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- More than 30 years of agricultural research and development management in Africa, 16 years (1989-2003, 2011-to date) at IITA from postdoc to Head of the Savanna Program and 7 years (2003-2010) at CIAT-TSBF. As Director General at IITA, I have successfully doubled the science staff complement from 110 to 240, and tripled the budget from $50 million in 2011 to $150 million in 2019, and as TSBF Director, I had been privileged to build this institution with a budget of $1.2 million in 2003 to $14.5 million and staffing from 5 to 31 IRS with strong support from 60 NRS currently and expand its research for development activities from only western Kenya to several countries in major agroecosystems of east, central and southern Africa. Our area of great impact had been the Great Lakes Regions (DR Congo, Rwanda, and Burundi).
- Demonstrated ability to think strategically, rapidly analyze, and integrate diverse information from varied sources into conclusions, recommendations, and practical work implementation of major research for development projects and programs.
- Strong end user orientation and interpersonal skills with proven ability to work cooperatively with large multidisciplinary teams, all levels of staff, managers, donors, and partners in public or private sector.
- Published more than 120 research articles in peer reviewed international journals and was awarded the International Foundation Sven Brohult for contribution to agricultural and agroforestry research.

RELEVANT QUALIFICATIONS AND KNOWLEDGE

Leadership

I have focused my career on the research for development of agricultural institutions and building the capability of young scientists in Africa. My experience in the preparation of strategic documentation is considerable. As Director General of IITA I led the strategic exercise that developed IITA's refreshed strategy (2011-2020), with a strengthened research-for-development capacity. IITA now operates through decentralized and well-integrated research programs based on key farming systems located in major agroecological impact zones in sub-Saharan Africa.

As the Director of the CIAT-TSBF Institute I had provided a strategic vision *[From knowledge to implementation (2005-2010)]* for research on tropical soil biology to benefit land-users, especially resource-poor farmers. The Institute, solely devoted to soils research, had been able to maintain a strategic problem focus while at the same time adapting its program to a rapidly changing institutional context. I have oriented the design and implementation of an integrated natural resource management research program that is linked to production intensification, market policies, and health. Significant achievements are presented in the document CIAT-TSBF*'s achievements and reflections 2002–2005 (http://www.ciat.cgiar.org).* Our contribution to the CGIAR mission has been rated as excellent by the Center Commissioned External Review in 2005 and the External Management and Program Review in 2007. I contributed to the various strategic plans developed during my time with IITA 1989-2003. I was

one of the principal authors on the CIAT strategic plan of 2010-20 that revived the center after the difficult recommendations of the EPMR in 2008.

CIAT-TSBF under my leadership was involved as a learning partner and developed the section of the Soil Health Strategy on Integrated Soil Fertility Management (ISFM) principles and practices by suggesting different investment scenarios in sub-Saharan Africa. Based on this strategy, the Bill & Melinda Gates and Rockefeller Foundations have invested about $200 million for five years in Soil Health Program of the Alliance for a Green Revolution in Africa (AGRA) since September 2007. I have played a major role in the creation of the Consortium for Improving Agriculture based Livelihood in Central Africa **(CIALCA),** including three international research centers *(*IITA, CIAT-TSBF and Bioversity), university partners in Belgium *(*KUL, UCL) and national research (ISAR, INERA, ISABU, IRAZ), and development partners in DR Congo, Burundi, and Rwanda. During the last six years (2004-2010) research for development done by CIALCA has already had an impact on farmers' attitudes and livelihoods (www.cialca.org). The CIALCA model illustrates well this integrated strategy between disciplines and institutions. Other areas of strategic understanding of how agricultural research-for development can contribute to solving them that I have contributed to included (i) the conception and implementation of the sub-Saharan challenge program on Building sustainable livelihoods through Integrated Agricultural Research for Development "Securing the future for Africa's children", (ii) The African head of State Fertilizer summit declaration and recommendation, and (iii) Co-leading with IWMI the writing of the Consortium Research Program on Water, Land and Ecosystems.

