



Understanding Major Transboundary, Cascading, and Compounding Climate Risks: Adaptation without Borders

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Introduction



- Climate change impacts and risks are becoming increasingly **complex and more difficult to manage**: simultaneous occurrence of multiple climate hazards that **interact among themselves** as well as with **underlying non-climatic risks**
- The complexity is a result of the **accumulation/compounding overall risk** and risks that are **transmitted across sectors, regions, continents, and sectors**.
- Furthermore, current responses to climate change impacts can also **create new impacts and risks** (IPCC, 2023).



What are Transboundary Cascading and Compounding Risks?



- Transboundary, cascading, and compounding climate risks (TCCCRs) are climate-related threats that **cross sectors and borders (national, regional, continental)**, spread **through linked systems**, and intensify when multiple hazards or stressors happen **at the same time or sequentially**.
 - **Transboundary risk:** a climate impact in one country/ region affects another country/region through connectors: **shared rivers, ecosystems, food trade, migration, energy systems, or supply chains**.
 - **Cascading risk:** one shock triggers another, such as drought reducing crop yields, which **raises food prices** and then increases **social stress**.



TCCCRs



- **Compounding risk:** multiple hazards or stresses, which are precursors to risks, happen **concurrently or sequentially**, such as flood plus disease, or drought plus heat wave, or drought, conflict and poverty, etc.
- In many countries, the main examples of these risks include **drought, flooding, food-system disruption, water stress, infrastructure damage, displacement and forced migration, and energy shocks**, all interacting with poverty and weak coordination.
- These risks cascade across both national borders and administrative boundaries to generate risks to **people, ecosystems, supply chains, economies, infrastructure, trade and finance flows**.



TCCCRs



- With globalization, no single country or region can **adequately cushion itself** from the intensifying transboundary and cascading climate risks, let alone endeavoring **to be resilient to climate shocks** by advancing adaptation in isolation.
- Management of TCCCRs, therefore calls for **a coordinated borderless effort rallying all actors at local, national, regional, and global levels.**



What is needed to manage TCCCRs?



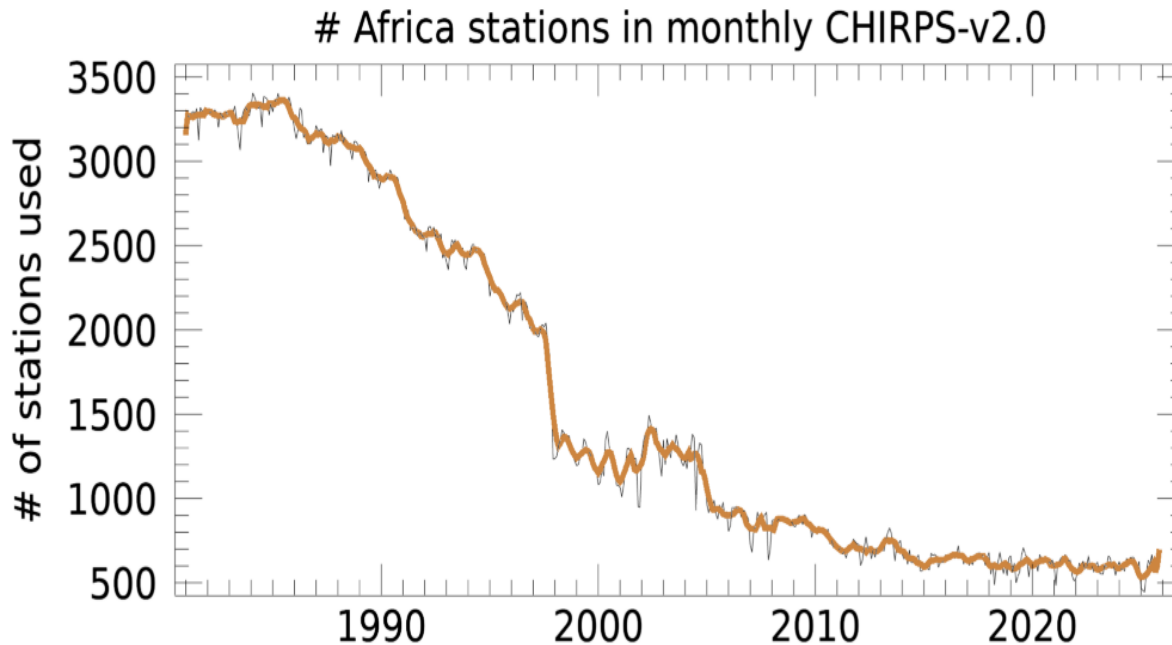
- **Knowledge of** where climate risks move, who they affect, how they multiply, and what regional institutions can do to address them (**Research**), generated from credible **Data** (monitoring and observations), and a governance framework (**Coordination**).
- A defined scope for **enhanced cooperation and collaboration in planning adaptation**, both within and across countries, regions, and continents.
- Long-term planning, all-of-government approaches, transboundary cooperation and benefit-sharing, development pathways that increase climate action and reduce inequality and implementation of NDCs to build governance for climate resilient development (IPCC, 2022).



