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**“Can GM crops alleviate poverty in Africa?  
Evidence from Bt maize research in Kenya”**

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**Abstract**

Stem borers are major insect pests of maize, the main staple food crop in East and Southern Africa. Tackling this pest through conventional breeding is very difficult, but Bt maize offers farmers an effective and practical control option. Although GMOs have been an amazingly successful technology, Europe and Japan have been reluctant to embrace it, since the expected benefits are small compared to the perceived risks. In Africa, however, potential benefits can be very high, especially given stagnating economies and food production, decreasing per capita food production, and an increasing number of poor people. It is therefore important to address the concerns of farmers and consumers, compare the benefits to the risks, and check if there is no bias against small-scale farmers and seed producers.

The Insect Resistant Maize for Africa (IRMA) project, aims to develop resistant maize varieties for small-scale farmers, using both biotechnology and conventional methods. Research started in Kenya in 1999 and the results, from biophysical as well as social sciences, allow us to compare benefits with costs and risks. In particular, we can now to analyze if this technologies, Bt maize, can make a contribution to poverty alleviation.

In this paper, we address ten major questions related to Bt technology for Africa: five concerning the environment and economics, five concerning equity and poverty. Based on the results of IRMA's research, the following answers can be formulated.

## **Environmental and Economic Concerns**

1. Maize is very important for the poor in East and Southern Africa. It is the major food crop, its expenditure share increases with poverty, and small-scale farmers tend to be net buyers.
2. Stem borers are a major problem for small farmers. Participatory Rural Appraisals (PRAs) show that stem borers, with storage pests, are the major pest problem, and relatively more important in low-potential and poorer areas.
3. Bt maize is very effective against most major stem borer species, and has good potential for the others.
4. Bt maize is generally considered safe for the consumer.
5. Bt maize is unlikely to be dangerous for the environment, but insect resistance management (IRM) strategies need to be put in place, and local varieties protected.

## **Equity Concerns**

6. The poor are very likely to benefit from this technology. Reduction of crop loss will benefit poor farmers, especially in the low-potential areas. Price reduction will benefit poor consumers as well as poor farmers, who tend to be net buyers.
7. The local seed industry will likely benefit from the technology. No relevant patents are filed in Kenya, and the technology is developed by non-profit research institutes.
8. The poor will likely have easy access to the technology. Cheap technology and competition in the seed industry should keep its cost down. Moreover, the gene is dominant and seed can therefore be recycled by farmers.
9. Consumers are likely to accept the technology. Surveys show that almost half of urban consumers are aware of GM crops and have no major objections. They are concerned, however, with biodiversity and environmental risks.
10. Through the project, consumers and small-scale farmers are actively participating in the debate on GMOs, and have a voice in the decision-making process.