

Realizing the promise and potential of African agriculture







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## Foreword

In recent years, while there have been increases in food production in Africa, these increases have been offset by an even larger increase in human populations. While the availability of food per person since 1990 has increased by 30 percent in Asia and 20 percent in Latin America, it has gone down in Africa by 3 percent. Today many millions of people in southern Africa are on the brink of starvation.

In March 2002, the Secretary-General of the United Nations requested that the InterAcademy Council (IAC) prepare a strategic plan for harnessing the best science and technology to increase the productivity of agriculture in Africa. In response to the Secretary-General's request, the IAC Board invited the 90-national member academies of the InterAcademy Panel on International Issues (IAP) to nominate candidates for undertaking this study on the role of science and technology in improving agricultural productivity and food security in Africa. The IAC Board then appointed a Study Panel on Agricultural Productivity in Africa, composed of Co-Chairs Speciosa Kazibwe of Uganda, Rudy Rabbinge of the Netherlands, and M.S. Swaminathan of India, plus 15 other distinguished members. The Study Panel's personal experience in agricultural sciences and agricultural policies spans all regions of the world, including of course Africa; it also includes many scientific disciplines.

The charge to the Study Panel was to produce a consensus report for the United Nations that (1)

addresses how science and technology can help to improve agricultural production in Africa, and (2) identifies the larger economic, social, and political conditions that will be necessary for effective use of this science and technology in both the public and private sectors. The Study Panel began its work with a series of regional workshops throughout Africa, which allowed it to benefit immensely from the expertise and views of African scientists on the key agricultural issues facing Africa. Then the Study Panel held a series of meetings to develop its conclusions and recommendations.

The document that follows is the result. First written in draft form, the final report incorporates the Study Panel's response to an extensive external, independent and anonymous review process that involved 13 experts plus two distinguished scientists who served as review monitors. We thank all of the Study Panel members, reviewers, and monitors who contributed to this important effort. Special appreciation is due to the Study Panel's Co-Chairs and Study Director, who put much time and devotion into ensuring that the final product would make a difference.

The InterAcademy Council also gratefully acknowledges the leadership exhibited by the Bill and Melinda Gates Foundation, the Carnegie Corporation of New York, and the Netherlands Ministry of Development Cooperation, which provided the financial support for the conduct of the study and the distribution of this report.

As this report emphasizes, realizing the promise and potential of African agriculture requires long-range approaches that will need to involve a broad array of African institutions and constituencies. But every long journey begins with first steps, and we urge that the following be initiated as soon as possible:

- The UN Secretary General, in consultation with



the African Union, should identify the most appropriate regional, national and international institutions to implement the innovative pilot programs that are recommended, which are designed to shape Africa's agricultural future. There should be strong African involvement at every step.

- Interdisciplinary teams from African universities, research centers, extension services, and farmers' organizations should be created to prepare plans for promoting priority farming systems. Local farmers' advisory councils involving both men and women should be constituted to assume ownership and undertake monitoring and evaluation of the resulting initiatives.
- African national governments should create centers of agricultural research excellence to serve the interests of smallholder farm families. These centers should help to provide location-specific information relating to meteorological, management, and marketing factors – as well as to promote literacy on critical genetic, quality, and trade issues among smallholder farm families.

The scientific academies of the world, as close partners with their colleagues in Africa, stand ready to contribute their part to this great humanitarian effort of the early 21st century.

Bruce ALBERTS  
President, U.S. National Academy of Sciences  
Co-Chair, InterAcademy Council

Goverdhan MEHTA  
Former President, Indian National Science Academy  
Co-Chair, InterAcademy Council



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# Preface

Africa is recognized as a continent of promise and potential, much as yet unrealized. Agriculture is pivotal to the realization of these aspirations as it contributes 70 percent of employment, 40 percent of exports and one-third of gross domestic product. Agricultural development in rural Africa, where three-quarters of the continent's food and nutrition insecure reside, would offer these communities relief and hope for a brighter future. Enhancing African agricultural productivity is a prerequisite for eradicating African poverty and associated food and nutrition insecurity. The smaller the farm, the greater is the need for marketable surplus and thereby cash income that is essential for sustainable nutrition security. Agricultural productivity trends in recent decades in Africa have been disappointing.

The InterAcademy Council sponsored this study at the request of the Secretary General of the United Nations, Kofi Annan. It was to explore how science and technology can be more effectively used to improve agricultural productivity and thereby to improve food security. This report is complementary to the current assessment by the UN Millennium Development Goals Hunger Task Force as it looks at other aspects involved in reducing hunger and food insecurity.

