

## Spotlight Issues II.2

### Role of higher education in reducing food insecurity in Africa

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#### INTRODUCTION

According to the Food and Agriculture Organization (FAO, 2002), approximately 800 million people in the developing world are food insecure. In Africa, millions hover near starvation in a world of plenty. Since 1990,

food availability per capita in sub-Saharan Africa has declined by 3%. This compares to per capita increases of more than 30% in Asia and 20% in Latin America. Almost 200 million Africans were undernourished at the dawn of the millennium compared to 133

million in 1980. Children undernourished in Africa now number 33 million, or more than one-third of pre-school children. Almost all of these children live in sub-Saharan Africa, the only region in the developing world where child undernourishment has been increasing.

Nutritional deficiencies, particularly deficiencies of iron, iodine, and vitamin A, have far-reaching consequences on growth, development and health, contributing to impaired immunity and cognitive function, growth failure, increased morbidity and mortality (Graham et al., 2001; Smith and Haddad, 2000; CGIAR, 2002).

Education plays a vital role in enhancing economic development, reduction of poverty and sustainable development. This can be accomplished through capacity building by offering proper training and research. Research assists in innovation of technology, increasing productivity and new food product development. As stipulated in the Millennium Development Goals, there is a focus on food security and poverty alleviation issues. In this regard, higher education has a critical role in strengthening innovative research, training and extension activities. This review assesses the role of tertiary level education to combat food insecurity in Africa.

### MAJOR CHALLENGES TO FOOD SECURITY IN AFRICA

Part of the problem for not achieving food security in Africa is the very low levels of investment for agriculture. This has led to low incomes for farmers and rural residents, reduced competitiveness, and increasing food insecurity and child malnutrition. In addition, poor farming practices, limited access of farm products to the market, poor policies, diseases, demographics and climate have vastly contributed to African food insecurity. In some African countries food aid is regarded as insurance (Hoddinott, 2003).

### FARMING

Africa's agriculture is generally primitive (Chema et al., 2003; Dixon et al., 2001). Low levels of external farm inputs, post- and pre-harvest crop losses, poor food storage and preservation, unfertile soil and degradation of the environment are a few of the factors contributing to poor farming practices in Africa. As the majority of food products' production is based on rain the production is affected by the adverse climatic conditions. The agricultural systems in general need to be sustainable (Brinkerhoff et al., 2002).

### ACCESS TO MARKETS

Inadequate roads and transportation, and poor information technology and knowledge have hindered farmers in bringing their produce to the market. In addition, Africa's high export costs limit farmers' access to international markets.

### POLICIES

Policies in Africa are not inclusive in their design, which brings about uneven development within countries. Policies that promote monopolistic competition for large-scale industries affect small industry.

### DISEASE, DEMOGRAPHICS AND CLIMATE

Disease and infection have continued to be a serious challenge in Africa. These include, among others, malaria and HIV/AIDS. They vastly reduce the working manpower available to agriculture and household food security. The farming population in Africa is ageing, male workers are migrating to urban areas, and many rural areas are becoming urbanized.

### ROLE OF HIGHER EDUCATION

Appropriate application of various technology options enhances crop and animal production and makes more effective, efficient use of land, labour and other resources. Universities need to create technologies having the potential to increase productivity of land, labour and farm inputs (Michelsen et al., 2003; Oehmke et al., 1996). This can be done through providing target-oriented, strong and holistic science-based training within a socio-economic background relevant to the needs of the continent, and conducting impact-oriented participatory research and also dissemination of knowledge and research outputs through extension services. One possible way of doing this is by aligning the research with that of the national development plans, which for most countries is likely to be poverty reduction strategy plan. This will ensure that it is both demand-driven action research and helps the country along the path of realizing its development goals and thereby addressing the issues of food insecurity. However, in many African countries this is not happening. Universities operate in silos and are not directly linked to national development plans.

Curricula in the African higher education

system need to be flexible and market driven, incorporating aspects of sensitivity to the environment and sustainability, natural and social science, information technology and entrepreneurship. They have to be able to produce scientists with commitment to lifelong learning and, furthermore, they should also reflect current issues and needs such as climate change and address them appropriately. This could be done by constant revision of the curriculum and linking it with the national development plan, which reflects the current needs and issues. They must be equipped with both problem-solving and critical thinking skills, and possess good communication and interpersonal skills. Among others, African higher education institutions should incorporate the following areas in their curricula:

- Create a community that integrates energy, climate, environment and social science researchers and educators to promote active and sustainable engagement to address food insecurity
- Implement a broad range of informal educational and outreach programmes to promote the study of achievement of food security through availability and affordability, poverty eradication strategies, and knowledge of productivity and competitiveness of farmers and agricultural business entrepreneurs
- Ways of establishment of sustainable domestic, intra- and inter-regional, and international agricultural markets
- Systems in achieving an equitable distribution of wealth
- Agricultural biodiversity management and development through the application of science and innovation and best practices that conserve and sustain the natural resources used in agriculture
- Develop interdisciplinary research, innovative courses at the interface of disciplines and new degree programmes that benefit all stakeholders including private industries and businesses
- Ways of developing micro, small and medium agricultural and agriculture-related enterprises, including in the 'informal' sector
- Innovation of technologies for the reduction of post-harvest losses
- Information and communication technologies

- Mainstreaming of environment and sustainability into agricultural activities

Impact-oriented participatory research is an area where science and technology can directly contribute to improved food security (Gemo et al., 2003). HEIs in Africa should focus on technologies that require less labour and minimum cost (pre- and post-harvest technologies, processing, packaging, marketing, traditional preservation methods and so on); research to improve seeds that can resist pests, diseases and drought; and the production of crops with both a high yield and nutrient content (bio-fortified crops) through breeding and molecular biology techniques. In addition, African universities need to look for technologies for food fortification and food safety, value addition for food staples, horticulture, and animal products through post-harvest research. As the role of women in ensuring household food security is high, technology options that are accessible to them are indispensable.

In Africa a number of establishments take part in planning, funding and conduct of agricultural research. These include national agricultural research centres, universities, international agricultural research centres and extension services. The institutions' research activity is dominated by the production of improved seeds and excludes pre- and post-harvest technologies, food fortification issues and extension services. Moreover, they work independently of each other and there is no coordination of efforts, which leads to duplication and thereby wastage of resources both human and financial.

Diffusion of technology is ended through extension (Hambly and Setshwaelo, 1997). It is believed that African scientists have shelved a high number of research outputs, thereby reducing their value towards achieving sustainable development of the nation states. Although, the scientists are determined to conduct impact-oriented research, limitations in budget and extension systems have hindered their activities. Investment in information and communication technologies, education and an extension system that involves smallholder farmers is indispensable. Therefore, the universities need more research pertaining to the future of extension systems in Africa.

## CONCLUSION

Food insecurity in Africa can be challenged through the building of strong links among universities and all other stakeholders in order to increase agricultural productivity, improve pre- and post-harvest technologies and develop new food products. University curricula need to be flexible and reformed. In addition, curricula and research should be reorganized as a community approach in order to understand, identify and respond to scientific need and engage members of the government, business and the community concerning climate, environment and energy issues to address food security. It is essential to enhance and coordinate interdisciplinary interaction among universities, business, government and community that will lead to a better understanding of the links between the environment, socioeconomic relationships and interactions on both a local and a global scale.

To achieve impact-oriented participatory research universities need to mobilize sustainable funding and minimize support of external donors. Strong partnerships with government agencies, the private sector and universities in research, exchange of students, faculties and ideas to design innovative courses and research can address global concerns of food insecurity.

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