

## Drought and Climate Change: How do we sustain our water supply?



## How do droughts happen and what are their impacts?

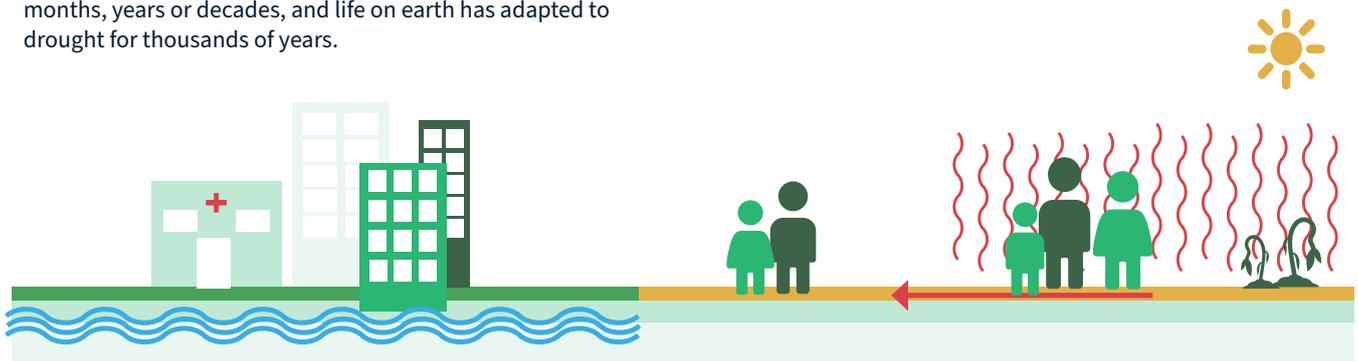
Droughts occur when an area/region has less rain and snow (precipitation) than normal. Droughts are characterised as meteorological – they are caused by prolonged periods of dryness in weather/climate resulting in:

- Decreases in water resources in rivers, streams, lakes, groundwater, dams and reservoirs.
- Hotter temperatures which increase evaporation of moisture from surface areas, causing soil erosion.
- Insufficient soil moisture for vegetation and crop growth.
- Low water resources: resulting in shortages of clean water for human demands/needs, ecosystems and animal life, infrastructure and development activity, agriculture and livestock, energy production and transport.

Droughts are natural phenomenon that take effect over months, years or decades, and life on earth has adapted to drought for thousands of years.

Droughts manifest in lack of water supply for residential and commercial use – impacting on all social, political and economic activity.

- Long term drought causes water shortages and can lead to water pollution, while also increasing food insecurity and the risk of famine.
- Human health becomes vulnerable to the severe impacts of malnutrition and water borne disease epidemics.
- Animals and plants species die, leading to extinctions and irreversible losses to biodiversity.
- Displacement happens as people migrate from rural to urban areas to access water, food, housing, health services and jobs.
- Social tensions and conflict arise around sharing habitable land and scarce resources – as in urban informal settlements, where housing and water supply is limited.



## Climate change increases the risk of drought

- As greenhouse gases enter the atmosphere at an increasing rate, the global climate is warming, and causing average temperatures to rise across the whole planet. This causes changes in our weather/climate with much more extreme conditions: hotter and longer heat waves, more wildfires, dust storms and droughts. Extreme storms, heavy rainfall and floods are also more likely after droughts.
- Droughts and water shortages - impacted by less precipitation- have increased in the last 50 years.
- Meteorologists study the impact of the atmosphere on the climate – looking at precipitation patterns, stream flow, and soil moisture over long periods of time to forecast droughts.



### DESERTIFICATION

is the permanent process of habitable and productive land becoming too dry to sustain forms of life.

