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Review Article

The church and genetically modified food in Nigeria: An ethical appraisal

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Abstract: The church in Nigeria does not seem to know the trend in food production where genetically modified food has taken hold of global agriculture. Pastors and Priests seem blank on what is happening, either because of ignorance, carelessness, or due to lack of biblical basis on which to teach or formulate policy. Despite these, the Christian populace in Nigeria is not left out in the onslaught of genetically modified organisms and foods as they continue to consume these products. This paper ethically appraises the role of the church in raising awareness and educating her adherents on the issues surrounding genetically modified food in Nigeria. Following qualitative and Christian ethical approaches, the paper argues that Christian churches in Nigeria should establish a committee that will study and advise them on the harmless foods for consumption in Nigeria.

Keywords: Ethics of Genetically Modified foods; the Church and GMOs, ethics and inorganic foods

Introduction: The 21st century has witnessed/is witnessing a monumental increase in the rate of hunger, poverty, and starvation globally, especially among the low-income countries¹. This is aggravated by the

low production of agricultural products, giving rise to migration and all manner of crises globally². On the other hand, the few agricultural companies facing a huge population of hungry people to feed, with a dwindling/poor crop production caused by

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drought and lack or poor soil fertility has resorted to genetic modification of crops and the use of inorganic fertilizers to enhance agricultural food production³. In support of this assertion, the World Hunger Organization opines that “increasing yields is an especially important aspect, given that there are thousands of people who do not have enough food”⁴. The United Nations Food and Agriculture Organisation in a paper titled: “The State of Food Insecurity in the World 2014” states that “14.5% of people in developing regions are undernourished. In Africa, this figure is 20.5% and in Sub-Saharan Africa, it rises to 23.8%, the highest percentage in the world”⁵.

Some of these genetically modified food and inorganic products have been perceived and asserted to be harmful to human/animal health and the environment. Also, the consumption of some of these foods has led to serious health hazards and other unknown diseases,⁶ as Hartmann et al discovered in their work on the health implication of GM potatoes expressing *Galanthus nivalis* lectin on rat small intestine.⁶ Verma et al explain that some of the genetic implants in potatoes are snowdrop flower lectin known to be toxic to mammals and cause an unknown effect on human health⁷.

Furthermore, a critical look at the Christian scripture may not present us with any reasonable position of genetically modified and inorganic food products. However, if the production of food in a large quantity through inorganic means and genetic modification of such foods could be proven harmful to the health of consumers, the ethical question that confronts us is, “is it worth it?”. Nigerian church is plagued with ignorance and lack of concern. Most of the preachers, priests, and Bible teachers hardly ever mention anything about GM foods in their messages. This shows the height of ignorance and our lack of concern.

Again, it has been observed that the agencies saddled with the responsibility of approving these food products for human and animal consumption are perceived to have faltered and compromised their stand to favor the production companies at the expense of the health of the populace. This is due to

economic benefits derived from such products thereby bringing utilitarian calculus to bear. This paper, therefore, examines these factors to ascertain what the position of the church should be as the church continues to shine as the light of the world.

Conceptual Framework: The use of the term Genetically Modified Organisms (GMOs), refers to such plants and animals that have been subjected to biotechnological manipulation at the genetic level which consequently alter or distort the natural makeup of living organisms^{8,7}. The World Health Organisation defines genetically modified organisms (GMOs) as “organisms (i.e. plants, animals or microorganisms) in which the genetic material (DNA) has been altered in a way that does not occur naturally by mating and/or natural recombination”⁹. Omobowale et al define a genetically modified organism as one whose genetic configuration has experienced a thoughtful reengineering or modification.¹⁰ On the other hand, inorganic foods are such food products that are obtained through the employment of synthetic fertilizers, which may be considered to have harmful effects on the environment and also on the human system^{11,12}.

