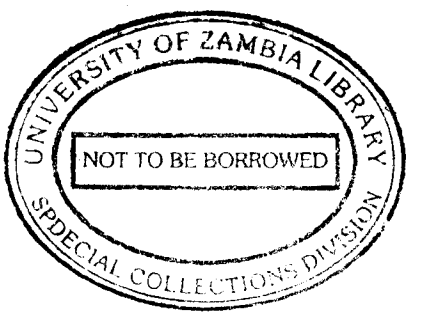
AN EXAMINATION OF THE INTERNATIONAL AND NATIONAL DEBATE ON GENETICALLY MODIFIED ORGANISMS AND THE LAW.



BY

YVONNE NACHEMBE NALOMBA

UNZA

2005

UNIVERSITY OF ZAMBIA

SCHOOL OF LAW

I recommend that the directed research essay prepared under my supervision by **YVONNE NACHEMBE NALOMBA**;

Entitled:

AN EXAMINATION OF THE INTERNATIONAL AND NATIONAL DEBATE ON GENETICALLY MODIFIED ORGANISMS AND THE LAW

Be accepted for examination in partial fulfilment of the requirements of the award of the Bachelor of Laws degree of the University of Zambia. I have checked it carefully and I am satisfied that it fulfils the requirements relating to the format as laid down in the regulations governing directed research essays

MR GEORGE M KANJA
(SUPERVISOR)

05.01.06
DATE

AN EXAMINATION OF THE INTERNATIONAL AND NATIONAL DEBATE ON GENETICALLY MODIFIED ORGANIMS AND THE LAW

BY

YVONNE NACHEMBE NALOMBA

Being a paper submitted in partial fulfilment of the examination requirements for the degree of Bachelor of Laws of the University of Zambia

2005

TABLE OF CONTENTS

CHAPTER FOUR

CHAPTER FIVE

DEDICATION

This work is dedicated to all who sacrificed for me, both spiritually and financially, especially my family. It has not been an easy journey and without your support, I would not have managed. I thank God for all of you.

ACKNOWLEDGEMENTS

First and foremost, my gratitude goes to Victor Mulenga and Thomas Silomba who tirelessly helped me with my research. Please do not change; continue with the same zeal

I am indebted to Mr. Thomas Nyirongo who continuously offered up prayers on my behalf and believed in me. I would also like to thank Mr. Matthews Mwale for the use of the printing facilities and the photocopying machine.

I thank my supervisor Mr. G. M. Kanja for getting me started. His insights on the topic were highly appreciated, as were the materials that were given to me.

I would also like to acknowledge the support given to me by my classmates Muki Phiri and Mumbi Mubanga, especially for their encouragement.

To you all, I would like to say, may the Lord God Almighty enrich your lives to the fullest.

PREFACE

Zambia is one of the countries that has been faced with the question of genetically modified organisms. In 2002, Zambia was faced with the problem of famine. The United States of America through the World Food Programme offered Zambia a consignment of Maize. Zambia rejected this maize on the basis that it contained traces of GM strains. Swaziland, Lesotho, and Mozambique however, accepted the food.

It has been contended that there is no evidence as yet to show that genetically Modified foods are unsafe. In this context, Zambia could be said to have been taking precautionary measures. On the other hand, none of the countries that advocate for these foods can confidently say with assurance that these foods will not pose any health or environmental risks in the future. The debate rages on with some people accusing countries such as the United States as trying to dump such products on the African countries especially those that have been hit by famine.

This paper will try to examine the debate in detail. Zambia cannot remain aloof; hence this paper will tackle the national as well as the international debate. It will also go on to look at the role of the law in this debate. To be considered is the need for legislation that will regulate GMOs in Zambia and what the law should seek to address.

CHAPTER ONE

1.0 INTRODUCTION

There are many questions and problems surrounding genetically modified organisms. Since it is such a new field, biotechnology and its application are surrounded by scientific uncertainty. The debate continues as countries as well as individuals are not decided on whether to accept genetically modified organisms or not.

Information and discussion about genetically modified organisms technology is said to be polarised and polemic, with supporters of GM dismissing opponents as 'anti progress', while opponents of GM often conjure up exaggerated and inaccurate fears. Reasoned argument, assessing benefits and risks, and seeking consensus are said to be rare.[1]

Questions are being asked and though answers are being given, there are concerns about the long term impacts of GM technology on the environment and fears about the safety of GM crops for human health.

[1] "The GM Debate- Who Decides ? An Analysis of Decision Making about Genetically Modified Crops in Developing Countries". A Panos Report. London; Panos Institute (2005) p1

1.1 WHAT ARE GENETICALLY MODIFIED ORGANISMS?

Genetically modified organisms (GMO) are organisms or cells whose genes are deliberately altered to make them capable of producing new substances or of performing new functions.[2] Genetic modification alters the genetic make up of living organisms such as plants, bacteria or combining genes from different organisms.

Genetic modification involves the transfer of genes from one host to another. This is done to transfer specific genes from one host to a new host. The new host is then able to do certain things that it could not do before. For example, scientists can borrow the genes from other plants or animals, which produce a natural resistance to common pests or produce a certain vitamin or some other attribute. Through genetic modification, crops can be produced to include natural pest resistance, substantially reducing the requirement for pesticide usage.

The technology used to alter the genetic material is called Genetic Engineering and it entails changing the characteristics of living organisms or cells by transferring the genes from one organism, across specie boundaries in to another.[3] Genes from humans have been inserted in to a bacterium so that the latter can produce human insulin.

[2] as per Report of the Fact Finding Mission by Zambian Scientists on Genetically Modified Foods. P.28
[3] ibid p.28

1.2 BACKGROUND

Biotechnology itself is not new. It has along history dating back to the development four thousand years ago by the Egyptians of fermentation, bread making, brewing and cheese making.[4] Modern biotechnology or genetic modification by contrast transfers DNA from one organism to another, so allowing the recipient to express traits or characteristics normally associated with the donor.

Though plant breeding existed for thousands of years, it became a scientific endeavor only after Gregor Mendel formulated his laws on inheritance in 1866. Originally, Gregor Mendel's genetic theory was used to manipulate and improve plant species. This was called classic selection. This method is however said to be arbitrary and it can take several years to develop a new variety. On the other hand, genetic modification, by contrast, is said to be quicker and more predictable.[5] Gregor Mendel's theory can only cross breed among different varieties of the same species where as genetic modification can transfer a gene from one species to another such as from animal to a plant.

After the discovery of the three-dimensional double helix structure of DNA, scientists were able to identify and splice genes from one kind of organism into the DNA of another. The first genetically engineered organisms were single celled bacteria, in to which human genes for valuable products such as insulin (for

[4] Jules Pretty. 'Genetic Modification: Overview of Benefits and Risks. University of Essex
[5] supra note 1 p. 4

diabetics) or human growth hormone (for children whose growth is severely retarded) had been transplanted. The bacteria were then able to manufacture these useful proteins in large amounts.[6] In 1982, the United States Food and Drug Administration approved the first genetically engineered drug, a form of human insulin produced by bacteria. This was the first consumer product developed through modern bioengineering.[7] Other products followed such as the first recombinant vaccine for humans.

Moreover, farmers have long crossed plants displaying favorable traits in order to produce an improved hybrid. Consequently, almost all of the food that is eaten today is no longer from genetically pure species.

