

# OPINION

## Defy climate change Eritrea: Weather Extremes Require Rethinking in Agriculture. Hunger can be Prevented

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By Martin Zimmermann and  
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When we started our three-week trip to Eritrea, we had an unusually large number of questions with us. We have recently been asked repeatedly: "Why is Eritrea not as badly affected by the drastic drought disasters as its neighbors? Why does the country not appear on the "hunger maps" or only as a blank spot? What is being done differently there to ensure supplies are independent of external help?"

How current these questions are was confirmed by the alarming news situation shortly after our return. In mid-November, devastating floods occurred in parts of Ethiopia, Kenya and especially Somalia following irregular rainfall and periods of drought. The results of the UN and aid organizations: Somalia alone recorded at least 46 deaths, around 500,000 people became internally displaced, and the floods caused immense property damage. The entire Horn of Africa is increasingly suffering from such extreme weather events caused by climate change. This also applies to Eritrea. However, the country is not plagued by recurring famines like its neighbors.

How has Eritrea managed to make great progress towards the desired self-sufficiency despite the devastating effects of climate change, the sanctions policy of the West and the still noticeable consequences of a decades-long war of independence? How has agricultural production been

developed so successfully that malnutrition or undernourishment can still occur in individual regional administrative units ("subzones") under certain conditions, but at the same time it is clear that no one is starving in Eritrea?

The search for answers leads to the Ministry of Agriculture. Agriculture Minister Arefaine Berhe welcomes us in Asmara. When asked the opening question: "What is your secret, that in Eritrea, unlike many neighboring countries, no one dies of hunger and the country is not dependent on external food aid?" - a smile flashes across his face. "A good question," he answers: "We live in the Sahel zone, and over decades the climate has changed so much that only those who develop a strategy for soil and water conservation and thus react to the changes can survive here. This applies to small-scale subsistence farming as well as to small, medium-sized and large agricultural operations." Climate change or the keyword drought does not mean that there is no more precipitation during dry periods, he emphasizes. "The problem is that there is too little or too much precipitation. Let's take the example of agriculture in the highlands: Sometimes the short rainy season in March/April - i.e. when the farmers are sowing - is canceled completely or partially. Or the rainfall is so heavy that it leads to soil erosion and thus the loss of fertile arable land." The same applies to the main rainy season from June to September: "In short, what has changed is that we can no longer practice agriculture here, which relies on regular rainy



Less is more: The farmers supported by the government should concentrate on keeping one dairy cow at a time

seasons. We responded to that. «  
Use every drop of rain

We want to know what that means in concrete terms. »We pursue successful soil and water conservation. This is only possible with a package of measures and with the active participation of the population. This includes reforestation as well as terracing in the highlands. And we have to use every drop of water." In 1991, the year of independence, the minister said, there were only around 100 dams in the entire country. A lot of fertile soil was lost in violent flash floods. Things are different today: "Since then, we have built more than 800 dams. Today, small earthen dams, medium-sized and large dams hold back the water, raise the groundwater level, prevent soil erosion and even enable us to expand the agricultural areas used by small and larger companies - completely independent of rainy-season-based cultivation. The country has thus taken a big step forward made for food security.

"This strategy works very well - that's part of the secret you're asking about," says the minister, laying out facts on the table: "After 32 years of independence, we produce six times as many vegetables and 71 times as many fruits." However, the minister

emphasizes that the potential has not yet been exhausted. Today, flowing irrigation is still predominantly used. »A lot of water is wasted. We want to change that and expand drip irrigation using solar-powered pumps. To this end, irrigation pipes and cables are manufactured in the country in the polyplastic factory in Massawa. The medium-term goal is to produce juice from fruits such as oranges, lemons or mangoes and to preserve tomatoes in cans in order to export such products in the medium term.

To increase productivity, the government is supporting farmers by introducing high-yielding varieties. "We are also working on the further development of markets and infrastructure, better access to inputs, loans and advisory services, and the strengthening of agricultural cooperatives," says Berhe. The focus is on cultivation diversity. "We have to move away from monocultures and rely on research and cooperation with foreign partners." The Halhale National Agricultural Research Institute plays a key role in this. An example: From 2014 to 2017, the Eritrean government, in collaboration with Irish partners, developed selected disease-resistant potato seeds and distributed them to farmers. In just a few years, potato production was quadrupled.

The Eritrean agricultural experts cannot be accused of a lack of enthusiasm for experimentation or hostility to innovation: "A small pilot project for date cultivation started in Massawa almost two years ago," says the minister. With success. Today there are already 15 date producers based there, and the number is rising. When it comes to fertilizer, they also rely on their own resources without chemicals - and regional cooperation. A pilot project for the production of organic natural fertilizer is being carried out with several neighboring countries and is to be developed to the point where it

is suitable for mass production. Field tests to date show that its use allows up to three harvests per year without damaging the soil. This is made possible by pest-resistant crops that are constantly changing.

### Sustainable improvement

The Ministry of Agriculture pays particular attention to small-scale subsistence farming: "The majority of Eritrean farmers live in the densely populated highlands and practice traditional rain-fed farming combined with a small number of farm animals. Farmers usually produce around 60 to 70 percent of their annual food requirements; in good years the proportion can be slightly higher. They cover the remaining 30 to 40 percent by selling animals or working as day laborers in nearby cities.

In order to secure the existence of small farmers, his ministry introduced an integrated minimum package for households in 2013, the "Minimum Integrated Household Agriculture Package" (MIHAP). In addition to the cultivated land, each household receives an improved crossbred dairy cow or six piglets, 25 chickens, two beehives, a vegetable patch and 20 trees (ten fruit trees, five legumes such as moringa, leucinia, pigeon bean as additional feed for cows and five trees for firewood). "This package has the potential to sustainably improve the family's living conditions and cover the food needs of your own family and four other people - and you can also earn additional money by selling surplus products," says Berhe, describing the concept.

It is crucial that farmers concentrate on one dairy cow that can produce at least ten to 15 liters of milk per day instead of keeping three to five dairy cows with low productivity. On average, the family will use 20 percent of the milk and be able to sell the rest. "The other component, free-range poultry farming, doesn't require a lot of work." The family uses some of the eggs produced, and the rest is sold. The honey produced also benefits the family; the surplus is in demand on the market. "Grown vegetables and fruit, which provide most of the nutrients, are also an essential part of the package, which has proven itself for around ten years," said the minister. The program will be expanded step by step.

Given these efforts and the positive development, can Eritrea be fully self-sufficient without importing food, especially grain? That's our next question. "No, when

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Of central importance in a region with unreliable rainfall the Jegar small dam