

2012–2020 Refreshed Strategy

*The lead research partner
facilitating agricultural solutions for
hunger and poverty in the tropics*



IITA's Refreshed Strategy 2012-2020

The lead research partner facilitating
agricultural solutions for hunger and
poverty in the tropics

Our Mission

To offer leading research partnership that facilitates agricultural solutions for hunger, poverty, and natural resource degradation throughout the tropics

The International Institute of Tropical Agriculture's refreshed strategy serves as a guide and goal for the effective and efficient implementation of its agricultural research for development (R4D) and contribution to development impact in the tropics. It provides the foundation for developing a cohesive and better-focused high-quality research program to achieve IITA's vision and mission, ensuring strong programmatic alignment within the CGIAR global research program portfolio. It enhances accountability through better monitoring and evaluation of expected targets and to maintain and improve our comparative advantage in relevant, cutting-edge agricultural research.

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Foreword

This document presents a strategy for operationalizing our vision as “the lead research partner facilitating agricultural solutions for hunger and poverty in the tropics.” Our commitment as IITA staff is to organize and strengthen IITA’s research-for-development (R4D) and research partnerships, building on IITA’s past achievements and enhancing its scientific and administrative capacity to deliver on its mission of increasing agricultural production, food security, and income in the tropics, with a special emphasis on sub-Saharan Africa (SSA). The Refreshed Strategy has been approved by the IITA Board of Trustees and will guide its leaders, staff, and partnership management.

IITA’s refreshed strategy is a management tool to implement R4D and to maintain a financially stable center. It provides the foundation for developing a cohesive and better-focused, high- quality research program to achieve IITA’s mission, ensuring strong programmatic alignment within the CGIAR global research program portfolio. It enhances accountability through better monitoring and evaluation of expected targets, making sure that we maintain and improve our comparative advantage in relevant, cutting-edge agricultural research. Therefore, an ongoing analysis of our competencies and advantages, considering both of these as dynamic areas, provides greater insights that guide choices across the broad range of activities that IITA could or should pursue.

Dr Nteranya Sanginga
Director General, IITA

I. Executive summary

Africa and other developing regions across the tropics must increase agricultural productivity, food availability, food safety, and the sector's overall performance against the backdrop of a larger and more urban human population, uncertain effects of climate, increased demand for energy, disease pandemics, rural-to-urban migration, and, in some cases, civil strife. Most food and nutrition insecurity exists in sub-Saharan Africa due to chronically low crop yields as well as unacceptable postharvest losses.

In spite of the challenges, opportunities abound. IITA is committed to science-driven improvements in agriculture. In the past, IITA has delivered over 70% of CGIAR's impact in SSA. Indeed, Africa continues to need such a proactive CGIAR Center as IITA because of its inherent links to the needs of the continent. By 2020, IITA and its partners will raise over 11 million Africans out of poverty and redirect over 7.5 million hectares of underutilized, marginal, and degraded lands to more productive and sustainable use, guided by and contributing to the four System Level Outcomes (SLOs) as defined by CGIAR: reducing rural poverty, increasing food security, correcting undernutrition, and promoting more sustainable management of natural resources. The IITA experience in Africa will be extended to benefit all the tropics.

IITA will strengthen its R4D capacity by building on its past successes, its core assets, and comparative advantages. It will operate through decentralized and well-integrated research programs based among key farming systems located in major agroecological impact zones in SSA. These programs will: (1) consolidate the gains for cassava in lowland areas in West and Central Africa and extend IITA root and tuber cropping systems into East and Southern Africa; (2) enhance and diversify maize-legume farming systems integration in the moist savannas of Africa; (3) intensify banana-based systems in the mid-altitudes of East and Central Africa; (4) promote cereal, cowpea, and livestock integration in the dry savannas of West Africa; and (5) develop high-value crops and enterprises suited to the different impact zones. Two of the important features will be profitability of farm enterprises and employment generation particularly for the youth. These programs will be aligned to R4D programs that contribute to the larger CGIAR Research Programs fundamental to the process of CGIAR reform. IITA will continue to foster innovative partnerships and play catalytic and brokerage roles between advanced research institutes (ARIs), national, regional, and pan-African entities, the private sector, and farmers' organizations.

IITA's impact both within SSA and beyond to other tropical areas will be mediated through active engagement in the CGIAR Research Programs. The CGIAR Research Program on Integrated Systems for the Humid Tropics (Humidtropics), led by IITA,



IITA has historically focused its research on genetic improvement and plant health of important African staple crops.

will progressively become the focal point for the integration of all R4D at IITA. Meanwhile, our historical focus on genetic improvement and plant health of our mandate crops (cassava, yam, plantain, banana, cocoa, cowpea, soybean, and maize) will be strengthened and contribute to the CGIAR Research Programs on Maize, on Roots, Tubers and Bananas, and on Grain Legumes. Clearly IITA has an important role in terms of the conservation and distribution of genetic resources for our mandate species through our participation in the CGIAR Research Program on Managing and Sustaining Crop Collections led by the Global Trust Fund. IITA will renew its research on natural resource and crop management, and contribute to the CGIAR Research Program on Water, Land and Ecosystems. However, maximum benefits from these

research areas can only be obtained within an enabling socioeconomic environment, where factors such as viable farm input supply and produce markets, functional institutions, a certain level of gender equity, and supportive policies are in place. The CGIAR Research Program on Policies, Institutions and Markets provides an opportunity for collaboration and impact throughout SSA.

To address emerging challenges to agricultural development, research competencies will be strengthened in the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and CGIAR Research Program on Agriculture for Nutrition and Health (A4NH). Critical areas that cut across potential CGIAR Research Programs—Gender Inequality and Capacity Strengthening, Learning and Knowledge Sharing—are an integral part of this strategy. These are challenging goals, and closing the yield gaps of key commodities in a sustainable manner requires doubling the current human and financial resources available to IITA over the next eight years.

II. Changing context of African agriculture and IITA's contributions

The challenges to overcoming poverty and food insecurity, malnutrition, and achieving sustainable management of natural resources in SSA arise on several fronts. Africa's population growth remains high compared to other regions in the world (2.4% in SSA against 1.3% in non-African countries). In addition, the urban population is rapidly growing, putting pressure on the rural areas to produce surplus food at affordable prices. Food insecurity is a huge and increasing challenge largely because production per unit area has not increased in sub-Saharan Africa as it has elsewhere in the world. Too often, modest gains in food production have come at the expense of the natural resource base. For example, low levels of fertilizer use have led to an estimated annual loss of 8 million tons of nitrogen, phosphorus, and potassium from soils, nutrients valued at \$1.5 billion per year¹. Left unchecked, the effects of soil depletion are catastrophic. In addition, destructive agricultural practices along forest margins in Africa worsen deforestation rates—currently 200% of the global average. Alternatively, sustainable intensification of agricultural production better conserves and recycles soil nutrients and reduces the need for clearing new lands for agricultural production.

Sustainable intensification of production systems offers the potential to simultaneously address several pressing development objectives, particularly unlocking the agricultural potential, adapting production systems to climate change, sustainably managing land and water resources, and reducing rural poverty in regions that have been most intractable to lifting the poor above the poverty line of large parts of sub-Saharan Africa. Sustainable intensification of agricultural production entails complex trade-offs at the systems level involving scale of production, profitability, risks, household goals, and natural resource protection. These trade-offs and potential synergies operate at different scales. Understanding and managing these trade-offs are increasingly important and require new, innovative, integrated, and collaborative research approaches and partnerships that did not previously exist.

Climate change is projected to reduce agricultural productivity by an estimated 10–25% by 2080², through temperature increases, less rain, and increasing dry periods in some areas, and fewer, more intense storms causing erosion and floods

¹ See, for instance, the recently held Head of State Fertilizer Summit, Abuja, Nigeria.

² For instance, the Bill & Melinda Gates Foundation and the Alliance for a Green Revolution in Africa (AGRA) decided to invest in a Soil Health Program in SSA because they regard soils as a pillar for an African Green Revolution.

in others. This will likely increase the incidence of pests, weeds and diseases, risk of crop failure, and in the extreme, unpredictable shifts in the agroecological zoning of the continent. The Panel of the IITA 6th EMPR noted that the traditional focus on strengthening of the national agricultural research systems (NARS) is insufficient because in many cases their capacities for agricultural research are declining, and our capacity-building and training approaches must be rethought. This shortcoming has implications for the type and quality of collaborative research conducted within our programs and ultimately impedes the needed agricultural transformation in SSA.

The global, regional, and scientific context in which these changes are occurring must also be considered. The 2007-2008 global food crises was a wake-up call for a world that has become complacent in investing in agriculture. The good news is that agricultural research issues are now on the agenda of policy makers³ and development investors⁴, and African leaders have a new commitment towards advancing agriculture. Recent developments such as the Comprehensive Africa Agriculture Development Program (CAADP) framework agreement, the beginnings of more national investment in agriculture, and increased global attention and resource mobilization for African agriculture are encouraging. As an African-based and highly respected institution, IITA is well placed to make a distinctive contribution to this most pressing of challenges.

Several key science and technology developments have occurred in Africa that have potential to accelerate agricultural improvement at scale. For example, IITA has delivered over 70% of the impact from CGIAR in SSA.⁵ The impact of this type of research, measured many years later, shows productivity gains estimated at \$1.36 billion for improved maize over a 20-year period. The benefits of biological control innovations (e.g., for controlling cassava mealybug and green mite) is about 100 times higher than investment costs. There are other examples arising from IITA and other research organizations working in Africa.

The revolution in bioinformatics, in nanotechnology, and the increased capacity of selected NARS institutions (e.g., KARI, Kenya; NARO, Uganda) are creating new challenges and opportunities for achieving our mission. At the same time, the global institutional and development policy agendas are increasingly driven by the Millennium Development Goals, the World Development Report for 2008, and most recently the G20 Declaration on food security and the Rio 20+ Conference

³ See, for instance, the recently held Head of State Fertilizer Summit, Abuja, Nigeria.

⁴ For instance, the Bill & Melinda Gates Foundation and the Alliance for a Green Revolution in Africa (AGRA) decided to invest in a Soil Health Program in SSA because they regard soils as a pillar for an African Green Revolution.

⁵ CGIAR. 2007. SPIA Impact Assessment Report. Science Council Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy.

on sustainable development, renewing attention to agriculture and its importance for achieving the Millennium Development Goals of a world free from hunger and absolute poverty.

Africa's successes in the last 10 years have attracted recognition of the sector's importance in economic growth. National leaders are paying attention to constraints such as infrastructure, financial services, and regional markets. More specifically, food demand is rising in response to population and income growth. Multinational businesses are attracted to both material sourcing from developing countries and their growing market with rising purchasing power. For example, the West African middle class is projected to reach 175 million by 2025. Their changing diets bode well for the production and processing of crops advanced by IITA, specifically cassava, yam, banana, plantain, soybean, tree crops, and maize, many of the most important staple crops in SSA. These factors, combined with scientific advances



The importance of the agriculture sector in driving economic growth is now being recognized with the renewed attention to agriculture by national governments, leaders, and policy makers.

and IITA's tested R4D approach will deliver major impact. In a test of IITA's R4D approach, yields of cassava, a major staple of an African economy, Nigeria, increased by 10 million tons in four years. It benefited 8 million farmers and 90 million consumers and IITA's "put to other use" approach avoided a price drop of this commodity.

Despite all these successes over the years, 2011 has been a year of intense reflection and changes at IITA that have included innovations in R4D system orientation and changes in leadership at both the management and governance levels. In CGIAR, the emergence of the Consortium and the Fund Council as the two pillars of the reform has created the conditions for a more collective and cooperative working relationship between the main parts of the system and a unique opportunity for a new agreement with our donors that has the potential for stabilizing our funding base. Several reviews of CGIAR in SSA and the views of its national partners point to the need for consolidation of the efforts of CGIAR Centers working in Africa. IITA's major goal is to focus on areas that combine our comparative advantages with growing demands and to integrate our efforts and the necessary skills with those of our partners for enhanced research quality and impact.

Our proposal for a Strategic Direction for IITA 2011–2020 (*'The lead research partner in facilitating agricultural solutions for hunger and poverty in the tropics'*) offers several suggestions and priorities that take into account the 6th IITA External Program and Management Review (EMPR) report, IITA's responses, the draft IITA Strategy 2011–2020 'It is possible', the decentralized IITA structure, and the ongoing CGIAR reform process.

III. Vision of success

Africa needs a proactive CGIAR-supported Center that is closely linked to the needs of the Continent. IITA's revised mission is in line with that of the new CGIAR and will focus on the four System Level Outcomes described in the Strategic Results Framework (SRF), namely, (i) increase in food security, (ii) reduction of rural poverty, (iii) reduction of undernutrition, and (iv) more sustainable management of natural resources. Over the next eight years, IITA will advance these SLOs within the five impact zones (Figure 1) by increasing in target R4D regions major staple food yields (cassava, yam, maize, banana/plantain, soybean, and cowpea) by 60%, increasing average farm income by 50%, lifting 15% of poor households above the poverty line (over 11 million Africans), reducing the number

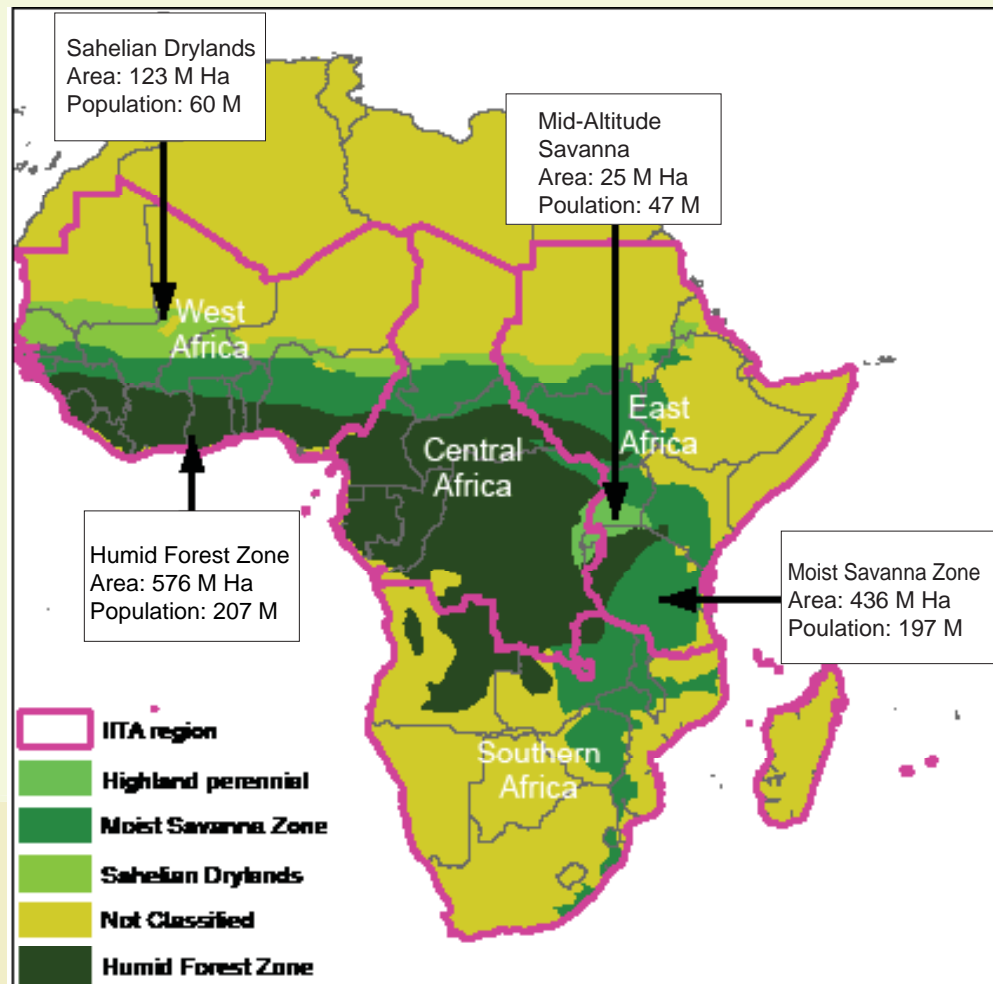


Figure 1. Impact zones and major cropping systems of four agroecological zones across sub-Saharan Africa.



Part of IITA's mission is to revitalize over 7.5 million hectares of farm lands in sub-Saharan Africa.

of malnourished children by 30%, and restoring 40% of these farms to sustainable resource management (revitalizing over 7.5 million hectares of degrading farm lands).

