

Transdisciplinary science insight for understanding managed retreat across hazards, scales and geographies

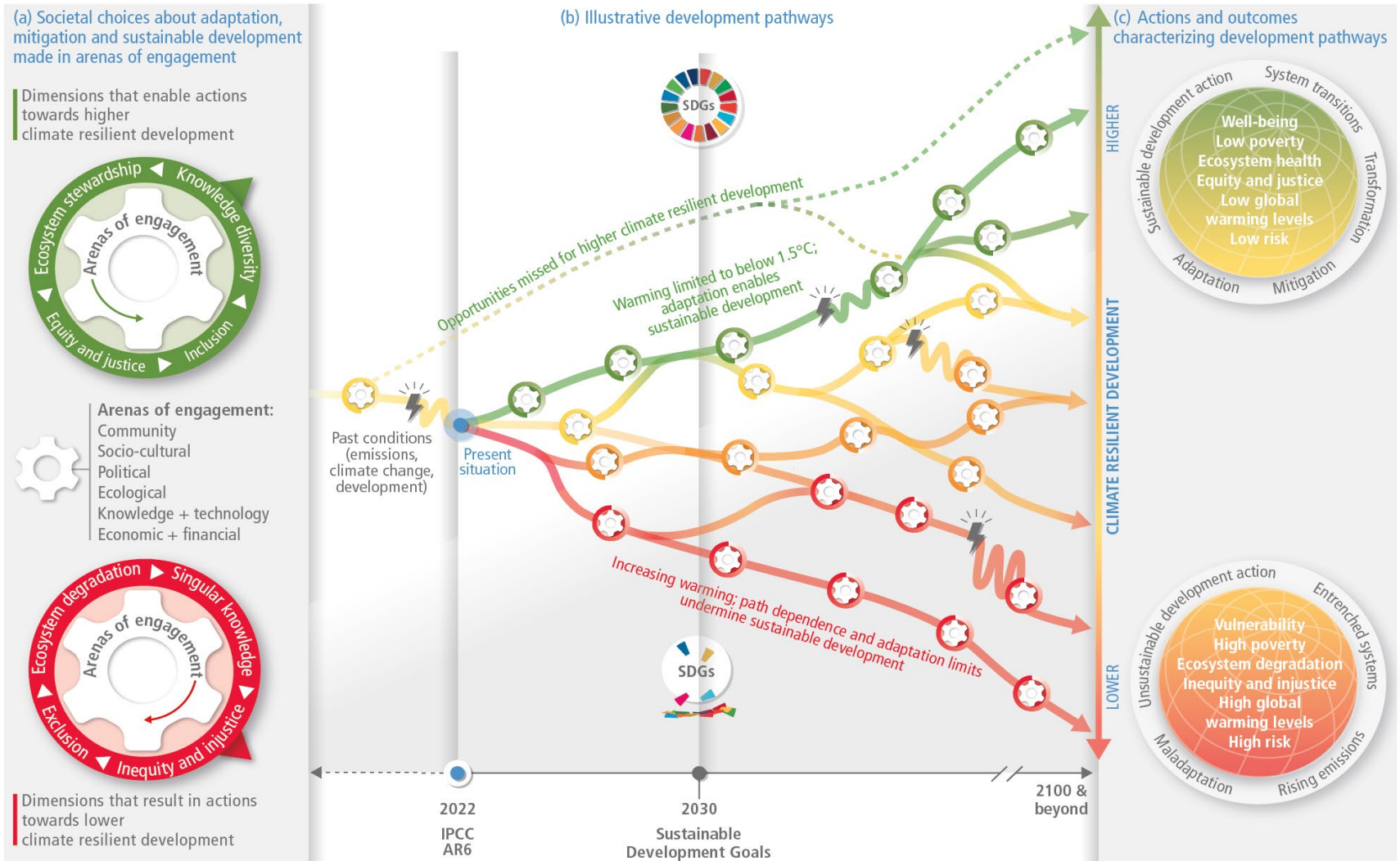
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Wissenschaftliche Session III "Nachhaltige Anpassungsstrategien"

Klimatag 2022 Wien, 21.4.2022

Climate resilient development pathways

There is a rapidly narrowing window of opportunity to enable climate resilient development