This report is addressed to a wide audience, ranging in Africa from heads of state, ministers and permanent heads in most portfolios to farmers and their representative organizations. The recommendations and action agenda in the report give a key role to leaders of universities, national agricultural research systems and institutions; the

private sector, regional and subregional intergovernmental organizations; academic, scientific and extension staff; nongovernmental and community-based organizations and the mass media. Multilateral and bilateral financial, research and development and donor agencies are also an important audience, as they have a important role to play in African agricultural development.

Like the first report of the InterAcademy Council in 2004, *Inventing a better future: A strategy for building worldwide capacities in science and technology*, this report is strategic and conceptual rather than prescriptive. This is as intended by the Study Panel. The African continent is large and diverse, and it would be presumptuous of the Study Panel to devise detailed operational plans. These are more appropriately made by relevant national, regional and continental organizations with the knowledge and experience of their mandated domains. The Study Panel hopes that the report's analyses, strategic directions and recommendations will generate a strong sense of ownership and commitment by the various stakeholders in Africa's development, and motivate them to take the necessary next steps.

Toward this objective the Study Panel suggests using pilot programs as a way of connecting its strategy and recommendations. These pilot programs are but one of the five steps that the Study Panel recognizes that are required to realize Africa's agricultural promise and potential:

1. Undertake analyses
2. Formulate strategies
3. Plan and conduct pilot programs
4. Develop operational plans
5. Implement plans.

The Study Panel addresses the first three of these steps; the other two become the next steps for our



readers to embrace and carry forward. To develop a strong sense of ownership and commitment for our intended audience, the Study Panel adopted a two-tiered approach in conducting this study. First, a series of consultative workshops in four regions of Africa were held to allow stakeholders to convey their views on the constraints and opportunities in African agriculture, and the role that science and technology could play in future. Second, several background papers were commissioned on key topics bringing together current thoughts and research for the Study Panel's consideration. The report is hence a synthesis of the outcomes of this two-tiered process, and the result hopefully is a hybrid with vigour.

The Study Panel, composed of 3 Co-Chairs and 15 members, met three times in Africa during 2002-2003 to formulate its recommendations, based on its review of the documentation from the workshops and commissioned papers, extensive electronic communications, and additional papers contributed by the Study Panel members. Strengthened by consultative drafting and spirited redrafting, the report followed the InterAcademy Council's peer review and monitoring processes from December 2003 to February 2004. The final report represents the consensus views of all the Study Panel members.

Speciosa Wandira KAZIBWE  
Study Panel Co-Chair

Rudy RABBINGE  
Study Panel Co-Chair

M.S. SWAMINATHAN  
Study Panel Co-Chair



## Report review

This report was externally reviewed in draft form by 13 internationally renowned experts chosen for their diverse perspectives, technical knowledge and geographical representation, in accordance with procedures approved by the IAC Board. The purpose of this independent review was to provide candid and critical comments that would help the IAC to produce a sound report that met the IAC standards for objectivity, evidence and responsiveness to the study charge. The review procedure and draft manuscript remain confidential to protect the integrity of the deliberative process. The IAC wishes to thank the following individuals for their review of this report:

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Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the conclusions and recommendations, nor did they see the final draft of the report before its release.

The review of this report was overseen by:

**Hans R. HERREN**, Director General, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi, Kenya

**Mamphela A. RAMPHELE**, Managing Director for Human Development, The World Bank, Washington, DC, USA

Appointed by the IAC Co-Chairs, these review monitors were responsible for ascertaining that the independent examination of this report was carried out in accordance with IAC procedures and that all review comments were carefully considered. However, responsibility for the final content of this report rests entirely with the authoring Study Panel and the InterAcademy Council.





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The Study Panel appreciates the contribution of the authors who prepared background papers, which, together with the consultative workshops, provided the essential building blocks for the report. Those involved were: Nienke Beintema, Prem Bindraban, Carl Eicher, Lawrence Haddad, Peter Hazell, Huub Löffler, David Muduuli, Peter Matlon, Sudip Mitra, Rudy Rabbinge, Han Roseboom Elly Sabiiti, Dunstan Spencer and Clesensio Tizikara.

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The InterAcademy Council (IAC) secretariat and the Royal Netherlands Academy of Arts and Sciences (KNAW) in Amsterdam, where IAC is headquartered, provided guidance and support for this study. In this regard, special mention is made of the assistance provided by Albert Koers, John Campbell, and Margreet Haverkamp of the IAC Secretariat.

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tion of New York, and the Netherlands Ministry of Development Cooperation for providing funding to support the study.

Last but by no means least, the Study Panel thanks the InterAcademy Council Board and especially Bruce Alberts and Goverdhan Mehta, the IAC Co-Chairs, for providing it with the opportunity to undertake this important study.