The powerful new tool of biotechnology is genetic engineering and the associated recombinant DNA technology that makes it possible. These techniques give human kind the ability to create new plants, animals and microorganisms with properties they could never have acquired naturally. New organisms are now being created not according to the natural laws of survival, but according to human will. According to Robert Walgate, the results will inevitably be profound: they may be destructive: they may be creative. They will probably be both.[8]

---

[6] Robert Walgate, Miracle or Menace? Biotechnology and the Third World London: Panos Publications (1990) p2

[7] http://ww tmsce.com/biotech/timeline.html visited on 22/7/05

[8] opcit p2

1.3 POTENTIAL RISKS OF GMOS

One of the reasons as to why GMOs have fueled so much debate is because it has not been established as to what extent they can be harmful. Though assurances have been made as to their safety, some consumers are still not satisfied. The question of potential health and environmental risks associated with GM crops is a major point of debate. All sides in the debate acknowledge that GM technology is not risk free. There is disagreement over the extent to which potential risks become actual risks.[9]

1.3.1 POTENTIAL RISKS TO HEALTH

Proponents of GMO argue that the potential benefits are greater than the risks. The fear is that people may consume without knowing the effects of these organisms on their health. However it is claimed that there is not a single proven instance of it being harmful. Some potential risks put across by critics of this technology are that there could be allergenic and immune system reactions to new substances contained in the foods. There is also the fear that these organisms can transfer antibiotic resistance markers.[10] Though no one has died from consumption of GM foods, opponents cling to the precautionary principle. They are holding from using this new technology until there is conclusive evidence that it will do no harm.

[9] supra note 1 p8
[10] http://www.ornl.gov/sci/techresources/Human_genome/elsi/gmfood.shtnol visited on 5/3/2005

1.3.2 POTENTIAL RISKS TO THE ENVIRONMENT

The traits most often introduced in GM crops have been insect resistant herbicide tolerance to enable improve insect pest management and weed control.[11] Some of the environmental risks cited are genetic pollution and horizontal gene flow to wild or weeds that are related to the crops. The fear is that the bio-engineered crops may cause wide reaching damage to the environment. For example, insect resistant crops may harm species that are not their target. It is also believed by the critics of this technology that the insects that the GM crops are designed to kill could develop resistance to these crops, ultimately requiring farmers to use more aggressive control measures such as increased use of chemical sprays.

It is also claimed that the gene transfer could also cause non-GM crops to be contaminated by GM crops in neighboring fields threatening the rich crop diversity of many developing countries. It is feared that the transfer of pesticide resistant genes to related weeds might produce 'super weeds'. Those immune to commonly used control methods.

1.4 ARE THERE ANY BENEFITS THAT CAN BE DERIVED FROM GMOs?

Proponents of GMO's have put across a number of benefits that can derive from GMOs such as the ability to control weeds easily. This, it is said will lead to increased profits through lower labour requirements. There will also be less environmentally damaging herbicides, which will replace more toxic chemicals.

There could also be increased yields through better weed management and, therefore, increased profits. Genetic modification can provide reduced crop losses through disease if the crop is modified in such a way so as to make it disease resistant. This in turn will reduce the application of fungicide.

Some crops may be modified in order to enable them mature in the shortest time possible while others may be modified in order to withstand drought or grow in poor soils.[12] Some forms of genetic modification may even allow some food to have longer shelf life and enhanced nutritional content.

Despite the above potential benefits that GMOs have, there is so much controversy both internationally and national which centers not only on health and the environment but also on trade, ethical and uniqueness of the technology itself. Other controversies include the definition of patent and property pertaining to products of genetic engineering. All these controversies will be dealt with in the chapters following.

[11] Report on the Fact Finding Mission by Zambian Scientists on Genetically Modified Organisms. P29
[12] http://www. Genewatch.org/crops AndFood/Basics/traits.htm visited on 5/3/2005

CHAPTER TWO

2.0 THE INTERNATIONAL DEBATE ON GMOs

The debate is mainly between the European countries and the United States of America. America is the world's largest grower of genetically modified crops. By contrast, genetically modified activity in the European Union member states is minimal, partly because the European Union had ended a six year moratorium on growing genetically modified crops in 2003.[1]

2.1 THE EUROPEAN UNION AND UNITED STATES DISPUTE

In 2002 when Southern Africa was hit by famine, the United States Government had called on the European Union to urge Southern African States not to reject grains that contained genetically modified strains. The European Union declined to intervene. They rejected the call from the United States Government for it to reassure African countries that genetically modified food aid from America was safe.[2]

The United States, Canada and Argentina are the largest producers of genetically modified organisms and they have encountered some difficulty in exporting these products to the European union and developing countries. These countries have accused the European union of having influenced developing countries, especially

[1] 'The GM Debate- Who Decides? An analysis of decision-making about genetically modified crops in developing countries.' London; The Panos Institute. Page 13

[2] http://www.gmfoodnews.com/re220802.txt visited on 30/3/2005

those in Africa to reject GM foods. As a result of the European Union stand, it is alleged that most African countries are shying away from investing in this technology. The three countries went ahead to raise a complaint against the European Union with the World trade Organisation as a result of the policies adopted by the EU concerning Genetically modified organisms.

The World Trade Organisation is responsible for regulating international trade. It was established to remove discriminatory practices and barriers to free trade. It oversees a set of agreements, which forms the rules by which trade operates. Under the World Trade Organisation, member countries have been obliged to allow imports if the imports have been proved to be safe, that there would be no risk to health, both to animals and humans and that they posed no risk to the environment.

The European Union had placed a five-year moratorium on genetically modified organisms that the United States claimed was harming farmers its farmers and denying the consumers the benefits of genetically modified crops. The EU adopted several Directives, which required a case by case evaluation of potential risks to human health and the environment before any genetically modified organisms could be placed on the European Community. On the basis of the evaluation, authorisation could either be granted or rejected. The Directives further provided for a labeling as well as a traceability system. Traceability is required for products containing genetically modified and food and feeds from

genetically modified organisms. It is meant to facilitate withdrawal of food and feed from the market if any unexpected adverse effects were to arise.[3] Two new European Union Regulations concerning the authorisation, traceability and labeling of genetically modified organisms and GM derived products became law in September 2003 and came into force in April 2004. It required that all foods and animal feed that contained at least 0.9% of GM ingredients or more be labeled. The idea was that consumers should be able to make their own choice as to whether to GM products or not. Most biotechnology companies are opposed to the labeling of GM foods and feeds as they fell that they are no different from conventional foods. It is however believed that consumers must be given a right to choose. In this way, the consumer is expected to take some form of responsibility for choosing the foods. The United States has argued that the American consumers have been eating such foods and have not been put at any risk in any way, therefore such Regulations are baseless.

Approval as to whether to allow the release of genetically modified organism in the European Community does not rest with any one Government. Approval has to go through the three component organs of the European Union.[4] That is, the European Commission the European Parliament, and the Council of Ministers. In the United States of America on the other hand, the Food and drug Agency indicates after what it deems adequate testing, that it will not oppose the use of the

[3] Simonetta Zarilli 'International Trade in GMOs : Legal Frame Works and Developing Country Concerns' at http://www.UNCTAD/DITC/TNCD/2004/1 visited on 8/9/05

[4] supra note 1 at p14

product. The United States Department of Agriculture likewise has to be convinced that the new plant is not going to a pest, but then allow its use. Approval as such is not required of a genetically modified organism.[5]

The European Union was applying the precautionary principle in applying the moratorium and as a result, there was a differing approach to the regulatioin of genetically modified products between Europe and The United States of America. The barrier was imposed because of the concern over the safety of genetically modified organisms. This brought pressure on the European Union from the United States, Canada and Argentina to lift the moratorium because they had a lot to lose if the restrictions continued. The United States feels that there is no need for special Regulations in the treatment of genetically modified organisms.

In reaction to the complaint lodged at the World Trade Organisation, the European Commission begun to modify its position on the regulation of GM food in Europe. The Commission indicated its willingness to end the moratorium on the introduction of new genetically modified organisms in agriculture. Responsibility for the protection of organic agriculture from contamination by genetically modified organisms was left to member countries. Later on the Commission and the European Parliament reached a compromise in which the latter accepted that the member states were the ones to be responsible to avoid

[5] Tim Josling. 'Whose Afraid of the GMO? EU and Us Trade Disputes over food safety and Biotechnology' Seminar paper presented at the Center for International Studies and the European center of California- University of Southern California

contamination. This was done through a formal amendment to the European Regulation on genetically modified food and seed.

These amendments have been criticised because it is felt that member states may come up with different standards with regards to Genetically modified organisms and this will increase the dangers of contamination of organic foods. It is also believed that the biotechnology companies may weaken the protection standards that the countries may come up with by playing the member states against each other. The argument is that GM producers in the North will be able to force acceptance of GM food through out both the developed and the developing world.

