

Spotlight on Agriculture

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DROUGHT versus ARIDITY

This article is to introduce the concepts of *aridity* and *drought* and also to dispel some misconceptions about these phenomena. It needs to be stressed that there is a huge difference between *drought* and *aridity*. Namibia is an arid to semi-arid country, but this does not mean that we experience drought every year and everywhere.

ARIDITY

Aridity is a **permanent feature** of the climate of a certain area. An **arid** climate is one that is permanently dry. In Namibia a large area of the country can be described as arid. Aridity is thus a characteristic of the climate of a region -- there is thus generally a lack of rainfall and the vegetation and indigenous fauna plus farming enterprises have (or should have) adapted to this natural aridity. There have been many attempts at climate classification in the past and there will probably be many more in future. One classic example of climate classification was done by Köppen, who divided the world's climate into five main groups, namely:

- | | |
|--|--------------------------------|
| A Tropical, rainy climates with no cool season | D Humid, microthermic climates |
| B Dry (arid) climates | E Polar climates |
| C Humid, mesothermic climates | |

The B climates are separated from the rest as dry or arid climates. The criteria for these are a combination of rainfall and temperature. For winter rainfall areas the criterion is $p < 2t$, where p is the mean annual rainfall in cm and t the mean annual temperature in °C. For summer rainfall areas the criterion is $p < 2(t + 14)$. The B climates are further subdivided into BW (desert) and BS (steppe). The cut-off values between BW and BS are $p < t$ for winter rainfall areas and $p < t + 14$ for summer rainfall areas. The whole of Namibia falls within the BW and BS climate zones, so that it is either classified as desert or steppe climate.

This is just one of the many ways of classifying climate; the point being that **aridity** is a **permanent** feature of the climate and the environment has adapted to this dry climate.



The average rainfall per annum for Gellap Ost Research Station near Keetmanshoop is 150.8 mm. A below average year (left) and a wet year (right) with 129,8 mm during the 1997/8 and 318.9 mm during the 1999/2000 rainy seasons respectively, are indicated.

DROUGHT

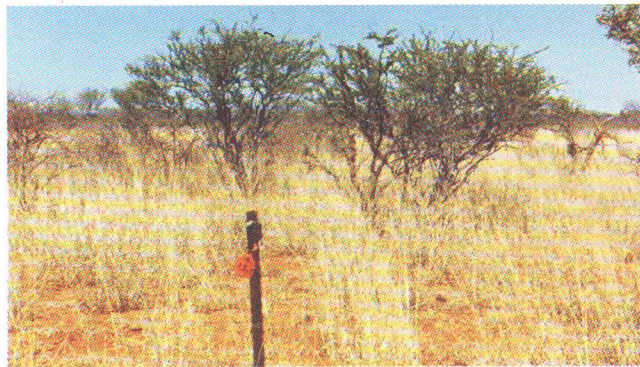
Drought, on the other hand, is not an everyday occurrence, but an abnormal situation caused by a **protracted period of deficient precipitation**. This means that when precipitation is normal, drought does not occur, even though this normal precipitation may be very little, such as in the Namib Desert.

Drought is a **temporary aberration** and differs from aridity, since it can occur in any climate zone, while aridity is a permanent feature of the climate. Drought is a non-event insofar as it is caused by the absence of something and not like other natural disasters such as tornadoes, hurricanes, hailstorms, earthquakes, tsunamis and volcanoes, which each have a definite event with a start and finish. Drought is insidious and may start with the first dry day after a wet spell and may not necessarily end with good rains, but only after a protracted spell of wet weather.

There are also different types of drought, like meteorological drought, agricultural drought (that can be subdivided into crop drought, pasture drought), hydrological drought and others. Although it has a score of definitions, it originates from a **deficiency of precipitation** over an extended period, usually a season or more. This deficiency results in a **water shortage for some activity, group or environmental sector**.

Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (evaporation + transpiration) in particular, a condition often perceived as "normal". It is also related to the timing (principal seasons of occurrence; delays in the start of the rainy season; occurrence of rains in relation to principal plant growth stages) and the effectiveness of the rains (rainfall intensity; numbers of rainfall events). Other climatic factors such as high temperature, high wind and low relative humidity are often associated with it and can significantly aggravate its severity.

By virtue of these facts, it has been difficult to define and characterize drought. Worldwide, researchers are investigating the classification and quantification of different types of drought into clear, comprehensible indexes or classes.



The average rainfall per annum for Omatjienne Research Station near Otjiwarongo is 425.4 mm. A dry year (left) and wet year (right) with 189.0 mm during the 1998/99 and 827.6 mm during the 1975/76 rainy seasons respectively, are indicated.

ILLUSTRATION

To illustrate the difference between drought and aridity, the following graph has been drawn for an average year, the driest El Niño year and the wettest La Niña year, for two stations with widely differing rainfall averages. Bethanie is definitely more **arid** than Katima Mulilo, which is one of the wettest stations in Namibia. Both can, however, experience **dry years (drought)** or wet years.

AVERAGE, WET AND DRY SEASONS

