

Cooperation in International Waters in Africa



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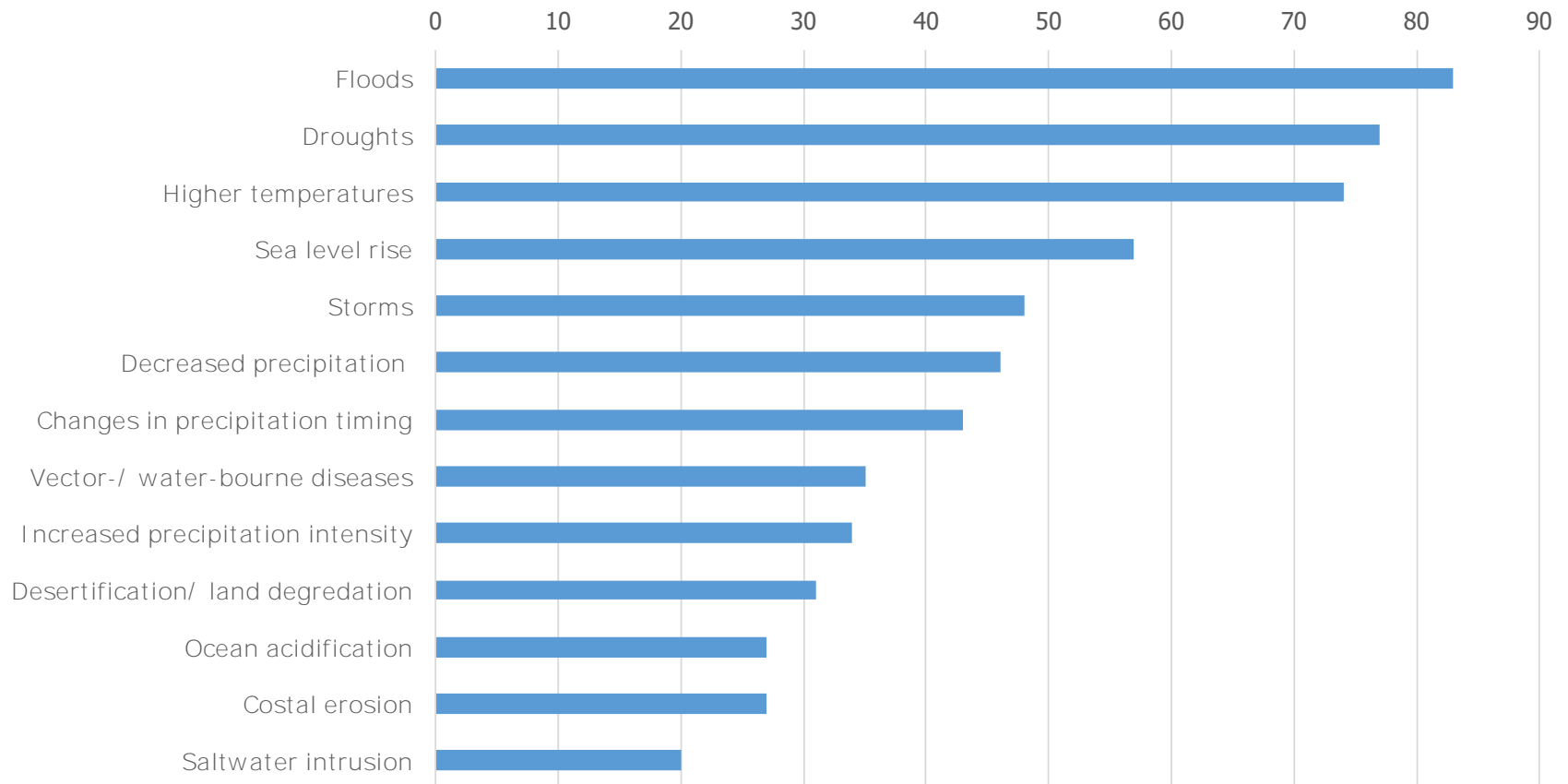
*Designing for Resilience in Transboundary Waters –
The Case of Africa*