By 2020, IITA will operate through (i) decentralized but integrated regional research programs working on major agricultural constraints in Africa, specifically on crops, farming systems, and their natural resource base within an enabling socioeconomic environment, and (ii) the CGIAR Research Programs that will also foster innovative partnerships and outscaling of technologies developed in SSA to the global tropics. IITA will have twice the current human and financial resources to be able to substantially narrow yield gaps on key crops in several countries in a sustainable manner within the timeline of this refreshed strategy.

IV. Strategic objectives

Our strategy is embedded in a vision of continental reconstruction under peaceful conditions and built on the following strategic objectives: *(i) improve food security and availability (SLOs 1 and 3), (ii) increase profitability of foods and other agricultural products (SLO 2), and (iii) ensure sustainability of natural resource management (SLO 4)*. Achieving these objectives requires an enabling environment that (i) helps national entities expand agricultural growth mainly through higher productivity on existing farmland, (ii) encourages strategic alliances within and outside CGIAR, (iii) revives the capacity for R4D through innovative partnerships, and (iv) stimulates an efficient internal organizational structure. To achieve these objectives at the organizational level, IITA will develop structures and processes to provide the performance and incentive systems that encourage interdisciplinary teamwork, partnerships with other stakeholders and emphasis on mutual learning, and effective knowledge management that promotes change. In this way, agricultural research will fulfill its responsibility to support development and become an effective contributor to national and global development objectives.

Increase food security and availability (approximately 50% effort)

Increasing and sustaining the yield growth of Africa's key staple crops is essential to meeting its growing demand for food over the next decade. This objective will be achieved through the combined synergistic effects of increasing crop yields, enhancing system productivity resilience, decreasing losses due to pests and diseases, and improving postharvest management including food safety. We must fill the widely documented gap between current farm yields and potential yields on experimental stations. What are the major factors accounting for yield losses on farmer's fields in Africa? How can they be reduced or eliminated on a large scale? Genetic improvement coupled with the effective management of pests and diseases will remain an important component of yield improvement but must be increasingly complemented by the maintenance of agricultural resources, particularly soil quality, and a more efficient use of labor and other production factors (high quality agro-inputs, healthy and quality vegetatively propagated planting materials, etc.), including water and nutrients (see also Objective 3, next page). Capacity development of local producers (through the national systems) and the reduction of the gender gap in agriculture will also reduce food and nutrition insecurity and food availability of poor households. All of the Institute's effort to increase production and productivity will be tackled within the context of a full appreciation of the potential impacts of climate change.

Increase profitability of foods, feeds and other agricultural products (approximately 20% effort)

A single-minded pursuit of production increases (Objective 1) is counterproductive as it often lowers prices and penalizes producers. The factors that constrain widespread adoption of new technology are exactly those that are closely associated with rural poverty, namely poor education, limited land resources, weak access to input and commodity markets, and marginal agro-climatic conditions. For this objective to succeed, a fundamental understanding of crop value chains, and why some are so successful and others are not, is required. Studies conducted with key stakeholders in value-addition are also required to design more effective interventions. Key factors will be opportunities for improved postharvest handling through local processing of agricultural products and the reduction of tedious and non-ergonomic labor practices, particularly drudgery traditionally assigned to women. This labor saving in turn permits greater opportunity for cottage industry and entrepreneurial value addition, and entry of new products into local markets.

Ensure sustainability of natural resource management (approximately 30% effort)

Sustainable management of natural resources has been a central objective of CGIAR at large and IITA in particular since the expansion of the number of centers in the late 1980s. Research on natural resources management suffered because of lack of ready return to investment and specific donor interests, and longer-than-usual time for adoption and was subsequently reduced to a minimum within IITA's agenda. It is clear from the 6th EPMP recommendation and its being noted as one of the pillars of the CGIAR SRF and the renewed interest of the donor community in this topic that this research competency needs to be revived. This intervention is important as long as it is closely integrated with productivity goals and addresses conservation issues that promote sustainable development. Otherwise natural resource management alone risks becoming a peripheral "end in itself" that does not benefit poor farmers and thus becomes an ineffective use of limited institutional resources.

V. Impact and outcome through regional hubs

IITA will focus and integrate its R4D around farming system-based outcomes. IITA's primary focus will continue to be sub-Saharan Africa (SSA), while recognizing that the products of its research will be relevant for tropical Asia and America, especially within its leadership of the CGIAR Research Program on Integrated Systems for the Humid Tropics (see section VI). The R4D agenda will be implemented within four impact zones, representing major agroecological zones and farming systems (Figure 1). These impact zones are based upon (i) the large population depending on these systems for food and nutritional security and income, (ii) a useful understanding of farm baseline conditions and opportunities based upon past research, (iii) the need for intensification due to high population pressure on land, (iv) the nearness to large local and regional markets and processing centers, and (v) the presence of ongoing complementary projects dealing with specific aspects of this strategy. The following target farming systems and impact zones will form the focus of the R4D agenda.

Humid Forest Impact Zone: Consolidate the gains for roots, tubers, and bananas (cassava, yam, and banana/plantain) crops in lowland areas in West and Central Africa and expand IITA's work on cassava cropping systems into East and Southern Africa.

The humid forest zone of West and Central Africa occupies 5.8 million km² and supports a population of 163 million. IITA-improved cassava cultivars and their accompanying crop husbandry (mosaic resistant-germplasm, the judicious application of fertilizer blends, understory intercropping with nitrogen-fixing grain legumes, organic resource transfers, biological control of key pests, including new and future invaders) are particularly well suited to this zone and investments in expanding these systems, at both commercial and smallholder scales, is timely. IITA must provide technical backstopping to stimulate this development. Closing the cassava yield gap from the average of 10 t/ha to 35 t/ha of current improved varieties is the major goal but requires widespread testing of these varieties and continued efforts that control pests and diseases. Efforts to identify best management practices and production methods and to better communicate these gains to the farmer are important accompanying actions. Similar efforts will be made for yam, banana, and plantain. Linked to this must be an initiative to reduce the drudgery of local processing and to provide improvements in market conditions. A comprehensive 10-year strategy to develop cassava production in the humid tropics of Africa could result in 51 million metric tons of additional food worth US\$4.1 billion.

IITA's expansion of cassava must also include its importance as a food security and drought-coping mechanism in Southern Africa where cassava production is not widely practiced by small-scale farmers. As cassava expands, it can also become an important income-generating activity including economic use of by-products from processing centers currently treated as wastes. Such processing contributes to livestock enterprises and provides a source of industrial raw materials such as starch and ethanol. Market research and institutional development further stimulates the development of cassava-based industries at cottage and factory scales. Tree crops are also important in the Humid Forest Zone. IITA will build on traditional cash tree crops and their roles in intensified production and marketing and stimulate recognition for more diverse, processed, and hygienic foods in urban areas. Entry points for systems intensification include cocoa-based systems with cassava, maize, sweetpotato, grain legumes, banana, and vegetables in collaboration with the CGIAR Research Program on Forests, Trees and Agroforestry. This approach includes animal enterprises that improve household protein intake, income opportunities, and beneficial interaction with cropping. Opportunities for better natural resource management include integrated soil fertility management (ISFM), fostering biodiversity, and protecting system carbon stocks with special attention to accrued environmental services, off-site effects, and beneficial trade-offs.



Further exploiting the potentials of crops such as cassava for value addition would help increase the incomes of small-holder farmers through economic use of by-products.

Moist Savanna and Woodland Zone: Enhanced and diversified maize-legume farming systems in moist savannas of West, East, and Southern Africa.

Improved productivity within maize-legume intercrops and rotations offers particular promise in terms of food and nutritional security and income generation. Accompanying intensified smallholder dairy and small ruminant production results from better-managed livestock, improved feed resources, and well-organized product markets, bringing special advantage to women. Multipurpose soil, water, and nutrient management requires systems understanding and will be developed in close collaboration with the CGIAR Research Program on Water, Land and Ecosystems.

Several technical breakthroughs in field crop traits and management developed by IITA and its partners must now be extended to approximately 20 million households cultivating 31.7 million ha of cereal cropland. IITA must stimulate a process where improved maize-legume production practices, including controlling pests and diseases, are identified and field tested such that extension materials are developed around proven management regimes, training is conducted among rural development specialists and, where appropriate, technologies are translated into new farm inputs in conjunction with the private sector. Elimination of parasitic *Striga* on cereals is for the first time feasible using technologies pioneered by CGIAR Centers but must be backstopped by conscientious field sanitation, effective community by-laws, and agro-dealer awareness. Profitable intensification of grain legume enterprise, elimination of parasitic *Striga* from cereal cropland, and control of previously unmanaged pests and diseases are three important outcomes from this investment. Cropland expansion through targeted larger scale private investment will also play an important role in the moist savannas of Africa, particularly in the vast *miombo* woodland of Southern Africa, similar to intensification of the *Cerrados* of Brazil, where innovation in soil management required to sustain the productivity of these highly weathered soils has the potential to open a new “bread basket” for Africa. In this way, stronger south-south linkages have an important role to play in technology development and transfer.

Sahelian Drylands Zone: Cereal, cowpea, and livestock integration in the dry savannas of West Africa.

The Sahelian drylands occupy 1.2 million km² and have a population of 38 million. This zone presents a particular challenge for agricultural investment given its low rainfall, frequent and extended drought, fragile soils, and competition for resources between cropping and livestock. Nonetheless, available crop cultivars and innovation in water management stand to benefit about 4.9 million households on 23.2 million ha cropped with millet and sorghum, resulting in additional 5.2 million metric tons of food worth \$851 million and improving per capita food production by 137 kg millet/year. Better management of dry savannas involves fertilizer micro-dosing, water harvesting, manure management, and control of wind erosion.

Control of parasitic weeds is also important and technologies developed in the moist savannas may also be applied here. Commodity markets are particularly underdeveloped in the Sahel and improved market conditions serve as a driver for better land management and wider availability and use of farm inputs.

Mid-altitude Savannas and Forests: Banana cropping systems in upland East and Central Africa. Banana and plantain are the staple crops for approximately 30 million people farming 6 million ha in the humid and subhumid uplands of East and Central Africa. For many years, these production systems were in decline because of uncontrolled pests and pathogens, declining soil fertility, poor quality planting materials, and poorly managed organic residues. Twenty years of agricultural research by IITA and its partners in the management of banana-based cropping systems has led to a suite of innovative management recommendations that increase banana yield by at least 5 t/ha. A new range of value-added products made from banana and its companion intercrops permits income generation from improved banana production. Recent agronomic research by IITA has demonstrated that abiotic constraints, mainly due to poor soil fertility, are much more widespread than previously thought. Opportunities to intensify these systems exist, such as interplanting with coffee. This allows fertilizers to be used profitably and simultaneously enhance staple food and cash crop production.

Cross-cutting Agroecological Impact Zone: High-value crops with potential across different impact zones. A focus on diversification and high-value crops is consistent with the CGIAR Research Program on Policies, Institutions and Markets and the CGIAR Research Program on Agriculture for Nutrition and Health, and offers IITA the possibility of establishing research expertise in new crops and cropping systems. The current support for the various tree crop projects and the application of IITA's experience in integrated pest management of horticultural crops have led to expertise that can be transferred to new, higher value enterprises over the next several years. In the case of tree crops, IITA has long experience in crop management and socioeconomic analysis in forest and along-forest-margin systems. For vegetables, IITA's biological pest management experience is a principal entry point, which may be critical in reducing dangerous overuse and misuse of synthetic pesticides, and consequently their contamination of crop products, water sources, and the environment. However, as recommended by the 6th EPMR, IITA must carefully define its particular areas of expertise and its strategy for collaboration with other partners within and outside the CGIAR system.

Administrative Hubs

IITA will consolidate operational facilities and administrative services in these major impact zones (Figure 1), which serve as Regional Hubs. Today, IITA operates from Ibadan (hosting the headquarters) that will serve West Africa Hub, Dar es Salaam for Eastern Africa, and Lusaka for Southern Africa. Activities in Central Africa will be administered by the Hub in Kinshasa (Figure 2).

We will initiate two science platforms. The soil and plant health platform will be based at *icipe*, Nairobi, Kenya, as a formal alliance is made between IITA, *icipe*, CIAT, IFDC, and IPNI. At its main campus in Ibadan, IITA will house the projected biotechnology platform for West Africa (See Annex 1 for more details of the descriptions of the different hubs). We will consolidate research sites and operational facilities and administrative hubs. More than decentralized research programs, these regional offices will represent important strategic assets to remain engaged in local and regional contexts, establishing partnerships and mobilizing resources, implementing R4D programs, and managing risks. They will define IITA's personality as an institution. From a research point of view, it may be wise to have slightly different foci at the hubs to build critical mass in any given competency and make sure we are able to meet regional research demands via collaboration between hubs and with other research institution in the countries and region.

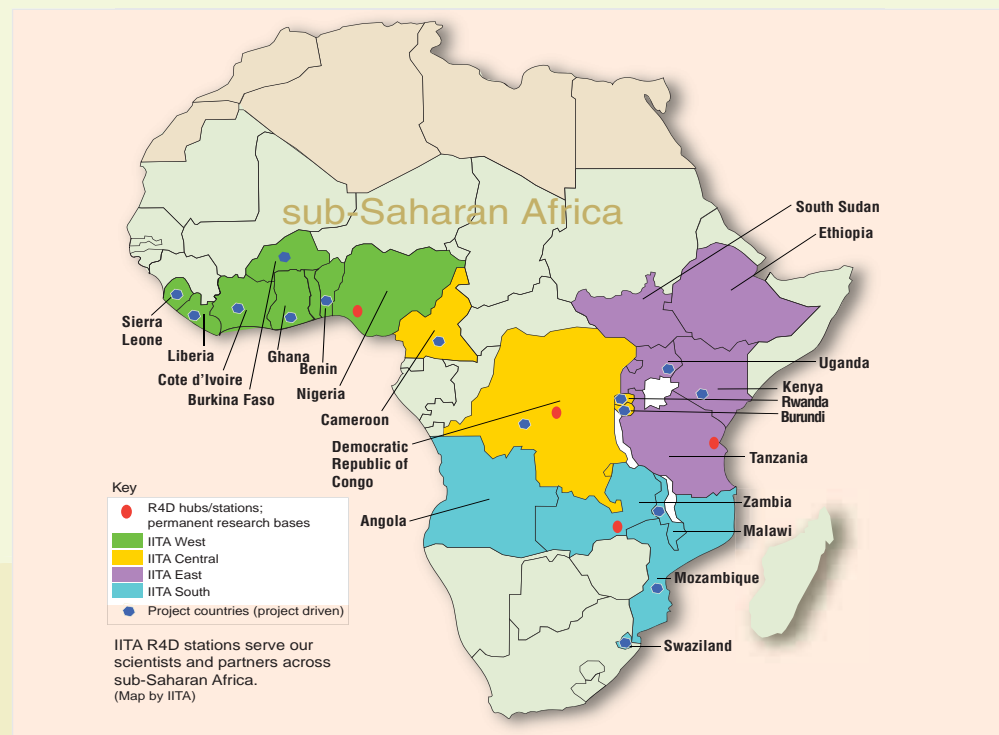


Figure 2. The four IITA Hubs in sub-Saharan Africa.

VI. Alignment of IITA's research with CGIAR Research Programs

Several attempts to consolidate CGIAR in Africa have seen little progress and a bold move is needed. To effectively respond to the challenge of this timely opportunity, CGIAR and IITA are adopting an R4D perspective as the unifying concept of their scientific effort. By relying on the identification of clearly defined development challenges identified jointly with other stakeholders where science and technology can play a significant role as the “entry point” of its program development process, CGIAR demands tighter focus and full accountability as expected by the international community. In practice, IITA will work to organize the activities needed to use existing knowledge, generate knowledge not readily available, and integrate the technological and social processes leading to significant development impacts. We will do so through a responsive mode of operations with partnerships and collaboration as our key guiding principle.

IITA will set a positive example in consolidating our operations with other key CGIAR centers working in SSA based upon complementarities of strategic advantage. Achieving this vision requires exploiting core competencies across the CGIAR system and better aligning research programs and downstream institutional arrangements around explicit strategies designed to impact on the four SLOs.