Climate Data Gaps



There are significant data gaps in weather observations in many parts of the world, especially in the Global South (**Africa, the South Western Pacific, South America, and Antarctica**)



The inadequacy of weather observing Networks is particularly, pronounced across Africa. In 2019 only **26%** of weather observing stations reported in line with WMO equipments.

WMO State of Climate Services 2020

Inadequacy of weather observation infrastructure, data, and information contribute to **ineffective climate risk management and adaptation** .



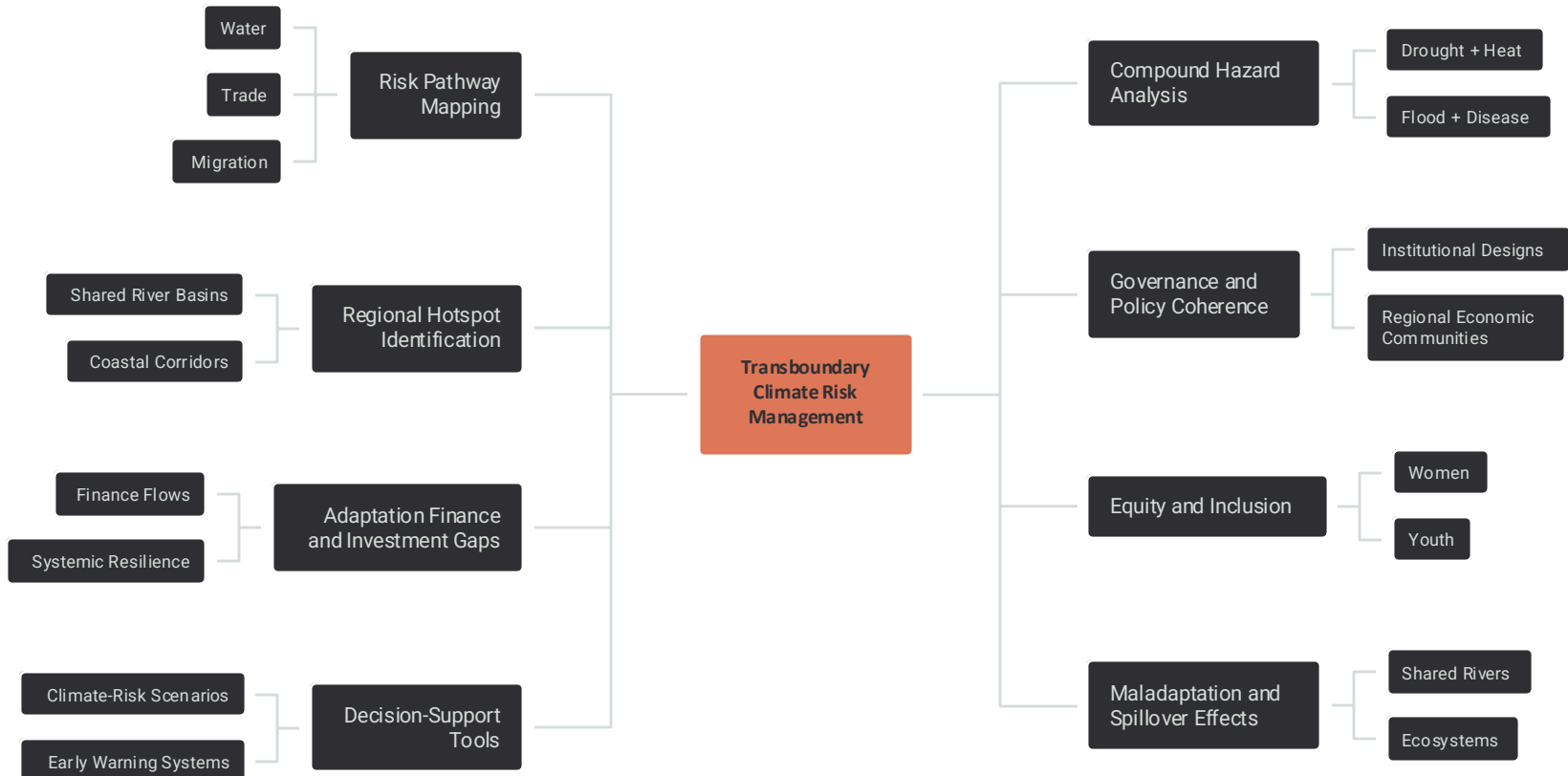
What would be the role of RSO?