2.2 UNITED NATIONS POLICY

Most of the organs of the United Nations such as the World Health Organisation, World Food Programme and the food and Agriculture Organistion have not opposed the introduction of GM foods or GM technology. The United Nations came up with a policy in 2002 and a joint United Nations statement was issued on the 27th of August 2005.[6] It highlighted potential environmental issues related to maize but pointed to the fact that GN foods that were being marketed presented no known risk to human health. The Joint United Nations statement endorsed the World Food Programme policy whereby each government had the right to accept or reject any such food donations.[7]

---

[6] WORLD FOOD PROGRAMME Policy on Donations of Foods Derived from Biotechnology (GM/GE4/WFP) at http://www.mindfully.org/GE/GE/WFP_Donations_GM_Foods 14oct02.htm visited on 5/6/2005

[7] ibid p13

With regard to all donations of food, the World Food Programme policy has been that all Governments make their own decision as to whether to accept the food containing or consisting of genetically modified organism or not. If a government accepts the food, the World Food Programme will set up terms for import of such food. If a government puts up a condition that such food, if it is maize or soybeans, must be milled, then the World Food Programme will adhere to such a demand. The Food and Agriculture Organisation and the World Health Organisation have not undertaken any formal safety assessments of genetically modified foods. It is the donors who certify that the foods are safe for human consumption.[8]

Based on national information from a variety of sources and current scientific knowledge, the Food and Agriculture Organistaion, the World Health Organisation, and the World Food Programme hold the view that the consumption of foods containing genetically modified organisms that were being provided as food aid in Southern Africa was not likely to present any human health risk.[9]

If the above organs would like national governments to make their own decisions whether to accept genetically modified foods or not it is then only right that consumers be given the same choice through labelling.

[8] ibid p.9
[9] ibid p10

2.3 THE QUESTION OF PATENTING

In 1980, the United States Supreme Court granted the first patent on a living organism. Until then, patents on life forms were not allowed, partly because it seemed to go against the philosophy behind patenting, which is to reward human inventions, and not living things or works of nature.[10] The Supreme Court in **Diamond v Chakrabarty**[11] ruled that genetically altered life forms could be patented. This decision allowed the Exxon Oil Company to patent an oil eating micro organism. The Chief Justice said that the issue was not one of patenting matter, whether alive or not. Rather it was an issue of whether the bacterium could be classed as naturally occurring or as a human invention. The judges decided that, as the organism did not exist in the past, it had to be seen as 'a product of human ingenuity'.

Genetically modified organisms are produced through genetic engineering that allows scientists to reorder the basic building blocks of life in order to create new varieties of living organisms. Billions of dollars are spent each year on such technology and as such it is seen as a priority to obtain a patent protection, which guarantees the exclusive right to commercialise the end product.

A patent is a governmental grant conferred upon an inventor or a discoverer of a new and useful art, machine, manufacturer or composition of matter, securing to the patentee the right to exclude all others from making, using or selling the invention.

---

[10] supra at note 1

[11]

Generally, this right to exclude all other from exploiting the patented product operates to invest the patentee with a monopolistic franchise to make, sell or use the patented invention. Patenting of seeds and animals endows the patent holder with exclusive economic rights that prevents farmers from engaging in the tradition of saving and exchanging seeds, without payment of royalties. Those who are pro-genetic modification argue that protection of intellectual property is necessary to forster research and development of new, beneficial products. They further argue that patents will encourage the dissemination of new discoveries of genes and bioengineering processes, for example, by giving inventors an incentive to share their discoveries.

However, the other side of the argument is that it may encourage biopiracy, the virtual theft of natural resources from developing countries. A biotech company might take a plant from a seed that has been preserved by the local farmers for many generations and after introducing a new gene in to the seed, such a company may then go ahead to have the seed patented thus taking the seed from the public domain in to the private domain.

This can be illustrated by the controversy between India, Pakistani and a Texan company called Rice Tec. The decision to grant Rice Tec a patent caused an uproar in India and Pakistani. The two countries felt that Rice Tec was claiming to have invented traits, which were already in existence in the traditional Basmati rice

varieties that had been grown on the sub continent for centuries.[12] Campaigners claimed that this patent gave Rice Tec a broad based patent which would allow the company to prevent growers from freely using their own seed and which could stop them from exporting their products to the United States. However, in May 2001, the Patent and Trademark Office revoked a number of claims by Rice Tec. It was decided that the rice lines, plants and grains detailed in the claims were substantially the same as the types of Basmati already grown in India and Pakistani and therefore could not be patented.

Beranard Le Buanec, the Secretary General of the International Association of Plant Breeders has said that biopiracy is not actually possible. If someone isolates a gene but there is no new use to which this can be put, then they cannot get protection. If something already exists, and a patent is given, this right can be cancelled by the relevant office as demonstrated in the Basmati case.[13]

Patenting is justified on the grounds that it is an incentive necessary to motivate the profit motivated private sector to meet public needs like the provision of increased agricultural yields and life saving therapies and diagnostic techniques. According to Robert Walgate, companies and others that develop useful biotechnologies such as modified genes, or old genes in new aim to patent them in order to get the most return on their investment.[14] It is most unlikely that companies like Monsanto would spend

[12] Joff Wild "The Future for Patents on Life" January 2002.
[13] Ibid

[14] Robert Walgatep141

huge sums of money on genetic engineering if there were no profits derived from such technologies and what better way to realise profits than through patenting. In this way, it would ensure that farmers paid royalties. If the benefits were freely given then there would be no return on the investment. People deserve to enjoy the fruits of their intellectual work and thus such work must be in all fairness be protected, it is argued. Proponents of patenting further argue that countries that offer weak or limited protection would suffer economic losses, as investors in the biotechnology industry will look elsewhere.

The whole notion of patents or any type of intellectual property protection for life forms runs contrary to the traditional ways in which the properties of life forms are bred and nurtured in many parts of the world where notions of common ownership and collective development predominate. The granting of patent rights putts in to private hands what is considered to be a common inheritance. It imposes potential hardship on the farmers who will be forced to by patented seed or pay royalties for each planting season. Patent protection for biotechnology is strongest in the United States of America and political pressure is strongest that developing countries should recognise US patents. Most African farmers are peasant farmers and as such may not be in a position to benefit from such arrangements.

One dimension of genetically modified organisms is that the methods used to create the seeds lie in the hand of a few multinational corporations. This means that there are substantial private benefits for the companies producing them. It also means that

farmers no longer have the right to own the seeds as they cannot reuse the seed without permission. Some companies own both the seed and the herbicide meaning that a farmer is left at the mercy of the multinational companies.

2.3.1 TRADE RELATED ASPECTS OF INTELLECTUAL PROPERTY (TRIPS)

Another aspect of the GM controversy arises from the World Trade Organisation Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). The main objectives of the TRIPS agreement are to establish adequate and effective levels of protection for intellectual property rights and to reduce distortions and impediments to international[15] trade from differing standards of protection. The Trips Agreement lays down minimum standards in a number of areas. As to inventions, article 27 paragraph 1 requires member countries to grant patents in all areas of technology without discrimination. Article 27 paragraph 2 provides a general exception to this. A World Trade Organisation member need not grant patents for inventions objected to as being contrary to ordre, public or morality. Article 27 paragraph 3 further allows exceptions for plants, animals and essentially biological processes. However it requires some protection for plant varieties, whether by patents or otherwise.

Developing countries by accepting to improve the standards of protection under the TRIPS Agreement assumed a wide range of obligations in almost all areas of intellectual property rights, that is, copyright and related rights, industrial designs,

[15] http://www.iccwbo.org/home/statements_rules/statements/199trips_and_bio_convention.asp visited on 8/9/05

trademarks, patents, and plant varieties protection. Most developing countries did not provide for protection of plant varieties.

