

Risks and Benefits of Genetically Modified Maize Donations to Southern Africa: Views from Malawi

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In 2001 and 2002, many countries in the Southern African Development Community (SADC) have suffered from severe food shortages resulting in an estimated 14 million people facing starvation due to inadequate quantities of the staple maize. The international community's response has been the donation of foodstuffs, including genetically modified maize. Reactions of the recipient countries of Zambia, Zimbabwe, and Malawi have been different. Zambia appealed to the donors not to send genetically modified maize, whereas Malawi accepted the maize donations. Malawi is currently facing many public health challenges because 10% of its 10-million population is HIV-positive, maternal mortality rate has almost doubled between 1992 and 2000, and there are also an estimated 1 million orphans due to HIV/AIDS. In the European Union, genetically modified maize falls under "Novel Foods" and its marketing and distribution are strictly regulated by law. This has never been the case in the southern African countries. In this article, we discuss the ethical challenges associated with genetically modified maize donations to southern Africa. Although genetically modified food offers a way to avoid many adverse effects of food shortages, we believe that some of the ethical questions of genetically modified food donations should be solved first, under the leadership of the donor countries and partnership of the developing countries. There are fears that consummation of genetically modified maize could have adverse health effects. These fears must be addressed if the confidence of developing countries in the donor community is to be maintained.

Keywords: Africa, Southern; developing countries; ethics, professional; food; food supply; Malawi; plants, genetically modified; starvation

Malawi is a south-eastern African country bordered by the United Republic of Tanzania to the north and north-east, Zambia to the north and north-west, and the People's Republic of Mozambique to the east, south, and south-west. The country's population is estimated at 10 million (1). Malawi covers 118,484 square kilometers of which 94,276 is land and the remainder is water. The country has an agriculture-based economy, with tobacco contributing at least 70% of foreign exchange earnings (2). Rain-fed maize is the main crop. The agricultural sector has not been performing well in the past 5 years. Malawi has experienced adverse famine during the 2001-2003 period. The bulk of maize that was donated in 2002 had been genetically modified. In this paper, we discuss the ethics of donating genetically modified maize to a country that has never grown such crops, because the potential risks of genetically modified food are still little understood.

Major Causes of Poor Health in Malawi

The major causes of morbidity and mortality in Malawi are malnutrition and communicable diseases, such as malaria, acute respiratory infections, and diar-

rhea (3). Infant mortality rate is 104 deaths per 1,000 live births (4). Maternal mortality rate was 1,120 per 100,000 live births in 2000, almost twofold higher than in 1992, when it was 620 per 100,000 live births (4). Increasing incidence and prevalence of human immunodeficiency virus (HIV) infections and acquired immunodeficiency syndrome (AIDS) are thought to be the main causes of the increasing maternal mortality rate. The first cases of HIV/AIDS in Malawi were identified in 1985 (5-7). Since then, the disease has become the leading cause of death among adults in the country. The estimated proportion of HIV-infected population is at least 10% (3,7). At Queen Elizabeth Central Hospital (QECH), which serves the largest commercial town of the country, Blantyre, HIV-seroprevalence rate among antenatal women has been estimated at more than 30%. As a result of the HIV/AIDS pandemic, there has also been a resurgence of tuberculosis in the country (8).

Famine

It has been estimated that up to 14 million people in the southern African region, including Malawi, Zambia, Zimbabwe, and Namibia, are facing critical

food shortages (9). The suggested reasons behind this sad state of affairs include poor agricultural practices, lack of modern farm inputs, and adverse climatic conditions resulting in drought and floods. Unstable political situation in Zimbabwe, which was once a grain basket for the region, and market-based agricultural reforms by western donors have been blamed for the lack of agricultural productivity (10).

In the case of Malawi, the major causes of the current food shortages have been HIV/AIDS, government expenditure excesses, poor economic policies, International Monetary Fund, the World Bank, donor pressures and donor dependence, insufficient rains and frequent floods, sale of grain reserves, lack of both farm inputs and agricultural extension workers, closure of companies and trade policies effects, and lack of money to buy food.

