

REGULATION OF BIOTECHNOLOGY IN UGANDA: A NECESSARY EVIL?

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ABSTRACT

Humankind has been feeding on biotech products, better known as genetically modified organisms (GMOs), for decades without paying keen attention to this reality. Innovation into biotech products was orchestrated, among other reasons, by growth in demand for food as well as harsh climatic conditions that negatively affected supply of agricultural products in the global market. When the presence of genetically modified agricultural products in the market place came to the surface, negative publicity outshined the benefits accredited to them. This fueled the overwhelmingly hostile knee-jerk reaction that the general public currently gives to GMOs. This article looks at the perceptions towards GMOs and how the negative misconceptions could easily derail us from enjoying the benefits that are imbedded within them and more particularly, addressing food security. In this paper, Uganda is used as a case study because of the wealth of research and development (R&D) into GMOs that have been conducted in Uganda over the years. The article argues for a renewed understanding of GMOs through robust dissemination of information and the need for effective regulation of their usage so as to ensure that mechanisms are diligently employed by the producers of GMOs to avoid the negative consequences accredited to them. The key objective should be on having a balance between rewarding innovation and satisfying consumer interests. On the whole, the article posits that the merits associated with GMOs outweigh the demerits and, as such, they should not be seen as a necessary evil, especially if their production and market placement are adequately regulated.

Key words: Biotechnology, Genetically Modified Organisms, Food Security

1. INTRODUCTION: FOUNDATIONAL ASPECTS TO THE ROOT PROBLEM

Uganda, like most Least Developed Countries (LDCs), is predominantly an agro-based economy. A wide variety of food crops are grown in Uganda and these are inclusive of

Maize (Corn), Millet, Sorghum, Rice, Cassava, Potatoes, Beans, Cow Peas, Soya Beans, Plantains and Coffee. However, according to the National Statistical Abstract of 2017, there was a marked decreased production in most crops between 2015 and 2016.¹ This is in spite of an ever increasing national population which currently stands at approximately 44 million people.²

The decrease in food production juxtaposed with an increase in population is widely spread out in sub-Saharan Africa. The Academy of Science of South Africa released a study report on the 'Regulation of Agricultural GM Technology in Africa'.³ In this report, it states that "according to the UN Food and Agriculture Organisation's (FAO) State of Food and Agriculture 2010-2011, sub-Saharan Africa:

- Is home to 26 percent of the world's undernourished population;
- Has the highest number of countries experiencing food emergencies due, in part, to climate extremes such as drought and exacerbated by civil unrest;
- Experienced increased food imports during the first half of this decade; and
- Is very vulnerable to global food price increases."

This therefore portrays a reality of an increase in demand for food while at the same time, there is also a decrease in food production to satisfy the market. Food security is therefore at the peripheral of the socio-economic development of agro-based economies such as those in sub-Saharan Africa.

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¹ Uganda Bureau of Statistics: *2017 Statistical Abstract* at p. 61. See: [https://www.ubos.org/wp-](https://www.ubos.org/wp-content/uploads/publications/03_20182017_Statistical_Abstrac)

[content/uploads/publications/03_20182017_Statistical_Abstrac](https://www.ubos.org/wp-content/uploads/publications/03_20182017_Statistical_Abstrac)
[t.pdf](#) (Accessed December 19, 2017)

² See: <http://www.worldometers.info/world-population/uganda-population/> (Accessed June 10, 2018)

³ Academy of Science of South Africa (ASSAF), Regulation of Agricultural GM Technology in Africa – Mobilizing Science and Science Academies for Policymaking, November 2012. See: <https://www.assaf.org.za/files/2012/11/K-9610-ASSAF-GMO-Report-Dev-V8-LR.pdf> (accessed March 1, 2018)

2. WHAT IS FOOD SECURITY?

Numerous definitions have come out with attempts at describing the concept of Food Security. This article, however, borrows from the understanding of Food Security proposed by the FAO in stating that food security is attained “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”⁴ The focus of this article is to address the issue as to whether agro-biotechnology contributes towards food security as a supplement for - or beyond - the conventional methods of farming.

The new trend towards changing the traditional farming methods started in the 1960s in an era dubbed as the “Green Revolution”.⁵ This era witnessed increased investments in the agricultural sector and was marked by development and distribution of new high yielding food varieties mainly wheat and rice⁶.

Biotechnology in the food industry thus emerged as one of the solutions in addressing the problem of decreasing food production in an ever increasing market base. As highlighted below, biotechnology is not only meant to address the increasing demand for food, but also address the challenges impending adequate supply of food, such as climatic conditions and plant disease.

