

Tapping into traditional water knowledge

Seasons from southern Africa



Watering life, together, forever



Old ways and new – together show us what to do

Traditional practices focus on participation in decision making, equity in distribution and care for natural resources. Understanding them helps us to return to these basic values in our 21st Century thinking about the management of water. Let us respect and learn from the wisdom of our elders, and continue the long tradition of living with, and adapting to, the natural world that supports us all.

Water is central to predicted climate change impact. In 2012 SADC's Water Division commissioned a series of studies of how SADC member states were incorporating traditional knowledge into their approaches to water planning and disaster risk reduction.



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The studies show that people in southern Africa have been coping with extremes of weather for many generations. Across the region they have carefully observed their environment and lived with the rhythm of the seasons, learning to predict weather, prevent destruction of their crops and homes, and help each other cope with droughts and floods.

Even more important than colourful details about local practices is peoples' practical and spiritual understanding of nature, and the role of their traditional leaders in learning to prevent and manage natural disasters.

This booklet of the seasons shares some of southern Africa's traditional climate lore. It highlights the value of combining this knowledge with the best that modern science has to offer.



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January

Ferikgong - Kgweri ya kgoro
(Setswana)

In Botswana this was a month of clouds and rains. We called it *go longwa maraka* – the first small harvest to check if the produce was ready for reaping. We could tell the rains were coming because the *motsebe* tree had flowered, the *morokwapula* bird pecked at the trees a lot, and the dung beetles were active in rolling their dung.

Now it rains only in January. It is hotter and there are fewer heavy thunderstorms.



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Researchers have been working with farmers in Botswana's Okavango region and government meteorologists to exchange local and scientific knowledge about weather forecasting.

More than 70% of the farmers involved in the study said that, "Based on personal experience, I can predict whether there will be enough rains or not in a farming year".

Scientists are increasingly interested in watching the behaviour of living organisms in relation to the changes in the environment. As well as predicting the weather, these *bioindicators* can help signal changes in the health of ecosystems.



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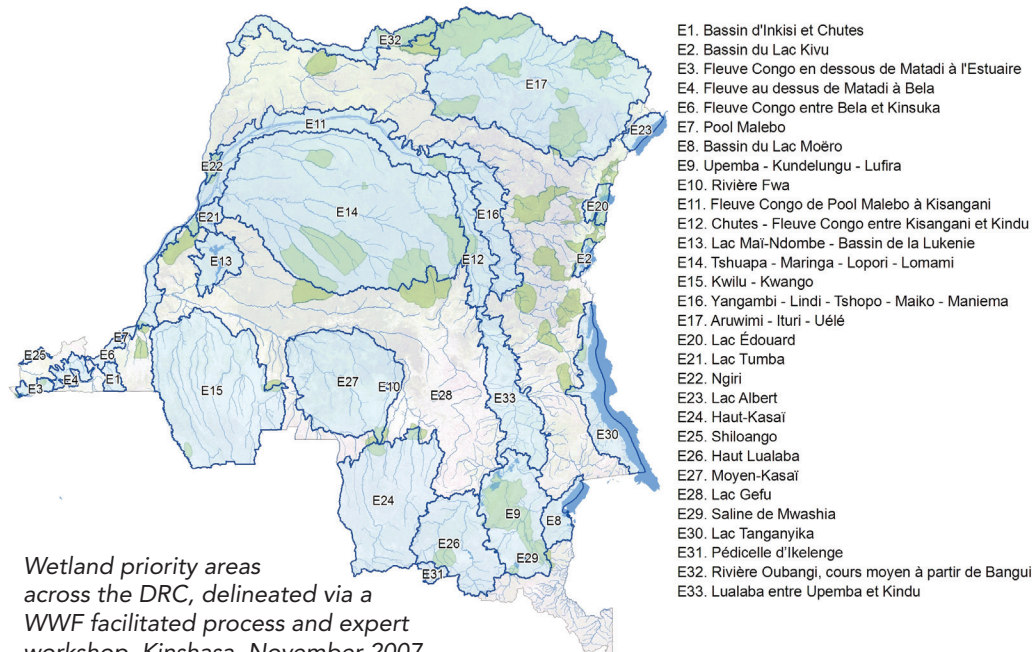
February

Février
(French)

In Democratic Republic of the Congo (DRC) this month was when the soil was still a bit moist and people had to do a lot of weeding of the crop fields. The rainfall reduced so the last weeks of the month were usually dry.

In former years, people observed that, if this dry period extended into March, drought would follow. In case of droughts, the King, who was the owner of all wetlands, would give permission to make use of wetlands for crops. People believed that lack of respect for the King would increase the likelihood of drought.

Now, dry spells are longer and droughts are more frequent. People are beginning to build homesteads on wetlands.