Water a major channel for climate impacts



Main climate hazards identified in the NDC adaptation component

UNFCCC, 2016; 137 countries

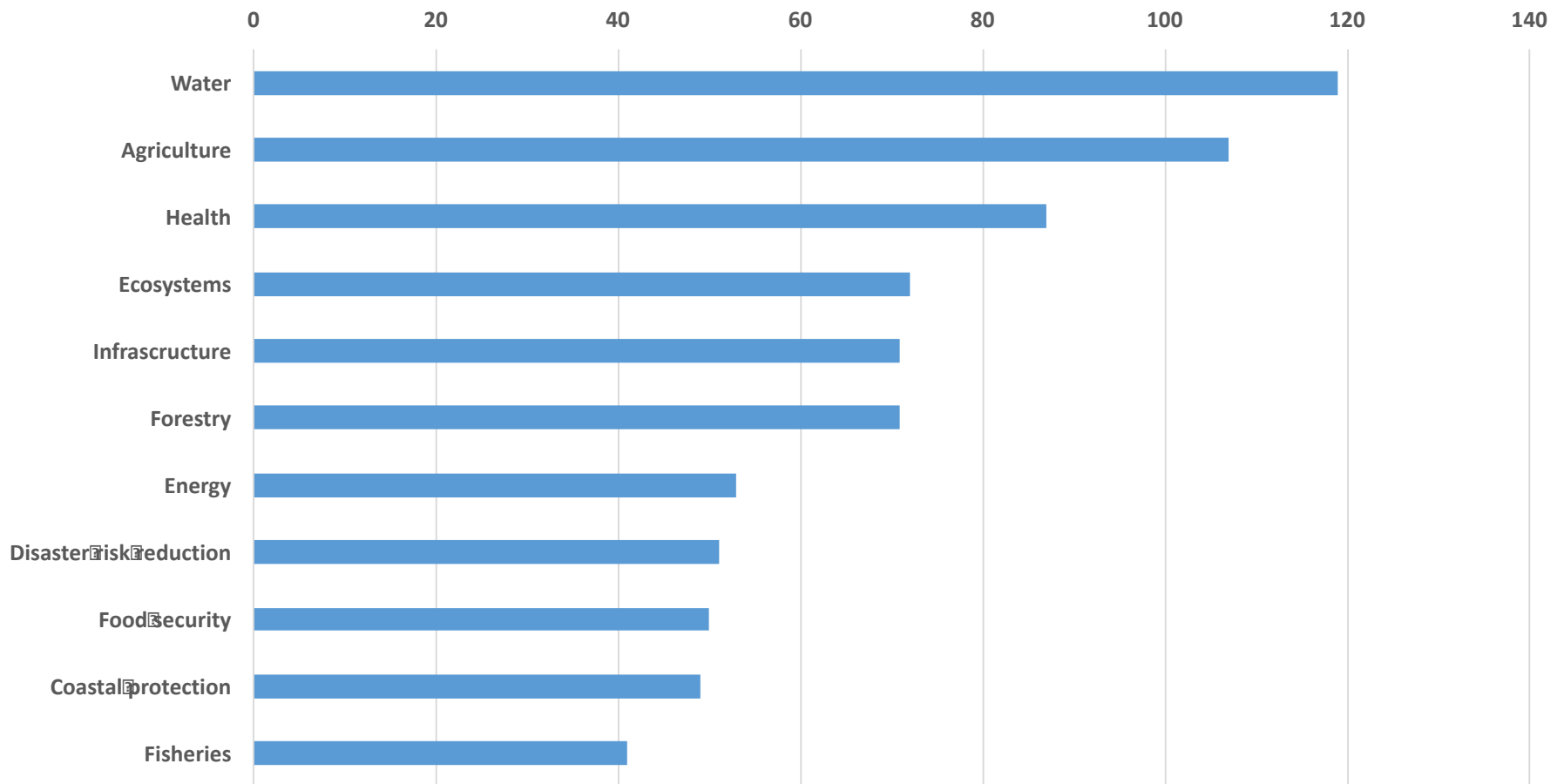


WRM a critical pathway to build resilience

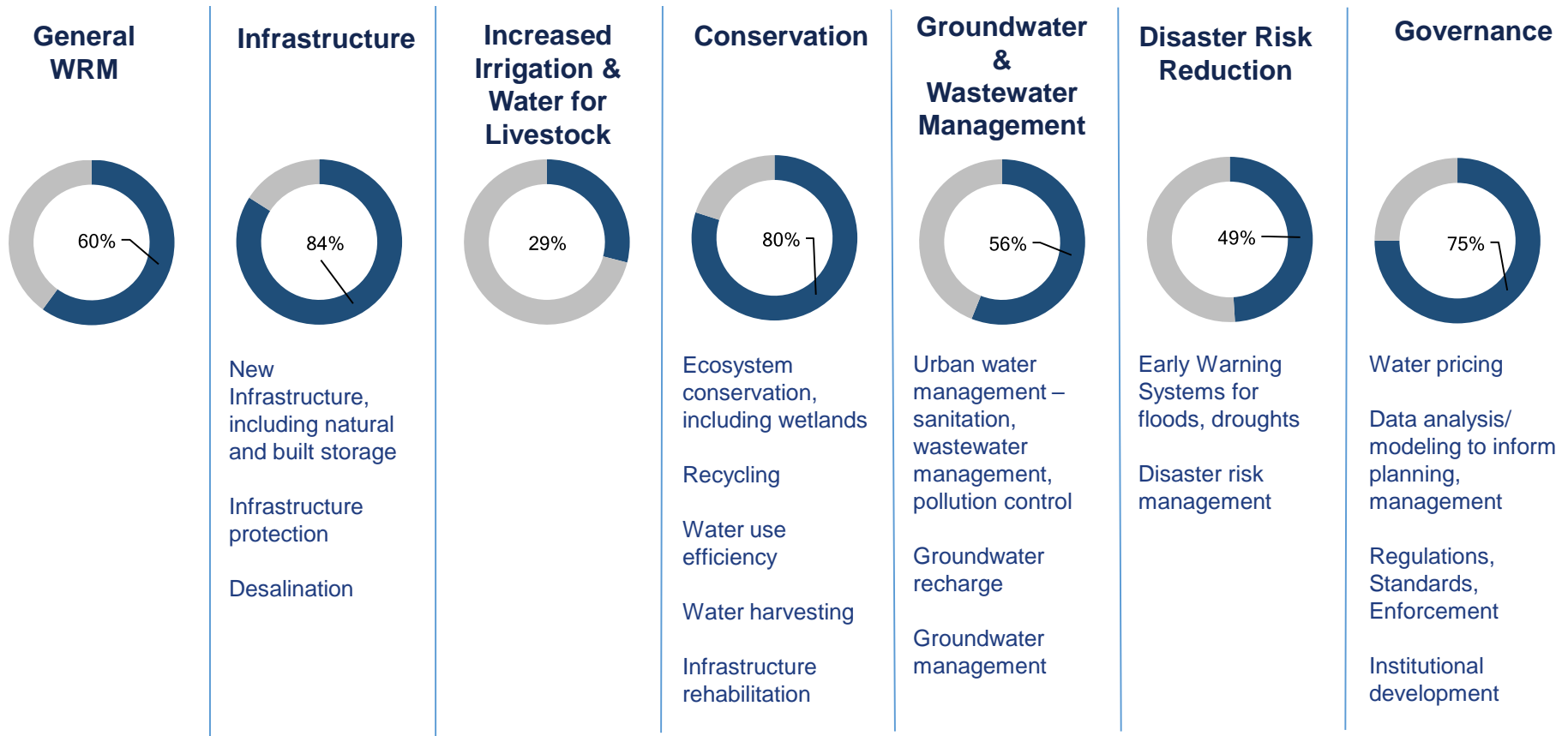


Adaptation action areas prioritized in NDCs

UNFCCC, 2016; 137 countries



Proposed WRM adaptation actions in NDCs



% of 80 GWP partner countries analysed

Global adaptation architecture nationally focused



Assessment of adaptation needs and capacities as part of the NAP process informs the adaptation component of NDCs; NAP implementation contributes to NDC delivery

National Adaptation Plan (NAP)

Country-driven, continuous, progressive, iterative process
Identify medium and long term adaptation needs
Develop and implement needed strategies and programmes
Gender-sensitive, participatory and fully transparent approach

Nationally Determined Contributions (NDCs)

Country commitments on mitigation, adaptation, to the global community as part of the Paris Agreement
National appraisal and delivery of NDCs undergo global stocktake every five years

