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Food Aid and Genetically Modified Organisms

Introduction

The Zambian economy has a history of over dependence on the mining industry. Steps to rectify this state were taken by increasing investment in the agricultural industry. The investment in agricultural paid dividends in the 1970's and 1980's as there was a stead increase in agricultural production. Zambia attained both household and national food security during that period. The problem the country faced during that time was inadequate and inappropriate storage facilities, which led high post harvest looses. The problem was most acute during and on the onset of the rain season. The situation was reversed in the 1990's as Zambia started experience reduced agricultural production due to the introduction of the Structural Adjustment Programme of the World Bank and the International Monetary (IMF).

Structural Adjustment Programmes stopped government involvement in agricultural production. The government removed agricultural subsidies and stopped procuring agricultural inputs such as seeds, fertiliser and agrochemicals. In addition, the government agencies ceased involvement the marketing of agricultural products. This adversely affected small-scale farmers who produce 80% of the national food crop requirement. Subsequently this led to reduced food production and made it difficulty for the government to manage food emergencies.

The Southern African Food Crisis

Some countries in Southern Africa experienced food shortages in the 2001/2002 due to reduced harvest of food crops as a result of the less than normal rainfall. There was nothing unique or unusual about this particular food crisis because generally food shortages or sometimes famine occur in Southern Africa because of unfavourable weather conditions caused by natural cyclical phenomenon such as El Niño.

In responding to the food crisis the World Food Programme (WFP) of the United Nations offered Zambia food aid in form of corn. It was later reported that some of the corn from the WFP was genetically engineered (GE) and this was subsequently confirmed by the WFP. Mozambique and Zimbabwe did not accept GE corn because of environmental concerns, but later the two countries joined Malawi and accepted GE corn as long as it was milled. The Zambian Government did not accept the GE corn in any form.

The WFP were informed by relevant government agencies not to distribute the GE Food Aid pending the outcome of the national consultation on the issue. It was reported that the WFP moved some of the GE corn to some of storage facilities outside Lusaka. The WFP were on record that it was not in a position to provide non-GE corn since the USA the major donor to the WFP did not segregate non-GE corn from GE corn.

In assessing projected food availability and the extent of the anticipated food shortage the Zambian government determined there was no impending nation-wide famine. The government termed the impeding food shortage as a food crisis and not a famine. It was forecasted that the food shortage

would be most acute in the Southern Province of Zambia and to some varying degree in some parts of Eastern, Central, Western and Lusaka Provinces.

National Consultation on GE Food

The Zambian government subsequently called for a national consultation on whether or not the country should accept GE Food Aid. The national consultation was conducted in the form meetings, interactive radio programmes, interactive television programmes and newspaper articles. Some people contributed to the national consultation on GE Food Aid by writing letters to newspaper editors. Even Zambian who lived outside the country expressed their views on GE in general and also on the issue GE Food Aid through newspapers.

In contributing to the national consultation on GE Food Aid, three institutions namely the National Institute for Scientific and Industrial Research, the National Science and Technology Council as well as the Soils and Crop Research Branch of the Ministry of Agriculture and Co-operatives independently advised their respective Government Ministries against the acceptance of the GE Food Aid. The national consultation on GE Food Aid culminated into a national public debate on Genetically Engineered Foods.

The Zambian citizenry from all walks of life participated in the national public debate on Genetically Engineered Foods. Prominent among the participants were traditional leaders, members of parliament, representatives of non-governmental organisations, scientists, university lecturers and professors, senior civil servants, representatives of agencies of the United Nations, representatives of the donor community and ordinary people. Only two Government Ministers attended the debate, these were the Minister of Agriculture and Co-operatives and the Minister of Science, Technology and Vocational Training. The Secretary to the Cabinet chaired the national debate on GE Food.

The National Institute for Scientific and Industrial Research, the National Science and Technology Council as well as the Soils and Crop Research Branch of the Ministry of Agriculture and Co-operatives presented a joint position paper advising the Zambian Government not to accept GE Food Aid. An overwhelming majority of participants to the debate also urged the Government not to accept GE Food Aid. Only a couple of participants spoke in favour of accepting the GE Food Aid. A subsequent report of the national public debate on Genetically Engineered Foods recommended that the Zambian government should not accept GE Food Aid [1].