Generally, GMOs have held that the employment of biotechnology to boost and ensure sufficient, nutritious, and long-lasting food in keeping up with the worldwide call for extra food is an expression of responsibility on the part of the producers. However, those on the other line of the divide see genetically modified organisms as overstepping of human boundaries and alteration of natural course. GMOs describe organisms whose genetic substances have been transformed or modified unnaturally¹³. When this term is applied in crops, it is used to describe plants whose gene or genes from dissimilar kinds have been stably introduced into a host genome using techniques of genetic transfer and where, in most cases, such introduced genes have been revealed to produce a gene product. The new genes are translated or converted and the new protein articulated. This scientific procedure allows the plant to obtain a new distinguishing nature such as resistance to certain insects or

tolerance to herbicides.

Christian Tradition and GMO/Inorganic Foods:

With over 148 million hectares of farmland at present being utilized for the cultivation of GMO crops worldwide.¹⁴ Biblically speaking, as it concerns the issue of GMOs and inorganic food, the church seems to be handicapped. This is because there are no substantial scriptural references upon which hands could be laid to lucidly and objectively take a stand or argue for or against GMO and inorganic foods. This is however not to say that there are no religious voices from the Christian circle raised in advocacy for or against GMOs. In a policy document adopted by the alliance of churches and related agencies working together, it is observed that the fundamental issues surrounding the GMOs are about their impact on supply chain, environmental and cultural issues coupled with social and economic effects⁸. In the light of this, one is left to wonder who is right and who is wrong, especially in a civilization where rightness and wrongness are viewed more with 'relative lenses' than from an absolute moral point of view. It is interesting to note that even in the Christian religious circle; there are variant schools of thought on GMOs. Hence, the Christian religion is already divided against itself on this ethical issue. One wonders then if any argument propounded by the church, especially against GMO, because there is no unanimous stand by the church.

In support of GMOs, the National Council of Churches (USA) in an article titled, "Genetic Science for Human Benefit" argues that creation, by divine power, is not static, "but dynamic and ongoing. As creatures uniquely made in God's image and purpose, humans participate in the creative process through the continuing quest for knowledge, which now includes unraveling and learning to control the intricate powers compressed in genes of DNA molecules."¹⁵ In support of this position, the said document also categorically states its stance that, so much has not been known about GMOs to declare categorically its harmfulness or harmlessness, or its usefulness to human health either in the long or short term.¹⁵ Following this point of view, the main point of argument is that since there is not

enough evidence to prove that GMOs are harmful to the human system, therefore, GMOs are justified. However, this kind of argument lacks merit from the legal point of view since a plaintiff does not depend on the defendant's weakness to prove his case as the onus of proof is always on the plaintiff. It is, therefore, a matter of concern to justify GMOs because there are not enough pieces of evidence to prove their fatality. The absence of enough evidence to prove the harmfulness of GMOs does not automatically imply the presence of enough evidence to prove that they are safe.

For the parties who have concerns on religious grounds about GMOs and inorganic food, one of their expression is that by genetic engineering of plants, the scientists and all those involved in the

process are 'playing God'.⁴ From the perspective of this argument of playing God, the anti-GMO party who so take their stand on religious grounds are of the view that the God who is responsible for the human increase on the planet earth is capable of feeding the same population without any form of human help or manipulation. The question this position may pose is, was the global population increase as it is currently part of God's agenda at creation? When God told Abraham that his progenies will be as numerous as the stars in the sky (Genesis 15: 5; 26:4); to what extent was that increase intended? When Adam was commanded in Genesis chapter one to be fruitful and multiply and fill the earth (Genesis 1:28-30), what was the scope of such command, taking into cognizance the fact that food is an essential need? If we say that God is not troubled by the ever-increasing global population and demand for food supply, we may again have to reflect on another important question; how did God originally intend to feed the global population? Through organic plants or using other creative means which may necessitate the employment of bioengineered crops and GMOs? Or are we to assume, on the other hand, that God is simply overwhelmed by the global population and the consequential food shortage and by implication has consented to the employment of whatever scientific means to salvage the hungry population that craves for an even distribution of their daily bread? An appropriate response to these questions cannot be attained without some conjectures and unbridled insinuations.