The CGIAR Research Program concept is intended as an instrument to achieve this greater alignment as it becomes the main organizational structure of CGIAR research. This model can as well apply across IITA programs. In the past, IITA programs were organized along lines of commodity support (e.g., roots and tubers, banana and plantain, cereals and legumes, high-value crops) and cross-cutting projects (agrobiodiversity, agriculture and health, the System-wide program on Integrated Pest Management). Our programs are now aligned with and are part of the CGIAR Research Programs grouped into four major competencies: biotechnology and genetic improvement, plant production and health management, natural resources and crop management, and social science and agribusiness that will contribute to the SLOs through the CGIAR Research Program on Integrated Systems for the Humid Tropics led by IITA (Figure 3). The weight of the contributions of the different CGIAR Research Programs to the four SLOs as presented in Figure 4 may serve as a starting point for priority setting. This assessment may be used to broadly guide our resource mobilization and allocation of IITA participation among CGIAR Research Programs. The scoring as presented in Figure 4 may serve as a starting point for assessment by the Board after this strategy has been transformed into a business operational plan. It clearly reinforces

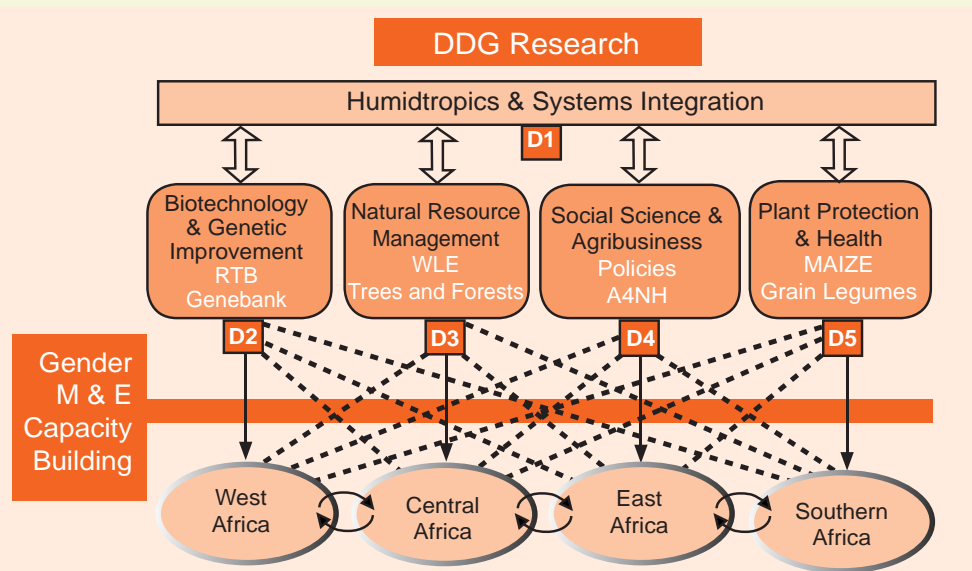


Figure 3. Linkage of IITA core competencies with the CGIAR Research Programs and their larger integration into the CGIAR Research Program on Integrated Systems for the Humid Tropics.

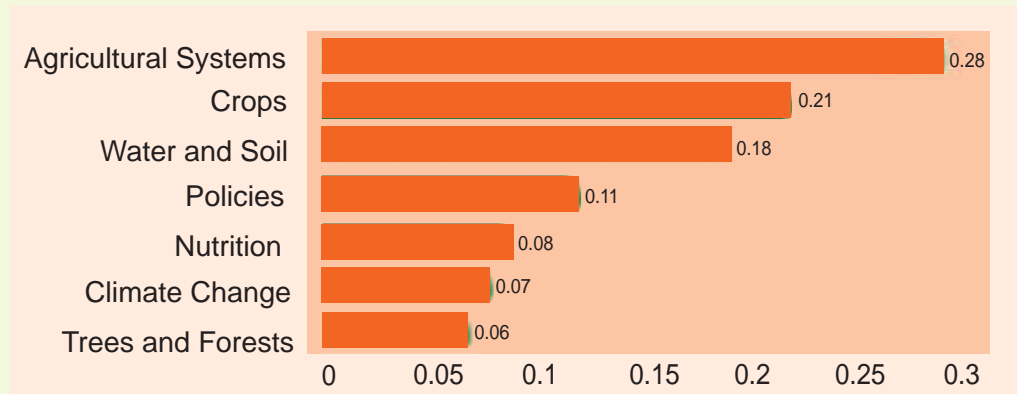


Figure 4. Relative contributions to the CGIAR Research Programs..

our choice in focusing on the four research areas all contributing to the agricultural systems in the humid tropics.

Arranging research within CGIAR around the SLOs involves integrating across a range of very different research areas; aligning research outputs to research outcomes, usually within an innovation systems framework; and greatly expanding field-based, in situ research activities, often within longer term benchmark sites. The CGIAR Research Program on Integrated Systems for the Humid Tropics, led by IITA, will progressively become the focal point for the integration of all R4D at IITA and allow for spillovers of IITA R4D knowledge, technology, and other research products in other continents. The weights for CGIAR Research Programs derived from this assessment may be used to broadly guide priority setting and relative resource allocations to CGIAR Research

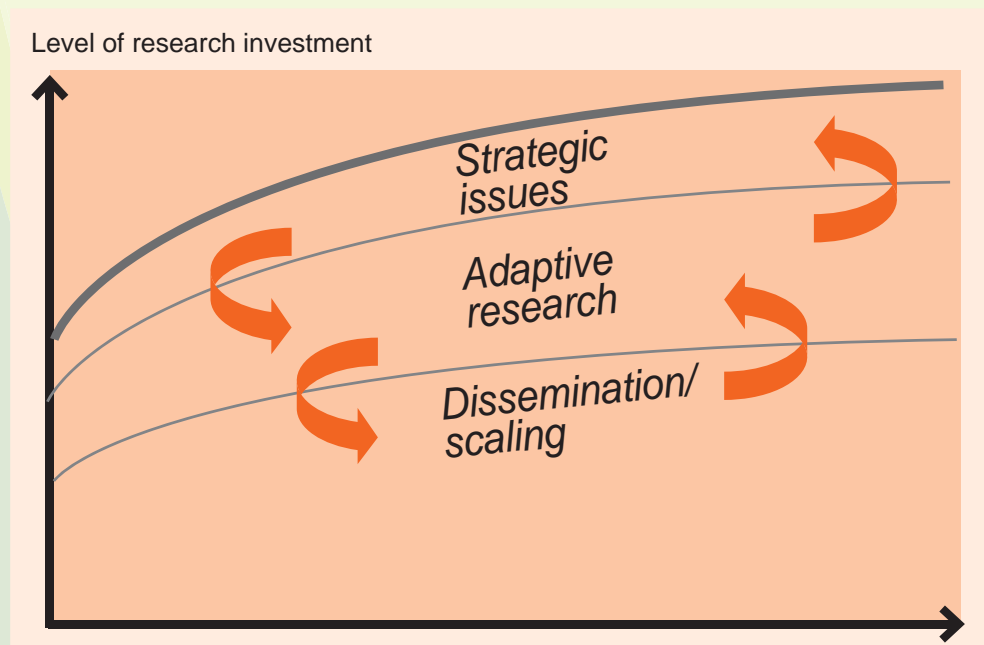


Figure 5. Relationship between the nature of R4D opportunities and the level of investment over time.

Programs but also for IITA's proposed investments. We will explore investment options that support the R4D continuum from process, strategic, and adaptive research that is delivered or disseminated to larger scale in collaboration with national partners, rural development interests and farmer organizations in a stepwise manner throughout the impact zones described above (Figure 5).

CGIAR Research Program on Integrated Systems for the Humid Tropics

The CGIAR Research Program on Integrated Systems for the Humid Tropics, referred to as Humidtropics, seeks to transform the lives of the rural poor in the humid lowlands, moist savannas, and tropical highlands in three major Impact Zones of SSA and tropical America and Asia, presently containing a population of 2.9 billion persons, mostly poor smallholder farmers. Humidtropics research is guided by a global hypothesis: *"A stepwise series of preferred livelihood strategies exist within the humid tropics where poverty reduction, balanced household nutrition, system productivity and natural resource integrity are most effectively achieved and contribute best to human welfare"* and several related Component Hypotheses addressing key constraints in each of the selected Program Action Areas. Over the next 15 years, Humidtropics will advance SLOs within the 11 Action Areas (Figure 6) by increasing staple food yields by 60%, increasing average farm income by 50%, lifting 25% of poor households above the poverty

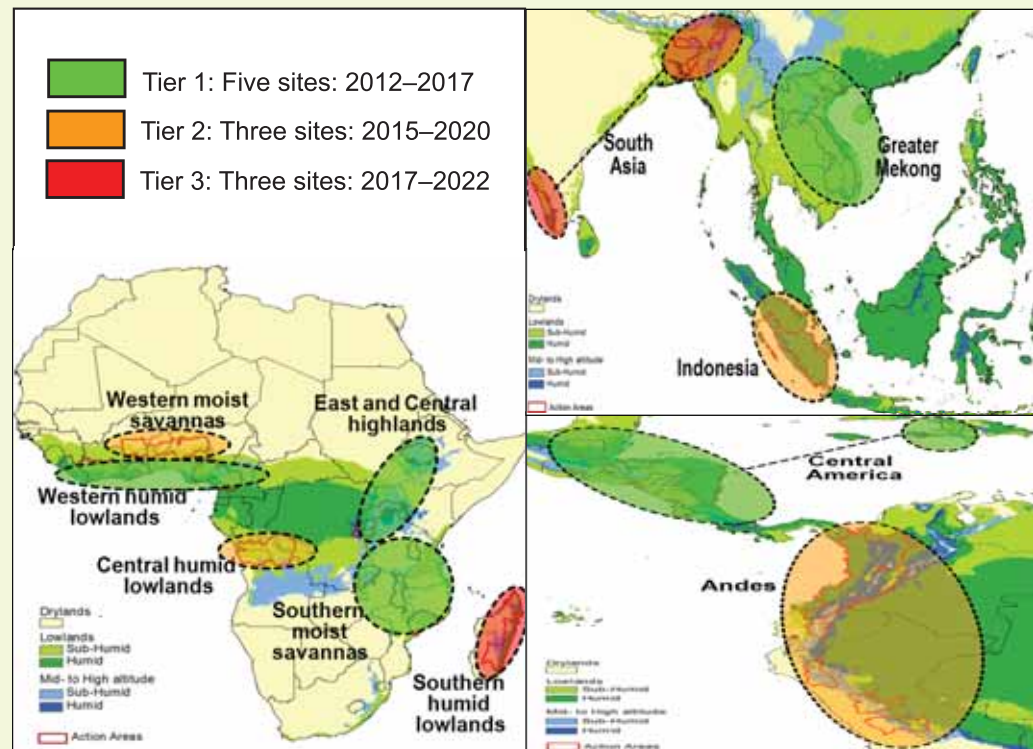


Figure 6. The Impact Zones and Action Areas of Humidtropics.

line, reducing the number of malnourished children by 30%, and restoring 40% of farms to sustainable resource management. These metrics have been generated using the Integrated Modeling Platform for Animal and Crop Systems in the Tropics (IMPACT), a tool developed by the International Food Policy Research Institute (IFPRI).⁶ The scenarios use several combinations of factors, including investments in agricultural R4D, efficiency of agricultural R4D, investments in irrigation, changes in natural resources management, and changes in agricultural marketing.

To achieve the above results, a dynamic program structure is built around three complementary Strategic Research Themes (SRTs): Systems Analysis and Synthesis, Integrated Systems Improvement, and Scaling and Institutional Innovations. Together these SRTs will conduct a baseline Situation Analysis leading to identified entry points for integrated production systems research; design and implement a robust

⁶ Here only an overview is given. IMPACT has 115 countries (or in a few cases country-aggregate regions), within each of which supply, demand, and prices for agricultural commodities are determined. Large countries are further divided into major river basins. World agricultural commodity prices are determined annually at levels that clear international markets. Growth in crop production in each country is determined by crop and input prices, exogenous rates of productivity growth and area expansion, investment in irrigation and water availability. Demand is a function of prices, income, and population growth and contains four categories of commodity demand—food, feed, biofuel feedstock, and other uses. For details of results and model design, see report by Rosegrant et al. (2009) on the Alliance website.

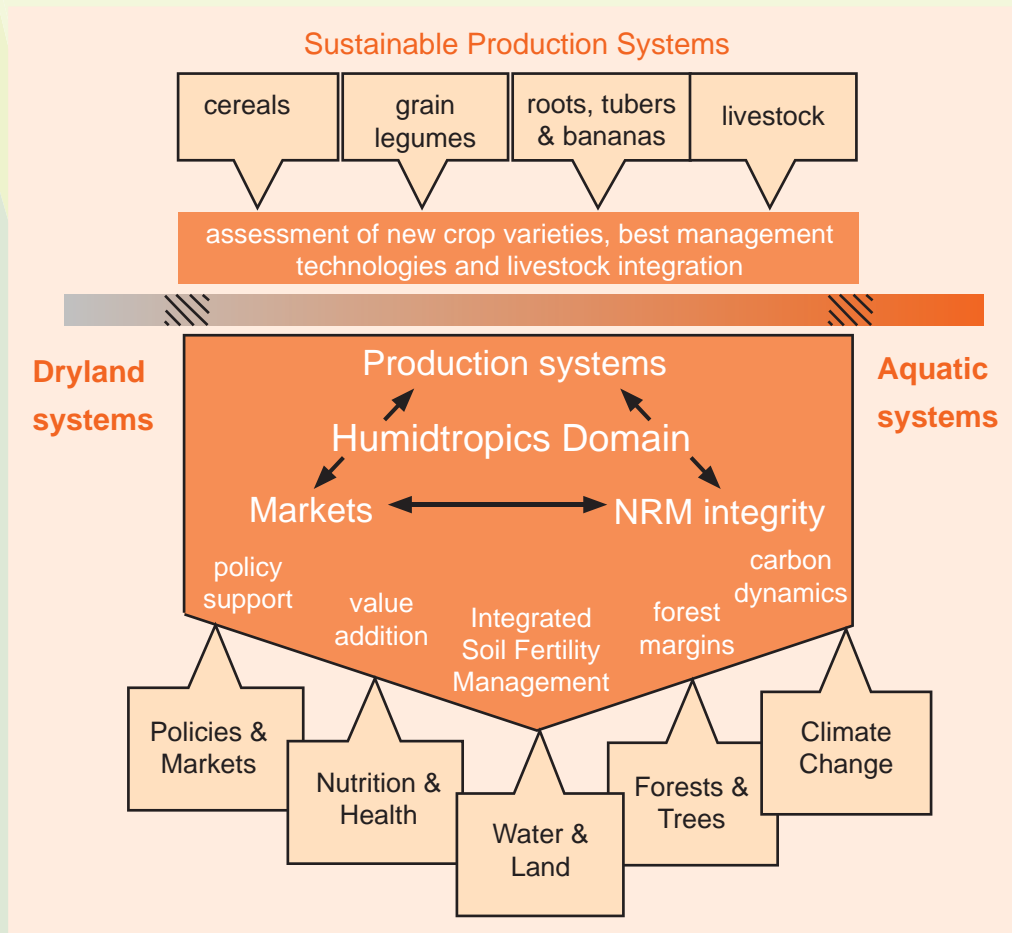


Figure 7. Relationships between Humidtropics and other CGIAR Research Programs.

gender-sensitive monitoring and evaluation (M&E) framework; assemble, test, and refine systems interventions through participatory processes; champion new farm opportunities through R4D platforms as pathways to assess fuller impacts and adoptability of the most promising opportunities; link these platforms to partner development institutions; and then advance the effectiveness of these institutions to scale up these interventions, with a particular focus on poor households and gender equity.

Humidtropics is by nature and design, a mechanism to integrate research results from the strategic objectives of other CGIAR Research Programs according to their contribution to food and nutritional security, poverty alleviation, and natural resource integrity (Figure 7). Humidtropics is very clear about the boundaries that separate its work from the other CGIAR Research Programs, either in terms of focus, i.e., production systems, or in terms of agroecology, i.e., humid and subhumid tropics.

However, as an integrative CGIAR Research Program, Humidtropics integrates the findings of all of the other CGIAR Research Programs. In some cases collaboration may be limited to shared methodologies and knowledge but in others research is built upon joint sites and mutually-agreed technologies. Moreover, Humidtropics provides an opportunity to develop new competency in production systems, addressing agricultural constraints and opportunities in contrasting agroecologies across SSA, tropical Asia, and tropical America.

Core competencies and the CGIAR Research Programs

Achieving our vision and impact on the four SLOs requires exploiting core competencies and better aligning CGIAR Research Programs and key research strategic interventions (specific IITA contribution) that will achieve the different SLOs within the impact zones in Figure 1.

