

Outline of presentation



- **Main research question**
- **New Early Warning System (EWS) Framework**
→ Beyond four components
- **Application / Research Data**

- **Results and Discussions**
- **Conclusion**

Main Research Question



- How do certain attributes of governance and institutions function and how should they function in society to enhance the capacity to manage resilience in the case of uncertain tsunami risks.

The New Integrated Early Warning System –Governance Framework



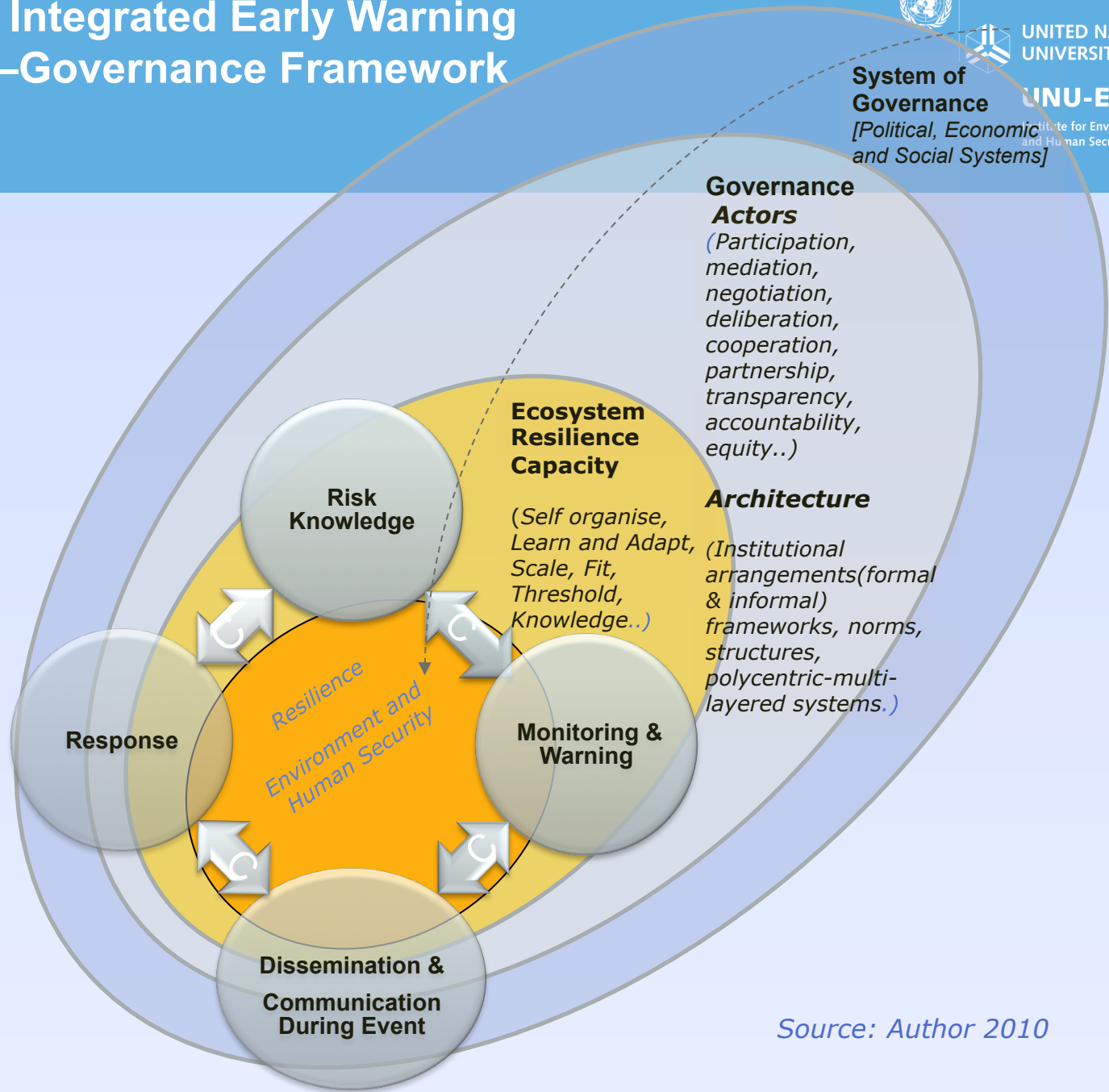
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**System of
Governance**

