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## Introduction

African scientists, experts, policymakers, civil society organizations and representatives of international organizations from over 24 African countries met in Maseru, Lesotho, to deliberate on the perennial and persistent food insecurity problem in sub-Saharan Africa and to provide African perspectives towards a holistic approach to finding solution to the problem, including the use of relevant tools of science and technology.

The conference agreed and noted the following points:

Participants noted with satisfaction the fact that this conference was not only timely but more importantly the only one among many on this critical issue with a deliberate, strong African perspectives;

The conference acknowledged that sub-Saharan Africa is the only continent experiencing chronic food insecurity, largely because of the dependence on rain-fed agriculture, in spite of the great advances in the agricultural science and technology;

The conference noted that food insecurity in Africa is as a result of several failures: the failure of the international and national agricultural research systems; domestic policy failure, especially regarding science and technology; institutional weakness and market failures as well as the failure to locate the food security problem within an economy-wide innovation system;

The conference argued for the exploration of a new way of measuring the performance of both the international and national agricultural research systems. The new way would incorporate incentives that require scientists to look beyond the laboratories and experimental systems, place less emphasis on published papers,

encourage a move to a multi-disciplinary framework requiring more interaction with social scientists, ultimately to better appreciate policy imperatives and the requirements for moving from science to innovation;

Participants expressed concern that there are weak links or virtually none between the international agricultural research systems and the national systems and urged for stronger partnership and collaboration between the two in a manner that minimizes the differences in status and the condescending attitude of the international systems as generators of knowledge and the national systems as mere extension agents;

Participants compared the experience of Asia with that of Africa and noted that one significant difference in the success of Asia's green revolution was the critical investment in water prior to the green revolution policies. Such investment is lacking in Africa where access to water resources and irrigation technology is still limited. This is an issue that is compounded by significant differences in ecological, environmental and socio-cultural endowments within and across African countries that make application of research results across countries very costly. In this respect, the conference noted that scientists exaggerate the universality of agricultural science, often minimizing the costs of transferring or adapting research knowledge from one ecological zone to another, and thus leading to frequent adoption failures;

The conference discussed the importance of new technology, and in particular, how biosciences can be used to improve food security in Africa. It was noted that, in general, bioscience research relating to livestock is expensive and under-funded. Participants lauded the idea of establishing centers of excellence where facilities and resources can be shared by many countries. These centers would in turn serve as hubs for the much needed public-private sector partnership both in the extension services and in the investment for technology uptake. Again, the conference emphasized that African researchers and institutions should have key roles in the design and implementation of programs associated with these centers of excellence;

The conference noted with dismay that although Africa is largely agrarian, the poverty reduction strategic papers (PRSP) already prepared in several African countries have assigned no role to agricultural science and technology and the policy imperatives associated with this;

Participants reiterated that technology-led development is a leader-driven endeavor and that African leaders must show greater interest and take charge of the process that deploys science and technology to solve food insecurity in Africa, and ensure that agricultural technological capabilities are built and that African scientists are significantly utilized in this process;

Participants observed that food insecurity in Africa is concern to African governments and the international community but that donor dependence cannot lead to a sustainable solution;

In their concluding remarks, the conference participants noted that Africans and African institutions should be strengthened to find a lasting solution to food insecurity because they better understand the African farmer, her cultural and environmental setting and the institutional requirements for the transfer knowledge to the farmer; and

The discussions of the conference were further guided by several commissioned thematic papers on some of the key issues that affect agricultural performance in sub-Saharan Africa: 1) WTO and the future of Africa's agriculture; 2) From Science to Production: Transferring Knowledge to the Rural Farmer- What works and What Doesn't; 3) Integrating Indigenous and Scientific Knowledge for Improved Food Security in Africa; 4) The Biotechnology Revolution and Its implications for Food Security in Africa; 5) Agricultural Biotechnology and its implications for Food Security: Lessons from Asia and Latin America; 6) Harnessing Information and Communication Technologies for Improved Agricultural Performance in Africa; 7) Gender Dimensions of the Current Agricultural Performance in Africa; 8) Why has Africa Fallen Short of Building Dynamic Agro-processing Capabilities: Constraints, Options and Prospects?; and 9) Markets, Institutions and Agricultural Performance in Africa.