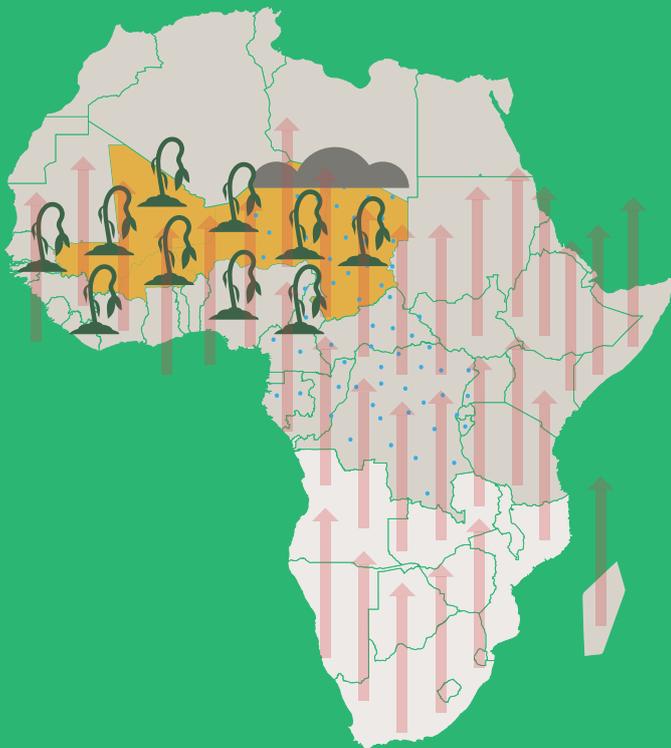
### LAND DEGRADATION

takes place when soil becomes permanently unproductive as a result of erosion and loss of biodiversity due to climate conditions and human activities: deforestation, overgrazing, poor farming practices, urbanisation and commercial development.

# Drought in Africa

Africa is at high risk for drought, the cause of 25% of natural disasters on the continent, compared to 8% globally.

- If global warming continues at the same rate, it will increase the frequency and intensity of already extreme temperatures in the sub-Saharan regions severely impacting countries, its inhabitants and development.
- The Intergovernmental Panel on Climate Change (IPCC) Working Group III states that global temperature rise can still be limited to 1.5°C with urgent and extensive transitions in land and water resource management, energy production, infrastructure development and transport.
- The IPCC climate change model predicts the following global hot spots for increased drought: Mediterranean regions of Europe and Africa, Central America, southwest of United States of America and the subtropics of the southern hemisphere.



**Sub-Saharan Africa:** Increased temperatures will be higher than the global mean temperature increase – regions within 15 degrees of the equator will see an increase in hot nights, longer and more frequent heat waves.

**Western Sahara region:** Experience the strongest drying, seeing a significant increase in length of dry spells.

**Central Africa:** Will experience shorter wet spells and a slight increase in heavy rainfall

**West Africa:** At risk of increased food insecurity as drought impacts crop yields.

# Climate Change in Southern Africa

Less rainfall is predicted over the regions of: Limpopo Basin in Botswana, Mozambique, Zimbabwe and South Africa; parts of Zambezi basin in Zambia and parts of Western Cape in South Africa.

Increased temperatures are predicted in areas of the south-western regions of South Africa, Namibia and Botswana. These areas will be drier with more frequent heat waves and droughts.

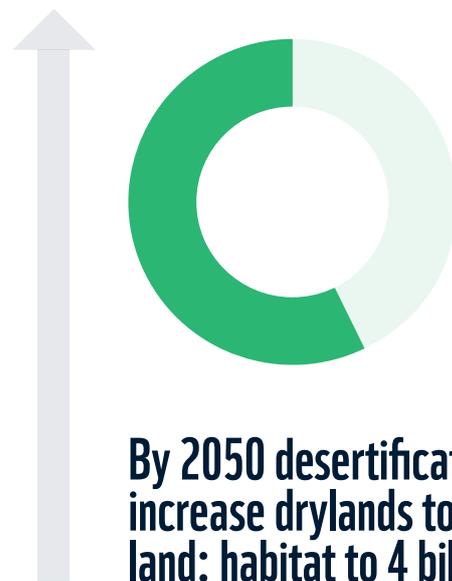
South Africa is a water scarce country: low precipitation and high evaporation results in limited water resources and supply.