The recent developments in CGIAR, including the One CGIAR, the emergence of the Consortium of centers, potential new Consortium Research Programs, and further potential new moves towards restructuring of funding opportunities and even the further merging of Centers has given IITA a critical opportunity to display leadership in promulgating collaborative research for the alleviation of poverty and malnutrition among a diverse group of research and development actors. Though it is extremely important that IITA demonstrate its independence, it is also important that the Consortium of CGIAR Centers together strive in future to set, rather than react, to the agenda for supporting the disadvantaged areas in which the bulk of the world's poor live. As Director General of IITA, I and my senior managers have firmly clarified the regional and global predominant capabilities of IITA within the context of both the current Strategic Research Framework recommendation to strengthen IITA's position in Africa and the global CGIAR change management process and donor interests in Africa.

Resource mobilization and project management

In addition to managing the research for development team, I ensured effective collaboration with research partners and took care of donor relations and resource mobilization to secure the financial support needed to implement research programs. My experience at IITA and CIAT-TSBF attests to the fact that I have had substantial fund raising experience and a long history of contact with the donor community. IITA's funding has tripled in 10 years, and its project portfolio has increased to about 200 research projects. CIAT-TSBF's funding increased since 2003 from a low of $1.2 million per year to an excess of $14.5 million presently. Project funding ranged in size from $50,000 to $20 million.

Linkages to partners and capacity building

Striving to engender good and long-lasting collaboration between research groups and all their potential partner institutions (regional bodies, NARES, NGOs, CBOs, the private sector, and farmers) is a theme running throughout my career. In my role as director general and director, I learned to appreciate the

strengths that result from collaboration. I have invested a significant amount of effort in developing institutional linkages. A fundamental dimension of development for research is capacity building and training. I have considerable experience in the development and organization of training programs, particularly degree related and short-term training. Much of this training was done in collaboration with partners such as NARES, ARIs, and some donors. I have trained more than 30 PhDs—some have assumed leadership roles in their own countries. We have organized many fora for scientific exchange, including seminars for scientists, students and visiting researchers from Africa and Advanced Institutes and Universities from the North. Strategic retreats have also been organized for fund raising and strengthening IITA and CIAT–TSBF position within and outside Africa.

Linkages with advanced research institutes have been indispensable to ensure inclusion of state-of-the-art methods and approaches within our research activities. We have fostered innovative partnerships by playing catalytic and brokerage roles between ARIs (advanced research institutions, both private and public), national agricultural research systems (including universities), and the private sector. Different mechanisms for research dissemination have been used. These include networks, e.g., the African Network for Tropical Soil Biology and Fertility (AfNet), a pan-African network that is able to mobilize 400 scientists that engage in ISFM research for development, and consortia, e.g., CIALCA. Such mechanisms for programmatic coordination have also been used for global initiatives such as the Conservation and Sustainable Management of Belowground Biodiversity (CSM-BGBD) and the World Digital Soil Map funded projects led by CIAT-TSBF.

Based on the research work by CIALCA in the Great Lakes we discussed the creation of an independent non-governmental organization called CIALCA Development International (acronym: CIALCA Dev. Int.). CIALCA Dev. Int. will bridge the missing links between Research, Extension and Capacity Building (REC). On my initiative, we are building the main infrastructure in Bukavu, east DR Congo comprising of laboratories including soils, microbiology, nutrition and GIS+ sample processing and storage facilities; meeting rooms; library; and greenhouse facilities.