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### **The World Trade Organization (WTO) and the Future of Africa's Agriculture**

The conference noted that generally trade liberalization potentially could benefit Africa's agricultural performance by opening markets. Yet, WTO as an institution lacks complete transparency in its process and embodies in its structure, a great deal of power asymmetry in representation between members. The conference, therefore, noted that the key to effective participation in WTO lies in capacity building of negotiators, and in Africa using its best people in the negotiating process. Africa must be fully engaged in the negotiations on the removal of agricultural subsidies by industrialized countries as well as in shaping the WTO's development agenda;

It was agreed that while this regime is important, there are other key factors that affect the performance of agricultural commodities in the external market such as investment in water and rural infrastructure, production techniques, standards and access to technology;



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# From Science to Production

### Transferring Knowledge to the Rural African Farmers

The conference noted that the key to the transfer of knowledge to farmers lies in understanding the African farmer, her environment, economic and socio-cultural circumstances. The participants noted that some of the bottlenecks to successful transfer of technology include inappropriate packaging of technology and information, lack of participation by recipients in the knowledge generation process; abrupt or lack of funding continuity; inefficient or inappropriate markets and institutions;

Participants also discussed successful transfer experiences in Eritrea involving the National Agricultural Research and Extension Systems (NARES) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the sorghum project in Nigeria and the East African Uji Mix. It was agreed that lessons from successful transfers will be documented in order to fully appreciate the players and institutions involved and how these experiences can inform a national systems of innovation approach to food security;

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### **Integrating Indigenous and Scientific Knowledge for Improved Food Security**

The conference noted that scientific knowledge is validated based on experiments while indigenous knowledge could be tacit and is validated based on experience. The participants agreed that knowledge partnership is important, integrating both, and leading to innovation that capitalizes on the strength of both. Indigenous technological knowledge (ITK) is affordable, adaptable, and sustainable for the most part, and provides for non-formal agricultural education. It therefore strengthens farmers' confidence and capacity to solve problems;

The participants noted that an experiment carried out in Kenya showed that some ITK methods were as effective as scientific methods. The integration of both saw farmers making informed decisions on crop management and production options while enabling researchers to forge stronger links with the farmers, cultivate their confidence and established a stronger basis for further experimentation and integration of both methods. The participants further noted that incentives must be put in place to encourage scientists to work with farmers and to link their work to ITK in an institutional framework that recognizes the strengths of both knowledge generating processes;

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### **The Biotechnology Revolution and its Implication for Food Security in Africa**

The conference acknowledged the potential benefits of biotechnology in attaining food security but noted that the danger lies in the absence of capacity in Africa to make sophisticated choices, analyze and localize the benefits as well as the capacity to manage the attendant risks; hence the need for investment in research and training. In most of Africa, the policy framework for evaluating and domesticating biotechnology is lacking. The conference noted that this should be the first order of priority;

Participants noted that biotechnology is misunderstood in Africa leading to misinformation, confusion, generalization and simplistic assumptions. The conference noted that Africa should examine the whole spectrum from tissue culture to Genetically Modified Organisms (GMOs). They also noted that strong incentives should be provided to encourage the formation of strategic alliances and the participation of the various key players in this field. These alliances would be useful in influencing, for the benefit of Africa, the global governance regimes that are emerging, requiring flexible enforcement of intellectual property rights and responsive regulatory policies that address the needs of Africa;

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### **Harnessing ICTs for Improved Agricultural Performance in Africa**

The conference noted that ICTs could be used as strong tools to improve the performance of agriculture in Africa through improved training, speedy access to marketing information, extension services, and meteorological information. Participants noted examples of agricultural skills formation among rural women using telecentres and the use of ICT to educate, successfully, rural women on sustainable use of natural resources in food production;

The participants also noted that the benefits of ICTs to the rural farmer need to be further interrogated to avoid “oversell”. Locating telecenters in rural areas does not translate into access and benefits. Of critical importance is the information content, its relevance to the needs of the farmers and the integration of their socio-cultural relevance in the packaging and delivery of the information;



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### **Gender Dimension of Current Agricultural Performance in Africa**

The conference noted that women play significant roles in Africa's agriculture. The participants observed that in order to understand the gender dimension of Africa's agriculture, one must examine it in the context of the role of women in Africa's development, and the factors that militate against their leadership role in the economy in all its facets. Women are the producers and laborers on the farm but the institutions that support agriculture are led by men. This state of affairs is compounded by having extension services that are not sensitive to women's learning behavior and to other constraints that confront women in an African society;

The participants recognized that the HIV/AIDS scourge with higher incidence among women would affect adversely the performance of the agricultural sector, the nutritional status of women and children, and increase overall gender inequity. This suggests a strong need to examine the issues more holistically rather than sectorally;

The conference noted that the challenge in attaining gender equity was to deepen democracy in Africa, including democratization of access to technology, integrate women's concerns in the political discourse, and ensure greater participation by women with men and women working in partnership to address developmental goals such as food security

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### **Why has Africa Fallen Short of Building Dynamic Agro-Processing Capabilities**

#### **Constraints, Options and Prospects?**

The participants noted that a dynamic agro-processing capability was essential in improving the performance of agriculture in Africa and for overall improvement in food security. Agro-processing introduces dynamism in agriculture through technological linkages, improved learning and organization in the supply chain and the inevitable increase in the income of farmers. The conference noted that robust economic and technology policies that engender this structural shift, from the production of raw materials to its processing, and a strong implementation culture could be the key to Africa's growth and development;