Core Competency 1: Genetic Improvement and Biotechnology

Advances in biological sciences, particularly genomics, transgenic and non-transgenic breeding methods, cloning, plant tissue culture, apomixis, somatic embryogenesis as well as Integrated Pest Management (IPM) based on biological control will be linked to the **CRPs** dealing with crops (Figure 7). Interfaces between biology and information and communication technologies, ecology, biodiversity, even nanotechnology are transforming both the processes and products of agricultural research, as well as the institutional and economic environment of agricultural technology development and innovation systems. IITA's historical expertise on the **genetic** improvement and **plant health** of key crops grown in Africa (cassava, yam, cowpea, plantain, banana, soybean, and maize) will provide a fundamental resource, which will be strengthened and continued to realize outcomes in terms of both cutting-edge research and the development of appropriate technologies.

Strategic Intervention 1: IITA will be an active contributor to MAIZE; Roots, Tubers and Banana; and Grain Legumes

Key priorities related to these CGIAR Research Programs include:

Global Alliance on Maize for Improving Food Security and the Livelihoods of the Resource-poor in the Developing World (MAIZE). This research program, led by CIMMYT, aims to double maize productivity by 2050 with essentially no expansion of maize area through more intensive, sustainable, and resilient farming systems adapted to climate change and the rising costs of fertilizer, water, and labor. These adjustments include the latest seed varieties, precision agriculture techniques, and innovative technologies for smallholder farmers. With a network of more than 350 partners, the program will focus on unlocking the genetic code of maize and harnessing its full genetic diversity. The research will also contribute to more stable maize prices, while improving farmers' incomes and livelihood opportunities.

Roots, Tubers and Bananas (RTB). The Program combines the research activities of CGIAR centers working on banana, plantain, cassava, potato, sweetpotato, yam, and several other tropical and Andean root and tuber crops. Its primary objective is to more fully realize the potential of these crops for improving nutrition, income generation, and food security among some of the world's poorest and most vulnerable populations. The program builds on the expertise, complementarities, and comparative advantages of four CGIAR centers: CIP as Lead Center, Bioversity International, CIAT, and IITA. IITA is particularly well positioned to contribute to these goals through four of these target crops; cassava, yam, banana and plantain and to assist in program operations across Africa.

Grain Legumes. This research program will apply modern crop improvement, agronomic management, seed systems improvement, outscaling interventions, and related value-chain innovation to maximize the benefits that grain legumes make available to smallholder farmers in developing countries, especially women. This program has global partnerships among the CGIAR system; ICRISAT as Lead Center, CIAT, ICARDA, and IITA plus an array of regional partners. IITA is well positioned to contribute to activities related to cowpea and soybean, and again to assist in program operations across Africa.

Strategic Intervention 2: Strengthen IITA's unique comparative advantage in genetic improvement of cowpea, soybean, banana, plantain, yam, cassava, and maize.

Key priorities related to this intervention include:

- Breeding for yield and suitability for specific agroecologies and crop production systems.
- Developing genetically enhanced germplasm with tolerance or resistance to biotic and abiotic stresses in response to climate change (drought, heat tolerance, water use efficiency, nutrient use efficiency, emergent pests and diseases).
- Develop genetically enhanced clones, lines, and populations with traits that satisfy the changing demands of processors and consumers.
- Maximize genetic improvement research by using the latest in technologies and information ensuing from advances in genomics and transgenics.

Clearly IITA has an important role in terms of the conservation and distribution of genetic resources for its mandate species. Beyond this, the characterization and use of genetic resources are crucial to the success of our breeding programs. New approaches to germplasm characterization, both genomic and phenomic, add value to IITA's collection and enhance our ability to underpin breeding for food security. This will include development of molecular approaches, and corresponding strong partnerships in this area, as well as breakthroughs in bioinformatics.

The strategy illustrates how IITA will address the challenges of informatics with respect to staffing, hardware, software, and partnerships. Genetic resources can also be a key research tool addressing broader questions of, for instance, adaptation to climate change and linkages between biodiversity and ecosystem services. Agrobiodiversity research in general and in particular the need for integration between in situ and ex situ conservation with an enhanced focus on crop wild relatives are also viewed as important to future research.



The collection, conservation, characterization, distribution, and use of genetic resources are crucial to the success of crop breeding programs.

Core Competency 2: Plant Production and Health Management

IITA recognizes that bridging the yield gap will involve integrated management of several factors that limit production of a given crop in a particular environment. Hence, IITA will strengthen its activities that will bring together better genotypes and improved crop management options that minimize biotic and abiotic stresses through contribution to MAIZE; Roots, Tubers and Bananas; and Grain Legumes.

Strategic Intervention 3: To prevent and reduce pre- and postharvest losses due to new and emerging pests, pathogens, and weeds through targeted surveillance and improved diagnostics and detection, including epidemiological studies to identify control interventions that are best suited to each cropping system. IITA will continue to capitalize on its renowned reputation to develop durable biological control solutions for pests and pathogens based on critical understanding of key ecological interactions. Classical, conservation, and biological control solutions will be deployed for pre- and postharvest pests and pathogens. Comprehensive capacity building initiatives will be used to inform regional and commodity based networks including extension, research, and regulatory personnel of the most appropriate technologies to identify and manage pests and pathogens.

Key priorities within this intervention include:

- Diagnosing, identifying, and cross-boundary monitoring of emerging biotic threats and new invaders (links to several CGIAR Research Programs)
- Developing ecologically sustainable, economically profitable, and socially acceptable solutions for improved pest, pathogen, and weed control (links to several CGIAR Research Programs)
- Developing strategies for mitigating the compounded and additive effect of biotic stresses coupled with climate changes (link to CCAFS)
- Designing and implementing plant and soil health management options for controlling soil-borne noxious organisms such as nematodes, aflatoxin-producing *Aspergillus* fungi, and *Striga* parasites in cereal and legume cropping systems (links to MAIZE and Grain Legumes)

Strategic intervention 4: IITA will identify and promote promising crop management options in specific edaphic, climatic, and farming system conditions

Key interventions will include:

- Understanding the physiological basis of crop adaptation to stressful environments to achieve synergies between genotypes and technologies for specific agroecologies
- Phenotyping physiological and metabolic traits including photosynthetic activity and assimilate partitioning, transpiration, and water use efficiency
- Developing agricultural intensification strategies that combine appropriate tillage systems, crop diversification, and efficient use of inputs
- Developing best-fit production practices including integrated pest management for targeted ecologies to optimize the productivity of the resource base
- Developing crop diagnostic tools that can be used to evaluate the potential of different crops, genotypes, and management options in targeted ecologies

Strategic intervention 5: IITA will develop approaches to facilitate the availability and effective dissemination of good quality planting materials to farmers

- Facilitate the development of community based seed systems for increasing farmers' awareness and access to quality seed of improved varieties with farmer and end user-preferred traits
- Improving availability of foundation and certified seeds through an innovation platform of local partners and private sector participation
- Develop policies and strategies that improve seed production and delivery system

Strategic intervention 6: IITA will strengthen partnerships and enhance capacities and knowledge sharing

- Building innovative partnership models to enable effective targeting, priority setting, and scaling-up of R4D impacts
- Designing strategies that encourage both women and men farmer participatory research to enhance acceptance and adoption of promising technologies
- Identifying training needs and designing training modules to enhance capacities of stakeholders along commodity value-chains
- Develop communication tools including the use of cell phones and Internet to ensure producers have access to information in a timely manner irrespective of locations and can provide feedback to researchers in a cost-effective way.

Core Competency 3: Natural Resource Management

IITA will comprehensively renew its research on natural resource management (NRM), particularly in relation to sustainable intensification of farming systems. Again, much of this work will be conducted through participation in two CGIAR Research Programs as follows:

Strategic Intervention 7: IITA will be an active contributor to Humidtropics (described above); Land, Water and Ecosystems; and CCAFS

- CGIAR Research Program on Land, Water and Ecosystems. The Program, led by IWMI, combines the resources of 14 CGIAR centers and numerous other partners to provide an integrated approach to NRM research. The program focuses on the three critical issues of water scarcity, land degradation, and ecosystem services, as well as the CGIAR SLO of sustainable natural resource management. IITA offers a suite of proven land management strategies built around its target crops. IITA is also well placed to contribute through its expertise in combating aquatic weeds and documenting changes in biodiversity.
- CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). CCAFS offers developing country farmers new options for adapting to emerging impacts of climate change in the coming decades and for mitigating climate change through a “carbon-friendly” agriculture that also strengthens food security and reduces poverty. Developed in collaboration with the Earth System Science Partnership (ESSP), the initiative involves all CGIAR Centers (under the leadership of CIAT) and a wide coalition of partners.

Strategic Intervention 8: IITA will excel in integrated soil fertility management research by following a livelihoods perspective

Key priorities within this intervention include:

- Expanding knowledge on soil biological processes, identifying beneficial organisms and their mechanisms, and translating this advance into management strategies and input products that improve access to and use efficiency of nutrients.
- Matching improved germplasm to specific agroecosystems and farm niches to further increase nutrient acquisition and input use efficiency.
- Developing tools that complement farm heterogeneity and farmer typologies in devising ISFM interventions.
- Developing best-fit ISFM practices for the target cropping systems and impact zones as a starting point for further innovation and adaptation by farmers.
- Developing decision support tools and models to analyze trade-offs among various land management and livelihood strategies.

Strategic Intervention 9: IITA will excel in sustainable land management research following a landscape perspective

Key priorities within this intervention include:

- Developing analytical methods and tools for the management of multiple use landscapes.
- Enhancing the management of landscapes through changing stakeholder awareness and greater capacity for community-based rural planning.
- Creating multiple benefits and improved governance of environmental resources through the harmonization of intersectoral policies and institutions.
- Managing soil health for enhanced ecosystem services, including adaptation to and mitigation of climate change.
- Contributing to the development of the digital soil maps of Africa as a framework for land degradation surveillance and ISFM recommendations.
- Promoting agricultural intensification to reduce deforestation and more productively manage forest margins by indigenous communities.

Core Competency 4: Social Science and Agribusiness

Impacts from the research outputs resulting from Core Competencies 1 and 2 can best be obtained within an enabling context, where such factors as viable farm input supply and commodity markets, functional social, civil and political institutions, and good policy are in place. The CGIAR Research Program on Policies, Institutions and Markets offers a great opportunity for collaboration and impact within SSA. Smart agricultural financing of production, processing, and input/output marketing, interact strongly with increased crop productivity resulting from systems intensification.

Strategic Intervention 10: IITA actively contributes to the CGIAR Research Program on Policies, Institutions and Markets

Key priorities within this intervention include:

- Policies, Institutions and Markets will identify conducive policies and institutional arrangements necessary for smallholder producers in rural communities, particularly for women and other disadvantaged groups, to increase their income through improved access to and use of markets. Led by IFPRI, this CGIAR Research Program seeks to produce a body of new knowledge that can be used by decision makers to shape effective policies and institutions that reduce poverty and promote sustainable rural development.



Mainstreaming gender, poverty, and policy can accelerate and help demonstrate the impact of research.

- Understanding the interaction between innovations in productivity, NRM, market access and policy on rural poverty has application to other research programs as well.
- Generating insights into the institutional norms and dynamics that have an impact, both positive and negative, on the key food systems and value chains of SSA.
- Mainstreaming gender, poverty, and policy analysis to accelerate and demonstrate impacts of IITA research on the four SLOs.
- Forecast scenarios of key drivers of agricultural intensification to guide the design and implementation of biological and natural innovations.
- Measuring impacts of interventions across a large spectrum of innovations for accountability, planning, and learning.

Strategic Intervention 11: IITA will actively contribute to the CGIAR Research Program on Agriculture for Nutrition and Health

The goals of this program are particularly important to expanding the scope of competencies within IITA and to contribute to Strategic Objective 1 of IITA for the next decade to improve the nutrition security and health of poor farming households.

Key activities within this strategic intervention follow:

- CGIAR Research Program on Agriculture for Nutrition and Health: This research program aims to accelerate progress in improving the nutrition and health of poor people by exploiting and enhancing the synergies between agriculture, nutrition, and health. With IFPRI as the Lead Center, this program will also involve IITA and nine other CGIAR Centers.

- Enhancing the nutritional quality of food products along the value chains.
- Breeding for higher micronutrient content in staple crops consumed by a large majority of poor rural and urban households.
- Maintaining and enhancing the leadership role in the management of mycotoxin- producing microorganisms through biological control, improved farming practices including harvest, storage, transport and processing methods, and awareness of producers, consumers, policy makers, and donors.
- Promoting health platforms that bring together specialists from agriculture, environment and health sectors for research, knowledge exchange, and cross-disciplinary training on sustainable agricultural practices with potential for reducing diseases among rural populations.
- Reducing risks of occupational hazards from pesticides and their residues on agricultural produce leading to the reduction of toxic materials on fruits and vegetables.
- Research activities will also be conducted on the quality of water used in irrigation systems and related health risks. Further investigations will be conducted on the development of innovative risk mitigation technologies.

Strategic Intervention 12: IITA will develop and disseminate R4D outputs that promote the fuller commercialization of agricultural surpluses and economic use of agricultural by-products

Key priorities in this area include:

- Strengthening IITA's expertise in postharvest handling and agroenterprise development to stimulate practical innovation in value addition and agribusiness.
- Stimulating effective private-public partnerships for commercialization of products from IITA's research breakthroughs (e.g., nutritionally enhanced crops, biocontrol products).
- Investing in value chain research, market development and agroenterprise development for IITA mandate crops.
- Reducing the drudgery of work, particularly among the most vulnerable, through development of more efficient field practices and more ergonomic tools.
- Minimizing postharvest losses and loss of nutritional quality of products and improving safety, resulting in expanded market access and improved nutrition.

VII. Innovative partnerships and capacity development

The research agenda for improving Africa's agriculture requires a redirection from conventional approaches, the development of new skills, and a retooling of laboratories. R4D requires a new tack grounded in interdisciplinary thinking, encompassing a range of spatial scales and interactions with a wide range of stakeholders. IITA cannot be successful without engaging partners' skills, capabilities, and resources, and intends to achieve this through diverse partnership arrangements. IITA has benefited from strong and continued links with a suite of advanced research centers across the world to better understand and overcome agricultural constraints through the development of appropriate technologies. However, there are several countries in SSA that have weak capacities in agricultural research compared to two decades previously, and this trend must be reversed.

In sub-Saharan Africa in 2000, 93% of the region's agricultural R&D agencies employed fewer than 50 researchers, and 40% of them employed fewer than five full-time scientists (Beintema and Stads 2004). In the context of SSA, subregional research organizations such as ASARECA and CORAF that previously served as focal points for research networks have changed their program structures and Center interaction with national programs has suffered. There is a potential for better program alignment between CGIAR as a system and these subregional organizations, and better coordination will lower transaction costs of collaborative research. African leaders have made a new commitment to investing in agriculture and pursuing agricultural growth through CAADP. Agricultural R&D is an important pillar of CAADP and will be strongly promoted by the Forum for Agricultural Research in Africa (FARA) and the Alliance for a Green Revolution in Africa (AGRA). In at least some donor countries, foreign aid has been reinforced by governments mindful of the public outcry against poverty and hunger in the mid-2000s and the ongoing campaign to "make poverty history".

Partner capacity is critical to the development of IITA's agricultural research for development agenda and yet capacity constraints are huge and vary among institutions and countries. Indeed, a longer-term perspective towards capacity building is required. A partner organization should be one that shares risks and investments in an endeavor, rather than simply being an ad-hoc participant briefly consulted or contracted for an isolated, short-term project. IITA will critically review and assess partner organizations for their contribution towards long-term development goals.

The ongoing CGIAR reform now provides IITA with a critical opportunity to display leadership on collaborative research among a diverse group of research and development actors. It is also important that IITA and the Consortium of CGIAR Centers together strive to foresee

rather than react to changing agendas reinforcing national capacities directed towards eliminating poverty. Programs combining work on institutional innovations with development of improved production systems will often involve innovation platforms, as is being tested within the sub-Saharan Africa Challenge Program and Humidtropics. These platforms include public, private, and civil society partners whose roles change over time as innovations become mainstreamed and new technologies are commercialized. In the past, the main partners for IITA's R4D mission were the NARS of collaborating nations. This collaboration will continue but IITA will increasingly look towards ARIs and African universities in its upstream research. IITA will very actively seek partnership with small and medium enterprises (SMEs), farmer organizations, community based organizations, women and youth groups, and other for-profit entities in advancing its objective of creating greater demand for products resulting from its interventions. It will forge linkages with a wider cross-section of the private sector in its agribusiness approaches and as part of its agricultural research for development paradigm. The Center is also cognizant of the value of a sustained relationship with sister CGIAR centers, creating complementary programs and sharing resources more efficiently as is expected among CGIAR Research Program partners. In terms of its policy advocacy, IITA must be more responsive to national governments and governmental organizations as well as the positions of subregional and African organizations. Relations must be cultivated with nongovernmental and civil society organizations as well. Of particular



Partnerships with small and medium enterprises, farmers and community based organizations, women's and youth groups, and other private entities can advance IITA's objective of stimulating and creating greater demand for products of its interventions.

relevance to this consolidation is the formulation of CGIAR Research Programs. There are some critical elements that cut across these research programs including Diversity and Gender and Capacity Strengthening, Learning and Knowledge Sharing, Communication, Research Methods and Data, Impact Assessment, and Legal and IP Advice and Support, which are also integral parts of our proposed strategy.