HIV/AIDS

From 1985 to 2001, about half a million people died from the disease. There are about a million orphans in Malawi as a result of HIV/AIDS. The infection and subsequent disease is most prevalent among adults in the 20-49 year age group, usually the most productive segment of the population. HIV infections have resulted in increased hospital expenditures, reduced work performance due to absenteeism (because of one's own sickness, sickness of a close family member, and funeral attendances), and reduced energy. Since the majority of Malawi's population are subsistence farmers, reduced crop production is probably the consequence of the drop in their productivity.

Another effect of HIV/AIDS epidemics in reducing crop output would be its indirect effect on reducing farm inputs. Although the extended family structure is fast waning, still many income-earning people remit their income to their rural kindred for the purchase of farm inputs. In a situation where illness has resulted in increased health care expenditures, the remittances to rural relatives may be significantly reduced. Rural households have not been spared from HIV/AIDS either. Increased health care costs could result in further limitation of resources to procure farm inputs.

Poor Economic Policies

Government expenditures are still excessive, and economic policies poor (11-16). Increased enthusiasm in the population at the beginning of the government's financial year is almost a perennial phenomenon in Malawi. Each year the government announces new measures to cut down on expenditures and sends the message to the nation to "prepare for hard times while working toward long-term gains". However, they soon revert to the old practices and the budget is off-track again. The donors are blamed for the ensuing economic difficulties because they withhold aid. The donors, on the other hand, argue that they cannot provide support, ie, send aid, before the government assures strict control of expenditures. Some of the reasons for over-expenditures are "ghost" public servants (13) and abuse of the state budget by the executive branch of the government for covering

various travel expenses. While some sectors of the society have complained about the financial losses experienced through the misuse of public resources, the Executive branch has argued that traveling is inevitable part of their function.

The so-called "ghost" public servants are persons who do not exist, e.g., deceased or former government employees, whose names appear on the payroll list. Salaries to non-existent employees are paid out and collected by some other persons. There have also been "ghost" institutions, such as non-existent schools. The Ministry of Education, Science, and Technology pays for staff salaries and other expenditures made by such non-existent institutions.

International Monetary Fund, the World Bank, and Donors

Malawi's national budget is heavily dependent on international grants and loans (17,18). The International Monetary Fund and the World Bank, the European Union, Great Britain, and the United States are major sources of aid to the country. In the past two years, Malawi has been receiving substantial financial support from Norway through its NORAD agency. The dependence on donor money has resulted in the country being vulnerable to the desires and dictations of the donors, and the government of Malawi often cannot implement policies that do not agree with the interests of donors. With regard to the current crisis (famine), over-reliance on donors has played a role in at least two ways. First, the Malawi government followed the advice by the International Monetary Fund to sell strategic grain reserves when the country had a maize surplus. The other example is the Starter Pack program, when the government, with the support of the donor community, instituted a process of subsistence for farmers in a form of free farm inputs, such as fertilizers and seeds, in order to boost crop production. This was one of the reasons for the high maize yield in 2000. The government had planned to continue with that program for 2 to 3 more years, so that the gains could be consolidated. The donor community did not think that there was any need for that and the funding was cut off. In result, the government could not embark on the plan, because a significant amount of the resources needed came from the donors.

Draughts and Floods

Insufficient rains in some parts of the land and floods in other have also exhausted the country (19,20). Most of the cropping land in Malawi is rain-fed. If there is not enough rain, crops fail despite the fact that almost a third of the country is occupied by fresh water. There are increasing attempts to assure irrigation, mostly by using manual treadle pumps, which hold the potential to improve household food security. Various parts of the country, especially the Lower Shire in the Southern Region and Karonga in the North, have suffered major floods that have resulted in washing away the farmland. Families affected by the floods have been receiving relief items, sometimes for years, because floods occur over and over again. Efforts to relocate the households to less

flood-prone areas have been futile, because victims do not want to leave the graves of their forefathers.

