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**SPAAR/FARA Vision of African Agricultural Research and Development**

# **Vision of African Agricultural Research and Development**

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## **Introduction**

African agricultural production over the past two decades has not kept up with population growth. Political and natural factors have inhibited investment, technological change and growth. Without substantial improvements in agricultural productivity and sound natural resource management, most African rural dwellers will not be able to improve their well-being for the foreseeable future. Increasing agricultural production to achieve food security, higher incomes and sustainable economic growth while preserving the natural resource base remains the central challenge of African development.

Agriculture is critical to Africa's economic, social and rural development. An important objective of the agricultural agenda is to make African agriculture competitive in world markets. Institutional innovations are needed to make agricultural public institutions more responsive to markets, more accountable to the communities they serve, and better recognized as an important tool to achieve economic growth. The beneficial interplay between technology change and the broader environment offers a realistic hope for agriculture to provide the impetus for economic growth.

Increased agricultural productivity in Africa cannot be achieved without the benefits of cutting edge science and without advances in technology development, capacity building, technology transfer, and policy research to bear through the development, adaptation and dissemination of new technologies and without improving the policy environment in which farmers operate. Lack of government commitment to agricultural development has inhibited the quality and quantity of donor efforts, discouraged private investment in agriculture, and caused sustainability problems for public investments.

Recovery will not be easy. Wholesale institutional and policy reforms will not happen quickly. Much will depend on whether the continent as a whole will achieve the necessary political stability for implementing a difficult and complex agenda for economic reforms, whether it will broaden and deepen the reform effort in key areas essential for private sector activity to flourish; and whether it will receive the necessary political and financial support from the international community. Solving the fundamental problem of lack of African government commitment to agriculture will require expanding efforts at information, education and communication.

## **The Rebirth of a Continent**

Africa is undergoing a profound and positive political, social and economic transformation. A number of countries that have emerged as open and democratic nations are beginning to achieve significant economic growth. Their relative political and economic successes are encouraging others to follow suit. As a consequence, more governments are now engaged in building the foundation for restoring growth.

A consensus is now emerging that the region has the ability, over the next 20-50 years, to build on some of these achievements, regain its standing and generate significant gains in the quality of life of its population. Throughout Africa, governments are beginning to focus on what they can do best. People are taking charge of their own affairs. There is now more pragmatism and less ideology. Civil society is beginning to express itself more insistently. An “African Renaissance” is taking hold, characterized by: a regional confidence, a sense of renewal and hope for a better life; a concern for problem-solving and crisis management; a promotion of African self-interest; a greater sensitivity to Africa’s talents, its rich and diverse cultural heritage and its natural resource endowment.

In political terms, the renaissance is characterized by an embrace of wide-reaching institutional and policy reforms, shifts in sentiment toward the role of the state, a greater openness and transparency on the part of governments, a concern for a more egalitarian income distribution; and a spirit of an African-African partnership.

On the eve of a new millennium, the region must clearly establish its priorities for policy reforms that would lead to sustainable growth and poverty reduction, especially in the rural areas. It must reposition itself in a fast evolving world economy by crafting its own model of development. The evolving African model must have, as its ultimate long-term goal: (i) the protection of the poor and the availability of food and other essentials at affordable prices; (ii) the creation of employment opportunities; and (iii) an equitable distribution of wealth. The program of reform will focus on key areas, including enhancing competitiveness, improving governance, sharing growth and ensuring quality of life.

## **A Vision of African Agricultural Research and Development**

This renaissance provides a unique historic opportunity to link up and mobilize African leadership in the political, economic, scientific/technical and social spheres in order to support a well-defined development strategy leading to a new vision for African agricultural research and development. It is a vision of a transformed African agriculture and its expanded productive capacity. By the year 2020, the continent could:

- have dynamic agricultural markets among nations and between regions;

- be a net exporter of agricultural products;
- have food availability and affordability, equitable distribution of wealth;
- be a strategic player in science and technology development, especially in agromedical fields; and
- have a culture of sustainable use of the natural resource base.