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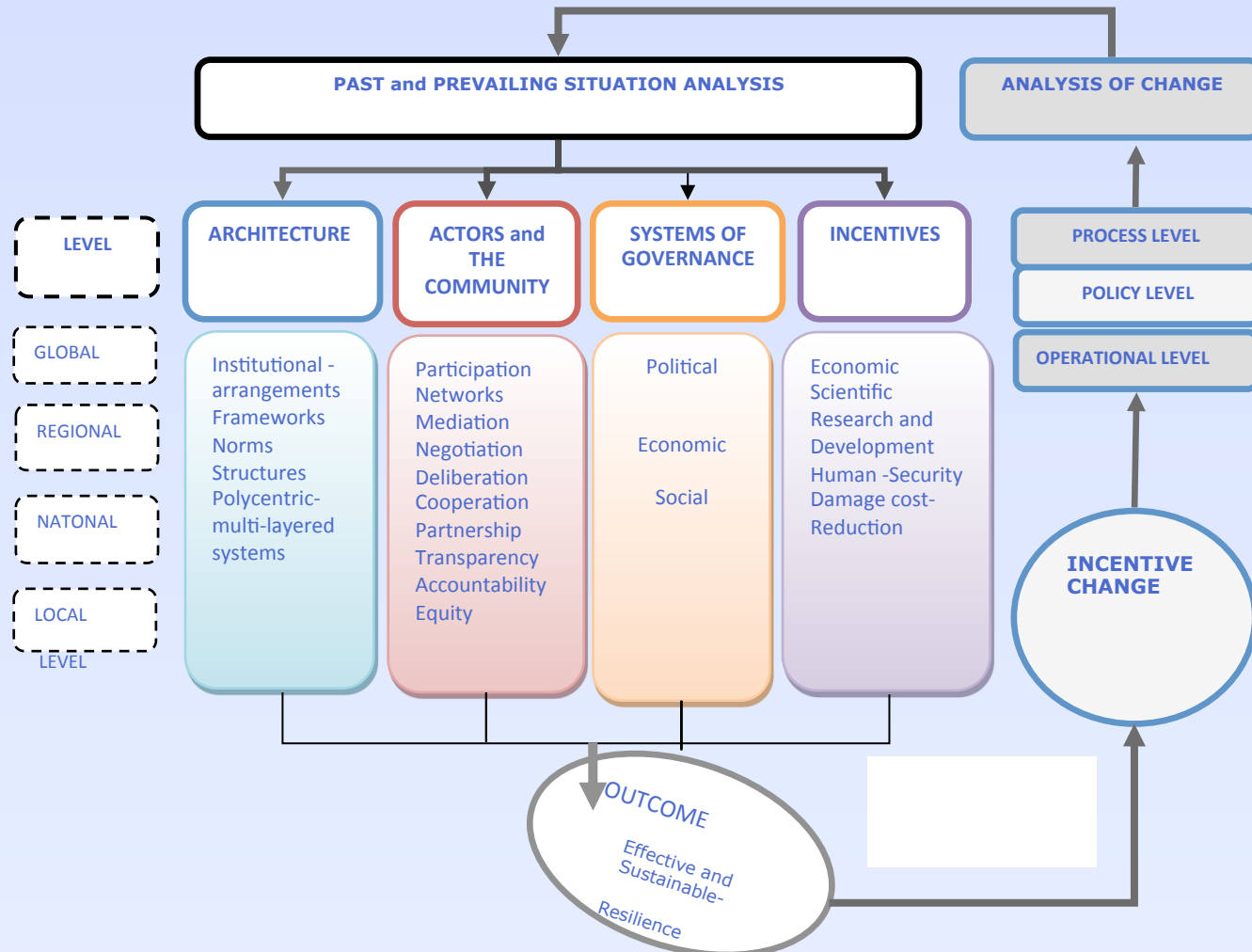