An issue of contention is based on the assumption that intellectual property rights allow the existing material to be taken out of public use and that TRIPS by allowing the protection of plant varieties will encourage biopiracy. Farmers will no longer be able to keep and reuse seed from the previous season, as it has been their tradition. There have been reports in which Monsanto and Pioneer Hi Bred International have sued some farmers in the United States who have planted seed that they had saved from the previous years. Moreover, the companies may use technology on their genetically modified seed that would ensure that any seed saved after a harvest does not germinate. An example is the terminator gene technology. Such technology will transfer power from the farmer to the companies.

There have been other concerns that have been raised such as that plant variety protection threatens food security and agrobiodiversity and that it forsters the monopoly and dependence on foreign companies for seed.[16] There is also concern there could be exploitation of the technology by the companies that have obtained such rights. Such exploitation it is feared may lead to activities that will damage the environment. For example, that a patent on a genetically modified organism can promote its commercial exploitation, which may have unforeseen damaging environmental effects. Or that protection for a new plant variety, however benign

that variety's properties, can promote over-wide commercial use, with loss of biodiversity in the form of less productive but more diverse traditional varieties.[17] One of the consequences of plant varieties protection will be hardship on farmers especially those in Africa. They will be at the mercy of these multinational companies, which control the availability of genetically modified seeds for basic crops such as maize and soybeans. This is a serious threat to the livelihoods and independence of such farmers, to the food security of their communities and to the sovereignty of their countries.

2.4 WORLD HUNGER

It is argued that biotechnology may help to alleviate the world hunger problem. To understand whether this is true, it is necessary to examine the causes of hunger. Hunger stems not necessarily from lack of food, but also from economic and political reasons. The world may produce enough food yet millions of people in the world remain hungry. Certain groups are hit the hardest by hunger including women, children, people in rural areas and those living in under developed nations. The causes of poverty and hunger include demographic changes, lack of economic prosperity, environmental degradation, lack of infrastructure and illiteracy, war and strife. Food security is not a technological problem. It is a matter of inadequate means of production of the world's poorest peasant farmers who cannot meet their own needs locally and lack of purchasing

[16] George Mpundu Kanja "Implications of TRIPS Agreement on Small Farmers in Developing Countries with Particular Emphasis on Africa"> A paper presented at WIPO_WTO Colloquium for Teachers of Intellectual Property Law, Geneva, 28th June to July 9th. P3
[17] opcit

power of both the urban and rural poor. It is untenable to think that any one approach or technology can solve the problem. Biotechnology can merely be a part of a solution.

Some opponents argue that biotech companies are using world hunger as a form of moral blackmail to sell genetically organisms. Consumers feel that they have to accept biotechnology or else they feel guilty about standing in the way of progress to help stop world. The companies make themselves out to be the saviours of the hungry people but they do not actually use their expertise to help developing nations because they have no profit incentive.

It is actually felt that the technology would actually contribute to world hunger by making farmers dependant on private corporations for seeds or other agricultural necessities. With the introduction of terminator technology, it is doubtful whether farmers could afford to buy new seed each year since more than half of the word's farmers is poor. It is argued that solving world hunger is not an inherent characteristic of biotechnology, but it can help if its benefits are shared with those who need it most.

CHAPTER THREE

3.1 THE DEBATE IN ZAMBIA

While most countries in the world had been embroiled in the debate on genetically modified organisms for some time, it only became an issue of discussion in Zambia when donations of food aid were made after the famine in 2002. Many of the people had never heard of genetically modified organisms or what they were. There seemed to have been inadequate information at the time. With such a situation, the debate was between the government, the World Food Programme and the donor countries like the United States of America. The majority of the Zambian people did not know what genetically modified organisms were. The United States accused Europe of exaggerating the risks to health and the environment and charged that most African countries like Zambia refused to accept or invest in the technology because of such exaggerations.

The government, despite the famine being experienced in the country rejected the maize. The government went ahead to ban genetically modified organisms in the country until it was satisfied with their safety to humans and animals. The concerns that were expressed through the media were that genetically modified organisms could suppress the immune system in the human bodies. It was felt that the food could not be given to starving people as it was not known what the risks were. Some opponents argued that this technology would perpetuate

dependency on producer organisations that have patented their products.[1] Another fear was the presence of terminator genes, which could make the seeds sterile. This would be a disaster for small-scale farmers who keep from a harvest for planting in the next farming season. Some people felt that genetically modified seeds were a threat to agriculture especially to small-scale farmers and those practicing organic farming. The fear was that fields planted with GMO seed could contaminate organic fields. Organic farmers would no longer be in a position to guarantee their products.

The risk of losing the European market on agricultural produce once Zambia accepted the maize was one of the arguments. Agriculture Minister Mundia Sikatana said Government feared that Zambia could lose its European market if it introduced GM crops.[2] There was a risk that most small-scale farmers would keep some of the seed for planting and once this was done, there was a possibility of having maize and animal feed containing traces of GM on the market. If Europe rejected agricultural produce from Zambia on the basis that it was genetically modified, then this would have an impact on the economy.

There was lack of information concerning genetically modified organisms especially on their effects and use. Above all, there was no legislation to regulate the import use GMO seed. As result of the above concerns, the government sent a team of scientists on a fact-fining mission on genetically modified organisms in

[1] G. K. Kanja. Biotechnology and Law in Africa Book Questionnaire. P9

October 2002. The scientists visited the United States of America, the Republic of South Africa, the United Kingdom, Belgium, Norway and the Netherlands. The team had the following terms of reference;[3]

(a) to obtain views on genetically modified foods especially maize in terms of food safety, Environment, Trade and Ethics from the regulators, interest groups and farmers

(b) Study the Biotechnology and Biosafety regulatory processes and,

(c) Explore the possibility of obtaining some assistance to build national capacity in Biotechnology and Biosafety

(d) Determine the acceptance of GM foods especially maize.

After the mission, the scientists submitted a report. The report highlights how the countries visited deal with genetically modified organisms and the regulatory mechanisms that are in place. It also highlights the potential risks and concerns raised over genetically modified organisms such as environmental risks resulting from gene flow and genetic erosion concerns, development of herbicide tolerance weeds and the effect of GM crops on non target organisms. It also addresses the issue of food safety, capacity building, trade and ethical issues.

The team came up with the following conclusions;

(a) the distribution of GM maize grain carries a high risk of eroding the local maize varieties

[2] Times of Zambia, "Anti-GMO scientists accused of bias as tempers flare at bio-tech conference" Wednesday, November 29

(b) the safety aspects of GM foods are not conclusive

(c) on trade, there is a potential risk of GM maize affecting the export of baby corn and honey in particular and organic foods in general to the European union if planted.

(d) All countries visited had regulatory mechanisms

(e) There is generally good will to assist Zambia to build capacity for biotechnology and biosafety.

(f) There is a universal agreement that GMOs should not be introduced without the explicit consent of recipient countries.

The recommendations were that;

(a) The government should maintain the current stand of not accepting GM foods by employing the precautionary principle on Genetic Engineering.

(b) The government should adopt the draft Biotechnology and Biosasfety Policy and enact the Biotechnology and Biosafety Regulations as soon as possible because this will facilitate the establishment of the regulatory, assessment and monitoring mechanisms which are necessary for dealing with GMO which are in the country and those which might come later.

(c) The government should ratify the Cartagena Protocol because it will facilitate Zambia's appropriate interaction on issues pertaining to transboundary movement of GMOs with other countries on issues of Biotechnology and Biosafety.

[3] Report of the Fact – Finding Mission undertaken by Zambian Scientists on Genetically Modified Foods

(d) The government should follow up the possible support for capacity building from USAID, the United Kingdom, the Republic of South Africa, Norwegian and the Netherlands governments.

(e) The government should establish the types of GM maize which is in the country now and the ones which have been consumed by the Zambian people, in order to establish whether Gm maize with Starlink or antibiotic resistant bacteria markers have been imported in to Zambia. These have been found to be potentially harmful to humans

(f) The government should ensure that a delegation attends the WFP executive

President Mwanawasa rejected the food aid citing health, environmental, trade and market share concerns. This decision came after the team had submitted their report.

