



## Case - Ethics & GM Crops in Sub-Saharan Africa

### Description

A case study that looks at the ethical questions raised in using genetically modified crops to help prevent famine in Sub-Saharan Africa.

### Body

Estimates from the Food and Agricultural Organization (FAO) of the United Nations suggest that annual world agricultural production needs to increase by approximately 60 percent from 2007 levels in order to meet global food demands by 2050 (Alexandratos & Bruinsma, 2012). While various models predict that this demand will be met, it is estimated that nearly one billion people will not have proper access to world food supplies by 2020, and as a result will be chronically undernourished.

One way policy makers have attempted to address this problem is by turning to genetically modified (GM) foods. Currently, most GM crops (95%) are grown in just six countries: the United States, Brazil, Argentina, India, Canada, and China (Brookes & Barfoot, 2013; James, 2012). In Africa, where food accessibility problems are particularly acute, the commercialization of GM foods has only just begun. Burkina Faso, Egypt, Sudan, and South Africa are the only countries in Africa to have commercialized GM crops, while field trials are underway in Uganda, Nigeria, Malawi, Kenya, and Cameroon (AGRA, 2013).

It's often claimed by proponents that introducing GM crops to countries in Africa would provide an array of benefits, such as reduced resource inputs, in addition to

increasing overall yield and improving food access. In Kenya, for example, 13.4% or 0.4 million tons of corn crops are lost annually due to stem borers, a loss valued at \$80 million (De Groote, 2011). Stem borer resistant GM maize already exists, relatively cheaply. It's estimated that for \$5.7 million, GM corn would produce \$208 million for Kenya over the next 25 years (De Groote, 2011; De Groote, Overholt, Ouma, & Wanyama, 2011). However, there are also widespread concerns about stem borers developing resistance to this maize, as has happened in parts of South Africa (Kruger, Rensberg and Van den Berg, 2011)

There are numerous challenges to introducing GM crops to Sub-Saharan African countries. One is that many people are reluctant to either eat or grow GM foods. In fact, the import of GM foods is currently banned in Angola, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe (AGRA, 2013). Much of this resistance stems from health concerns and the public's perception that GM crops are inherently dangerous (De Groote, 2011; Kimenju, Bett, & De Groote, 2011). In Kenya, for example, government officials have justified the continued ban on GM corn by citing a study conducted in 2012 linking consumption of GM corn to cancer in rats (Willingham, 2012). Though this study has been discredited by various scientific organizations, including Kenya's National Biosafety Authority, it has only served to confirm the public's preexisting fear of GM crops (De Groote & Kimenju, 2012; "Kenyans protest," 2011).

Another challenge is that many suspect the primary beneficiaries of GM foods will be owners of large farms and multinational corporations (De Groote, 2011). Small farms might thus be unable to sustain business. Demands for rural labor may be reduced, requiring rural laborers to move to urban areas for work. And in most cases only the corporations that own crop patents will have control over the final product of GM crop cultivation, such that farmers will have little say in what happens to a crop after harvest (e.g., whether it is exported rather than consumed locally). While nutrition and access to food will likely generally improve, GM crops might exacerbate existing inequalities, raising questions about social and environmental justice. GM crops may also more broadly challenge traditional agricultural practices and cultures that have grown up around small-scale local farms.

There are also various concerns over the impact GM crops will have on other plant and animal species. For instance, field studies usually test to make sure a newly introduced GM crop will not spread to non-target crops or disrupt surrounding ecosystems (Nicolia, Manzo, Veronesi, & Rosellini, 2013). However, it is not usually

feasible to study long-term effects, and without proper oversight, it is possible (though unlikely) that genetically modified material could spread outside cultivated areas, potentially affecting genetic diversity in native crops or wild plants. In addition, where GM crops are created to be herbicide-resistant, the use of herbicide could affect wild plant populations, possibly creating herbicide resistant wild plants, or having potential impacts on the ecological system. In the US, the use of the herbicide glyphosate around GM crops has led to significant declines in milkweed, which in turn seems to have had negative impacts on the Monarch butterfly population, which depends on milkweed.

There are plans to introduce GM drought-tolerant maize followed by other GM crops, to sub-Saharan Africa, where drought tolerance is needed most, for the first time in 2017. Drought-resistant maize is already commercialized and produced in the US.

- ***Imagine that you are asked to decide whether drought-tolerant GM maize and other GM crops should be introduced into sub-Saharan Africa. What ethical issues might be raised by introducing, or not introducing these crops? Would you be willing to take responsibility for introducing GM maize and/or other GM crops? Give reasons for your answer. In your answer, you must discuss drought-tolerant GM maize; you can choose whether to discuss other GM crops too, but if you do, you should specify which crops you have in mind. You may talk about sub-Saharan Africa generally (bearing in mind that there are many differences between sub-Saharan countries) or focus on one particular country, such as Kenya.***

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## **References used in the case (you may find these useful)**

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## Resource Type

Case Study / Scenario

## Topics

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Human Rights

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**Discipline(s)**

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Engineering

Life and Environmental Sciences