Ministerial Roundtable Dialogue

High-level Segment - Geneva, 4 July 2007
Roundtable 1
4:30 – 6:30 p.m.

Issues Paper

Ending the cycle of food crises: cultivating a home-grown Green Revolution in Africa

1. *Why* a Green Revolution in Africa?

In several ways, Africa has scored numerous success stories towards achieving food security for its citizens. A good number of countries have demonstrated that yields of staple crops can be boosted significantly, as with maize in eastern and southern Africa, and cassava in West Africa and more recently rice in West and East Africa. In commercial agriculture, successes have been booked in the cotton, horticulture and dairy sectors, and in various other agricultural sub-sectors and commodity markets. Commitments to cut hunger and malnutrition are featuring ever more prominently in key national development and poverty reduction strategies and policies. Nevertheless, these successes have not led to a sustainable reduction in the prevalence of poverty and hunger on the continent.

African governments are acutely aware of the need to address the region's food security concerns and have already taken important political steps to accelerate poverty reduction efforts. The New Partnership for Africa's Development (NEPAD) provides a vision and strategic framework for "Africa's renewal"[1], while the recent Summit on Food Security in Africa (held in Abuja in December 2006) among other measures to enhance food security, re-called the importance of implementing the Comprehensive Africa Agriculture Development Programme (CAADP) as a central programme for 'accelerating agricultural development and food security on the continent'. In addition, policy makers are fully aware of growing environmental concerns, and the need for careful management of (still abundant) natural resources, in the face of increasing evidence of anticipated negative impacts of climate change on the continent.

Why then have there been repeated calls for a "**new Green Revolution**" in Africa? The reality, recognised first and foremost by African leaders themselves, is that the continent remains in a desperate situation. Africa is the only region in the world where agricultural productivity is declining. Yields of maize and other staple cereals typically remain less than 1.0 ton per hectare. Latest FAO estimates indicate that, over the past 15 years, the number of undernourished people on the continent has actually *increased* by 45 million to 220 million

[1] From the NEPAD home page: www.nepad.org

people suffering from extreme hunger today, representing more than one third of the total population in Africa. Launching an African Green Revolution to increase agricultural productivity – particularly among Africa's smallholder farmers – is therefore central to ending hunger and extreme poverty by accelerating growth. **At the heart of the Green Revolution is the idea that, using existing science and technology, agriculture can become the engine for Africa's economic growth**.

Beyond low productivity and weak policy environments for agriculture and rural development, natural and man-made disasters have had a severe negative impact on Africa's overall food security situation, resulting in repeated food crises in all parts of the continent. In addition, the HIV/AIDS pandemic and the high prevalence of other diseases, places a serious additional burden on people's productive capacity and gender inequalities in a highly gendered sector, sharpening the deleterious effects of hunger and malnutrition in rural areas, and undermining efforts to improve agricultural production. The Millennium Development Goals (MDGs) simply appear out of reach for many countries.

Given that the vast majority of Africa's population depends on agricultural and rural development for the eradication of extreme poverty and hunger, and economic prosperity, there have been several calls for stepped-up action in Africa, including in the context of the UN Millennium Project.[2] Most prominently, Kofi Annan, Jacques Diouf and several Heads of State reinforced the calls for urgent action at the high-level presidential seminar on 'Africa's Green Revolution' held in Addis Ababa in July 2004.

2. What have we learned?

While there are renewed cries for a Green Revolution in Africa, there are also calls for caution to ensure that lessons learned from the Asian Green Revolution are adapted and adjusted to the African context. A technical paper written for the 1996 World Food Summit (WFS) highlights that lessons from Asia have taught us that scientific advances alone cannot solve the food security problems of developing countries[3]. Political leaders must create suitable socio-economic and institutional enabling environments, while much easier access to credit and markets should play a key role in improving productivity, in particular of the poorest.

A new thrust to the Green Revolution must meet the legitimate needs of the hungry and food-insecure themselves and directly involve smallholders across all productive sectors (agriculture, livestock, fisheries, forestry) in the development and application of new technologies. It has also been recognised that greater equity does not necessarily arise from increased food production alone, and that sustainable and successful progress nearly always involves broad popular participation, allowing people themselves to select from among the new tools and blend these with the technological, social, cultural and economic settings with which they are familiar in their traditional livelihood systems. In this context, research has shown that based on alternative methods and philosophies, indigenous knowledge, and native crops,

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[2] UN Millennium Project. 2005. Investing in Development. A practical plan to achieve the Millennium Development Goals. New York. 329 pp.