Source: Author 2010



Analytical Steps

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Source: Author 2010

Application

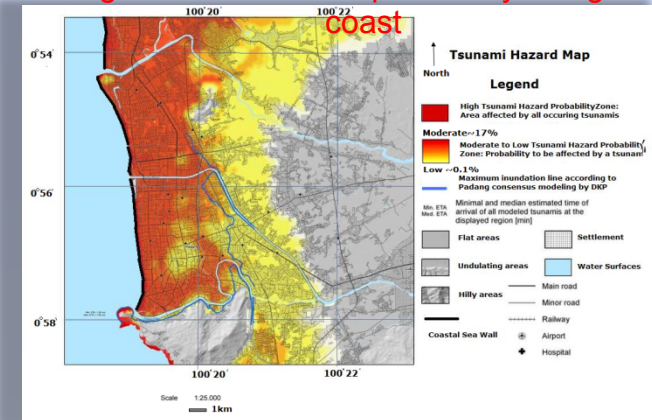
- The study focuses on Padang coastal city and Bali in Indonesia.



Source: National Geographic Society 2003

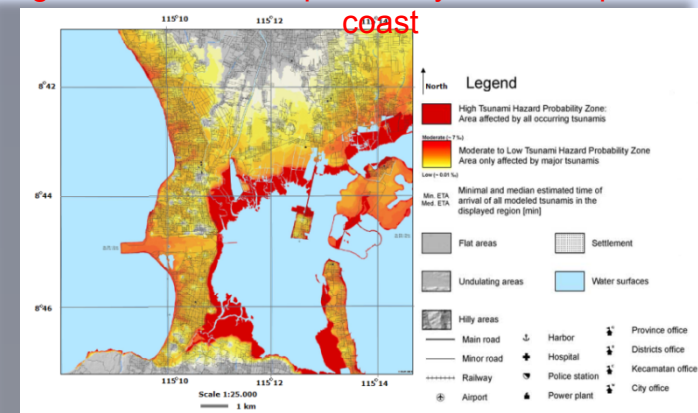
Padang Tsunami Hazard Map

High tsunami hazard probability along the coast



South Bali Tsunami Hazard Map

High tsunami hazard probability at certain parts of the coast



Source: DLR in the framework of the GITEWS project 2009

Data



- Actor Expert Interviews
- Informants Interviews
- Focus group discussions
- Surveys
- Technical papers and documents
- Media material
- Other secondary quantitative data

Systems of Governance to Implement and Sustain TEWS in Indonesia

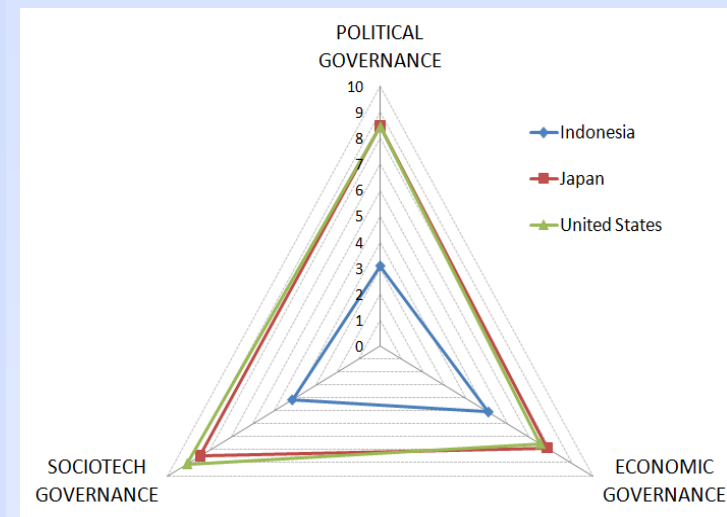


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- Emerging strong economic system of governance in Indonesia
- Wide governance gap between Indonesia compared to the United States and Japan.
 - Indonesia will face tough challenges to implement and sustain an effective TEWS



