Flood Resilience Alliance

Disaster resilience measurement: data for science and practice

Finn Laurien

EGU, Vienna, 2019

NH9.11: Methods and Tools for Natural Risk Management and Communications – Innovative ways of delivering information to end users and sharing data among the scientific community

Co-authors: Adriana Keating and Michael Szoenyi

In partnership with:

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What is disaster resilience?

“The ability of a system, community or society to pursue its social, ecological and economic development objectives, while managing its disaster risk over time in a mutually reinforcing way.”

Keating et al. 2017

In other words, a community has resilience if its development continues despite flood occurring.

Disaster-development system

Why resilience to flooding?

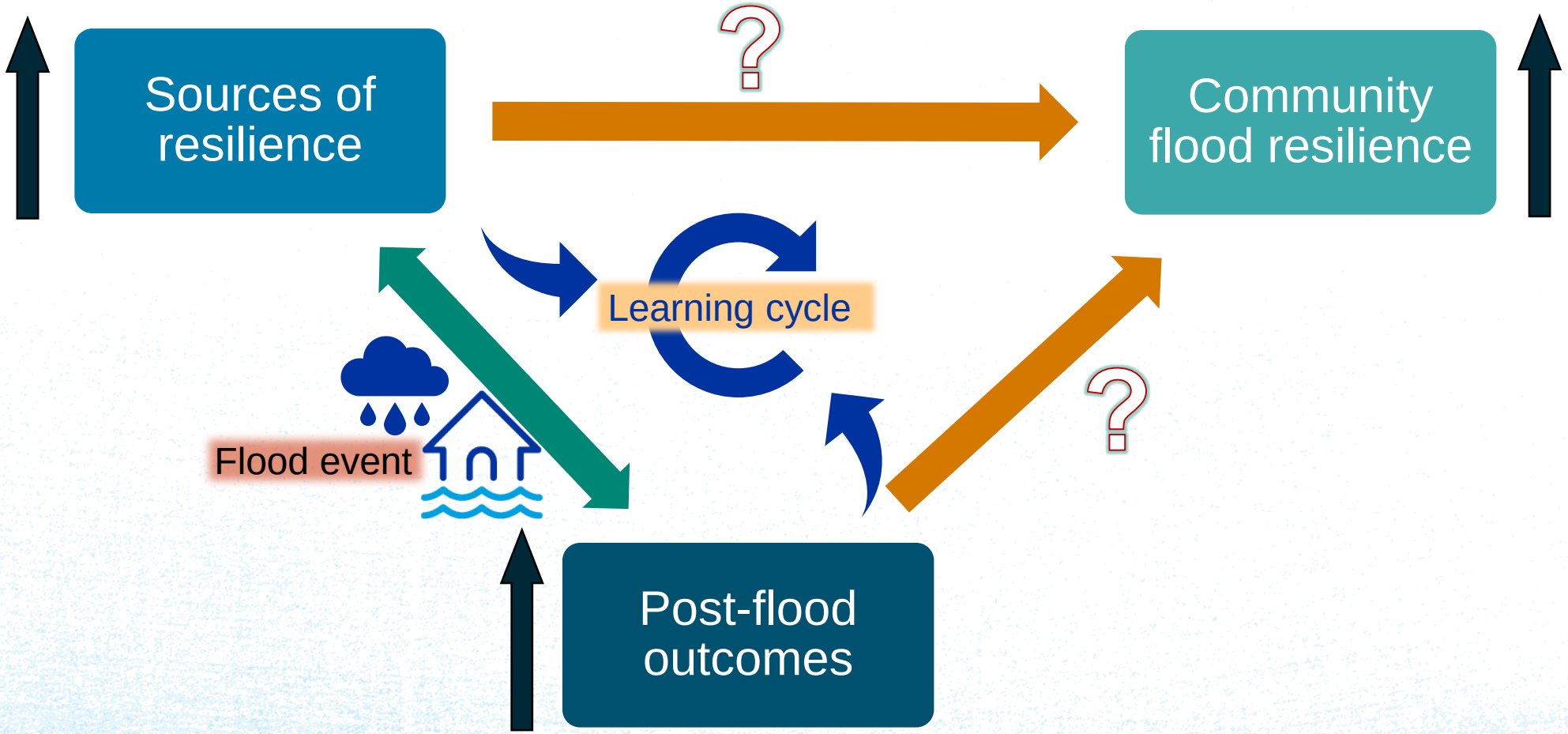
Floods affect more people globally than any other types of disaster (CRED, 2017)

And the situation is getting worse (IPCC, 2014)