3. WHAT IS BIOTECHNOLOGY?

Biotechnology is the use of living organisms and molecular biology to produce healthcare-related products and therapeutics or to run processes such as DNA fingerprinting.⁷ This paper is particular focused on

agricultural biotechnology as an offshoot of biotechnology that pertains to plants. Professor Chidi Oguamanam has described agricultural biotechnology as “. . . a subset of biotechnology steeped in diverse techniques for manipulating genetic materials of living organisms and for exploring and exploiting the complex chemistry of biological systems for food production and other agro-industrial ends”.⁸

4. IS BIOTECHNOLOGY EVIL?

The response to this question, particularly with regard to agricultural biotechnology, is dependent on the perspectives of the stakeholders in the food industry. These perspectives are presented as follows:

- a) Agricultural researchers and Research & Development (R&D) firms

Bongo Adi argues that “Agricultural biotechnology has the potential to increase the productivity and adaptability of crops, diversify the variety of agricultural crops and enhance the nutritional value of food to combat the perennial problems of poverty, malnutrition, food insecurity and diseases”.⁹ In the same vein, Paragraph 2 of the Memorandum to Uganda’s National Biotechnology and Biosafety Bill,¹⁰ defends the need for modern biotechnology as an aspect that will create “enormous opportunities for modernization of agriculture, protection of the environment, enhance public health and industrialization.” Ugandan researchers in Agro-biotechnology have also come out strongly in favour of the proposed legislation.¹¹

⁴ World Food Summit, Nov. 13-17, 1996, *Rome Declaration on World Food Security: World Food Summit Plan of Action*, 1, WFS 96/REP, available at http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/003/w3613e/w3613e00.htm cited in Chidi Oguamanam, *Agro-Biodiversity and Food Security: Biotechnology and Traditional Agricultural Practices at the periphery of International Intellectual Property regime complex*, 2007 Mich. St. L. Rev. 215, at p. 230.

⁵ Douglas Gollin et al, *Two blades of Grass: The Impact of the Green Revolution*, National Bureau of Economic Research (NBER) Working Paper Series, 2018 No. 24744 (https://www.nber.org/system/files/working_papers/w24744/w24744.pdf) (Accessed May 2, 2021)

⁶ Bongo Adi, *Intellectual Property Rights in Biotechnology and the fate of poor farmers’ Agriculture*; A version of this paper was submitted to the United Nations University International Courses (International Trade and Dispute Settlement) in 2000. See: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1422-2213.2006.00270.x> (Accessed March 3, 2018)

⁷ See: <https://www.investopedia.com/terms/b/biotechnology.asp> (Accessed May 2, 2021)

⁸ Chidi Oguamanam Fn 5 supra, at p 222

⁹ Ibid, fn 7 supra at p. 2

¹⁰ The National Biotechnology and Biosafety Bill, No. 18 of 2012

¹¹ Peter Wamboga-Mugirya, *Uganda’s agriculture sector welcomes new GMO crop law*, Cornell Alliance for Science

Dr. Denis Kyetere, the Executive Director of the African Agricultural Technology Foundation (AATF) opines that, on account of the proposed regulation of biotechnology, Uganda now stands out as a leader in advanced agricultural research on the Continent and other nations will be watching how it utilizes a legal framework for advancing better crop technologies¹².

Needless to say, Agro-tech researchers are cognizant of the benefits that accrue from modern agro-biotechnology. They view regulation of this industry as an approval stamp that will gradually change the mindset of GMO pessimists and bring the general populace into understanding and embracing the benefits accruing from the use of agro-biotechnology in the food industry.¹³ Gilbert Gumisiriza, an Agricultural Research Analyst, dismisses anti-GMO activism as a manipulation of the human mind by a cult movement committed to agricultural stagnation in vulnerable developing countries.¹⁴

This assertion may be justified from the perspective of those knowledgeable about the benefits to be obtained from the use of agro-biotechnology but one also need to appreciate the concerns of others hesitant to embrace the use or generation of GMOs, especially local farming communities as highlighted below.

b) Local farming communities

Most local farming communities, particularly in least developed economies like that of Uganda, find it difficult to adapt to the systems of modern farming

and plant breeding that define agro-biotechnology. Professor Graham Dutfield points out two key reasons for this: (1) Subsistence farmers from developing countries, to a large extent, obtain seeds from their own farms or from neighbours; and (2) local farmers often perform breeding within their own fields in order to develop varieties that are compliant with their own local conditions.¹⁵

This goes to show that agricultural practices from local farming communities are at cross-roads with those of modern agro-biotechnology. It is the considered view of this author that modern agro-biotechnology appears to be more focused in providing solutions for a larger market as well as addressing large scale challenges. It is, as such, individualistic and – to a certain extent – commercially-focused, as it inevitably requires some form of legal protection for the innovations involved – an aspect that is covered later in this article. Agricultural practices of local farming communities, on the other hand, are mainly subsistence in nature and thus primarily concerned with satisfying the needs of the nuclear family for another day and, at most, borrow a few ideas from neighbours within the local proximity if any farming challenges arise. It is thus a practice that relies heavily on Traditional Knowledge (TK) and communal rights¹⁶.