UN Millennium Project Task Force on Hunger. 2005. Halving hunger: it can be done. Earthscan, London, 245p

[3] FAO, 1996 World Food Summit; "Lessons from the green revolution: towards a new green revolution"; available at: www.fao.org/docrep/003/w2612e/w2612e06a.htm

joined with cutting edge technology, offer hope for a more lasting solution to the world's increasing food needs[4].

3. *What* are key ingredients of a Green Revolution? *How* can a home-grown process best be realised?

In the following, the paper considers the nature of a Green Revolution in Africa, – *what* needs to be done to jumpstart and sustain such a Revolution – and outlines modalities for its implementation - *how* to do it.

Apart from ensuring that a Green Revolution in Africa is owned by Africans, it should also be realised that not "one size fits all". Given the many different ecosystems and farming systems, different solutions are needed for different parts of the continent. The following are **four key factor**s that will guide a home-grown African Green Revolution in achieving its objectives:

3.1 Innovation.

- Further investment in technological innovation is essential for a successful green revolution in Africa; however, it should also be recognised that much of the existing knowledge and technology must be made more easily accessible to the smallholder farmer in an affordable and sustainable manner[5].Technology development and application needs to be gender-sensitive and take into account women's important role in agriculture and their needs for appropriate tools as well as time-saving technologies.

- Productivity enhancement should be core to the Green Revolution for Africa. Nevertheless, as argued by some, while the Asian Green Revolution can be termed a 'seed-chemical fertilizer' revolution, the African Green Revolution must be based upon new farming systems consisting of 'seed-livestock-agro-forestry' interactions, in addition to appropriate chemical fertilizer use *(*from *e-Jade)*.

- Productivity enhancements must also result in a more stable production of staple crops and of income, rather than presenting a risk factor in causing severe production and price fluctuations

- Innovations must also be sensitive to the need for sustainable resource management (environment, water, soils), in particular for fragile or marginal production systems; in this context, new technology must promote the development of appropriate and innovative farming systems

- The role of biotechnology must be further explored, as well as the application of biological pest and weed control and IPM-methods that can give higher and environmentally sustainable yields with low inputs, while also seeking adaptation to vulnerable and marginal areas of lesser immediate potential.

3.2 Incentives (for enhancing competitiveness)

- African governments should give priority to sound national agricultural policies, and adjust to new international trade regimes through revised pricing and trade policies. The creation of

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[4] Richard Manning (2001). "Food's Frontier: the Next Green Revolution"

[5] For example, FAO's 'Technology for Agriculture' or TECA initiative aims at improving access to information and knowledge to about available proven technologies in order to enhance their adoption in agriculture, livestock, fisheries and forestry

more open access to markets and fair and predictable prices for produce are important to enable production increases on the African continent.

- A clear focus on improved delivery systems for the physical inputs required for increased productivity (seeds, fertilizers, crop protection chemicals and veterinary supplies) must form part of these policies, as should policies to enhance access to credit and strengthened rural financial markets

- Importantly, stable political and economic conditions must prevail for agricultural potential of any one country to be realised.

- Last but not least, there should be a clear recognition of the great potential for African women to play a central role in enhancing competitiveness of the agricultural sector; in this regard, programmes supporting gender equity and women's empowerment in all sectors represent an essential component for a Green Revolution in Africa.

3.3 Infrastructure

- Massive investments in road infrastructure for better market access are essential, if current extremely high transaction costs as a result of poor road networks are to be reduced and make African agriculture more competitive.

- Associated with the above, the functioning of agricultural markets must be greatly enhanced, including through improved access, the establishment of efficient market places, and the provision of market information services

- Investments in soil and water management are also essential, if the risks associated with heavy soil erosion and a high dependency on rain-fed agriculture are to be minimised. Provision of energy services need to be extended to rural areas to enable rural populations to enhance their productive capacities.

