

# TOWARD A REPORTING FRAMEWORK ON TECHNOLOGY'S CONTRIBUTION TO SOCIAL JUSTICE



## A CASE STUDY ON TRANSBOUNDARY FLOOD EARLY WARNING SYSTEMS IN NEPAL, INDIA AND BANGLADESH

### ABSTRACT

Technology plays a key role in making flood early warning systems (EWS) effective; providing understandable, timely and actionable information to those most at risk. We developed a framework using social justice principles to analyse the access, use and innovation of technology for EWS. We extract information on these dimensions from the Key Global Agreements for a transboundary EWS case study in Bangladesh, India and Nepal. Although the information is not harmonized, based on self-reporting and at a multi-hazard and countrywide level, we can conclude, supplementing with ground-truth data, that access to EWS services as well as EWS technology required is not distributed fairly and that innovation is often not inclusive. We recommend current reporting mechanisms include subnational and disaggregated reporting on the framework as a first step towards widening the technology spectrum available to the stakeholders using and operating EWSs.

### RESEARCH OBJECTIVE AND METHODOLOGY

#### Research objectives

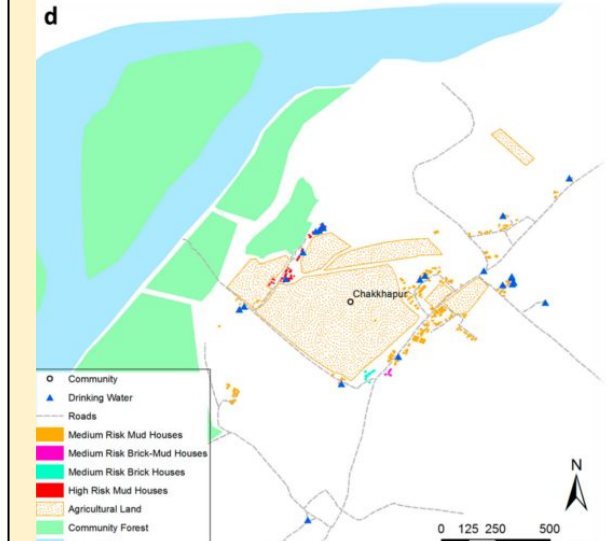
- Develop a framework to assess the role of technology in making an EWS more effective as well as compliant with social justice principles.
- Analyse the transparency mechanisms of three global processes (Sendai, SDG and Paris Agreement) as well as national and local policies reports on the role of technology for social justice according to the framework.

#### Research method

A case study on transboundary flood EWS in Brahmaputra and Karnali river basin including Focus Group Discussions, Key Informant Interviews and desk research.

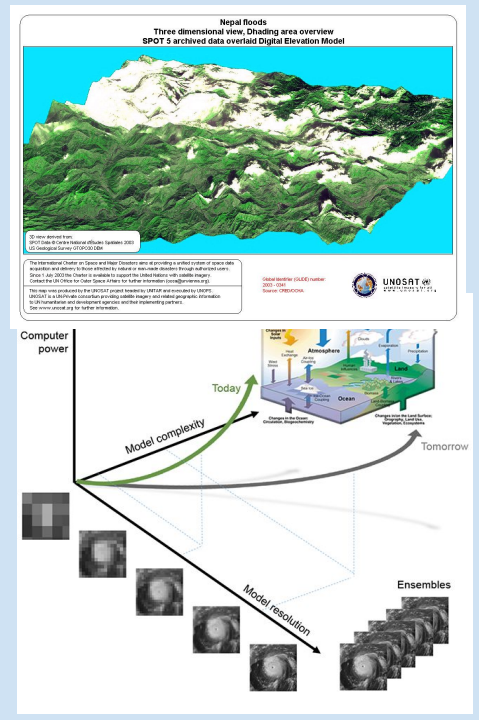
### FUTURE

**NATIONAL, COMMUNITY-BASED/INDIGENOUS EWS Risk Knowledge**



Participatory and collaborative mapping; mapathons; geospatial datasharing platforms.

**Monitoring and Warning**




More advanced measurements (IoT, satellite-gauges). High-resolution DEM data; ensemble modelling; high-performance computing. Warning on impact level.