The conference noted that, unfortunately, past and present economic policies of governments in the region failed to recognize that technology arising from new knowledge was the engine of growth. The participants noted that some of the economic policies were anti-technology and anti-innovation. Thus, the structural shift that could have boosted the agro-processing industry failed to materialize as a result;

Participants noted that to build a strong agro-processing capability, economic and technology policy must be integrated; trade and production have to be linked; technological capability building, technology transfer and domestic content must be emphasized for all firms particularly multinationals. A country with a national system of innovation approach would be better able to overcome the constraints and stimulate better economic performance

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### **Markets, Institutions and Agricultural Performance in Africa**

The conference noted that African farmers face problems of transaction costs, missing markets, poor infrastructure, and other institutional constraints that limit the benefits from engaging in agricultural production;

The participants further noted that these issues were not adequately recognized in the design and implementation of the structural adjustment or current liberalization programs. There were renewed debates around the wisdom of abolishing marketing boards in Africa and how it could have denied farmers a source of new knowledge, credit guarantee, quality control, price stability and rural infrastructure. The conference agreed that the previous assumptions that the private sector would fill any necessary vacuum created by the demise of the marketing boards have failed to materialize. As well, the huge supply response from higher farm-gate prices never materialized; and

The conference noted that indigenous approach to developing market and market information are essential for enhanced agricultural sector performance. Such collective and concerted efforts among farmers, agro-processors, and governments must target the re-establishment of grades and standards, provision of market information, access to credit, reconfiguration of agricultural support institutions and rural infrastructural development.

Communiqué Issued at the end of *The Conference on Science & Technology and Food Security in Africa* held in Maseru, Lesotho, between 10 and 11 November, 2003 under the joint auspices of The African Technology Policy Studies Network (ATPS) And The Ministry of Communications, Science and Technology (MCST) of the Government of Lesotho

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## **ABOUT THE AFRICAN TECHNOLOGY POLICY STUDIES NETWORK**

The African Technology Policy Studies Network (ATPS) is a multi-disciplinary network of researchers, policy makers, actors in the private sector and other end-users interested in generating, promoting and strengthening innovative science and technology policies in Africa. With a regional secretariat in Nairobi, the network operates through national chapters in 23 African countries, with an expansion plan to cover the entire sub-Saharan Africa.

One of the objectives of the network is to disseminate research results to policy makers, legislators, the organized private sector, civil society, mass media and farmers' groups through publications, dialogue and advocacy. Among its range of publications are the Working Paper Series (WPS), Research Paper Series (RPS), Special Paper Series (SPS) and the Technopolicy Briefs.

**Technopolicy Briefs Series are commissioned short papers written by experts from all over the world specifically to address current science and technology policy concerns and questions in Africa. The briefs are also summaries of technical papers published under our WPS, SPS and RPS written to highlight significant policy recommendations. These briefs are written with the busy policymakers and non-specialists in mind. The materials are designed for general readership and help advance the advocacy and knowledge brokerage roles of the ATPS.**

ATPS is supported by a growing number of donors including the International Development Research Centre (IDRC), SIDA-SAREC, the Carnegie Corporation of New York, the Rockefeller Foundation, the World Bank, the OPEC Fund, Ford Foundation, Coca-Cola Eastern Africa, the African Development Bank, and the Royal Dutch Government.

## Acronyms

|         |  |
|---------|--|
| GMOs    | Genetically Modified Organisms                                   |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| ICT     | Information and Communication Technologies                       |
| ITK     | Indigenous Technological Knowledge                               |
| NARES   | National Agricultural Research and Extension Systems             |
| WTO     | World Trade Organization   |

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## **Table of Contents**

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|            |   |           |
|------------|---|-----------|
| <b>1.0</b> | <b>Introduction</b>   | <b>1</b>  |
| <b>2.0</b> | <b>The World Trade Organization (WTO) and the Future of Africa's Agriculture</b>    | <b>4</b>  |
| <b>3.0</b> | <b>From Science to Production</b>   | <b>5</b>  |
| <b>4.0</b> | <b>Integrating Indigenous and Scientific Knowledge for Improved Food Security</b>   | <b>6</b>  |
| <b>5.0</b> | <b>The Biotechnology Revolution and its Implication for Food Security in Africa</b> | <b>7</b>  |
| <b>6.0</b> | <b>Harnessing ICTs for Improved Agricultural Performance in Africa</b>              | <b>8</b>  |
| <b>7.0</b> | <b>Gender Dimensions of Current Agricultural Performance in Africa</b>              | <b>9</b>  |
| <b>8.0</b> | <b>Why has Africa Fallen Short of Building Dynamic Agro-processing Capabilities</b> | <b>10</b> |
| <b>9.0</b> | <b>Market, Institutions and Agricultural Performance in Africa</b>                  | <b>11</b> |