

WATER, HEALTH AND CHANGING CLIMATE REGIMES IN AFRICA

CHALLENGES AND OPPORTUNITIES IN AFRICA
PANEL

US WATER AND ENVIRONMENTAL SECURITY
SEPT 18

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ROADMAP

Climate Change +
Variability



CONTEXT

Research +
Programmatic Gaps



CHALLENGES

What Can We Do
About It?



OPPORTUNITIE
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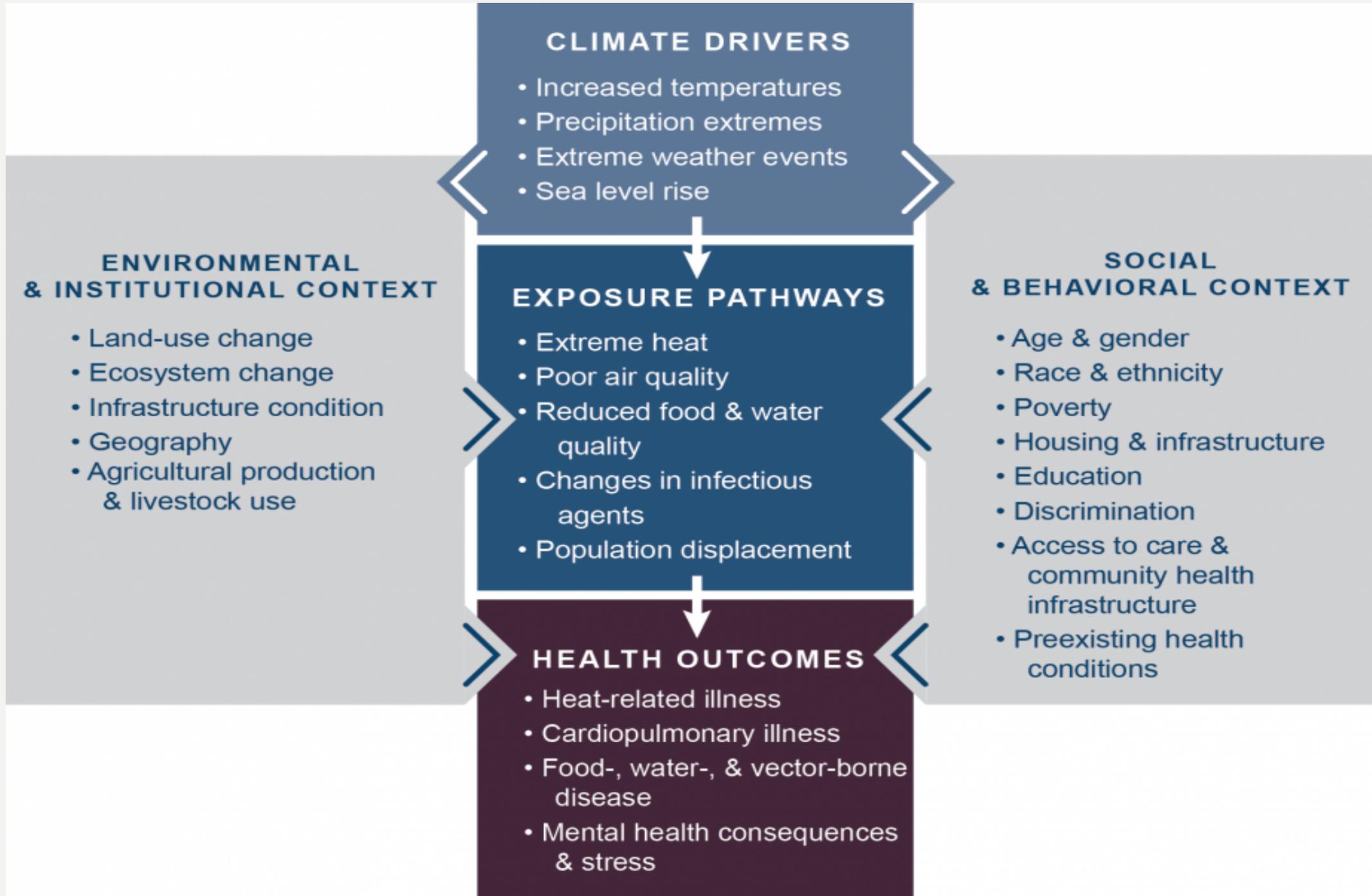
TERMS AND DEFINITIONS

- **Environmental Security** – process of which solutions to environmental problems will affect national security
- **Climate Variability** – The way climate fluctuates yearly above or below a long-term average value.
- **Climate Change** – Long-term continuous change (increase or decrease) to average weather conditions or the range of weather.
- **Climatological Normal** – 30-year average of weather variables
- **Vulnerability** – level of exposure + population sensitivity + adaptive capacity
- **Adaptation** – adjust in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities
- **Public Health Adaptation** – public health adaptation is considered as any short- or long-term strategies that can reduce adverse health impacts or enhance resilience in response to observed or expected changes in climate and associated extremes.

