

## The Panacea and Perfidy of Genetically Modified Foods as an Intervention to Food Security in Some Countries of the Developing Part of the World

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### Abstract

The issue of whether to adapt or adopt genetically modified food methodology in the world remains an immensely contested stalemate, and is believed to pose an ethical, moral and political dimension. While some people associate the process with capitalism, imperialism and global hegemonic powers to dictate the world and confine global power within some already established quarters, some opine that it is a strategy to bolster food security and therefore subdue the much desired food insecurity. The aim of this article, through a review of literature methodology is to raise debates and discourses on the benefits (panacea) and challenges (perfidy) associated with genetically modified foods (GMFs). Findings indicate the following benefits: GMF are scientifically viable; are a benefit to hunger and drought prone countries; can reduce the global state of malnutrition; can result in food becoming cheaper; presents a strategy of improving food and income security to small scale farmers of many countries. GMF are also believed to be perfidious in the following ways: poses both environmental and health hazards to consumers; production is believed to violate the health rights of individuals and countries; associated with power hegemony of mightier global countries. The researchers have called for a cost benefit analysis to determine which way out, and also increased research to determine the scientific validity of the GMFs.

**Keywords:** Traditional breeding, conventional farming, modern farming, hunger prone countries, marketing strategy, food security, food insecurity and intellectual property rights

### 1. Problem Statement

It is these researchers' contention that despite the fact that many development pragmatists have shown an inextricable positive impacts between the use of GMFs to increased food production, and therefore food security and thereby decreasing chances of hunger and other nutritional related spinoffs, this scenario only presents one side of the coin, while other pragmatists through the policies of their countries consider the production of genetically modified food an unethical practice, reasoning that GMF constitutes a health risk that stand to jeopardize the health and future of the countries' generations. As countries of the developing part of the world continue to suffer immense state of food insecurity, lowered food production due to droughts, decreased water levels and effects of factors such as global warming, such countries are in a state of dilemma whether to experience a policy paradigm shift and allow the policy of GMF. In these researchers' contention, countries need to conduct a cost benefit analysis (CBA) and assess which side to follow and why. The, then, presents debates and discourses to consider the benefits (panacea) and challenges (perfidy) of each side. Importantly, the discourses and debates are likely to shed enough light that will hopefully increase the state of food security in hunger prone countries.

### 2. Operational Definition

#### 2.1 Panacea and perfidy

While the meaning of panacea is the solution to all maladies, or remedy to all challenges, in this article, the term means a

desirable or a beneficial state of affairs. Also while the word perfidy refers to treachery or state of deception, the word is used in this article to herald an undesirable state of affairs.

### 3. Methodology

This article has used document analysis. Document analysis is whereby the study uses facts or information which is already generated by other researches or studies (Shepherd). Text books, internet sources, government records, newspapers, education websites, journals and reports have been used to explore debates and discourses on the use, adoption and adaptation of genetically modified food in various countries of the developing part of the world. Document analysis has been used because it is inexpensive in the sense that it uses readily available information at little or no cost (Pizzaro & Bartels, 2011: 57).

### 4. Introduction and Background

Food, according to Maslow's hierarchy of needs constitutes a basic need. Every one has an inalienable right to access food alongside other needs such as shelter etc (Maslow, 1964). Availability and access to food, therefore, constitutes a sign of genuine human security for sustainable livelihood (Qaim & Kouser, 2013:1). Because of the danger that the humankind poses due to lack of food, the global community under the auspices of United Nations has set eradication of hunger by the year 2015 as the number one among the Millennium Development Goals (United Nations, 2012). Drawing from the above, undeniably, steps to food security such as the production of genetically modified foods (GMFs) cannot be overlooked. All things being equal (*ceteris paribus*), GM foods can improve food security through improved nutrient quality and improved quantity in yields in food crops compared to traditional breeding (Qaim & Kouser, 2013:1; Sharma et al, 2002; Uzogara 2000). A genetically modified food (GMF) refers to food that was derived from the genes which have been modified in a way which is not natural. A gene refers to a biological unit that controls an organism's inherited traits (Republic of South Africa, 2013). Food security is when people at all times have access to the right quantity and quality of food to maintain a healthy and active life (FAO, 1997). In South Africa, the safety of GMFs to humans is governed by Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997) (Republic of South Africa, 2013). In the United States of America there is the Safe and Accurate Food labelling act of 2014 which advocates for the safety and correct labelling of GMFs (Agri View, 2014). In a research conducted by Pew in the US, 58% of the people were not aware that they are eating GMFs. In short, acts guide the safety of people. United States of America, Brazil, Canada, Argentina, China and India are among the well-known producers of GM crops and food world-wide (James, 2007: GMO Compass, 2007). In Africa, South Africa, Burkina Faso, Egypt and Sudan have fully commercialised GM crops a source of GM foods. On the other hand, countries such as Zimbabwe, Zambia, Ethiopia, Kenya, Tanzania and Madagascar do not allow importation of GM foods unless they are milled (Tran, 2013). The mixed views of African countries raise a lot of questions of whether food insecurity in African countries is a result of intolerance to GMFs, or inadequate modernisation of agriculture machinery and irrigation techniques, or lack of income to buy food. The scenario poses a million dollar questions which beg a million dollar answers.

