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POLICY BRIEF

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Understanding Genetically Modified Organisms in Ghana

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Abstract

While in the past food crop farmers were able to adapt to droughts and floods through cultural and other traditional practices, today's crop farmer is faced with increasingly unpredictable weather conditions and is unable to adapt so easily. The current rate of population growth suggests that by the year 2050, crop production will have to be doubled or tripled to meet food needs. This suggests a need to increase productivity through the supply of productivity enhancing technologies. Conventional crop improvement alone has been found not to be able to double crop production by 2050 as current statistics continue to show poor and declining crop yields in some areas. The development of genetic engineering is said to advance the techniques of breeding to enhance crop production. But this is not without debate. In Ghana this situation has attracted concerns of policy makers, scientists, producers and other stakeholders found operating along the value chain of various food crops cultivated. The question in the public domain today is whether Ghana should accept genetically modified organisms (GMOs) as a means of coping with climate change, increasing population and food insecurity. This brief is intended to inform the policy makers and other stakeholders on why (and why not) GMOs should be accepted.

Introduction

The question about the emerging climate change vis-a-vis the increasing human population and food insecurity all over the world has brought to the fore intense debate on whether or not genetically modified crops should be accepted. Traditionally, it has been observed that farmers and scientists alike have attempted to avert crop failure and food insecurity through the application of diverse practices and techniques based on the prevailing climatic conditions. Yet while such practices have not ended, it is observed that the emerging climate change is completely reframing Africa's food security and technology debates. These debates have been intense and therefore require for an open discussion on the subject. The question under debate is whether developing countries, faced with serious food insecurity and high population growth should accept or not accept GMOs? If the technology is accepted, will this ensure Africa and for that matter Ghana's sustainable food production? This brief summarizes a discussion at a policy symposium organized by CSIR-STEPRI in collaboration with the Ministry of Food and Agriculture (MoFA) under the auspices of Association of Commonwealth Universities (ACU) and DFID, UK as a way of contributing knowledge to the current policy debates on the subject.

Context

Statistics indicate that well over 25% of the world's 925 million hungry people live in sub-Saharan Africa and about 50% of these people the world over are from smallholder farming communities, where they live on marginal lands that are vulnerable to the effects of climate change (FAO, 2010). In spite of this, it has been realized that nearly 90% of food on the continent and for that matter Ghana is produced by smallholder farmers.

Genetic engineering or recombinant DNA technology and other modern biotechnologies have been identified as critical in reducing the impact of the emerging climate change. It is a process whereby selected genes from one organism are taken and introduced into the DNA of another, directly altering the organism at the molecular level for a desired trait. The application of genetic engineering leads to the production of genetically modified organisms (GMOs). In plant breeding, GMOs are crops that have been enhanced with desirable traits such as pest and disease resistance and drought tolerance. Thus, the GMO has been altered through the use of recombinant DNA technology to produce a healthier and better yielding plant or crop.

Already there are GMOs which are widely grown in the USA, China, South Africa and several other countries. For example, there are genetically modified crops that have resistance to pesticide use, allowing commercial farming operations to use more pesticide on crops without killing the crop itself. Genetic engineering has also been used to increase the nutrient content, taste and shelf life of certain crops to make them more easily marketable.

Yet, GMOs have continued to remain one of the most controversial and debatable subjects as a result of the concern for food safety and environmental sustainability. This suggests that any discussion of GMOs should aim at addressing the technologies unique benefits and risks in attempting to balance the debates. Among others, the main issues come under the following:

- **Food security:** Whether GMOs can provide higher yields consistently over the long term? Are they more resilient to climate change than local crops produced through conventional breeding?
- **Health:** What are the potential long-term impacts on human health and wellbeing?
- **Biodiversity:** How will GMOs change agricultural ecosystems (e.g. impacts on pollinating insects, weed resistance and local varieties)?
- **Trade:** How would adopting transgenic crops affect African export markets?
- **Profit margin:** Do the higher yields justify the higher cost of GMO seeds and fertilizer? What is the true cost to smallholders over the long term?
- **Capacity:** Do African countries have the scientific infrastructure and knowledge for research, monitoring and evaluation?
- **Livelihoods:** What are the potential impacts on smallholder farmers? Will traditional knowledge and culture be eroded?

These have been explained by the scientists working on the GMOs. The scientists assert that GMO products are safe and produce real benefits to farmers and consumers alike, and that GMOs are environmentally acceptable. The scientific consensus suggests that GMOs are as safe to eat as any other food, and that they reduce soil-damaging tillage, reduce carbon emissions, and insecticide use.

In spite of these benefits, GMOs do not lack limitations. The anti-GMO lobby insists that GMOs are dangerous both to human health and the environment.

While a study conducted over 25 years within 130 research projects have concluded that GMOs are not per se riskier than conventional plant breeding technologies, yet another report using data from over 400 research scientists has pointed out that the lack of transparent communication about GMOs' benefit and risk has been the greatest limitation on the adoption and acceptance of the technology. This suggests that in as much as possible, the discussions on the subject should try to achieve a balance.

Conclusion

From the Policy Symposium it can be concluded that genetic engineering or recombinant DNA technology and other modern biotechnologies are critical in reducing the impact of climate change and to improve food security situation in Ghana. However, there are public concerns for food safety, health and environmental sustainability of GMO applications which need to be addressed through effective regulation and public education. Public education and awareness creation strategies should aim at addressing the GMO technologies unique benefits and risks as well as its complementary role to conventional breeding approaches to allay the fears among various stakeholders.

Recommendations

Several recommendations emerged from the presentations and discussions by participants during the policy symposium. Importantly, five are presented here since they are seen as key to addressing policy issues in the area of GMO acceptance in Ghana.

1. Increase awareness creation among all stakeholders especially the producers and other value chain actors;
2. There must be local investment in research and development on GMOs vis-à-vis conventional breeding to provide an alternative for producers and consumers in order to determine the best solutions for Ghana's food security issues in the context of climate change and other crises;
3. Increase research on the potential impacts of GMOs on human health, biodiversity and local economic development;
4. Intensify the capacity building processes among scientists on climate change adaptation and GMOs through increasing funding opportunities for research; and
5. Design and implement policies that protect smallholder farmers from failures and crises of farming through the provision of insurance packages.

Reference

Food and Agriculture Organisation (2010). The State of Food Insecurity in the World 2010. Addressing Food Insecurity in Protracted Crises