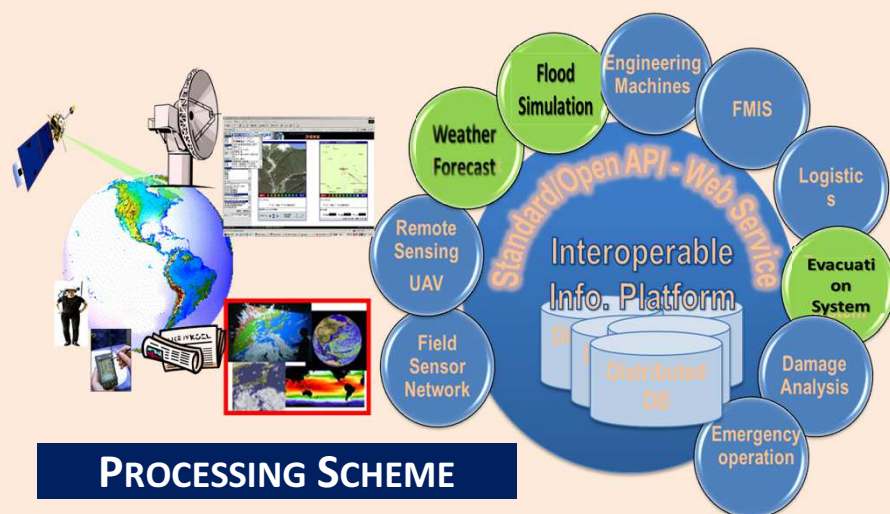
FRAMEWORK OF PRODUCT DELIVERY





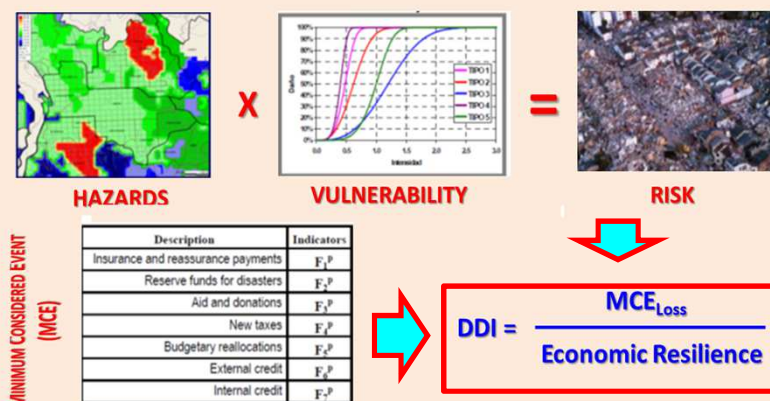
GOOD PRACTICES





PROCESSING SCHEME

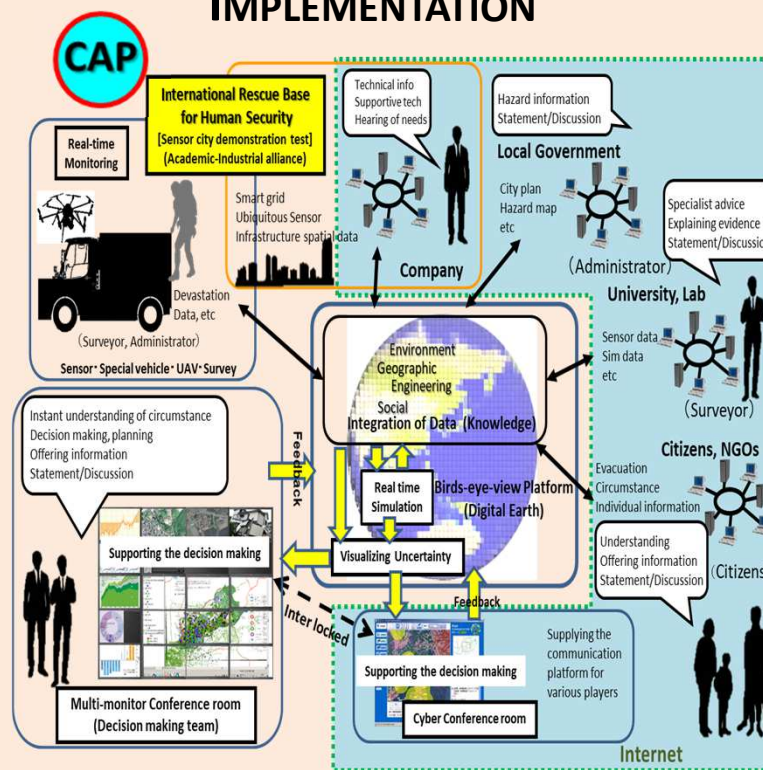
PRODUCT DELIVERY



IMPACT BASED FORECASTING – RISK BASED WARNING

COMMUNITY BASED DSS ON DRR

DIGITAL EARTH BASED DRR IMPLEMENTATION



Source: Fukui, H., Findings and Recommendations for Early Warning System for PICs ---Towards Resilient and Sustainable Society in Pacific, the 2nd EGM Pacific MHEWS on Knowledge Hub, Double Tree Hotel, Jakarta, 8 -9 Jun'17.

1. **Observational Instrumentation**: (1) Land, (2) River, (3) Ocean, (4) Upper Air, (5) Space → **densely populated and integrated** → Hydro-met and Geo-spatial data parameter;
2. **Processing**: Data, storage, computing tool → SPEED → **impact based analysis and forecast** → globally **standard format** (Risk based warning and impact based forecast);
3. **Dissemination infrastructure** → broad coverage and near real time based;
4. **Interface institutions** → decision dash board system → Inter-institutional coordination;
5. **Community awareness** → disaster literacy → **self evacuation** (not panic).

OPPORTUNITY

1. **Investment**:
 - What is sufficient;
 - Decreasing budget allocation;
 - Long term development.
2. **Funding**:
 - Donor countries;
 - PPP.
3. **Technology development**:
 - Cascading Approach (WMO);
 - Open Source;
 - Band width;
 - Minimum Essential Infrastructure → **Roadmap**.
4. **Capacity Building**:
 - Capacity gap;
 - Twinning Scheme



GAP ASSESSMENT



PACIFIC GAP ASSESSMENT FINDINGS



1. Risk Identification

- a. Leading Agency;
- b. Equipment/Facility;
- c. Data/Information Management

2. Forecasting and Assessment

- a. Leading Agency;
- b. Coordination/Communication Mechanism;
- c. Human Resources;
- d. Equipment/Facility;
- e. Data/Information Management

3. Warning & Communications

- a. Leading Agency;

- b. Coordination/Communication Mechanism;
- c. Equipment/Facility;
- d. Data/Information Management:

4. Immediate Response

- a. Leading Agency.
- b. Coordination/Communication Mechanism;
- c. Human Resources
- d. Data/Information Management:

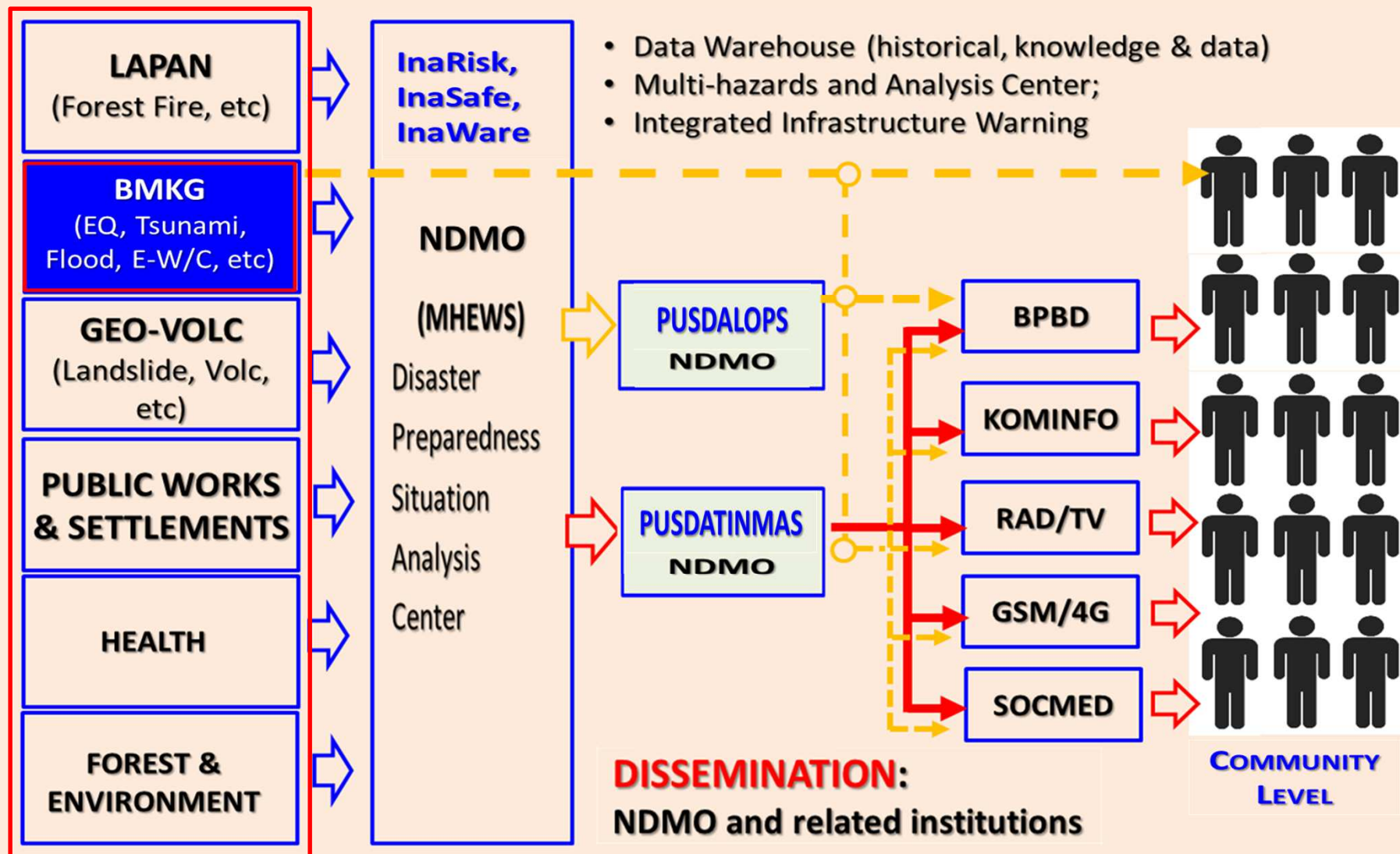
5. Budget

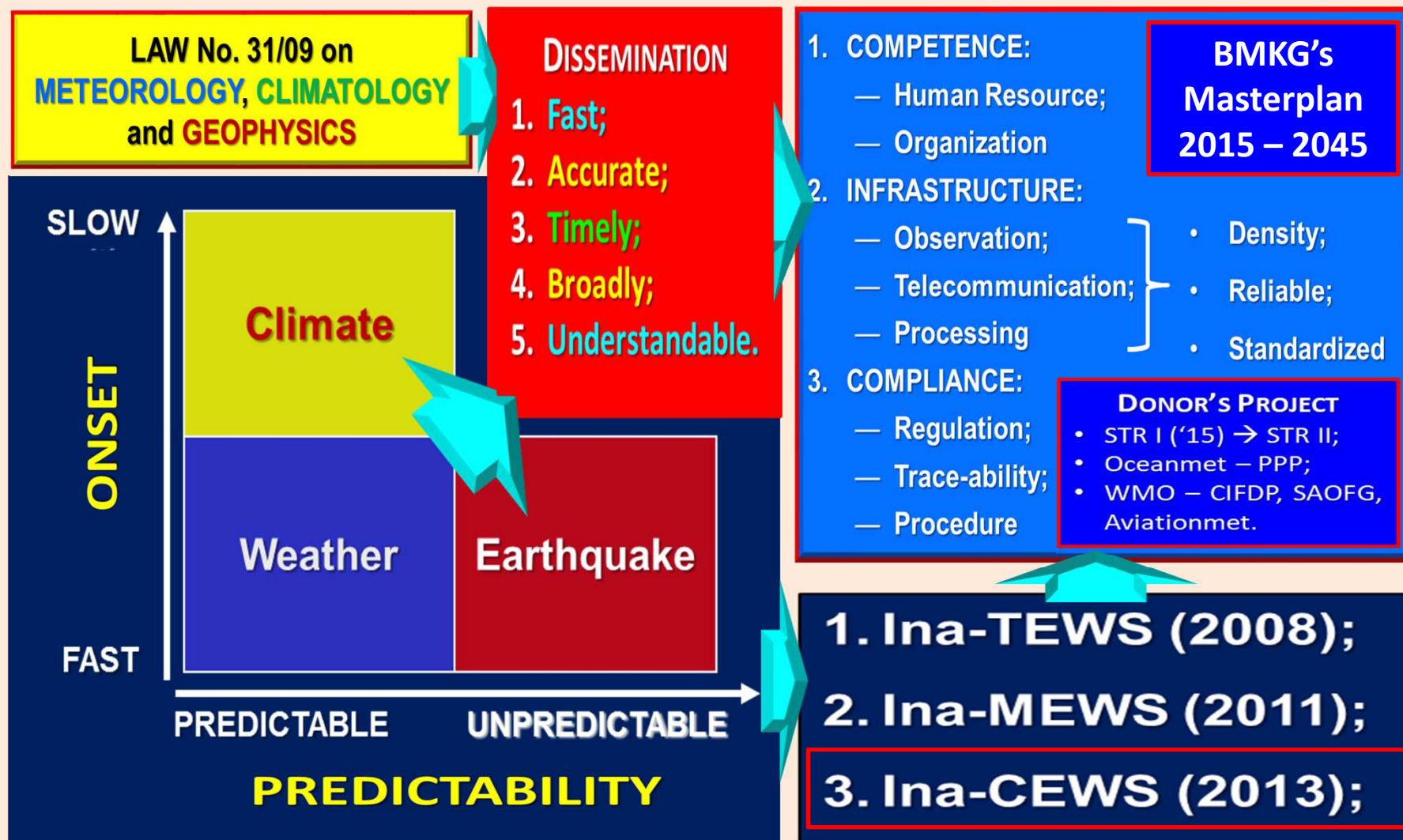
6. Supporting Policy/Legislation



