Farmers Turn to Science to Boost Crop Yields

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Sabon Gari Ganu

Late last June, farmers in Sabon Gari Ganu village in northern Nigeria's Katsina state divided their plots of land into 56 rows. Using seeds from 16 African countries, the farmers planted each row with a different variety of millet—some small seeds, some round, some dark and some light. Throughout the rainy season, the farmers watched carefully to see which varieties would grow and which would not.

Five months later, the farmers sat down to vote on which seed varieties they preferred. Women and men were each given ballots, either light or dark blue, respectively. Four seeds were chosen. "Our plan now is that the four chosen will be intensively promoted," explains A. Kabir R. Charanchi, a chief agricultural officer for the Katsina state government who works on the project. "We are now going to bring more seeds for multiplication."

In one of Nigeria's—and indeed Africa's—harshest climactic zones, Katsina state is turning to scientific research to boost crop harvests. The initiative in Sabon Gari Ganu, funded by donors including the International Fund for Agricultural Development (IFAD) and the government, is aimed at improving crop varieties in the arid region.

Researchers at the Lake Chad Research Institute and the Institute for Agricultural Research, among others, collected and developed the improved seeds. Sabon Gari Ganu is just one of 40 villages in six local government areas testing the new millet varieties. And the trials are not only of seed types; farmers also volunteered their land for fertilizer and weed control trials.

"We use a 'Demonstrate' plot, a portion of the farmer's land, and we say, let him add optional new crops and then traditional ones," explains community development officer Abubacar Saulawa. Just a few months after the trials began, community members said they would switch to the new varieties, and crop yields went through the roof.

Ravaged Farmland

Once a booming agricultural exporter, Nigeria is today a food-importing nation. Oil, rather than agriculture, became the mainstay of the country's economy in the 1970s and 80s, leaving other sectors in disarray.

Only recently has the government showed a renewed interest in bringing agriculture back. "Local

governments are supposed to implement activities that our programs [do], but for lack of funds, among other things, they do not," explains Bukar Tijani, program manager for IFAD in Katsina. "Now we have come in to supplement and cause the government to make a contribution."

Most families in the North still survive on homegrown grains, but over the last several decades, rural communities such as Sabon Gari Ganu have seen both their crop yields and their incomes fall.

With a growing population, farmers have hurried to occupy land—once an abundant resource in the region. The resulting pressure on the land has pushed soil fertilities steadily downward over the last three decades.

Farmers who could once shift from plot to plot now farm the same land year after year, stripping the soil of nutrients. Fertilizer, subsidized by the state and federal governments, often arrives late or not at all. Dr. Umar A. Alkaleri, an analyst for the International Center for Soil Fertility and Agricultural Development in Abuja estimates that only 40 percent of the fertilizer destined for last year's planters reached its destination.

Increased pressure on the land has had another effect, as well: "From Katsina to the northern border of Nigeria, within the last several years, 11km has all been lost to desert," estimates Alkaleri. Higher temperatures and lower rainfall have made cultivation even more difficult in a region that already receives only 700-800mm of precipitation a year.

The Intervention

Difficult conditions have hit crop yields hard, and farmers even harder. "The main occupation [in the North] is agriculture, and because most make a living off of their crops, poverty is widespread" says Tijani.

Turning the situation around has been the goal of IFAD and the Katsina government's trials in Sabon Gari Ganu and other communities, and local farmers say they are starting to see a difference.

Abdul Malik, a farmer aged 30, says he gathers 15 to 17 100kg bags of millet using improved varieties, where he used to gather only 10. With his increased income, he bought two new soil tilling machines this year, where before he had just one. "I'm satisfied at this level [of production,]" he says, "but I continue to hope for more improvement."

If the trials continue to raise yields, farmers will not be the only ones to profit. Middlemen who move the crops to market may also see their businesses improve. Already, vendor Halilu Mohammed says his shipments have increased fivefold since new varieties were introduced. As a more stable source of cotton, the village now attracts nearly double the previous price of 700 naira, or about $5.80 per 25 kg.

More Yet to Come

Though livelihoods can be improved, experts agree that there is no easy cure for Nigeria's agricultural system. Increased production does not guarantee a buyer for the crops. Transportation to local and international markets is a constraint; refrigerated storage facilities are rare and as much as a third of Nigeria's agricultural products spoil before they reach market.

When products do arrive they often find a saturated market. Many farmers in the North produce just one crop, filling market stalls with just a few different vegetables and grains at each season. "There has to be a diversification of the market," explains Tijani. "We have to be looking at hot cakes on the international market, so we are not looking at subsistence only."

Science looks to be an appealing way to start fixing the problem. Improved varieties—and an increasing number of them—will make it easier for farmers to diversify their crops. If efforts to fight soil infertility succeed, those crops will grow more easily and with less need for costly agricultural inputs.

As West Africa's largest country, and Africa's most populous, that might just be enough to get Nigeria back into the world market.

The IFAD and local government teams in Katsina agree that change will be slow. But it might just be coming.