



PACIFIC CLIMATE CHANGE ROUND TABLE

Innovative Tools for Adaptation and Mitigation

Adaptive Tools and Methods in the light of Climate Change:
Enhancing Early Warning Systems for Adaptation and Resilience

3 –5th July 2013, Nadi, Fiji

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Background

- CC is expected to lead to an increase in weather-related extreme events
- DRR concomitant to this aims to mitigate the impacts of those extreme events.
- DRR needs to become an integral part of CCA

What Next?

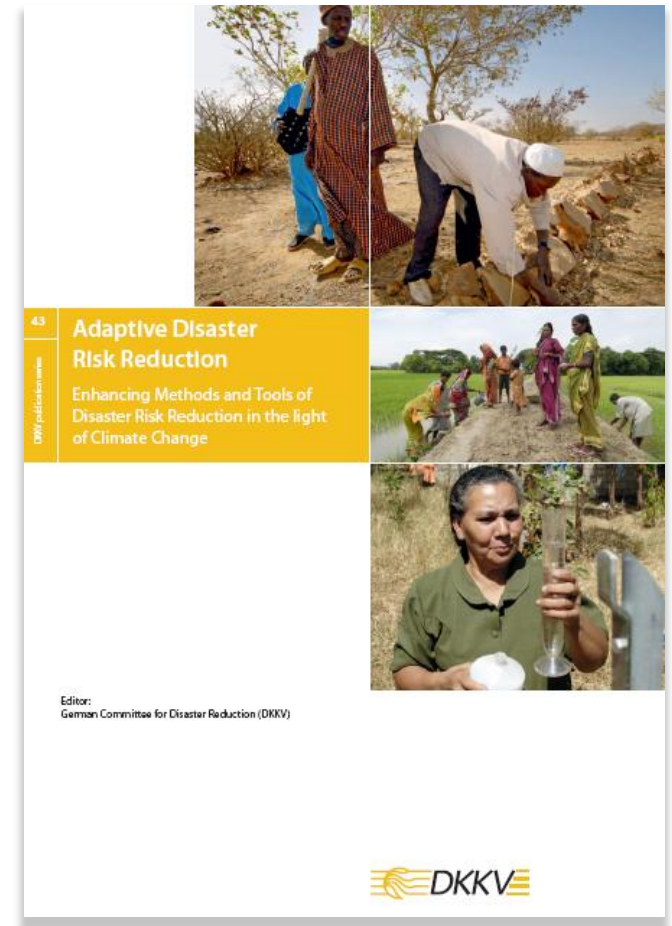
- Need to move beyond generic statements and think of concrete measures.
- How exactly the experiences of DRR can inform CCA strategies and tools.
- Need to identify what are the most relevant and effective DRR methods and tools for adaptation and mitigation.
- In other words, which tools and methods are most important and of relative priority for CCA and the adaptation to extreme events.

Exploring How to Enhance Tools and Methods For Adaptation and Mitigation

- Through expert interviews, international expert workshops, literature reviews, case studies we have explored the linkage, different methods and tools of DRR that can inform CCA



Birkmann et al 2011



Birkmann, Chang Seng and Suarez 2011

Exploring How to Enhance Tools and Methods For Adaptation and Mitigation

Based on HFA-four components of tools and methods are used in the analysis.
These include:

- (1) Risk identification and understanding
- (2) Reduction of the underlying risk factors (structural and non-structural measures),
- (3) Disaster preparedness and emergency management
- (4) Institutional capacity and financial mechanisms.

Exploring How to Enhance Tools and Methods For Adaptation and Mitigation

1. Risk identification and Understanding

- Vulnerability assessment, risk assessment and risk communication to stakeholders
- Systems for monitoring hazards, vulnerability and risk
- Regional/ trans-boundary risks included in national and local risk assessments;
- Cost-benefit analysis;
- Inclusion of concepts in school curricula, educational material and training, particularly public education;
- A public awareness strategy to stimulate a culture of disaster resilience.