The Zambian Government studied the report of the national public debate on GE Food and the recommendation that emanated from it. The Minister of Information and Broadcasting informed the nation and the world at large the decision by the Zambian Government not to accept GE Food Aid. The Minister made it clear that the decision by the government was not an indication of a lack of appreciation of assistance that was offered to Zambia. He went to urge all well-wishers to source for non-GE Food Aid that was available locally, in the region and globally.

Basis of the Decision

The Zambian Government evoked the Precautionary Principle in not accepting the GE corn. Zambia, like most African nations, currently has no regulatory system and appropriate infrastructure to cope with the scientific assessment that is required before the deliberate introduction of GE products. In addition, the government was mindful of the uncertainty surrounding the safety of GE

foods with regard to both human and animal health. There was also concern on environmental consequences of accepting GE corn. There was an observation that in the first place GE corn was brought into the Zambia without the "Advance Informed Consent" by the Zambian authorities, contrary to international practice.

The health concerns were based on the following three reasons: GE foods might contain new food toxins, or new allergens and might increase antibiotic resistance because of the widespread use of antibiotic resistance marker genes in GE products [1]. It was noted that the millions of Americans who consume GE corn do so mostly in processed foods such as corn flakes and taco chips, and the new genetic formations that might cause health problems would be rendered harmless during the processing of these products. By contrast, Zambians eat unprocessed corn as the staple food and usually as the only source of carbohydrate, so its impact would be different. It is consumed for breakfast, lunch, supper and as a snack in-between meals. Another consideration was that the likely recipients of the Food Aid are the most vulnerable members of the society, the old, women and children some of whom are in poor state health who maybe immuno-compromised.

The environmental concerns were based on the fear of genetic contamination of traditional varieties since some recipients of the GE Food Aid would save some of it for planting since it came in the of form grain [1]. This could lead to the loss agricultural diversity in Zambia.

An example is the case of the Mexican native corn being "contaminated" as recently reported in the science journal *Nature* of gene flow from U.S. corn varieties to criollo varieties in Oaxaca in southern Mexico [1bis]. In addition, there were other mitigating factors, such as the worry that the Zambian agricultural exports to the European Union could be adversely affected.

The Precautionary Principle

The decision not to accept GE corn was based on the Precautionary Principle as adopted in the United Nations Conference on Environment and Development (The Rio Declaration) and the Cartagena Protocol on Biosafety.

Principle 15 of the Rio Declaration states that:

> Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. [2].

Article 11.8 of the Cartagena Protocol states:

> Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of 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 that living modified organism intended for direct use as food or feed, or for processing, in order to avoid or minimize such potential adverse effects. [3]

Other Mitigating Circumstances

Non-GE corn was available in some parts of Zambia, in the region and elsewhere in the world. The northern parts of Zambia had a surplus of corn. What was required were resources to transport the

corn to areas of Zambia that had food deficient. A number of African countries had surplus corn that was non-GE and that was available. Non-GE corn is available at the global level, even in the United States of America (USA). In the USA 30% of the corn is GE, and it is possible to segregate non-GE corn from the GE corn.

The Zambian government had made its decision not to accept GE Food Aid in July and August of 2002 and the impact of the food crisis was going to be critical in March and April of 2003. This gave well-wishers enough time to source for non-GE Food Aid.

A lot of resources and time was spent on convincing the Zambia Government to reverse it's decision. For instance, Zambian scientists were invited to undertake a fact-finding mission to the USA, South Africa, the United Kingdom, the Netherlands, Norway and Belgium.

The decision by the Zambian Government not to accept the GE Food Aid had not been made under pressure from either local or international Non-government Organisations (NGOs) or the European Union (EU), as had been portrayed in the media and argued by international NGOs. The decision was entirely a result of internal consultations in Zambia. It was based in part on a scientific assessment of GM foods that called for the use of the precautionary principle.

Reaction to the Zambian Decision

The heaviest pressure on the Zambian Government to accept GE Food Aid had come from agencies of the United Nations (UN), especially the World Food Programme (WFP), World Health Organization (WHO) and the Food and Agriculture Organisation. These three UN agencies issued a joint statement to the effect the there no reason for African countries not to accept GE Food Aid, since GE foods were consumed by millions of people globally and no adverse effects had been observed thus far [4].

The WFP insisted that it could not source non-GE Food Aid. It was not willing to provide resources to transport corn from surplus areas of Zambia to deficient areas. The WFP insisted that it would not source non-GE corn from the region because it could obtain corn through an open tender. The WHO went as far as inviting Ministers of Health from Southern Africa to discuss the issue of GE Foods.