- The region has experienced regular droughts but needs to be better prepared for increasing drought conditions and decreasing water supply across all the provinces of the country.
- National Disasters due to drought conditions were declared by the national government in March 2018 and again in March 2020. There was limited response by government to the needs of the affected areas. In future national, provincial and local governments should deliver co-ordinated resources to the worst affected areas, communities and farmers.



## Drylands

consists of arid, semi-arid and dry sub-humid areas covering 38% of land on earth, 2.7 billion people live in drylands: 90% from developing countries.



**By 2050 desertification will increase drylands to 43% of land: habitat to 4 billion people.**

# DROUGHT IN THE SOUTHERN & WESTERN CAPE - HOW DO WE SUSTAIN OUR WATER SUPPLY?

It was previously understood that droughts like *Day Zero* in the Western Cape would only occur once in every 150 years, but now such droughts are expected to occur once every 20-30 years because of climate change.

What can we learn from recent droughts and our responses to them in order to adapt and sustain our water supply?

## SOUTHERN CAPE 2009 - 2010

- 2009: no rainfall after a period of heavy rainfall and severe flooding
- municipality identified water demand needs – did not implement plans to increase water supply
- rapid urban development without sufficient water supply infrastructure
- government surprised by severity of drought
- drought disaster declared – 2009
- severe water use restrictions
- water tariffs quickly increased
- consumer education campaigns implemented when dam levels critical
- emergency drilling of boreholes to use groundwater
- small desalination plants built and hardly used, provided small percentage of water
- reduction of water use
- floods returned soon after the drought ended

## WESTERN CAPE *DAY ZERO* 2015 - 2018

- 2015 – 2017: very low winter rainfall
- municipality identified water demand – did not implement plans to increase water supply
- lack of political will to invest in water infrastructure
- slow response and cooperation between national and provincial governments – political dynamics
- drought disaster declared – 2017
- agricultural sector allowed to use reservoir water
- severe water use restrictions
- water tariffs gradually increased
- consumer education campaigns implemented when dam levels critical
- reduced use of water, panic buying of bottled water, water tanks sold out
- temporary desalination plants procured to increase water supply
- initiation of limited water supply from aquifers
- drilling of boreholes to use groundwater
- 2019: there were some restrictions and less water use
- 2020: dams now full with no restrictions

## We can sustain our water supply against the impact of climate change and droughts by:

→ **Planning before a crisis:** reform water resource management and improve equitable access

→ **Increase efficiency, equitable use and conservation measures:** invest in infrastructure and increase supply: implement restrictions, saving and conservation measures. Research shows during the Day Zero Drought municipal revenue was not lost as wealthy high water users decreased their water consumption but paid higher tariffs. By March 2018 most Cape Town households, wealthy and poor, had reduced use to 200 litres per day

→ **Ensuring all households have their right to basic minimum water supply:** no penalties to poor households during drought periods – resulting in poor health and increased debt

→ **Increase water supply:** • groundwater – too much use may deplete aquifers • desalination plants – are costly and energy-intensive • rainwater – transform water infrastructure: use Cape Town city as a catchment area • waste water re-use – is more cost effective than desalination as it is purer than sea water

→ **Adaptation:** we need urgent change to sustainable land management to push back land degradation by combining the best of science and local, indigenous and traditional methods to restore soil, and use less water and chemicals to produce local crops.

## ! TAKING ACTION

If you would like to understand more about the water sector and the connections between: human rights and service delivery, water laws and governance, the role of civil society, energy production and fracking – visit our website / click the link below / contact us for a hard copy:

- [EMG'S GUIDE TO THE DROUGHT IN CAPE TOWN \(2019\): IS OUR WATER SUPPLY SAFE?](#) • [WHY DOES THE WATER SECTOR NEED CIVIL SOCIETY?](#) • [WATER MANAGEMENT DEVICES](#) • [GOVERNMENT OF WATER](#) • [THE WATER - ENERGY NEXUS](#) • [FRACKING](#) •

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