2. Reduction of the underlying risk factors

- Risk Reduction as an integral objective of environmental policies and plans;
- Social development policies and plans to reduce the vulnerability of populations most at risk, poverty reduction;
- Policies and plans to reduce the vulnerability of economic activities (livelihoods);
- Incorporation of Disaster Risk Reduction into planning, including enforcement of building codes.

Exploring How to Enhance Tools and Methods For Adaptation and Mitigation

3. Disaster preparedness and emergency management

- Disaster preparedness plans at all administrative levels
- Emergency plans, recovery plans, stockpiling and reconstruction plans;
- Early Warning Systems (EWS);
- Financial reserves to support effective response and recovery;
- Procedures for exchanging relevant information during disasters and for assessing performance after the event.

4. Institutional capacity and financial mechanisms.

- Strengthening of governance;
- National policy and legal framework for DRR ;
- A national multi-sectoral platform for DRR and inter-institutional arrangements;
- Internal institutional arrangements (technical and institutional capacities) for DRR, and educational and training programmes for employees;
- Accessibility to resources for DRR plans and activities;
- Creation of public funds to support projects, programmes and activities,
- Application of financial incentives (e.g. tax reduction) for private property and activities to promote DRR,
- Community participation

Most Important Tools, Methods and Areas For Linkage

- Relatively most important/priority tools , and methods to address CC include:

— First in ranking:

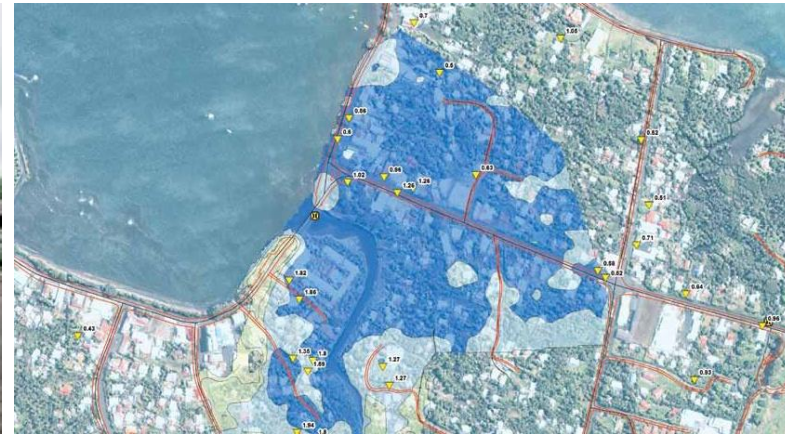
Reducing underlying risk factors

- E.g. Incorporation of DRR into planning, including enforcement of building codes.

Incorporated



Not-Incorporated



Most Important Tools, Methods and Areas For Linkage(Cont)

- **Second in ranking:**

Institutional capacity and financial mechanisms

- E.g. National policy and legal framework for DRR;
- A national, multi-sectoral platform for DRR, and inter-institutional arrangements;

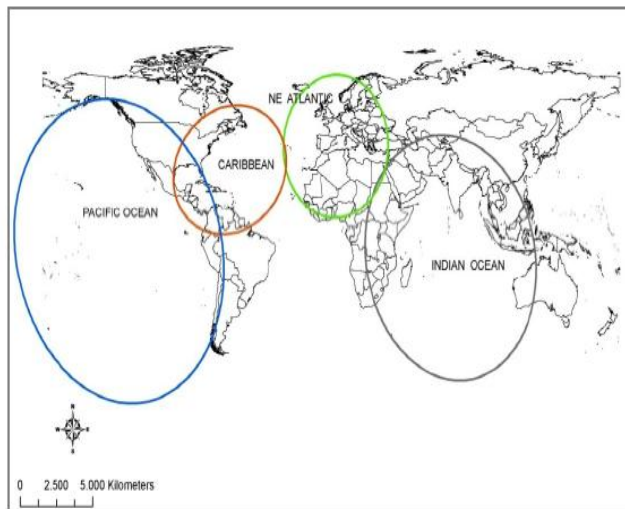


Most Important Tools , Methods and Areas For Linkage (Cont)