Bongo Adi, describes this juxtaposition succinctly by stating that: “Farmers’ seeds were now declared “primitive cultivators” and “land races”, suggesting no intellectual work had gone into their evolutions. The Green Revolution varieties were on the other hand, referred to as, “elite”, “modern” and

blog, November 29, 2017, <https://allianceforscience.cornell.edu/blog/2017/11/ugandas-agriculture-sector-welcomes-new-gmo-crop-law/> (accessed March 3, 2018)

¹² *ibid*

¹³ Peter Wamboga-Mugirya, *Uganda Scientist dismisses anti-GMO activism as bio-hegemony cult*, Cornell Alliance for Science blog <https://allianceforscience.cornell.edu/blog/2018/03/ugandan-scientist-anti-gmo-activism-cult/> (Accessed March 5, 2018)

¹⁴ *ibid*

¹⁵ Graham Dutfield, *Social and Economic Consequences of Genetic Use Restriction Technologies in Developing Countries*, pp.293-303 at p. 294, in Jay P. Kesan (Ed.), *Agricultural Biotechnology and Intellectual Property: Seeds of Change*, CAB International, 2007

¹⁶ Food and Agriculture Organization (FAO): *Agricultural practices and extension services*, Chapter 6 in ‘Guidelines on Spate Irrigation’, see: <http://www.fao.org/3/i1680e/i1680e02.pdf> (Accessed May 2, 2021)

“miracle”.¹⁷ Citing Shiva, he goes on to add that local farming communities in developing countries consider community seeds as sacred and a free gift of nature which should not be commercialized.¹⁸

Local farmers are also part of the same consumers of agricultural products mainly due to the fact that the primary beneficiaries of their services are their own families. As such, apart from the conflicting paradigm showing the current parallel focus towards agricultural practices, as consumers, there is also generally a negative reaction towards GMOs.¹⁹

c) Consumers of agricultural products

The interests of consumers and their appreciation towards agro-biotechnology, focuses on two major aspects: food safety and liability for product deficiency. As expounded upon in detail below, there are global concerns that GMO products are carcinogenic and that GMO seeds (such as terminator seeds) have negative effects on the Soil, especially in preventing other seeds from being placed in the same soil components.²⁰ Where such fears arise, the follow-up issue is then whether the R&D firms and corporate institutes that rely on and utilize GMOs can be held liable for negative effects upon local farmers and those that consume GMO products.

In an online article, Canary Mugume- an investigative journalist - shares his experience in having undertaken an investigation into whether there are any GMO products in the Ugandan market.²¹ He purchased several brands of cereal from a local supermarket and was intrigued at establishing that the labelling on the boxes of cereal highlighted the

fact that they were produced by GMOs.²² He proceeded to carry out investigations into product liability in case of deficiencies in the product. On inquiry with the Uganda National Bureau of Standards (UNBS) – the National Regulatory Body that oversees adequate standardization of products and services in the country – he was informed that UNBS does not have any specific standards for GMO products because it does not standardize technology.²³ UNBS emphasized to him, however, that under UNBS’ supervision, all products (whether GMOs or not) are expected to meet the quality and safety parameters set by the National Authority.²⁴ Ironically, this contradicts the earlier denial from UNBS on standardizing technology because it reflects the fact that UNBS recognizes its mandate in looking into the quality and safety of GMO products that are in the Ugandan market.

Needless to mention, however, that Canary Mugume’s experiences are reflective of the fact that GMO products are already in the Ugandan market and that there are consumer concerns, legitimate or not, over the safety of such products and establishing liability over unsafe products. In addressing these concerns, the Biotechnology and Biosafety Bill provides for the establishment of an Institutional Biosafety Committee to, among others, monitor effective research into, as well as output of GMOs ;²⁵ submission of Risk and Safety Assessment Reports by GMO manufacturers;²⁶ product liability in terms of offences and penalties, related to general release of GMOs without approval, failure to disclose important information related to GMOs, or furnishing of false information .²⁷ On failure to

¹⁷ Ibid, fn 7 supra at p. 3

¹⁸ Ibid, fn 7 supra at p. 19, citing Shiva, V.: 1996, ‘*The Seeds of our Future*’ Development Journal 4.

¹⁹ GMOs – Top five concerns for family farmers, See: <https://www.farmaid.org/issues/gmos/gmos-top-5-concerns-for-family-farmers/> (Accessed May 2, 2021)

²¹ Canary Mugume, The dark secrets behind the GMOs war in Uganda, <http://nilepost.co.ug/2018/05/22/the-dark-secrets-behind-the-gmos-war-in-uganda/> (accessed 28 June 2018)

²² Id.

²³ Id.

²⁴ Id.

²⁵ Clause 14.

²⁶ Clause 29.

²⁷ Clause 37.

disclose information, it is not clear whether such provision also addresses the issue of food package labelling, which is given top most consideration within international best practices related to safety standards in biotechnology.