- Increasing population, urbanization, and economic development in hazard prone areas
- Increasing trends of loss of life and economic and insured losses due to floods
- Increasingly interconnected and interdependent flood risks

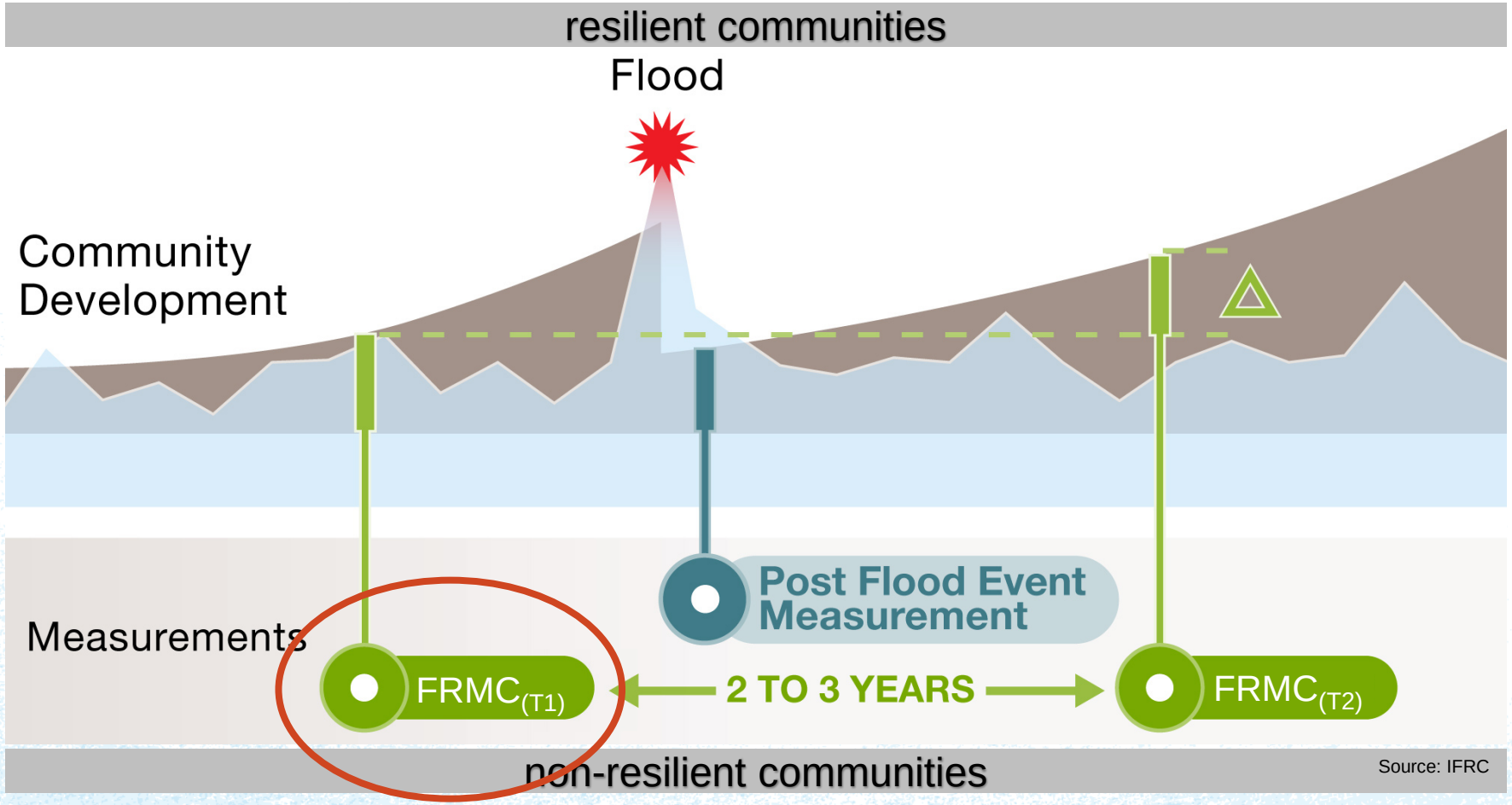
Source: Zurich Alliance

Conceptual framework of measuring community flood resilience (FRMC)