Source: Author 2010

TEWS/ DRR Related Architectures and Structures

Evolution of Institutional Changes Related to DRR in Indonesia



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Goal	Disaster Risk Reduction / Disaster Management <i>Paradigm Shift from Response towards Preparedness</i>										
	Emerg Relief	Coordination of Disaster Response			Manage Induced Disasters and Social Unrest						Steering Committee [Formulate Policies, Monitoring and Evaluation] Executive Board [Coordinate Command and Execute]
Structural Change	Advisory Board	NAT DM Coord Board BAKORNAS PBA	NAT DM Coord Board BAKORNAS PB	NAT DM Coord Board BAKORNAS PBP	INATEWS Dev	DRR Action Plan 2006-2009				^Creation of Multi-Level DM Agencies	Nat DRR Platform
Legal Basis	Constitution										
		Pres Decree No. 28 / 1979	Pres Decree No. 43 / 1990	Pres Decree NO. 106 / 1999	Min Decree NO. 21 / 2005 HFA initially signed	Pres Decree NO. 19 / 2006	DM Law NO. 24/ 2007	Pres Decree: No .8 / 2008^ Gov Regulation: PP No. 21/ 2008- DM Arrangement PP No22/2008- Funding PP No 23/ 2008 –External support			
	1945	1966	1979	1990	1999	2005	2006	2007	2008		2009*

INATEWS: Indonesian Tsunami Early Warning System

Time (Years)

Dev: Development

Nat: National

HFA: Hyogo Framework for Action 2005-2015

Pres: Presidential

Min: Ministerial

Coord: Coordination

Emerg: Emergency

*Full implementation (Institutionalized in 2008)

Source: Author 2010

TEWS / DRR Related Architectures and Structures



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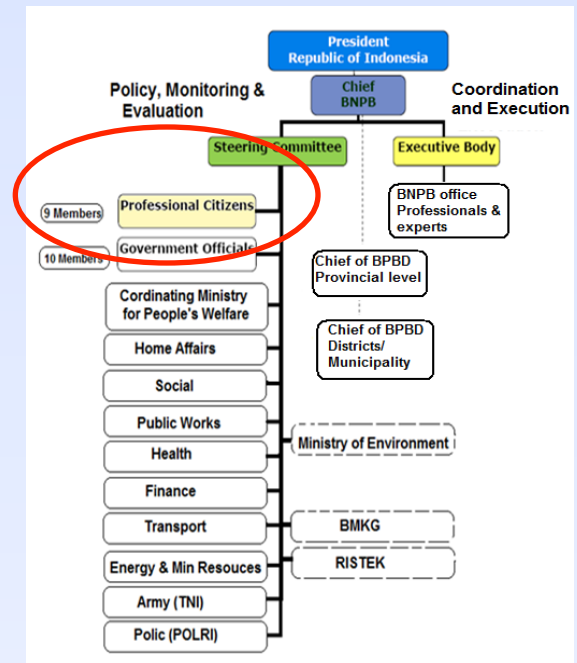
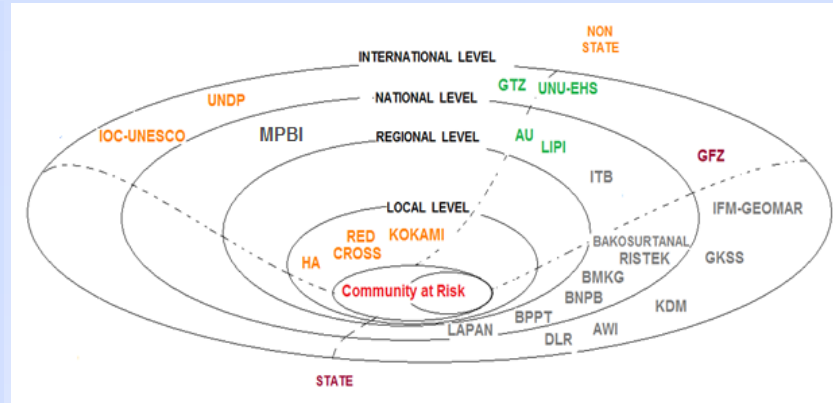
- There are many challenges in implementing the polycentric-multi-layered architectures and structures.
 - Few provinces and districts have actually completed the DM local regulation and established the sub-national DM agencies and EOCs .