The short fall in this particular respect of product liability, is therefore generally to the effect that the Bill is silent on the likely repercussions upon GMO producers in the event that it is established that a consumer has suffered upon the consumption or utilization of a GMO product.

It is nonetheless a buildup of consumer concerns that is transferred towards political leaders and Governments to work out a solution towards the question of GMO usage as seen below.

d) Politicians and government perceptions

Professor Jay Kesan cites political demonstrations that began in Europe in the early 2000s against importation of GMOs and the low acceptance levels towards GMOs which culminated into the introduction of government standards on food-labelling in Europe and Japan.²⁸ This was to the effect that food items must have labels indicating how much of the ingredients are GM²⁹.

It is generally highlighted that the major concern, especially from Europe and Japan, is that genetic engineering has an overall negative effect of reducing plants, animals and micro-organisms to “mere commercial commodities bereft of any sacred character”.³⁰ This resonates with the previously highlighted conflict with regard to the notion that the general characteristic of African agricultural

practices is that they are communal in nature and based on family survival rather than individualism and profit generation. It is nonetheless important to appreciate that the introduction of agrobiotechnology will continuously shift agricultural practices from what has been termed as land-based farming to “transdisciplinary convergences in therapeutics, pharmaceuticals, chemicals, and marketing in complex industrial and political economics of globalization”³¹.

On the face of the Ugandan “GMO” Bill, considering that it is a 2012 draft regulation, it is apparent that the Ugandan government has played ping pong to passing legislation on safe production and utilization of biotechnology in the country. In a 2004 study report, it was reported that the consensus among Ugandan government officials was that the Country should invest in GMO technologies as well as encourage importation and application of GMOs³².

However, on fast tracking into 2018, there is hardly any progress made towards regulation of this nascent industrial development. The Bill, in spite of its limited shortfalls highlighted within this article, was shelved in the Ugandan Parliament for a good number of years and then hurriedly debated and passed in October of 2017 by the Parliament of Uganda. However, although the President had initially expressed frustration at the delay in Parliament’s debates over the Bill, when it was taken to him for signing into law, he out-rightly rejected the Bill in its current form and sent it back to Parliament for further scrutinization.³³ The President’s objection towards signing the Bill into law was generally premised on the reasoning that:

²⁸ Jay Kesan, *Seeds of Change: A Link among the Legal, Economic and Agricultural Biotechnology Communities*, in Jay P. Kesan (Ed.), *Agricultural Biotechnology and Intellectual Property: Seeds of Change*, ibid, fn 16 supra at p. xx.

²⁹ Id.

³⁰ Bongo Adi, fn 7 supra at p. 4, Citing Persley, G.J.: 2000, *Promethean Science, Chapt. Agricultural Biotechnology and the Poor: Promethean Science*, Washington, D.C.; CGIAR

³¹ Chidi Oguamanam, fn 5 supra at p. 222

³² Ronald Naluwairo and Godber Tumushabe, *Uganda’s position on GMOs: Whose Position? Reflections on Uganda’s Policy Making Process on GMOs*, ACODE Policy Briefing Paper No. 5, 2004

³³ See: Ivan Okuda, *Museveni declines to sign GMO bill into law*, Daily Monitor Newspaper, December 28 2017 <http://www.monitor.co.ug/News/National/Museveni-declines-to-sign-GMO-bill-into-law/688334-4243964-wfyvm9z/index.html> (accessed March 19, 2018)

the Bill talks of giving monopoly of patent rights and forgets about communities that developed original material; there should be no cross-pollination between GMOs and indigenous seeds; there should be clear labelling of GMO products; and the consumer must be protected from harmful GMOs.³⁴

The issue of fair and equitable sharing of benefits with local farmers is of paramount importance in least developed economies like Uganda where agrobiotechnology favors Patent rights of breeders over and above the rights of local farmers. However, the Bill, in its current form, has no specific mention of granting monopoly of patent rights, an issue which is addressed later on in this article. As for the other concerns from the President which are pointed out above, although as aforementioned, the Bill is not clear as to whether provision of information or the lack thereof, involves labelling of GMO products, it can be argued that cross pollination is unconsciously covered under the provision which makes it an offence to engage in GMOs without obtaining the necessary approval (clause 37). Consumer protection against harmful GMOs is generally the objective of the Bill. It would therefore be incomprehensible for the President not to sign the Bill into law on the basis that this principle was lacking in the Bill. The first paragraph under the Memorandum of the Bill clearly highlights the objective of ensuring that consumers of biotechnology receive a product that has gone through all the necessary safety standards. It stipulates thus:

“The Object of this Bill is to provide a regulatory framework that facilitates the safe development and application of biotechnology;

...

to provide mechanism[s][sic] to regulate research, development and general release of genetically modified organisms and for related matters.”³⁵

It is therefore apparent that on most of the issues raised by the President in objecting to signing the Bill into law, he was ill-advised. This paints a hazy picture in the regulation of biotechnology in Uganda based on mistrust and political uncertainty which, subsequent to the passing of the National Biotechnology Policy in 2009, has only reflected government inaction in following up with the necessary regulation.