These changes are predicated on an annual economic growth rate of 4 percent, from the current 2 percent. Reaching an average 4 percent p.a. economic growth rate in most African countries requires an even larger annual growth rate for agriculture, about 6 percent, because of the relatively large contribution of agriculture to GDP (about 35 percent), and the fact that in most countries the major private businesses are agro-industry, agricultural marketing and farm input supply. The projected growth rate of 6 percent will allow African farmers to prosper and not just survive. It is within reach if African agriculture is allowed to realize its full potential by further deepening the sources of technological innovations and impact, improving agricultural policy regimes, and taking a broader and longer view of the context in which agricultural development takes place.

Central to the renewal of African agriculture is the dual challenge of how to generate, adapt and disseminate improved agricultural technologies to remove the constraints to productivity, and how to bring about institutional innovations that will enable the African agricultural research community to provide the scientific leadership and advance the development of efficient, demand-driven, participatory and pluralistic national agricultural research systems and sub-regional organizations.

## **Potential of African Agriculture**

A highly productive agricultural sector remains at the heart of development. As the fundamental economic activity in most African countries, agriculture will remain the backbone of most of the economies of the continent for the foreseeable future. It accounts for about 35% of the continent's GDP, 40 percent of its exports and about 70 percent of employment. Since agriculture is a leading sector in African economies, its slow development is one principal reason for the disappointing economic growth and the continuing poverty on the continent.

Compared with other regions of the world, the overall picture of African agriculture is bleak. Its crop yields and animal productivity remain relatively low. Farmers still face innumerable obstacles to fulfilling their potential. Food security and poverty elimination at the farm level in Africa is widely constrained by inappropriate policies that affect smallholders' access to input and output markets, to land, capital and new technologies. They do not have incentives to invest in their farms or in technical change. Nor do they have adequate profits (in cash or in kind) to save and

invest. Success will depend on governments supporting smallholders with enabling policies, efficient and reliable access to input markets and effective channels for assessing innovations.

There have been pockets of innovation and impact. Food production has grown relatively fast, even though it still has not kept up with population growth. The 1990s have witnessed an increase in world trade in five of the nine major African exports—cotton, sugar, tea, tobacco, bananas. This increase has been accompanied by an expansion in non-traditional export crops. Agricultural policy regimes have improved, as evidenced by the liberalization of agricultural marketing and pricing and, generally, an improved macro-economic stability in many countries in the region. Since 1990, twenty-five countries have had real agricultural GDP growth rates of over 2 percent, with a dozen of them enjoying growth rates of over 4 percent. Between 1993 and 1997 an additional half a dozen also had real agricultural GDP growth rates. Production data indicate that the pace of agricultural growth in many African countries has picked up considerably during the 1990s. Per capita food production has increased by 37 percent in Sudan, 24 percent in Benin, 19 percent in Nigeria, 12 percent in Ghana, and 11 percent in Guinea. Much of the growth, however, was a result of area expansion with yield increases accounting for less than two percent. Intensification of food production—using modern technologies on the lands best suited to this use—must be at the heart of rural development efforts in the coming years.

These changes have already made a difference in the lives of many rural and urban dwellers. From Guinea to Zambia to Eritrea, access to food by low-income consumers has improved. Much greater investment in agricultural research, extension, infrastructure, transport, general education, and health will be needed to enable all Africans to have access to food. On the technological front, there are many improved varieties and food production technologies already available or well-advanced in the pipeline that have the biological potential to double and triple traditional yields. Earlier-maturing, high-yielding varieties of maize, rice, sorghum, cassava, and grain legumes offer exciting new possibilities for multiple cropping, including green manure crops. Conservation tillage offers greater hope to check soil erosion, conserve moisture, and reduce the back-breaking work and drudgery of weeding and land preparation. Nutritionally-superior maize varieties are being enthusiastically adopted in a growing number of countries. Africa has yet to capitalize on its rich indigenous knowledge and develop mechanisms that will enable its institutions to acquire and utilize relevant and appropriate technologies.

## **Challenges for the Agriculture Sector**

Reduced to its essentials, the challenge for African agriculture is to reach a 6 percent annual growth in a generation. The goal can be achieved by expanding and accelerating innovation of the last decade.