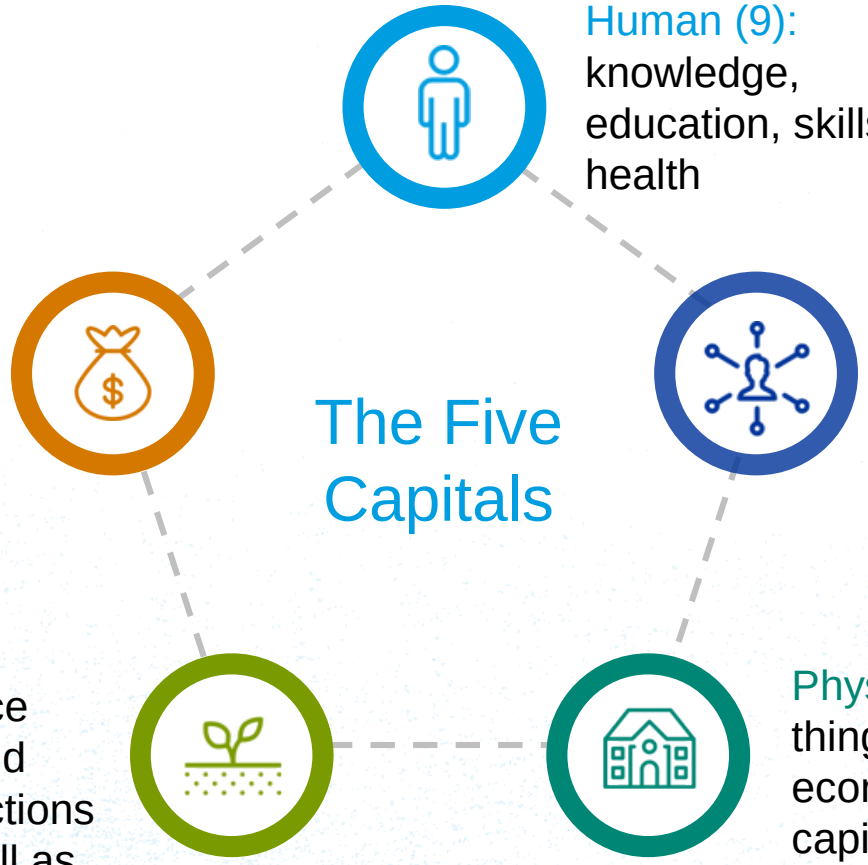


Operationalization of the FRMC framework: How do we measure flood resilience?

FRMC: Flood Resilience Measurement Tool for Communities



FRMC framework with 44 sources



Human (9):
knowledge, education, skills, health

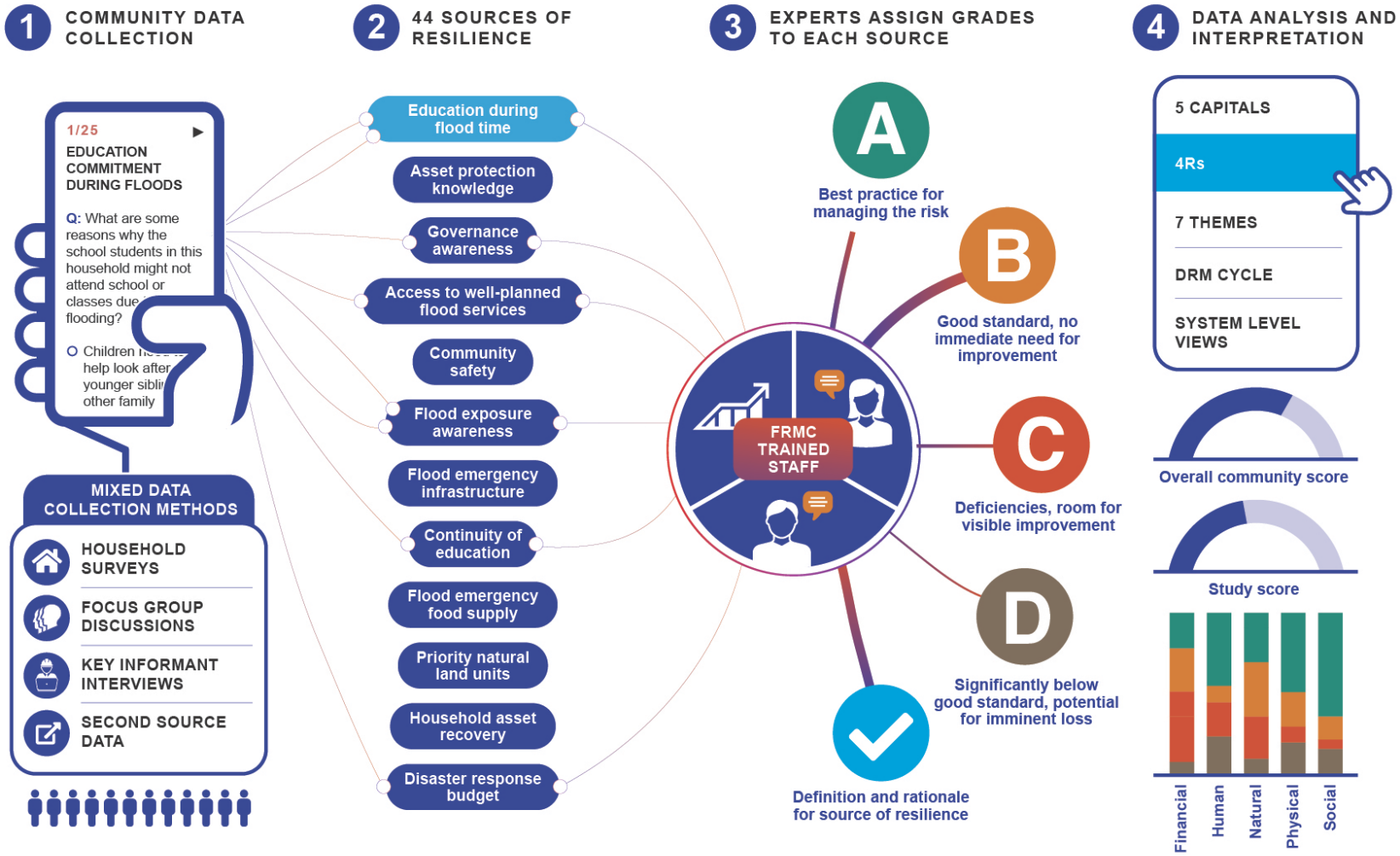
Financial (7):
level, variability, and diversity of income sources and access to other financial resources that contribute to wealth