Advocates of GMO food on the other hand,

especially utilizing the utilitarian ethical theory sees it as a point of duty and justifiable to employ whatever means there is to provide viable and lasting food crops in a quantity that matches with the global demand so that the world doesn't die of starvation from food shortage. Using this ethical standpoint, it can therefore be said that the end (which is the provision and distribution of food products in sufficient quantity) certainly justifies the means. In the light of the utilitarian ethical theory, in trying to argue for or against the justification of GMOs, we may have to first answer the question of whether it is right to allow the world to starve and die of hunger and malnourishment when God has given us the scientific know-how via bioengineering? Which is a lesser evil, to watch people die of hunger or to feed them with genetically manipulated food or food grown and preserved by chemicals that may have harmful effects on their health in the future? Will it in any way portray a sense of responsibility to deny the world of the 'benefits' of GMOs on the grounds of religious concerns that are shared by a few? To the utilitarian, since the extent of harm caused by GMOs on human health is yet to be ascertained, it is, therefore, a duty to ensure a distribution of food to the global population using GMOs and inorganic food. As noted by Food and Agricultural Organisation that "food contestation does, therefore, not mean that the contest is for a limited resource, but rather concerns the distribution of this resource"¹⁶. This implies that the creation of GMO foods is primarily for equal distribution to all and sundry globally and not merely for massive food production. Highlighting the global need for food distribution and the justification for the employment of GMOs, the United Nations Food and Agriculture Organisation documented that "14.5% of people in developing regions of the world are undernourished. In Africa, this figure is 20.5% and in Sub-Saharan Africa, it rises to 23.8%, the highest percentage in the world"^{4,5}.

It is worthy to also note that the availability of food to match the demand is not the only reason why scientists engage in gene engineering of crops. It is also to confer valuable and useful assets on those crops which include improving the quantity and quality of the yield. Omobowale et al argue that this will

...increase their micronutrient content, the reduction in the maturation time of seedlings, the enhancement of plant resistance to pests and disease, the improvement of the adaptability of crops to nutrient-deficient soil and the production of proteins for human and animal medicine and the conferment of drought resistance¹⁰.

The Pontifical Council for Justice and Peace, which is based at the Vatican, asserts that the Catholic Church endorses genetic modification of crops. They see it as a major way of solving the problem of food shortage in the world. To them, it is part of God's original plan. John Paul II adds that there must be a serious scientific and ethical assessment before it could be made available for human consumption¹⁰.

However, despite this position by the Vatican, certain organizations within the Roman Catholic Church with differing views on genetically modified crops exist. One of the outrages by the group against the Pontifical Academy of Science is on the latter's cooperation with the US embassy to the Vatican to host a pro-GM conference tagged, "Feeding the World: The Moral Imperative of Biotechnology"¹⁰. In their position, the St. Columbian's Mission Society through Father Sean McDonagh, an instead of GMO foods¹⁰.

GMO/Inorganic Food and Health in Nigeria: According to a poll in July 2013, half of Americans cling to the belief that GMOs are dangerous.¹⁷ Commenting further on this report, Glasgow notes that it is obvious that Americans maintain a skeptical stance about GMOs, irrespective of assurances of safety by the scientific community¹⁷. French molecular biologist Gilles-Eric Seralini, et al, in the Journal of Food and Chemical Toxicology, reported an increased tumor size in rats that were fed with GM maize and roundup^{18,19,20}. In a review, "evidence shows that GMO may have an unpredictable danger to the human health directly or indirectly".²¹ Commenting on the demerits of GM foods, Bawa and Anilakumar argue that one of the biggest threats to the growth and development of GM foods is its harmful effects on the human body. The duo argues that the eating of genetically modified foods has the likelihood of developing

diseases that are insusceptible to various antibiotics which could be beneficial to humans. They stressed further that the manufacturers worsen matters by not labeling some of these GM foods as genetically modified ²².