- The key obstacles include:
 - Multi-level commitment
 - Bureaucracy
 - Lack of financial resources and specialised human capacities.

Actors Interaction with the TEWS / DRR Architecture in Indonesia



- Relatively high degree of multi-stakeholder participation
- New steering committee of DM Agency (BNBP) consisting of professional citizens



Disaster Management Financing

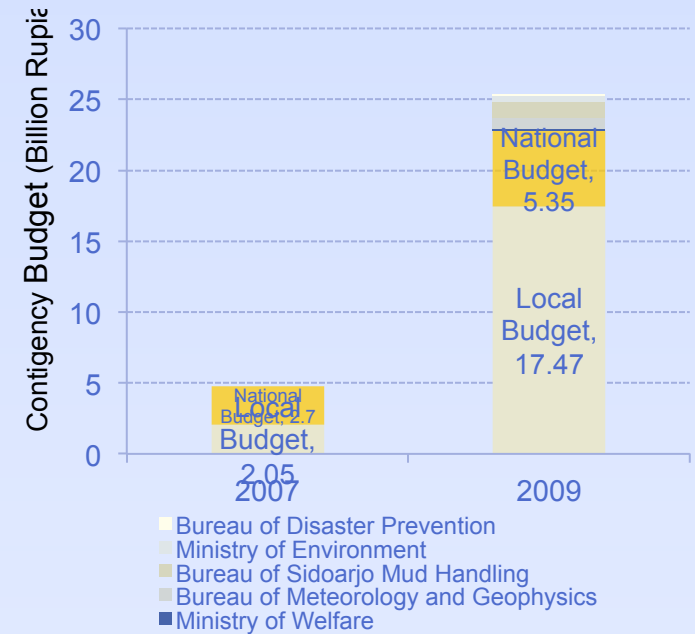


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- The DM financing:
 - Increased (2.1 % national budget)
 - Integrated in the government annual plans
 - Increased at the local level (i.e. financial decentralisation)



Data source: Ministry of Finance, Indonesia 2009



Disaster Management Financing

- However, budget allocation is:
 - Significantly spatially variable leading to unjust allocation of funds
 - Mostly for post disaster response.
 - DM financing is an issue that is constantly contested and negotiated.

