

Chapter 78

Are GM Crops the Answer to Africa's Critical Food Security Status?

Learning From the Experiences of Developing Countries

Nira Ramachandran
Independent Researcher, India

ABSTRACT

Despite unprecedented technological breakthroughs and rising incomes, the most basic human requirement—food security remains out of reach of many. The countries of Africa are the worst affected, and consistently score lowest on the Global Hunger Index. The downside of technological advance and increasing urbanisation is the decrease in cultivable land and water availability exacerbated by climatic unpredictability. While concerted efforts are on to control the crisis, it is time to take positive action and capture technology to boost food security. Genetically Modified (GM) crops engineered to be drought/flood resistant, reduce pesticide requirements or provide vitamins open up tremendous possibilities for enhancing food and nutrition security and counteracting negative environmental impacts. This paper reviews the current status of GM crops in Africa, the scope for expansion, possible impacts on food security and the validity of existing concerns about bio-safety and farmers' needs in the light of developing country experience.

INTRODUCTION

One of the major challenges that Africa faces today is that of ensuring food security for its population. Over the last few decades, the continent has witnessed severe food shortages, even starvation in one country or the other. This may be attributed to a variety of causes—environmental, economic, strife-related or as a result of pandemics like HIV/AIDS sweeping the continent. The continued heavy dependence on food-aid and cheap food imports also tend to undermine local agriculture and leaves the consumer

DOI: 10.4018/978-1-5225-9621-9.ch078

Are GM Crops the Answer to Africa's Critical Food Security Status?

unprotected and completely vulnerable to global price fluctuations. Food Aid dates back to the late 1950s, but the number of food emergencies have tripled since the mid-1980s (MDG Report, 2013). Climate change which brings in its wake unpredictability of temperature and rainfall as well as an increase in severe climatic events is further exacerbating the situation. In this backdrop, it is encouraging to note that a number of countries in sub-Saharan Africa have improved their food security status in the new millennium. While the decade of the 1990s witnessed extremely slow progress in Africa as against South Asia, there has been more rapid improvement, from 2000 onwards. In fact, the Global Hunger Index (GHI) 2014 finds sub-Saharan Africa outpacing South Asia. The six countries which have made substantive progress reducing their GHI scores by over 50% since 1990 are Angola, Ethiopia, Ghana, Malawi, Niger and Rwanda. Yet even today, 12 countries have GHI scores in the “alarming” or “extremely alarming” categories: Central African Republic, Ethiopia, Comoros, Mozambique, Niger, Sudan, Zambia, Sierra Leone, Madagascar (GHI scores: 20-29.9), and Burundi and Eritrea (GHI scores: 30-39.9) (GHI, 2014). The Global Hunger Index is a composite of three hunger indicators: the proportion of undernourished population, the proportion of underweight children below the age of 5 years and the infant mortality rate, which effectively represent the food security status of a country. As the GHI scores in sub-Saharan Africa are heavily weighted by the proportion of undernourished population unlike in the case of South Asia, where underweight children tend to have more impact on the score, it is not surprising to find that in these countries (with alarming or extremely alarming scores), about one-third of the population does not consume the minimum calorie requirement. In Burundi and Comoros this proportion reaches as high as 65 and 67%, respectively.

The fact that Africa is endowed with vast and underutilised natural resources like huge tracts of cultivable land, water and temperatures suitable for cultivation, makes this chronic shortfall in food production a story of unused potential. With reference to potential land area alone, the FAO (2009) estimates that the unutilised rain-fed area suitable for cultivation could be as much as 700 million ha. It is widely accepted that food shortages in the African context result from the fact that 90% of the cultivators are small and marginal farmers, almost 60% of cultivated area is un-irrigated, and the practice of cultivating a large variety of crops on small farms does not lend itself to the adoption of green revolution technologies, which have been suggested as being more suited to large scale monocultures. In addition, poverty, illiteracy and weak infrastructure preclude access to markets or improved inputs. The Millennium Development Goals Report (2013) states:

In fact, the challenges of the past have grown and become more complex, exacerbating food insecurity. Africa's agriculture is underdeveloped, and people have begun abandoning it for better livelihoods. The effects of climate change are more pronounced and Africa's population is increasing so fast that countries might be unable to produce all the food they need.

An estimated 232 million undernourished people live in Africa (FAO, 2015) of whom almost 95% are in the sub-Saharan region alone. With the population of this region projected to reach 1.5–2 billion by 2050 (FAO, 2009), it becomes imperative to seek out viable solutions to the food security issue. This paper focuses on genetically modified crops and their potential to contribute to a food secure Africa.

19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/are-gm-crops-the-answer-to-africas-critical-food-security-status/233036

Related Content

New Design Approach to Handle Spatial Vagueness in Spatial OLAP Datacubes: Application to Agri-Environmental Data

Elodie Edoh-Alove, Sandro Bimonte, François Pinetand Yvan Bédard (2018). *Innovations and Trends in Environmental and Agricultural Informatics* (pp. 129-155).

www.irma-international.org/chapter/new-design-approach-to-handle-spatial-vagueness-in-spatial-olap-datacubes/207274

Making Agricultural Learning Accessible: Examining Gender in the Use of Animations via Mobile Phones

Julia Bello, Anne Namatsi Lutomia, Eric Abbott, Robert Mazur, Sostino Mocumbeand Barry R. Pittendrigh (2020). *Environmental and Agricultural Informatics: Concepts, Methodologies, Tools, and Applications* (pp. 716-736).

www.irma-international.org/chapter/making-agricultural-learning-accessible/232986

Changing Consumption Patterns in Green Economy

Violeta Simaand Ileana Georgiana Gheorghe (2015). *Agricultural Management Strategies in a Changing Economy* (pp. 186-212).

www.irma-international.org/chapter/changing-consumption-patterns-in-green-economy/125991

Agribusiness Technology Transfer and Innovation as a Catalyst for Food Security in Developing Countries: Case of Kenya

Samwel Macharia Chegeand Daoping Wang (2021). *Opportunities and Strategic Use of Agribusiness Information Systems* (pp. 185-206).

www.irma-international.org/chapter/agribusiness-technology-transfer-and-innovation-as-a-catalyst-for-food-security-in-developing-countries/266582

Energy-Saving Technologies for Pre-Sowing Seed Treatment in a Magnetic Field

Volodymyr Kozyrskiy, Vitaliy Savchenko, Oleksandr Sinyavskyand Vasyl Bunko (2020). *Handbook of Research on Energy-Saving Technologies for Environmentally-Friendly Agricultural Development* (pp. 213-242).

www.irma-international.org/chapter/energy-saving-technologies-for-pre-sowing-seed-treatment-in-a-magnetic-field/232095