

Following approval of GMO crops, Nigeria sets sights on other biotech advances, including gene editing and synthetic biology



Having approved its first GMO food crop [earlier this year](#), Nigeria is poised to take another step forward in the biotechnology arena. The nation's legislature wants to give its biotech agency the power to regulate several new technologies, including gene editing, gene drives and synthetic biology.

The Nigerian government, this week, signed the NBMA (amended) Act 2019 with the aim of preventing any adverse effect to human health and environment. The measure expands the role of the [National Biosafety Management Agency](#), which was established in 2015 to safeguard human health and the environment from potential adverse effects of modern biotechnology and genetically modified organisms and to harness the potential of modern biotechnology.

Since its inception, the agency has given Nigerian scientists the ability to develop new crops, including a pest-resistant [cowpea](#), for use by the nation's farmers. Universities and research institutes now have confidence to carry out biotechnology research, which is expected to increase agricultural productivity as well as contribute to food security in Nigeria. The nation also approved its GMO [cotton](#) seed in 2018.

Many countries across Africa have yet to develop and embrace the products of modern biotechnology. But Nigeria – Africa's most populous nation – has achieved significant strides in this arena, looking at modern biotechnology as a way to counter some of the major challenges bedeviling the continent including food insecurity, climate change and diseases.

Nigeria's biotech efforts started in 1992, when the nation signed the Convention on Biological Diversity, followed by the Cartagena Protocol on Biodiversity in 2002.

[mosquito and dna](#)

Image: Jill George/NIH

Now, Nigeria is [seeking](#) to bring other new technologies – including gene editing, synthetic biology and [gene drives](#) – under the umbrella of its national biosafety law. At a public hearing in May, Nigerian scientists, policymakers, government agencies and civil society organizations discussed the bill to amend the biosafety management act of 2015.

The idea of expanding the biosafety act of 2015 is a step in the right direction and a demonstration of Nigeria's willingness to take leadership position in science, technology, and innovation in Africa, said Abdulrazak Ibrahim, a molecular biologist at Ahmadu Bello University Zaria.

"It means we have come of age, and it shows foresight in the path of the Nigerian scientific community and biotechnology stakeholders," Ibrahim said.

In an interview with the Genetic Literacy Project, Ibrahim said many scientists have grown concerned that Africa is missing out in the global "gene revolution." The issues have grown more complicated with the

addition of these emerging technologies with the potential to disrupt both agriculture and human medicine.

CRISPR, for example, is completely different from traditional genetic engineering and its products are different too. “So, if we don’t prepare, it means that we will not only miss the benefits of ‘gene revolution,’ but may eventually miss these powerful emerging technologies,” said.

It is important, he said, for Nigeria to develop a regulatory framework for gene editing, gene drives, and synthetic biology to help scientists develop home-grown solutions. Said Ibrahim:

“Otherwise, companies will just flood our markets with products from these technologies. The ground is already prepared for this to start happening.”

Africa’s agriculture is highly rain-dependent and the continent’s food systems are threatened by climate change and global green-house gas emissions.

[Reisbauern Nigeria x](#)

Image not found or type unknown

Credit: Giz.de

Ibrahim believes that one way to solve Africa’s agricultural challenges is through the deployment of new technologies, describing them as “quick win solutions” to existing problems. “Our population is expanding, technologies like CRISPR which has the ability to produce results instantly are critical in solving our food and nutrition needs in Africa,” he said.

This move to include emerging biotechnology into the regulatory framework has raised [public concerns](#) over the risks involved in the use of gene editing, gene drives, and synthetic biology. Notably, a [memorandum](#) on the NBMA Act of 2015 signed by Nnimmo Bassey, an environmental activist and director of the ecological think-tank, Health of Mother Earth Foundation (HOMEF), called for the dismissal of the

bill. Bassey argued that other evolving aspects of modern biotechnology pose a threat to life, ecological diversity, and environmental sustainability.

Follow the latest news and policy debates on sustainable agriculture, biomedicine, and other 'disruptive' innovations. Subscribe to our newsletter.

[SIGN UP](#)

However, Ibrahim argued that risks often associated with new technologies are nothing new and Nigeria has the capacity to manage the possible risks that emerging biotechnology bears, adding that Nigeria should not shy away, but rather prepare for it. He noted that three transformations changed human history on earth: domestication, globalization and fossil fuel.

"Imagine thousands of years ago before all of these [transformations]; if you were asked to weigh the possible harms from each of them, you would say 'No. don't let us go this way, it's too risky.'"

This is exactly where we are with these emerging technologies, they represent the next big biological transformations that will change the world, Ibrahim said.

The inclusion of emerging biotechnology into Nigeria's biosafety regulatory law, could place Nigeria high among its African peers and in the global biotechnology landscape. But the nation's biosafety agency must ensure an accountable, transparent, and participatory regulatory regime that is inclusive of non-governmental stakeholders while considering the societal perception of other evolving aspects of modern biotechnology and its potential risks on human and environmental health.

Abdullahi Tsanni is a biochemist, essayist and freelance science writer based in Abuja, Nigeria. His interests include agricultural research for development, climate change and sustainable development goals. Follow him on Twitter [@abdultsanni](#)