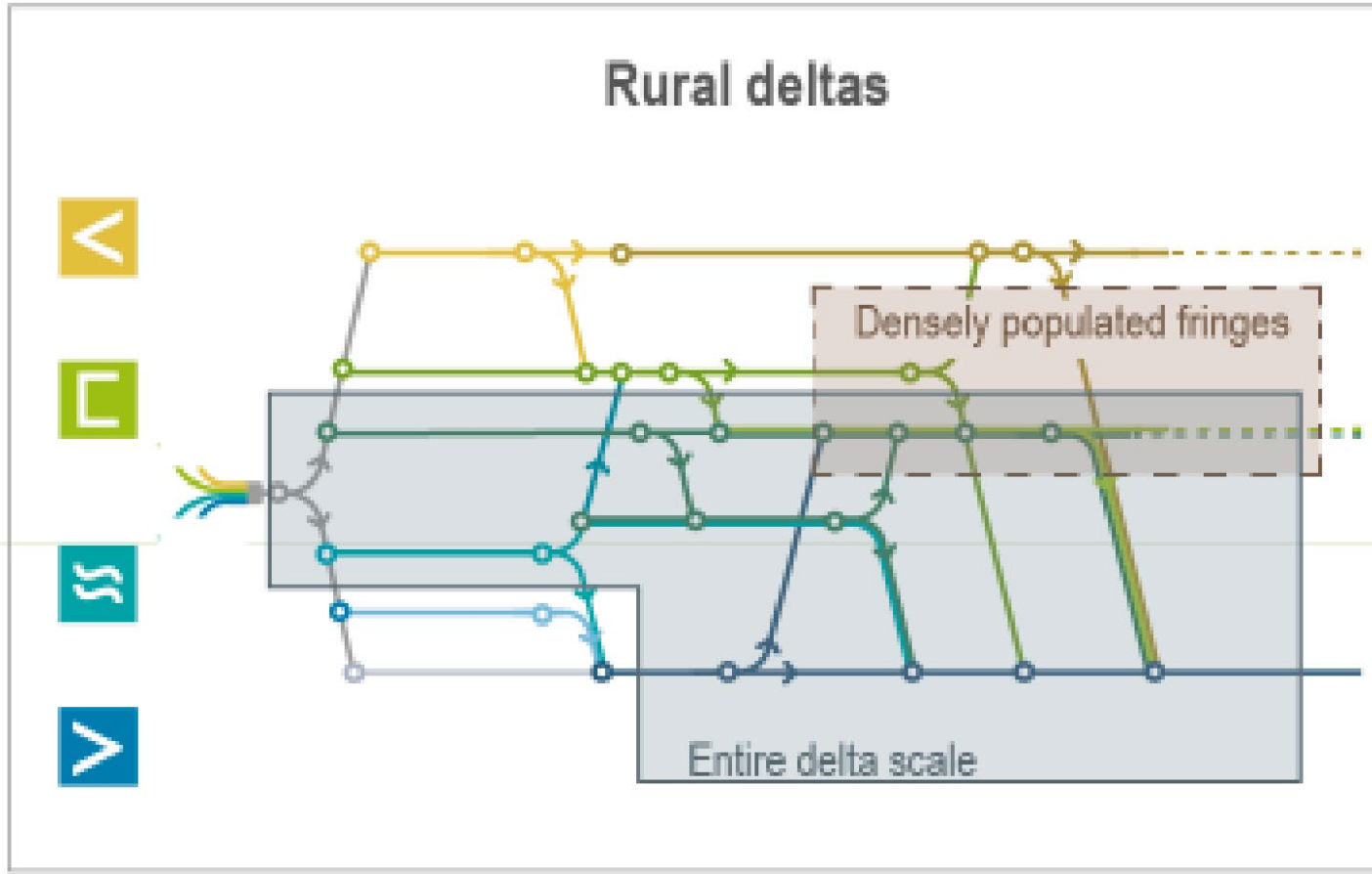


Illustrative climatic or non-climatic shock, e.g. COVID-19, drought or floods, that disrupts the development pathway

Narrowing window of opportunity for higher CRD

Pathways and transformation in coastal systems: (managed) retreat

Generic strategies	Examples of specific measures
Advance	New seawards land claim above sea level
Protect	Sea walls, levees, storm barriers Wetlands, mangroves, coral reefs
Accommodate	Wet and dry proofing built environment Floating cities
Retreat	No build zones Planned relocation



IIASA Cross-Chapter Paper 2: Cities & Settlements by the Sea, 2022, Figure 2

Responses to ongoing sea level rise and land subsidence in low-lying coastal cities and settlements and small islands include protection, accommodation, advance and planned relocation (*high confidence*). These responses are more effective if combined and/or sequenced, planned well ahead, aligned with sociocultural values and development priorities, and underpinned by inclusive community engagement processes (*high confidence*).