Since 2008, the DRC's Tumba-Ngiri-Maindombe area has been protected as a Ramsar Wetland of International Importance – the largest in the world.

Scientists are using satellite images to map the changes taking place in the DRC's wetlands. These maps can support the DRC's water and land managers in tracking and managing the cutting of forest trees, and the spread of cleared areas near wetlands.



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March

Tlhakubele
(Sotho)

In **Lesotho** in this month the sorghum grains became visible and caused a secretion that attracted the birds and aided pollination. The temperatures started to drop, and the grass to lose its green colour. These days, the rainy season is delayed and lasts for a shorter period than it did in the past. In general, the weather is drier than it used to be, with less snowfall.

People have learned to dry vegetables, grains and meat to preserve them, and to collect wild herbs that act as pesticides for the food they have stored in baskets, or in holes in the ground.

Lesotho government scientists are recommending conservation agriculture techniques to help rural people in Lesotho cope with climate change.

The right timing is important for conservation agriculture: Lesotho's meteorology experts are producing seasonal weather forecasts that can guide farmers in their planting of crops.



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April

Epulo
(Chichewa)

In Malawi, this month saw the onset of cooler and drier weather.

If mango trees had many flowers towards the end of summer it was believed that the next rainy season would be poor, with many dry spells.

In some parts of the country, prevalent south-easterly trade winds known as *Mwera* were also a traditional indicator of an upcoming poor rainy season.

Nsangu, a tree, that sheds its leaves during the rainy season, and grows new leaves during the dry season, provided extra fodder. If this tree did not shed its leaves until very late, people believed there would be drought.

Floods and droughts have increased tremendously of late, with persistent hot summers and warm winters.



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A study in Southern Malawi compared local people's perceptions on climate change and variability with scientific evidence from a nearby weather station.

The study showed that traditional indicators that have been used to predict weather and climate for generations, and people's memory of major climatic events over the years in the area, agreed with the scientific evidence from the temperature and rainfall data.

Researchers are now promoting integration of Malawian indigenous knowledge into scientific climate forecasts at the local level, to enhance the resilience of communities vulnerable to climate change.



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May

Mai
(French)

In Mauritius this month was the usual beginning of winter, when the temperature was cooler, and winds blew over the islands from the east and south-east. As rivers began to flow more slowly or dry up, people needed to get a lot of their fresh water from wells.

In this island country some older people had a special gift of being able to hunt for ground water, using a “water stick” that vibrated in their hands when any water was located below the ground, even at depths of 20m.

In recent years there has been change in rainfall patterns, and the wet places and springs have been drying up. Many boreholes have been drilled to help irrigate the sugar cane. Sometimes the water is polluted from fertilisers and sewage.

Scientists know that surface and groundwater resources in Mauritius are closely connected. Groundwater plays a major role in feeding flows of rivers.

Government water managers have discovered and tapped into almost all of the country’s underground water resources. During the dry winter season, yields from boreholes drop by about 20%.

Government researchers have been working with communities to produce local maps of traditional farm plots and water sources. This is helping farmers to adopt soil and water conservation practices to cope with climate change.



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June

Junho
(Portuguese)



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In **Mozambique**, the beginning of winter in June found families starting to use the maize, groundnuts, cassava and beans they had stored in household silos. They also ate dried fruits from forest trees, such as Massala.

For those living in the south, organic peat soils called *machongos* provided fertile and continuously wet fields for crops, even in the winter months with no rainfall. Farmers dug shallow ditches by hand for both irrigation and drainage, producing rice, maize, beans, and vegetables when other fields were empty.

In recent years, with warmer winters and frequent use, the soil in some of these *machongos* have become too dry and acid for the crops.

Scientists have been studying how the soils and water of Mozambique's wetlands interact to learn how to best to use the rich peat soils for agriculture.

They have learned, like the traditional farmers, that drainage of *machongo* fields must be carefully planned to avoid pooling and excessive runoff.

Because these soils are especially vulnerable to the impact of climate change on water systems, the scientists are encouraging shallow drainage and frequent irrigation. They also say that, where applicable, farmers should use manual tools intensively, and avoid burning for land-clearing.



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In eastern Namibia, this month was known as the time that different types of trees, mostly fruit trees, prepared for spring by flowering. The more flowers the trees had, the better the rains that were expected.

In the spring, if people saw termites carrying grass into their mounds, they knew there would be drought. Cattle coming into the *kraal* with grass in their mouths also predicted a dry rainy season.

In the old days, the rains would begin with strong winds in August, but now it begins to rain only in November or December.

There are lighter storms, less grazing, less rain, and a shortage of food.