– Third in ranking:

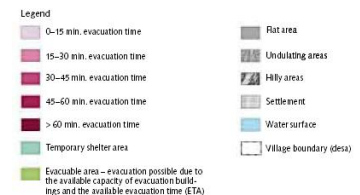
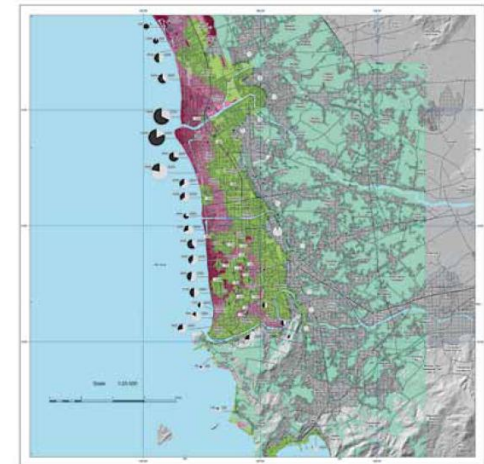
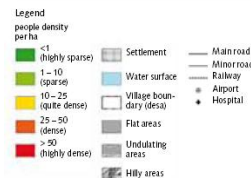
Identification and understanding of risk, disaster preparedness and emergency management

- E.g. Early Warning Systems



Global-regional governance of tsunami. Source: Chang Seng after IOC-UNESCO (2010).

Figure 13: Tsunami hazard exposure: daytime population



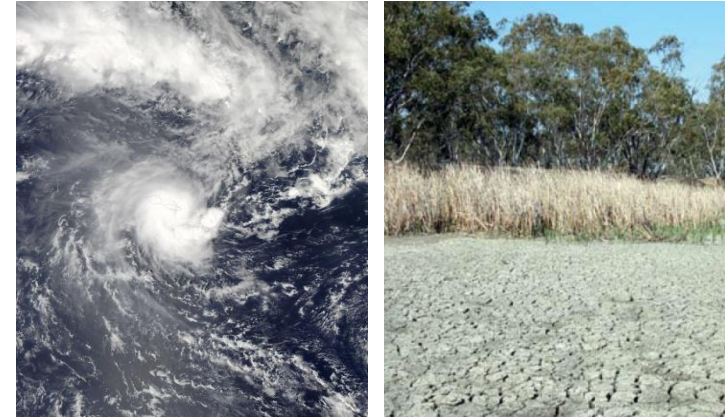
Tsunami exposure/risk assessment in Padang, Indonesia

Key Challenges/Opportunities

- It is not really about new tools, but their effective and efficient use
- These tools (e.g. EWSs) need to be adapted, improved and strengthened to foster their effective and synergies between DRR and CCA

Key Challenges & Opportunities towards Innovating Early Warning Systems, Preparedness Strategies

1. **Multi-Hazard-Risk Approach**-How to deal with the integration and monitoring of the combined effects of creeping and sudden-onset hazards in the light of CC.



2. **Livelihood Approach**-Moreover, CCA requires that EWSs extend their focus from saving lives in the short term to securing livelihoods in the medium and long term.



Key Challenges & Opportunities towards Innovating Early Warning Systems, Preparedness Strategies Lessons from Japan and Samoa

3. Complex, Cascading Risks and Disasters-EW systems often focus on sudden-onset hazards. Less attention is given to uncertain, complex cascading risks and disasters

- earthquake-tsunami- nuclear radiation and migration (Japan)
- tropical cyclone -river flooding and relocation (Samoa)



