

**ASSURING FOOD AND NUTRITION SECURITY IN AFRICA BY 2020:  
Prioritizing Action, Strengthening Actors, and Facilitating Partnerships**  
April 1–3, 2004, Kampala, Uganda

**SUMMARY NOTE**

**Parallel Session:**     **Implementing Action in Key Areas: Raising Agricultural Productivity**

**Panelist:**            *Florence Wambugu*, Executive Director, A Harvest Biotech Foundation International, Kenya

**Title:**                **How to Develop and Utilize Biotechnology for Improved Food and Nutrition Security in Africa**

**Date:**                April 2, 2004

**Background**

There are about 800 million hungry people in the world. Of these, 232 million (29%) are found in India, 200million in Sub-Saharan Africa (SSA), 152 million (19%) in Latin America, 112 million (14%) are in Asia other than India, 56 million (7%) in the Caribbean and 40 million (5%) in the Near East and North Africa (Scherr, 2003). The number of hungry people is on the decline everywhere in the world apart from the Sub-Sahara Africa where the number is increasing. Of the hungry, 50% are found in farm households in marginal lands, 22% are the landless rural people, 20% are the urban poor while 8% are dependent on the natural resources. 92% of them are not victims of extreme events but all suffer from chronic malnutrition. There is a serious food deficit especially in SSA with per capita calorie intake of 2,100kCa/day (lowest in the world!). Up to 80% population is rural, and largely dependent on agriculture for food and income, and on forestry for cooking energy. Africa imports at least 25% of its grain. By 2025, the world population will be more than 8 billion and food needs in developing countries will double. There is little room for horizontal expansion with less than 5% coming from expansion of arable land and an additional 10% coming from expansion through irrigation. More than 80% must come from increased food production per unit land

**Raising Agricultural Productivity**

The key elements to raising agricultural productivity involve addressing constraints related to soil and water management for improved soil health, focusing on inorganic and organic fertilizers, agro-forestry, irrigation, development of improved seeds and seedlings for higher yields and quality nutrition (focusing on farmers' selections, conventional breeding, and genetic engineering), integrated pests and diseases management (IPM), mechanization, information outreach, and creation of an enabling environment through government policy (focusing on good governance and regulatory framework, and service provision, including increased funding). New technologies offer hope to raising agricultural productivity in Africa, and biotechnology is vital in that process.

Biotechnology applications such as tissue culture techniques to produce disease-free planting materials; use of DNA markers and other molecular tools to increase the accuracy and efficiency of conventional breeding; and the development of transgenic crops with novel, useful genes are essential

for helping future generations, particularly those in the least-developed countries or less-hospitable agricultural areas, to move beyond subsistence and towards food security and expanding economic opportunities. Biotechnology also holds promise to reduce the high dependence on pesticides and enhance environmental protection. The most compelling case for biotechnology, and more specifically GM crops, is their capability to contribute to:

- increasing crop productivity, and thus contribute to global food, feed, and fiber security;
- biofortification of food crops with micronutrients, vitamins, and minerals to fight malnutrition;
- conserving biodiversity, as a land-saving technology capable of higher productivity;
- more efficient use of external inputs, for a more sustainable agriculture and environment;
- increasing stability of production to lessen suffering during famines due to abiotic and biotic stresses; and
- to the improvement of economic and social benefits and the alleviation of abject poverty in developing countries.

### **Strategy for Raising Agricultural Productivity through Biotechnology**

Several considerations need to be factored in for successful development and utilization of biotechnology for improved food and nutrition security in Africa:

- i. Understanding the challenge, i.e. what everybody has been doing and why there are no products in the market for farmers;
- ii. Defining the scientific challenge, i.e. what really needs to be done to come up with a product that would easily be utilized by the small-scale farmers, i.e. compatible to local needs and socioeconomic considerations;
- iii. Identifying the scientific team or consortium that has the relevant expertise, interest, and drive that would work together and focus on the solution, i.e. product development; also consulting them for involvement and explaining responsibility and negotiating implementation budgets, including benefit considerations for their institutional involvements;
- iv. Discussing/negotiating/developing implementation budgets with the donor, project implementations strategies, milestone achievements and implementing budget disbursement schedules, progress monitoring and evaluation procedures, results dissemination procedures, quarterly and annual reports and procedures; and
- v. Facilitation of project implementation; actually making the consortium work together in harmony, monitoring progress, removing bottlenecks and constraints that reduce effectiveness, arranging for necessary training, placements, who is inviting who to do what, keeping and reminding members of important milestone interactions, making sure the team maintains focus on the goal and working together; conflict mediation, maintaining regular 4-month period team planning meeting and such for progress monitoring and information sharing

The strategy should involve development of a consortium of institutions and organizations focusing on the development of a durable product. Each member of the consortium should contribute their comparative advantage and expertise and be committed to the common goal. For instance, funding can be sought from either philanthropic foundations or private sector. The private sector such as the private companies (Monsanto, Syngenta, Dupont) may contribute by donating technology while private laboratories such as the CGIAR system may contribute in carrying out the R&D to develop or adapt technologies to African products.

Public sector can also contribute although experience shows that public-sector institutions have little capacity for R&D. However, public institutions such as the national research institutions can contribute by taking leadership in on-station and field studies related to product development, including multi-locational field trials and all related issues. Several of their scientific staff can also gain on job

training in advance laboratories within the consortium. In addition, local farmers should be involved in conducting field trials.

Recognizing that human capital and training are the most important factors for sustainable and successful product development, training should be incorporated to build capacity and to preclude dependency of developing countries on industrialized countries for the new technologies. The training program should depart from the traditional practice of training scientist strictly in the public institutions in the north and instead design project-specific, hands-on training that can be undertaken with private sector corporations and should extend to incorporate infrastructure strengthening and/or building in local institutions to impart sustainability. The existence of institutional and infrastructural capacity is a vital component in the development and commercialization efforts.

Capacity is also needed in food and environmental safety regulations. This is a role that government agencies should play. The thrust of the biosafety development should be to build responsible and effective capacity in regulatory oversight in national programs that will ensure that products are tested and introduced in a safe and effective way, and preferably in harmony with existing biosafety regulations in other countries. Such program should focus on regulatory practitioners and scientists who should be empowered to promulgate and implementation of biosafety guidelines.

Nongovernment organizations are essential in the delivery of the benefits of biotech product to the resource poor by negotiating and brokerage to ensure that the marginalized can also access the benefits of biotech products. Other considerations include the existence of technology delivery systems. Key in delivery system is the private sector participation, who would commercialize the technology leading to large-scale production (multiplication) of the technology making the access sustainable as well as bringing down the cost to affordable levels by small scale farmers.

The recognition and existence of a system that promotes intellectual property rights (IPR) is essential in stimulating local innovation and public/private sector collaboration to encourage investment. At the same time, public acceptance of the technology should be promoted through awareness creation. Proper needs assessment and prioritization will ensure that products of biotech are demand driven.

Strong leadership will guarantee product delivery and realization of objectives. Leadership should bring motivation and spearhead consortium building. Leadership should be provided by a facilitator organization that has proven track record in impact creation and product delivery. The organization should have a good network, be able to address barriers, conflict mediation and maintain focus in situations where several partners with different interests are involved in a joint initiative.

Finally existence of an enabling political environment will ensure that investment from the private sector is protected and profits accrued thereof can be recouped.

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