What is debatable among GMFs is that some pragmatists and their countries are saying they are detrimental to health and others are claiming that opposing the issue of GMFs is anti-science, political and market based (Wild, 2013). Should the world starve whilst GMFs are there? Is the issue of food insecurity about lack of food or lack of economic means, unequal distribution, or lack of power? This has made the public to be both confident and confused because they no longer know who to believe among the GMFs supporters and the anti-GMFs supporters (Wild, 2013). South Africa is an example of a country which permitted the GMFs as a staple food. For instance, 86% of maize for producing maize meal for human consumption in 2012 to 2013 was genetically modified. Tests were done and it was found that more than 50% of some mealie meal was genetically modified. For example, Premier's Iwisa contains 81.2% GM, Pioneer's White Star Super Maize meal contains 72.04% GM and Premier's Nyala Super Maize Meal contains 87.44% GM. These companies labeled their mealie meal without revealing that their GM constitution (Vivo, 2013). However, the use of food production through GM has undoubtedly improved food production quantity wise and therefore improved the state of food security nationally. This makes these researchers to believe that GMFs could occupy a significant niche in the eradication of food insecurity and hunger, and thereby making hunger prone countries such as a number of African countries make a significant score in the fulfillment of Millennium Development Goal number one (United Nations, 2012).

## **5. Panacea for the Use of Genetically Modified Foods ( GMFs)**

### *5.1 GMF are scientifically viable*

Perhaps it's good to adduce plausible and sound scientific evidence on the position of the GMF especially on how they may be impacting upon the health of the people who feed on them. To this end, the world Health Organisation, Food and Drug Administration and scientific academies pointed out that GMFs have gone vigorous sound tests under certification boards of health and proved that there is no scientific evidence to substantiate that GMFs cause great danger to the health of people (Khan et al, 2012). However, the world appears to doubt this finding by these global bodies and more research is still being done as there are those associating GMF with cancer and other health hazards (Khan et al, 2012). There is also a set of thinking by poor countries that the advent of GMF is a capitalistic and imperialistic approach to increase the developed countries new form of production. There is also a set of thinking that the purported certification of their health validity could be a marketing strategy while the producers are aware of the perfidious effects of the GMFs. These researchers think that this debate needs a wider and critical participation so that the real and conventionally grounded truth can prevail.

### *5.2 GMF can be a panacea to hunger and drought prone countries.*

Undeniably, GMFs reduce the problem of food insecurity which poses a developmental set back especially in poor countries of the globe (Wild, 2013). Even internationally, food insecurity heralds a bad omen to human development which is the reason why the Millennium Development Goal number one aims at reducing hunger significantly by the close of year 2015. It is these researchers' contention that GMFs could be a solution to food insecurity considering the fact that about 925 million people in the world suffer from hunger with 88% of those who suffer from hunger being in Sub-Saharan Africa and Asia-Pacific regions (Bain et al, 2013:2; Jachertz, 2012). Though some people discredit GMFs, it is believed that there is no documented evidence of people who have died of GMFs.

### *5.3 Use of GMF may hopefully reduce the problem of malnutrition*

Incontrovertibly, the use and adoption of GMFs methodology of food production is likely to reduce or annihilate altogether the challenges associated with food scarcity such as endemic malnutrition (Qaim and Kouser, 2013:1). This could elevate not only the health of children in hunger prone countries of Africa and Asia, but will also give space to such children to productively pursue other activities such as schooling that are negatively affected by food shortage and its concomitant challenges. This scenario of absence of malnutrition, therefore, will constitute a huge score in the fulfilment of Millennium Development Goal number one that envisages to annihilate hunger and its associated concomitant horrendous and pinching effects of poverty (United Nations, 2012). Malnutrition is a sign of indirect hunger. It is believed that over one third of children below the age of 5 years in the world die of malnutrition (World Health Organisation, 2011). It is estimated that about two billion people world-wide are malnourished. Thus, this group of people is believed to lack minerals such iodine, vitamin A and zinc (Bain et al, 2013:2). In such a case, adoption of GMFs methodology of production can be a solution to malnutrition. This is because GMFs crops are bigger quantity wise, and in many cases lowly priced.

