



## The Role of GMOs in Food Security in Africa

### 1. Introduction

Global food production faces many challenges, including climate change, availability of arable land, and degradation of natural resources such as soil and water; all of which makes it difficult for farmers to produce enough nutritious and healthy food to feed growing populations. These challenges are most likely to affect the economic sustainability of crop production; employment in agriculture and related activities; and, ultimately, increases in food prices. Ensuring food security is thus one of the greatest difficulties that low-income countries and regions still struggle with in this era. Despite overall gains in food production on a global scale, a large proportion of the population in most African and Asian countries is still without access to enough food for basic daily consumption. Over 330 million individuals living in Africa in 2016 were classified as being food insecure; and the trend is recorded to be increasing instead of declining.<sup>1</sup>

African countries confront many significant political, economic, social and environmental constraints to increased food production. Though the continent has the world's largest area of potentially arable land,<sup>2</sup> it still struggles to produce enough food to end hunger and eradicate poverty. Most people in Africa are still dependent on subsistence crop farming and livestock keeping as a primary livelihood; and another large proportion of the population is employed by the commercial agricultural sector and its related subsectors. The agricultural sector in Africa has great potential for economic transformation, but requires substantial investment in resources and skills if it is to be fully developed.

### 2. The GMO Debate

Over the years, different approaches in the form of technological innovations, human skills, altered consumption patterns, and regulatory change, have been researched and applied to improve food productivity and to develop the agricultural sector to its full potential. The application of genetic engineering to agricultural development can also be regarded as one of these technological approaches towards addressing food production challenges. Genetic engineering is the artificial modification of an organism's genetic composition, which involves the process of transferring genes from one organism to another organism of a different species, giving the latter certain specific genetic traits of the former.<sup>3</sup> The result of this process is called a transgenic or genetically modified organism (GMO). Examples include crops which are resistant to certain insects, which can withstand specific herbicides, or which can survive harsh environmental conditions such as drought.

Many countries have either passed or proposed legislation to regulate the development and use of GMOs in their food supply systems at some point. South Africa is one of four countries on the African continent that has adopted the use of GMOs; and is the only one that cultivates GM food in the form of maize and soybeans, in addition to cotton. The other countries – Burkina Faso, South Sudan and Egypt – only cultivate cotton. GMO-related activities in South Africa are regulated under the GMO Act 15 of 1997,<sup>4</sup> which covers activities such as research and development; imports and exports; and production and consumption of GM products.

Many agricultural scientists, and the agri-business sector, promote the use of GMOs as a method for mitigating food security challenges. They believe that the use of GMOs is a technology that food-deficit countries should take advantage of, as it has the potential to improve food production even in the midst of environmental challenges and crop disease outbreaks.

However, these claims are widely criticised by the 'anti-GMO' school of thought, which holds that there are uncertainties about the implications that GMO food may have on the health of consumers and on the environment. Adding to these concerns is the threat that GMO seeds could threaten, or even eradicate, indigenous seed varieties through cross pollination. This would put small-scale and subsistence farmers at a risk of losing ownership of their seeds to the big corporations which own the patented GMO seeds. And further, it would perpetuate the struggles of such farmers, who would constantly have to buy expensive GMO seeds from these corporations every planting season. In addition, forced reliance on GM seed also reduces seed diversity, as many traditional varieties of some crops will no longer be cultivated. In the past, this has led to severe famine when disease has struck the commercially grown varieties of a crop, and insufficient seed stock of alternative varieties has been available.

GM crops are currently grown in only 26 countries around the world, while about 38 countries have prohibited their cultivation (though only nine out of the 38 have banned their importation altogether). Europe has the largest number of countries that prohibit farmers to cultivate GM crops, but it is the world's largest consumer of GM products through imports.<sup>5</sup> The interdiction in most countries was enacted as a result of the worldwide anti-GMO campaign against big GMO producing corporations, such as Monsanto in 2016.<sup>6</sup>

Some African countries have recently made changes in regulatory review and commercial approvals, to accept and adopt a variety of GM crops such as maize, rice and potatoes. These include countries such as Kenya, Malawi, Uganda, Ethiopia, Nigeria and Ghana.<sup>7</sup> This can be attributed to the continent's state of unpreparedness in adapting to the effects of climate change, which exacerbates challenges of food production and degradation of natural resources, in a region that has an ever-increasing population.