In an interview conducted by the News Agency of Nigeria at Abuja, Dr. Rufus Ebegba, the Director-General, National Biosafety Management Agency (NBMA) strongly and sternly debunks the perceived health hazard of GM foods claiming that people have the wrong impression about these foods. He argues that every food consumed today has been modified in one way or the other²³.

However, in a paper published by Vanguard in December 2020, on the impact of GM foods and how Nigerians experience it reported how Mrs. Bello bought fresh carrots, garbage, and vegetables which got rot overnight and did not know why. He further reported that Madam Helen concurred that such has happened to her three times recently. Mrs. Imoh also shared a similar experience. These women all showed ignorance of GM foods²⁴.

Orakpo ²⁴ reported that Prof Frank Ogbo explained that it has nothing to do with genetic modification of foods but as a result of enzymes and microorganisms in the food that caused the decay. On the other hand, Prof Nkiru Meludu, Head, Department of Agricultural Economics and Extension, Nnamdi Azikiwe University, believes the short shelf life of agricultural foods is caused by genetic modification. She, therefore, concluded that natural foods cannot be the same as genetically modified food²⁴.

Another area where GMOs could be hazardous to human health is the destruction of the ecosystem and the environment. Prakash et al in their argument on the danger of GMOs to the environment explain that GMOs that are introduced "may interbreed with the wild- type or sexually compatible relatives" thereby causing the disappearance of the novel traits in wild types. They argued further that GMOs grow faster and produce faster, which advantage may cause them to have a competitive advantage over the natural species. This they argue may lead to them becoming invasive and "cause ecological and economic damage"²⁵.

GMO/Inorganic Food Production and the Economy:

In most cases, proponents of biotechnology in agriculture have always associated it with the prospects of poverty alleviation. This is seen in the sense that the introduction of GMOs into agriculture promises an increase in rural incomes, sustainability of production in resource- poor areas, and provision of more nutritious foods at a lower cost. Hence, the advanced countries in biotechnology see it as a moral obligation to be their brother's keeper in making such products available in the poorer countries²⁶. The question that remains then is, "at what cost?" Should the environment be endangered because we are hungry? Should peoples' health be subjected to the risk presumably associated with GM foods and inorganic products to escape hunger? Should animal species be subjected to extinction because humans need food?

Biotechnology has the potency of contributing to sustainable production and distribution of foods, commonly cereals and maize, in arrears considered to be disadvantaged in resources. Farmers experience detrimental problems owing to drought, pests, and acidic soil, but through biotechnology, insect resistance and aluminum tolerance can be employed to circumvent these environmental hurdles. Consequently, a full-cycle farming season and production and storage in larger quantities of food and distribution is achieved through GMO - this, also serves as a boost to the economy²⁷.

Regulating Agencies and GMO/ Inorganic Food Consumptions:

The International Service for the Acquisition of Agri-Biotech Applications (ISAAA) report of 2014 indicated that 181.5 million hectares of biotech crops are grown in a total of 28 countries.²⁸ The European Union on the other hand has established a strict regulatory framework to trace GMOs and derived products and ensure that they undergo an authorization process, which aims at guaranteeing human, animal safety, as well as environmental health. As part of this regulatory framework, mandatory labeling of any GMO-derived or GMO-containing food or feed has been introduced, intending to ensure consumers' freedom of choice.²⁹

In Nigeria, the responsibilities for regulating and monitoring food safety standards and practices

are saddled on the following organizations and government agencies:

1. National Agency for Food and Drug Administration and Control (NAFDAC),
2. Standards Organization of Nigeria (SON)
3. Nigeria Agricultural Plant Quarantine Services (NAQS)
4. Consumer Protection Council
5. Federal Ministry of Health
6. Federal Ministry of Agriculture & Water Resources
7. Federal Ministry of Commerce
8. Federal Department of Fisheries and Federal Department of Livestock