Social (11):
social relationships and networks, bonds aiding cooperative action, links facilitating exchange of and access to ideas and resources

Natural (5):
the natural resource base, including land productivity and actions to sustain it, as well as water and other resources that sustain livelihoods

Physical (12):
things produced by economic activity from other capital, such as infrastructure, equipment, improvements in crops, livestock, etc.

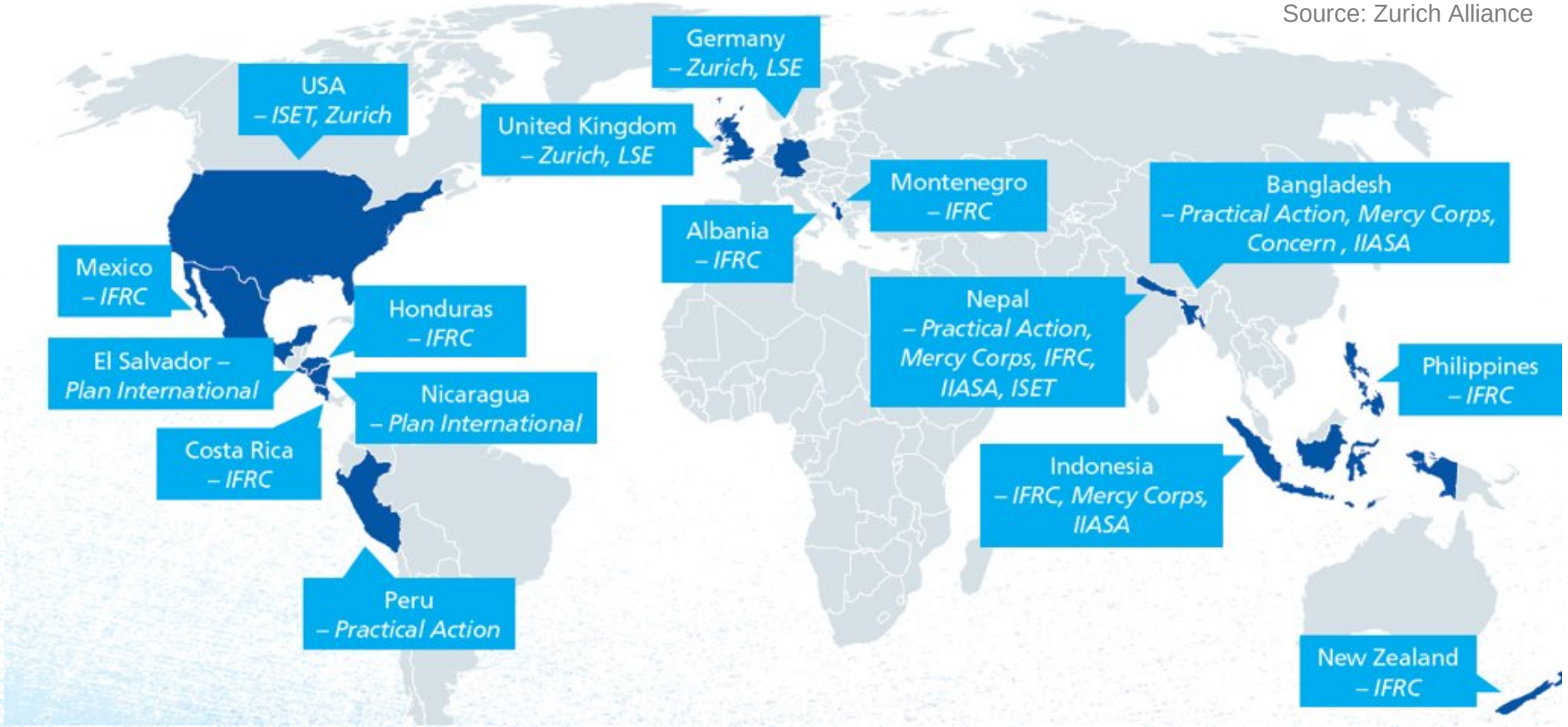
FRMC data collection process



Source: Laurien et al (under review)

FRMC application communities – "study sites"