Such inaction on the part of the government of Uganda, is fueled by assumed risks and negative perceptions towards the use of GMOs and the corporations that produce them. The most common of these perceptions are expounded upon as follows:

a) Considered carcinogenic

It is a general belief that agricultural products that are prepared for human consumption should be naturally grown. This therefore makes it difficult to appreciate the possibility of using artificial techniques in the use of living organisms to produce agricultural or animal products, which ironically, have been in consumption across the globe for decades. It is on the basis of the idea that GMOs cannot possibly hold the same health benefits derived from naturally grown crops, that assumptions are created to the effect that GMOs can lead to non-communicable diseases such as cancer.³⁶

As earlier on mentioned in the first part of this article, Gilbert Gumisiriza asserts that the labelling of GMO products as health hazards is actually a

³⁴ Ibid, also see: Report of the Committee on Science, Technology and Innovation on a Bill for an Act entitled The Biosafety Act, 2017

³⁵ Republic of Uganda: The National Biotechnology and Biosafety Bill, No. 18 of 2012, See: http://mediad.publicbroadcasting.net/p/kwmu/files/201610/biotechnology_biosafety_bill_2012_3_.pdf (Accessed May 2, 2021)

³⁶ Touyz L. Z. (2013). *Genetically modified foods, cancer, and diet: myths and reality. Current oncology (Toronto, Ont.)*, 20(2), e59–e61. <https://doi.org/10.3747/co.20.1283> (Accessed May 2, 2021)

manipulation of the mind.³⁷ Indeed, this fact came true through a revelation that ActionAid Uganda (AA Uganda), a Civil Society Organization, had falsely and with intent, painted a wrong picture about GMO crops by spreading false propaganda to Ugandan farmers about GMOs. ActionAid Uganda had been telling farmers that GMOs can cause cancer and it relied on false reports from various scientists.³⁸ These Scientists later disassociated themselves from such reports and categorically stated that there has so far not been any scientific research connecting GMOs to negative health effects.³⁹ ActionAid UK (the parent Organization of AA Uganda) also responded by denouncing AA Uganda in making a false report and added that “all AA chapters have been explicitly instructed not to claim ill health effects from GM crops, that AA Uganda has apologized and withdrawn its claims⁴⁰.

As such, the belief that GMOs cause cancer is a mind manipulation that has – so far- not been supported by any concrete evidence.

b) Un-natural

Biotechnology is the opposite of natural. Researchers, working in labs, use genetic engineering to produce a new form of plants with a specific purpose in mind. Professor Graham Dutfield argues that although terminator technology⁴¹ – an aspect of genetic engineering in Agro-biotechnology – can boost further investment in agricultural biotechnology, it also has a down side. Adoption of terminator technology can weaken natural plant breeding efforts globally by reducing the variety of germplasm available and gradually marginalize

traditional farming practices, such as seed sharing, by modern practices of multi-national corporations.⁴²

However, although GMOs are unnatural, the focus should be on the desired end for which they are created. When you have an unnatural outcome which, nonetheless benefits the consumer, then that is a big plus for the product. This includes using technology to increase productivity and adaptability of crops to ecological hazards.

Part V of the Biotechnology and Biosafety Bill caters for situations in which the use of biotechnology can create potential harm to the environment. It provides to the effect that the entity that is found culpable of causing such harm to the environment is given an order by a Government regulatory authority to restore the environment to the state it was in before the damage.⁴³

No guarantee can be given, however, that there can be sufficient environmental restoration subsequent to damage caused by terminator technology. A reasonable way forward, therefore, is to ensure that research activities that potentially have adverse negative effects on the environment, albeit also presenting some benefits towards food security, should be conducted in isolated premises or green houses with guaranteed seclusion and controlled exposure to the environment. Such an approach would thus preserve traditional subsistence farming practices keeping them safe from potential dangers that may follow from agro-biotechnology and at the same time keep the door open for local farmers to

³⁷ Ibid, fn 12, supra

³⁸ ActionAid International, *ActionAid CE's Response to INGO Accountability Charter Independent Panel Feedback*, July, 30 2015 at p. 8, see: <https://accountablenow.org/wp-content/uploads/2017/01/ActionAid-CE-response-to-Independent-Panel-Feedback-Report-2013-July-2015.pdf> (accessed June 20, 2018)

³⁹ Ibid

⁴⁰ Id.