The USA put pressure on the Zambian through statement of senior officials. In his address to the World Summit on Sustainable Development, the USA Secretary of State General Colin Powell stated that there was no reason for African countries not to accept GE Food since millions of American consumes them. The U.S. Ambassador to the United Nations Food Agriculture Organisation, Tony Hall reportedly told reporters that

> "People that deny food to their people, that are in fact starving people to death should be held responsible for the highest crimes against humanity in the highest courts in the world" [5].

The U.S. Secretary of Agriculture, Anne Veneman, blamed the anti-biotech forces for scaring Zambians into believing that GM corn would harm them.

> "It is disgraceful that instead of helping hungry people, these individuals and organizations are embarking on an irresponsible campaign to spread misinformation and create an atmosphere of fear, which has led countries in dire need of food to turn away safe, wholesome food,"

said Ms Veneman [6].

The Zambian incident had escalated into a full-blown diplomatic row. In a commencement address President Bush was reported to say

> "By widening the use of new high-yield bio-crops and unleashing the power of markets, we can dramatically increase agricultural productivity and feed more people across the continent,"

He continued to say that

> "Yet, our partners in Europe are impeding this effort. They have blocked all new bio-crops because of unfounded, unscientific fears." [7].

In addition, the U.S. Government has also filed a case at the World Trade Organization against the European Union for supposedly having a moratorium on GMOs [8].

The refusal by Zambia to accept GE Food Aid was covered widely both by the print and the electronic media. Some of the coverage was outright insulting as shown by an article in The Economist magazine of September 23, 2002 said that "Africans have two reasons for being wary of GM food aid: one silly, one slightly less so" [9]. The "silly" one being that GM food is bad for human health and the other that GM maize could contaminate local varieties of maize [9].

Finding Missions on Genetically Engineered Food

The Zambian government's refusal to accept Genetically Modified (GM) maize donated as food aid precipitated two fact-finding missions. The first mission was by a team of Zambia scientists who toured of the United States of America, the Republic of South Africa, the United Kingdom, Belgium, the Netherlands and Kingdom of Norway by a team of Zambian scientists with the aim of obtaining further information regarding the safety of GM food crops on the environment and human health including ethical issues and impact on trade [10]. The second fact-finding mission was by scientists from SADC (Southern African Development Community) countries who visited the USA and Belgium.

The Zambian team recommended that the government maintained the position not to accept GM Food Aid by employing the precautionary principle [10]. The team further recommended the adoption of the draft National Biotechnology and Biosafety Policy and the enactment of legislation to implement the policy [10]. The team also edged the government to consider ratifying the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena Protocol on Biosafety) [10].

National Biotechnology and Biosafety Policy

As a first step towards establishing an enabling environment for research and development and the commercialisation of biotechnology, the Zambian government adopted a National Biotechnology and Biosafety Policy in August 2003. The policy was developed with the assistance of the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP) that had pilot project to assist eighteen countries establish national biosafety frameworks. Even though the

policy was adopted after the food crisis, its development started in 1997. However, the issue of GE food aid helped expedite the adoption of the National Biotechnology and Biosafety Policy.

The mission of the Policy is to guide the judicious use and regulation of modern biotechnology for the sustainable development of the nation with minimum risks to human and animal health as well as the environment [11]. The objectives of the Policy are to support the safe application of biotechnology techniques; to support the development of regulatory capacity; and to ensure the effective control of trans-boundary movement of biotechnology products [11].

The National Biotechnology and Biosafety Policy is based on the position the African Group took during the negotiations of the Cartagena Protocol on Biosafety [11]. It is built on the Precautionary Principle and upholds the philosophy of case-by-case assessment of each application before the introduction of GMOs in line with advance informed agreement. The decision-making process requires a risk assessment report that must include socio-economic factors and it emphasises public participation. With regard to liability and redress the policy states that the polluter pays.

The policy will be implemented by the enactment of legislation that will establish the National Biosafety Authority (NBA) and Biosafety Advisory Committee(s) (BAC). These will constitute the institutional framework for the national decision-making and international co-operation on Biosafety [11].

The NBA shall support the development of regulatory capacity to assess, test, monitor and control for the safe research, development, application and commercialisation of biotechnology in accordance with agreed biosafety guidelines and regulations.

The BAC shall advise the NBA on prohibitions, authorisation and the exercise of necessary control of imports, authorisation or notification of contained uses, authorisation of trial or general releases; and control measures to be taken where an intentional release of GMO(s) may occur.