PARIS CLIMATE AGREEMENT

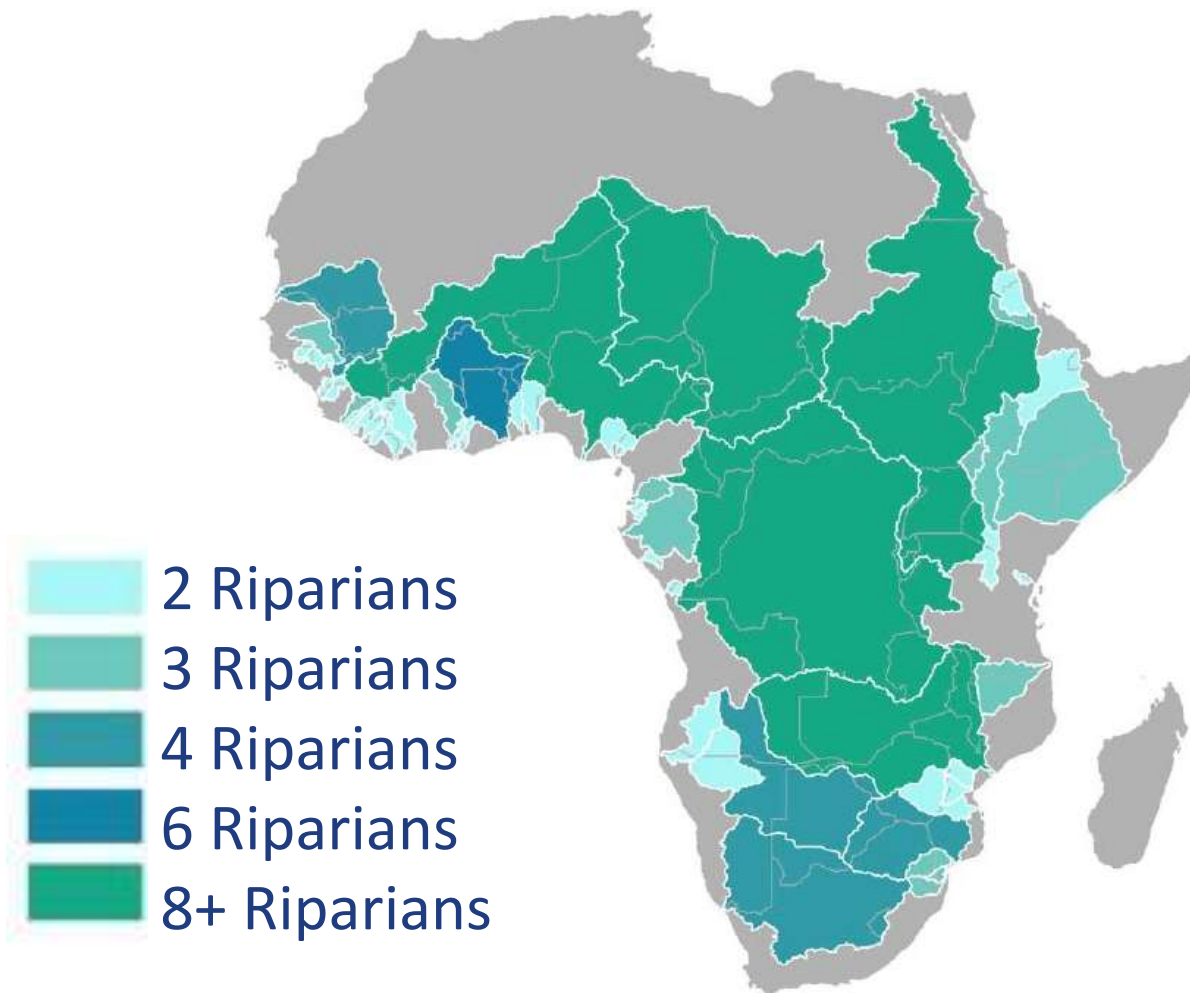
NDCs highlight national adaptation needs and gaps in the global arena, facilitating mobilization of partnerships, capabilities, and finance for NAP implementation



Most of Africa's water is transboundary

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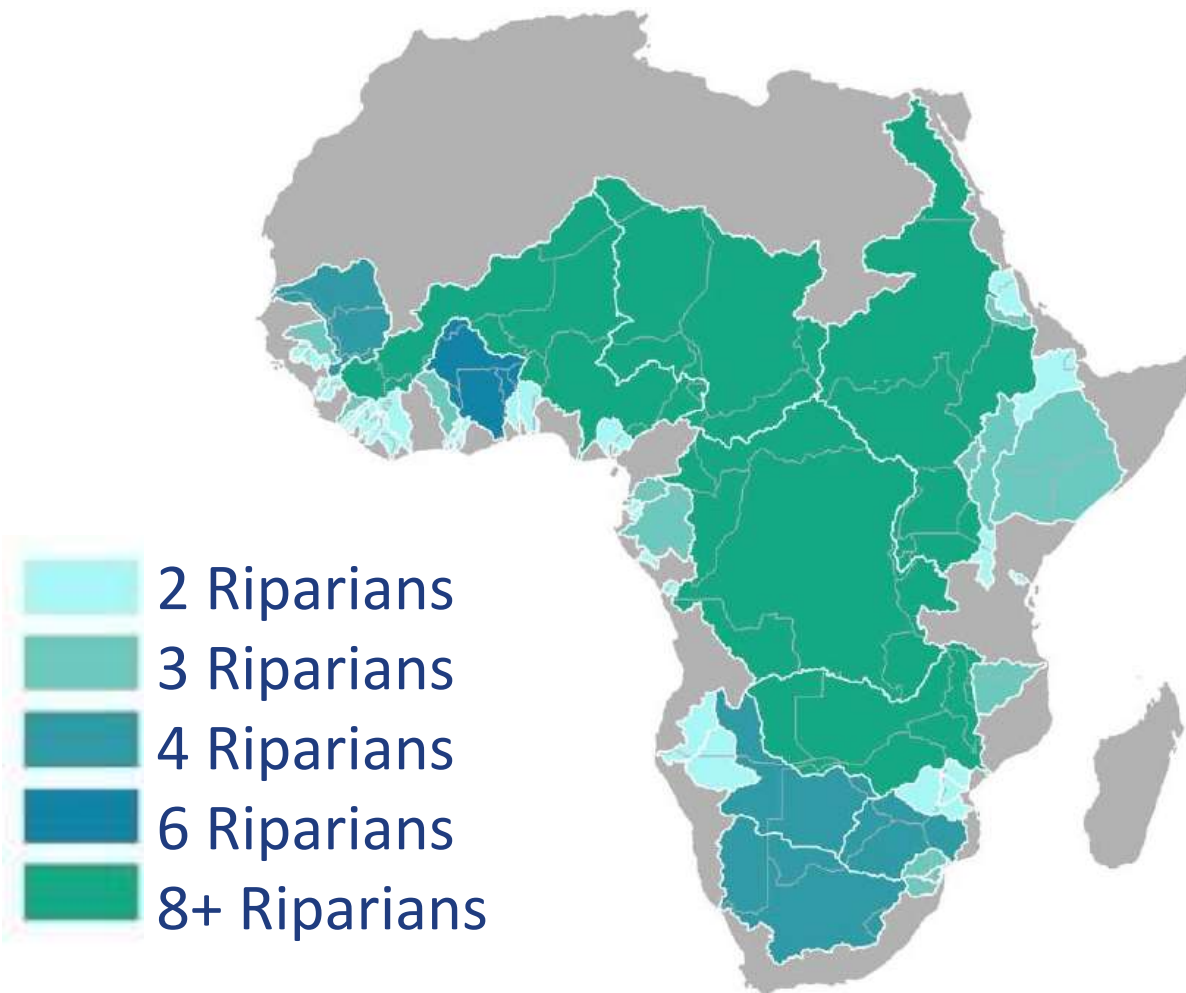
- Over 90% surface water in 63 transboundary river & lake basins
- Aquifers underlying 40% continental area are transboundary