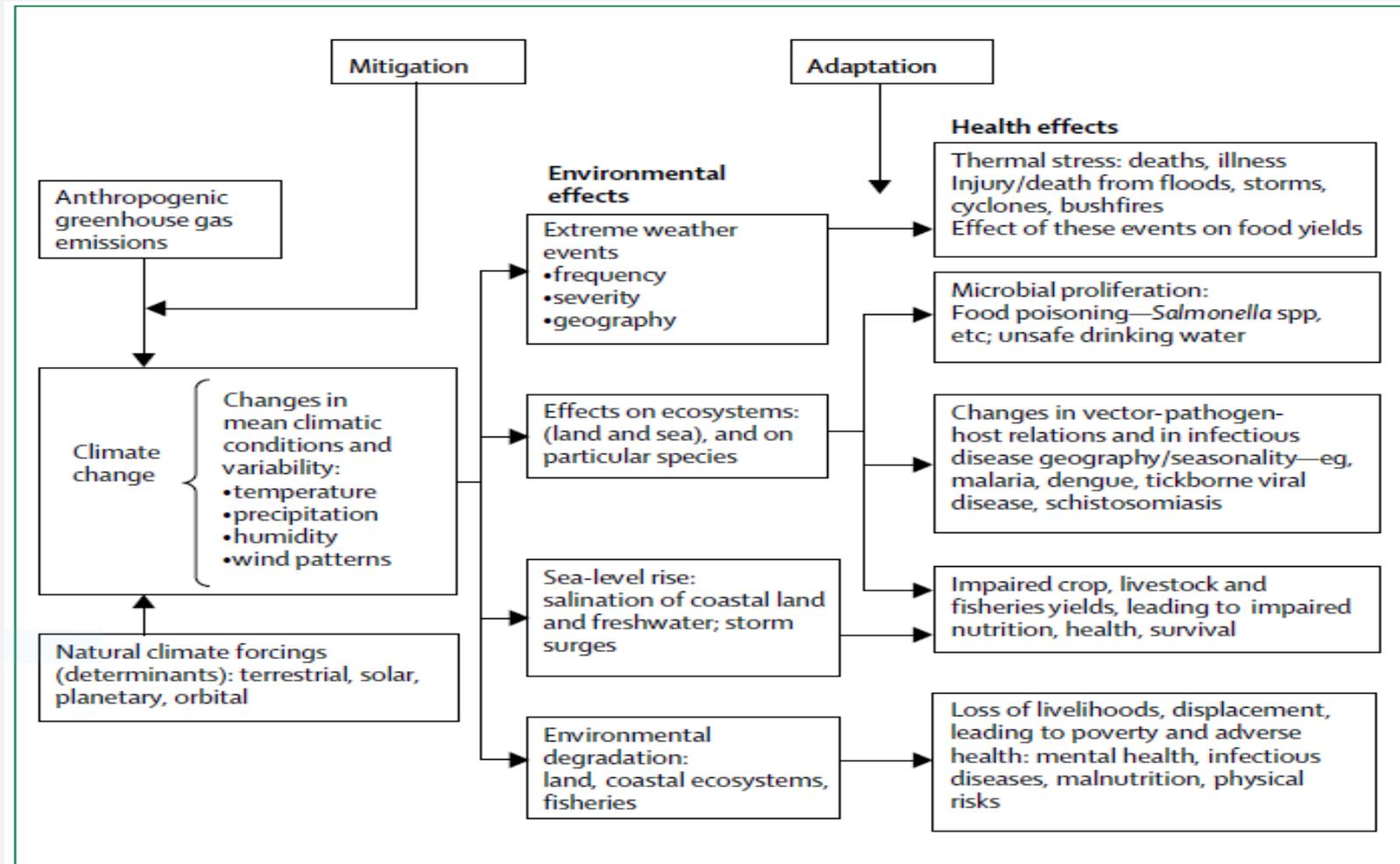


CONTEXT

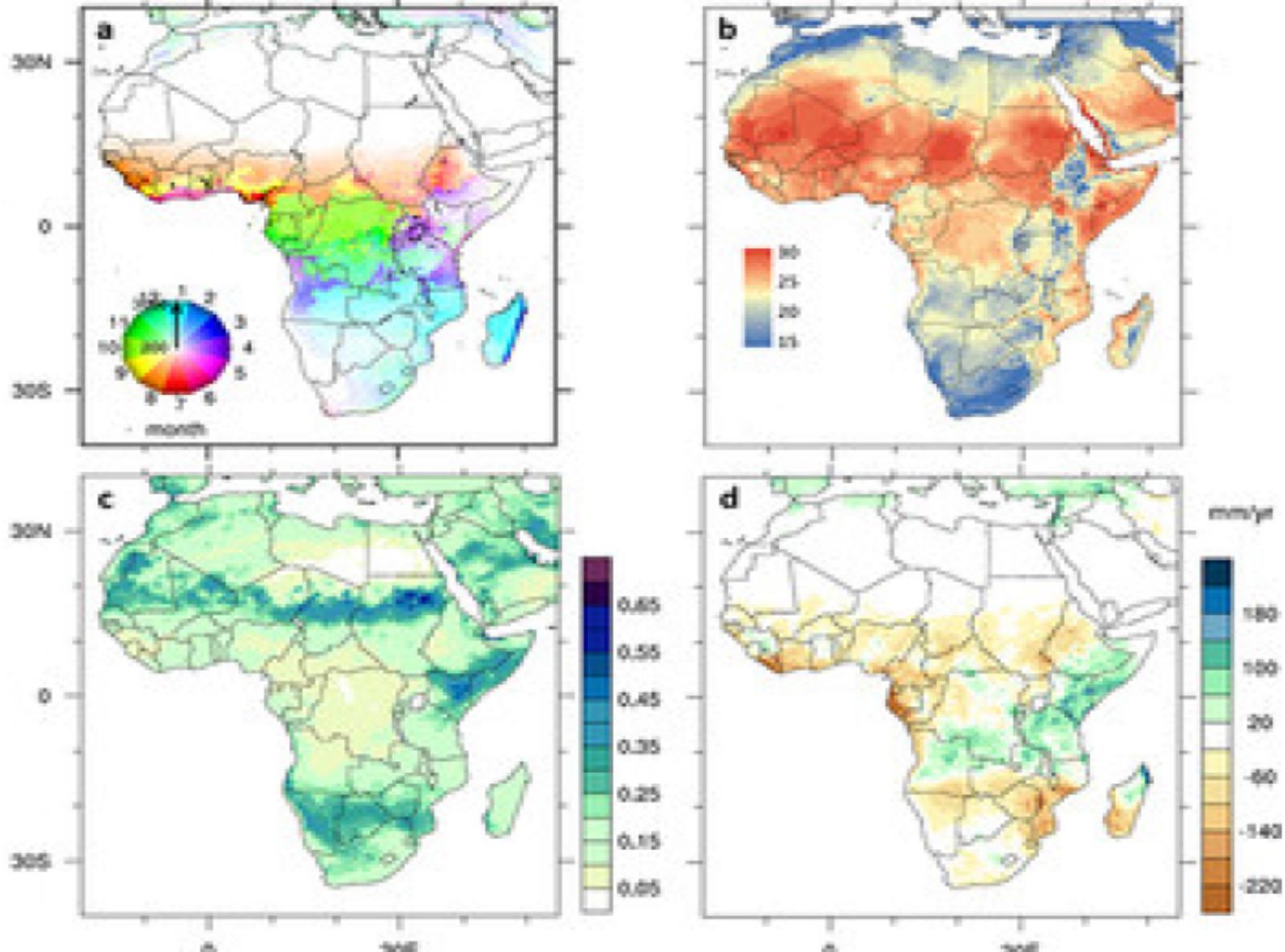
ONE SIXTH