Gender inequality

There are three necessary approaches to addressing gender within IITA. They are: (a) a strategic approach within the framework of achieving impact on the SLOs; (b) a mainstreaming approach across research programs of IITA specifically incorporating gender analysis; and (c) a capacity building approach focused on hubs, where greater female equality within key institutions will translate into more effective focus on gender inequality at the household level. IITA will develop a gender strategy in close cooperation and compliance with the CGIAR gender strategy developed by its Gender Network. Gender analysis will be conducted by the different programs to guide the activities of research teams to enhance their ability to address gender inequalities and focus on the key gender constraints. This includes opportunities of gender-sensitive approaches in crop, livestock, and system interventions and the gender division of tasks and responsibilities. An analysis of access to ownership and control over productive resources as well as the constraints faced by men and women in accessing improved technologies, services, inputs, and markets will show how these influence agricultural production and marketing. The results of these analyses will be used to develop gender-responsive approaches and interventions for each set of activities or interventions.

Capacity strengthening, innovation, learning, and knowledge sharing

In operationalizing its strategy, IITA identified Capacity Strengthening, Learning, and Knowledge Sharing as among the critical cross-cutting areas in R4D that require greater attention. IITA's approach calls for the joint development of the capacities of a broader range of stakeholders and partners. IITA will embrace a culture of knowledge sharing and learning that sustains productive relationships, partnerships, and networks. The actions in this area will be primarily, through improving skills and expertise, the flow of information, ensuring its access and appropriation by all agricultural actors, and enabling learning systems to make effective use of information and knowledge. This will require integration of information and knowledge management, monitoring and evaluation, and communication processes with research programs and activities. The capacity to learn, generate, retain, and share knowledge is an important element of developmental research. IITA will continue to provide a variety of training strategies and delivery approaches to suit the needs of partners, but

will add new elements to increase the depth and breadth of capacity building impact across the organization and its activities as it engages with a wider range of partners.

The purpose of Capacity Strengthening, Innovation, and Learning and Knowledge Sharing is to manage our knowledge resources more effectively to meet the Strategy 2012-2020 targets. For the purpose of supporting the implementation of the Strategy, this challenge has been divided into four broad areas:

- How to manage knowledge internally to build a learning organization;
- How to manage knowledge resources and relations by sharing innovations, what we learn together with partners as well as exchanging information with them;
- How to integrate Capacity Strengthening, Innovation, Learning and Knowledge Sharing into project and research planning, implementation, and evaluation;
- How to strengthen IITA's capacity in technology dissemination and upscaling.

During the course of the 6th EPMR of IITA, the issue of training was repeatedly raised by the NARS members. In general there was recognition of the active role that IITA has played in training but at the same time the NARS took exception to diminishing training opportunities. From the perspective of the NARS, they linked training to both program and institutional sustainability and the need to avoid erosion in both areas. NARS and universities are requesting that we strengthen our capacity building similar to its role in the 1980s and 90s. From its inception, IITA has supported both formal and nonformal training activities from its core budget as part of its strategy to



Renewed emphasis on capacity building will help ensure the success of IITA's strategy to improve food security and reduce poverty in Africa through strengthening the capability of scientists and technicians of national programs to conduct research and training necessary for agricultural development.

improve food security and reduce poverty in Africa. IITA's training activities have been guided by the overall goal of strengthening the capability of scientists and technicians of NARS to conduct the research and training necessary for agricultural development in their own countries. Furthermore, IITA's training activities facilitate research collaboration between IITA and NARS.

In addition, building a regional platform for information and knowledge sharing using IITA's existing knowledge management center where a repository of training materials will be archived, curated, and distributed, will contribute towards building a pool of effective NARS researchers.

IITA's comprehensive strategy for training comprises graduate research, individual attachments, and the development and distribution of training materials.

The present realities of declining research and training budgets calls for the reassessment of the present approach to training. Future training must be service-oriented and must provide the opportunity for skill-based professional capacity development and enhancement for NARS employees and for graduate students of agriculture to develop their professional skills. Training at IITA will undergo major transformation, moving away from the traditional IITA-based training format to a decentralized and more field-based effort with increased use of electronic media.

IITA has adopted three key approaches to contribute to the pool of effective NARS researchers. This new plan will be implemented through the following programs:

- Professional Capacity Advancement Program (PCAP) targets professionals from partner national research institutions and universities. A Visiting Fellows (VFs) program will target BSc or MSc degree holders with several years of experience and fresh PhD degree holders who will be assisted to conduct research alongside IITA scientists. The VFs will work as part of a team. The Capacity Development Office, together with the IITA host scientist, will ensure quality management of the learning process. Appointments will range from 6 to 18 months, depending on the availability of funds and the type of research project.
- Graduate Research Program (GRP). The long-term goal is for the IITA-trained researchers to take up positions in research institutions in their home countries. Areas of study provided by IITA scientists or offered by other institutions but relevant to IITA research will be an integral part of IITA projects and will be widely advertised and competitively recruited. Areas of study relevant to IITA's research focus will also be provided by partner universities where IITA scientists offer technical supervisory expertise.

- Short-term Course (STC). Scientists identifying a critical need for training of research collaborators may propose courses that will be packaged and advertised by the Capacity Development Office. IITA will continue to explore with relevant institutions (universities, development agencies, NGOs, CBOs, NARS) partnership ventures with donor support for training materials production and adaptation, and development of online resources, multimedia products, interactive tutorials, and the joint organization of courses, workshops, and conferences. A dedicated unit to promote Capacity Strengthening, Learning and Knowledge Sharing has been created to work at the system level, serving CGIAR Research Programs, centers, and partners in these areas. It will work on strategic initiatives that link regional and international partnership and capacity building interventions on specific areas such as the biotechnology platform and soil health consortium.

Special initiatives

A West Africa Regional Genomics and Biotechnology Platform for biotechnology research, services, and capacity building is moving forward with a strategic plan based on broad consultation with regional partners such as FARA and CORAF. The platform aims to respond to specific scientific needs, train the next generation of African researchers and enhance competitiveness in West Africa. Areas of expertise needed include crop breeding, transgenic techniques, tissue culture facilities, diagnostics, phenotypic characterization, access to genomic facilities, bioinformatics, and rapid propagation based on somatic embryogenesis. The goal is to develop and maintain a standard at the ARI level. The platform will have three structural components, which will take several years to develop: a policy and intellectual property platform, a technical platform, and a focus upon biosafety. This platform will also further advance molecular biology for plant improvement for IITA priority crops.

Need for a Pan African Platform for Soil Research for Development. Reviews of the CGIAR in SSA and the views of its national partners point to the need to build capacity in soil fertility research and for consolidation of the efforts of Centers in this area. A research-for-development platform that brings together the best soil scientists and the physical and financial resources needed to address major challenges described above is now required. IITA envisages land managers in the tropics making flexible use of ISFM and IPM knowledge and technologies to produce and market more food while improving their agricultural resource base. IITA seeks to catalyze and coordinate this capacity-and-technology building to assure that ISFM becomes a prominent feature within the agendas of research and development organizations throughout the world. These partnerships must be open ended and problem focused to create desired impacts. Alongside IITA, important implementing agencies of ISFM and IPM include current country programs, regional networks (ASARECA, SACCAR,

and CORAF), pan-African networks under FARA, and the CGIAR Research Programs. These partners in Africa will add value to the AGRA Program on Soil Health.

Youth Agribusiness Development Initiative (YADI). Indifference towards careers in agriculture among youth remains a severe constraint in rural transformation. This group has the greatest education, enthusiasm, and strength but have too few opportunities to apply such talents within local communities. In response, many youths resort to livelihoods that make poor, even destructive use of agricultural resources, adopt lifestyles of resigned idleness, or migrate to urban areas. So often, rural development has addressed the special needs of women, the poor and the vulnerable without also including the most dynamic members of rural communities, the youth. Given the proper opportunities and incentives, rural youth can quickly be directed towards market-oriented agriculture, agribusiness, and service provision with a huge impact upon the larger farming community. These impacts begin by offering training in vocational agriculture, then providing resources and incentives to enter into agribusinesses that support planned interventions and systems intensification. These incentives are offered in a manner that supports the growth of self-reliant and resilient small-scale business models and the emergence of businesspersons responsive to technical advance and partnering. This transformation is consistent with the larger rural development plans of African governments and in line with the commitment of IITA and other CGIAR centers piloting various agribusiness service hubs. The overall goal of YADI is to reorient rural youth towards more productive engagement in agriculture through expanded opportunities in agribusiness, service provision, and market-orientated agriculture.

A regional research and training center to link climate changes with biodiversity and biotic stresses. Crop productivity will be impacted not only by the direct effects of climate change such as drought and the irregular and more intense rains and floods, but also through exacerbating biotic stresses. Studying these interactions, and developing mitigating strategies by making better use of available ecosystem services, will be one of IITA's priorities for the next decade. Hence, based on the historical record of successes in developing and implementing biological control and biopesticide solutions, the Benin station will be restructured as a biodiversity center for research and training to provide sustainable control of crop biotic stresses linked with climate change in West Africa. This center will partner with CORAF institutes, West African universities, CGIAR Centers, and other IARCs in the region. In this regard, IITA will acquire the rehabilitated forest of Drabo Gbo in Benin as a field research station linked to the Cotonou biodiversity center and offer taxonomic services to other CGIAR centers, African universities, and national programs.

A business model for public-private partnerships. The private sector is already a key player in the supply of genetic technologies, seeds, agrochemicals, veterinary products, agricultural machinery, and implements. This role will continue to grow as

the cost of biotechnology applications continues to fall, intellectual protection instruments become more standard, and input and service markets consolidate. In most cases, efforts by both multinational and national input supply firms are concentrated on commercial agriculture where the market and institutional conditions are present to ensure suitable rates of return on their investment. This trend makes economic sense, and offers increasingly wider scope to open partnering opportunities with public entities, both national and international. What is needed is the strengthening of downstream capacities bringing new technologies and enterprises to the rural poor through both market expansion and corporate social responsibilities. An example of this trend is IITA's partnership with the chocolate industry, to improve cocoa production and quality in West Africa that is now a model for private-public partnership ready for application to other agricultural sectors. Indeed, private companies including YARA, Nestlé, and various mining concerns are currently engaged in agriculture through corporate social responsibility with capacities to reach large numbers of farmers. IITA will become the leading center of excellence for research on cassava and soybean in SSA that fosters public-private partnership. Furthermore, it will facilitate the emergence of similar research partnerships in yam, banana, plantain, and cowpea. This approach will include innovative expansion of new biotechnology products, particularly commercial production of biological control agents and biopesticides.

Establishing the IITA Foundation. Despite encouraging signs of renewed commitments to agriculture, an element of “donor fatigue” exists. Also, unpredictable events such as catastrophic storms and tsunamis, social and political revolutions, and financial crises limit commitments and redirect priorities of donors which in turn compromise the financial resources available to research. Overcoming this risk requires innovation in the IITA business model to include the establishment of the IITA Foundation for commercial advancement of breakthrough agricultural technologies (or possibly “IITA Limited”). Its main objective will be to bridge the missing links between Research, Extension, and Capacity Building (REC) needed for greater impact and sustainability of results and institutions. Through well-targeted projects and programs, the IITA Foundation will stimulate public-private partnership and opportunity for investment within a framework of greater efficiency and shared accountability, leveraging relatively modest resources to attract much larger contributions and investments from the private and public sectors and philanthropic foundations. IITA is exploring the possibility of engaging regional and multinational seed companies that market maize hybrids to farming communities. We will explore the concept of the “Agribusiness Incubator” where IITA research products are showcased in pilot-scale facilities that provide training opportunities to potential entrepreneurs and also provide a platform for these agribusinesses to finalize commercialization of technologies. Examples are commercialization of improved yam propagules through handling and distribution of vine cuttings, biocontrol products, hybrid seed production systems, new food products, and lower cost and more ergonomic agricultural tools and machinery.

VIII. Delivering internally efficient organizational structures

A new organizational structure has been operational since January 2012 (Figure 8). It now represents a major change in the way our institutionalized Research for Development operates. It strengthens our capacity to respond to the challenges posed by the new initiatives such as the CGIAR Research Programs, and improves our relationships with our partners in the different multilateral and bilateral projects. Key elements of this organizational structure include:

Effective participation and coordination of CGIAR Research Programs. IITA is involved in nine CGIAR Research Programs. In response, we have appointed Coordinators to work with Hub Directors and IITA management to ensure monitoring of performance and deliverables of these Programs and associated projects.

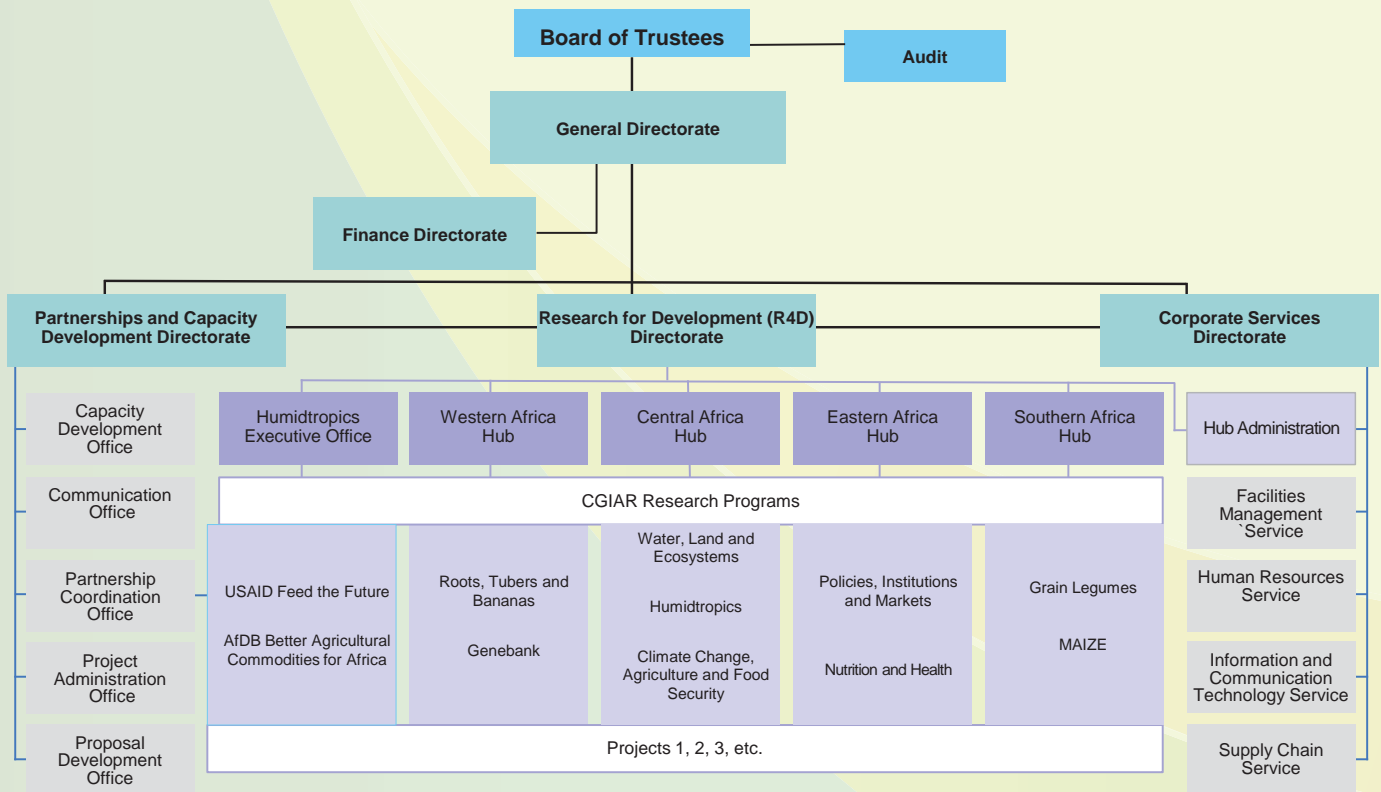


Figure 8. The new organizational structure of IITA.

