

Climate change adaptation through the water energy-food nexus in southern Africa



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Review

Southern Africa's Water–Energy Nexus: Towards Regional Integration and Development

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PROSPECTS FOR IMPROVING IRRIGATED AGRICULTURE IN SOUTHERN AFRICA – LINKING WATER, ENERGY AND FOOD

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Introduction

- ✓ Extreme climate events, such as droughts and flooding, have emerged as the biggest challenges faced by fast growing and emerging economies in southern Africa, 
- ✓ In terms of development, climate change is described as a wicked problem, because it is complex and straddles various sectors and levels, 
- ✓ Responses to climate change therefore necessitate transdisciplinary or cross-sectoral approaches, 


Introduction Cont...

- ✓ Current approaches to climate change adaptation are similar to how development is framed in the region and they have been sector-based, 
- The sectoral approach has been cited as another obstacle to sustainable development and efficient resource utilisation, 
- ✓ In this regard, emerging cross-sectoral approaches such as the water-energy-food (WEF) nexus could be useful. 

Introduction Cont...

- ✓ The WEF nexus is broadly defined as an approach that considers the *interactions*, *synergies* and *trade-offs* between water, energy and food when undertaking the management of these resources. 
- ✓ The WEF resources are inextricably linked, with usage within one sector influencing the use and availability in the adjacent sectors. 
- ✓ The WEF nexus has been studied widely, with each study focusing its analyses on niche or sector, be they political, social, or scientific perspectives. 

Study aims

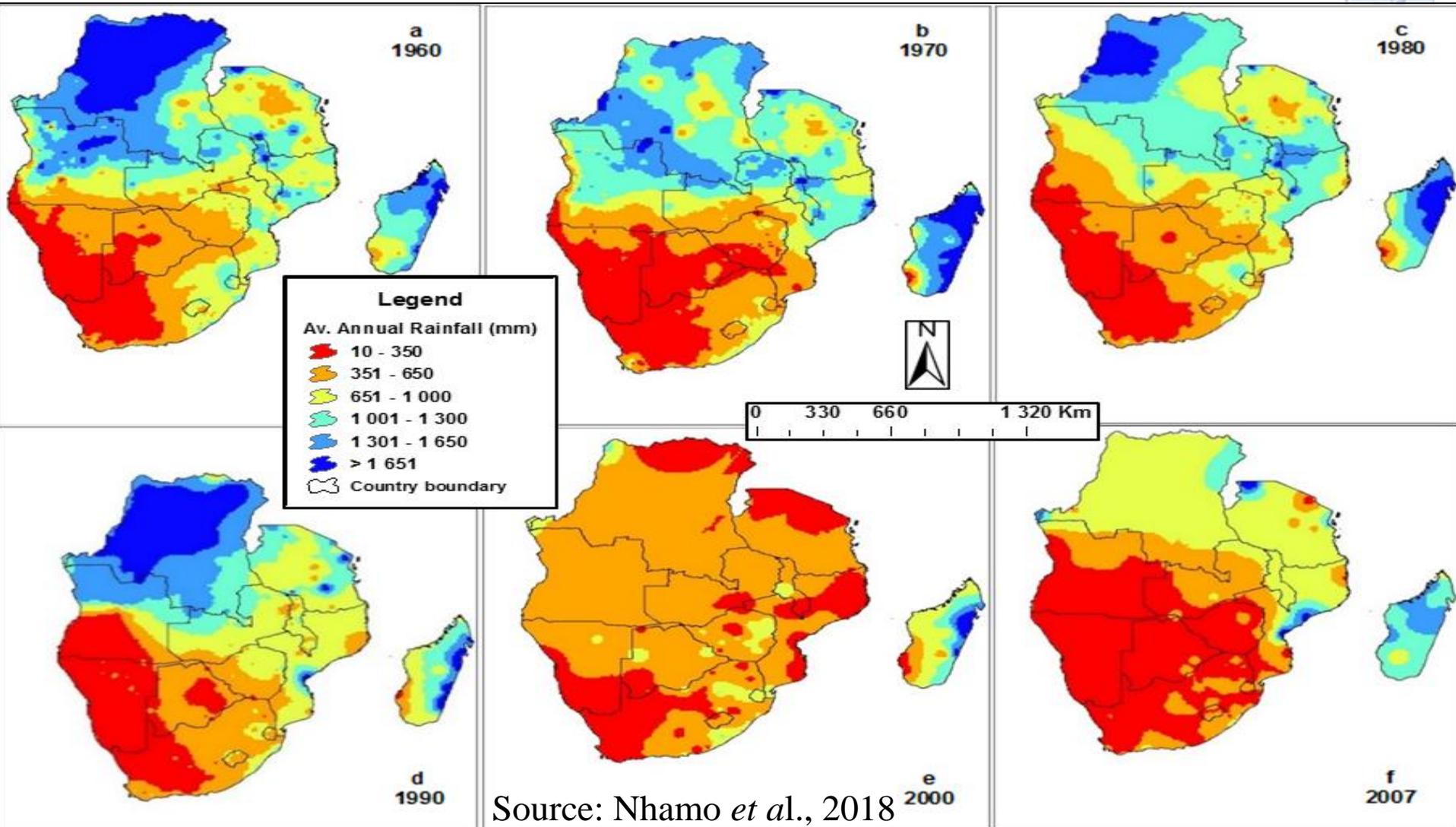
- ✓ This study highlights the impacts of climate change on water, energy and agriculture sectors in the SADC region, and explore opportunities for the WEF nexus in developing cross-sectoral sustainable climate change adaptation, mitigation strategies and plans, 
- ✓ In this study, agriculture is a proxy of food in the WEF context. Scientific articles, published reports and accessible grey literature related to climate change and WEF nexus were reviewed, focusing on the SADC region. 