Disaster and climate resilience in a changing climate.

What capacities for what change?

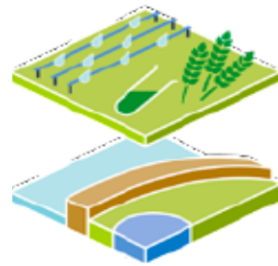
Change along resilience pathways

Capacities and enablers

From incremental....

...to transformational

- Social
- Physical
- Human
- Ecological
- Financial
- Learning
- Innovation
- ...



Improved infrastructure, i.e. efficient irrigation systems to deal with drought

Flood protection and safeguarding of fresh water supply

Alternative lifestyles and employment.
Change of farming type i.e. from crop to livestock



New city planning to safeguard people and infrastructure



Intensity of change

Adapted from Thornton & Manasfi, 2010; IPCC, 2018



Adapted from Tanner et al., 2017



Case of geomorphic change and flooding in Bangladesh

Paszkowski, A. et al. Capacity for addressing geomorphic and climatic change? Measuring community resilience in riverine Bangladesh, *in preparation*

Paszkowski, A., Goodbred, S., Borgomeo, E. et al. Geomorphic change in the Ganges–Brahmaputra–Meghna delta. *Nat Rev Earth Environ* 2, 763–780 (2021). <https://doi.org/10.1038/s43017-021-00213-4>

Paszkowski, A., Laurien, F., Mechler, R., Hall, J. (2021). Time for change: Assessing the transformational capacity of riverine Bangladesh. IIASA YSSP report.

Mechler, R., Deubelli, T., Venkateswaran, K. Transformational risk management - science, practice and policy perspectives, Springer, *forthcoming*

Methods:

- Geomorphic change analysis
- Measurement of resilience and adaptive capacity
- Assessment of risk management options

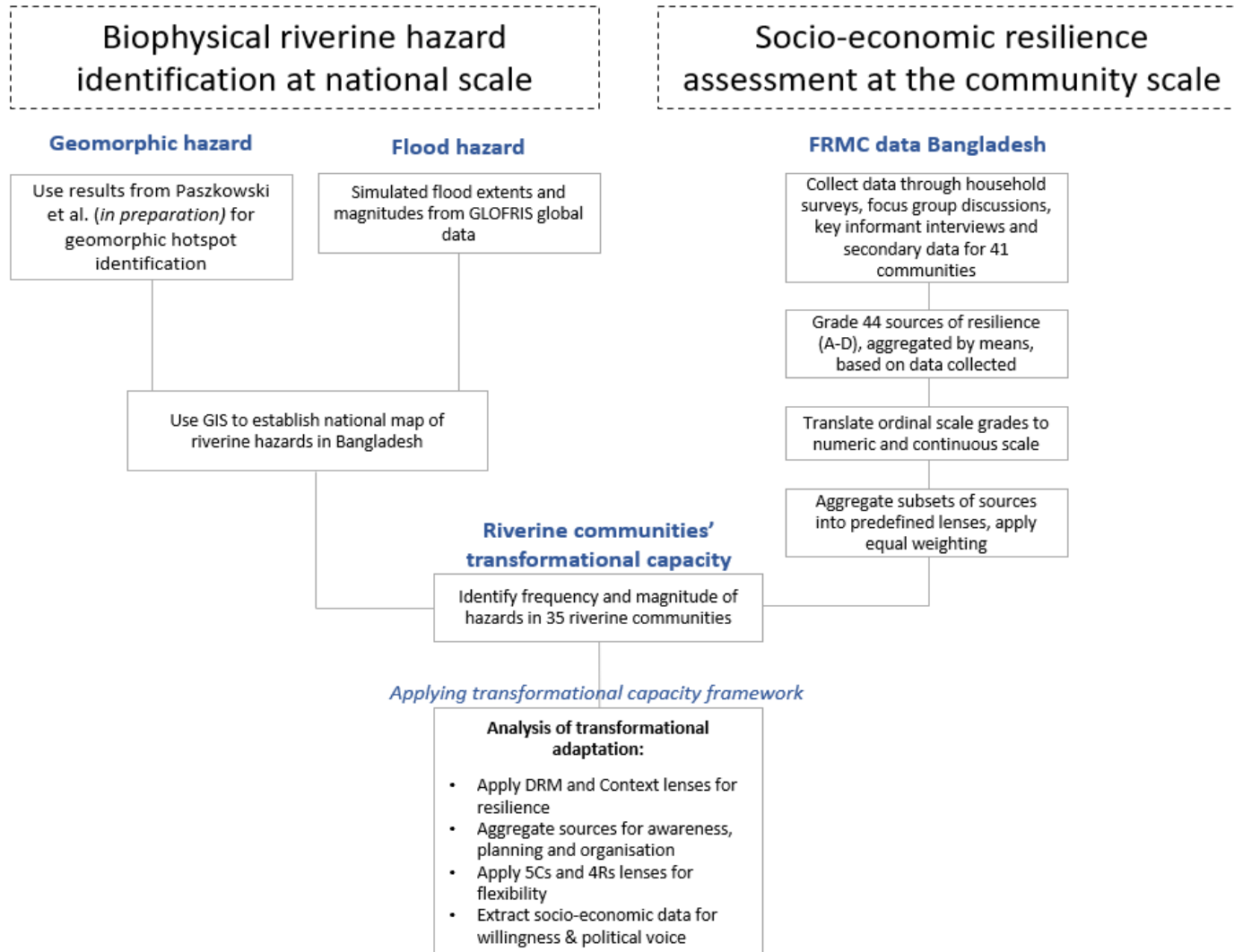
In partnership with:



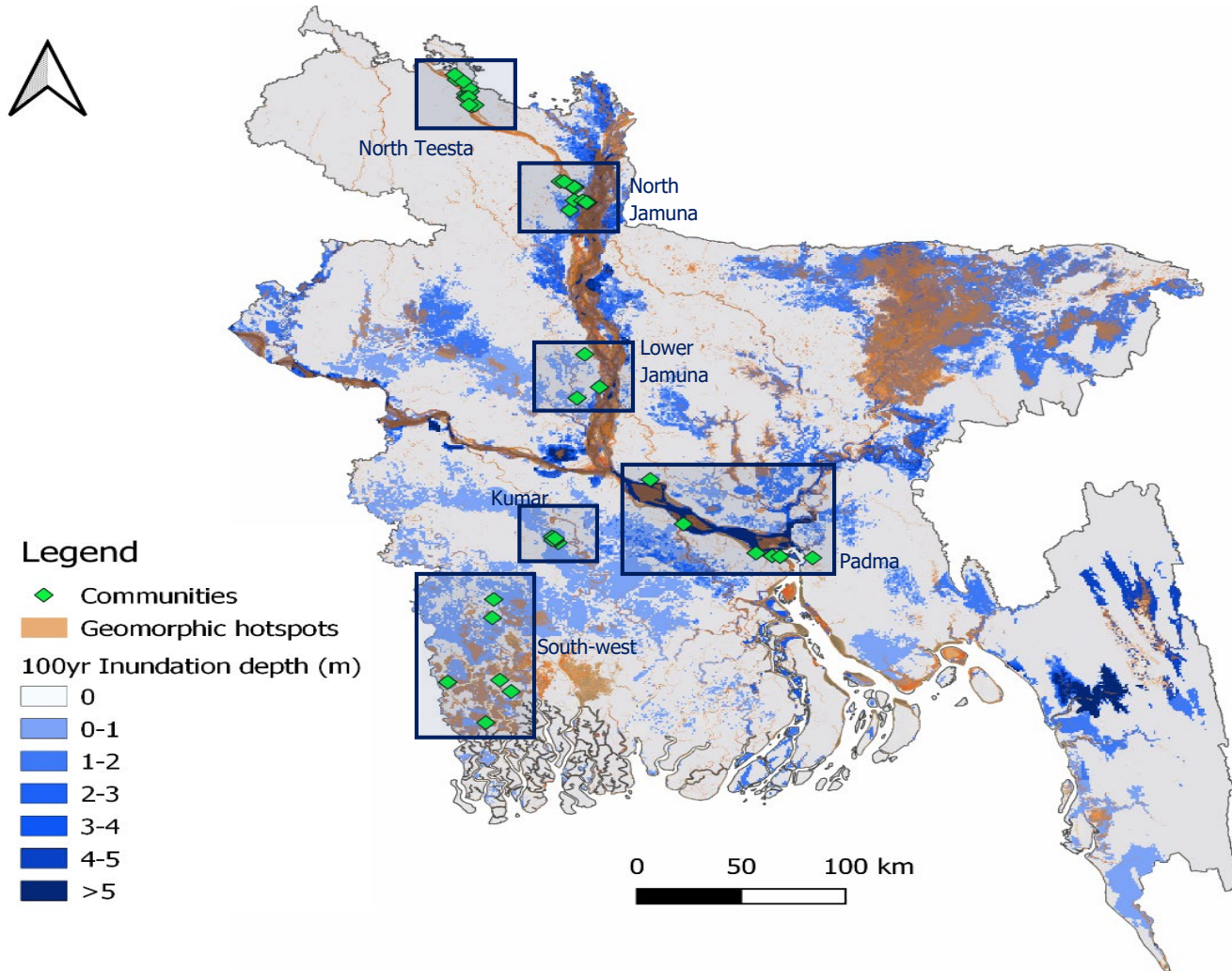
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Methodological approach