**Table 1: Comparative Average Yields (t/ha) of Maize, Rice, Sorghum and Wheat, 1990-1998**

	Sub-Sahara Farmer Fields	Sub-Sahara Potential	China	India	USA	The World
Maize	1.2	5.0	4.8	1.6	7.7	3.9
Rice	1.6	4.0	5.9	2.8	6.4	3.7
Sorghum	0.8	2.5	4.0	0.8	4.1	1.4
Wheat	1.6	3.5	3.5	2.4	2.6	2.5

In order for agriculture to play its proper role in the economic development of the continent, it must (i) increase efficiency and competitiveness along the food chain (at the local, national, regional, continental and international levels); (ii) organize, capture and consolidate agricultural market niches; (iii) increase farm-level productivity and increase market access through improved quality enhancement and diversification of products developed; (iv) formulate and implement policies that address land use, trade, energy utilization, labor use efficiency and other agricultural inputs; and (v) enhance the scope and quality of soil and water use and management.

A concerted effort is needed to address the distortions in agricultural markets, enhance the production-consumption continuum, improve access to basic infrastructure and protect the natural resource base. The full potential of African agriculture must be captured by:

- (i) completing the large unfinished policy agenda, including anti-export biases in trade regimes, remnants of marketing boards and parastatals in some countries (e.g. Tanzania and Ghana).
- (ii) breaking through demand barriers: enhance private agribusiness environment and skills, foster (sub)regional economic and trade integration; access to OECD agricultural and food markets;
- (iii) sharply improving access to public infrastructure and services;
- (iv) promoting agriculture-led industrialization through value-added activities. Domestic improvements in business practices remain critical in an era of global competition, as does improved access to sub-regional and OECD markets for processed goods.

- (v) improving input markets and use: promote sub-regional seed, fertilizer markets; improve access to fertilizer by eliminating remaining policy distortions and monopolies; and
- (vi) bringing the best and most appropriate science to bear through the development, adaptation and dissemination of new technologies.

Agricultural development hinges on the availability of technology to increase productivity in a sustainable manner that does not deplete or degenerate the natural resource base. The development of the agricultural sector in Africa has been severely hindered by the slow rate of technology generation, transfer and adoption by farmers. The continent has the capacity, in one generation, to develop and adopt improved and new farming technologies to reverse the trend. Key to these developments will be technological innovations--adapted to local situations--and higher rates of technology diffusion and adoption. Such a breakthrough depends critically on a dynamic, creative and strong African agricultural research system.

A broader view of both the role of agriculture and the factors which contribute to agricultural growth is necessary. A beneficial interplay between technological change and the larger environment offers hope for agriculture to provide the impetus for economic growth. Generally speaking, social development (education and health), environmental concerns, physical infrastructure development as well as political development are all vital to the development of agriculture. Agricultural development contributes to progress in each of these areas, by creating wealth--broadly distributed throughout the population--necessary to maintain social progress, finance preservation of the environment, and enable people to divert more energy from mere survival to a thriving existence. Agricultural development therefore has implications that reach far beyond the agriculture sector. And, similarly, some of the most important actions contributing to agricultural growth lie actually outside agriculture. The transformation of the agricultural sector cannot be isolated from the broader political and economic systems.

The current situation in sub-Saharan Africa calls for a new approach and a renewed commitment built on local experiences. The emerging consensus on the role of the civil society and community leadership, and the proactive measures intended to correct gender bias can serve as a tangible basis for changing the rules of the game in the rural sector. Also needed are implementable actions and partnerships designed to accelerate the transition to a more productive future. The key strategic interventions proposed build upon the strengths and achievements of African countries in their efforts to build effective and cohesive sub-regional and national agricultural research and development institutions.

In developing a regional strategy, it is important to avoid two opposing extremes: promoting ideals which are difficult to achieve; or relying on the notion that everything should be left to indigenous skill and cultural strengths, which would be insufficient in a rapidly changing environment. A correct balance is likely to be somewhere in the middle. Some underlying factors common to success in Africa include (i) a recognition of, and pride in, indigenous and traditional strengths; (ii) an engagement of local expertise and corresponding ownership; (iii) political commitment by the leadership, signaling the importance of agriculture in African economies; (iv) a decentralization of

responsibility and accountability to primary stakeholders; (v) stakeholder participation in choices and actions that affect them; and (vi) better coordinated, less fragmented donor support.