Overview of southern Africa

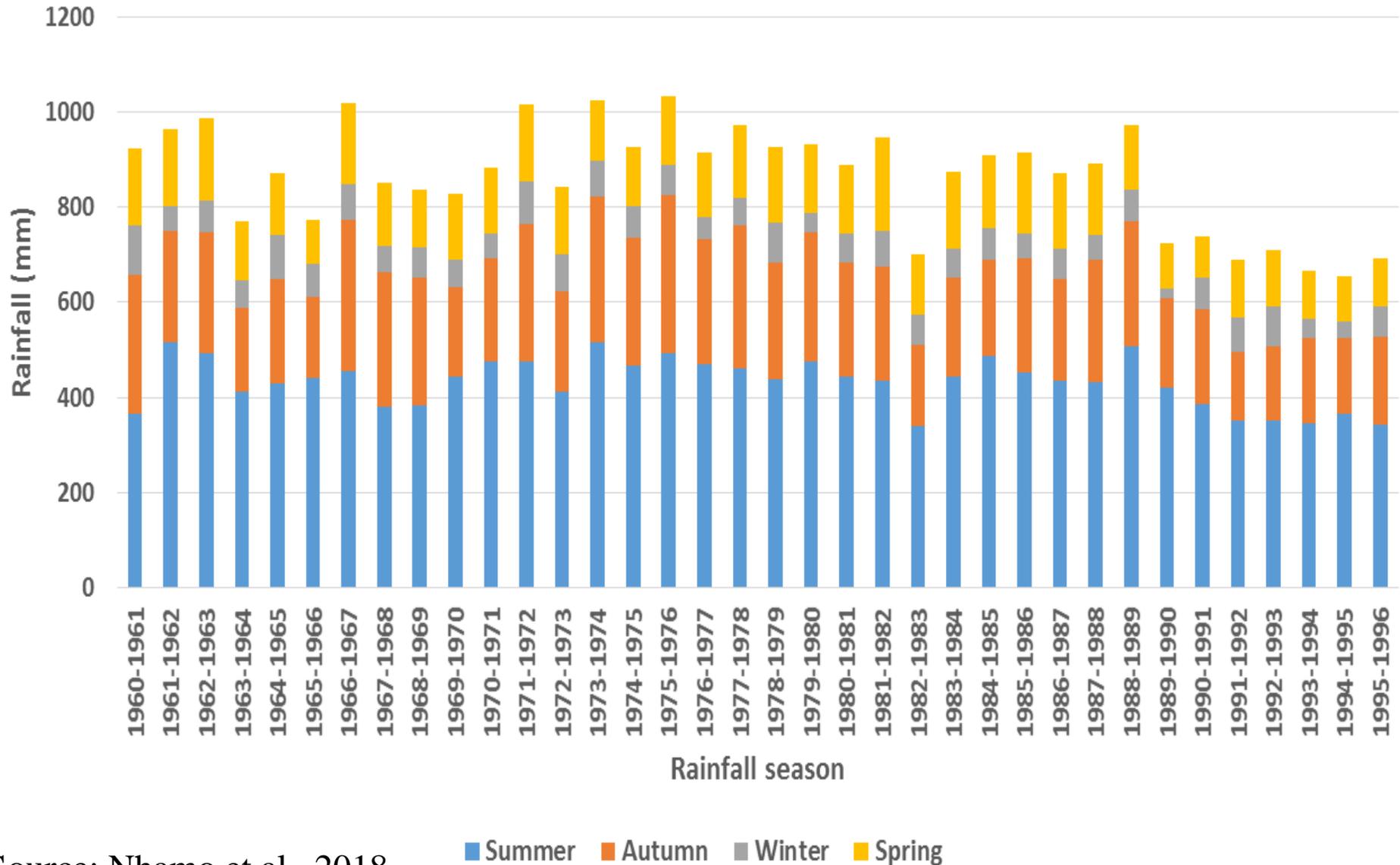


Climate Change impacts on WEF resources in the SADC Region