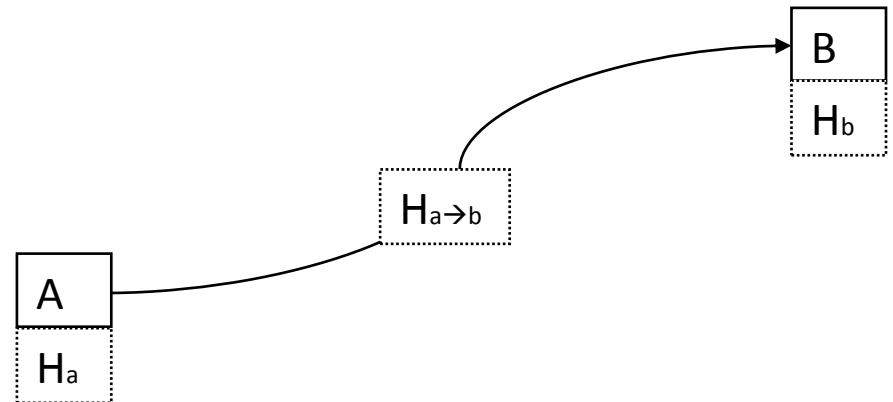
Key Challenges & Opportunities towards Innovating Early Warning Systems, Preparedness Strategies-Migration

5. Dynamic Exposure, Vulnerability and Changing Risk

- Up to now, most EWS do not sufficiently consider migration and daily mobility patterns within the information or warning chain as a flexible and adaptive tool for reducing disaster risk (Chang Seng, Birkmann 2012)



Displaced Sudanese face harsh environment. Source: UN Photo/Albert Gonzalez Farran



Key Challenges & Opportunities towards Innovating Early Warning Systems, Preparedness Strategies-**Daily Exposure**

- EW systems have to better account for dynamic exposure, vulnerability and changing risk patterns/profile

6. **New Trends** e.g. Not only climate change but socio-economic development have to be considered in EWS