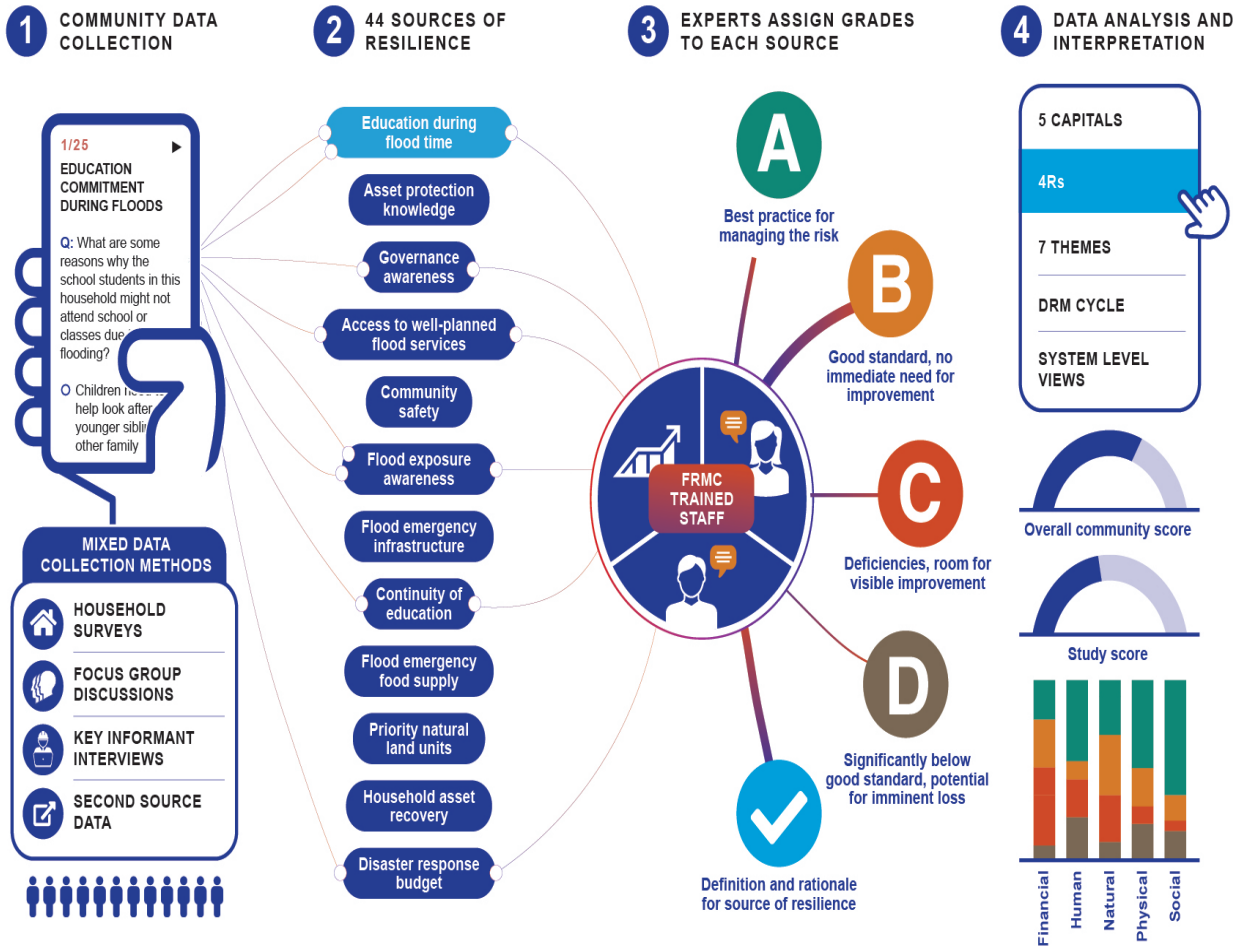


Geomorphologic change and floods in Bangladesh



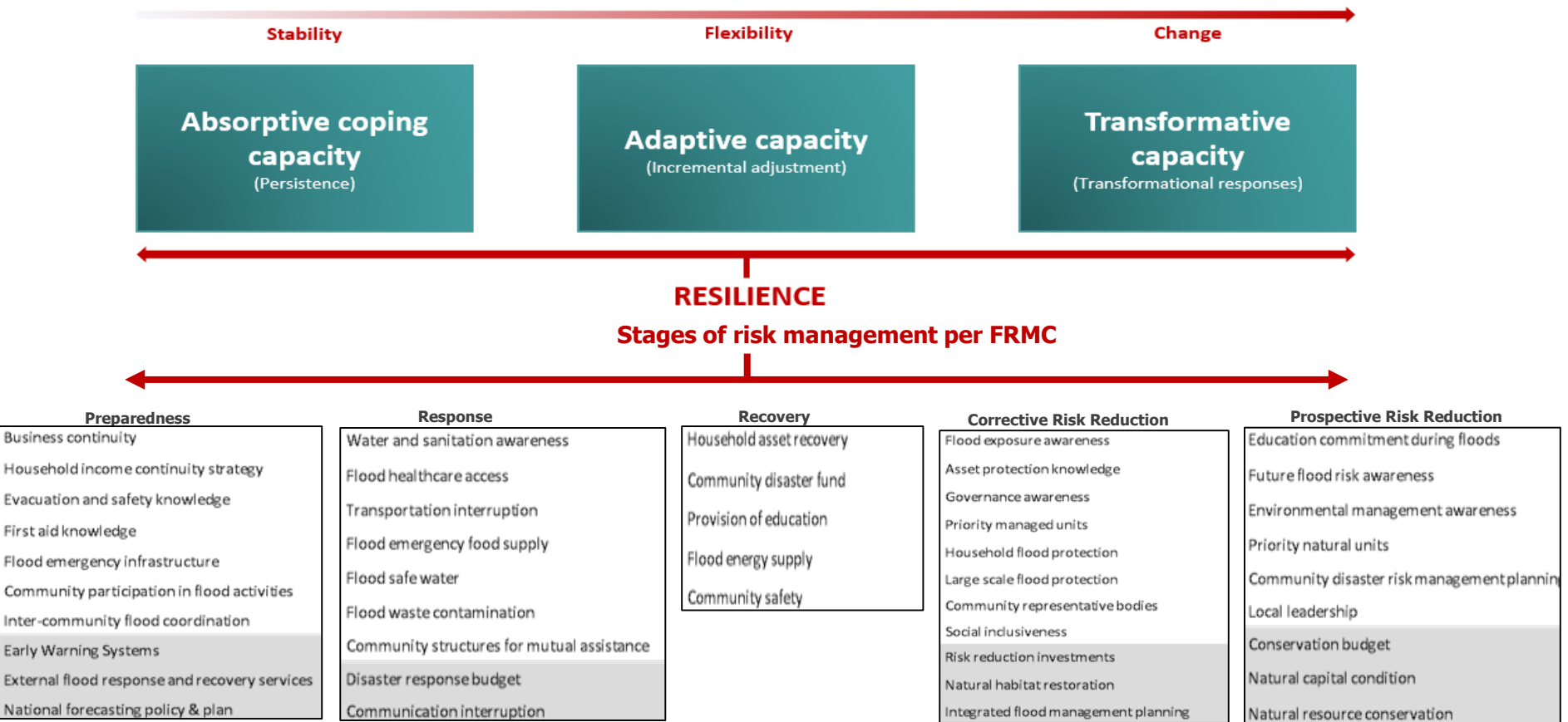
Measuring Resilience Capital/Capacity