- Identify the risks (climate risk maps) and develop a pathway to generate the necessary knowledge, data and promote monitoring/ observations networks.
- Synthesize evidence on specific transboundary and cascading climate risks, including the means to assess their significance to support decisive political action aimed at managing such risks in a sustainable manner.
- Promote action-oriented research to address TCCCRs, helping governments and Regional Economic Communities move from fragmented risk management toward coordinated resilience planning.



Priority Research Needs for Transboundary Risk Management





What Systematic Observations are needed?



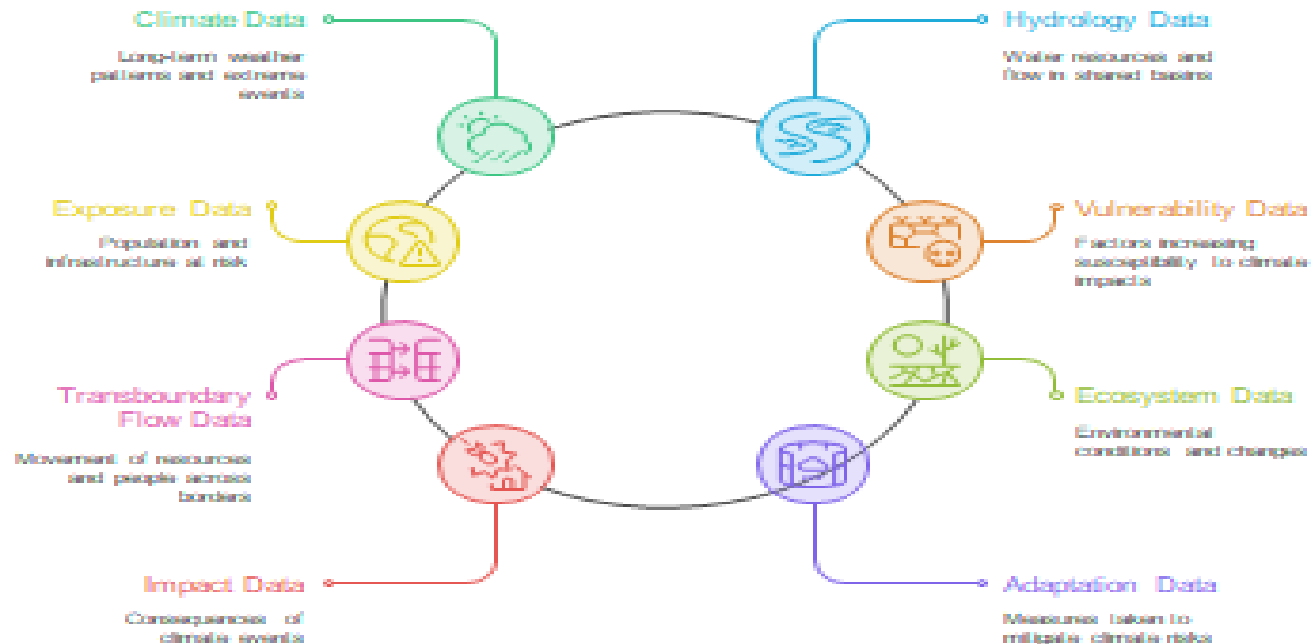
- Observations (Data) should go beyond climate hazards, **to include** joined-up, high-resolution, multi-sector data that show where hazards occur, who is exposed, how impacts move through ecosystems, sectors, and borders, how it accumulates over time, and how vulnerability changes over time.
- Observations/ measurements should be taken repeatedly, not just one-off surveys (**Long-term**), **using common indicators across countries and regions (Comparable)**, generating data that can be combined across climate, water, **land, food, and social systems (Linked)**, and making observations that help planners see **warning signs before risk cascades (Actionable)**.