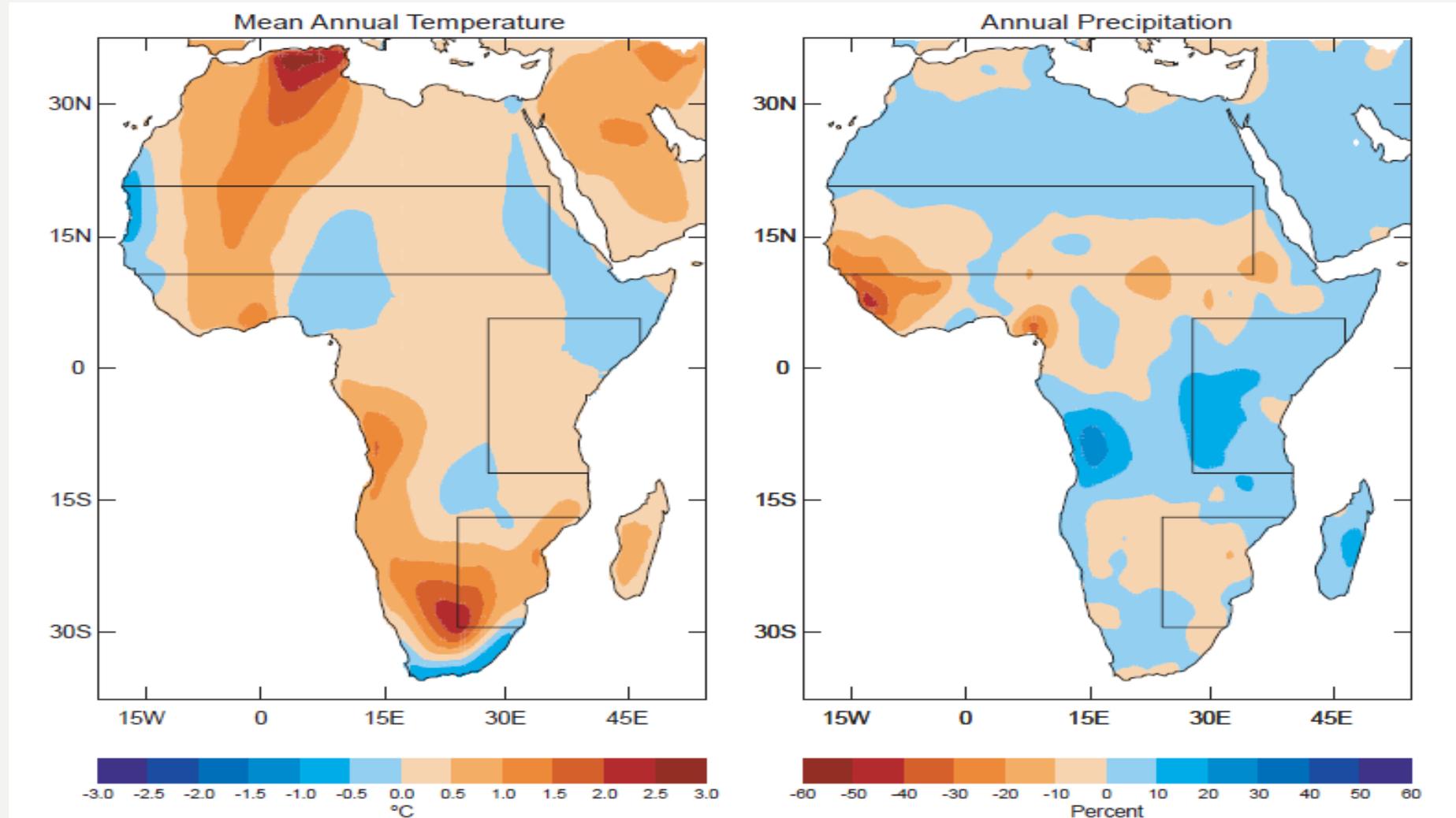
SCHEMATIC SUMMARY OF MAIN PATHWAYS OF HOW CLIMATE CHANGE AFFECTS POPULATION HEALTH