Decentralized R4D program. Hubs within the impact zones are assuming greater autonomy and responsibilities to respond to agricultural challenges. Planned Action Areas within Humidtropics illustrate this change through Hub Directors, who assume both thematic and agroecological (geographic) duties (Figures 3 and 8 center bottom). Scientists report directly to Directors according to their location and operate in disciplinary programs managed by one of the Hub Directors.

Strategic leadership for research at the institutional level is provided by two Deputy Directors General (DDGs). One DDG for Partnerships and Capacity Development and another for Research for Development ensure that IITA achieves its goals, uses its resources effectively, and contributes to the broader goals of CGIAR.

Some of the interesting features of the new structure include strategic interventions that result in more efficient internal organizational structure including:

Managing for research excellence and development results. We strive to offer a stimulating and challenging work environment that attracts and retains the best scientists and workforce, renowned for its excellence, innovation, and dedication to the challenges of agricultural research and development in Africa.

Stimulating and mainstreaming a culture of innovation, learning, and efficient risk management. The challenges and opportunities facing African agriculture and R4D are constantly evolving, old challenges are deepening, and new challenges are emerging. Obstacles to the realization of the IITA vision and Strategic Plan must be identified and overcome. If not, even the best research will have diminished impact. This action calls for strengthening IITA's partnership and capacity building, in addition to expanding resource mobilization.

Communicating for influence. Successful communication of IITA research findings in ways adapted to key audiences is critical to create awareness, build support for IITA, and mobilize the needed resources, and ensures that the relevance of IITA research is clearly communicated to African governments and international stakeholders for influencing policies and funding. As a result of the reform process, CGIAR and IITA have an opportunity to reposition themselves as global leaders in R4D and to greatly magnify the development impact of their efforts. Communication will occupy a strategic place in IITA and figure importantly in the work of the Hubs. Knowledge, innovations, research results, policy assessments, practical guidance, and recommendations for action are not useful unless they are communicated to those who can use them. IITA will improve how it communicates and shares its research results and achievements to be able to take advantage of new opportunities, effectively demonstrating to a targeted group of stakeholders, including African governments, why IITA research is crucial to national and regional strategies

for poverty alleviation, agricultural development, and food security. Successful communication of IITA research results in ways adapted to key audiences is critical to create awareness, build support for the Institute, mobilize the needed resources, and ensure that the relevance of IITA research is clearly communicated. Means to be employed will include private briefings with key officials, working with media and the use of social media, and marketing and outreach activities to ensure that IITA's research results are accessible, used, and shared within research communities, by decision-makers and the general public in a timely and effective manner.

Support of communication professionals will also be secured, using a mix of outsourcing and core team resources as appropriate. The Communication Office at headquarters will facilitate the overall strategic communication design and take the lead in implementing, directly and through hub communication teams, a special communication effort to convey these key messages to stakeholders. The aim is to fortify stakeholders' confidence that not only structures but also attitudes and mindsets are supportive of the outcomes of the reform process and the new CGIAR Research Programs. Each Hub will need its own communication strategy. This will outline the key messages to be conveyed, the key target groups, and the media and other channels for communicating with these target groups. The communication strategies of both headquarters and Hubs will be harmonized into an "umbrella" communication strategy to increase their combined effectiveness to avoid misimpression of competing entities.



Emphasizing communication to influence policy makers and investors is a key feature of IITA's refreshed strategy.

IX. Human resource management and governance

Human resource and operational support

IITA operations, including human resources, are facing challenges never before encountered in our organizational history. The shift to CGIAR Research Program allocation for what were formerly core funds, the need for full cost recovery of all services, the need to manage a decentralized IITA into hubs located in diverse locations, and the process of CGIAR reform are new to IITA administrative staff already operating under demanding conditions. The resources available to IITA's human and operational support team must increase with the expanded scope of their responsibilities. Achieving the vision of IITA depends upon the quality of its human capital. IITA will provide its scientists and professional staff with an exceptionally rewarding professional experience to meet current and future challenges. Scouting, investing, and nurturing young and new talent, as well as attracting and retaining recognized professionals will enhance IITA's capacity and reputation.

The total internationally recruited staff (IRS) as of January 2012 stood at 115, with 60 from Africa, 28 from Europe, 15 from Asia, and 12 from the Americas. This figure includes 4 Executives, 4 Directors, 48 Scientists, 13 International Specialists, 1 Postdoctoral Fellow, 4 Associate Program Officers, 15 Regionally Recruited Staff, 6 Visiting Scientists, and 20 consultants (Figure 9). Of these staff, 27% are women. A majority of staff (53%) are assigned to the Headquarters in Ibadan. The number of staff increased to 137 in December 2012.

Over the next eight years, IITA's strategy calls for strengthening its staffing capacity to a total of 267 scientists (Table 1), representing a 10% increase per year in

Table 1. IITA's staffing requirements (FTE) between 2012 and 2022 assuming 10% annual growth.

CGIAR Research Program	2012	2017	2022
Humidtropics	48	54	61
Policies, Institutions and Markets	17	19	21
MAIZE	22	25	28
Roots, Tubers and Bananas	43	48	54
Grain Legumes	25	28	32
Agriculture for Health and Nutrition	19	21	24
Water, Land and Ecosystems	9	10	11
Climate Change, Agriculture and Food Security	28	32	36
Total	211	237	267

Table 2. IITA internationally recruited staff requirements in the hubs between 2012 and 2022 assuming 10% annual growth.

Hubs	2012	2017	2022
West Africa	71	107	160
Central Africa	9	14	20
East Africa	20	30	45
Southern Africa	15	23	34
Total	115	174	259

staffing levels (Table 2). IITA's organization will evolve into a matrix-like structure as described in Figure 8. In addition to the R4D positions, we will have eight additional international staff requirements in the following areas (accounting for differences between totals in Tables 1 and 2).

Director General Directorate

- Internal Resource Mobilization Unit. IITA will hire new staff to help support the increase in fundraising needs due to the new strategy (see section on Resource Mobilization for more details). A new Resource Mobilization, Protocol and External Liaison (RMPEL) Unit has been recently created to assist the General Directorate in resource mobilization initiatives, protocol matters, and external liaison with prospective donors and government agencies with particular focus on championing better funding for IITA.

The R4D Directorate

The Office of the Deputy Director General leads and manages the R4D Directorate including all hubs and CGIAR Research Programs, is a member of the General Directorate, and collaborates with the other Directorates.

- Internal Monitoring and Evaluation Unit. IITA will build its Monitoring and Evaluation capabilities to enable strong results-based monitoring across the organization (see section on M&E for more details).

The Partnership and Capacity Development Directorate

The Office of the Deputy Director General leads and manages the Partnerships and Capacity Development Directorate, is a member of the General Directorate, and collaborates with the other Directorates. It supervises the Heads of Office and oversees the programs assigned to the Directorate. The Directorate monitors and evaluates the performance of the Directorate's Offices, and manages proposal

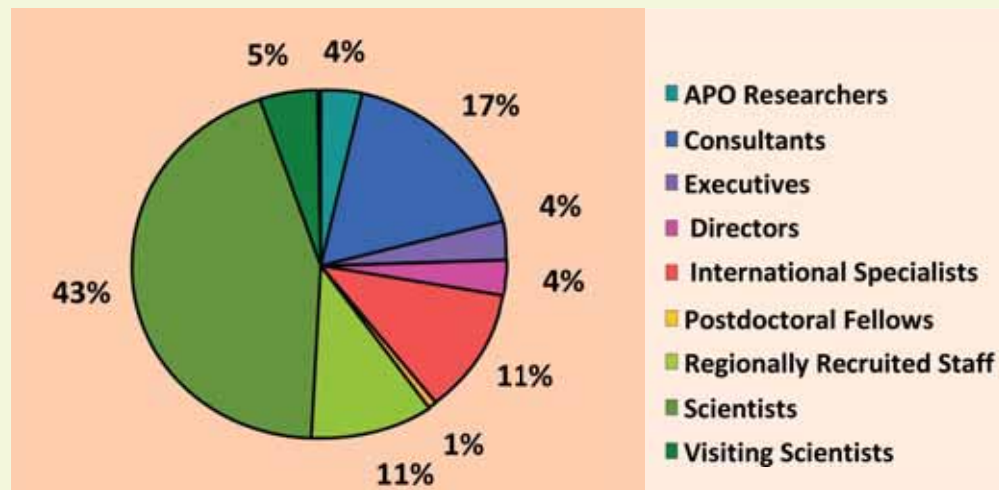


Figure 9. Percentage distribution of IITA staff by position category.

development audits to ensure that proposals are viable and matches investor, partners, beneficiaries, and other stakeholders' needs and guidelines. It identifies resource mobilization opportunities and supports the development of proposals. The Directorate performs any other duties within its competence as assigned by the Director General. The following Offices report to the Directorate:

Proposal Development Office works with the Directors and scientists in identifying relevant requests for proposals and proposal development. It identifies and follows up on funding opportunities, manages and supports proposal development and submission together with IITA scientists, and assists with donor and partner liaison. The office also assists the other Directorates with their resource mobilization efforts. These services include reviewing and sending out RFPs, reviewing proposals for technical quality, adherence to IITA's strategies and donors' administrative requirements, assisting with finalizing necessary documents to be submitted, and where applicable, submitting proposals.

Project Administration Office protects IITA against unforeseen contract, legal, and financial issues. It manages contract-related relationships with IITA staff, partners, and donors, and establishes sound operational procedures to guarantee adherence to standard rules, regulations, policies, and requirements of donors, partners, and IITA. Services include contracts administration, grants administration, legal and intellectual property (IP) service, reporting service, and PROMIS management service. The IP service is new and various options are being considered for having in-house expertise. We are establishing and will have a solid working relationship with the Consortium Legal Counsel of CGIAR.

Communication Office is the focal point for communication and social marketing services. It is a service provider to all the Directorates and supports internal and external communications, stakeholder relationships management, partnerships, capacity building, resource mobilization, and advocacy efforts. The Office ensures that all communication and social marketing efforts are targeted, coordinated, and implemented efficiently and effectively. It ensures the effective dissemination and sharing of knowledge, supports R4D programs and CGIAR Research Programs, and provides media relations, multimedia publishing, knowledge sharing, and social marketing services.

Partnership Coordination Office is responsible for the management of projects that are mainly implemented by a diverse group of partners doing research, development, capacity development, and monitoring and evaluation. These projects are often in several countries and in more than one of the regional hubs.

Capacity Development Office aims at developing the capacities of both individuals and institutions thereby stimulating learning, and facilitating and promoting information, experiences and knowledge sharing, and technology



Stimulating learning and facilitating knowledge sharing would help increase the uptake of technologies among end users.

transfer. It actively seeks opportunities to develop capacity of internal and external stakeholders and consists of the following units:

- *IITA Learning Center* - This is composed of the Conference Center formerly under the Communication Office, and the Training Unit formerly under the Human Resources Service. The Learning Center offers several capacity strengthening modalities at undergraduate and graduate levels, individualized training, practices, internships, mentoring and coaching, and thesis work towards postgraduate degrees. Group and learning events combine conferences, expert lectures, sharing of research results and practices, training courses, laboratory practices, and fieldwork.
- *IITA Knowledge Center* - This is the former IITA Library based in Ibadan previously under the Communication Office. The Knowledge Center collects, organizes, describes, and facilitates increased sharing and dissemination of agricultural information, experiences, and technologies that are currently stored in various locations with a comprehensive information and knowledge management system. It will also contribute to the development and management of knowledge networks activities and practices.
- *IITA International School* formerly under Human Resources Service.

Corporate Services Directorate

Corporate Services Directorate is being managed by an interim Deputy Director General to help with improving and consolidating its services. As per the reorganization of December 2011, the following services are provided:

Office of the Deputy Director General leads and manages the Directorate, is a member of the General Directorate, and collaborates with the other Directorates. It supervises the Heads of the Services, monitors and evaluates the performance of the services, manages the overall administrative functions of IITA, leads the Hub Administrative Services, and performs any other duties within its competence as assigned by the Director General.

Human Resources Service (HRS) manages IITA's national and international employees and the Ibadan-based health clinic. It is responsible for the attraction, selection, development, assessment, and rewarding of employees, while also supporting organizational leadership and culture, and ensuring compliance with employment and labor laws. HRS also serves as primary liaison with the staff associations. The services include HR strategy and policy implementation, staffing and orientation, compensation, rewards and benefits administration, welfare

management, disciplinary and grievance processes, performance management, employee capacity building, contract review and renewal, HR database management for NRS and IRS, relocation and disengagement services, internal communication, HR policy implementation backstopping for stations outside Ibadan, managing employee and industrial relations, and providing medical services at the IITA campus in Ibadan.

Hospitality Service is a self-sustaining service responsible for meeting hospitality needs of IITA employees, campus residents, and visitors to IITA Ibadan. Its services include accommodation at the Ikeja Guest House in Lagos and the International House in Ibadan, business and personal travel support for IITA staff and official visitors, food and beverage services in all outlets on the Ibadan campus and Ikeja Guesthouse, and managing the community convenience store and procurement.

Information and Communication Technology Service is responsible for ensuring that the Institute has sufficient capacity to engage with digital technology and communication. It ensures that IITA has the appropriate and current hardware, software, and data safety protocols. It provides institute-wide user support, help desk support, networking support to both local and wide area networks, software application and development support, advice on order and procurement of computer equipment; and supports telephony.

Facilities Management Service encompasses multiple disciplines to ensure functionality of the Institute's built environment by integrating people, places, processes, and technology. It provides technical services required by the Institute and its R4D programs, including automotive, refrigeration and air conditioning, utilities (water, electricity, and gas), electronics, heavy equipment, grounds and custodial services, fabrication, building construction, housing, and construction project management.

Supply Chain Service manages and supervises purchasing and supply chain (logistics) support services to all IITA stations in respect of overseas and local (Nigerian) purchases of goods, works, and services. For other IITA Africa Stations, local (in-country) purchasing, authority is delegated to regional administrators. Supply Chain Service in Ibadan includes IITA (UK) Ltd. that supports all IITA Africa overseas purchasing activities. Services include the following: procurement, logistics (shipping) and asset management, stores and inventory management, and IITA Ltd.

Security Service is responsible for ensuring the safety and security of all staff and visitors at all IITA stations in Nigeria and to provide and promote, as far as reasonably possible, a safe and secure environment. The Service is tasked with protecting the property and assets of the organization from fire outbreaks and criminal activity and encourages all users to promote a secure environment through their own conduct. The Security Service is also responsible for outlining procedures to deal with reports of crime, threats, and damage. It identifies trends and reacts quickly to remove or reduce risk.

It provides an agreed level of response against criminal activity, monitors authorized access, and prevents unauthorized access.

Finance Directorate

Finance Directorate reports directly to the Director General, manages the Institute's multi-donor budget, and monitors the financial transactions of all programs and projects. It holds several responsibilities to internal and external users who include staff, management and board, CGIAR, host governments, donors, implementing partners, suppliers, and the public. The responsibilities include financial planning, budgeting and analysis, accounting to donors, financial guidance to project managers, treasury management, processing the payroll, financial compliance, risk management, and other financial operations. The Directorate is currently organized into the following service units and is headed by the Director of Finance: Office of the Finance Director, Treasury Service, Corporate Accounts Service, Projects Accounts Service, and Payroll Service.

The Finance Directorate's Services work closely with IITA stations' accountants and administrators in managing day-to-day financial operations and reporting. At hub level, the Regional Financial Officer, working closely with headquarters, provides an advisory and capacity building role to the station accountants more especially as IITA focuses on decentralization.

In ensuring an effective control environment, there are established financial policies and guidelines in place that are periodically reviewed to ensure coherence. These are used in conjunction with donor guidelines governing use of bilateral funds, and the CGIAR Financial Guidelines Series, No. 2—Accounting Policies and Reporting Practices Manual.

Oracle Financials and in-built, add-on programs are currently used at headquarters for accounting, budget monitoring, and reporting in addition to other functions. Some stations use Sage Platinum in accounting and reporting while others use

spreadsheets. The reporting is currently centralized with headquarters having the responsibility for review and upload of data into Oracle Financials, while stations have view access to reports in the Oracle system for budget monitoring. As decentralization to hubs continues to take shape, it is envisaged that accounting and filing systems at hubs and stations will need to be enhanced to accommodate hub reporting needs and their monitoring by headquarters.