Flood Resilience Measurement for Communities (FRMC) tool

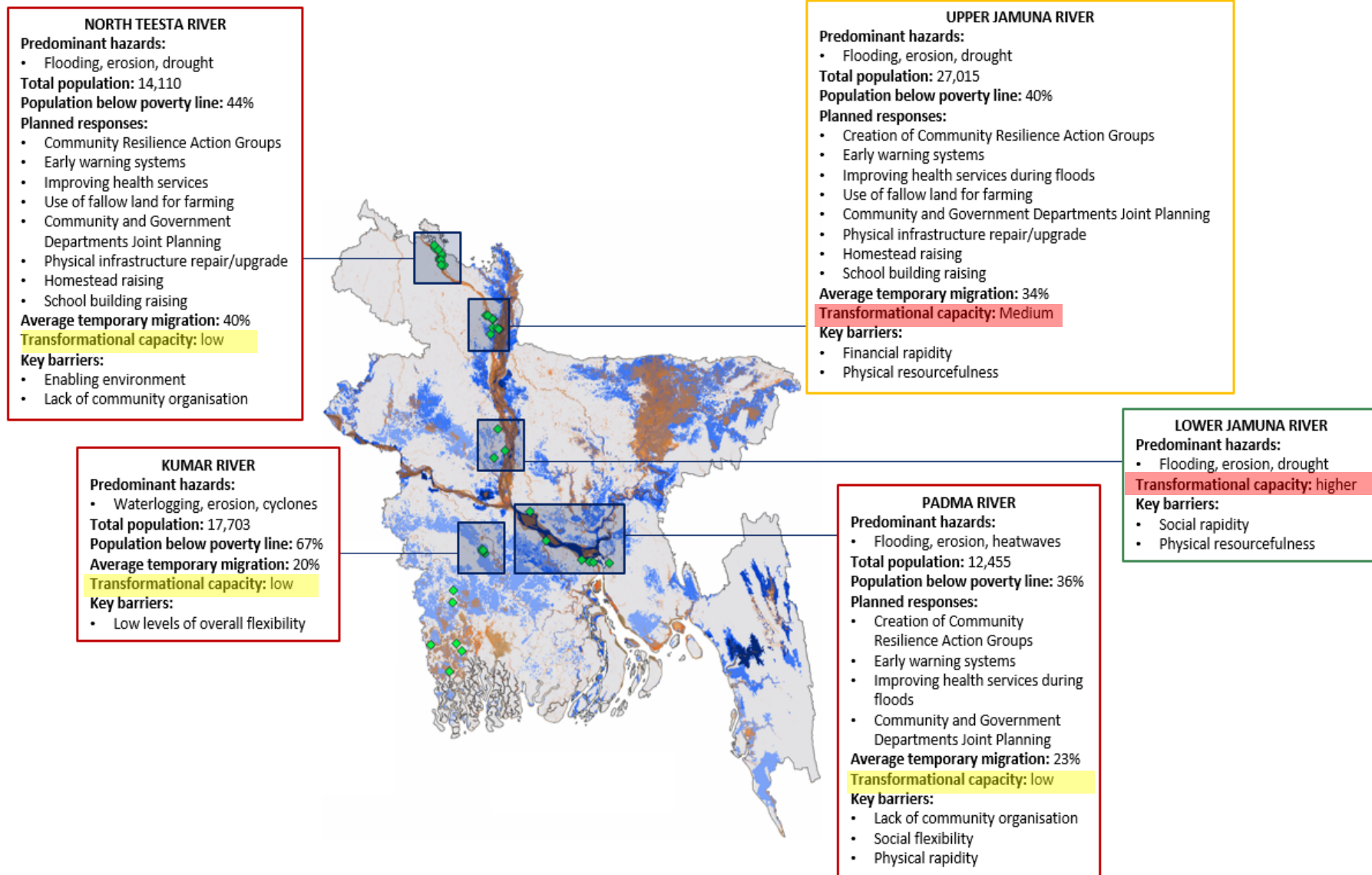


- Indicator-based resilience capacity assessment tool
- 5 capacities logic associated with livelihoods model
- Research working with implementation
- Boundary object and work: Engagement and trust
- Used in >250 communities globally