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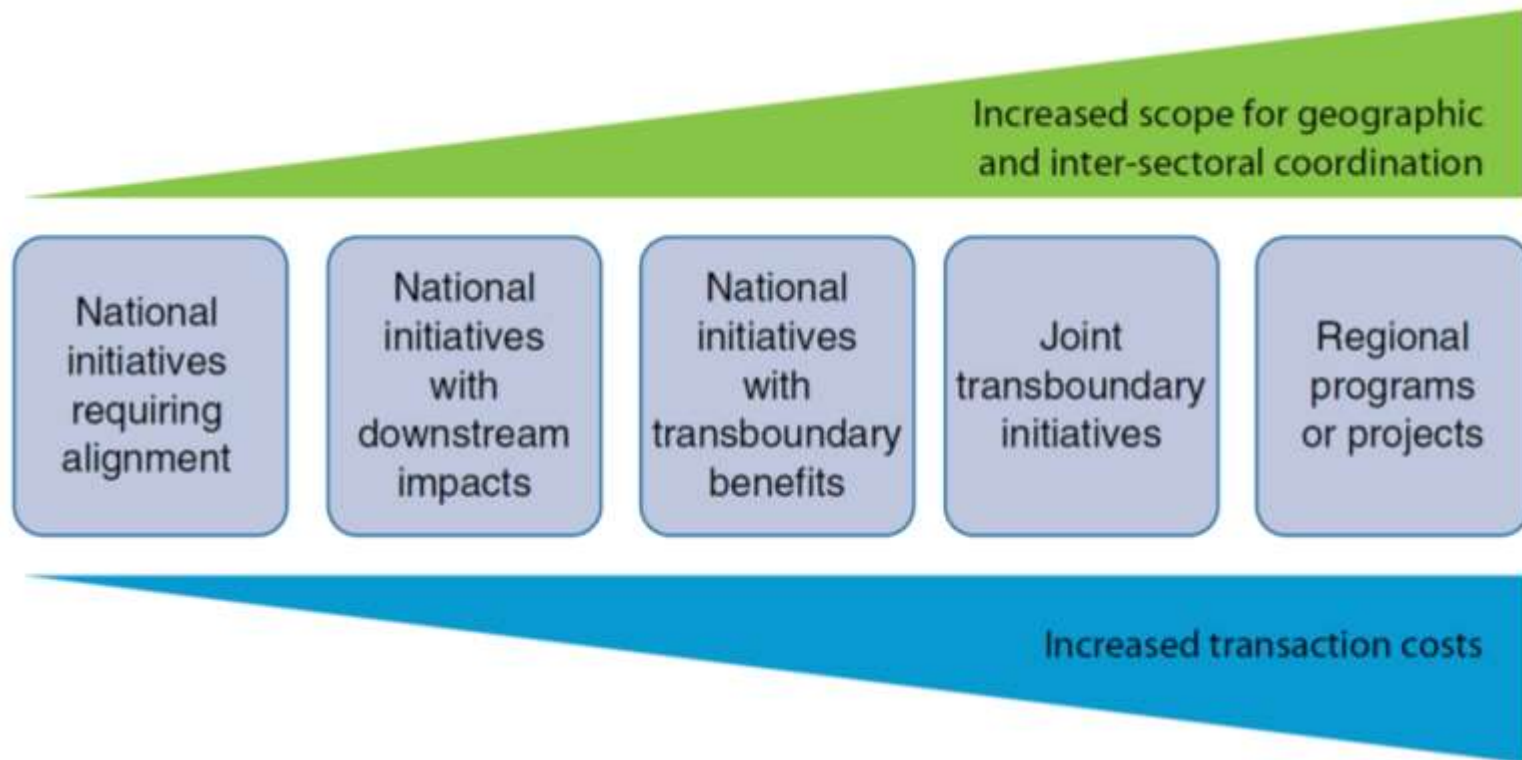


- *WRM actions identified only at local/national levels fail to account for hydrological reality, limits range of options for & scope of resilience*
- *Coordination needed among regional, national, local actions*

Transboundary cooperation can take many forms



... and depends upon a variety of economic, environmental, political, social factors



The transboundary challenge



TRANSBOUNDARY COOPERATION IS COMPLEX

Investments perceived to have 'public good' nature

- Long time horizon (30-50 years)
- Increased uncertainty in future water availability, needs
- Riparian perception of risk
- Inadequate evidence/understanding of opportunities of cooperation

A MARKET FAILURE
Strong likelihood of underinvestment in adaptation measures requiring transboundary cooperation

- Limited availability of finance to address additional transaction costs of regional approaches to building resilience often cited as a barrier in Africa