As at now November 2005, Zambia has maintained its stand on GM foods. Some of the recommendations have been implemented. The government has adopted a Biosafety Policy and it has ratified the Cartagena protocol on Biosafety. Currently, there is no research and development in Zambia on genetically modified crops or other genetically modified organisms. [4] This could be due to the fact that there is no legislation that is in place yet. However, in the late 1990s there was an attempt to conduct field trials on Bt cotton. Such attempts were abandoned until a national regulatory system was in place.[5]

[4] Peter Gregory and Lovemore Simwanda. Agricultural Biotechnology and Biosafety in Zambia. P. 4
[5] ibid

It has adopted the National Biotechnology and Biosafety Policy. The Policy was issued in August 2003 by the Ministry of Science, Technology and Vocational Training. The mission statement of the policy is to guide the judicious use and regulation of modern biotechnology for sustainable development of the nation, with minimum risks to human and animal health, the environment and biological diversity. The policy has got four objectives;[6]

1. to support safe application of biotechnology techniques for the enhancement of Zambia's socio – economic and environmental well being
2. to support the development of regulatory capacity to assess, test, monitor, and control for the safe application and commercialisation of Biotechnology in accordance with agreed Biosafety legislation and guidelines
3. *to ensure effective control of transboundary movements of Genetically* Modified Organisms (GMO) or products thereof resulting from biotechnology through the exchange of information and risk assessment as well as a transparent system of advance informed agreement.
4. To ensure the safe and judicious use of biotechnology with a view to maximising its potential benefits while avoiding to the maximum extent possible, any adverse effects on human and animal health as well as to the environment.

The policy has nine guiding principles that are to be taken in to account when implementing the policy. These are;

1. The precaution Principle

2. Advance Informed Agreement
3. Recognition of Undesirable Effects of GMO(s) and Products thereof
4. Risk Assessment
5. Socio – economic Impact
6. Public Participation
7. Liability and Redress
8. conservation of the Biological Diversity and Trade
9. Rights over Genetic Resources and Technologies

Implementation of the policy is to be done through the National Biosafety Authority.[7] The establishment of the National Biosafety Authority is provided for under the draft legislation. This then means that the policy cannot be implemented, as the law that is supposed to set up the National Biosafety Authority has no yet been enacted. In an interview with Dr. Dorothy Mulenga at the Ministry of Science, Technology and Vocational Training, it was disclosed that the proposed Biosafety Bill has not yet been tabled before parliament. Dr. Mulenga could not say as to when the Bill would be presented to Parliament as it was now with the Ministry of Justice. However, she pointed out some of the provisions that are to be found under the Act such as the establishing of a National Biosafety Authority. The Authority shall be a body corporate and will be composed of 13 members to be appointed by the government. The proposed bill also outlines the functions of the National Biosafety Authority and establishes

[6] The National Biotechnology and Biosafety Policy. P6
[7] ibid .p12

an Advisory Committee. The committee will act as the national advisory body on matters relating to GMOs. It will also render advice to the Minister or Authority on any matters relating to GMOs.

The proposed legislation will apply to the import, export, transit, contained use, release or placing on the market of any GMO whether for release in to the environment, for use as a pharmaceutical, food, feed or processing of a product. The National Biosafety Authority will not give its approval where there is reason to believe that harm or damage may occur or where there is lack of scientific evidence. An applicant will be required to carry to obtain approval from the National Biosafety and to carry out a risk assessment of the impact of that the GMO will have on the environment and to human and animal health. Approval from the Authority will be withheld were there is evidence that the GMO pose risk to human health and the environment. It was also revealed that the proposed legislation has a liability regime. Liability for any damage will be borne by the user. It must however be proved that damage caused is by the GMO. Labelling is also a requirement. It however, remains to be seen what the final document will look like.

The policy highlights the fact that there is no law in the existing Zambian statutes that can be used to protect human and health as well as the environment, including biological diversity from potential risks posed by GMOs and products. The laws that are in existence deal with the transfer, handling, release and use of

an Advisory Committee. The committee will act as the national advisory body on matters relating to GMOs. It will also render advice to the Minister or Authority on any matters relating to GMOs.

The proposed legislation will apply to the import, export, transit, contained use, release or placing on the market of any GMO whether for release in to the environment, for use as a pharmaceutical, food, feed or processing of a product. The National Biosafety Authority will not give its approval where there is reason to believe that harm or damage may occur or where there is lack of scientific evidence. An applicant will be required to carry to obtain approval from the National Biosafety and to carry out a risk assessment of the impact of that the GMO will have on the environment and to human and animal health. Approval from the Authority will be withheld were there is evidence that the GMO pose risk to human health and the environment. It was also revealed that the proposed legislation has a liability regime. Liability for any damage will be borne by the user. It must however be proved that damage caused is by the GMO. Labelling is also a requirement. It however, remains to be seen what the final document will look like.

The policy highlights the fact that there is no law in the existing Zambian statutes that can be used to protect human and health as well as the environment, including biological diversity from potential risks posed by GMOs and products. The laws that are in existence deal with the transfer, handling, release and use of

animals and plants. Other laws deal with protecting the general public and the environment from possible effects of industrial activities. The country has no laws that deal specifically with the transfer, handling and use of microorganisms. Though the Policy states that it is possible under the current scenario to ensure that biotechnology research, development, application and commercialisation is carried out with minimum adverse effects both to human health and the environment, the Policy highlights the fact that the non existence of legislation could pose a risk.as Zambia could be attractive to foreign countries wishing to test their products that cannot be tested under tough regulations.[8]

The Policy without any form of law to back it up is not enough. Effective biosafety regulations or policies must have legal backing. There is need to enact legislation as soon as possible considering that some traders had imported GMO millie meal. The Minister of Agriculture Food and Fisheries disclosed in an interview with the Zambia National Broadcasting Corporation that some Millie Meal in Livingstone had been found to contain genetically modified organisms.

3.2 COMPARATIVE ANLYSIS WITH SOME SADC COUNTRIES

It should not come as a surprise to the rest of the world that some countries in Africa rejected the food aid in 2002 and that there was confusion as there is little application of GM technology and hardly any policies at all in most of the countries. Most countries in Southern Africa lag behind in gene technologies. It

[8] Ibid p6

is prudent at this point to make some comparisons with some countries that are part of the Southern Africa Development Community. The countries are Tanzania, Zimbabwe, Malawi and South Africa. These Countries have been chosen at random and not that there is anything unique about them.

3.2.1 ZIMBABWE

Zimbabwe was one of the countries that accepted the donated GM maize in 2002 under the condition that it be milled under supervision before it could enter the country. Like Zambia, it is party to the Convention on Biological Diversity and the Cartagena Protocol on Biosafety. The country has adopted a National Science and Technology Policy, which emphasises the need for the country to embrace biotechnology, develop its own capacity to utilize the science and also ensure that the application of modern biotechnology does not compromise human health and environmental quality.[9] Thus any importation, transportation and use of Living Modified Organisms can only be done if sanctioned by Biosafety Board. The role of the Board is to manage the transfer and use of Living Modified Organisms. The Boards decisions are based on risk assessment. The import, export, production, testing, uses and release in to the environment of GMOs in Zimbabwe is governed by the Research Amendment Act of 1998 and the Research (Biosafety) Regulations of 2000 and in addition, Biosafety Guidelines for risk assessment and standard procedures for carrying out inspections have been

[9] ibid

developed.[10] Zimbabwe, however, has not yet reached the stage of commercialising GMOs.

3.1.2 SOUTH AFRICA

South Africa is the only country in Southern Africa today growing GM crops on a commercial scale.[11] The **Genetically Modified Organism Act** was passed in 1997. The Act provides for measures to promote the responsible development, production, use and application of genetically modified organisms. The Act under Section 3 (1) establishes the Executive Council of Genetically Modified Organisms. The responsibility of the council is to approve and monitor activities involving GMOs. The country has a National Biotechnology Strategy. The National Strategy recommends the establishment of a Biotechnology Advisory Committee to be responsible for implementing the strategy, coordination of biotechnology research and development and in alignment with national priorities. Apart from this Act, the country is also a party to the Convention on Biological Diversity and has ratified the Cartagena Protocol on Biosafety.