### *5.4 GMFs are usually lowly priced than the ordinary same food product.*

Perhaps the panacea of having GMFs in the market is their relatively levels of affordability. It is these researchers' contention that with poverty looming in many parts of the world as food prices escalate and people's purchasing powers increasingly dwindle, introduction of genetically modified food that people can afford with ease is welcome. This has an impact of achieving the much desired state of food security especially in a score of developing countries that are both prone to hunger and drought (Bouisa et al, 2003). Incontrovertibly, the use of GM mode of production presents a state in which crops are more productive on a small piece of land as compared to traditional breeding which is less productive and require large pieces of land and thereby causing more damage to the environment. This means that smaller pieces of land achieve a higher carrying capacity and production (Gepts, 2002; Ulukan, 2009). In addition, GM crops are economical in various fronts. They save on labour through minimal cost of weeding. Also, the GM crops are herbicide tolerant and resilient because they are both insect resistant as well as have weed resistant features. For example, GM crops such as soya beans, canola and corn produce a chemical called Bacillus thuringiensis which kills pests. Though the chemical is toxic to pests, it is believed not to be harmful to humans and to the environment. This, it is believed could also

reduce environmental hazards such as soil erosion which happen through weeding. Besides being environmentally friendly, the production cost is generally cheaper because it saves on weeding labour costs. Therefore, it is undeniable that GMF can increase or raise the state of several countries' food security through lowered prices. In the same vein, doctoral Scientists such as Rob Fraley, Mary-Dell Chilton and Marc Van Montagu did a research which proved that GMFs solve the problem of food insecurity in the sense that they have insect resistance genes. This makes the farmers or producers save money on frequent spraying of pesticides (Chrispeels, 2014:4). To the relief of drought prone countries such as those in the central Africa and eastern horn of Africa, GM crops are drought resistant. Perhaps GMF are timely in the coming periods that are estimated to be characterised by immense climate sensitive diseases such as malnutrition and diarrhoea (Bain et al, 2013:2).

### *5.5 GMFs constitute a viable strategy for improving food and income security to small scale farmers*

Considering the fact that most of the farmers in Africa are small scale farmers lacking most of the farm infrastructure and inputs such as pesticides, introducing GMFs will save costs for buying pesticides and weeding (Wild, 2013). Since with traditional farming many farmers spend huge part of their time weeding, then the advent of GMF will usher in weed resistant seeds which will make them save time and therefore give them time to consider other economically grounded aspects of their household activities. This will cause them to improve not only in quantity but the quality of food which they would get. This will definitely positively improve on aspects of food security. This is because food security is about both quantity and quality of food which people have. However, caution needs to be taken in that although GMFs can undeniably improve food security and livelihoods of the farmers, there is a critical need for monitoring of GM seeds because they might result in weeds which could be resistant to chemicals (Khan et al, 2012:8). Another factor is that GM seeds are more expensive than the traditional seeds. This may make them unaffordable to a score of farmers. In some cases, the costs of buying GM seeds might be higher than the total cost of buying the traditional seeds, the costs of pesticides and weeding. Therefore, the application and adoption of GM mode of production to small scale farmers can be a daunting and an uphill task if not properly managed.

## **6. Perfidy Associated with the Production of Genetically Modified Foods (GMFS)**

### *6.1 GMF food production poses both environmental and a health hazard to consumers*

Perhaps this is a debate that needs more scientific exploration. This is because while some scientists have hailed the GMF mode of production by indicating that it is less expensive in that the crops are pest and weed resistant, other contrary information proves that the process could be perfidious and unwelcome to farming generally. For example, in a research done by Professor Guenether Stotzky of New York University, he proved that the roots of GM crops produce toxins which pollute the soil for eight months. This has an effect of depressing the microbial activities which in turn have an impact on the food security because disturbing the soil results in lower yields in the future (Nathan, 2009; Conner et al 2003). Bates et al (2005) pointed out that laboratory tests reviewed that GM crops may result in super pests which will affect traditional farmers. They went on to say that boll worms will evolve to super pests which will be resistant to sprays. This in turn will affect the yields and probably result to a state of food insecurity. In the same vein, Vidal (2012:25) opines that, though GM crops are believed to be resistant to pests, they have resulted in the increased use of pesticides. This contradicts with the GM companies' belief that GM crops are environmentally friendly as well as being pest resistant.