### 3. Roundtable Discussion.

The CPLO recently hosted a roundtable discussion on *'The Role of GMOs in Food Security: An African Context'*. The speakers were: Dr Stephen Greenberg from Centre for African Biodiversity; Dr Bongani Maseko from AfricaBio; and Dr Tlou Masehela from the South African National Biodiversity Institute (SANBI). Dr Greenberg spoke about the adverse environmental and socio-economic impacts that the adoption of GMOs could have on small scale and subsistence farming in South Africa. He placed great emphasis on the importance of having a diversified agricultural approach to achieve food security, rather than a 'single-seed dependent' approach to farming, as imposed by multinational corporations with a GMO research and development agenda.

Dr Tlou Masehela shared with the audience some of the practical cases that SANBI is currently working on in terms of research and monitoring of the use of GMOs. He mentioned that it is very common for farmers who encounter challenges such as the recent drought period in South Africa, to voluntarily adopt the use of GMOs so as to increase crop yields and avoid economic loss. This so far seems to be working for commercial farmers who are in the business of making profits through their produce, and according to Dr Masehela it is because the GM seed planted in these circumstances is resistant to crop diseases induced by the drought conditions.

Dr Bongani Maseko, from AfricaBio, spoke about the benefits of using GMOs in a continent where poverty and hunger are prevalent. He reiterated that biotechnology should not be viewed as an ultimate solution to all of Africa's food shortage challenges, but rather as one of many tools that could help in achieving food security. He also mentioned that, even though concerns have been raised regarding the health and environmental effects of GMOs, there is no scientific evidence to prove any detrimental effects of planting and consuming GMOs, as compared to conventional food.

The main points of concern for the participating audience were that consumers should have the right to know what they are eating; and that policy on GMO regulation should be made accessible to the general public. Participants also argued that GMOs are economic instruments for multinational corporations to enrich themselves, and that their

promotion had very little to do with the development of small-scale farming and the achievement of food security. It was suggested that the entire food system should be re-arranged to be conventional (non-GMO) and people-centric; and that governments should consider investing in organic and integrated farming approaches as a way of promoting rural and township agriculture.

#### 4. Conclusion

Most of Africa's agricultural and rural development challenges are related to misguided policies, inefficient institutions, and a lack of well-trained human resources to implement relevant policies. Food needs vary from one region to the other, which means that locally appropriate approaches towards attaining food security are important. To a large extent, the development and use of GMOs seems to be viable for large-scale farming activities where there are abundant resources and existing market channels. However, African farmers who engage in subsistence and small-scale farming are reluctant to purchase expensive GM seeds every planting season.

Farmers are required to sign annual license agreements when purchasing GM seed, in which they agree not to sell, replant or distribute the seed after harvest. Furthermore, the agreement allows the breeder (the company selling the seed) to audit the farmers' next planting season to ensure that they do not hold back seed. It is easy to see how this system traps farmers into an endless dependence on GM seeds and the companies that sell them.

There is a great need for a constructive debate, conducted on the basis of scientific evidence and factual research, about the benefits and challenges of GMOs. Most importantly, the debate should include accessible and transparent information and knowledge-sharing with both consumers and farmers. Efforts and resources should also be focused on alternative technologies and sustainable farming methods that are suitable and adaptable to local contexts, in order to ensure relevant and appropriate solutions.

---

**Lovedonia Mkansi**  
**Project Co-ordinator**

---

<sup>1</sup> <https://www.worldhunger.org/africa-hunger-poverty-facts-2018/>

<sup>2</sup> <https://city-press.news24.com/Business/60-of-arable-land-is-in-africa-and-it-has-billions-in-investment-potential-20181109>

<sup>3</sup> <https://www.sciencedirect.com/topics/neuroscience/genetic-engineering>

<sup>4</sup> <https://www.daff.gov.za/daffweb3/Branches/Agricultural-Production-Health-Food-Safety/Genetic-Resources/Biosafety/Legislation>

<sup>5</sup> <https://gmo.geneticliteracyproject.org/FAQ/where-are-gmos-grown-and-banned/>

<sup>6</sup> <https://gmo.geneticliteracyproject.org/FAQ/where-are-gmos-grown-and-banned/>

<sup>7</sup> <https://geneticliteracyproject.org/2017/03/06/led-nigeria-africa-gradually-opening-door-genetically-modified-crop-cultivation/>

This Briefing Paper, or parts thereof, may be reproduced with acknowledgement.  
For further information, please contact the CPLO Events and Media Co-ordinator.