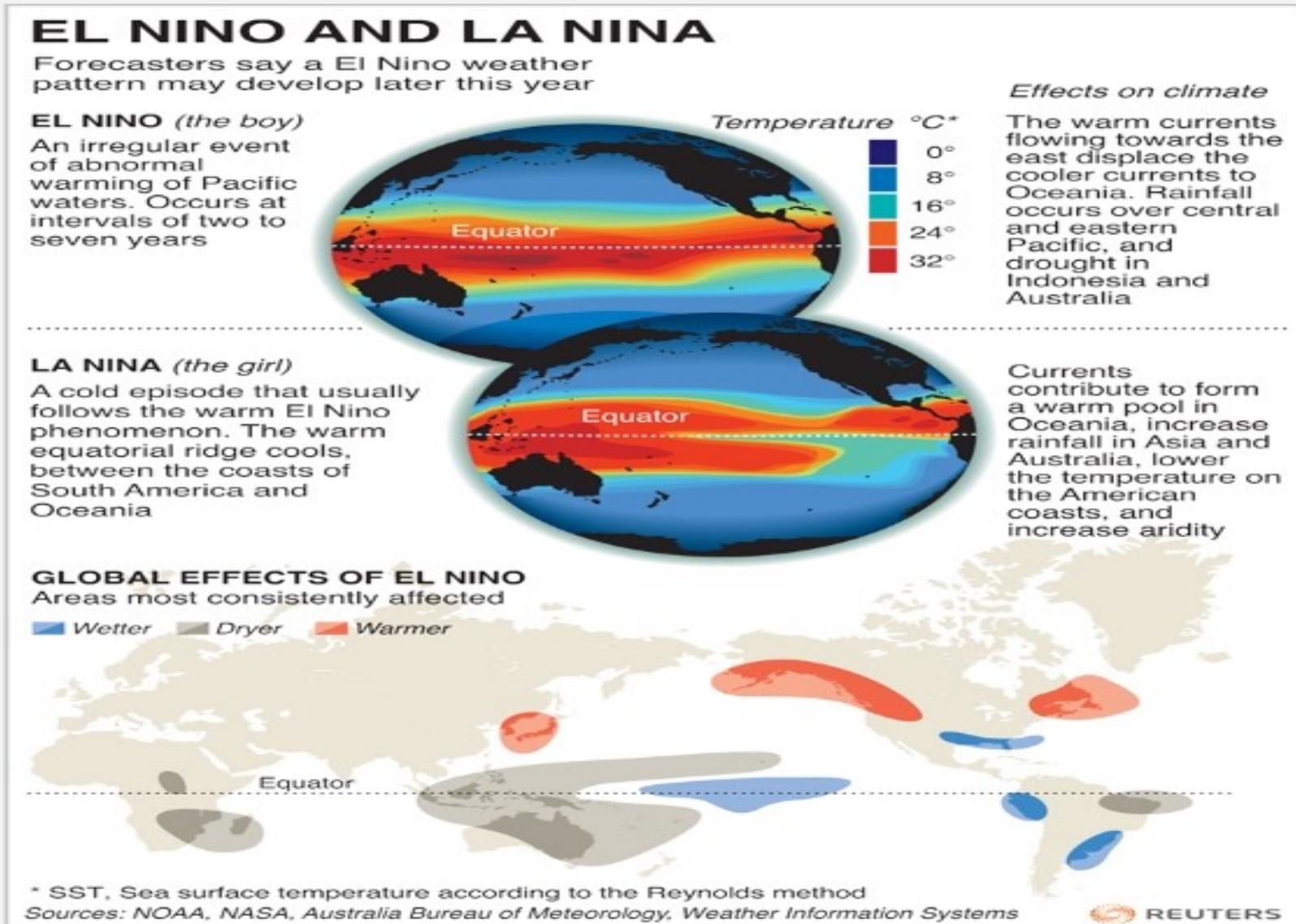
AFRICAN CLIMATE REGIMES



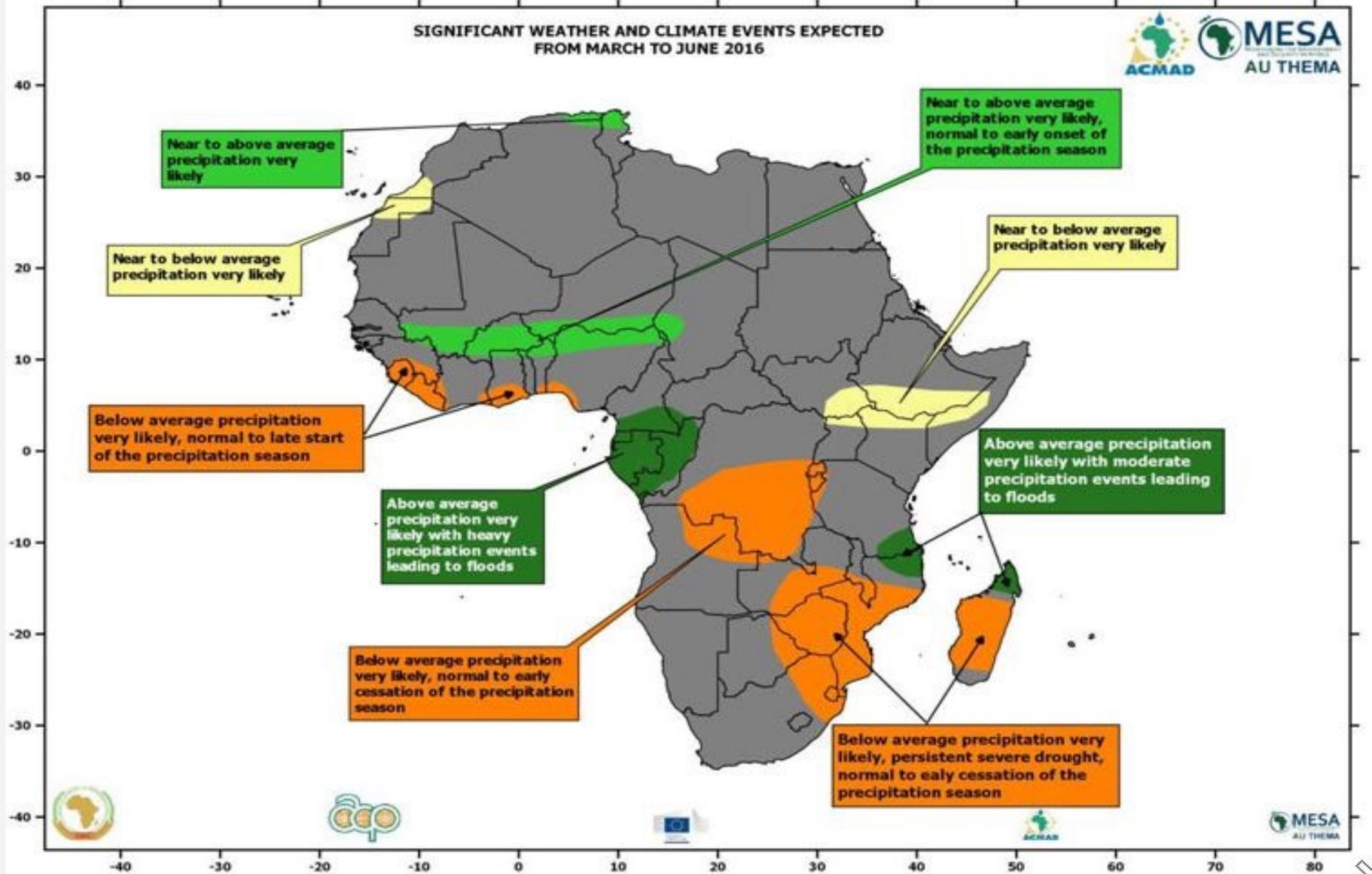
CHANGING CLIMATE REGIMES IN AFRICA



CLIMATE VARIABILITY IN AFRICA



EL NIÑO IMPACTS IN AFRICA

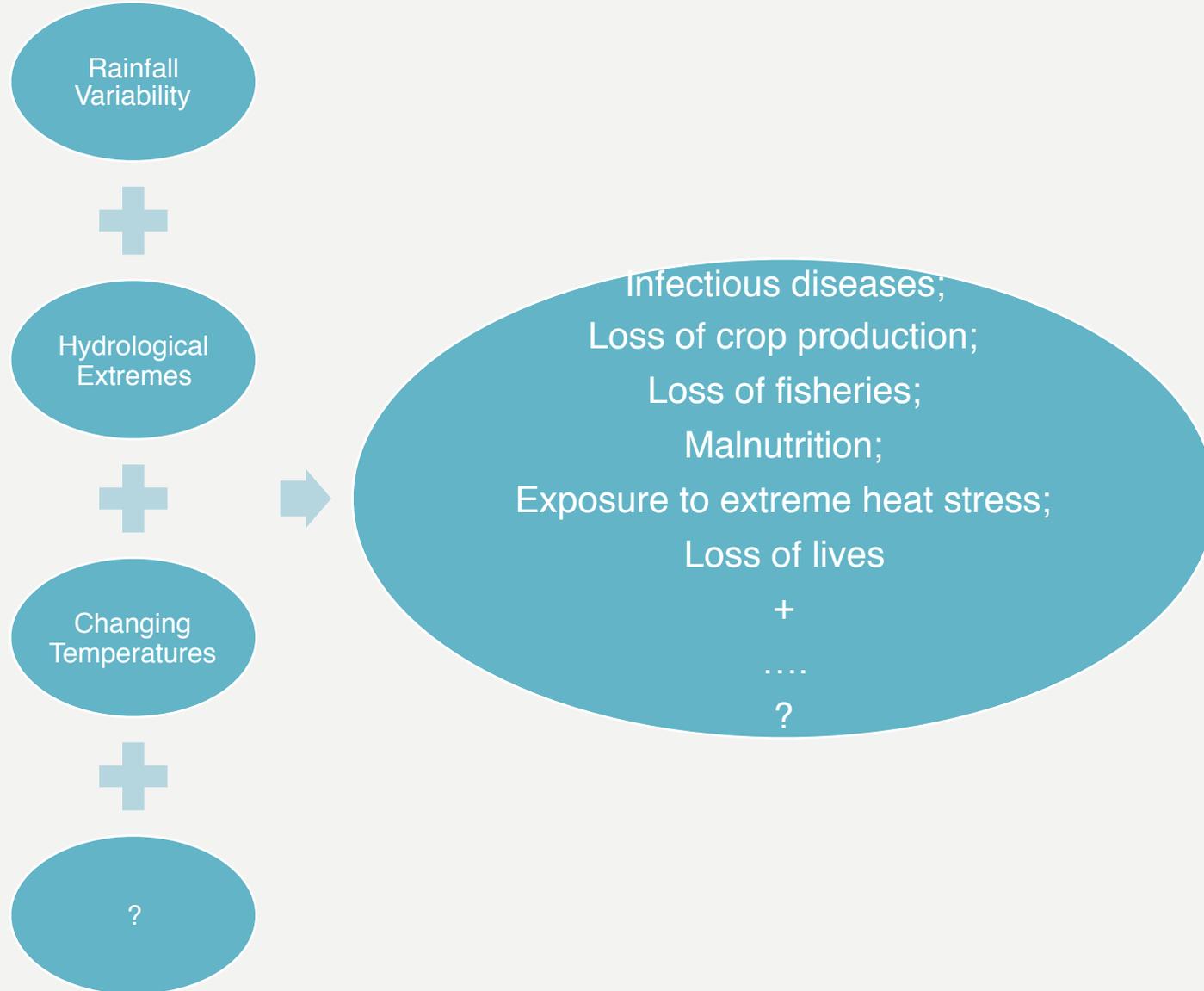




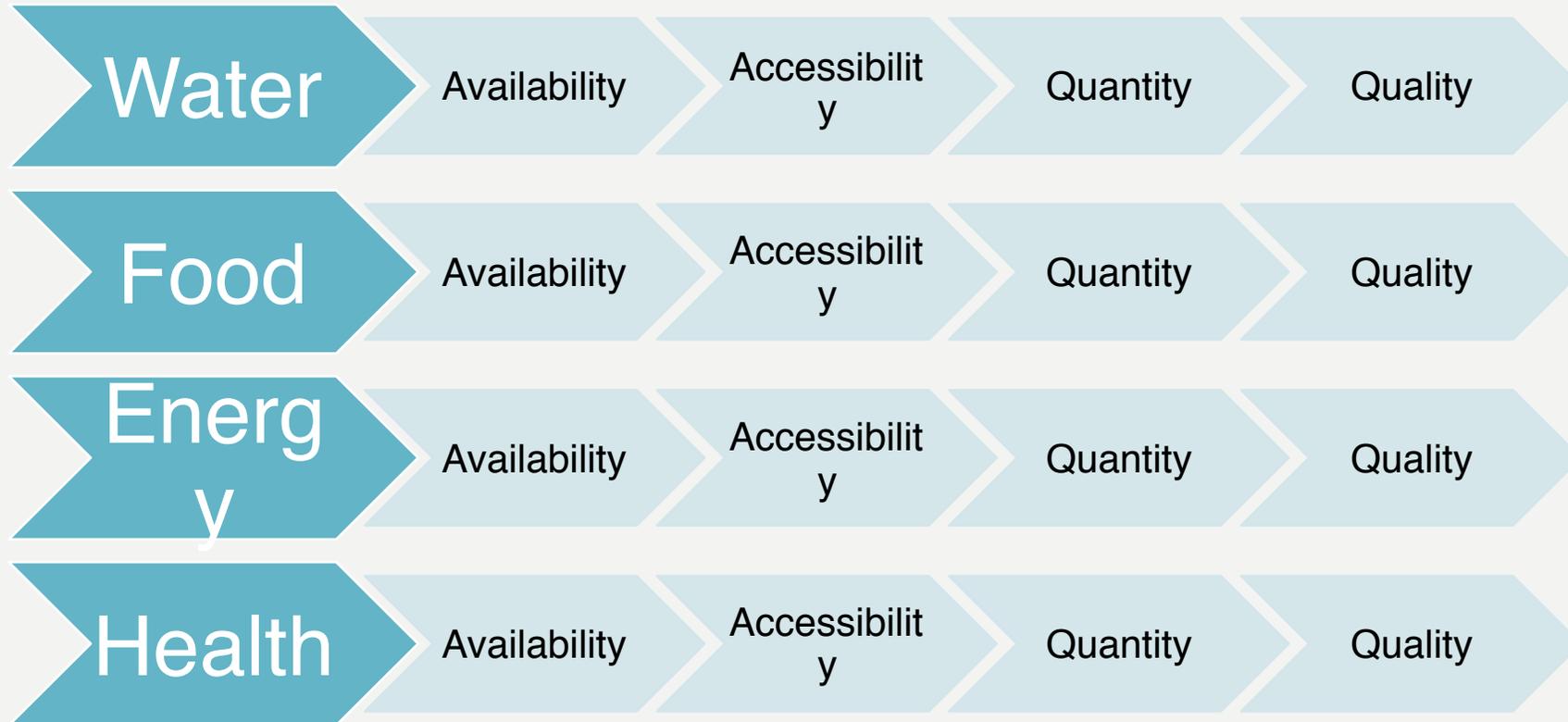
CHALLENGES

ONE THIRD

CLIMATE CHANGE IN AFRICA



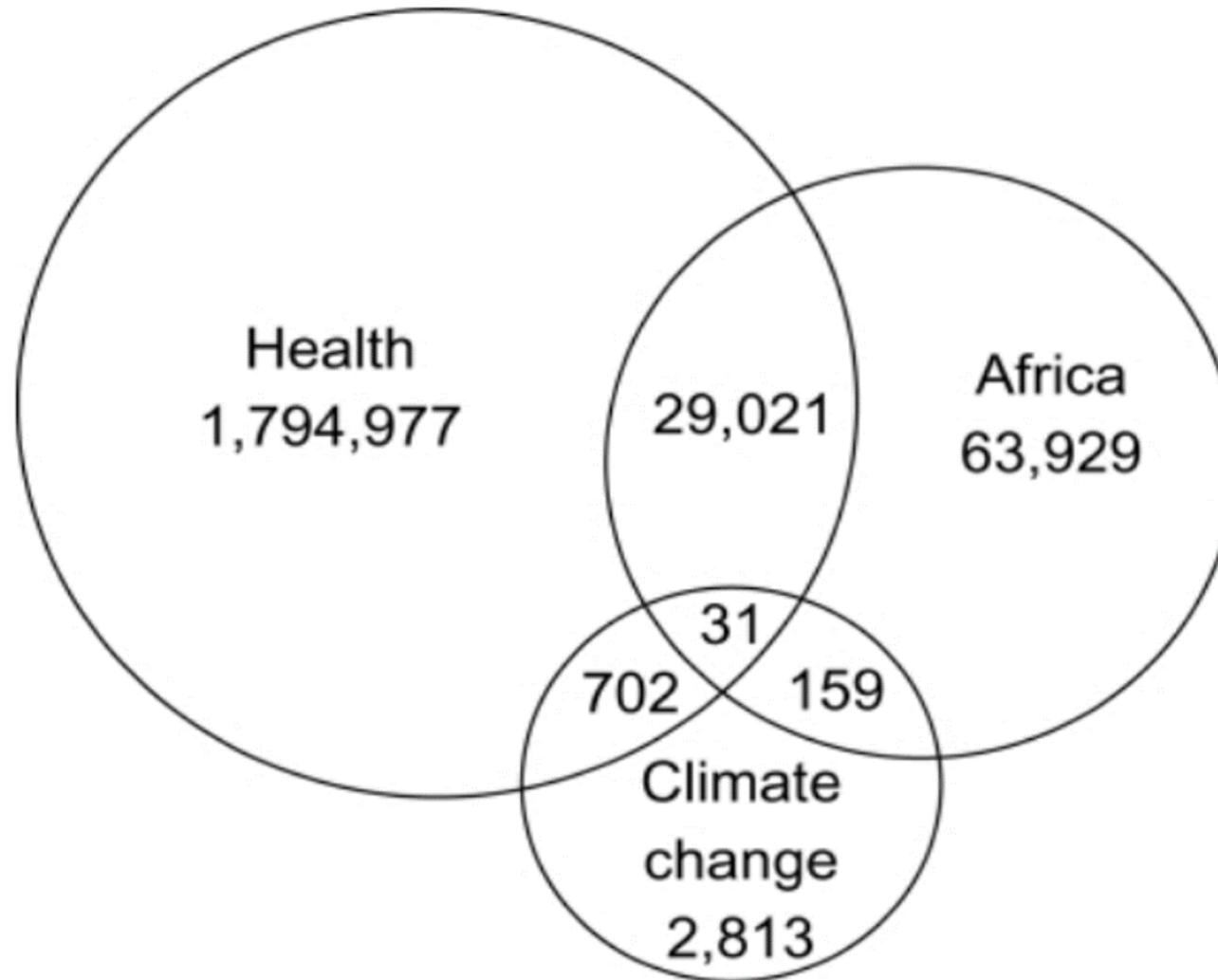
DIRECT AND INDIRECT



GAP(S)

- So far, research on vulnerability and adaptation to climate change from the social sciences has **not** been applied widely in terms of health.
- Accordingly, even less is known about the **interconnections** between vulnerability and adaptation to climate change and health impacts within Africa.
- There is also a need for better **understanding** of the social processes that shape vulnerability to the impacts and the means by which individuals and institutions can manage the impacts
- Despite a growing awareness of Africans' vulnerability to climate change, there is relatively **little empirical evidence** published about the effects of climate on population health in Africa

HEALTH + AFRICA + CLIMATE CHANGE



COMPLEXITY OF UNDERSTANDING HEALTH IMPACTS