The TEWS at the Level of Padang and Bali



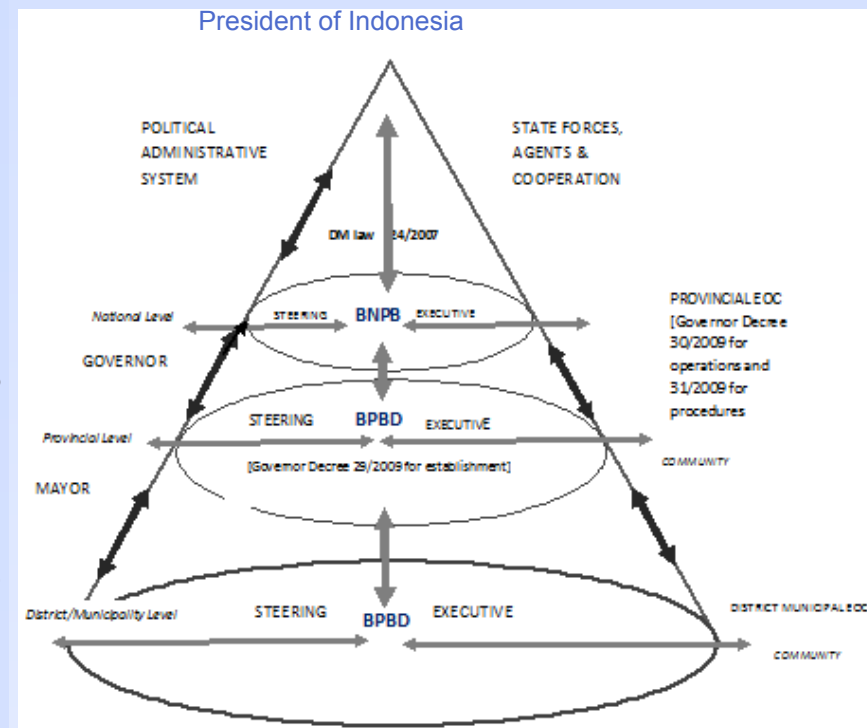
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- Similar polycentric-multi-layered architectures are being developed and implemented in Bali and Padang.
 - Governor Decree to legitimise the establishment and functions of the local BNPB and EOC.
- A tsunami warning chain is gradually emerging
 - Province and districts with EOC have the mandate to make decisions what to do according to the SOPs once tsunami information is received (Governor Decree)



Source: Author 2010

The TEWS at the Level of Padang and Bali



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- The key contrasts between the development of tsunami resilience in Padang and Bali are as follows:
 - Political commitment and participation are perceived to be higher in Padang.
 - Risk knowledge generation has been a highly contested area in Padang.
 - Padang has made more progress in institutional disaster preparedness
 - The emerging multi-stakeholder partnership and institutional arrangements with the tourism sector, the traditional and cultural structures are far more complex in Bali.



- At least two non-state actors have emerged as agents and have exercised agency beyond the state where and when the state was unable to effectively respond.
 - MPBI (Indonesian Society for DM) exercised agency in institutional change in DM Indonesia.
 - KOGAMI (Tsunami Alert Community) exercised agency in community disaster preparedness in Padang, Indonesia.
- The underlying conditions of their authority and legitimacy include:
 - A mix of knowledge base
 - Consent and trust from the state
 - Support from the community.
 - Extensive network at multiple levels and scales
 - Flexibility

Towards a Future Effective and Sustainable TEWS



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- There is sufficient evidence to suggest that the current TEWS which relies on a technocratic approach and follows a multi-level linear warning chain process would be partially or completely ineffective in dealing with the earthquake-tsunami risks as revealed in the case studies.

- Tensions arise and there is constant debate about the actual mode of TEWS governance
 - “...Official earthquake-tsunami information was largely absent in the first 30 minutes after the earthquake in Padang” (GTZ-IS 2010).