**Dissemination and Communication**

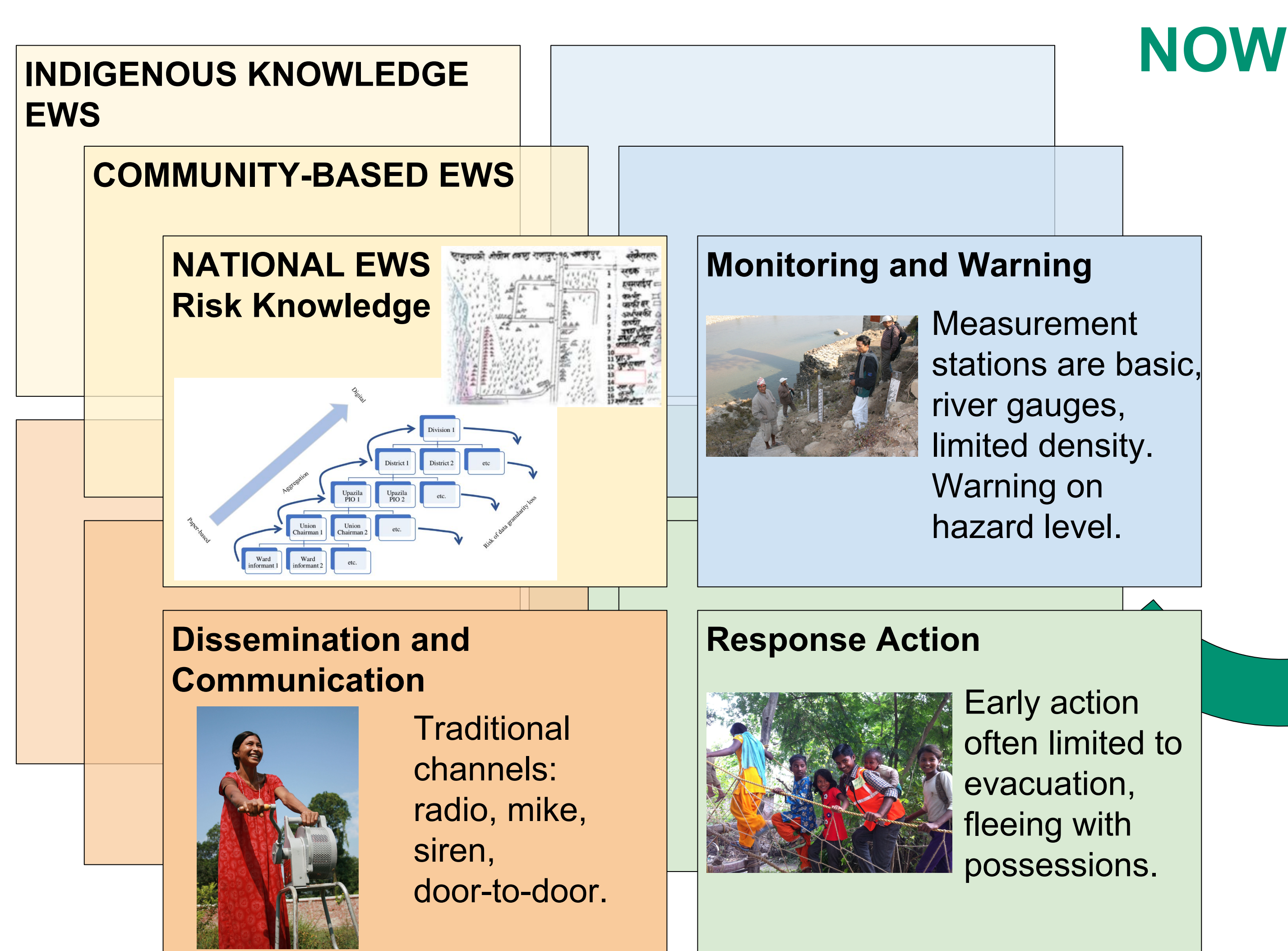


Increased coverage with mobile voice-based services; Common Alerting Protocol, Access to ICT/Internet.

**Response Action**



Early warning messages with actionable information, broader range of early actions. More loss and damage avoided.



*Transformed EWS – bottom up with top down – enabled through Technology, Capacity and Finance mobilized under **Global Agreements** 1 and aligned with **Technical Guidelines** 2 driven by **Social Justice Principles** 2*

1 Global Agreements or Guidelines	Targets	Reporting
UNISDR (HFA/Sendai)	global target G increase availability and access (G3 and G5)	data readiness review; national progress reports
UN (MDG/SDG)	goal 3/13 capacity/education EWS, goal 17 access to ICT	(voluntary) national reviews
UNFCCC (Paris Agreement)	article 7 research EWS, article 8 loss and damage	national communication; adaptation communication (to be developed)
WMO, UNESCO-IHP	WMO guidelines for measurement station density; UNESCO International Flood Initiative guiding principles	surveys conducted between 2005 and 2012; Water Information Network System

2 Tech Justice Framework	Current Status	Social Justice Principle
Access to services	National and CB-EWS do not effectively reach poor and vulnerable communities.	Distributive
Access to technology and knowledge	National EWS have limited forecast skill, lack of high-performance computing, ensemble models and high resolution, near-real-time data. Example Nepal lead time 2-6 hours Karnali basin, 170 hydrological stations less than recommended WMO density.	Distributive
Use	Impact of flood risk management solutions (such as hard engineering) on vulnerable communities and future generations is often not considered.	Intergenerational, Procedural
Technological innovation and implementation	Not much room in budgets for EWS development; over-reliance on rolling out copycat technology.	Procedural, distributive and recognitional

### CONCLUSIONS

- Roll-out of flood EWS to the most vulnerable is vital so they themselves, as well as local stakeholders, can take early actions that reduce avoidable loss and damage.
- Technology plays a key role in realizing a flood EWS that leaves no one behind.
- National level reporting frameworks on EWS for the global agreements are currently high-level, based on (too optimistic) self-reporting and not harmonized.
- Communities that have adopted EWS over the years become more resilient as they learn and try out new early or adaptive actions. This learning is vital for transformational adaptations that will be required in many places.

### RECOMMENDATIONS

- National level reporting frameworks for the global agreements need to focus on progress to deliver to the last mile and should include reporting on access to, use and innovation of technology (to achieve social justice).
- Technology transfer, funding and capacity development will be essential to make sure EWS from developing countries can reach similar forecast skill and coverage as developed country EWS.
- Attention to social justice principles can help to mobilize the necessary support.

### REFERENCES

Van den Homberg, M. and McQuistan, C., "Technology for Climate Justice: A Reporting Framework for Loss and Damage as part of Key Global Agreements" in Loss and Damage from Climate Change, Concepts, Methods and Policy Options, Editors: Mechler, R., Bouwer, L., Schinko, Th., Surminski, S., Linnerooth-Bayer, J., Springer, 2018



Flood Resilience Portal



Colin McQuistan  
Colin.McQuistan@practicalaction.org.uk



Marc van den Homberg  
marcjchr@gmail.com