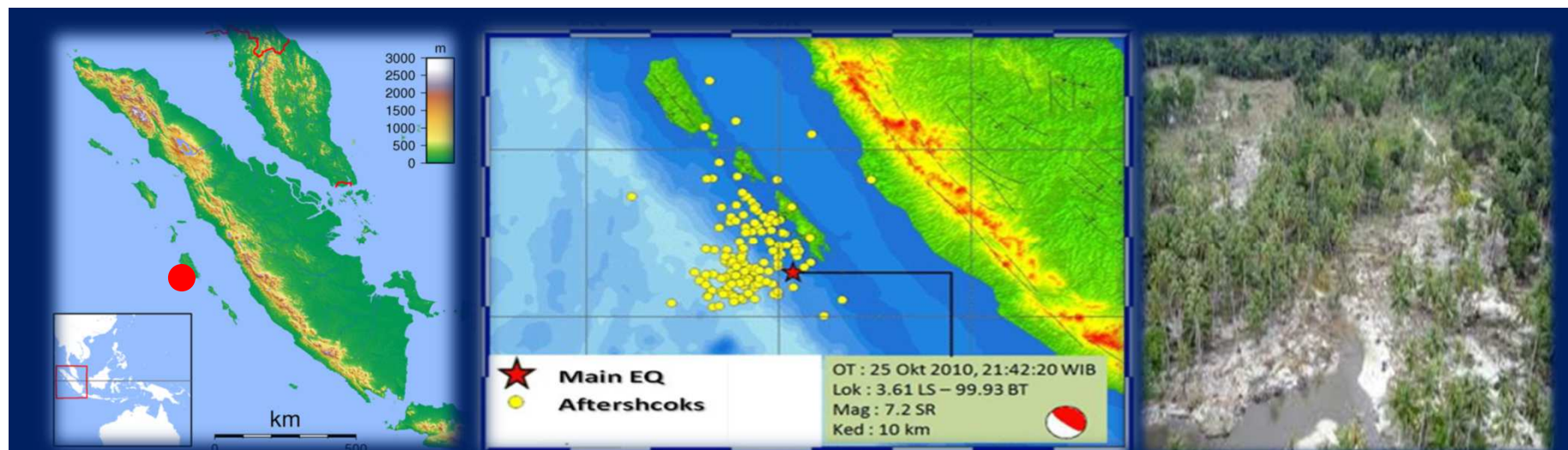
INDONESIA'S APPROACH

NATIONAL FLOW OF INFORMATION (LAW 24/07)