Climate change impacts on water resources



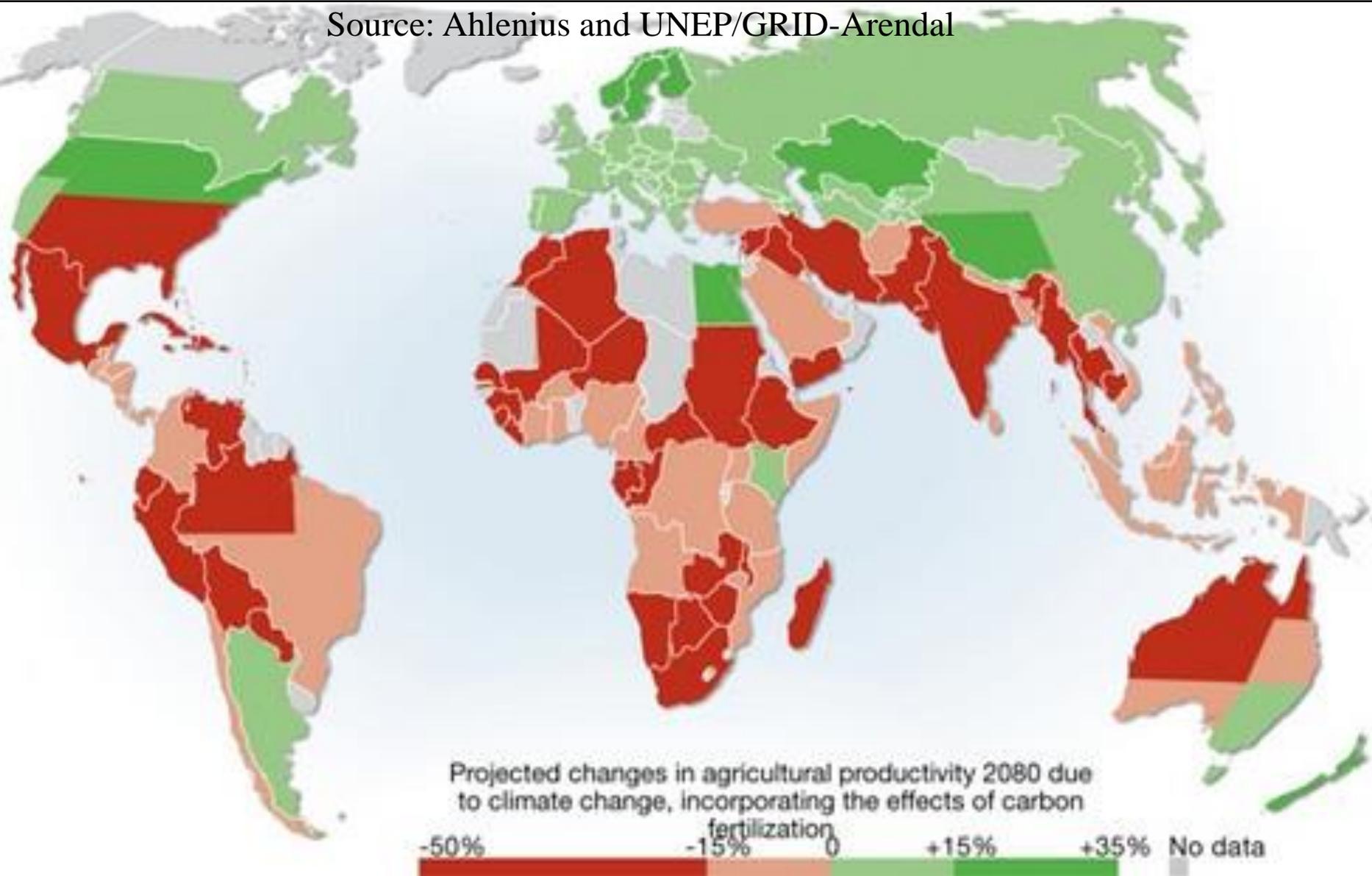
Historical changes in seasonal rainfall in the SADC region (1960 to 1996)