Source: Zurich Alliance

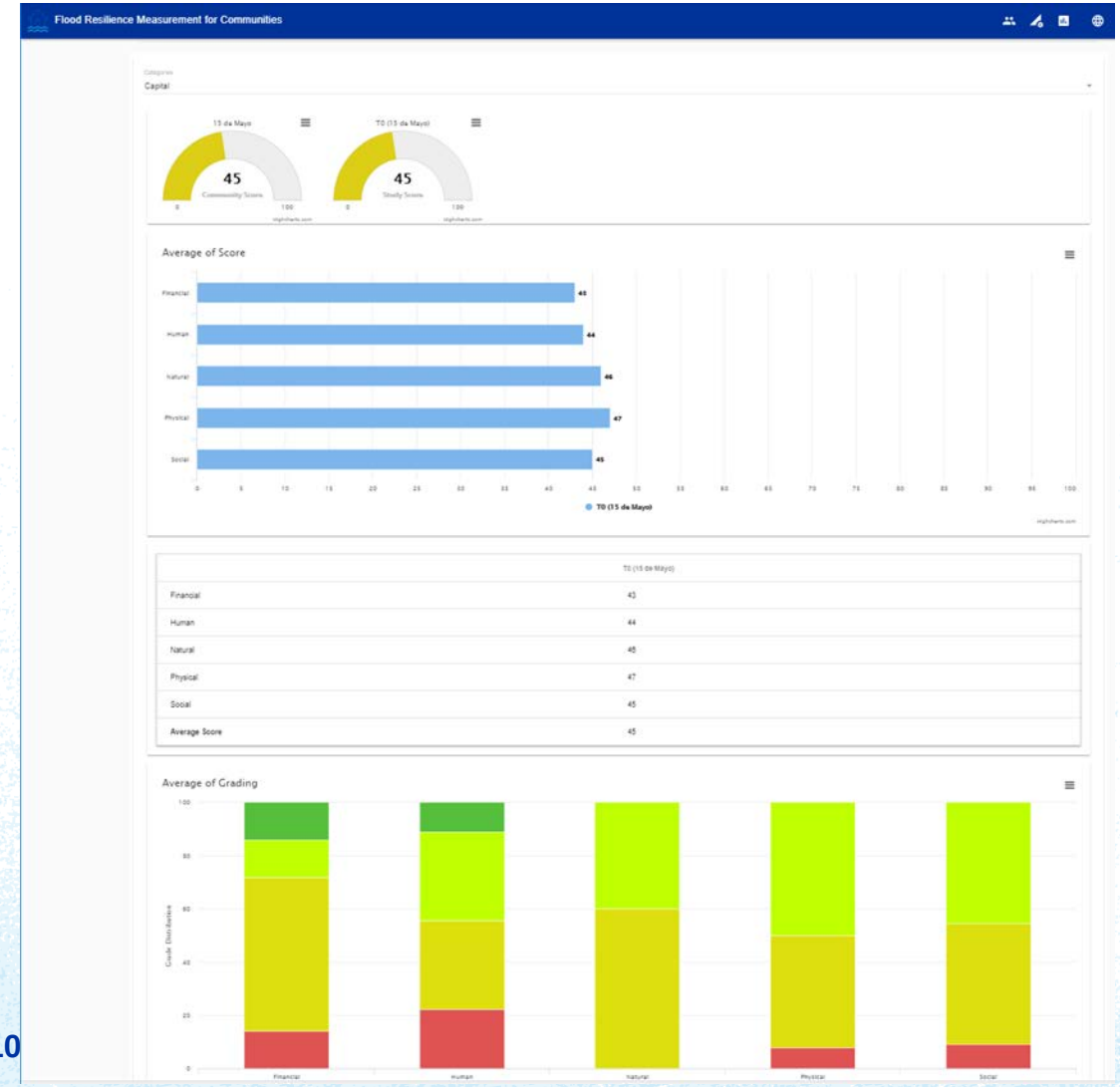


Phase 1: 118 community in 9 countries

Phase 2: 72 communities in 11 countries
(estimated; potential for scaling up)

FRMC findings

Practice perspective: impact of measurement

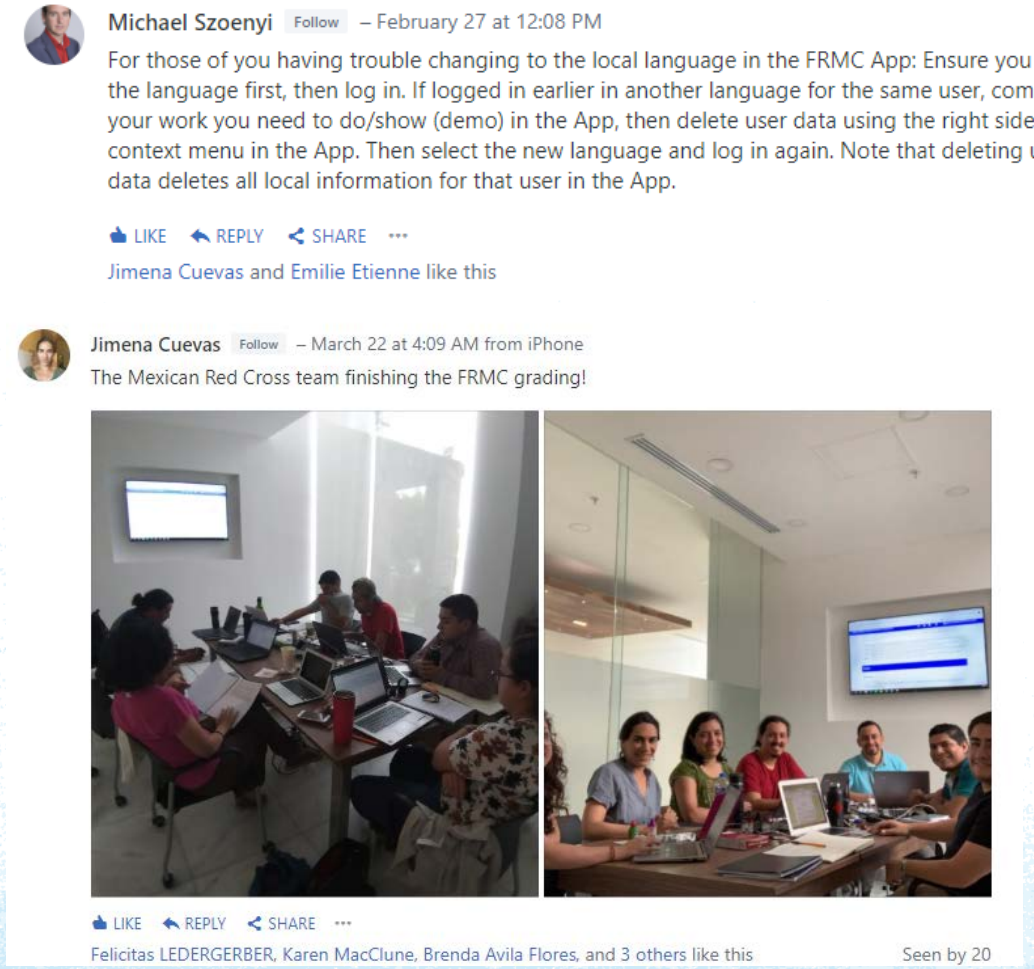


- Holistic and integrated thinking (systems thinking) within organisations, amongst stakeholders and community members.
- Connecting the dots – with a common DRR strategy that goes beyond first aid courses or physical defences
- Brought diverse stakeholders to the table.
- Standardised and quantified metric for tracking investments.