Sale of Strategic Grain Reserves

The sale of strategic grain reserves has already been discussed in relation to donor influence (21,22). However, the agreed upon procedures for selling the national stock were not followed. Politicians, including cabinet ministers, were buying the maize below cost price. Some politicians did not pay for the maize at all and are now under the Anti-Corruption Bureau investigation, because there have been allegations of collusion with the National Food Reserve Agency staff (23).

Farm Inputs

There is a lack of both farm inputs and agricultural extension workers (6). Extension workers have been identified as crucial in promoting 'modern' farm husbandry in Malawi. The roles of agricultural extension workers, including training farmers, supervising them, facilitating that the farmers obtain loans for farm inputs and facilitating marketing of farm produce. In the past few years, this cadre of public servants has decreased in number mostly because of HIV/AIDS and lack of replacement due the closure of Natural Resources College in Nursing over a number of years. In addition, many companies closed, effects of poor trade policies are felt, and there is lack of money to buy food.

Controversy of Genetically Modified Maize

Famine has frequently occurred in many countries in southern Africa (24). The international community has responded with donations of foodstuffs, including genetically modified maize (25). The media has already reported concerns about the possibility of unwanted effects of the genetically modified maize on human health (25,26). While Malawi has accepted to receive genetically modified maize donations despite warnings about the unknown ecological and health effects of such a food, Zambia did not allow the import of genetically modified maize into their country. On the other hand, Zambia is being accused of political arrogance, allowing its own people to die from starvation when they could have benefited from the maize.

Genetically Modified Crops in the European Union

On May 15, 1997, the European Community Novel Food Regulations came into effect, introducing statutory pre-market approval system for "novel foods" in European Union (EU) countries. Novel food is defined as food not consumed by the population to a significant degree, and contains, or is obtained from, genetically modified organisms (27). Marketing of genetically modified crops in the European Community falls under the Novel Foods Regulation (28). Before genetically modified food can be marketed, it must pass regulatory scrutiny by as many as four different regulatory bodies (29). It is mandatory that all such foods containing genetically modified ingredi-

ents must be labeled as such if marketed in the EU countries (30).

Consumer education is an important aspect where the introduction of genetically modified foods in the market is concerned (31). No genetically modified food can be introduced in the European Community without adequate consumer education and proper labeling. Africa has had no such concerns before, but with the offers and future possibilities of genetically modified maize donations, Africa will have to join the current debate on the safety, benefits, and risks from genetically modified foods.

Why Genetically Modified Food?

Genetic modification involves artificial altering of the genetic material (DNA) of a species. Crops have been engineered to confer various benefits, such as increased yield and pest and weed resistance, resulting in reduced reliance on pesticides and herbicides, enhanced taste, drought resistance and esthetic appeal, improved nutritive value, and longer shelf life (29). Genetically modified foods can potentially be used as a vehicle for medications and other pharmaceutical products. For instance, transgenic lettuce could be used for provision of oral vaccination for hepatitis B (32). Animal species have also been modified (33).

Ethical Issues in Genetically Modified Food Donations

There have been concerns that genetically modified crops may increase the risk of allergic reactions and other, yet poorly described, health hazards (34,35). Children and fetuses may be more susceptible to the potential adverse effects of genetically modified foods (36). Such realization has raised fears that the current donations of genetically modified maize to hunger-stricken countries, such as Malawi, could result in harm to health.

It is a well-recognized principle in all aspects of donations that the materials donated should benefit more than they could harm the recipient in any way (37). Some worry that donated genetically modified maize may present a health hazard to people in southern Africa. On the other hand, it is obvious that without maize donations (and this does not necessarily implies genetically modified maize) and other foods, the hunger situation may worsen and result in disease, disability, and deaths of many people. The HIV/AIDS situation could worsen as well. Deciding on the risk-benefit ratio of genetically modified food in a situation of starvation is not easy. It is even much more complex in the present situation, where the benefits of the food are known but the whole range of risks are not yet fully elucidated.