**FOREGONE BENEFITS,
RISK OF MALADAPTATION**

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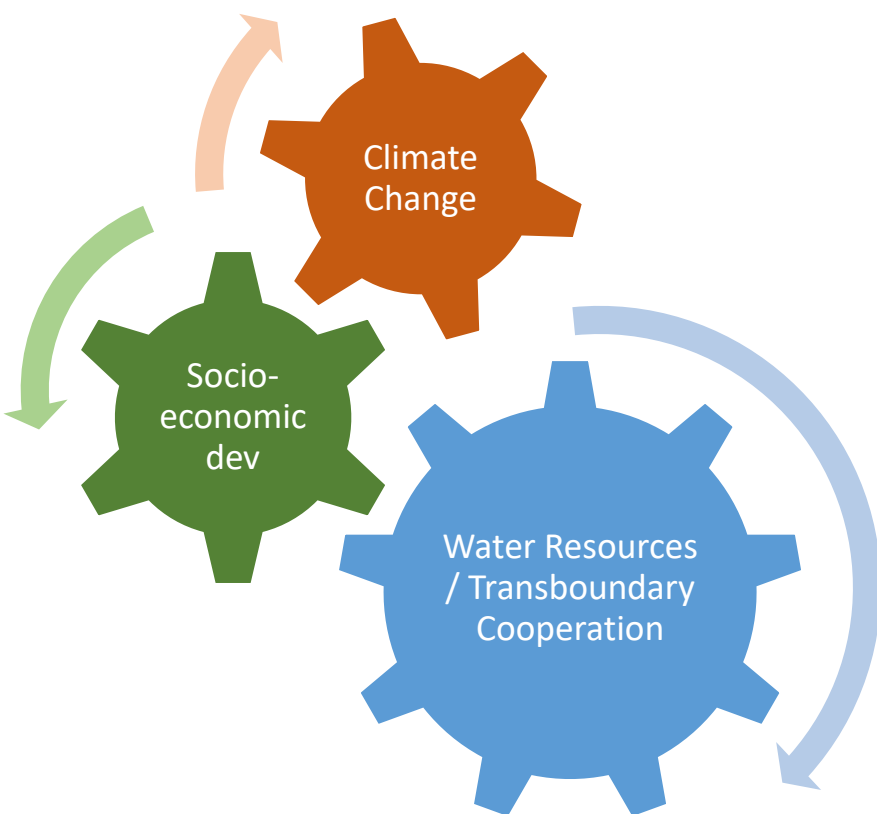
FOREGONE BENEFITS,
RISK OF MALADAPTATION

Opportunity for climate financiers to address 'market failure' that limits supply of regional public goods

- Support transboundary cooperation as part of support for climate adaptation in Africa

Purpose of this work

- *Highlight critical role of cooperation for adaptation*
- *Provide a conceptual framework for understanding interlinkages*



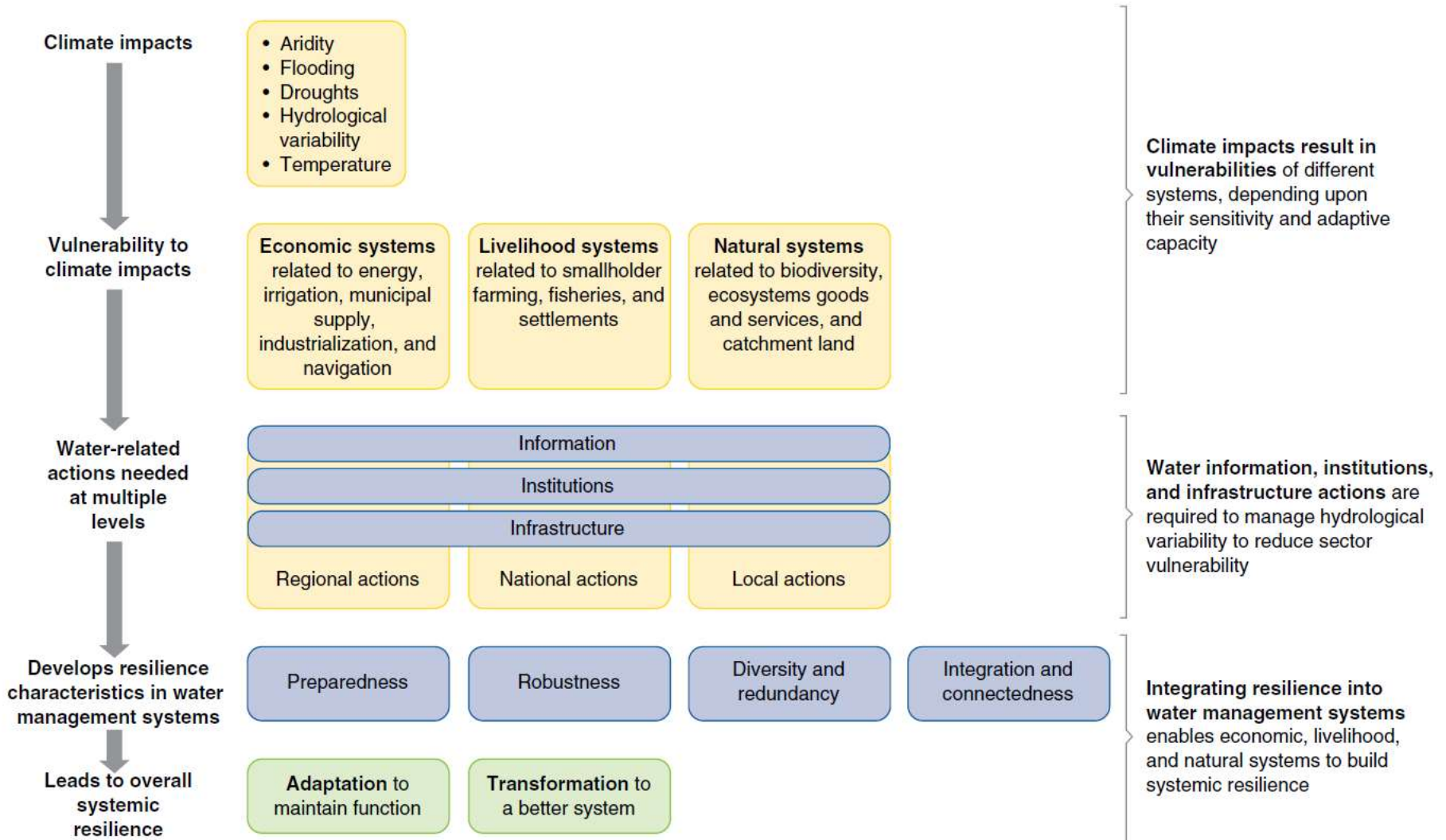
USEFUL FOR WHO? TO DO WHAT?