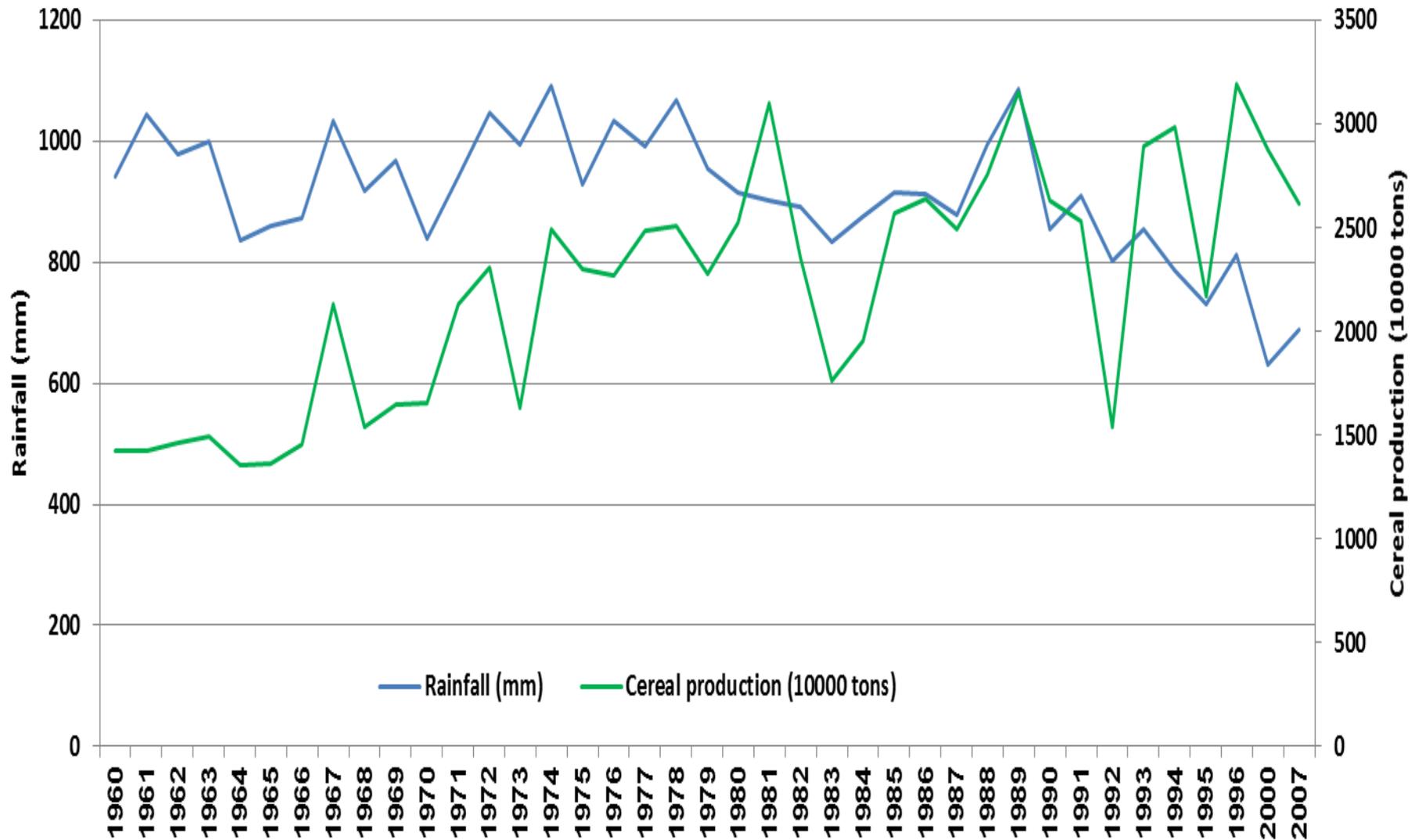
Source: Nhamo et al., 2018

Climate change impacts on agriculture

Source: Ahlenius and UNEP/GRID-Arendal

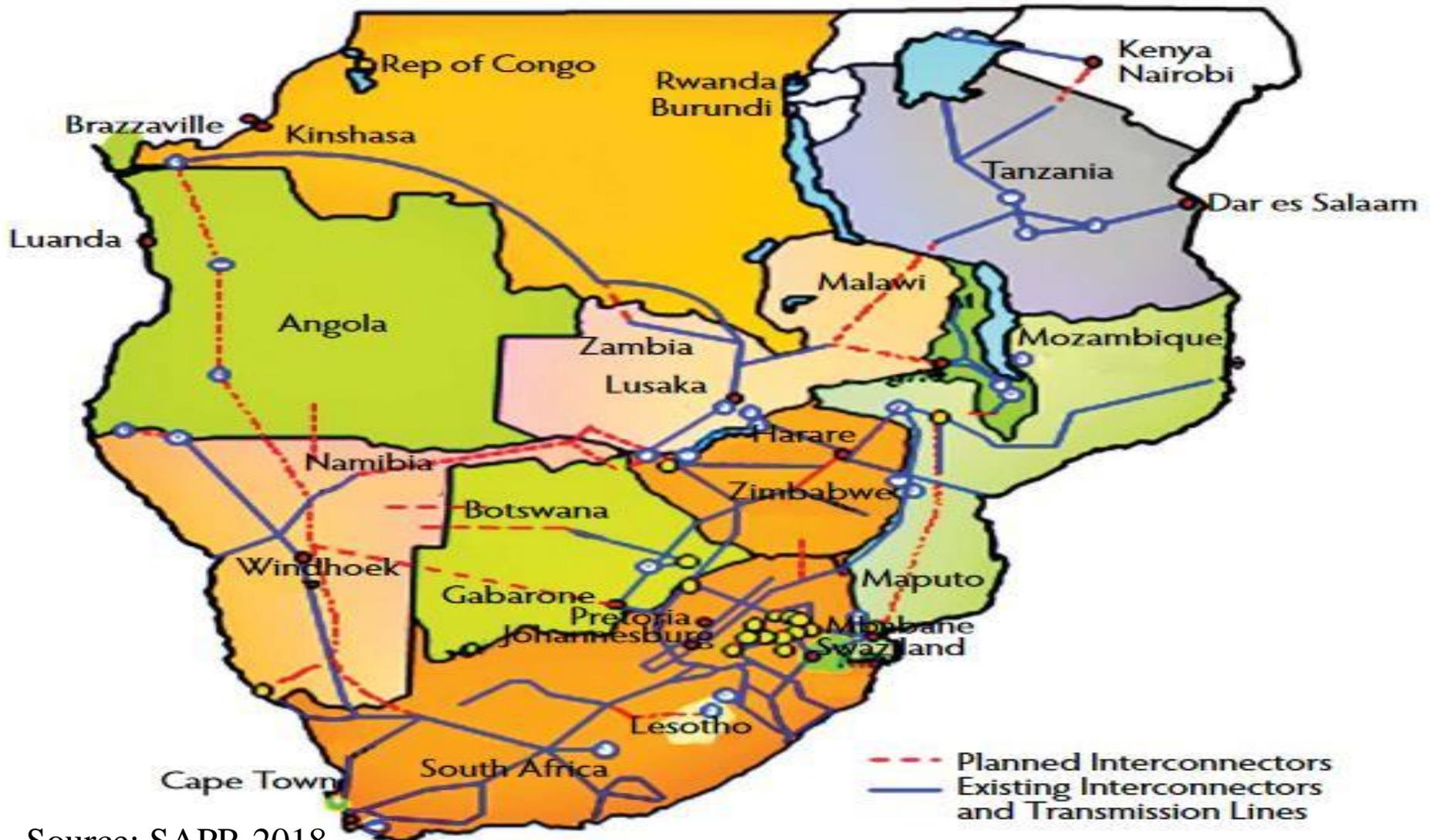


Relationship between rainfall and cereal production in the SADC region from 1960 to 2007.



Source: Developed by authors from ReSAKSS data.

Climate change impacts on energy sector



Source: SAPP, 2018

Implications for nutrition, health and wellbeing

- ***Climate change affects human health directly and indirectly:***
 - ✓ For example, heatwaves have increased mortality rates and flooding & droughts have reduced agricultural production, 
 - ✓ Climate change is described as a psychological and emotional stressor as people and communities who are exposed to extreme climate events would not be able to cope, 
 - ✓ The decrease in crop yields threatens the food security, health and nutrition of almost 70% of people in southern Africa who depend on agric for their livelihoods as food prices increase. 

Implications for nutrition, health and wellbeing Cont...

- ✓ Climate change is increasing the problems of undernutrition due to low yields and increases in food prices, 
- ✓ These challenges are threatening to reverse development gains and impede the achievement of SDGs on poverty, zero hunger, good health, well-being and water & sanitation (Goals 1,2,3 and 6). 

Integrating Water, Energy and Agricultural Sectors in Climate Change Plans

- ✓ Climate change exacerbates the problems of essential resources insecurity and vulnerability in southern Africa as WEF resources are climate sensitive,
- ✓ Cross-sectoral management of WEF resources is vital to achieving the SDGs as the nexus approach is designed to integrate resource development in a coordinated manner and it's a pathway to climate change adaptation,