3.4 Institutions

- There is an urgent need for strengthened national institutions that facilitate productivity enhancement and the functioning of commercial agricultural markets. This includes the revitalization of agricultural extension, training and research facilities and the research the capacity of national universities. The two-way linkages between research and extension must also be strengthened through participatory methods in extension and the development of new research agendas.

- Institutional reform must place particular emphasis on creating capabilities for reaching the poor and food-insecure, including women, who have often been overlooked in national strategies. Strengthen the capacity of poor men, women, and youth and their organizations to participate in development processes.

- Adequate and secure access to land and property rights must also be guaranteed, as this can improve production and help reduce poverty. While titling programmes may contribute to this goal, it is also important for national land policies to recognize and incorporate customary rights and tenure arrangements, given that some 90 percent of the rural population accesses land through customary systems.[6] Land tenure systems may also

[6] For more information on customary rights see "Securing access to common property in a "modernizing world" by the International Land Coalition and the system-wide program on Collective Action and Property Rights of the CGIAR

consider where there are environmental or other benefits to managing land-based resources such as rangeland, water and forests as common property.

- A key formula to success emphasized by the Africa Green Revolution initiative are public-private partnerships in support of providing smallholders with access in input and output markets while also facilitating access to credit (more on public-private partnerships under www.africagreenrevolution.com whose theme this year is "Partnership for Productivity")

- Given the high degree of hunger and malnutrition in rural Africa, there is an urgent need for strengthened national institutions for targeted nutritional and food security program interventions, especially in the growing number of post-crisis situations on the continent, and in areas where HIV/AIDS is wreaking havoc. Deep micronutrient deficiencies must be addressed directly, especially among women, who dominate Africa's current cohort of farmers, and children, who will be her next.

As suggested earlier, the **central question is how precisely these elements of an African Green Revolution can be brought together** in Africa's varied contexts. History and recent experience suggest that the Green Revolution in Africa:

- must be continental in design but fundamentally context-specific in implementation, based on a common vision, *owned and led by Africans*;

- involve simultaneous action in the technical, institutional, and environmental domains based on a *radical transformation* of agriculture sectors, including their underlying capacities for implementation;

- address socio economic issues, while paying particular attention to *gender equity* and the empowerment of women; and

- involve *coordinated efforts* from inside and outside of Africa, while recognising different roles and responsibilities of all actors.

Implementation capacity in agriculture is especially crucial if an African Green Revolution is to take hold. Appropriate systems for building partnerships, assigning responsibility, rewarding performance, and monitoring and evaluating outcomes are required. An immediate priority is identification of the policy, institutional, and organizational platforms that will provide a basis for identifying best practices in each of the above four thematic areas, and for mobilizing resources and action toward broad-based and rapid replication and up-scaling of winning interventions.

There is considerable experimentation and learning underway across the continent with alternative platforms. For instance, soil improvement, new crop and livestock varieties, and intensified input use are being combined with farmer collective action in input and output markets, revealing significant potential for increased incomes, improved sustainability of farming systems, and adaptation to a range of farming systems and agroecologies.[7] Also showing promise are organizations that link farm input supply with information dissemination, organizations that explicitly integrate research, extension, and training, and organizations that connect development, testing, and dissemination of improved post-harvest commodity

[7] See for example: "Readily Available Technology, Research Findings and Recommendations for Transfer to Farmers or End Users." The African Highlands Initiative of the Association for Strengthening Agricultural Research in Eastern and Central Africa, http://www.africanhighlands.org/; and "About Push-Pull – Implementation of Habitat Management Strategies for the Control of Stemborers and Striga in Maize-based Farming Systems in Eastern Africa and Mechanisms of Striga Suppression by Desmodium sp." International Center for Insect Physiology and Ecology, http://www.icipe.org/research_areas/plant_health/staple_food_crop_pests/push_pull/index.html.

management methods.[8] Efforts to link agricultural development policy with broader national development policy are also proving powerful instruments for promoting the multi-sectoral perspectives crucial to sustained growth in agriculture.[9]

A key unifying theme in this process of experimentation and learning is the importance of addressing the high degree of risk facing Africa's agricultural households, both as producers and as traders, especially in the context of climate change and variability. Overcoming some of this risk appears to require interventions predicated on rights-based entitlements, especially the right to food and the right to feed oneself. However, an African Green Revolution will likely rest on incentive-based schemes whose impacts depend on broad-based and rapid farmer and trader adoption of risk-reducing technologies and practices.