There is a very active import and export market of GMOs in South Africa. For example, in 2004, it is said to have granted twenty permits for commodity imports of GM maize. Forty-Five permits were granted for plantings, field trials or trial

[10] ibid

releases of GM maize. Permits for import of GM maize were granted to Companies like Monsanto, Cargill, Pioneer, Panner and South African Companies like Meadow Feeds.[12] At the pace that Zambia seems to be moving it will be a long time before it reaches this stage.

3.1.3 TANZANIA

Tanzania like Zambia has no legislation on biosafety. However, it has not imposed a ban on GMOs. Unlike Zambia, which has already adopted a Policy, Tanzania, is in the process of drafting the National Biosafety Guidelines, to facilitate the importation and use of GMOs and their products in Tanzania. The guidelines are not binding.[13] This means that the guidelines lack the force of law for compliance and enforcement purposes. Genetically modified organisms imported in to Tanzania for the purposes of release in to the environment are dealt with in accordance with the Advanced Informed Agreement procedure of the Cartagena Protocol on Biosafety. Where as the Biosafety Protocol allows decision making to take place in accordance with the precautionary principle,[14] the guidelines are silent on the precautionary principle. Tanzania is party to the Convention on Biological Diversity and has ratified the Cartagena Protocol on Biosafety.

3.1.4 MALAWI

---

[11] Doreen Mnyulwa and Julius Mugwagwa. Agricultural Biotechnology in Southern Africa: A Regional Synthesis

[12] http://www.biosafetyafrica.net/south.htm visited on 15/11/2005

Malawi accepted the food aid in 2002 on the condition that it be milled. Before the controversy, the country did not have a legal framework. At the moment, the country has a biosafety legislation which, is legally binding and at the same time has a National Biosafety Committee. However, the country is said to have little capacity for risk assessment.[15] Malawi is party to the Cartagena Protocol on Biosafety. Marriam Mayet writes

"Malawi's law is unspeakably appalling, displaying a flagrant and contemptuous disregard for biosafety. It is the only "biosafety" law that we have seen so far, that mentions or deals with the issue of risks posed by GMOs to human health and the environment in its preamble only and not in its operational provisions".[16]

The law does not provide for any risk assessment to be carried out for GMOs. A person merely requires a licence for GMOs in order to import, develop, produce, test, release, and use and apply GMOs.[17] There is a provision for four types of licences in the Act. These are, products licence, manufacturers licence, wholesale dealers' licence and a dispenser's licence. The law is that of permits and licences.

South Africa, Zimbabwe and Malawi are said to be the only countries in Southern Africa to have a legal framework on genetically modified organisms. Most

---

[13] Marriam Mayet. "Comments on the National Biosafety Guideline for Tanzania, Third Draft" March 2005.

[14] See Article 10 (6) of the Protocol

[15] **GMOs in African Agriculture: Country Status** at http://www.biosafetyafrica.net/south.htm visited on 15/11/2005

[16] Mrriam Mayet. Analysis of Malawi's Biosafety Legislation. At www.Biosafetyafrica.net visited 21/11/05

[17] ibid

SADC member countries lack the capacity to deal with GMOs. This was manifested in 2002 when some country needed food aid. Countries like Zimbabwe, Mozambique and Angola accepted the food aid on the condition that it be milled prior to the distribution. The team of scientists sent by Zambia on a fact finding mission state in their report that the GM maize that is grown in America is mostly used for animal feed and not for human consumption. The effect on human beings is therefore not known. Most of the SADC countries are party to the Convention on Biological diversity and have ratified the Cartagena Protocol on Biosafety but they have not gone a step further to introduce their own local laws and regulations. In introducing any legal framework on biosafety, such framework must not be a means to deprive Africa of a promising technology, but a way of ensuring safe application based on sound science.

The debate on biotechnology and its impact on Africa has already moved to another level. The issue now is not whether to adopt biotechnology, but how to adopt it. The challenge surrounds substantive matters related to the technology and specific policies and institutions required to enable Africans maximise the benefits and minimise potential risks associated with biotechnology.

CHAPTER FOUR

4.0 INTERNATIONAL LAWS ON GMOs

Laws that specifically regulate GMOs inevitably point to the fact that GMOs are unique in their potential impact on human and anima health and the environment and cannot be regulated by legislation relevant to their particular product category, for example, pesticides and pharmaceuticals. The biotechnology industry has sought to argue that separate regulation is unnecessary and restricts the development of the industry.[1] The conclusion of the Cartagena Protocol on Biosafety indicates that the separate regulation view may be prevailing.

4.0.1 CONVENTION ON BIOLOGICAL DIVERSITY

This Convention was adopted in May 1992 and entered in to force in December 1993. Its objectives are to conserve biological diversity and to ensure the fair and equitable sharing of the benefits from utilising genetic resources.[2] The Convention requires contracting parties regulate, manage or control the risks associated with the use and release of Living Modified Organisms resulting from biotechnology and which may have adverse environmental impact.

The Convention recognises that some genetic resources have commercial potential. The Convention's measures go further than encouraging benefit sharing. They are designed to vigorously promote activities, including co-operation in research and development, and private investment to develop genetic

[1] Justine Thornton, " GMOs "The Laws" "

resources needed to create the products or technologies that will give rise to benefits to be shared.[3] The Convention also explicitly recognises and supports "adequate and effective protection" for intellectual property rights.[4]

4.0.2 THE CARTAGENA PROTOCOL ON BIOSAFETY

In January 2000, negotiations on a Biosafety Protocol under the Convention on Biological Diversity of the United Nations were completed in Montreal. The Cartagena Protocol on Biosafety aims to regulate trade in genetically modified organisms and it came in to force on 11th September 2003 after fifty countries had ratified it. In fact, it regulates the environmental safety aspects of international trade of GMOs, although these are referred to as Living Modified Organisms in the Protocol (LMOs).

The Protocol distinguishes three categories of LMOs, that is, LMOs for voluntary introduction into the environment like seeds for planting; LMOs destined for contained use, those have limited contact and impact on the external environment; and LMOs intended for direct use as food or feed, or for processing, that is, genetically modified soya beans maize or cotton. The Protocol does not cover consumer product derived from LMOs, such as corn flakes, seed oil, or tomato paste. Living Modified Organisms are defined in the Protocol as "any living

---

[2] ibid p.5

[3] **Trips and Biodiversity Convention : what conflict**? At http://www.iccwbo.org/home/statements_rules/statements/1999/trips_and_bio_convention.asp visited 8/9/2005

[4] Article 16 (2)

organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology."[5]

Under the Protocol, a country which seeks to export Living Modified Organisms for "intentional introduction in to the environment" such as seed for planting musk seek advance informed agreement from the importing country before the first shipment takes place.[6] The World Food Programme did not seek such agreement in the case of Zambia. It did not follow procedure as laid down under the Protocol. It requires a country to allow the importation of a GMO only after it has obtained all the necessary information about it and carried out a risk assessment to evaluate the likelihood of harm to human health, to agricultural systems, to its environment and to its socio – economic conditions. Exports of LMOs which are to be used for food, feed or processing do not have to go through advance informed agreements, rather trading partners will inform each other of their policies through a biosafety clearing house.[7] In this way, it ensures the safe handling, transfer and use of LMOs.

The Protocol is a progressive piece of legislation and despite its strengths, the limited notification required for LMOs, which are intended for food, feed, or processing may be perceived to be a weakness.[8] The system is less rigorous as it only requires countries to notify the Clearing House when they have made

[5] Article 3 (g)
[6] article 8
[7] article6
[8] **The GM Dispute at the WTO: Forcing GM Foods on Europe**. At www.genewatch.org

decisions about allowing the use of a GMO in their country and to supply certain information it. Getting an explicit agreement from each country that such LMO may then be imported is not required, although countries may still decide not to allow imports. The Protocol however, allows countries to have their own national requirements for the import of such LMOs. This is the approach adopted in Europe where all releases of GMOs have to be given specific approval.