Standardized user products: addressing the reliability challenge

- F2F Training session on three continents.
- Guidance for FRMC methodology and implementation
- User guide for web application
- User guide for field workers (Android & iOS App)
- Webinar sessions with extended user feedback
- Guidance material for data analysis
- F2F workshop to discuss data analysis and next steps

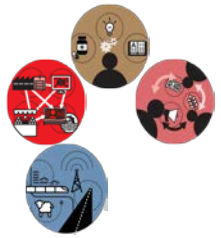
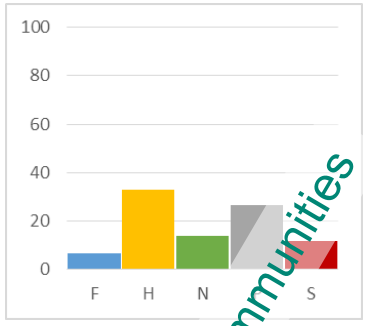
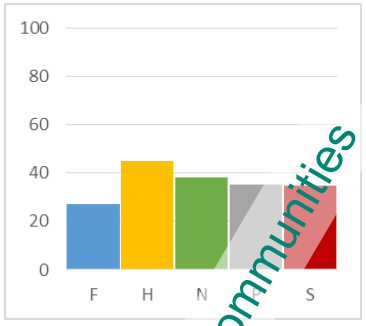
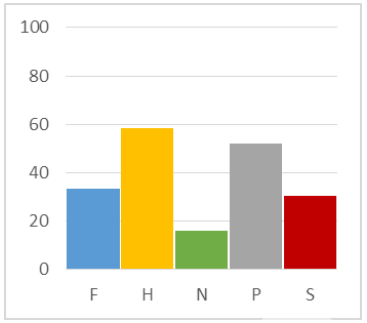
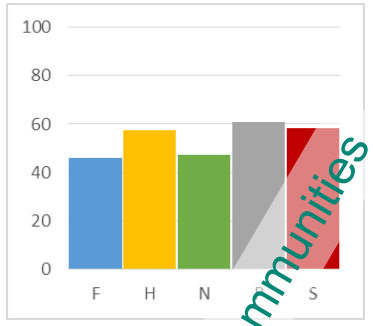
Interactive tools to support share knowledge



User perspective

- Community Awareness
- Risk Informed Programming
- Enhance Advocacy and Influence
- Supports holistic thinking on resilience

Resilience as dynamic functions

Multi-capital functionality				
	Weak dynamics	**Moderate dynamics**	**Moderate dynamics**	**Strong dynamics**
Cluster characteristics				
Highest correlation	Financial & Social (.34**)	Financial & Physical (.57***)	Natural & Physical (-.58***)	Financial & Natural (.85***)
2nd highest correlation	No significant correlation	Social & Human (.49 ***)	Social & Human (.57***)	Financial & Human (.77***)
3rd highest correlation	No significant correlation	Financial & Social (.36***)	Physical & Social (.54***)	Financial & Social (0.7***)

Weakly resilient communities

Moderate resilient communities

Urban communities

Strongly resilient communities

Enhancing the knowledge base and raising awareness

Impact of measurement at community and program level

- Fostering integrated thinking (systems thinking) within organisations, amongst stakeholders and community members.
- Connecting the dots – with a common DRR strategy that goes beyond first aid courses or physical defences.
- Standardised metric for tracking investment and finding solutions.

Empirical findings

- Community programs find “hidden” spots beyond their daily community work.
- Typology to support cluster-specific best-practice examples together with community programs.
- Community typology can build evidence for innovative disaster risk finance portfolios.

Study site in Java, Indonesia. Photo: Mercy Corps Indonesia

Thank you!