“Quantifying, predicting, and projecting the full impact that climate has on human health is a daunting challenge. In part, this is because of **inadequate data** over much of the continent. Climate-monitoring networks are sparse, economic and agricultural records can be inconsistent and incomplete, and health outcomes data are limited. But the **challenge runs deeper than data**. Understanding the impacts of climate on health is fundamentally difficult in any context because the connections are **highly mediated by physical, ecological, and sociological factors**. In Africa, **rapid economic growth, demographic change, frequent political instability, and environmental changes independent of climate** (e.g., overgrazing, deforestation) make it particularly difficult to trace climate impact to health outcome through these mediating dynamics.”

WATER AND CHOLERA

- Protection of Drinking Water
- Protection against Marine-Related Human Disease
- Improved Wastewater Management
- Watershed Protection
- Prevention of Food-Borne Diseases
- Disease Surveillance



Malawi Workshop
September 2018

Whither water
management to deal with:
-runoff,
-sea-level rise,
-decreased precipitation?

WATER AND EBOLA

- Drinking water and water used for or in support of care for Ebola patients and care givers always needs to be safe and free of fecal microbes. It is vital to keep excreta separated from drinking water sources. Any Ebola response effort must address the need for microbially safe water in Ebola treatments centers or other facilities for care of Ebola patients, as well as those in the affected communities.
- Existing recommended water, sanitation and hygiene measures in health care settings are important for providing adequate care for patients and protecting patients, staff and carers from infection risks (WHO, 2008). Of particular importance are the following actions:
 - 1) keeping excreta (faeces and urine) separated from drinking-water sources;
 - 2) handwashing with soap; and
 - 3) containment of excreta such that they are effectively separated from human contact (suspected or confirmed Ebola cases should be provided with separate flush toilets or latrines that are not used by other individuals.);
 - 4) providing sufficient provision of drinking-water to staff, carers and patients, personal hygiene, laundry and cleaning, adequate and accessible toilets (including separate facilities for confirmed and suspected cases) and the segregation and safe disposal of health-care waste.