Also, a research done by two Monsanto scientists Ted Elasser and Briane McBride proved that a genetically modified growth hormone called recombinant bovine hormone injected in cows is harmful to humans in the sense that the milk produced by cows which are injected with that hormone even after pasteurisation causes breast cancer, colony cancer and prostate cancer to humans. It was found that after boiling such milk for 30 minutes, only 19% of the hormone was eliminated of which normal pasteurization is only 30 seconds. It is this scenario that led to countries such as New Zealand, Australia and the European Union to ban the use of recombinant bovine hormone. This also led the United Nations not to certify this hormone as safe (Spiroux et al, 2009; Codex Alimentarius, 2004).

Perhaps that's why dissenting voices against GMF are increasing in different parts of the world. For instance, in 2013, some people in Johannesburg and in Cape Town protested against Monsanto, one of the biggest producers of GM seeds in South Africa based on the fact that research has proved that GM seeds produce GMFs which pose serious health problems such as cancer, birth defects, infertility and tumours (Wild, 2013). To say the least, GMF are slowly wreaking havoc to food industry in the world. For example in Brazil in 1996, the GMFs nearly created death when the nut genes were put in soya beans by a company by the name Pioneer Hi-Bred. This affected people allergic to nuts because

after eating it, they became unwell. This led to this GMF product to be removed from the market (Jeffrey, 2007).

### 6.2 GMF food production could be violating people's health rights

As much as GMFs can reduce the much undesired food insecurity and therefore help countries in making significant scores in their Millennium Development Goal number one (United Nations, 2012), the world is still in a state of ethical dilemma as to whether the GMF mode of food production is not compromising the health of the people. Since all the people have inalienable health rights espoused in their countries constitutions and bill of rights, it is not easy to make a global decision to justify the GM mode of production as a valid one. When GMF are put into the market and therefore compete favourably with the non GM food, a greater part of the world feels this is an unfair practice. Perhaps the voice of the World Health Organizations and other food bodies such as Food and Agriculture Organization (FAO) is critical in bringing this issue to a palatable state of affairs. Many people, especially the traditional producers of export food, still feel GM mode of production poses health hazards to the people of the world and that the world should be ethical and moral enough to ban the production of GM mode of production. In fact, this state has made GM mode of production to be stigmatized by even among the poor and hunger prone countries. Since the world is in a state of dilemma, it is the duty of the United Nations to give the world the best position as far as the advancement of food production through GM mode of production is concerned. On the other side of the coin, GMF producers may support GMF for the sake of profit at the expense of people's health. More so, some producers may even go to the extent of mislabelling GMFs as non GMFs for the sake of attracting customers (Chrispeels, 2014:6).

### 6.3 GMF associated with power hegemony of stronger countries

The fact that GMFs plays a pivotal role in fighting food insecurity could be good but at the same time, the production may pose a political issue. Perhaps this is because they are immensely produced by stronger countries with a major stake in the global political domain (Khan et al, 2012). Perhaps the advantage of producing GMFs finds global political support that validates the process. This could be happening at the expense of the health of the poorer countries that may be attracted to buy the products because of their lowered prices. The process of GMF production may therefore follow a capitalistic and imperialistic approach where the production takes place because the producers have immense political muscle at the expense of poor countries whose citizens' state of health may be in a state of jeopardy. An irony in the pursuit of GMF is that many poor countries may not afford to get into the fray simply because GMFs cannot be adopted because of the intellectual property rights (Barrows et al, 2014). A deeper subjective perspective and insights from the developing countries point to the fact that GMFs are not meant for food security, but for deindustrialising the traditional breeding industries due to political power

Therefore, power dynamics appears to be embedded in the dynamics of GMF. Apparently, scientists are afraid to tell the truth about the safety of GMFs because they are afraid to be opposed by the GMF company agencies who receive a lot of grants from GMF companies of technology (Vidal, 2012:25). Though GMFs have a potential to genuinely reduce food insecurity, to some extent GMFs might be there to fulfil political desires rather than food security issue (Khan et al, 2012:9).