For more information contact

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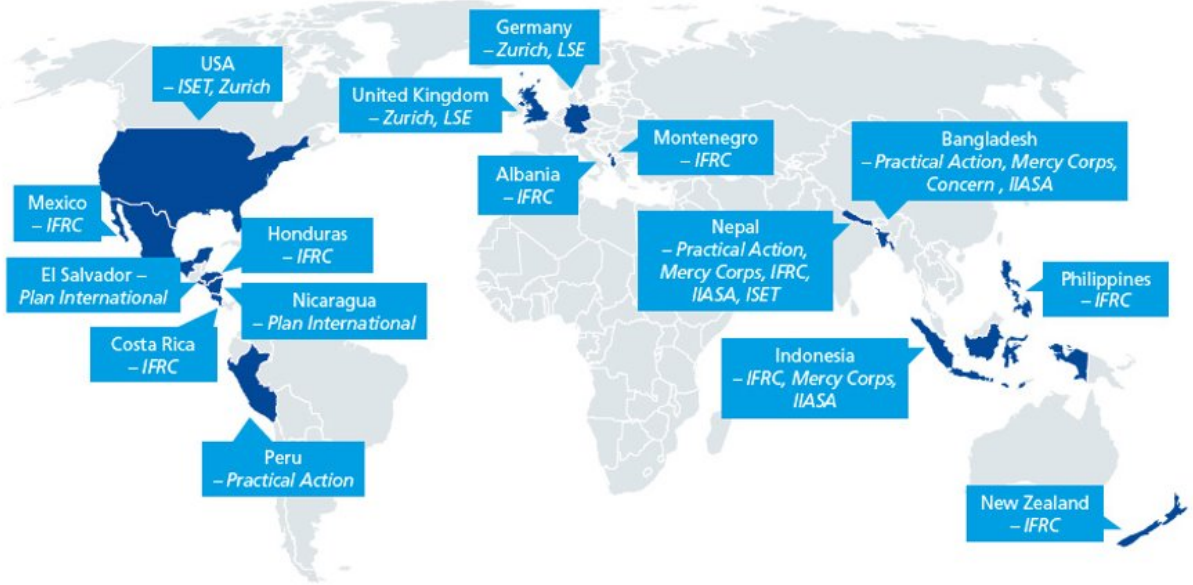
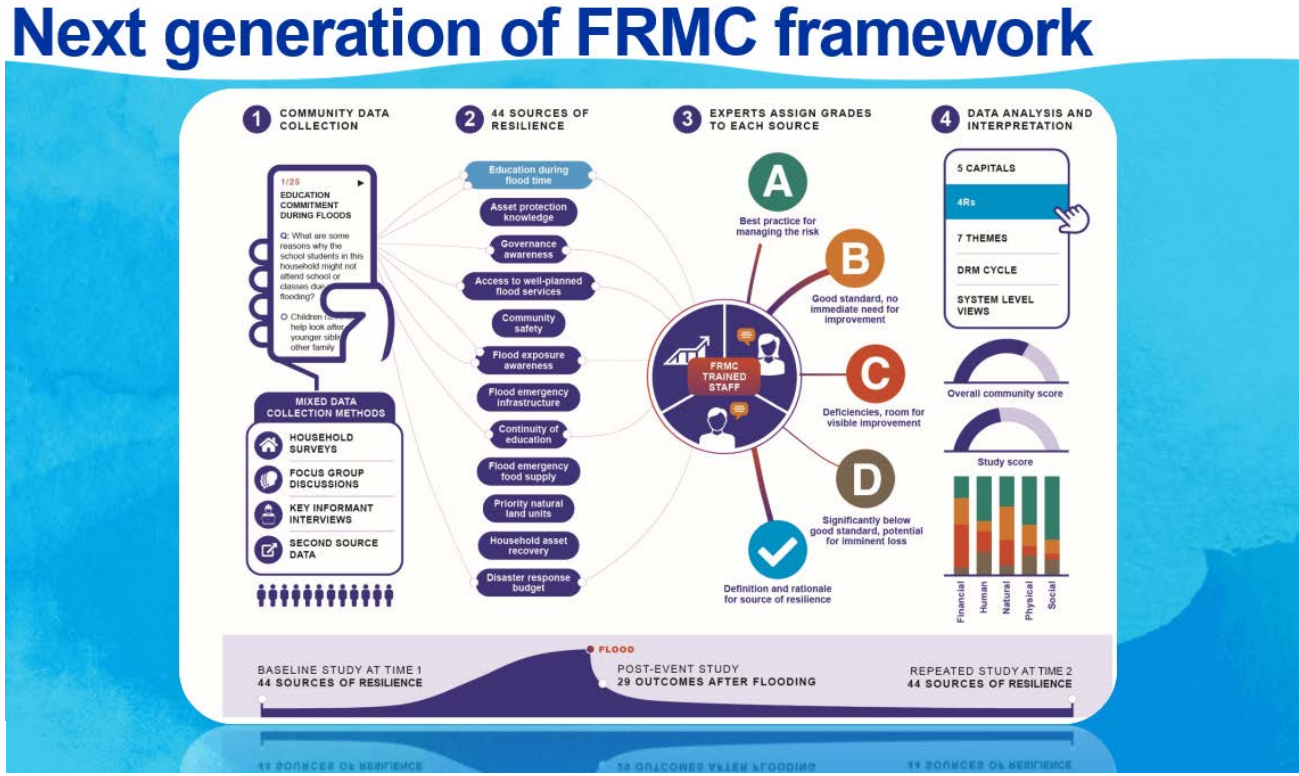


Map indicates community-based programs, post-event analysis (PERC), research studies and public policy advocacy.



Or visit

https://floodresilience.net/