Towards a Future Effective and Sustainable TEWS



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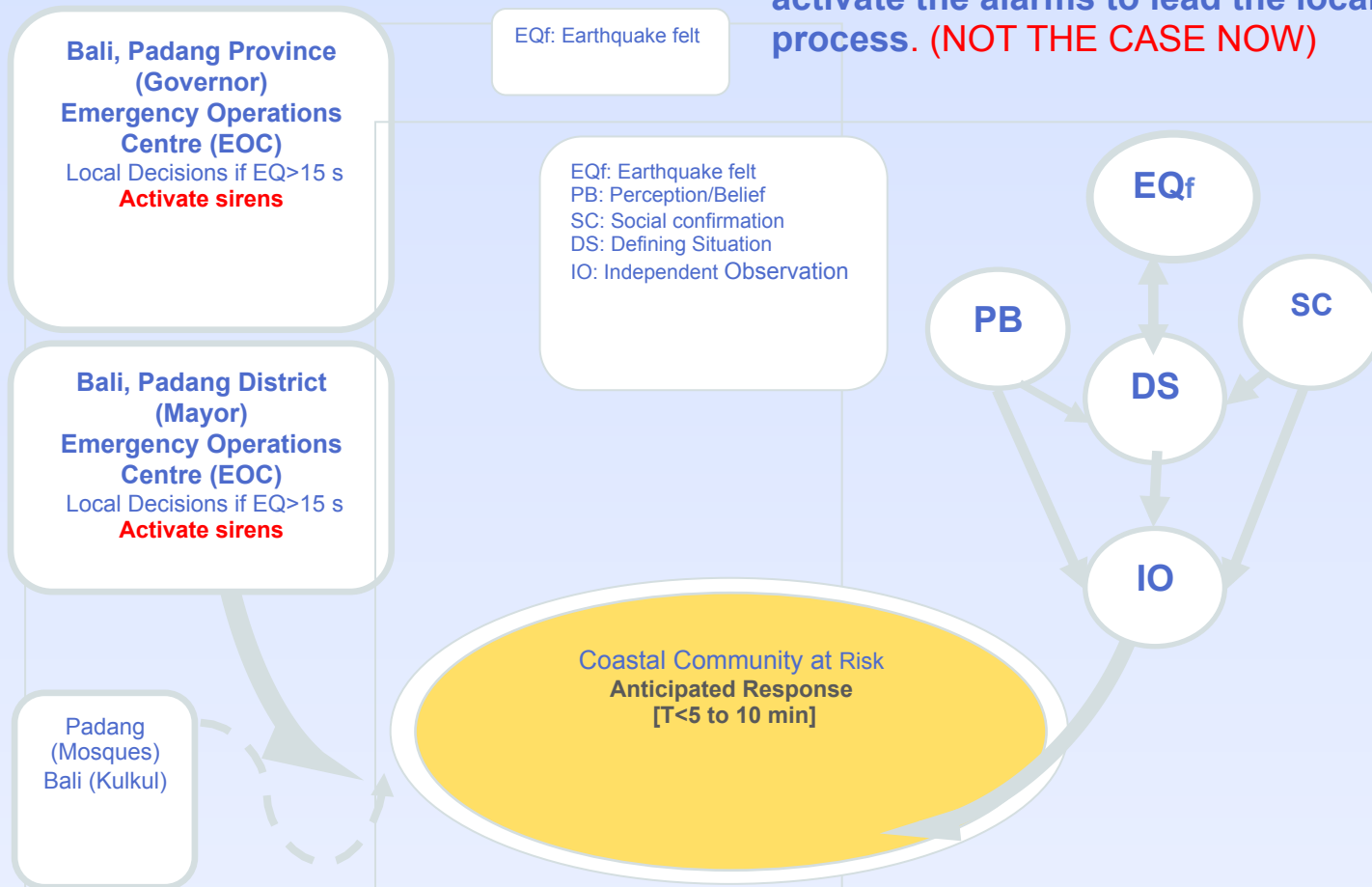
- From a resilience point of view it is argued that there is a problem of the fit and adaptability of the existing TEWS to the ecological challenge.
- Hence, a theoretical basis of a TEWS framework is proposed.
- The key idea is that EW starts not only with the instruments but also the people!

Towards a Future Effective and Sustainable TEWS



■ Micro-level reaction – Non-linear behaviour

- In the case that a significant earthquake is felt for long enough duration, the **EOC** at provincial and district level should independently have the mandate to activate the alarms to lead the local TEWS process. **(NOT THE CASE NOW)**