The precautionary approach is one of the main features of the Protocol. It explicitly says,

"Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity in the Party of import, taking also into account risks to human health, shall not prevent **that** ***Party from taking a decision, as appropriate, with regard to the import of the living organism..., in order to avoid or minimise such potential adverse effects".***[9]

Importing countries can thus ban imports due to lack of scientific certainty. The ban may last until the importing country decides that it arrived at scientific certainty about the effects of the products on biodiversity and human health.[10] This means that countries should be able to ban or have strict controls on GMOs even if harm has not been proved to occur but the potential for it exists. Though

[9] Article 10

[10] Simonetta Zarrilli. International Trade in GMOs: Legal Frameworks and Developing Country Concerns at UNCTAD/DITC/TNCD/20041

Zambia received a lot of criticisms for rejecting the food aid, from the above, it can be seen that it was merely exercising its rights under the Protocol.

When it comes to implementing and regulating the Protocol, developing nations are faced with all kinds of problems for a variety of reasons. For instance, the Protocol depends on full information for its effective implementation. It requires a labeling and traceability regime to be negotiated. But the United States, the biggest producer of GMOs in the world, refuses to label them.[11] So countries like Zambia may not necessarily know when an unlabelled US GMO is imported in to the country. In the meantime, safety is compromised. More worrying is the fact that should a risk occur, it will be difficult to organise financial and technical capacity to combat such a risk.

The Cartagena Protocol on Biosafety does not have any provision for liability. This was deferred and it was stated that the rules would be adopted within four years of the Protocol coming in to force.[12] Some major signatory states have not ratified the Protocol and this may hinder the application of the Protocol.[13] Countries like the United States of America, and the Russian Federation have never signed on.[14] The United States of America is a supporter of the World trade Organisation. Under the WTO the precautionary principle is not a basis for rejecting food aid or trade. If developing countries like Zambia join the WTO,

[11] ibid
[12] http://www.biodiv.org/biosafety/signinglist.aspx?sts=stf&ord=dt
[13] countries like Australia, Canada and China
[14] opcit

this means that the it will be very difficult to exercise the precautionary principle under the Cartagena Protocol.

4.1 OTHER PROVISIONS

Apart form the above international instruments there is also the African Model Law on Biosafety, the SADC Guidelines on Biosafey and the Codex Guidelines.

4.1.1 THE AFRICAN MODEL LAW ON BIOSAFETY

The Model Law applies to the import, export, transit, contained use, release or placing on the market of any genetically modified organism whether intended for release in to the environment, for use as a pharmaceutical, for food, feed or processing. The Model Law it is hoped, will serve as a basis for assisting member countries when drafting their own national legislation. The Model Law like the Cartagena Protocol on Biosafety provides for advance informed agreement or explicit written approval of a competent authority.[15] Import of a GMO or a product of a GMO in to the country can only be done after approval is given in writing.

The Law also requires that a risk assessment be carried out in respect of the GMO. Identification and labelling is mandatory under the Model Law. Such identification is to specify the relevant traits and characteristics. This is for the purpose of traceability. This would in turn facilitate the withdrawal of a GMO

from the market should problems, such as harm to the environment or human health occur. The law provides setting up of a competent authority to follow up, supervise and control the implementation of the law. The Model Law has a liability regime unlike the Cartagena Protocol. It has been called a tougher law than the Cartagena Protocol in that it it requires companies who export GMOs to pay compensation for accidents involving the technology.[16] Under Article 4 of the Model Law, a person who imports, makes contained use of, releases or places on the market a GMO or product of a GMO is strictly liable for any harm that might be caused by such GMO. The Law requires the importer to make full compensation for the harm. Another difference is that all types of GMOs undergo the same type of rigorous system of assessment. It makes no distinction, as does the Protocol. However, the Model Law is not binding. There is no formal process in place that allows individual countries to adopt the Law. Mariam Mayet writes that the Model Law is an attempt to facilitate the harmonising of existing legislation in the area of biosafety and to ensure the adoption of unified legislation in Africa.[17]

---

[15] Article 4. African Model Law on Safety in Biotechnology at http://www.africabio.com/policies/MODEL%20LAW%20ON%20BIOSAFETY_ff.htm visited on 14/11/05

[16] The GM Debate – who decides? An analysis of decision – making about genetically modified crops in developing countries. A Panos Report. 2004

[17] Mariam Mayet. WHY AFRICA SHOULD ADOPT THE AFRICAN MODEL LAW ON SAFETY AND BIOTECHNOLOGY

4.1.2 SADC RECOMMENDATIONS ON GMOs.[18]

The guidelines deal with the handling of food aid, policy and regulations, capacity building and public awareness and participation. SADC countries are encouraged to source food aid from within the region. The guidelines further emphasise the need for donor countries to comply with the Prior Informed Consent found in the Cartagena Protocol on Biosafety. The guidelines require that food consignments that are GMO or may contain GMO in the form of grain should be milled before distribution. The Guidelines have a provision for labelling and identification as provided for under the Model Law. Member countries that have no legislation on biosafety are encouraged to use the Model Law or the South African Guidelines when it comes to handling food aid containing GMO and is on transit. Member countries are expected to develop national biotechnology policies and strategies and establish national biotechnology regulatory systems. They are also expected to ratify the Cartagena Protocol on Biosafety. It requires member states to conduct risk assessment on a case by case basis and that each genetic modification should be conducted in the environment in which it should be released. The SADC Advisory Committee on biotechnology and Biosafety formulated these Guidelines. They were approved by SADC in August 2003. They were meant to be interim measures aimed at guiding the region on issues relating to biotechnology and biosafety.[19] These are mere guidelines and have no binding effect.

[18] http://www.gene.ch/genet/2003/Oct/msg00003.html
[19] ibid.

4.1.3 THE CODEX GUIDELINES

The Codex Alimentarius Commission is a United Nations, World Health Organisation and Food and Agriculture Organisation body. It was established to develop harmonised international food standards and guidelines that protect consumer health and ensure fair trade practices.[20] Codex established a task force to develop risk assessment guidelines for the food safety aspects of GM foods, which were agreed by Codex in July 2003.[21] The guidelines do not address environmental risks and nor do they address animal feed or animals fed with the feed. The Guidelines support the necessity of risk assessment of food derived from biotechnology. The guidelines at present do no address the issue of labelling and traceability.

The Cartagena Protocol on Biosafety is the main instrument in international law that that regulates international trade in genetically modified organisms.

[20] opcit note 8
[21] ibid

CHAPTER FIVE

5.0. CONCLUSIONS

The research has revealed there is not enough information being distributed to the public on GMO. The debate in Zambia is not inclusive and after the controversy in 2002, there has been little debate going on. Zambia's decision to reject the food aid was criticised. The government was seen as trying to prove a point, that is, of having stood their ground against the United States of America, when in actual fact, it had no capacity to conduct any form of risk assessment on the maize. Even if the United States had conducted a risk assessment, there was need to conduct one since this was a novel situation for Zambia.

The major participants in the debate have been the government, some scientists and some international institutions. There has not been enough information given to other stakeholders like the Zambian people to enable them adequately take part in the debate, especially small-scale farmers who will be affected with the introduction of GM seed in the Country. In fact, the experience has been that officials in certain government departments react with dismay when people other than scientists or students of Agriculture or students of biological sciences ask for information pertaining to GMOs. The attitude is that such information should not concern people from other profession or other disciplines. If there is going to be adequate debate on the subject, the dissemination of information must be improved.

Most people have adopted the same stand as the government. There has been nothing much written or said in Zambia about the benefits of GMOs. In order to argue adequately and make informed choices, the people would need more information on both the risks and the benefits of GMOs. Most of the information reported in the media is negative.