Core Data Needs

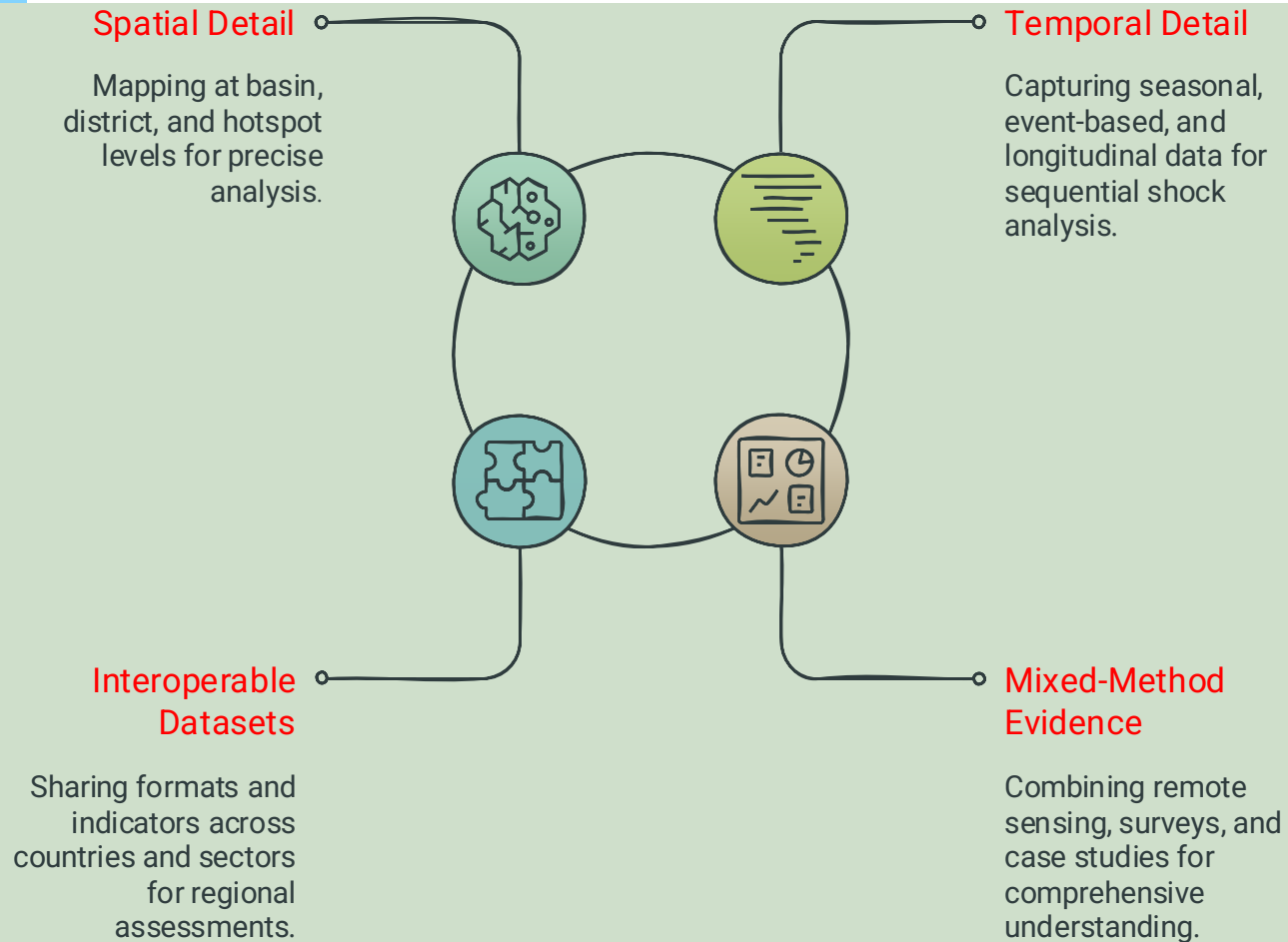


Data Types for Climate Risk Assessment





Data Granularity and Integration





Conclusion



- Profile climate risks as **system-wide problems**, and adaptation as a **global public good** because one country's choices inadvertently affect others.
- Adopt a borderless approach to adaptation in tracking how climate impacts spread through pathways of risk such as ecosystems, **trade, water, energy, infrastructure, food systems, displacement and forced migration**.
- **Develop risk pathway maps; compound risk hotspot maps; cross-border dependency matrices, etc**
- Develop a mechanism to support governments (national and RECs) and planners to **design and implement coordinated adaptation responses** that reduce spillover risks.