Capacity to work effectively at IITA and in its multicultural environment

I have demonstrated sufficient sensitivity appropriate to leading an institution such as IITA with multidisciplinary, multicultural, and multilinguistic working and social environmental dimensions. My exposure to many cultures and countries, started early in my career and my education, continues to this day. I remain alert to these important issues as I know these issues can fundamentally affect the morale and dynamism of an institution. I have good conflict resolution skills (born of exposure to cultural diversity) and managed at CIAT-TSBF to dispose of several long-standing enmities due to research ideologies between scientists interested in purely academic/process versus practical/delivery research for development. Good communication skills (oral, written and electronic) today are vital tools in the skill sets of a good manager, particularly in running a highly decentralized and geographically dispersed global institution like IITA, and my experience of decentralized management gained within the multicultural, ecoregional environments at IITA and CIAT-TSBF have been a major asset in this regard.

Management of complex structures and systems

CIAT-TSBF institute has operated as a semi-autonomous status and IITA is a complex multilocation organization. As the Director General of IITA/Director of CIAT-TSBF, I am responsible for the administration and welfare of staff at all locations. Capability and experience to comprehend complex technical, financial and administrative matters is essential. I had recruited scientists and national staff and

dealt effectively with HQ, regional hubs, and the host Center, and partners despite disagreement sometimes. Most of the problems I encountered include Management of Overhead and Indirect Costs, e.g., Increase of overheads charged on subcontracted services; Increase in rent of office space, and finances. Building and maintaining effective internal management partnerships and good teamwork is also an area where I concentrate my professional vitality. I had been happy to act as a bridge between the scientific community and the administrative and managerial support services. I also feel retrospectively that such enhanced teamwork and the nurturing of good communities of practice between and within science and administration were also one of my lasting contributions during my service at both IITA and CIAT-TSBF.

EXPERIENCE

I have accumulated many years of research experience in tropical agriculture in the following countries: Democratic Republic of Congo, Nigeria, Kenya, Austria, Zimbabwe, Belgium and my research interest and activities are wide, but my current greatest interest is in applied science and agriculture, particularly in the fields of Applied Microbial Ecology, Plant Nutrition and Soil Fertility. I have focused part of my career on capacity building and development of agricultural institutions in some countries in Africa, Latin America, and Southeast Asia.

2011 till date: Director General, International Institute of Tropical Agriculture
As the Director General of IITA for 9 years now, my duties include overall strategic leadership in research and development, including capacity development of national partners, and resource mobilization. I made it my priority to reposition IITA as a strong research-for-development actor in sub-Saharan Africa that drives the agenda for agriculture, and as the partner of choice for research on tropical agriculture. Since I joined IITA I have doubled the number of scientists from 110 to 240 from 49 countries, strengthened the research and administrative capacity of the Institute's regional hubs and stations, increased the research portfolio to almost 200 projects/programs, and tripled the funding from $50 million in 2011 to $150 million in 2019. IITA now has the second biggest budget in the CGIAR Consortium Office of 15 centers.

2003–2011: Director Tropical Soil Biology and Fertility Institute of Centro Internacional de Agricultura Tropical (TSBF-CIAT Africa)
As the Director of the CIAT-TSBF Institute my duties included research and training leadership of the decentralized institute staff of 30 senior scientists (+ local staff exceeding 50) organized in three global themes (Integrated Soil Fertility Management, Sustainable Land Management and AfNet for capacity building and distributed in three regions: West & Central Africa, Eastern & Southern Africa, Chair of the Research Committee and Member of the CIAT Management Committee. Active in fund raising, financial management and cost saving initiatives, and creating the new **CIALCA Dev. Int.**

2001–2002: Leader of the Savanna program, Principal scientist and Head, Soil microbiology unit, Resource and Crop Management Division (RCMD), International Institute of Tropical Agriculture (IITA)
Responsibilities focused on management of an active research and development of the savanna program on 'Improving and intensifying cereal-legume systems in the moist and dry savannas of West and Central Africa.' This program was composed of 34 internationally recognized scientists of over 15 nationalities contributing up to 100% of their time, and well-supported by locally recruited staff. Their expertise ranged from strategic research on crop improvement, plant health and integrated natural resource management to application of research to solve on-farm problems on poverty alleviation, food security, and land degradation. This program also has well-established research linkages with NARES through different

