ASSAR
Adaptation at Scale in Semi-Arid Regions

Planning for Climate Change in the Semi-Arid Regions of Southern Africa

INFORMATION BRIEF #1

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www.ASSARadapt.org

KEY POINTS

- **The semi-arid regions of Southern Africa are a true climate change "hot-spot" – experiencing more extreme climate changes than surrounding areas.**
- **Over the next 50 years, and compared to the surrounding areas, these regions are expected to become hotter, with continued variation in rainfall and more flooding.**
- **Climate changes – including increased frequency and intensity of droughts and floods – are predicted to negatively impact food security, economic growth, infrastructure and human health.**

Why focus on the semi-arid regions of Southern Africa?

Semi-arid areas in Southern Africa are characterised by high rainfall variability, frequent droughts, low soil moisture and extreme events such as flash floods. These conditions provide the foundation of vulnerability of communities in these areas.

Such communities are generally dependent on primary production and natural resources, rely on rain-fed agriculture, have limited livelihood options and employment opportunities, depend on activities that are sensitive to the impacts of climate change, face high levels of poverty, are exposed to high levels of HIV/AIDS, have limited infrastructure and services, and are affected by limited institutional capacity and weak resource governance.

It is therefore essential to understand how to enhance the ability of communities, local organisations and governments in Southern Africa to adapt to climate change in a way that minimises vulnerability and promotes long-term resilience.

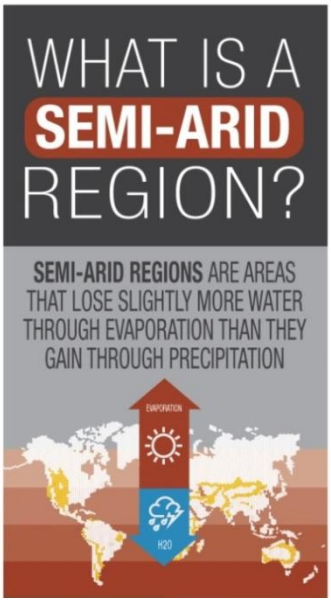
What are the key climate patterns of the past and projected trends for the future?

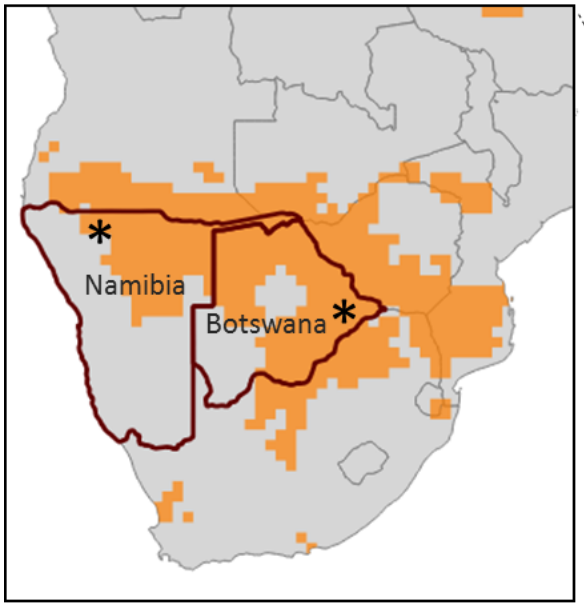
- In the past 50 years hot extremes such as heatwaves have increased, and cold extremes have become less frequent.
- These warming trends are projected to continue in the future with extremely hot days occurring about 20 times a year more often in the 2030s than today.
- The rainfall variation observed in the recent past is expected to continue into the future.
- Dry spells are likely to increase in the future with the longest dry period in a year projected to increase by about seven days in 2030 compared to today.

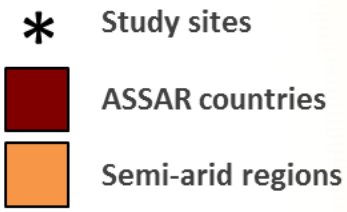
What are the expected impacts of future climate on semi-arid areas?

- Reduced crop yields and risk of failure in livestock production.
- Reduced water availability and water quality, impacting economic development, food security, health and sanitation.
- Increased occurrence of water- and vector-borne diseases.
- Increased pressure on urban centres as people migrate from rural areas.
- Increased damage to infrastructure.
- Risk of extinction of endemic species.
- Loss of ecosystem services (such as water purification and filtration, medicinal plants and biomass energy), loss of soil fertility and accentuated soil erosion.
- Decline in nature-based tourism due to ecosystem degradation, and shifts in wildlife distribution.

ASSAR is a research project being undertaken in the semi-arid regions of Africa and Asia, examining the dynamics and drivers of vulnerability, while exploring ways to enhance the resilience of people, local organisations and governments. ASSAR aims to promote climate adaptation policies and practices that are effective, widespread and sustained.







Understanding the past and future climate of semi-arid Southern Africa

Temperature

- Average temperature trends in the semi-arid areas of Southern African have increased by 0.25°C per decade since 1960. These warming trends are about 30% greater than those seen across the wider Southern African region.
- Climate model projections show a similar pattern of faster increases in temperature over semi-arid areas in the future. Combined model results indicate a warming rate of between 0.32–0.38°C per decade to 2050, depending on future greenhouse gas emissions being either moderately reduced or not reduced at all. Very hot days are projected to occur about 20 times more per year in the 2030s than today.
- These projected trends are 35-40% larger than those projected for the wider Southern Africa region, suggesting that the accelerated warming seen already will become even worse in the future.
- Temperature-related impacts on livestock, crops and infrastructure will be more severe in semi-arid regions than in other areas of Southern Africa.

Rainfall

- In the past 50 years total rainfall and the frequency of rainfall extremes have shown considerable variability – both year to year and decade to decade.
- From one year to the next, rainfall can vary between 40% below and 70% above the long term average.
- There has also been a pattern of drier and wetter decades; for example the 1970s were about 20% wetter than the long term average, while the 1990s were about 15% drier.
- The variation in semi-arid areas is more extreme than surrounding areas. For example, year to year variations over the broader region are -23% to +33% (compared to -40% to +70% for SARs).
- Given this variation in total rainfall and rainfall extremes, projections for future rainfall are far less certain than those for temperature. However, it is likely that the rainfall variability of the recent past will continue into the future.
- Projections suggest that dry spells will increase in the future – the longest dry period in a year is projected to increase by about seven days in 2030 compared to today.

Way Forward

- Improve technical capacity at the national and sub-national levels, to develop a greater understanding of climate change and its effects, and to develop and implement appropriate responses and adaptation strategies to reduce the impacts of floods, low rainfall and high temperatures on people, crops, livestock, infrastructure and services.
- Agricultural adaptation strategies may include: coordinating the timing of ploughing and crop planting events with rainfall events; using drought-resistant crop varieties and livestock breeds; shifting livestock to alternative grazing areas and; implementing soil and water conservation policies and practices.
- Develop common goals and facilitate better integration of different policies and practice sectors.
- Develop policies and programmes that accommodate and encourage new and diverse livelihood options and generate financial capital.
- Build an improved and accessible evidence base of adaptation options, and their associated benefits, that provides tangible demonstrations of these benefits.

PART OF: CARIAA Collaborative Adaptation Research Initiative in Africa and Asia

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