Towards a Future Effective and Sustainable TEWS

A Mixed Model Approach-Linking at Different Levels and Scales

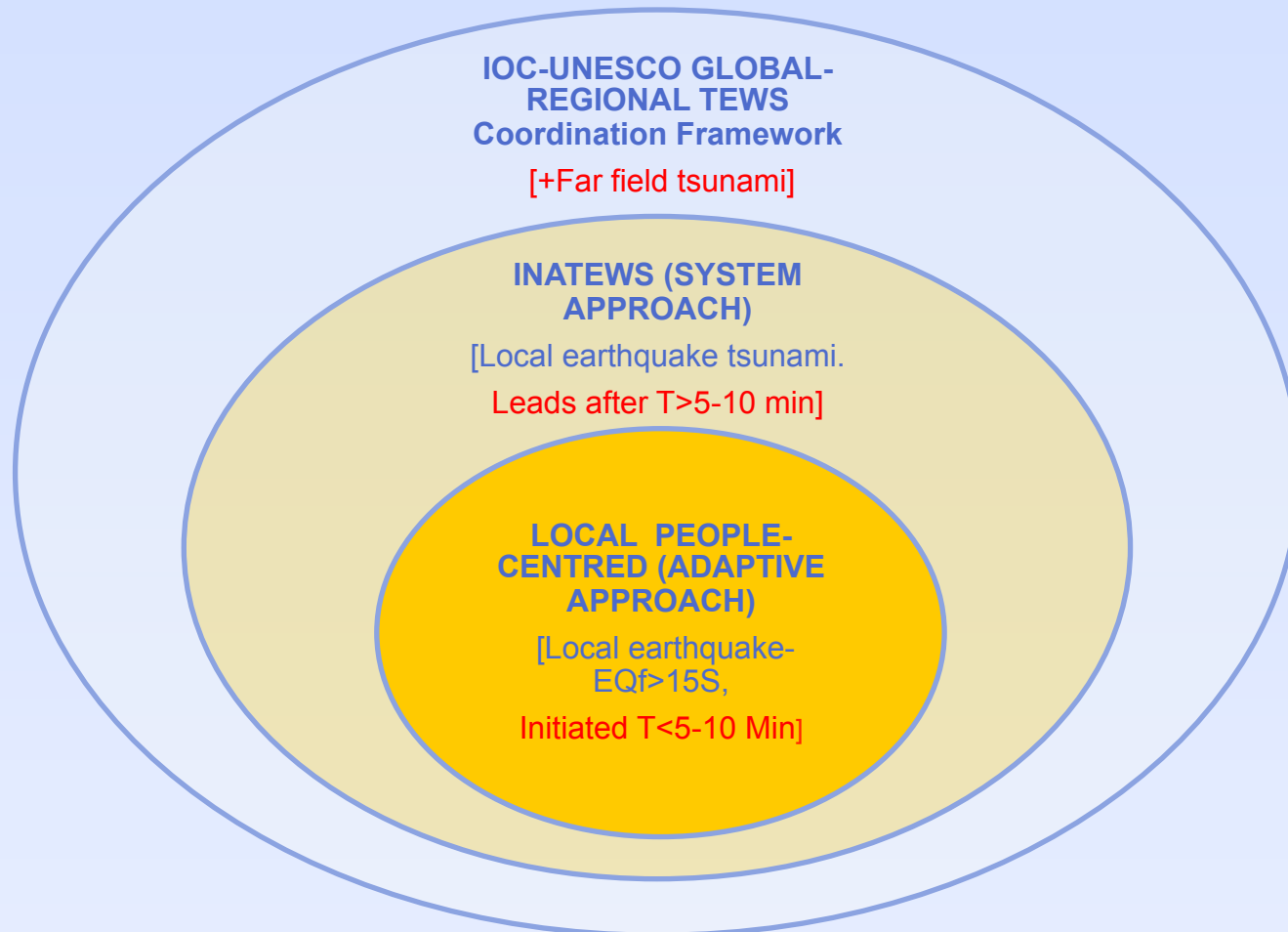


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Source: Author 2010

Conclusion



- Risk governance, multi-institutional arrangements and polycentric frameworks has strengthened the resilience capacities of Indonesia but are strongly affected by institutional path dependencies;
- Systems of governance strongly drives TEWS effectiveness and sustainability, however multi-level incentive mechanisms operating at different time and scales are needed to effect the desired change;
- The future of the INATEWS should rest on:
 1. Both system and people-centred –Mixed model approach and
 2. A broader city planning and governance strategy
- New proposed framework provided an in-depth understanding in TEWS- governance and links to DRR

Way Forward

- Application of the new EWSG Framework in the context of Climate Change



END

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