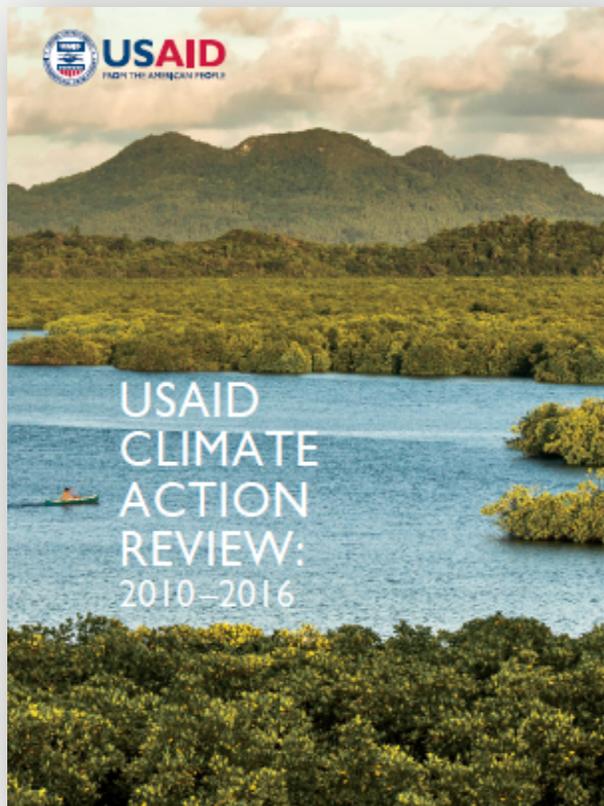
OPPORTUNITIES

HALF

EMBRACE COMPLEXITY

- “...Effective warnings and projections require both scientific and institutional capacity to address complex processes that are mediated by physical, ecological, and societal systems.” (Kaitchek 2017)

SYNTHESIZE (DEVELOPMENT / SECURITY...) OBJECTIVES WITH CLIMATE ADAPTATION



SYNCHRONIZE ADAPTATION WITH CLIMATE VARIABILITY AND CLIMATE CHANGE

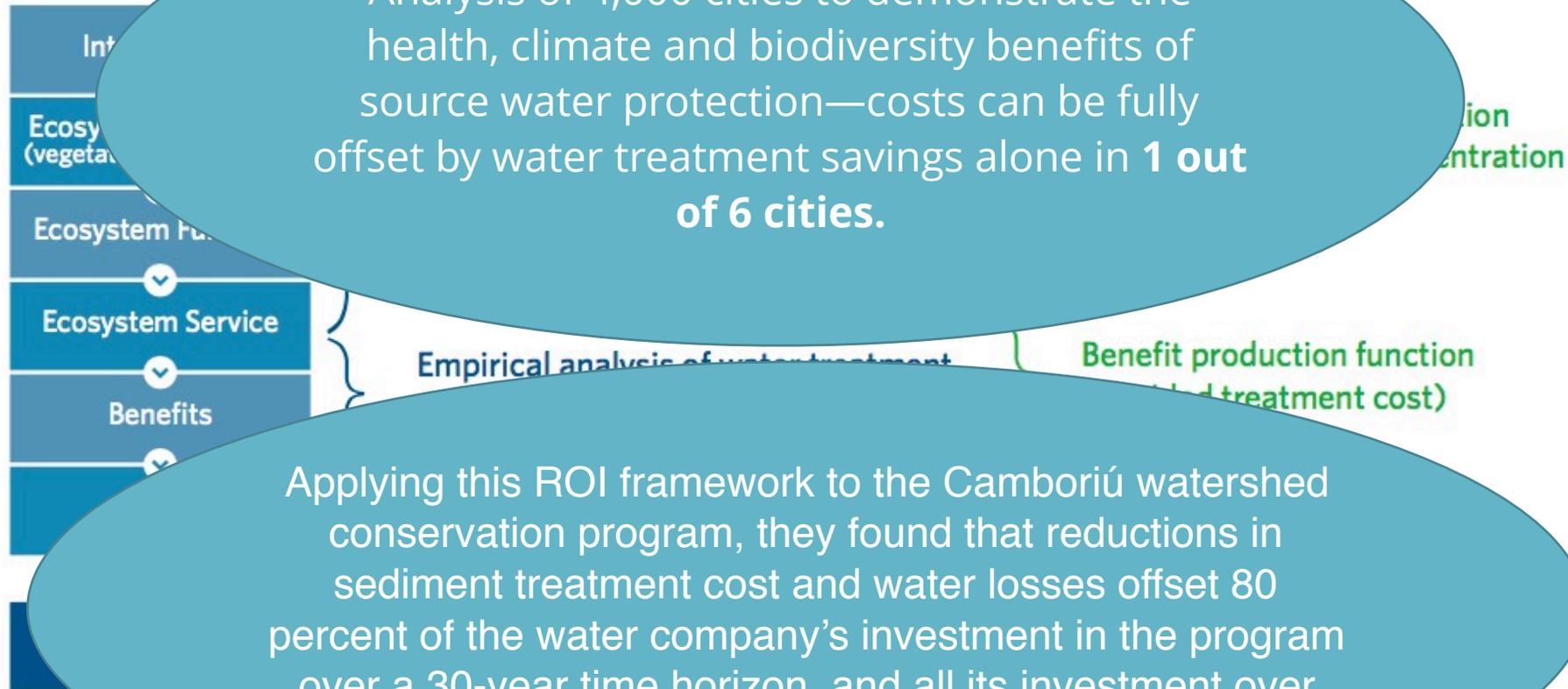
- Expand our knowledge and understanding of historical adaptation as baseline understanding...NOT prediction of future adaptation
- How can we:
 - Present livelihood adaptation options to manage climate variability and change?
 - Explain the relevance of adaptation options for livelihood development?
 - Increase understanding of anticipated changes in livelihood portfolios in drought or flood prone areas?

MINIMIZE TRADEOFFS + DEVELOP CO-BENEFITS / BENEFIT-SHARING

- Application of existing technologies, such as molecular fingerprinting to track algal blooms to be used to track contaminant sources or satellite remote sensing to detect coastal algal blooms, can also be used for _____?

INCREASE RETURN ON INVESTMENT

ROI FRAMEWORK



Analysis of 4,000 cities to demonstrate the health, climate and biodiversity benefits of source water protection—costs can be fully offset by water treatment savings alone in **1 out of 6 cities.**

Applying this ROI framework to the Camboriú watershed conservation program, they found that reductions in sediment treatment cost and water losses offset 80 percent of the water company's investment in the program over a 30-year time horizon, and all its investment over time horizons of 43 years or more.