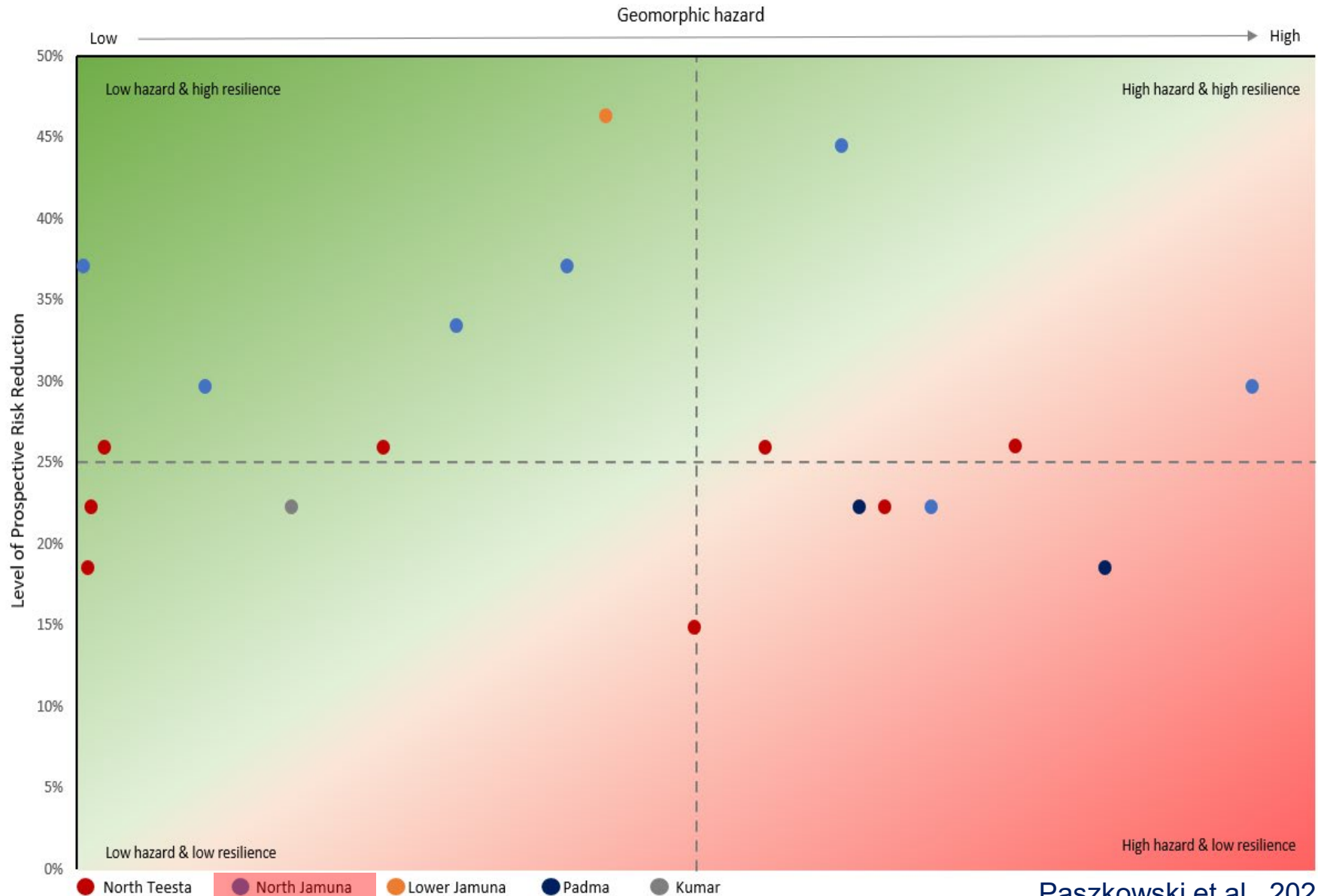
FRMC indicator system to understand capacities



Transformational capacity in key riverbasins in Bangladesh



Geomorphic hazard vs. prospective risk reduction



Summary



- Managed/strategic retreat moving to the spotlight in the context of worsening riverine and coastal floods hazards (as well as other hazards) – to anticipate forced displacement
- Adaptation Pathways offer technical insight into the options space and timing of potential actions
- Comprehensive capacity assessment can support change where and when needed – to consider intensifying efforts *in situ* along a spectrum of change as well as *ex situ systemic change* (e.g., retreat)- e.g., programme managers
- Int'l policy debates on Adaptation and Loss&Damage starting to consider action and support for transformation and retreat