## **Revitalizing Agricultural Research in Sub-Saharan Africa**

Revitalizing agricultural research is an essential ingredient for augmenting capacities for development in Africa. The goal of 6 percent annual growth cannot be achieved without a more effective and focused agricultural research. A long-term vision is needed that meets the development imperatives of food security and wealth creation. Past research efforts tended to be externally-driven, without adequate ownership, and therefore of questionable sustainability. African countries have continued to rely on technical assistance without adequately transferring know-how to local stakeholders, using indigenous knowledge and institutions, or creating a sense of ownership among the intended beneficiaries—therefore undermining sustainability. The present constraint is not absolute lack of knowledge or a sense of what is required. Rather it is the inability—due to political sensitivities, financial limitations and ineffectual management—to take the necessary actions. Prominent among these are efforts to upgrade, reposition and restructure the entire agricultural research system. Capacity-building, human resource development, resource mobilization, and development of information and new knowledge will be the cornerstone of the new agricultural research system.

There remains a pressing need for the institutional capacity necessary to carry the vision forward. Throughout the continent, public research institutions have been thwarted by lack adequate human, technical, financial capacity. Handicapped by lack of technological and scientific data, these institutions are saddled with many of the inefficiencies of the public sector. Well-trained professionals are often over-burdened, under-resources, and poorly paid. Capacity-related problems manifest themselves through lack of access by much of the rural populations, poor service delivery. Such problems are caused by many factors, e.g. insufficient number of highly skilled staff, poorly designed policies and regulations, wasteful and insufficient practices, inadequate operation and maintenance, poor financial management. Existing mechanisms do not have sufficient reach and capacity to assure financial support over the long term.

The situation is further exacerbated by the fact that budgetary and funding decisions are routinely not linked to policies, that policy objectives are not well-articulated and tend to be overly ambitious and set unattainable goals. Even if these institutions acquire the required technical and managerial skills, there is still the danger that political considerations, which neither reward nor hold parties accountable performance, would continue to militate against incentives. This and other government actions have contributed to the erosion of research institutions.

Factors which have undermined capacity building efforts and thus sustainability also come from the donor side, including a host of uncoordinated donor programs lacking coherence, consistency as well as programs more in tune with donor objectives than with local needs, priorities and



capacities. There has also been inadequate focus on creating sustainable institutions. The declining donor support brings to the fore the sustainability of institutions necessary to meet the challenges ahead. Sustainable financing of agricultural development and transfer requires (i) the diversification of funding sources that are based on partnerships of mutual interest; (ii) securing long-term of public funding; (iii) increasing the share of domestic funding (from government, farmers, NGOs, agribusiness, industry); (iv) developing innovative mechanisms for resource allocation such as competitive and contractual mechanisms, as well as linking resource allocation to performance and field impacts.

The capacity-building implications of the Vision are far-reaching, including not only traditional approaches—e.g. training, provision of equipment, and organizational restructuring, but also, more broadly, issues related to content and process, and the administrative frameworks that establish, implement, and enforce rules and incentives to spur efficient decision-making, operational performance and information management and sharing—including both the incorporation of indigenous knowledge and the availability of the requisite hardware and software for carrying out tasks. Of significant importance are issues related to the institutional arrangements, including the rules and incentives, how to educate, attract, retain, motivate and train professionals, and how to improve governance so that decision-makers act openly and responsibly. Various kinds of capacities are needed to address the complexities inherent in moving Africa toward agricultural self-sufficiency. These efforts should take a long-term perspective, and be given the time they need to take hold.

Developing and sustaining capacities is a slow, difficult and costly process, but which must begin quickly. It is a fundamental strategy for achieving the 6 percent goal. There is now a need for an Africa-based, and Africa-led research system to innovate and contribute to the frontiers of knowledge, cater to the needs of the poorest farmers, while preserving and validating indigenous knowledge, formulate and implement policies required to achieve accelerated agricultural production and increased productivity in the region.