Governance and Board of Trustees organization of IITA

The 'governance' milieu is changing rapidly within the CGIAR system. Whereas Center Boards, at the beginning and through the 1990s, tended to focus their oversight activities primarily on the quality and future direction of the research, today the oversight function has expanded to partnerships, financial stability, performance monitoring, and strategy implementation. IITA is actively reforming its Board operations. In 2011, the Board of Trustees (BoT) commissioned a study by IMD, a Swiss school on business studies, to review the new role in regards the ongoing reform in CGIAR. IMD recommended improving IITA's BoT performance with regard to (a) cohesive agreement on Board responsibilities and priorities, (b) focused priorities, especially partnerships and financial stability, (c) new composition and structure of the Board and its meeting processes, and (d) sound information infrastructure as follows:

(a) Cohesive agreement on Board responsibilities and priorities. The Board should discuss and agree upon some important principles for governance including adopting a clear statement of IITA's mission, vision, and strategic goals and establishing policies and plans consistent with this statement. IMD describes this as "protect and develop the long-term interests of IITA, its funding organizations, local governments, and citizens where IITA operates".

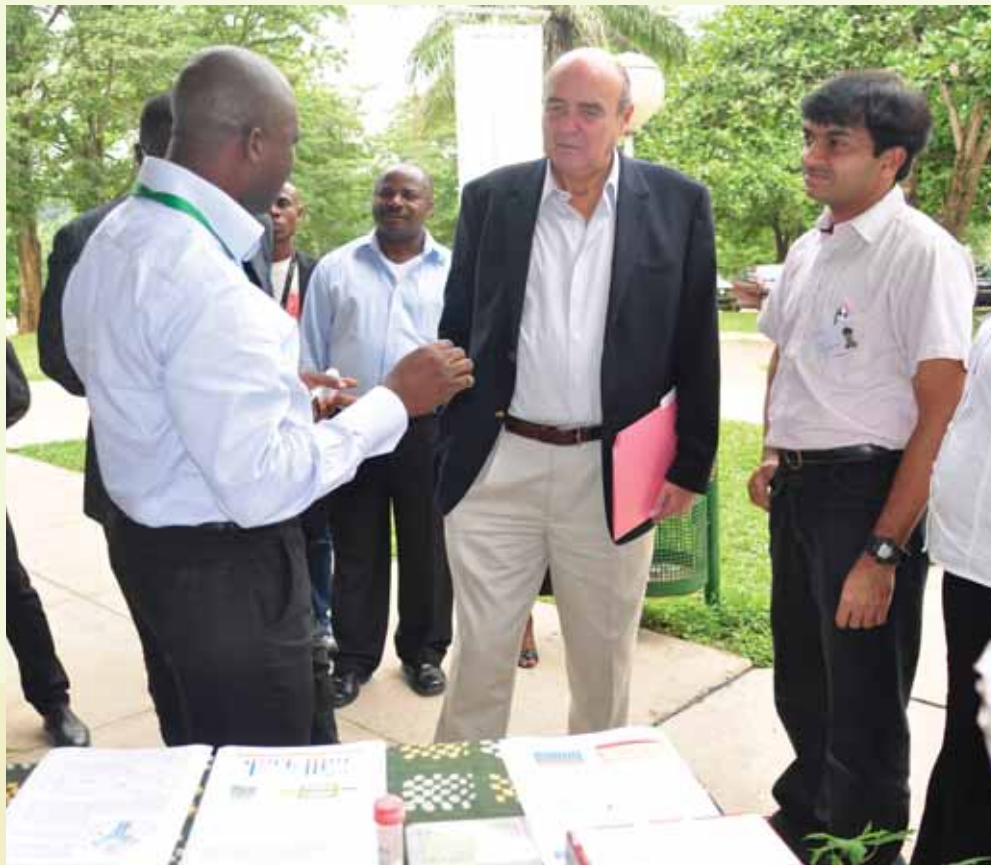
(b) Focused priorities on partnerships and financial stability. To remain effective, IITA maintains important relationships with many partners. To identify and prioritize these partners is important for BoT governance and guidance to the management of IITA.

(c) New composition and structure of the BoT. The Board composition should reflect the strategic expertise, resources, and perspectives of IITA's past, present, and future required to achieve the mission and strategic objectives of IITA.

(d) Sound information infrastructure. The BoT monitors performance of IITA through agreed benchmarks. These benchmarks promote productivity in a

science environment and collaboration in larger research groups to obtain enough momentum in each research area to ensure quality science. The IMD Report mentions Key Performance Indicators (KPIs) as the way to do this. The Board shall devise these indicators.

CGIAR Research Program Governance. Regarding the future involvement of senior IITA Management and Board members in CGIAR Research Program committees, it was mentioned during the Consortium meeting in Montpellier, attended by the Director General and Vice Board Chair, that the Board has overall responsibility of Humidtropics since IITA is the Lead Center. Some BoT members will be nominated to participate on the Advisory Committee of all the other CGIAR Research Programs where IITA is involved. Given the potential high transaction cost of managing effective participation in several CGIAR Research Programs from 2012 onwards, there will be regular updates on how the process evolves as the operations of different CGIAR Research Programs commence in 2012.



The governance milieu in the CGIAR system is rapidly changing.

X. Mobilizing financial resources

Resource mobilization strategy

To deliver the needed impact on the continent, development investors and African governments should consider doubling IITA funding. Funding support for IITA research is needed that recognizes both the urgency of immediate action and the importance of longer term investment for lasting solutions. At the heart of funding needs is the importance of maintaining a critical mass and diversity of scientists in Africa. The number of such scientists employed in both international and national institutions is diminishing. In addition, laboratory facilities for the type of research described in this document should be expanded and not compromised by unstable funding. Loss of this type of infrastructure will make it even more difficult to sustain and enhance the capacity of national systems to conduct proposed research for

development. There is thus a crucial need for a targeted and committed investment in R4D in SSA, and more widely, to enable and enhance the momentum that has already been achieved by IITA and its valued partners.

Preliminary estimates by IFPRI suggest increased agricultural productivity by 0.5% annually until 2025 and requires a CGIAR budget of \$1.6 billion by the same year, more than doubling CGIAR's resources, and we foresee IITA's budget growing proportionately. We envision a resource mobilization strategy (Figure 10) that will focus on CGIAR as its first source of funding (about 30%) through alignment of IITA's R4D programs with CGIAR Research Programs and effective leadership of the Humidtropics.

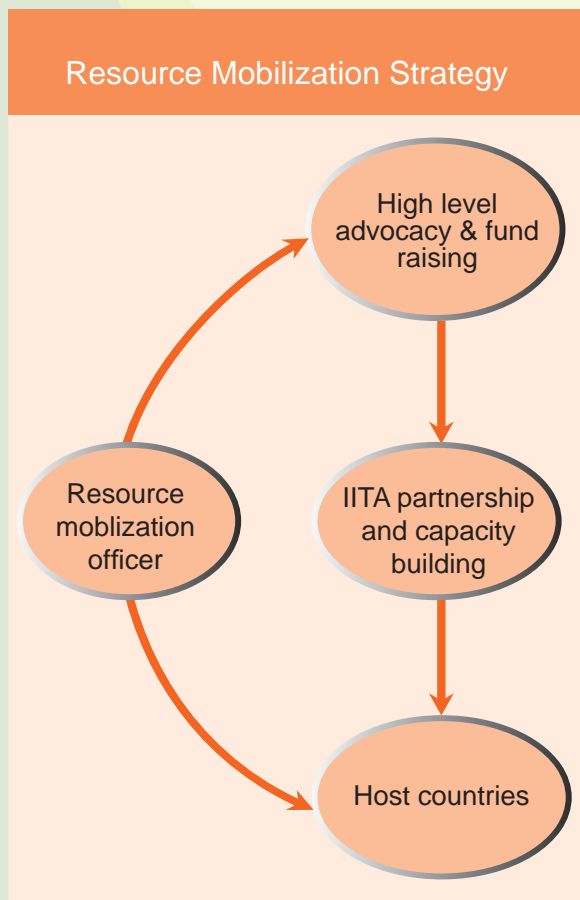


Figure 10. The resource mobilization strategy of IITA.

The second source of funding (about 50%) will derive from our engagement in the four Impact Zones described in Figure 1. This will allow us to develop a decentralized funding base and strong partnerships with local and national partners and effectively tap more development-oriented resources. The Bill & Melinda Gates Foundation, AGRA, and USAID have also adopted the concept of breadbasket impact zones into their strategies. For example, in Tanzania, USAID in its Feed the Future strategy, will focus its work in the southern agricultural growth corridor which the government of Tanzania has identified as one of its highest priorities in the private sector-driven Kilimo Kwanza plan. Similarly USAID has identified the northern Guinea savanna in Ghana as an impact zone for the cereal and maize farming systems. There will be need for research inputs that the respective IITA hubs can provide in those two impact zones (Figures 1 and 3). Providing leadership in best practices, policies, and technologies to build global food security capacity is one of the key priorities of the USAID Bureau for Food Security. Other bilateral funding will emanate from country programs funded by donors such as the European Union, Department for International Development (DFID), and other bilateral European donors according to their individual priorities. We will explore the prospects of approaching less known but resource-endowed family trusts for grants to support the IITA Foundation by involving the Board of Trustees and also by recruiting advocacy consultants familiar with these trusts.

The third source of funding (about 10%) will build upon IITA's growing competitive advantages in agrobiodiversity, plant health, and soils in Africa, all of which have a strong funding base and are clearly endorsed by several donors (e.g., Bill & Melinda Gates Foundation; the Rockefeller Foundation; Australian, British, Canadian, French, German, and Swedish development agencies, and diverse competitive grants). This strategy offers both regional and global impact, leverages recently emerging regional initiatives such as the recommendations of the African Fertilizer Summit, and increases in strength through partnership with other organizations, particularly *icipe*, CIAT, and International Fertilizer Development Center (IFDC).

Finally, special effort (about 10%) will be made with the host country Nigeria for IITA headquarters, and Tanzania, DR Congo, and Zambia hosting IITA Hubs, as well as other IITA activities across Africa. In this category, joint funding ventures with regional organizations (ASARECA, CORAF, and SACCAR) and FARA will be pursued through the African Development Bank. Looking beyond our traditional donors, funds will be generated from private sector partners interested in IITA research outputs. Project development and management will have a high level

of functional interdependence between offices directly providing support to restricted fund management and an office for Donor Relations and Intelligence planned by the Director General's office.

Targeted financial resources

Resource mobilization, for example funding obtained in a given year, funding opportunities in the “pipeline”, and major efforts at managing donor relations, constitutes an important activity of the DG. Our next five years’ (2013–2017) target is to double R4D investments to over \$120 million per year (Figure 11). This will involve strengthening the capacity of our teams in R4D Support and Finance to submit winning funding proposals so they can contribute to 15% of the overall Institute’s budget. Funds resulting from various CGIAR Research Program partnerships appear in Table 3. The budget of IITA has grown substantially over the last 12-month period (the proposed figure of \$70.3 million for 2012 is 38% higher than in 2011). It is important to monitor project implementation and execution against agreed criteria to ensure that this elevated donor investment has enhanced the accomplishments of IITA’s research outputs and that IITA’s capacity to undertake the increased level of activities remains. We should also monitor the long-term effects of this growth in budgetary resources in relation to the sustainability of IITA’s undertakings and the Center’s impact.

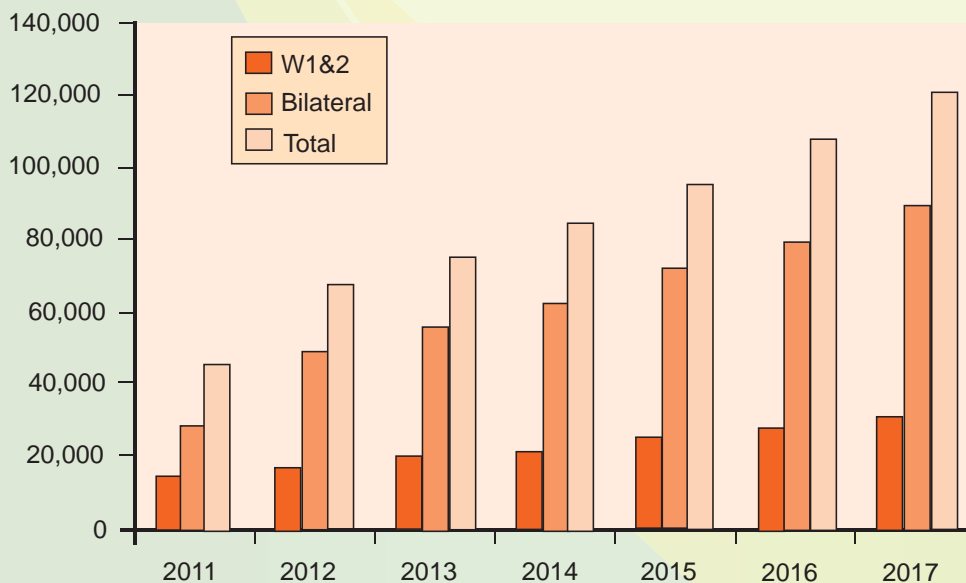


Figure 11. Projected evolution of IITA funding (x US\$1000) from Windows 1&2 and bilateral sources between 2012 and 2017.

Table 3. IITA-estimated Windows 1&2 and bilateral budget 2012–2017, by CGIAR Research Program assuming a growth rate of 12.5% per year (US\$000).

CRP Title	2012	2013	2014	2015	2016	2017	%
Integrated Systems for the Humid Tropics							
Windows 1 & 2	3,074	3,458	3,891	4,377	4,924	5,539	15
Bilateral	17,846	20,077	22,586	25,410	28,586	32,159	85
Total	20,920	23,535	26,477	29,787	33,510	37,698	
Policies, Institutions and Markets							
Windows 1 & 2	619	696	783	881	992	1,115	72
Bilateral	236	266	299	336	378	425	28
Total	855	962	1,082	1,217	1,370	1,540	
MAIZE							
Windows 1 & 2	1,696	1,908	2,147	2,415	2,717	3,056	15
Bilateral	9,866	11,099	12,487	14,047	15,803	17,779	85
Total	11,562	13,007	14,634	16,462	18,520	20,835	
Root, Tubers and Bananas							
Windows 1 & 2	5,170	5,816	6,543	7,361	8,281	9,317	30
Bilateral	12,148	13,667	15,375	17,297	19,459	21,891	70
Total	17,318	19,483	21,918	24,658	27,740	31,208	
Grain Legumes							
Windows 1 & 2	4,566	5,137	5,779	6,501	7,314	8,228	45
Bilateral	5,682	6,392	7,191	8,090	9,101	10,239	55
Total	10,248	11,529	12,970	14,591	16,415	18,467	
Agriculture for Nutrition and Health							
Windows 1 & 2	1,343	1,511	1,700	1,912	2,151	2,420	53
Bilateral	1,192	1,341	1,509	1,697	1,909	2,148	47
Total	2,535	2,852	3,209	3,609	4,060	4,568	
Water, Land and Ecosystems							
Windows 1 & 2	231	260	292	329	370	416	8
Bilateral	2,681	3,016	3,393	3,817	4,294	4,831	92
Total	2,912	3,276	3,685	4,146	4,664	5,247	
Climate Change, Agriculture and Food Security (CCAFS)							
Windows 1 & 2	787	885	996	1,121	1,261	1,418	79
Bilateral	214	241	271	305	343	386	21
Total	1,001	1,126	1,267	1,426	1,604	1,804	
AND TOTAL							
Windows 1 & 2	17,486	19,671	22,131	24,897	28,010	31,509	26
Bilateral	49,865	56,099	63,111	70,999	79,873	89,858	74
Total	67,351	75,770	85,242	95,896	107,883	121,367	

A significant proportion of the funds, while managed by IITA, flow to partner organizations. This is often an effective use of the funds; for instance, an ARI partner provides advanced technology to complement IITA's research, or an NGO facilitates the delivery of IITA's technologies. Partner organizations may be better able to fill a niche within an R4D activity or may undertake a particular role within the framework of capacity enhancement. In addition, the overheads allow some stability for essential research, or the availability of project funding may allow the Institute to continue employing a scientist over the short term until more reliable research funds are identified.



Working with partner organizations could complement IITA's research or facilitate the delivery of IITA's technologies.