⁴¹ Terminator Technology is a technique for genetically altering a plant so that the seeds it produces are sterile. See Crouch, M.L.: 1998, *How the Terminator Terminates*, Washington, D.C. The Edmonds Institute., <http://www.indiana.edu/people/terminator.html>. Cited in

Bongo Adi, fn 7 supra. Also See fn 16 supra at pp. 293-294

⁴² Graham Dutfield, fn 16 supra at pp. 293-294

⁴³ See supra fn 36

utilize such technology from an excluded zone if they so wish.

c) Linked to the “Evil Corporation”

The so-called “Evil Corporation” in this context, is the U.S based Monsanto Corporation that deals in Agribusiness.⁴⁴ Although Monsanto was established in 1901 as a producer of saccharin, a synthetic sweetener, it gradually moved into raw materials; then into chemical production.⁴⁵ In the late 1970S’ Howard Schneiderman, joined Monsanto and became its Senior Vice President for R&D.⁴⁶ He was credited for building up Monsanto’s dominance in Agro biotechnology.⁴⁷

Over the years, Monsanto was seen as a devourer of smaller farming entities which gave it a competitive edge in the agribusiness with the ability to influence direction of such business in developed countries.⁴⁸ For instance, towards the end of 1998, Monsanto controlled 86% of the US Cotton seed market.⁴⁹ It later on divested some of these interests in response to regulatory conditions that would enable it acquire other smaller stakeholders in the industry.⁵⁰ Nonetheless, within the same period of the late 1990’s Monsanto made significant acquisitions of shares in Seed companies across the globe which enabled it to generate access to the gene-market (plant breeding, seed testing, seed multiplication and distribution operations) in 51 countries.⁵¹

This buildup of a global domineering position in the seed manufacturing biotech industry positioned Monsanto as a Corporate entity that was perceived to edge out competition and traditional farming mechanisms (such as farm-saved seeds) that were

seen to offer any resistance or competition (however small) to its modern farming mechanisms.⁵²

This has thus created the discernment of Monsanto as the evil corporation, albeit the positive attributes that are highlighted in the next part of this paper.

d) Cultural Perceptions

The cultural perceptions towards GMOs are, to one extent, tied to the aforementioned belief that GMOs spread incommunicable diseases like cancer.⁵³ Other perceptions that are mainly specific to developing economies like Uganda, hold the view that Traditional Knowledge practices relating to the agricultural industry should also be given credence in how we relate with GMOs. The argument in this respect is that the production of GMOs borrows heavily from TK to create a product worthy of patenting as an individual right within the mindset of developed countries.⁵⁴ But to the local farming communities in developing countries, on the other hand, they are not compensated for the contributions they make towards the fruition of such product. In their understanding, the GMO is derived from a product that they have been enjoying under a common right. The commodification and valuation of the new product within a market with restrictions on usage and purchase, creates an element of bio piracy⁵⁵. The response argument in this line should therefore look more towards a strong access and benefit sharing mechanism within the legal system.

e) Selfish interests of profit motivation

Slightly over ten years ago, the value of global mergers and acquisitions passed the two trillion U.S

⁴⁴ As of June 7, 2018, Monsanto was acquired by German – based Corporate entity known as Bayer for 62 Billion U.S Dollars. See: <https://monsanto.com/news-releases/bayer-closes-monsanto-acquisition/> (Accessed June 28, 2018)

⁴⁵ Dorothy Leonard-Barton and Gary Pisano, *Monsanto’s March into Biotechnology* (A) See Teaching note on: <https://hbr.org/product/monsantos-march-into-biotechnology-a/690009-PDF-ENG> (Accessed June 29, 2018)

⁴⁶ Id.

⁴⁷ Id.

⁴⁸ Id

⁴⁹ Id.

⁵⁰ Ibid, fn 7 supra at p. 12.

⁵¹ Ibid, at p. 15

⁵² Supra, note 46

⁵³ Supra, note 37

⁵⁴ Ibid fn 29 supra at p. xix

⁵⁵ Id

Dollar mark – a total of 2.4 trillion USD.⁵⁶ Daniel Vasella, at the time a CEO of Novartis⁵⁷, stated that the real motive in such direction was that “ the common denominator of our business is biology. . .The research and technology is applied to discover, develop and sell products that have an effect on biological systems, be they human beings, plants or animals.”⁵⁸ The trend towards mergers and acquisitions has been on the increase since 1995.

This makes business sense largely because the transformation in the way large corporate entities look at Agriculture, is now towards businesses involving constant innovations and thus creation of monopolies in IP. The more innovations they own, the broader the IP portfolio and thus more profits made at the end of the day. For instance, between 1995 and 1997, Monsanto which was focused on the Seed and Agriculture industry, had a transaction value worth U.S 8 Billion dollars, while Bayer – a German Biotech Corporation, had a transaction value of U.S 1.2 Billion dollars within the same time period. First forward roughly 21 years later and in June 2018, Bayer fully acquired all the stakes in Monsanto at slightly over U.S 62 Billion dollars⁵⁹ and has intentions to drop the Monsanto name entirely. It goes without mention as to what this will mean in terms of future profits in Agrobiotechnology for the Bayer Corporation.