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July

Suramazeva
(Otjiherero)

In Namibia, government is working through projects like Forum for Integrated Resource Management to link traditional climate knowledge with science. Local level monitoring of the natural environment such as rainfall, rangeland and livestock conditions is a key part of this participatory approach. Vital weather data is shared through two-way communication between communal farmers and government extension services, allowing for timely interventions such as providing additional feed for livestock.

Working together, farmers and government scientists provide a simple but scientifically based early warning system that will enable them to better adapt to changes in climate.



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August

Ngwato a bošego
(SePedi)

In the Limpopo region in South Africa, this was the month of spring, and the people were consoled by the appearance of a new season. All creatures that hibernate during winter emerged. When tree frogs were heard, and hawks and eagles flew north, people believed that rains were coming.

People prepared themselves for the new season by discussing how the work would be carried out. They were careful to not plant njugo beans too early, as they believed this would prevent good rains. These days, the rains are less predictable and less intense.



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South Africa's state Department of Science and Technology recognises the importance of traditional knowledge through an official policy, and the National Indigenous Knowledge Management System developed and implemented by the CSIR Meraka Institute.

At a research centre in Limpopo's Maila Village, scientists are investigating traditional knowledge used in identifying and using medicinal wild plants. They now recognise that having access to a diversity of plants will help to cope with the increasing changes in climate.



In Swaziland in this month, hunting and repair of homesteads ended, and cattle were moved for summer pasturage. Millet was planted until November, and weeding of early planted crops began. Maidens carried out the reed dance for royalty.

In the past, when there was drought throughout the country, a levy of cattle called *Umdumezulu* would be sent to the queen mother's village. It was believed that the queen mother could make rain, stop rain, or direct it to a specific location.

These days, the rains are coming later.



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September

Inyoni
(Siswati)

Local farmers' observations that the rainy season is starting later in the year are supported by meteorological data in Swaziland. Dry spells and shift of rains has made it difficult to plan and grow a wide range of crops, and has resulted in reduced production.

Scientists are working with small scale farmers to become better at using scarce rainwater resources, building on understanding of traditional knowledge systems.

Swazi insurance companies are now introducing agricultural insurance schemes for farmers who lose their cattle or crops to drought or other natural disasters.



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October

Mwezi wa kumi
(Swahili)



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In Tanzania the appearance of many flowers on trees this month was a sign of good rains to come.

The *misitu ya jadi* forests established by ancestors for worship and other cultural rites, were protected in accordance with customary laws. They were used for places of prayer, and were believed to bring rain. Most of them were located on slopes, hills and around natural springs.

Uncontrolled felling of trees and other vegetation in these areas was forbidden.

It is now not possible to have clear predictions of the rain or drought.

Scientists have also observed that losing trees through harvesting, reduces the amount of water available and the diversity of plants and animals.

In Tanzania's Makete District, the government and local communities have been organising better management of woodlots by developing local woodlot operational plans and harvesting rules, setting rates and prices for products, and determining how surplus income will be distributed or spent. This conservation of forest resources is also helping to enhance soil and water management.



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November

Chinchi Kubili
(Bemba)

In Zambia this was the time between hot and wet seasons. People prepared the land for planting maize, rice, and groundnuts.

While waiting for the rains, people called north to south winds male, and south to north, female winds. When either was strong, rainfall was expected. If they expected poor rains, people planted early maturing crops.

Since the 1990s, the rains are coming later – sometimes not until December. In one year rain may start in November, another year, in December or January. There are sometimes dry spells at the most important stages of crop growth.



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Zambia's Meteorological Department has been providing rain gauges, radios, and mobile phones to both deliver weather information and collect farmers' observations through the Radio and Internet for the Communication of Hydro Meteorological Information programme.

Seasonal weather forecasts based on modern technology can be combined with these observations to provide more accurate predictions for local communities.

Farmers are empowered to act on these predictions and prepare for droughts and floods in a timely way.



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In northern Zimbabwe this month was the time for neighbours to take turns in weeding their field crops through *nbimbe* – a form of collective action.

While there was a lot to do during this time, Shona people believed that working on the weekly ancestral day of rest, the *Chisi*, would cause drought or crop failure.

Now it is not surprising to see people buy and sell produce on *Chisi* day, and also, some work full time in the fields.

And with unpredictable rains, people are now sometimes planting three different times.



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Researchers in Zimbabwe are finding that planning at the community level is an effective way of adapting to climate change. This is especially so when community members learn together through participation in community risk assessment, making use of both scientific and local traditional knowledge.

In one study, farmers who adapted their farming methods to seasonal climate forecasts significantly improved their harvests. Moreover, farmers who had attended a brief workshop and learned more about the forecasts, were significantly more likely to use the information than were farmers who learned of the forecasts on their own.

December

Zvita
(Shona)
Mpalakazi
(Ndebele)



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**Global Water
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Southern Africa

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