On the international plane, the debate is mainly between the United States of America and Europe. Both sides have their own reasons for, for the United Nations, the issues is centered on trade. It requires a wide market for its produce, therefore, it requires laws that will favor trading in GMO hence its not signing the Cartagena Protocol on Biosafety. For Europe the issue is safety to human and animal health and to the environment. For the moment there is no known risk or adverse effects either to the environment or to human and animal health. However in his book, a Dr Smith[1] alleges that a lot of information has been distorted and that he had information on the dangers of GMOs. He alleges that most GM foods fed on animals produced adverse results. He also alleges that once GM Soya was introduced in the UK, soy alleges were on the increase. He has made a lot of allegations which it is felt should be answered by the proponents of GMOs. The concern is genuine and the proponents of GMOs have not come up with convincing reasons except to say that there are no known risks. There is need for more information, especially scientific evidence to prove Dr Smith wrong.

The GM seed may need inputs that are not readily available to small-scale farmers and considering that Zambia lacks capacity in GMO research, the precautionary stance is appropriate.

The issue of intellectual property rights may not be of benefit to Zambia since it has not reached such stage of technological advancement yet. There may be more of importing and less of inventions. Moreover, the technology will need a lot of investments in terms of finances, manpower and other inputs, which at the moment the country cannot afford. Most African countries are not fully prepared to deal with genetically modified organisms. In fact they may not even reach the stage at which they can reap the benefits of GMOs. They lack the infrastructure and the capacity to deal with GMO. Zambia may adopt legislation but it may lack the capacity to implement it. It will need money to set up the National Biosafety Board as well as to train personnel who will run the board and the Advisory Committee.

The issue of plant variety protection under the TRIPS Agreement may mean that small-scale farmers in developing countries no longer have the right to conserve seeds. this will mean that farmers will perpetually depend on the GMO producing companies for their seed input. Third world countries may not benefit from such arrangements as small-scale farmers are in majority.

[1] Times of Zambia, Dangers of GMOs laid bare. 28th September 2005

Some scientists in Zambia are not addressing the issue of how safe GMOs are. The main concern seems to be that they can boost food security in the country.[2] Genetic engineering alone cannot solve the hunger problem. However, it could be one of the tools that can be used to increase food production. Most if not all Multinational Corporations like Monsanto are not in to genetic engineering so that they can stop world hunger. There is so much invested in to genetic engineering and such companies would like to see a return on their investment. This can only be realised if farmers were to pay royalties in return for their seed.

It is impossible to keep a country GM free. While most of Africa's export is to Europe, its food aid comes from America. America is pro GM and is responsible for a large GM crop production. The acceptance of GM food aid means that it would introduce GM seed in a system that was GM free. This would be as a result of seed retention. Europe would in turn reject such imports and this could spell disaster for most African countries in terms of the economy.

5.2 RECOMMENDATIONS

Since THE Cartagena Protocol on Biosafety is the principal document in international law regulating trade in GMOs, it is imperative that countries all over the world sign and ratify the document. This is especially important for countries like the USA who are producing genetically modified organisms on a large scale. The Protocol should include a liability regime so that countries producing GMOs

[2] Times of Zambia"Is Zambia ready for GM Foods?" Tuesday , October 18, 2005

should be liable for any risks that might occur in the interim. With a liability regime, countries will be able to employ the highest standards in such processes.

The government in Zambia should enact the Biosafety legislation as soon as possible as further delay may pose serious problems. Unscrupulous companies may come in to the country and use it as a testing ground for GMO.

Zambia must only allow GM imports that are beneficial to the country and it is recommended that there should be mandatory labelling of GMOs and foods that contain GM. This is the only way in which consumers are given a choice. This should not be done away with when the law comes into force.

Parliament should have enough time to study the bill because most of the Members of Parliament may not know or understand the nature of genetically modified organisms. The only information that they may have is that they pose some risks to health. They may only know the negative side. Therefore, there is need to make available all the necessary information before the debate begins.

There seems to be no end to the debate and as such it is prudent that countries put in place safeguards that will ensure that minimum damage is caused both to human and animal health and the environment in the event that such risk does occur.

REFERENCES

BOOKS

Walgate, Robert (1990). Miracle or Menace? Biotechnology and the Third World. London: The Panos Institute

THE INTERNET

Mayet, Mariam. Why Africa should adopt the African Model Law on Safety in Biotechnology at www.Biosafety.net

Mayet, Mariam. Comments on the National Biosafety Guidelines for Tanzania, third draft at www.Biosafety.net

Mayet, Mariam. Analysis of Malawi's Biosafety Legislation at www.Biosafety.net

Olembo, Norah . Intellectual Property Rights Policy at http://www.ifpri.org/pubs/books/oc46/oc46contribs.pdf

Pretty, Jules. Genetic modification: Overview of Benefits and Risks at http://www2.essex.ac.uk/ces/Research programs/susag/ofpandora.htm

Simonetta Zarrilli. International trade in GMOs: Legal Frameworks and Developing Countries Concerns at UNCTAD/DITC/TNCD/2004/1

Southern African nations adopt common GM strategy at http://www.gene.ch/genet/2003/Oct/msgoooo3.html

The GM dispute at the WTO: Forcing GM Foods on Europe at www.genewatch.org

Dr. Florence Wambugu's Statement on Biotechnology in Africa at http://www.bio.org/foodag/action/2003326.asp?p=yes

GM Trade War Looms. How will the World Trade Organisation handle the EU/US food dispute? www.foe.co.uk

Trips, bilateralism, multilateralism and implications for developing countries: Jordan's drug sector at http://www.bilaterals.org/article.php3?id_article=2192

Plant biotechnology: A tool for development in Africa at http:// www.ejbiotechnology.info/content/vol1/issue3/full/6/

Trips and the Biodiversity Convention: What Conflict? At http://www.iccwbo.org/home/statement_rules/statements/1999/trips_and_bio_convention.asp

The Status of biosafety in Africa at http://www.gene.ch/genet/2003/jm/msgoo42.html

The rise and fall of the GM debate in Zambia at http://www.genet-info.org/genet/2005/May/msgooo17.html

Biosafety Board of Zimbabwe at http://www.biosafetyzm.ac.zw/discussions.html

GM battle in danger of trampling Africa at http://www.scidev.net/opinions/index.cfm?fuseaction=readOpinion&itmid-199&language...

GMos in African Agriculture: Country Status at http://www.biosafetyafrica.net/south.htm

African Model Law on Safety in Biotechnology at http://www.africabio.com/policies/MODEL%20Law%20ON%20BIOSAFETY_ff.htm

OTHER REFERENCES

Gregory, Peter and Lovemore Simwanda. Agricultural Biotechnology and Biosafety in Zambia. June 2002

Josling, Tim. Who's afraid of the GMOs? EU-US Trade Disputes over Food Safety and Biotechnology. Seminar paper presented at the center for International Studies and The European Center of California, University of Southern California. March 1999

Kanja, G. M. Biotechnology and Law in Africa Book Questionnaire: Status of Biotechnology in Africa.

Kanja, G. M. Implications of TRIPS Agreement on Small Scale Farmers in Developing Countries with particular emphasis on Africa. WIPO-WTO Colloquium for Teachers of Intellectual Property Law. Geneva, June 2004

Lesser, W. The effects of TRIPS- Mandated Intellectual Property Rights on Economic activities in Developing countries. 2003

Mnyulwa, Doreen and Julius Mugwagwa. Agricultural Biotechnology in Southern Africa: A Regional Synthesis. Working paper No.1 for FANRPAN/IFPRI Regional Dialogue on Biotechnology, Agriculture and Food Security in Southern Africa. April 2003

Government of the Republic of Zambia: The National Biotechnology and Biosafety Policy. August 2003

STATUTES

The Convention on Biological Diversity

The Cartagena Protocol on Biodiversity to the Convention on Biological Diversity

Genetically Modified Organisms Act of South Africa. Act No. 15 of 1997

MAGAZINES

The GM Debate – Who Decides? An analysis of decision making about genetically modified crops in developing countries. Panos Institute Southern Africa. 2004

GMOs and Choice: A survey of Zambian Farmers' attitudes to Genetically Modified Organisms. (GMOs) Panos Institute Southern Africa. 2004

REPORTS

Report of the fact-finding mission by Zambian Scientists on genetically modified foods. 2002

GMO Statutory Liability Regimes: An International Review Report. Canadian Institute for Environmental Law and Policy. December 2004