A new agricultural research system is needed that:

- (i) is demand-driven, responsive to clients' needs, and more closely linked to development objectives for greater impact. The challenge is to move away from the linear mode of operation (research, extension, farmer) to a technology development and transfer system, squarely centered on farmers' realities and needs. Impact-oriented research rests on strong and effective public institutions and on farmers' access to new technologies and on their capacity to selectively adopt and adapt them to their needs and circumstances. The new research paradigm puts a premium on smallholder farming and small-scale agribusiness and seeks a major impact on women, youth and the disadvantaged. While in the past increases in cultivated area provided much of the required incremental production to meet the needs of rapidly increasing populations, in the future agricultural growth will depend heavily on enhanced productivity of both land and labor.

- (ii) addresses the whole value chain, from production, processing, marketing, to value-adding concerns that is linked to nutritional aspects, health, income and overall food security;
- (iii) consolidates and expands traditional markets while exploring and exploiting emerging market niches (e.g. biomedical); and
- (iv) is more actively involved in policy formulation, implementation and monitoring and evaluation.

## **A Strategy for Agricultural Research and Development**

This new research and development strategy will be centered around three main pillars: (a) science and technology; (b) policy; and (c) institutional building. Technology dissemination, policy formulation, implementation and evaluation will be a prominent part of this strategy. Concerted efforts should be made to strengthen capacities for policy analysis and formulation. An assessment of existing capacity (in terms of local human resources and appropriate organization and procedures) coupled with a large scale capacity-building effort targeted on sharpening research skills and stimulating technology adoption and transfer will be central in reaching the proposed 6 percent growth by year 2020. To do so, it will be necessary to use the best of the traditional and new biological and information sciences to improve the potential of the African germplasm and natural resource base in order to offer a wide range of options and opportunities for enhancing productivity in an environmentally sustainable manner. A specific action would be to build up a cadre of qualified and motivated African agricultural research and development specialists and policymakers capable of analyzing conditions, formulating goals and promoting the vision with other stakeholders.

Agricultural development has national capacity-building implications that reach far beyond the agriculture sector. The sector's role in research, evaluation, information transfer, and technology development are critical to social progress and economic growth. It is therefore important to support institutional linkages designed to build capacity in essential skill areas critical for the future development of the country.

Various steps can be taken to enhance research capacity. Definition of research policy creates a frame of reference for such initiatives. Government research policy might address such questions as the importance the nation attaches to agricultural research, the nation's research priorities, and how research will be funded. Research policy will clarify different concerns, including identification of the capacities to be strengthened, the incentives that will be offered, how research will be managed, how quality will be monitored, and how results will be disseminated. While a successful agricultural research program should attract funding from various arms of government, donors and the private sector, the agricultural research system as a whole should include some earmarked provision for research within its own budget.

This strategy calls for a better integration of agricultural services (research, extension, credit); an active involvement of users in governance by setting and monitoring the agenda; a reform of agricultural services aimed at improving management and accountability; better (i.e. more productive) linkages with the world of knowledge, beyond CGIAR and the traditional ARI.

## Meeting the Challenge

The new research agenda also calls for new roles and responsibilities of the key actors involved in African agriculture to meet the challenge of agricultural renewal:

**National Agricultural Research Systems [NARS]** are by far the central players in agricultural research in Africa. Despite progress in human resource development, program planning and system management, much remains to be done to strengthen their capacities for demand-driven, problem-solving and market oriented research, and strengthen the governance structure to involve technology users in the decision-making process. Such a change calls for the integration of research systems and the establishment of effective links between NARS and their partners, e.g. farmers and the private sector. Evidence suggests that national agricultural research institutions must evolve into an integrated and pluralistic system. NARIs should: (i) be encouraged to expand into fully fledged NARSs; and develop a national agricultural research and development response to the broader agricultural goals and put in place suitable partnerships to achieve these over the short to medium-term.

**The Consultative Group on International Agricultural Research (CGIAR)** should: (i) recognize and respond to the growing African perspectives and development initiatives that exist at the intellectual, scientific and government levels; (ii) achieve coherence, synergy and coordination of approaches to partnerships with African actors; and (iii) review the focus and operational systems in place in order to ensure that the programs, institutional arrangements and spending in Africa are adequate to meet the immediate challenges as well as the long-term goals of agricultural research and development.