Another difficulty is that the developed (generally food-sufficient) countries may use criteria for determination of benefits and risks of genetically modified food that differ from the criteria of developing (food-scarce) countries of Africa (38,39). In developed countries, the main reasons for concern may be allergies and sensitization, whereas in Africa these

are kwashiorkor and exacerbation of the malnutrition-infection disease synergy, including HIV/AIDS.

We consider a hungry population as a vulnerable group that needs special protection (40). The Belmont Report (41) states that not every human being is capable of self-determination. The hungry are unlikely to refuse food donations when they are under threat from either current or imminent starvation. We believe that it would have been proper and ethical if the starving southern African people were not provided genetically modified food. Of course, Zimbabwe has managed to refuse such donations, but on the other hand, Zimbabwe is presently not inclined to the West and we cannot be sure if non-genetically modified maize would have been accepted. In any case, the ruling elite in that country is unlikely to be starving and it is they who have made the decision to reject the donations.

We are also not sure about the agenda behind the genetically modified maize donations. Was it the will to save the starved or other considerations, such as market forces? Was there a possibility that Malawi could be offered non-genetically modified food? Is it an experiment to provide data for reports on the effects of genetically modified maize in Africa after it was introduced through relief efforts?

Which is the lesser evil, the possibility of development of allergic reactions or the almost certain starvation? We believe that considerations about allergies may not be a major concern, at least for the people of Malawi. The bulk of morbidity and mortality in the country are mostly communicable diseases and malnutrition and these are what the population has known most and probably fears most. The media has reported about fears of impotence as a result of ingesting genetically modified maize. Perhaps this can dissuade people to some degree from eating genetically modified food, as similar fears of impotence during child vaccination campaigns resulted in lower vaccination coverage of the population.

Another question that requires an answer is whether the potential for allergies in Europe is the same for Africa? Of course, zero risk to allergen sensitization cannot be guaranteed (42). Theoretically, we do not know how we can extend our hypothesis that atopy may not be the major concern for Africa. With high prevalence of HIV/AIDS and the concomitant development of atopy among some of the infected, can we say that allergic reactions would be reduced in such an environment?

While the intention of the donations of genetically modified maize is aimed at resolving the immediate starvation, it cannot be guaranteed that no such maize will be planted by the hungry masses. There are reports that some households have already planted the genetically modified maize despite public awareness programs that the maize should not be planted in Malawi (43). As has been witnessed in the past, starving people also lack seed. In fact, one of the reasons for the current hunger was non-availability of high yielding maize seeds. It is, therefore, very possible that from now on, genetically modified maize will be grown in southern Africa, not by choice but rather

ignorance and lack of alternatives. Consumer education should be tailored to the recipient countries' needs. The level of literacy may also have to be taken into account.

In conclusion, we recognize the dilemma that the Malawi government was faced with when offered food for its people. By not accepting it, the government risked reprisals from the hungry citizens and now, by accepting the genetically modified food, it has consented to this "experiment with genetically modified food" by proxy for its people. Short-term gains have once again outweighed potential long-term risks. In the present context, it is not possible to give an easy answer to a complex question of donations of genetically modified food. But we believe we have provoked constructive debate on the need to set ethical standards for emergency food donations, just as in case of pharmaceutical donations (44,45), to protect the hungry from dangerous food dumping. Although developing countries have in many cases trusted the goodwill of the donors and development partners, there is a need to depart from such a mentality. Even the medical profession is currently under scrutiny, since intentions of individuals and institutions in that profession may not always be for the benefit of the patients. The current food donations of genetically modified maize will go a long way in alleviating hunger and eventual death if adequate quantities are supplied to the starving. Even in the times of plenty, the debate will have to be rekindled.

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