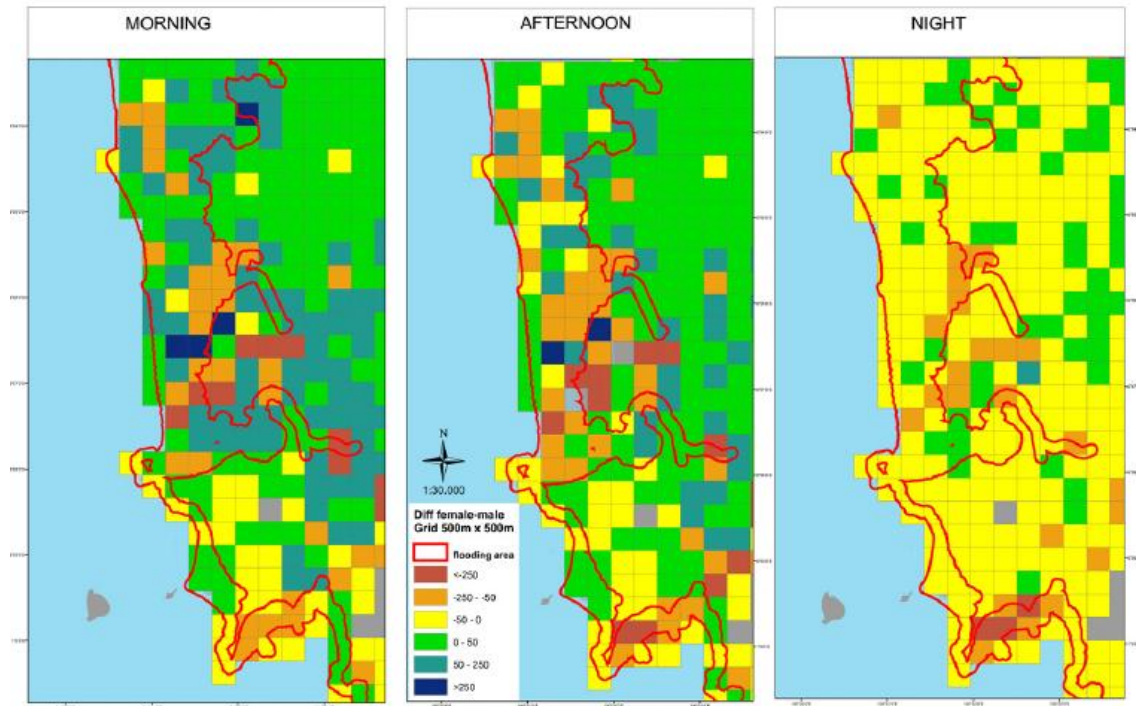


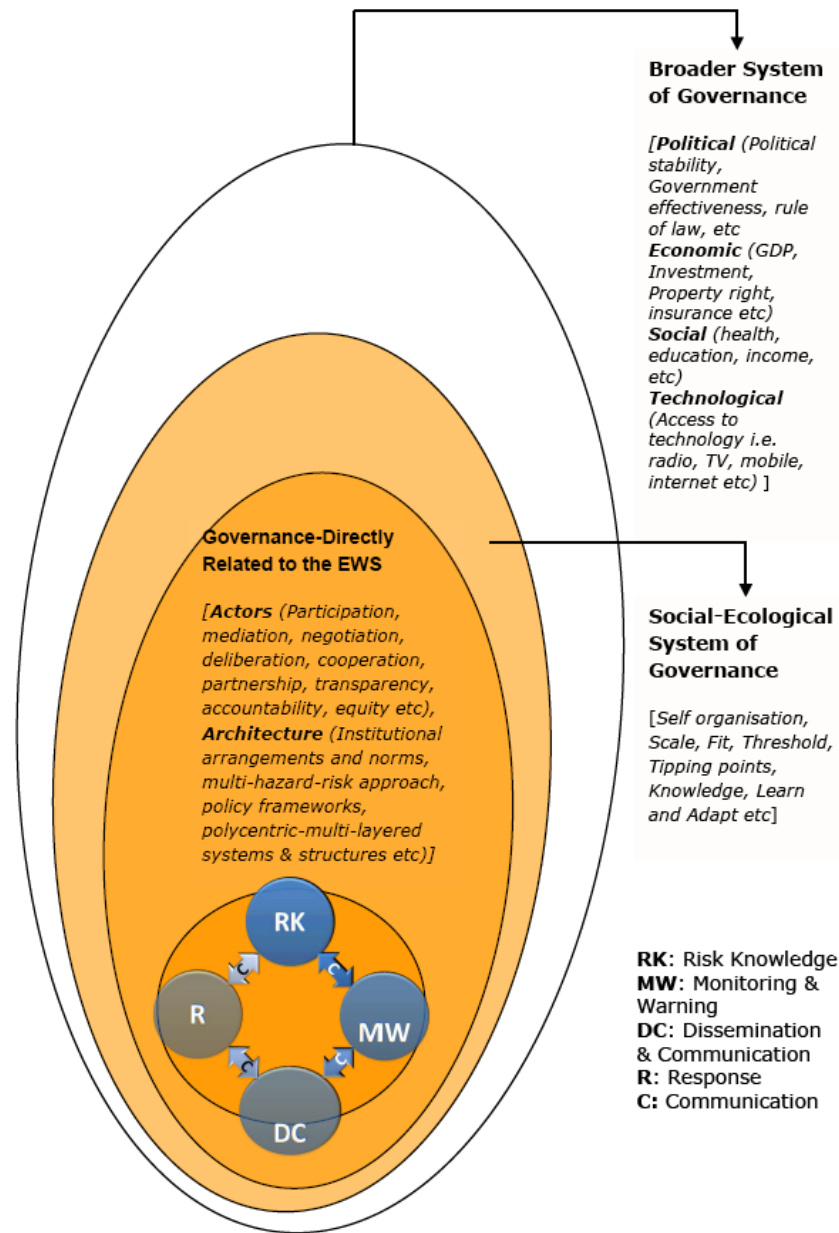
Fig. 3 – Spatial variation of female and male population distribution in the exposed area.

4. Uncertain & Ambiguous Risks-

Science , impacts of CC is still uncertain. EWSs have to go beyond technical systems – thus Governance has to be part of it.

- Governance is an important element in improving adaptive capacity and resilience.

➤Improving the governance and framework conditions of Natural Hazard EWS





“There are profound opportunities and benefits in enhancing and innovating Early Warning Systems for adaptation and resilience building to extreme events”

End
Thank You

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