National Biotechnology and Biosafety Strategic Plan

A positive consequence of the refusal by Zambia to accept GE Food Aid was realisation that there was an urgent need for the country to invest in the biotechnology research and development as well as its application. In order for Zambia to realise the potential benefits of biotechnology in contributing to human and animal health improvement; environment and biodiversity conservation; and increased crop and livestock production, there is need for the country to establish an enabling environment for biotechnology research, development, application, and commercialisation. This necessitated the development of the National Biotechnology and Biosafety Strategic Plan.

The strategic plan presents the vision of Zambia with respect to the research and development in biotechnology by identifying priority areas. The Strategic Plan provides the necessary guidance and modalities for the implementation of the Biotechnology and Biosafety Policy. It identifies seven core programmes for the effective and efficient implementation of the Biotechnology and Biosafety Policy. These are Human Resource and Infrastructure; Environment and Biodiversity; Legal Framework; Research and Development; Commercialisation; Regulatory Mechanism and Public Participation [12].

The strategic plan recognises the importance of adequate infrastructure, expertise and skills and training on appropriate human resource in biotechnology and biosafety; and the need to conserve the

genetic diversity of Zambia's crops, livestock, fish and controlling environmental pollution features prominently in the strategic plan. It also puts emphasis on the enactment of legislation that would govern the research, development utilisation and commercialisation of GMOs through an appropriate Biosafety Regulatory Mechanism [12].

The strategic plan envisages a biotechnology research and development agenda that is targeted towards increased crop and livestock production and productivity; strengthening the base for increased production and quality of industrial biotechnology products; with regards to health the strategic plan emphasises the need to protect the population against preventable diseases and the capacity to develop rapid and reliable diagnostic techniques for TB, HIV and malaria [12]. It links biotechnology research and development to effective commercialisation of biotechnology with the aim of ensuring that products of biotechnology are made available to the nation.

The strategic plan outlines mechanisms for public participation and awareness in issues pertaining to biotechnology and biosafety. The aim is to increase public awareness and understanding of aspects of biotechnology and biosafety thus fostering public participation in biotechnology and biosafety regulatory process including decision-making.

The Biotechnology and Biosafety Strategic Plan will cover a period of five years. Implementation of the Strategic plan will be decentralised with the Ministry of Science, Technology and Vocational Training playing a coordinating role [12].

The Cartagena Protocol on Biosafety

In February 2004 the Zambia government approved the ratification of the Cartagena Protocol on Biosafety. The wide coverage of the refusal by Zambia to accept GE Food Aid and the debate that ensued put the Cartagena Protocol on Biosafety into the limelight. It paved the way for sensitising policy makers, decision makers and the public on the Cartagena Protocol on Biosafety.

The Cartagena Protocol is one of the most important international treaties recently adopted. It marks the commitment of the international community to ensure the safe transfer, handling and use of living modified organisms [3]. It is an historic commitment as it is the first binding international agreement dealing with biosafety, thereby addressing novel and controversial issues.

SADC Advisory Committee on Biotechnology and Biosafety

The Southern African Development Community (SADC) decided to establish the SADC Advisory Committee on Biotechnology and Biosafety (SABBAC) before the food crisis that culminated in Zambia rejecting GE Food. The Zambian position accelerated the process of establishing the SABBAC. The SADC Food, Agriculture and Natural Resources (FANR) Ministers approved the establishment of the SABBAC that would develop guidelines, which would contribute to safeguarding SADC Member States against potential risks of GMOs [13].

A Task Force that was composed of Swaziland, Zambia, Zimbabwe and the FANR Directorate developed the Terms of Reference for the SABBAC [13]. The ultimate aim is for the SABBAC to assist SADC Member States develop their capacity to detect and monitor GMOs. The Terms of Reference for SABBAC included studying reports of the two fact-finding missions and making appropriate recommendations to the SADC Secretariat [14]. Other terms of reference included

preparations of a regional policy and strategy to guide Member States enact necessary legislation on biotechnology and biosafety and also to develop a model legislation that would take into account the Cartagena Biosafety Protocol and the African Union Biosafety Model Legislation that was approved in Addis Ababa in May 2001 [14].