Countries, technical teams *strengthen approaches to climate adaptation*

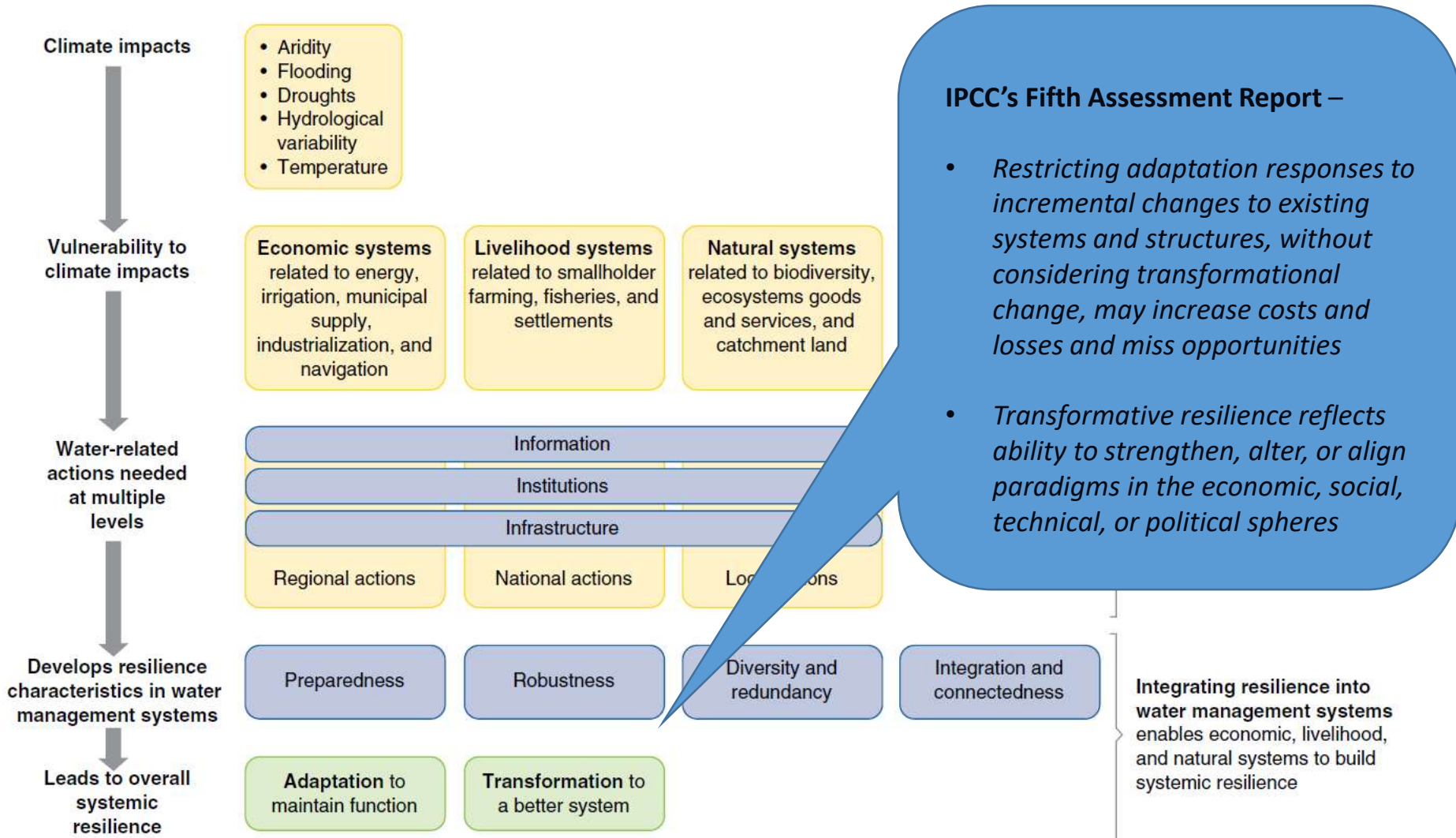
Countries, donors, partners *mobilize resources for transboundary adaption activities*

Climate financiers *address transboundary waters in financing strategies*

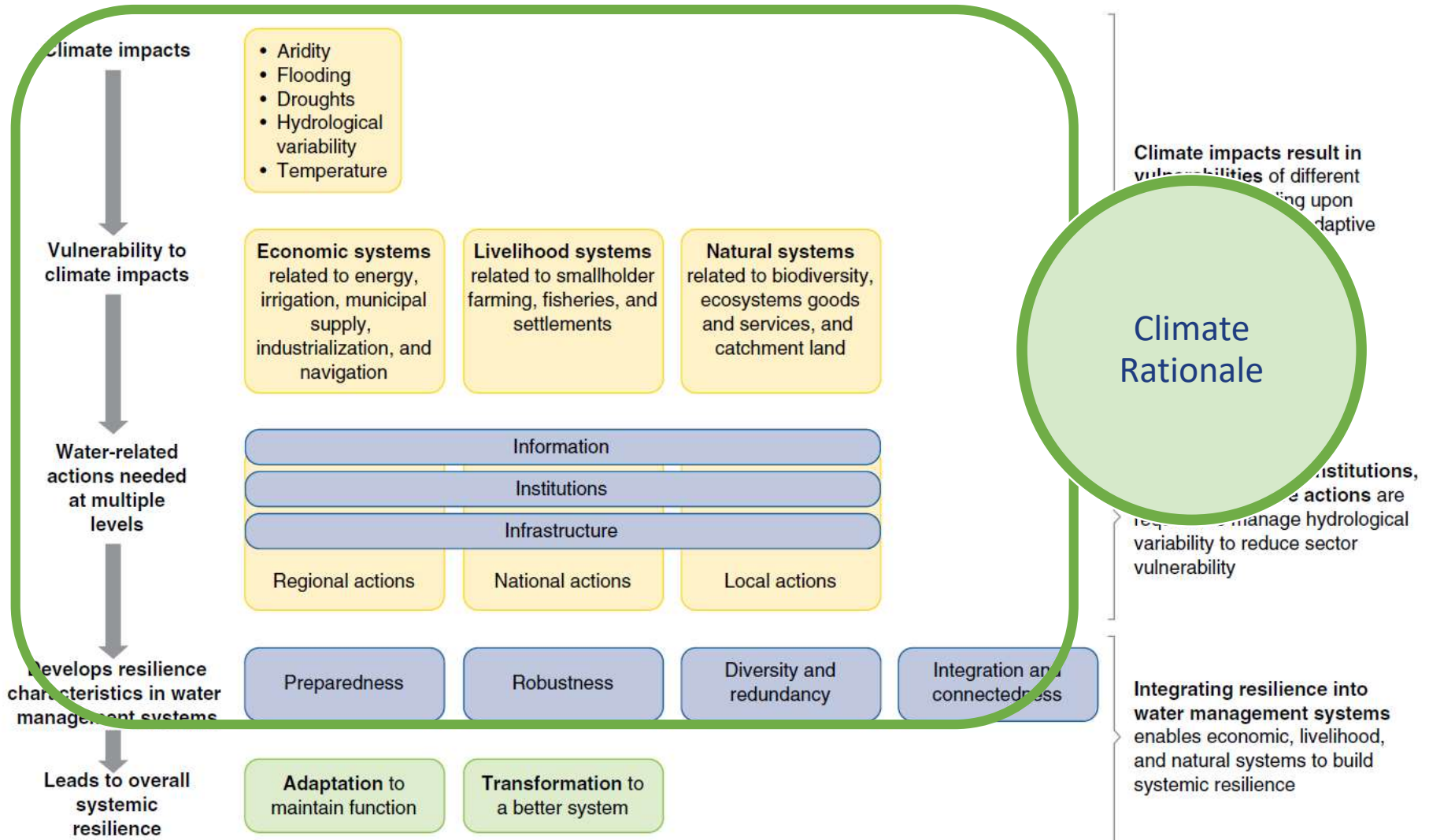
Role of transboundary cooperation in climate resilience: A framework