However, Jay Kesan warns that the profit generating objective and sharing of benefits that may be subjected towards benefiting local farming communities, is hampered by heavy regulation on the part of developing economies. This, in turn, discourages foreign investors in such markets.⁶⁰ As more countries pursue regulation of biotechnology practices, such regulation should balance out the interests of stakeholders as opposed to focusing more on protecting domestic interests. The latter

approach may erode the various parties from achieving their intended objectives.

Needless to state that the pursuit of profits is natural in businesses, and corporations engaged in the Agrotechnology business cannot be seen to shy away from displaying it. Criticism on this particular issue should be on a case by case basis following particular considerations of a focus on profits being seen to overshadow the safety of consumers of GMOs. However, government regulation of such businesses in matters related to taxation and conformity to business and consumer risks standards should be practical and should, as well, be seen to conform to international best practices that encourage safe business practices and growth of the industry.

Regulation that is seen to create a balance in effective R&D of Biotech products on the one hand, and consumer protection on the other hand, is of the essence. This is in light of the potential benefits that accrue from GMOs. In cognizance of all the criticism that has been levelled against GMOs, they do have quite a number of benefits derived from them.

For instance, although Monsanto has been portrayed as “the evil corporation”, it rolled out a humanitarian cause for the benefit of specific African countries, Uganda inclusive. In March 2008, Monsanto entered into a partnership with various African researchers working with funding from the Bill and Melinda Gates Foundation as well as the Howard Buffet Foundation. Under this partnership, Monsanto donated some of its genetic “markers” and other breeding resources to research institutes in Uganda, Kenya, Mozambique, South Africa and Tanzania⁶¹.

By way of emphasis, agro-biotech research targets global challenges affecting agricultural production such as drought which negatively affects crop yield in many

⁵⁶ Id

⁵⁷ Novartis International AG is a Swiss multinational pharmaceutical company based in Basel, Switzerland.

⁵⁸ Ibid, fn 7 supra at p. 10

⁵⁹ Ibid fn 45 supra

⁶⁰ Ibid fn 16 supra at p. xxi

⁶¹ Carey Gillam, *Special Report: Food – Is Monsanto the answer or the problem*, <https://reliefweb.int/report/uganda/special-report-food-monsanto-answer-or-problem> (accessed June 29, 2018)

African agro-based economies like Uganda. The Monsanto project is therefore enabling farmers to acquire better knowledge on the proper use of fertilizers and land management. The research involves “experimenting with a number of gene combinations to stimulate greater photosynthesis, improve root structures, and enhance other characteristics so the transgenic corn can yield more kernels with less water.”⁶²

It therefore follows that the highlighted benefits of GMOs are as follows⁶³:

- a) Reducing crop production costs and increasing yield;
- b) Reducing toxic chemicals in the environment by reducing need for pesticides;
- c) Environmental monitoring and remediation;
- d) Plant-based biopharmaceuticals.

Gilbert Gumisiriza, a Ugandan biosafety regulator, also articulates a clear summary of GMO benefits by stating that GM Technology focuses on the “need and mandate to save plants from ferocious pests, virulent diseases and adverse climate change impacts, while improving their ability to perform in nitrogen depleted soils without the use of synthetic fertilizers.”⁶⁴

GMO researchers therefore have consumer interests in mind while undertaking biotech R&D. Regulation of Agro-biotechnology in Uganda thus serves the purpose of ensuring that the research and output of such practice is well coordinated by government agencies with full participation and benefit-sharing coming in from local farming communities. This is on the basis of their strong impact on the economy.

As aforementioned, several African countries, alongside Uganda, have been carrying out research into GMOs over the years.⁶⁵ These too, recognize the need for such R&D

of Agro-biotechnology to be backed up by adequate regulation. As of late 2011, fourteen African countries had full regulations on GMOs: Burkina Faso, Cameroon, Ethiopia, Kenya, Mali, Mozambique, Malawi, Mauritius, Namibia, Senegal, Tanzania, Togo, Zambia and Zimbabwe.⁶⁶

5. IS THE NATIONAL BIOTECHNOLOGY AND BIOSAFETY BILL ALIGNED WITH INTERNATIONAL INSTRUMENTS?

Uganda is signatory to a number of International Instruments that are of relevance in conducting research and utilization of biotechnology. These are discussed below:

- a) The TRIPS Agreement

Uganda is a founder member of the World Trade Organization (WTO) which was established in 1995. On that basis, Uganda is obligated to domesticate the provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) which is an international legal agreement between all the member nations of the WTO. Article 27.3(b) of the TRIPS agreement provides that member states can exclude from patentability plants and animals but not micro-organisms and “essentially biological processes for the production of plants”. Under the same provision, member states can effectively protect new plant varieties either by patents or a sui generis system or by any combination thereof. In response thereof, in 2014, the Ugandan Parliament enacted the Plant Variety Protection Act as a sui generis legislation providing for the promotion of development of new plant varieties and their protection.

The long title to the National Biotechnology and Biosafety Bill, on the other hand, does not mention the word “protection” at all. The focus of this Bill, as

⁶² Op cit.