Genetically Modified Organisms and Food Security

There are two critical factors that contribute to food security, the availability of food and the access to food. Lack of household food security is caused by people not affording to buy food that is available and / or the lack of resources to grow their own food. National and regional food insecurity is a result of reduced food production due to various reasons, lack of resources to purchase food from either the regional or global market and the lack of means as well as resources to transport food from areas with surplus food to areas that are food deficient. The world today produces more food per inhabitant than ever before yet many households, nations and regions have no food security.

Global biotechnology companies have developed most of the innovations in modern agricultural biotechnology and are by nature profit-driven rather than need-driven [15]. Innovations in agricultural biotechnology coming from public institutions are declining due to lack of investment in research and development. In addition, most of the merger investment into public institutions is commissioned by the biotechnology industry. The situation is further compounded by the fact that innovations in modern agricultural biotechnology are controlled and protected by intellectual property rights.

Modern agricultural biotechnology can contribute to food security in developing countries if its techniques are employed to increase food production. This could be through the development of food crops the can grow under stressful conditions such as drought. Currently there are no genetically modified crops on the market that are drought tolerant. Genetically modified crops that are commercially available now exhibit herbicide tolerance, pest resistance, and virus resistance or a combination of these and other traits. Herbicide tolerant crops can survive high herbicides at concentrations that kill weeds. Herbicide tolerance is the most common trait in genetically modified crops. Genetically modified crops that are pest resistant can destroy insects like rootworm, bollworm and the corn borer when attacked. Virus resistant crops are protected from plant viruses that cause disease.

The focus of modern agricultural biotechnology is on producing cash crops to be sold on world markets. This state of affairs does not contribute to food security since it leads to reduced production of food crops. A feature of modern agricultural biotechnology is the growing dependence on monocultures of genetically modified seed. This does not promote food security, on the contrary because it reduces agricultural diversity. This is exemplified by the recent food crisis in Southern Africa. Communities that cultivated more than one single crop like maize, but multi-cropped with traditional staple foods like cassava and sorghum were still food secure in the face of drought and a maize failure.

Research and development in new genetically modified crops is concentrated on crops of interest to developed countries. It does not take into account the crops and the unique problems small-scale farmers developing countries face. Another aspect of modern agricultural biotechnology is that farmers have to buy seeds every planting season, they cannot save their best seed and they cannot

freely exchange seeds, as it is customary practiced. In addition, genetically modified seeds are more expensive than hybrid and traditional seeds.

Conclusion

The Zambian Government handled the food crisis 2001/2002 in a manner rarely seen the world over in three ways. Firstly the government called for a national debate and consultation on GE Food Aid; secondly the govern showed a lot of confidence in the scientific community by asking for their advise; and lastly, once the decision not to accept the GE corn was taken, the government was not swayed from its position despite all the direct and indirect pressure.

The reaction to the decision by the Zambian Government not to accept the GE corn exposed the ignorance about the nature of famine and the communities caught up in the unfortunate situation. This was shown by the remarks of USAID Administrator Andrew Natsios who claimed that "Starving people do not plant seeds. They eat them!" [16]. The fact of the matter is that it is in the nature of these communities to save seeds for planting.

The down side of food aid it that it is prone to political manipulation at the expense of recipient countries. Senator Hubert H. Humphrey of the USA once said:

> "I have heard that people may become dependent on us for food. I know that was not supposed to be good news. To me that was good news, because before people can do anything they have got to eat. And if you are looking for a way to get people to lean on you and to be dependent on you, in terms of their cooperation with you, it seems to me that food dependence would be terrific." [17]

Food aid from the USA comes with strings attached since it is either donated in the form of foodstuffs or it is tied to monetary aid that must be used to purchase of US produce. This confirms the notion that "The principal beneficiary of America's foreign assistance programs has always been the United States" and that its "foreign assistance programmes have helped create major markets for agricultural goods" [18]. This is despite the USA being a signatory of the 1999 Food Aid Convention, which recognises that food aid should be bought from the most cost effective source, be culturally acceptable and if possible purchased locally so that regional markets do not suffer [19]. Cash is widely acknowledged to be the most effective form of food aid [20] since it enables food supplies to be obtained locally and more quickly, supporting local economies and giving some possibility of ending the reliance on food handouts [21].

There is a concern that Food Aid could be used to promote and spread GMOs by design of otherwise. USAID also states that one of its roles is to "integrate GM into local food systems" [22]. This is supported by a statement by Don Westfall a biotechnology industry consultant and Vice-president of Promar International who said that "The hope of the industry is that over time the market is so flooded [with GMOs] that there's nothing you can do about it. You just sort of surrender." [23].

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