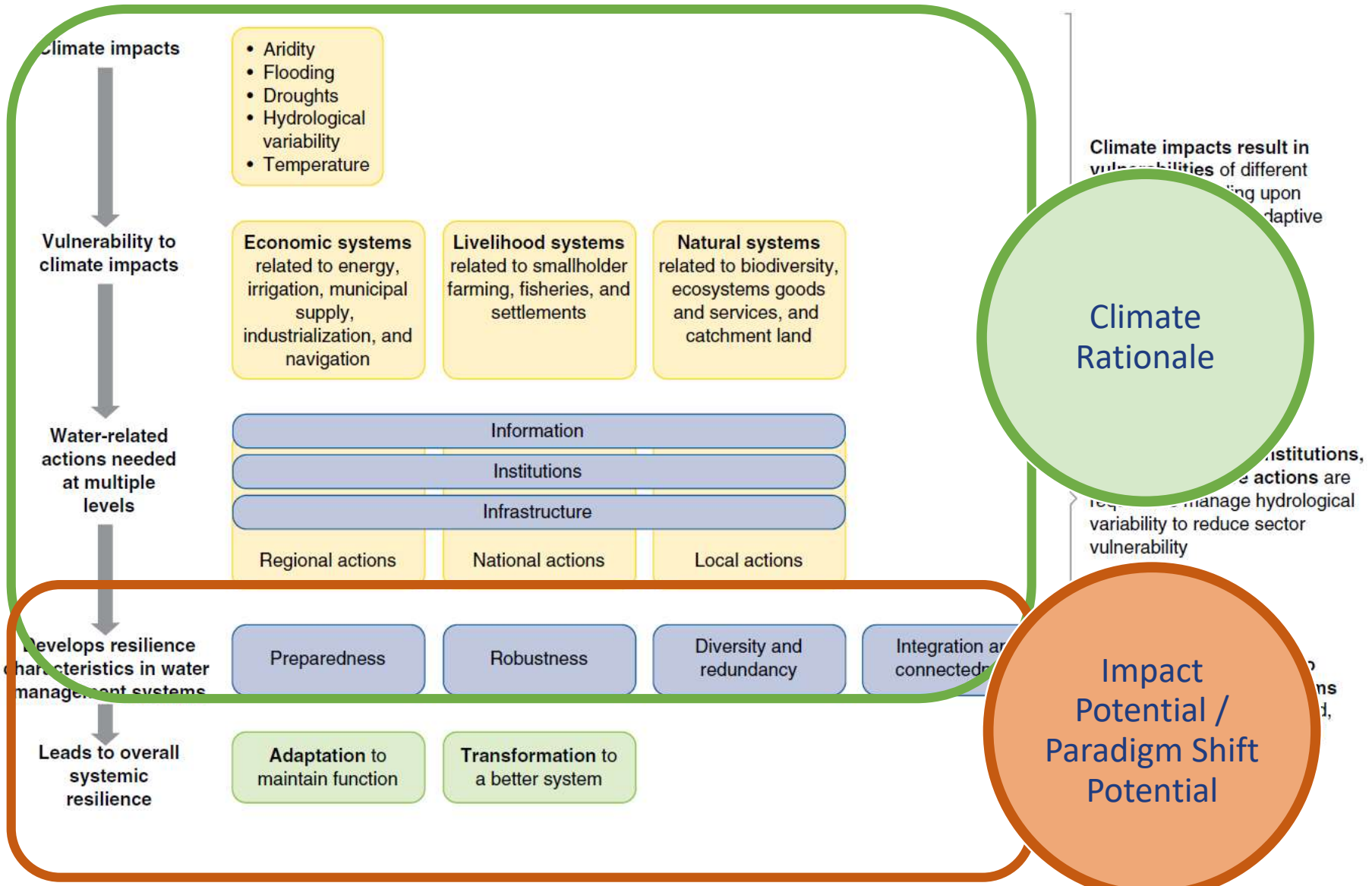
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Role of transboundary cooperation in climate resilience: A framework



WRM actions that build resilience



Characteristics of Resilience

Water Management Systems That Build Resilience

Characteristics of Resilience in Water Management Systems

Preparedness to manage and cope with change and shocks

Flood forecasting, early warning systems, emergency response plans, flood protection plans, urban planning and development, storage, system operating rules, land-use management, watershed management, preservation of natural infrastructure

Diversity and redundancy to ensure continuation of functionality

Linked water systems and regional power pools operated at different assurance, diversity in water and energy supply sources, diversity in crops and irrigations practices relevant to climate systems, excess institutional capacity, shared information systems

Integration or connectedness to allow for optimization, benefits of scale

Coordinated hydropower generation, regional power pool, conjunctive use of surface and groundwater, basin-level or multilevel planning, multipurpose infrastructure, integration of natural and built infrastructure, water-related policy harmonization

Robustness to withstand change and shocks

Well-designed, resilient, storage and flood protection infrastructure, appropriate operating rules, functioning ecological infrastructure, coordinated institutional systems, local community response systems, relevant information systems