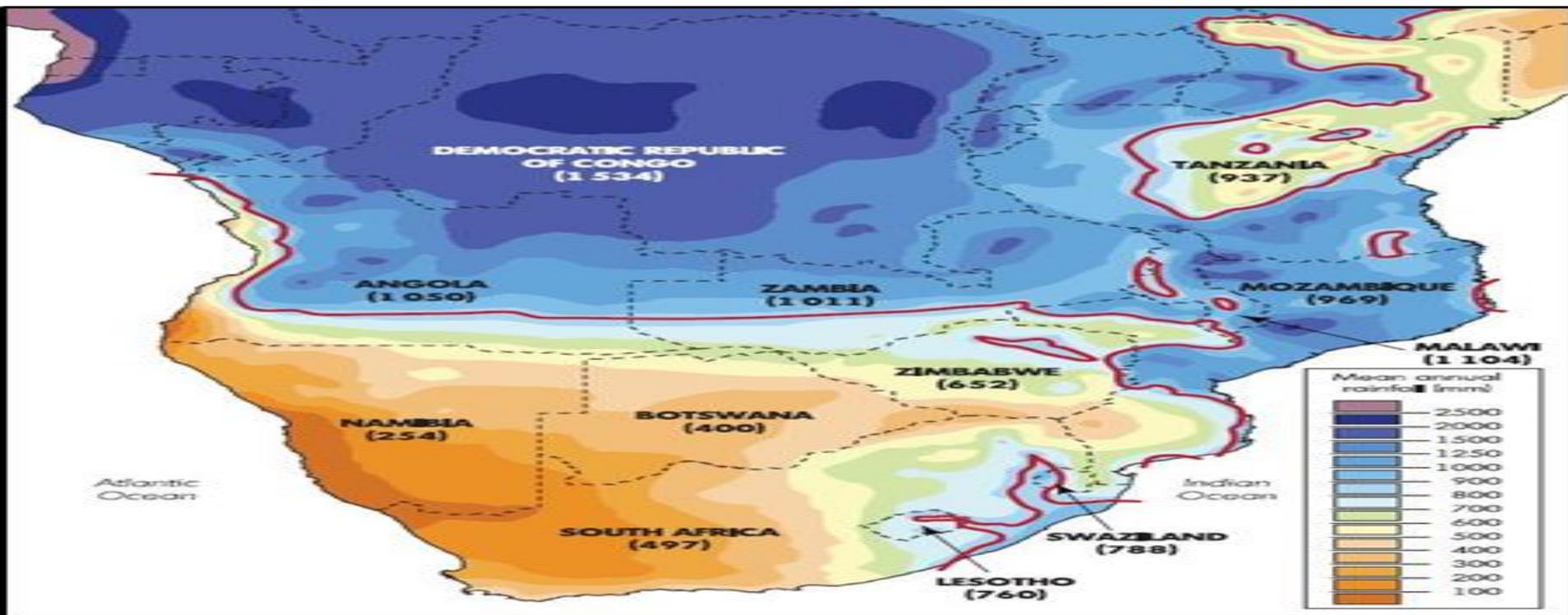
Integrating Water, Energy and Agricultural Sectors in Climate Change Plans Cont...

- ✓ Such coordination translates to savings from costs associated with duplication, increased efficiencies due to streamlining of activities, and higher likelihood of success due to consideration of WEF nexus trade-offs and synergies, 
- ✓ Climate change will have multiplier effect on several stressors (growing population, urbanisation and industrial growth), the WEF nexus could be a pathway towards balancing competing demands for water resources. 




Integrating Water, Energy and Agricultural Sectors in Climate Change Plans Cont...

- ✓ The integration of climate change into regional policies, strategies, plans is an important means to encourage action on climate change adaptation as policy gives political will.



Recommendations based on the WEF nexus approach

- ✓ The regional countries have similar goals on poverty alleviation, improving the quality of life for its inhabitants, economic development and job creation, 
- ✓ It also faces similar challenges such as increasing population, increasing rural-urban migration, food insecurity, unemployment and inequality, 

- Water, energy and food are central to the region's plans for sustainable economic development and transformation. *It is in this regard that the WEF nexus offers significant opportunities for a coordinated approach to addressing some of the region's pressing challenges and achieving regional goals,* 


Conclusions

- ✓ The WEF nexus draws on holistic, systems perspective that recognise the value of all sectors in equal terms, 
- ✓ Climate change is a cross-cutting challenge that needs to be tackled by all climate sensitive sectors, 
- ✓ The integration of climate change adaptation strategies into the WEF nexus offers opportunities to *create proper resource coordination, harmonisation of activities across all sectors, improves resilience and reduction of vulnerabilities to attain regional development targets,* 



Conclusions Cont...

- ✓ The WEF nexus presents an opportunity for policymakers, researchers and development agencies to integrate the sectors to optimise the use of the resource base, maximise synergies and trade-offs, and has grown to be an essential tool to achieve the SDGs on poverty alleviation, zero hunger, provision of water and sanitation, and access to affordable and reliable energy (Goals 1, 2, 6, and 7, respectively).





Thank you for your attention

