

# GROWING NUTRITIOUS FOOD WITH AN EYE ON CLIMATE CHANGE

*As seasons shift so must agricultural systems if we are to reduce climate shocks to food security.*

What happens when climate change throws a spanner in the palm-oiled cogs of a globalized food system? Farmers everywhere face a monumental challenge to meet the nutritional needs of Earth's expanding population in a shifting climate. Just as heatwaves destroy crops on land, disrupted ocean currents could leave fisheries floundering. Tropical zones that grow rice and corn today could dry up during longer, hotter summers as optimal growing regions slowly march poleward.

As growing seasons and territories shift, all countries need to support the global effort required to ensure food security for all. Tim Benton, Research Director in Emerging Risks at Chatham House, UK, calls for a food systems approach. "Food is not simply about

agriculture in one place," he says. "Each country is connected to the global market through its own export and import dependencies, and so the impacts of climate change are a global issue." Just as COVID-19 exposed the vulnerability of current food systems by disrupting the 'just-in-time' distribution model, climate change will do the same.

The food system also contributes to climate change, generating around a third of anthropogenic greenhouse gases. "We must make our food system more resilient without increasing emissions or pressures on the land," says Benton. Monoculture farming has already reduced natural biodiversity, while agricultural chemicals have degraded the soil and polluted water supplies. Governments must help farmers overcome these problems while also

ensuring food security, especially in times of crisis.

Climate-related disasters repeatedly highlight the need for nutritional preparedness. While high-yielding staple crops can be stockpiled for emergencies, they should be bolstered by locally grown nutrient-rich foods. However, safely storing nutrient-dense foods remains a challenge in hot countries. Crop diversity is also crucial for keeping land productive year-round and establishing a strong root system that stabilizes the soil, prevents nutrient depletion and improves water retention during droughts. Regenerative farming, which advocates no-tilling and organic compost, is gaining ground as a way to restore soil nutrients and plant biodiversity.

## Grain drain

The most food insecure regions will be hit hardest by climate change. Already, local food supplies are increasingly impacted by extreme weather events, new and shifting plant diseases and pest outbreaks such as the plague of locusts that devastated the Horn of Africa in 2020. "Climate is a major issue for African farmers: if it's not droughts, it's flash floods," says Namukolo Covic, nutritionist at the International Food Policy Research Institute. "Unpredictable rainfall makes it difficult for farmers because the expected timing for planting their crops keeps shifting."

**"Food affects climate and climate affects food, we must make our food system more resilient without increasing emissions or pressures on the land."**

Changing consumption patterns also undermine food security. Farmers have been coaxed away from growing naturally drought-resistant indigenous grains such as millets and sorghums and onto maize, a high-yielding but very thirsty crop. “Even in my lifetime I’ve seen a shift. As a child, I ate a lot of millets and sorghums as part of my staple diet,” says Namukolo. Agricultural policies in her home country of Zambia have been “maize-centric,” she says. “Most of the research is into maize; all the subsidies were for fertilizers to grow maize. Farmers will grow what they are helped to grow.”

“Yet food resilience should be addressed on multiple fronts. Much work has already gone into drought resistant maize, but there is now a greater realization of the value of other cereals,” says Namukolo. “African farmers are being advised to diversify, to add sorghum and millet to their crops in addition to maize.”

Deforestation to create vast monoculture farms has left the land at the mercy of flash floods and other weather-related events. Several African countries have now launched immense reforestation programs to reverse desertification and reduce the risk of landslides. There is even talk of planting a green belt along the southern Sahel, a “Great Green Wall” at the edge of the Sahara Desert. Ethiopia’s ambitious reforestation program has kept food security firmly in sight, with at least half of new plantings to be fruit trees.

**Production considers nutrition too**

Ethiopia has made great progress in food production since it was devastated by famine in the 1980s, but with little focus on nutrition. Now, Africa leads the world in adding much-needed nutrients to

crops. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has developed sorghums with high levels of iron and zinc. “Ethiopians are particularly deficient in these two micronutrients,” says Namukolo. “Combining biofortification with drought resistance addresses multiple challenges.” Other African countries are already growing cassava and maize with added vitamin A and iron-fortified beans, but production needs to be upscaled.

Making affordable nutrient-rich foods will require intensification, but the fragmentation of farmland into small plots makes it challenging to introduce sustainable intensification practices. Farming collectives are already helping smallholders minimize the risk of adopting new techniques.

Namukolo sees both opportunities and challenges for Africa in trying new things. “We are starting so far behind rich countries. But they have already made their mistakes and those can be lessons for us,” she says. “Developed countries want to help us do what they’ve done, but they should want to help us to do something different and do it better.” The stakes are high for Africa. “We are already facing climate issues and we have no other resources to fall back on,” says Namukolo. “For us, it is do or die.”

Paradoxically, the rest of the world could lag behind Africa’s efforts to nourish people while protecting the planet. “Over the past decade, we have moved away from globalized cooperation for the common good,” says Benton. “But if we don’t tackle the global challenges together, the perturbations will get bigger and we will be unable to cope with the increasing number of climate shocks.” Lobbyists hope to see food systems become prominent on the agenda at the next Conference of the Parties (COP26) in Glasgow in 2021.

“There’s a lot of buzz about the role of technology, but it is no silver bullet,” says Benton. “Everyone wants cheap food, and although technological efficiency gains drive down costs, we are often shifting the cost onto the environment and human health.” ●