Adaptability of a system to change

Flexible institutional arrangements, flexible infrastructure design, responsive flood mitigation strategies, policies that facilitate technology adoption and climate smart actions, policy and support that enables livelihood adaptability

Transformability of a current system to a better system

Flexible policy and legislation, regularly revised strategies, learning institutions that can reorganize, infrastructure systems that can be altered or operated in different ways, community and country resources to enable changes

Characteristics of Systemic Resilience

National-regional coordination



		Level of Required Actions	
		National	Regional
Information Systems	Data monitoring and sharing systems	Data collection, verification, quality control; Use of shared information for preparedness to flood, drought; Data dissemination and sharing with relevant sectors, local stakeholders, and regional entities; Harmonization of national practices with regional protocol	Agreement on data collection and sharing protocol; Regional platform/mechanisms available for exchange
	Decision-support information systems and early warning systems	Provision of data for calibration; Use of analytical tools for preparedness and robustness development projects; National preparedness plans and information dissemination schemes are developed or harmonized; National plans are informed by basin-wide models and jointly developed tools	Joint development of modelling and analytical tools; Forums for dialogue that use tools for development prioritization and planning; Early warning systems implemented, information disseminated to national or local constituents
Institutional Systems	Flexible policy and legal instruments	National law enforcement, policy implementation; Agreement and execution of management actions	Regional policy implementation; Agreement on climate-informed water/benefit sharing, abstraction limits, storage and release protocols, other regional protocol
	Institutionally and financially sustainable water resource organizations	Sub-basin organizations manage local processes, carry out sub-basin level management functions; National structures coordinate, allocate, and develop plans among sectors and ministries; Carry out information and investment functions and communicate with stakeholders for accountability purposes	Agreement on organization mandate; Capacity building within organizations; Financial sustainability measures in place; Working partnerships with national governments, other regional bodies established
Infrastructure Systems	Basin-scale, resilience-targeted, investment planning	Develop national plans for water management and development; Tailor and prioritize investments to local needs and norms; Coordination of national project prioritization and planning with regional agreements and processes	Basin-wide dialogue to jointly prioritize interests, evaluate cross-border and cross-sector trade-offs, agreement on regional investment plans that ensure system preparedness, robustness, redundancy, and adaptability; Regional resource mobilization
	Robust Infrastructure investment	Prepare and implement national investments in collaboration with regional counterparts to share risk, optimize benefits; Operate national infrastructure	Transboundary coordination in investment planning, implementation, and operation; Prepare, operate, restore joint infrastructure

Water Management Systems

- High seasonal and inter-annual flow variability; floods and droughts regular, and projected to increase – major risk to lives and livelihoods
- Nile Basin Initiative (NBI) developed a flood forecasting and Early Warning System
 - Coverage – highly vulnerable areas in Ethiopia, Sudan and South Sudan
 - System links together a wide range of stakeholders –
 - Local stations - daily flood level monitoring from local stations
 - National MET agencies - rainfall data and hydrological monitoring
 - Regional forecasting - real-time flood forecasting
 - Daily, weekly and seasonal flood forecasts disseminated to national ministries of water, national flood committees, local governments, communities and humanitarian orgs
 - Direct Beneficiaries – 150,000 people in Ethiopia, 200,000 in Sudan and South Sudan, including subsistence farmers and pastoralists
 - A further 1.7 million people indirectly benefit from the system
 - Benefits –
 - Informed decision-making around crop planning for the season and better management of livestock
 - Reduces loss of life, property damage and minimizes disruption of productive activities
 - Helps plan for temporary migration when needed
 - Informs Nile Decision Support System – by helping countries develop agreed-upon ‘climate change flood scenarios’ to improve long term basin planning

Basin-level planning: The Nile Decision Support System (DSS)



- A comprehensive system founded upon information sharing agreements
 - Information management system
 - Regional river basin modeling system
 - Multi-objective analysis of investment alternatives under a range of different scenarios
- Used by the countries jointly
 - Trade-off analysis and joint evaluation of investments of transboundary significance
 - Analysis of resilience benefits of to region's economy, livelihoods and natural resources
- An informed, cooperative path forward
 - While there is considerable irrigation and hydropower potential in the basin, national plans for irrigation expansion can only be met through cooperative management of the basin that carefully considers
 - inter-sectoral trade-offs of water use,
 - emphasizes smart agriculture techniques, and
 - includes a landscape of improved regional trade and integration

Shared dam safety standards, operating principles in E. Nile



- Agreement among Ethiopia, Sudan and South Sudan
 - Principles for dam design and safety
 - Coordinating operated rules, including flexibility to adapt to increasing hydrological variability and change
- Countries established national dam safety units to
 - Implement dam safety guidelines
 - Ensure that national level processes are aligned to regional commitments
 - Facilitate neighboring country coordination in dam planning, operation, and maintenance
- Nile Basin Initiative a platform for shared capacity building and dialogue
 - On the job training to dam operators from three countries
 - Developed technical field guides on dam safety
 - Developed a dam safety training module for Eastern Nile universities to build capacity of technical personnel



Cooperation to reduce economic impact of climate shocks in the Limpopo Basin

In Mozambique -

- 58% of pop vulnerable to water-related hazards, both in wet and dry seasons
- Productive sectors hit - agriculture, electricity generation, mining, transport, communications
- 1.1% of GDP losses annually, \$1.75B between 1980-2003, expected up to \$7.4 in 2003-2050

TB cooperation around weather forecasting, EWS, flood management, food security initiatives could help avert

- Direct cost of climate hazards – income and asset losses, food supply shortages and price spikes
- Longer term costs – disease outbreaks
- Opportunity costs of post-shock public expenditure



Cooperative WRM catalyzes socioeconomic development in Gauteng Province



- Johannesburg in an arid region, in watershed between Orange and Limpopo Rivers
- Rapid growth enabled by increasingly complex water system, since 1980s
- Water transfer from rivers in SA and Lesotho in different climate regions: source diversification/robust, inter-connecting infrastructure, mitigates climate risks
- Governance arrangements key! Backed by strong institutions and management instruments
- Significant drought in 2015-2016 – Gauteng’s economy spared from the worst of the brunt compared to rest of the country



An aerial photograph of a river flowing through a dense, green forest. The river is the central focus, with white water rapids in the middle section. A dirt road runs parallel to the river on the left side, and a small blue vehicle is parked on it. The surrounding landscape is a mix of dense forest and open green fields.

Thank You

Climate Resilience in Africa: The Role of Cooperation
around Transboundary Waters
openknowledge.worldbank.org