⁶³ Jay Kesan, *GMOs: Policy, Law & Regulation* (presentation), citing: Om V. Singh et al., *Genetically Modified Crops: Success, Safety Assessment, and Public Concern*, 71 *Appl. Microbiology & Biotechnology* 598-607 (Apr. 2006).

⁶⁴ *Ibid* supra fn 14

⁶⁵ The other countries are inclusive of Egypt, Kenya, South Africa, Morocco, Nigeria, Tunisia and Cameroon. See: Jay Kesan, *Agricultural Biotechnology and Intellectual Property: Seeds of Change*, fn 16 supra at p. xx.

⁶⁶ *Ibid*

reiterated, is more towards facilitating safe development and application of modern biotechnology. It can be claimed therefore that following the guidance of Article 27.3(b) of the TRIPS Agreement, Ugandan legislation gives plant breeders and biochemists the option to either apply for protection of their agro-biotechnology under the Plant Variety Protection Act or for the grant of a Patent under the Industrial Property Act.⁶⁷ The latter legislation provides for the protection of Patents, Utility models and Industrial Designs in Uganda. Section 13 of the Industry Property Act excludes Plant Varieties from Patent protection, however, one should also take note of the stipulation in 27.3(b) of TRIPS providing for “. . . the protection of plant varieties either by patents or by an effective sui generis system **or by any combination thereof**” (emphasis mine). This can also be read in line with the 1980 US Supreme Court decision in **Diamond v Chakrabarty**⁶⁸ in which it was decided that biological organisms, traits and genes may be eligible subject matter for utility patent protection. The authorities therefore back the claim in this article to the effect that biotechnology in Uganda can be protected either as Plant Varieties or as Patents.

b) The Convention on Biological Diversity and its Protocols

Uganda is a party to the 1992 Convention on Biological Diversity (CBD). The Convention provides for conservation and sustainable use of biological diversity and involvement of local communities in the sharing of benefits arising from their utilization. Of particular significance is the **Cartagena Protocol on Biosafety of the Convention**. This Biosafety

Protocol concerns protection of biological diversity from the likelihood of risks posed by living modified organisms resulting from modern biotechnology. Article 2.1 of the Cartagena Protocol requires member states to “take necessary and appropriate legal, administrative and other measures to implement its obligations under this Protocol.”⁶⁹ The Protocol entered into force in Uganda on September 11, 2003.⁷⁰

The Ugandan proposed legislation adheres to its obligations under the Protocol by designating the Uganda National Council for Science and Technology (UNCST) as the competent authority with powers to oversee the development and use of biotechnology including approving research, development and use of GMOs; ensuring safety of biotechnology to human health and the environment during development, testing and usage; promoting awareness of biotechnology and biosafety activities and research.⁷¹

Another significant instrument under the CBD is the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization. This Protocol aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable manner. Uganda ratified it on 25th June 2014 and it entered into force on 12 October 2014.⁷²

Although, as discussed above, the Ugandan Bill is skewed towards effective research and development of biotechnology, it is inevitable that the outcome of this research can be subjected to IP protection either as Patents or as Plant Varieties. The concern, therefore is that protective restrictions

⁶⁷ Act. No. 3 of 2014.

⁶⁸ *Diamond, Commissioner of Patents and Trademarks v Chakrabarty* (U.S 1980) 447 U.S. 303 (more) 100 S. Ct. 2204; 65 L. Ed. 2d 144

⁶⁹ See: Cartagena Protocol on Biosafety to the Convention on Biological Diversity, <https://bch.cbd.int/protocol/> (Accessed July 2, 2018)

⁷⁰ Op cit.

⁷¹ Clause 7 of the National Biotechnology and Biosafety Bill, No. 18 of 2012

⁷² See: Nagoya Protocol on Access and Benefit-sharing, <https://www.cbd.int/abs/> (accessed July 2, 2018)

emanating from usage of GMOs such as the saving, sharing and multiplication of seeds, are likely to conflict with the traditional farming mechanisms of local farming communities which are communal in nature. A related concern is the cost for IP protection of agro products which is considered out of reach for most local Ugandan farmers. As such, implementation of the Bill needs to take into account such concerns, especially considering that Uganda, as a signatory to the Nagoya Protocol, is expected to fulfill its obligations relating to access, fair and equitable sharing of benefits in GMOs.

6. CONCLUSION:

The National Biotechnology and Biosafety Bill is ultimately about food safety. It addresses the fact that in the current trend of the global economy coupled with market demands, communities need alternatives to tackle rising challenges in Agricultural production and, as such, the use of biotechnology is a solution that cannot be avoided. The regulation is thus meant to dispel all negativity surrounding GMOs by focusing on effective research and guaranteed food security. Although just like any other legislation, it is not perfect in its stipulations, especially with regard to public participation and awareness-building, there is nothing evil about defending GMOs through regulation. It is, as such, a necessary legislation to have in the strengthening of the country's Agro-based economy.

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