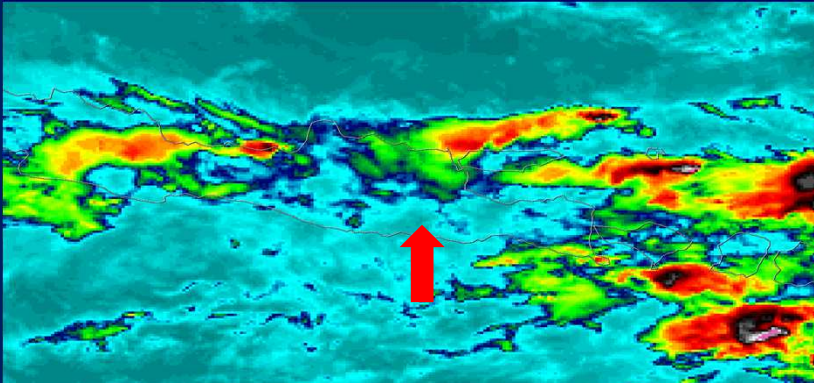
MENTAWAI'S TSUNAMI – 25 OCT'10



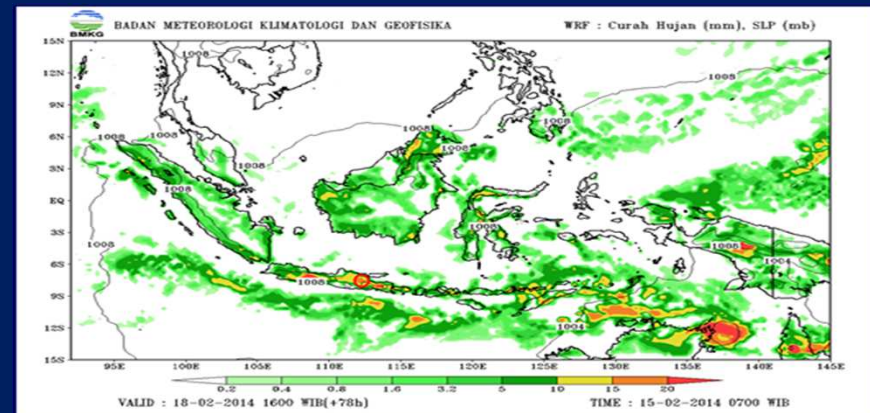
1. Mentawai's tsunami, **25 October 2010**, displaced **> ~ 20,000 people**, affected about **4,000 households**, and **435 people reported dead**, with over **100 more missing**;
2. TEWS worked well as it disseminated the warning within **4 minute 46 seconds**;
3. The epicenter was so close that a warning would probably have been too late as the tsunami only took about five to ten minutes to reach Pagai;
4. **Post comprehensive evaluation** → the **system worked well**, the **downstream part is as not fast as the upstream development**.

MT KELUD'S ERUPTION 14 FEB'14

Mount Kelud, East Java



13 Feb 2014 23:03 – 23:48



Heavy rain was predicted to occur in 18 Feb 2014 1 at ~16:00



- Volcanic ash spread over Java island till Yogyakarta. About 50 Mill-m3 posed danger Kelud volcanic materials around the slopes of the volcano;
- Heavy rains occurred as predicted around Mount Kelud since **3 p.m. on Tue, 18 Feb'14 led to cold lava flooding;**
- People have been ordered to stay alert and away from river banks;
- Total **economic loss ~ 17.8 Tr IDR**, 2 life loss due to house collapsed from the weight of ash, but **no single life loss during cold lava flooding post heavy rain fall.**



SUMMARY

1. End-to-end approaches through **long term planning** and **roadmap**, **step by step implementable work plan**;
2. Bridging the gap through continuous modernization of the **system**, **infrastructure** and **capacity building**.



Thank You



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