The appropriate mix of policies will be context-specific, defined in part by available resources, and in part by the breadth and depth of stakeholder participation that can be brought to bear in design and implementation of initiatives in the above four thematic areas.

4. A Focus on Smallholder Farmers

Boosting the productivity of smallholder farmers is central to achieving the home-grown Green Revolution in Africa. For a successful transformation of smallholder agriculture, five inter-connected constraints faced by smallholder farmers must be addressed:

A. Low and declining soil fertility: Declining soil fertility is the main cause of falling crop yields and per capita food production. It also acts as a key source of land degradation and environmental damage. The soils in many areas have been depleted of nutrients because smallholder farmers apply no or negligible amounts of fertilizers. On average, fertilizer use in sub-Sahara Africa (SSA) is estimated at 10 kg per hectare; compared to over 500 kg per hectare in developed world. To a large extent, this is due to the high cost of fertilizers in sub-Sahara, costing anywhere between 400-500 USD in Africa. This is 4-6 times the international market price. Without increasing fertilizer use significantly, no region in the world has been able to expand agricultural growth rates, and thus tackle hunger.

B. Poor access to improved seeds and planting materials: Smallholder farmers have limited access to improved seeds and planting materials. Even where improved seeds are used, the impact is often small unless they are accompanied by interventions to improve soil fertility and water management.

C. Dependence on rain-fed agriculture and poor management of water: The need to improve water management, its harvesting and using it to increase area under irrigation is also essential. Only 3.7% of the total arable land in Africa is currently irrigated, against 33% in Asia & the Pacific, and 29% in the Middle East and North Africa. In Africa, the emphasis should be on small-scale irrigation. Most smallholder farmers are unlikely to benefit from increased large-scale irrigation for technical and environmental reasons. Other key constraints that need to be addressed due to their implicit effects include infrastructure, specifically roads, communication and the energy supply conditions in rural areas.

D. Insufficient agricultural extension services: Few farmers in Africa have access to well-qualified agricultural extension services that propagate improved farming techniques, the use of natural and mineral fertilizers, sound water management, and pest control.

E. Lack of access to markets: Finally, rural communities across Africa are poorly connected to local and international markets. Poor transport infrastructure and services lead to high transport

[8] See for example the Sustainable Agriculture Centre for Research, Extension and Development in Africa, http://www.sacredafrica.org/ and The Kilimo Trust, http://www.kilimotrust.org

[9] For instance, Kenya's Strategy for the Revitalization of Agriculture and Uganda's Plan for Modernization of Agriculture.

costs. The lack of safe storage increases post-harvest losses (often over 30% in Africa), and the lack of market information depresses farm gate prices.

5. The way ahead: political and institutional requirements, partnerships, and regional cooperation

Countries that have achieved national and household food security and sustained hunger reduction, also for the poor, have a track record of strong political emphasis on agriculture, careful consideration of economic incentives for agricultural production, human and economic investments in research, extension and training, while also paying particular attention to gender equity and empowerment of women. A major lesson from the Asian Green Revolution is that governments must take the lead in shaping strategic priorities and mobilizing strategic investments in line with those priorities. The private sector and civil society bodies, particularly farmer and trader organizations, also have an important role to play, not only during strategy formulation, but also in design and implementation of context-specific interventions. These lessons apply strongly for Africa.

Many of the constraints and opportunities facing African agriculture cut across national boundaries, suggesting scope for regional initiatives to overcome or exploit them. Opportunities to reduce learning costs through deliberate information sharing across countries should also be seized.

There is no doubt the green revolution can happen, and do so in our lifetimes. The science and technology needed are there. So are the commitments, both national and international. What is required next are: a) operational programs at national level to scale up appropriate interventions such as improved seeds, fertilizers and extension services; b) increased financing to agriculture – the donor community should come through with its commitments and augment domestic resources; and c) strengthen public-private partnership in ways that improve access to markets for smallholder farmers. The UN system can provide tremendous technical and facilitation support and accelerate progress.

Ultimately, the measure of success for a home-grown Green Revolution in Africa would include improved nutrition and enhanced food security across the region, increased incomes and more secure livelihoods for the poor and most vulnerable people, environmental protection and sustained economic growth.

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