XI. Rejuvenating IITA's infrastructure

The IITA infrastructural plan for its HQ and Hubs calls for an excellent and well-maintained physical environment conducive to fostering research excellence in all IITA locations.

West Africa and IITA Headquarters

The IITA Ibadan campus is a major asset that needs to be maintained and enhanced for its value to research, science, and ecotourism. This 1,000-ha research park comprises a research complex with over 16 major laboratory blocks, greenhouses, experimental and demonstration plots, administrative offices, a housing complex with 77 houses and apartments, 108-room dormitory and hotel buildings including recreational facilities, conference hall and meeting/training facilities, a medical center, and an international school. A third of the campus consists of an unspoiled tropical forest, a natural preserve for birds, other fauna, and indigenous and exotic plants; and a 3-km lake that provides irrigation water and serves as a home for various species of fish and hundreds of resident and migratory birds. The campus itself is a rich center of biodiversity and represents a wealth of flora and fauna that are not common in other parts of Nigeria, and is thus an invaluable national and international resource. Thirty-two of IITA's 51 scientists (excluding the members of the Directorate) based in West Africa are at the Ibadan station. The facilities at headquarters are ageing, with more than 90% over 40 years old. There is a long-term commitment to maintain facilities and enhance the aesthetic qualities of both the buildings and open spaces to complement the ecotourism aspect of the IITA campus while ensuring that we offer our internationally recruited distinguished scientists competitive living conditions, but there are currently insufficient resources to complete this effort. Excellent infrastructure through targeted investments is key to achieving this goal. The following objectives have been identified for infrastructural upgrading:

- Provide high-quality R4D facilities to meet institutional needs
- Preserve and enhance the traditional aesthetic appeal of the campus
- Design campus systems to ensure an efficient, pleasing, and safe campus
- Upgrade and provide additional housing to increase the number and proportion of staff housed on campus in line with international standards.

Facilities that need to be upgraded will require about \$28 million and include the research farm (\$4.54 M); laboratory facilities, including the diagnostic and analytical labs, germplasm health, electron microscope room, postharvest technology and pathology labs (\$5.72 M); conference and training facilities, International House, dormitories, guesthouse (\$3.1 M); knowledge software and hardware infrastructure,

including bandwidth (\$1.77 M); utilities (water, electricity, and airconditioning units, \$8.16 M); supply chain stores and disposal park (\$240,000); Genetic Resources Center (\$140,000); yam barn and clonal crop field breeding facility (\$565,084); Bioscience Center (\$380,000); seed processing and conservation facility (\$1.04 M); screenhouses and animal houses (\$140,000); waste management and hazardous waste facility (\$860,000); and campus security (\$380,000). Other areas for improvement include energy efficiency, telecommunications, offices and social spaces, and signages. Other IITA facilities requiring attention include stations in Nigeria (Kano, Abuja farm, and Onne) as well as the IITA offices in Ghana, Liberia, and Sierra Leone. The station in Benin is currently under AfricaRice administration, which is also in charge of its maintenance. However, in view of the possible relocation of most of AfricaRice activities to Côte d'Ivoire, a more sustainable strategy for infrastructure upgrade and maintenance is currently being investigated. Once the administration of AfricaRice has moved to Côte d'Ivoire, the station will again be under IITA administration. With its important biodiversity collection it will be expanded to become the center for biodiversity studies, housing at the same time scientists of AfricaRice and Bioversity. Costs for this expansion have not yet been estimated.

East Africa - Tanzania

The Eastern Africa Hub covers over 10 countries. The scientists in this region operate in all or part of the 10 countries. They also provide scientific expertise outside of the boundaries of the eastern region. In the Eastern Africa Hub, the office space and laboratories are located in three countries, Tanzania (the main location for the Hub), Kenya (linked to the Biosciences eastern and Central Africa hub, BeCA), and Uganda (research on systems for the middle altitude ecologies). The majority of scientists in the Eastern Africa hub are based in Tanzania (currently 17 IRS/RRS out of 20 for the region). In this country, the office space and laboratories are found in two main sites: the Coastal area where the main regional office is located, housing currently 15 IRS/RRS. A new science building is under construction at Mikocheni, Dar es Salaam. There is a substation at Kibaha mostly for our pioneering work on cassava brown streak disease (CBSD) and a large plot granted by the government at Kwembe village near Dar es Salaam that requires development in the future. The second main location is Arusha in Moshi region where the banana program and the new USAID-funded Africa RISING project operate. Summing up the investment needs from several locations in the three countries where scientists are located, the total investment plan totals approximately \$2.3 million for the immediate needs (linked mostly to the science building at Mikocheni), \$440,000 over the short to medium term, and about \$220,000 for longer term investment.

Southern Africa

IITA-Southern Africa implements R4D activities in seven of the 13 countries in the region through direct intervention and collaborative linkages with various partners. Scientists and support staff are based in three locations: Lilongwe, Malawi; Nampula, Mozambique; and Lusaka, Zambia. The research focus for the region is intensification and diversification of maize-dominated farming systems through the integration of more cassava and legumes. Other research activities link agriculture, health, and nutrition as well as promoting value addition. The Lusaka office serves as the regional hub established in 2009, and is the least developed and underresourced location, although it houses the highest number of scientists and administration staff (8 IRS and 10 NRS). IITA-Zambia has no offices, laboratories, and essential equipment. IITA currently operates from a rented house, which is used for office accommodation while facilities of the national programs are used for field research. To make IITA-Zambia a fully functional hub for the region, there is an urgent need for investments in research facilities, which should consist of 15 offices, six laboratories including: (a) pathology, weeds, and entomology; (b) soil, plant and chemical analysis; (c) socioscience/GIS/computer lab; (d) biotechnology and tissue culture; (e) crop utilization laboratory; and (f) agronomy and physiology. Other priority needs include storage rooms for seeds and field equipment and a cassava processing demonstration center. Common facilities will include meeting rooms, computer rooms, parking space, library, screenhouses, and land for field experiments. In addition to the facilities established at the hub in Lusaka, the long-term vision is to have three testing sites in Zambia, representing the three major agroecologies in the region (humid, subhumid, and dry savanna). There is also the need to establish a research site in Chiawa (Zambezi valley) for off-season trials and seed multiplication during the dry season. The total investments in infrastructure and equipment are estimated at \$3.5 million over the next five years.

Scientists in Mozambique are working on developing legume value chains (soybean, cowpea, groundnut, and common bean). The country has large areas of underexploited land, making it ideal for experiments on seed systems and commercial agriculture. Like Zambia, IITA-Mozambique operates from rented offices and laboratory infrastructure from the national programs in Mozambique and Southern Africa. However, this location has two research farms, approximately 100 ha each, in Nampula and Zambezia provinces. IITA has also been allocated land, by the Nampula Government, which is earmarked for developing modest research facilities that will serve the needs of the Lusophone countries in Africa. The facility (offices, labs, seed store, and workshops) will require an investment of approximately \$2.3 million over five years. IITA-Malawi is the oldest location in Southern Africa and fully functional with three office blocks, one analytical laboratory, two small chemical and

seed stores, one stationery store room, and one screenhouse which were earlier developed for cassava research but later expanded to include soybean research as well as socioeconomic studies. IITA-Malawi needs \$150,000 to upgrade offices and research facilities.

Central Africa

IITA's R4D will be implemented through the presence of IRS and NRS in strategic locations across Central Africa, building on earlier IITA investments and through effective partnerships at the scientific and development level to complement IITA expertise. The Kinshasa office in DR Congo recently acquired by IITA is fully operational in terms of administrative support. Its current research portfolio is focused towards cassava improvement, seed systems, and postharvest handling. The Bukavu office in east DR Congo was recently constructed and acquired by IITA from CIAT and has office, laboratory, and greenhouse facilities. The research portfolio currently focuses on banana-coffee systems and covers aspects of germplasm, seed systems, agronomy, and soil microbiology, and value addition. The Yaoundé office in Cameroon has operational office, laboratory, and screenhouse facilities. With the cessation of the Sustainable Tree Crops Program (STCP) and declining donor interest in Cameroon, activities there are threatened. The current research portfolio very much focuses on IPM issues with some level of activity in the context of the Alternative to Slash and Burn Program. Strengthening the Bujumbura and Kigali offices is second priority since the Bukavu facility can also provide scientific and administrative support to activities in Rwanda and Burundi. Within the context of CIALCA and Humidtropics, however, continued presence of IITA staff in Rwanda and Burundi is foreseen.

Several investments are needed in the near future to enable the minimal critical mass to deliver on R4D expectations. With the recent investments in the Kinshasa and Bukavu facilities, no specific investments are needed besides funds for maintaining and upgrading the infrastructure. Continued efforts will be made to provide office space to other institutions as a means of recovering operating expenses. The laboratory in Yaoundé requires upgrading and integrating in an overall soil and plant reference laboratory network for sub-Saharan Africa. Similarly, the laboratory in Bukavu requires additional equipment to establish a standard soil and plant analysis and soil microbiology capacities to backstop various investments in the Great Lakes Region (e.g., N2Africa) and Humidtropics activities beginning in 2013. Currently, IITA Central Africa is housing eight IRS (one in Kinshasa, five in Yaoundé, and two in Bujumbura). For the Central African hub to be fully capable to implement the above strategy, a total of 37 IRS positions are needed (Table 1). In terms of financial resources, Central Africa has an active bilateral research portfolio of \$5 million with \$3.5 million earmarked for 2012, \$2.7 million for 2013, and \$1.3 million for 2014.

XII. Monitoring and evaluation

IITA cannot achieve any of the goals described in this strategy without the data and learning provided through monitoring and evaluation (M&E). M&E will be implemented at two levels; continuous internal monitoring within IITA and performance evaluation by the CGIAR. At the 2009 CGIAR Business Meeting, a new monitoring and evaluation framework for the CGIAR was approved. It entails a system for accountability where the Consortium Board has the responsibility for external evaluation of each Center, its CGIAR Research Program components, cross-cutting issues and the Consortium Office. CGIAR Research Programs will be evaluated by the Fund Council through an Independent Evaluation Arrangement (IEA). In addition, the IITA portfolio needs a credible internal system for performance measurement and management as soon as possible. Key elements of a practical performance management system that will be implemented in its first iteration and maintained over the next five years are:

- Quantitative outcome targets for the four SLOs in the different impact zones (Figure 1) aggregated to the continental level for the vision of getting 11 million people out of poverty and rehabilitating 7.5 million ha of degraded land.



A monitoring and evaluation system provides for accountability and performance measurement and management.

- Quantitative CGIAR Research Program and bilateral project outcome metrics of a limited number of meaningful outcomes that are proxies for impacts of each SLO by the CGIAR Research Programs and other bilateral projects.
- Harmonized CGIAR Research Program progress and financial reporting that enables verification of progress and assessment of value for money against agreed targets.

Implemented by IITA staff, expert consultants, and country-specific partners, IITA's M&E system will accomplish five objectives essential to the initiative's overall success. The M&E system will: (i) assess outcomes and impacts of IITA and determine whether these have been achieved cost effectively; (ii) capture the progress, success, and failures of IITA and its partners; (iii) guide IITA's management decisions, strategic planning and risk management; (iv) provide accountability to IITA stakeholders including its donors; and (v) contribute to broader knowledge and learning in the field of agriculture for development.

IITA's M&E functions will be coordinated by the internal M&E unit. IITA's internal M&E department will focus on monitoring for management purposes, and will therefore be a part of line management. Impact evaluations and Independent External Evaluations will be commissioned by the Board, conducted by an external entity, and the results presented directly to the Board. IITA management may also conduct evaluations as deemed appropriate. The IITA M&E strategy will be reviewed periodically and may be subsequently modified in light of lessons learned and the evolving needs of stakeholders. The Strategy will be supported by an implementation or business plan that will also be regularly reviewed and updated. Such high-level activities require the M&E unit to place a member of its team in each of the Hubs. At headquarters, the M&E unit will be organized along functional lines with responsibilities allocated to reflect its principal lines of activity: impact and independent evaluations and monitoring at the continental, regional, and country levels. To deliver the M&E strategy IITA will need four to five professional staff with an appropriate budget.

XIII. Risk management

Research is inherently a risky business, more so agricultural research in SSA where infrastructure is weak, national institutions are fragile, policies and markets are inefficient, and the political and economic conditions are unstable. The challenges and opportunities facing African agriculture and R4D are constantly evolving, and recognized challenges are shifting as new challenges are emerging. Obstacles to the realization of the Vision and Strategic Plan need to be overcome. If not, even the best research will have little impact. IITA will have to become more nimble and flexible to better respond to future unforeseen challenges and to simultaneously address chronic, emerging, and new challenges. We will deploy the professional expertise of IITA staff in a systematic, proactive, and continuous manner to achieve the best results and manage associated risks of conducting research in Africa. We will strengthen IITA internal scientific, administrative, financial, and institutional audit functions to provide more rigorous analysis and management of risks. We will continually assess these risks and develop innovative strategies on how to best manage them to have the greatest impacts. We will engage the Board's unique talents, skills, and abilities to continually assess our strategies, devise intelligent solutions to adapt to new challenges and opportunities, ensuring that we maintain exemplary performance within all our strategic interventions. IITA will continue to build its oversight framework, comprised of internal and external auditing, self assessment, quality assurance, board reporting, monitoring and evaluation, and risk management.



IITA needs to be able respond to emerging and new agricultural challenges. .

XIV. Timeline for implementation

We foresee three phases for implementation of this strategy: (1) 2012–2013 as a period for evaluating research priorities, alignment of IITA's research portfolio with CGIAR Research Programs, stabilizing and increasing funding, and refining communication, M&E, and resource mobilization strategies; (2) 2014–2017 as the period of growth and repositioning, building on Phase 1 achievements and continued investment in hub capacities; and (3) 2018–2020 for consolidation of success and development of the succeeding 10-year strategy.



IITA's research-for-development interventions will help ensure that producers and farmers get more value for their money and effort, and that consumers get food on their tables.

XV. Acronyms and abbreviations

Below is a limited list of acronyms and abbreviations to guide with reading this document. A comprehensive updated list with most commonly used acronyms and abbreviations in the CGIAR system is available at <http://www.cgiar.org/corecollection/helplistacronyms.htm>

AGRA	Alliance for a Green Revolution in Africa
AIS	Agricultural Innovation System
ARI	advanced research institute
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
AVRDC	The World Vegetable Center
CAADP	Comprehensive Africa Agriculture Development Program
CB	CGIAR Consortium Board
CEO	Chief Executive Officer
CGIAR	Consortium of International Agriculture Research Centers
CIALCA	Consortium for Improving Agriculture-based Livelihoods in Central Africa
CIAT	Centro Internacional de Agricultura Tropical
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo
CIFOR	Center for International Forestry Research
CIP	Centro Internacional de la Papa
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CORAF/WE CARD	Conseil Ouest et Centre Africain pour la recherche et le développement agricoles
CSO	Civil Society Organization
DG	Director General
DDG	Deputy Director General
ECA	East and Central Africa
EIARD	European initiative on international agricultural research for development
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária
EPMR	External Program Management Review
FAO	Food and Agriculture Organization of the United Nations

FARA	Forum for Agricultural Research in Africa
GCARD	Global Conferences on Agricultural Research for Development
GIS	Geographic Information Systems
GRP	Graduate Research Program
Humidtropics	CGIAR Research Program on Integrated Systems for the Humid Tropics
ICARDA	International Center for Agricultural Research in the Dry Areas
<i>icipe</i>	International Centre of Insect Physiology and Ecology
ICRAF	World Agroforestry Centre
ICRISAT	International Crops Research Institute for the Semi-arid Tropics
ICT	information and communication technology
IFDC	International Fertilizer Development Center
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPG	International Public Good
IRRI	International Rice Research Institute
ISFM	integrated soil fertility management
IWMI	International Water Management Institute
M&E	monitoring and evaluation
MDG	Millennium Development Goal
NARS	national agricultural research systems
NGO	nongovernmental organization
NGS	Northern Guinea Savanna
NRM	natural resources management
PCAP	Professional Capacity Advancement Program
PMEIA	Participatory Monitoring, Evaluation and Impact Assessment Approach
R&D	research and development
R4D	research for development
REC	research, extension, and capacity building
SACCAR	Southern African Center for Cooperation in Agricultural and Natural Resources Research and Training
SRF	CGIAR Strategy and Results Framework
SRT	Strategic Research Theme
SRT1	Systems analysis and synthesis
SRT2	Integrated systems improvement
SRT3	Scaling and institutional innovation
STC	short-term course
SLO	System Level Outcome



CGIAR

IITA is a member of the CGIAR Consortium