Realizing the promise and potential of African agriculture

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In May 2000 all of the world's science academies created the InterAcademy Council to mobilize the best scientists and engineers worldwide to provide high quality advice to international bodies - such as the United Nations and the World Bank - as well as to other institutions. In 2003 the Secretary General of the UN, Kofi Annan, called upon the IAC to present a report providing a technological strategic plan for harnessing the best science and technology to provide substantial increase in agricultural productivity in Africa.
An international panel accepted the challenge and performed a study, resulting in the report 'Realizing the promise and potential of African agriculture'.

Although the assignment concerned Science and Technology, the panel decided to also address the enabling environment. The panel reasoned that technological approaches alone never can suffice to reach substantial increase in productivity. Besides technological interventions, specific attention must be paid to institutional developments, to capacity building, markets and a conducive policy.
This notion led to recommendations in 4 domains:

1. Technology options that can make a difference
2. Building impact-oriented research, knowledge and development institutions
3. Creating and retaining a new generation of agricultural scientists
4. Markets and policies to make the poor prosperous and food secure

An important starting point of the Panel is that agriculture is the motor of national economies. As a consequence, increasing the agriculture productivity not only effects the food availability, but also stimulates the economy. This double effect justifies a large and combined effort to bring about this productivity increase. The Green Revolutions showed us the power of R&D in large parts of the world. A national investment in agricultural R&D is an investment in its future. Therefore the panel advises the African countries to increase the investment in agricultural R&D as percentage of GDP and to decrease donor dependency.

Yet a Green Revolution will not be the road for Africa. It does not take the specific African situation into account. Africa is characterized by a large variation of different farming systems and over 90% of all farming takes place in these integrated systems. The monocultures of high-yielding varieties and large-scale mechanization advocated by the Green Revolution can not be reached in Africa within the coming generations. In stead, a Rainbow Evolution is needed, accentuating the fact that a variety of solutions is needed to meet the challenge and that we have to built on the existing African practice. It is therefore imperative that farmers or farmer-organizations take part in the agenda-setting. The panel pleads for a quadrangle approach: research, education, extension AND farmer participation.

Not all farming systems have equal potential for further development. With limited resources, the international community is forced to set priorities. The panel recommends to favor those systems with the highest hunger-rate in combination with the highest potential. This largely co-incides with the hunger-hot spots identified by the MDG-hunger taskforce and the pilot-learning sides of the Challenge Program. To actually increase the productivity within these farming systems, the production-ecological approach shows the way. The potential agricultural yield is limited by yield-limiting factors like water, nutrients and labor and reduced by yield-reducing factors like pests and diseases. A major further problem in Africa that needs to be addressed is the post-harvesting.

As we all know, erratic rainfall is a major source of low productivity in large parts of Africa. Some advocate large-scale irrigation systems to regulate water supplies. In parts of Africa, like Egypt, this approach is indeed very successful. Yet large-scale irrigation projects are not feasible in many other parts of Africa. Small-scale systems may be of help, but the panel asks specific attention for the rain-fed agriculture since the rain-fed agriculture will remain the dominant system in Africa for decades to come. Ecological synergies including drought-tolerant cultivars should be exploited. In this respect Africa should take full advantage of new, powerful breeding methods that are recently developed.

Technological improvements are powerful, but will not suffice to increase productivity considerably. A conducive environment is necessary. The panel recommends in this respect to build impact-oriented research, knowledge and development institutions. The role of universities probably will increase in the near future because of the power of ICT, enabling distant-learning. Universities may increasingly play a role in the national agricultural research systems. Further, the panel recommends to cultivate African centers of agricultural research excellence,

exemplified by Biosciences East and Central Africa (BECA), which will provide African biotechnologists with access to cutting edge facilities and equipment.

The implementation of new technologies, education and institutions building all need a fertile socio-economic environment. Markets and policies must be in place to make the poor income and food secure. Vital in this respect is the rural infrastructure such as roads, information and communication technology and storage facilities. Appropriate grading standards, sanitary and phytosanitary regulations should be in place and enforced. Improved international market access will be a key ingredient in translating increases in African agricultural productivity into improved food security. OECD countries should allow developing countries more access to their markets and reduce their domestic agricultural subsidies and tariff/non-tariff barriers to trade. Africa needs a level playing ground to take full advantage of its agricultural potential.

In conclusion. agriculture practice in the developed countries shows that many solutions like the use of fertilizers, plant breeding and mechanization are at hand to tackle the relevant factors. Yet these solutions are not tailor-made for the African situation. Technologies on the shelf must be adapted or new technologies must be developed to help the African agriculture. Technologies must be accompanied with a stimulating socio-economic environment to develop full impact. Africa itself should take the lead in this. The developed countries should be encouraged to assist wherever they can.

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