Through its realignment process, CGIAR should: (a) seek to strengthen the decentralization of the policy focussed institutes (SNAR, IFPRI and IPGRI), System-wide and special programs (such as Future Harvest and the INIPAB Program) in Africa; (b) ensure that the clustering of capacity of CGIAR institutes (CIMMYT, CIFOR, ICRISAT, ICLARM, CIAT, CIP IMWI and IRRI) at a sub-regional level is enhanced and coordinated to support NARS programs; (c) ensure that the role and significance of Africa-based centers (WARDA, IITA, ILRI, ICARDA and ICRAF) in contributing to the integrated regional development strategies is articulated and applied consistently; and (d) ensure that the CGIAR centers are driven by an Africa Agenda when addressing the agricultural challenges in Africa.

**Sub-Regional Organizations [SROs]** will focus on (i) developing strategies and programs on the regional aspects of the specific long term goals for Africa; (ii) complementing and building on

NARSs' visions and mandates; and (iii) create effective collaborative mechanisms between and among NARSs.

**SPAAR/FARA** would have principal responsibility to: (i) refine the proposed African model for Agricultural Research; (ii) design a framework for the facilitation of policy dialogue on African perspectives on international agricultural issues; (iii) become credible and effective interlocutors with national African governments--advocacy is needed to stimulate interest in agricultural renewal and create the commitment and political will. Raising awareness will encourage public support of policy initiatives such as good governance and political decentralization.; and (iv) build a credible apex African forum for agricultural research; (v) facilitate the transformation process of NARIs to NARSs, including universities, NGOs, CBOs, local private sector etc.; (vi) support CGIAR's transformation in sub-Saharan Africa.

**African governments** have the potential to contribute much toward the renewal of agricultural research. They can play a key role in (i) developing and strengthening existing public sector institutions—by encouraging management and autonomy-- necessary to support the implementation of an African Agricultural Research System; (ii) ensuring increased and sustained investment in agricultural research; and (iii) creating an enabling environment and appropriate instruments to support the development of African agricultural research systems in general and NARSs in particular. Governments will need to do more to define the role of the private sector. In this respect, they will have a predominant role in creating an enabling environment, in creating laws, rules and regulations which provide incentives. African political leaders must be sensitized and convinced that sustainable agricultural development requires committed human and financial resources for the generation and effective transfer of technology. Governments of sub-Saharan Africa should take ownership, leadership and direction of the proposed Vision for African Agricultural Research and Development, and should underpin their commitment with the financial and human resources necessary to transform agricultural research institutions.

**Governments** should also provide leadership in creating and maintaining a climate conducive to the retention of scientific, technical and managerial staff to lead the region toward achieving long-term goals. Governments can also play an important role in reinforcing the incentives for improved donor coordination.

**Multilateral organizations** involved in agriculture will be instrumental in recognizing and responding to the growing African perspectives and initiatives in development, and in achieving coherence and synergy with respect to the coordination of approaches to partnerships with Africans. The African Development Bank and the World Bank would be expected to use their influence to sensitize Africa's political leadership to the need to establish sustainable financing initiatives to fully support national and sub-regional research and development.

**Bilateral partners** will be expected to (i) promote African-led initiatives; (ii) adopt a new culture of articulation of short-, medium- and long-term objectives to mark a shift away from "aid" toward "investment;" and (iii) ensure coherence and synergy in their actions.

An array of partners will be necessary to achieve impact from agricultural research. These include researchers, policymakers, public and NGO extension workers, the private sector, farmer organizations and individual farmers. Equally important are joint commitments by African governments and the international development community to meeting both the funding and a supportive policy environment necessary for agricultural research to contribute successfully to the productivity goals, notably by empowering local communities and preserving the natural environment. A partnership with national and regional organizations will also be needed to enhance the awareness of policy and decision makers of the impacts of policy research so as to mobilize national and regional support for policy research. There is also a need for high-level dialogue with key African policy makers, particularly those from outside the agricultural sector, to gain greater political commitment to agricultural research.