## 7. Theoretical Framework

This study uses the basic needs approach (BNA) and the sustainable livelihood approach (SLA). However, the basic needs approach receives a lower attention than the sustainable livelihood approach (SLA). The basic needs approach is the brainchild of the World Bank in the 1970s and explains the importance of basic consumption of goods such as food and health of the people. It also emphasizes that people's rights to food need to be met unconditionally (Thirriwal, 1994). This approach is concerned with justice and equity on the provision of basic needs such as food (Owumi & Musajuwa, 2013:43). Thus, development policies should be designed in a way in which basic needs such as food are easily availed to all. All means of food production need to be attached to human needs so that people can easily be able to produce their food with ease. The process should not depend on race, skin, colour, or on geographical locale

Sustainable livelihoods is about creating an enabling environment to allow people to generate and maintain the means of living and their well being and the future generations (Balgis et al, 2005). Livelihood is a source of living such as income. Livelihood consists of assets, capabilities and capacities (Krantz, 2001; Chambers, 1992). The sustainable livelihood approach is relevant in this paper because income is important to people to increase their purchasing power and therefore reduce food insecurity.

## **8. Way forward**

### *8.1 Win-win situation*

Food security policies should be designed in a way which does not create winners and losers. For instance, the technology for GMFs should be equally distributed to both developed and developing countries. The issue of intellectual property rights needs to be addressed to avoid a situation where most of the profits are ploughed back to a few people who own technology for GMFs. For instance, the world's three largest GM plant gene technology namely Monsanto, Syngenta and Dupont control over 70% of global seed sales and such seeds are expensive. Due to intellectual property rights, technology cannot be reproduced and this makes a few producers to enjoy the benefits at the expense of the majority.

### *8.2 Consumer preferences need to be considered.*

Consumer preferences should be taken into consideration when producing GMFs. Thus, both the taste and nutrient component is important. This is so because consumers prefer testable and nutritious food rather than just food (Colson and Huffman, 2011).

### *8.3 Monitoring and evaluation*

There is need for monitoring to delineate GMFs from non GMFs in the market. For instance, the European Union market does not allow GMFs but in 2009, Canadian GM flax was found in the EU market (VIJU et al, 2014). The implication here is that without proper monitoring and evaluation, GMFs may cause market confusion and conflicts.

### *8.4 Fostering cooperative synergy*

There is need for health practioners, GMO farmers and nutritionalists to work in tandem on the way forward to improve GMFs. This is to work towards improving the quality and test the safety of GMFs. In cases where GMFs are not healthy, people tell each other the truth and stick to natural foods. Working together might not be easy, but it is possible.

### *8.5 Treating the root causes of food insecurity rather than the symptoms*

As much as GMFs are important, solving the food insecurity issue from the grass roots is very critical. Empowering people with the economic means and appropriate technology, as well as motivating them to pursue food production is critical. This can definitely reduce the problem of food insecurity. The unequal distribution of food is another crushing root cause of food insecurity which needs to be dealt with. Thus food should be equally distributed and farmers should be helped with capital and technological knowhow such as irrigation. This will in turn increase the yield of food crops and thereby reduce food insecurity.

### *8.6 Zero tolerance to yesterday's technology*

Africa should not tolerate technology which has not been successful elsewhere and should not act as a dumping place where things which have failed elsewhere are easily accepted in Africa. If the GMFs are really genuine with no strings attached to them, they would have been accepted in Africa the very time when they were introduced. The issue of accepting yesterday's technology is problematic in Africa as it is problematic elsewhere. It is high time that Africans evaluate what to accept in the market and why. The time for Africans accepting to be a dumping ground for any cheap and usually substandard good is long gone.

## **9. Conclusion**

Though GMFs can be a panacea to food security in many countries of the world, countries need to hold debates and discourses to settle on whether to validate the production as well as their use by their citizens. There appears to be grey areas and mist surrounding the scientific validity of the GMFs. This needs to be cleared through intensified research without any possible bias. It is critical that countries engage one another and possibly conduct a critical cost benefit

analysis (CBA) that will inform their citizenry whether to produce or consume the GMF products. The global food and bodies such as the FAO and WHO owe the whole world a plausible and valid explanation on the health challenges, or benefits thereof associated with GMF. These researchers hope and wish that GMF do not constitute tools to be used by stronger nations to milk poor countries further and also extend their imperialistic and capitalistic tentacles.

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