Figure ES-1: Analytical framework for the Camboriú watershed conservation program

INSTANTIATE CLIMATE VALUE PROPOSITION

Impact	Focus
POLICY	create an enabling environment to support sustainable adoption of alternative technologies and business models to generate and share accurate climate and weather information
FINANCE	ensure public finance incentivizes both public and private sector institutions to invest in improving climate information data generation/dissemination and technology
PARTNERSHIPS	create revenue-sharing agreements between public and private sector institutions to collaborate on generating, calibrating, packaging and distributing information and technology
TECHNOLOGY	deploy cost-effective, accurate and easily maintained weather- and climate-monitoring systems
INCREMENTAL APPROACH	utilize previous steps to reach end-users, further engage with civil society, create effective cost-recovery mechanisms and monitor, evaluate and readjust approaches

INCREASE AVAILABILITY OF ROBUST DECISION –MAKING TOOLS

- The **Health Impact Assessment Framework** comprehensively can serve as a decision support tool for practitioners who may take into account the full set of implications of any policy options on climate change that could affect health. (*WORLD HEALTH ORGANIZATION*)
- **FEWSnet**: Recognizing the multiple pathways to food insecurity, FEWS NET issues food security outlooks and acute warnings for 29 countries in Africa through a combination of seasonal weather forecasts, crop stress modeling, food price monitoring and projection, satellite-based rainfall and vegetation anomaly analysis, extreme weather alerts, and ENSO tracking. (*NASA, NOAA, USGS, USAID*)

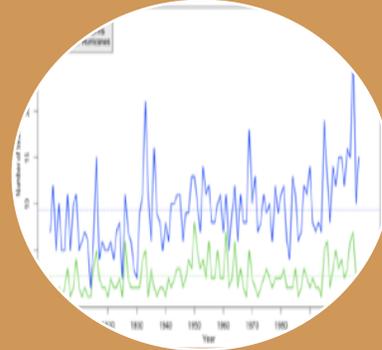
RECOGNIZE OPPORTUNITY PROVIDED BY CHANGING CLIMATE REGIMES



- Institutional Support

Sea Level Rise (cm)	Potential Land Loss (km²)	Potential Land Loss (%)	Population (millions)	
45	15,000	10.9	5.5	5.0
100	29,946	20.7	14.8	13.5
100	5,763	0.4	7.1	0.8
60	34,000	1.9	2.0	1.1
50	1,412	0.4	2.9	2.3
100	7,000	2.1	-0.05	-0.1
20	1,700	0.2	n.a.	n.a.
100	40,000	12.1	17.1	17.1

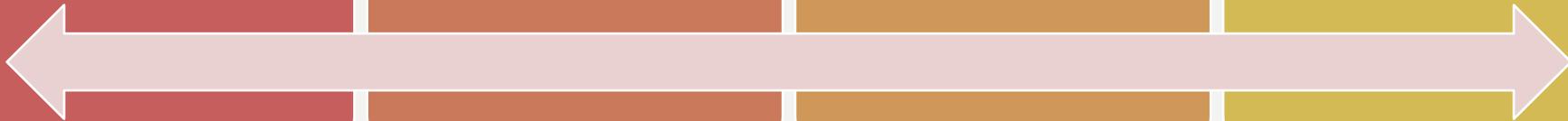
- Technical Support

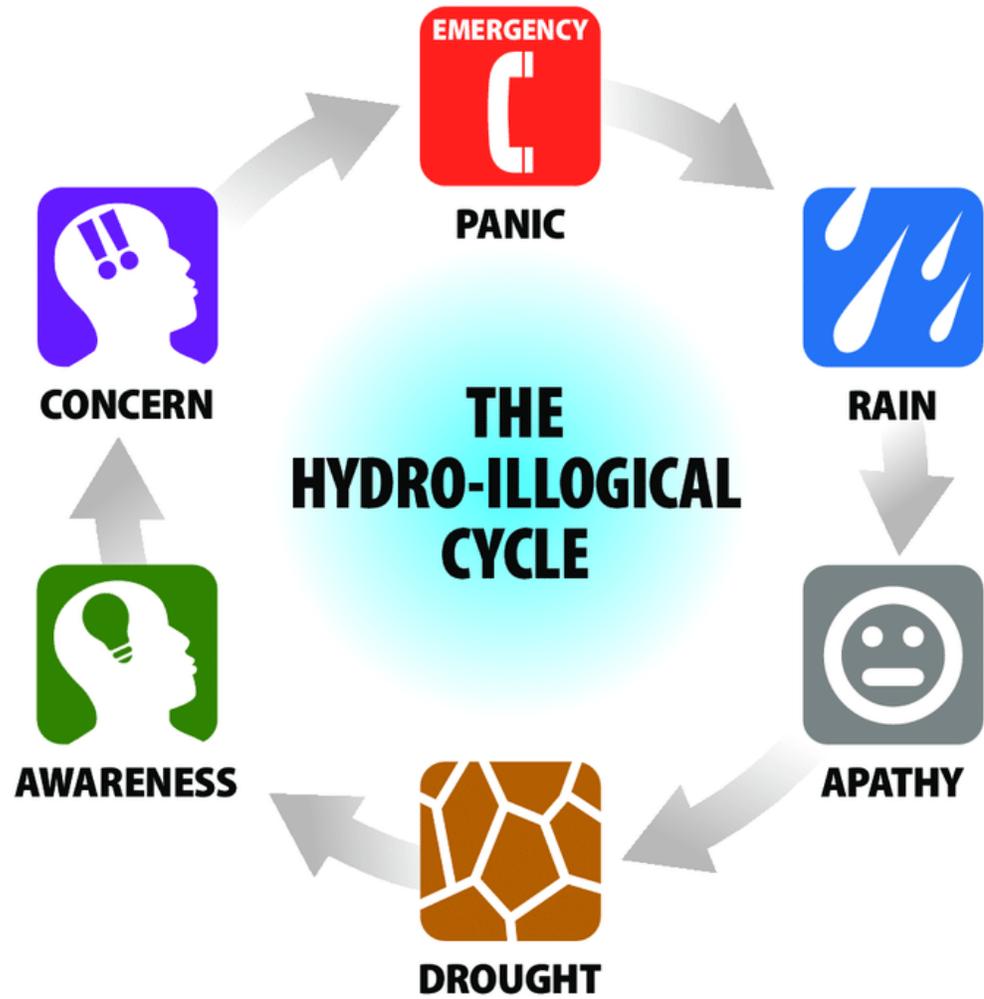


- Previous Disasters



- International Support





QUESTIONS

Thank you for your attention!