On February 26, 2015, the Nigeria Senate passed the Bio-safety Bill into law. This gave a portrayal that the country was prepared to receive, regulate and most importantly, commercialize biotechnology products. It is worthy of note that the law was made as a precautionary approach, such that requires certification and mandatory labeling for imports of all products of biotechnology. NAFDAC requires wheat and maize flour, vegetable oil and sugar consumed in Nigeria to be fortified with vitamin A. Salt must also be fortified with iodine.³⁰

However, though the government agencies are in place to ensure the proper labeling of food products when it comes to enforcement, the story is different as the presence of most of these agencies is hardly felt in society. Also, the issue of corruption is another challenge as some hazardous food products can easily be allowed to pass if enough money is exchanged.

Ethical Issues in GMO/Inorganic Foods: Be your brother's keeper; are the proponents their brother's keeper? If yes, to what extent? is another issue for determination. One outstanding controversial issue about genetic engineering of crops is described as "Terminator Technology"³¹. This has raised substantial ethical concerns because it provides a means of ensuring that seed cannot be realized or preserved at the end of one planting year or cycle. This manipulation is not only on the crops but also on the farmers to keep them dependent and subject to the control of the companies that produce and supply the seeds. So we can see that the supply of GMO seeds is aimed at totally

exterminating the availability of natural seed such that in the process of time, only the monopolists in the biotech industry will be supplying seeds to the farmers. This, according to Robinson³² causes conflict between human and business ethics. However, the technology could be employed to minimize the spread of transgenes. Two case studies serve to illustrate the ethical problems concerned with the distribution of benefits of transgenic technology. Ethically, this is tantamount to enslaving a people and giving them the assurance that they will be well fed – even though they don't have control of the food and are not certain what the implications are.

While the supporters of biotechnology in agriculture mostly project the prospects to the farmers who own the GM crops, it is, however, pertinent to note that this is often not the case. There are overwhelming adverse effects to the welfare of farmers and this includes inaccessibility to the available agricultural technology, the potential harm the technologies can inflict on the farmers' crops, phasing off of ancient and accepted farming methods, and control by the companies. While the potential benefits to poor farmers in developing countries seem great, it may be observed that transgenic research in plants began privately with the production of homegrown crops for the developed countries as its focus. The governments in advanced countries must increase their spending while private organizations and institutions must as well stimulate investment in order to bring benefits to the developing countries³³; hence, the promotion of biotechnology can be seen as a control method by the developed countries.

Conclusion: In conclusion, therefore, to some people, they believe that the use of GMOs in agriculture is an ethical question of whether or not to engineer in agriculture. Activists who are anti-biotechnology are worried about the future generations, and the future consequences on food production and security, as well as the environment. Concerns are that regulations are too fluid and poorly enforced, and the eventual effects of the use of GM foods remain unknown. The ethical question remains as to whether or not it is ethically right for nations that are well fed and advanced in technology to regulate and

control access to agricultural technology in developing nations.

Since global hunger has deepened, especially among the developing countries, and inequality is one major cause of it, adopting a method of boosting agricultural products through unequal processes such as GMOs, will rather exacerbate hunger. Therefore, for equity, biotechnology in agriculture should be geared towards better addressing the needs of poorer nations. Hence, while it is obvious that there are benefits to using biotechnology to improve crop production, there are also many fundamental and ethical arguments against its use.

The church in Nigeria on the other hand, should not live and operate as though in isolation of the happenings in the genetic engineering and modification of foods, animals, and crops. The church should awake to create awareness among its adherents on the potential benefits and health hazards associated with the consumption of such foods and the environment. They should encourage the regulatory bodies to be alive to their responsibilities instead of yielding to the corrupt tendencies of many manufacturers and producers who want to cut corners. Christian church leaders in Nigeria should establish a committee of experts that will study and advise them on the harmless foods in Nigeria.

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