networks in over a dozen countries in West and Central Africa. As Program Leader, I did direct research prioritization and monitoring, and was responsible for allocating and monitoring resources within a project framework and according to research priorities. I approached research management as a participatory process, both for developing annual and medium-term work plans, and executing needed mid-term adjustments. The multidisciplinary and output-oriented nature of IITA's research required that the Program Leader forged and maintained strong team spirit among disparate nationalities and diverse disciplines both within IITA and with our international partners. It also required that the Leader become familiar with a range of disciplines from traditional agricultural sciences through molecular genetics and the social sciences. Additional responsibilities included identifying opportunities for additional support for research, development and extension projects, as well as monitoring their progress.

1993–2002: Principal scientist and Head, Soil microbiology unit

I led several important research initiatives since joining the soil microbiology unit at IITA in 1993. These included: (1) conceived, and currently led the development research on Biological Nitrogen Fixation (BNF), Soil Organic Matter (SOM) and Balanced Nutrient Management Systems (BNMS). This has been one of my important contributions to the IITA mandate. We started rather very small (a team of myself as a senior scientist and B. Vanlauwe, as an associate scientist preparing his PhD) working on very few component process research on BNF and SOM. With time and commitment, we gradually built a team that is working on integrating this component process research into relevant farming systems. This team had about 16 scientists from IITA, NARES from 4 countries in West Africa, Belgium, Australia and IARCs such as TSBF-CIAT. IITA's DG then, Lukas Brader, for the first time after 10 years of his tenure recognized this research as a major contribution to sustainable and profitable farming systems during the ICW 2000 in Washington. The promiscuous soybean work had received the King Baudoin award and the Belgian Government had approved the BNMS phase 2 then.

1999–2001: Project coordinator, Improvement of high intensity food and forage crop systems

1996–1999: Project coordinator, Short fallow systems to arrest land degradation due to land use intensification

These constituted two of the 14 research projects within IITA's Project x Division matrix, and I led research on production systems that provided over 60% of the West and Central Africa's cereal and root and tuber food. Objectives of both projects were to generate, disseminate, and facilitate the adoption of knowledge and technologies required for sustainable and equitable intensification of agricultural production and resource base enhancement in moist savanna and humid forest ecosystems. The short fallow project, IITA's largest, was budgeted at over $3 million, and had approximately 15 internationally recruited PhD staff and various postdoctoral and visiting scientists. My role as project coordinator was to help provide integration at a systems/resource management level between the different research disciplines of the Resource and Crop Management and its associated research units in the current structure of IITA. These were joint strategic, multidisciplinary, research and development ventures among relatively advanced national research institutions, NARES, and other IARCs. Preparing logframe and annual reports on the state of research and related activities in the project was entirely part of the responsibilities of the coordinator.

1989–1992: Deputy Coordinator of the Alley Farming Network for Tropical Africa (AFNETA) project

I had a major responsibility of managing a collaborative research project on alley farming, involving 33 NARS institutions in 20 countries in sub-Saharan Africa, three International Centers (IITA, ICRAF, ILRI) in sub-Saharan Africa, two Advanced Institutions in USA (Michigan and Oregon State Universities, and the donors (CIDA, IDRC, and IFAD). The objective of the network was to extend the alley farming concepts across the different agroecological zones in sub-Saharan Africa. My responsibilities were to ensure the development, implementation and monitoring of collaborative research projects with institutions. This involved establishing an effective communication link with NARS institutions to advise and assist in the implementation and evaluation of their research project.

1987–1989: Research officer at the International Atomic Energy Agency (IAEA), Joint FAO/IAEA Division, Soil Science Unit, Seibersdorf Laboratory, Vienna/Austria

Biological nitrogen fixation measurement and management has been a major preoccupation for which I have devoted a considerable amount of my research effort, particularly in the development and use of the most accepted method involving the application of ^{15}N isotopic techniques. I was one of the first investigators to critically compare ^{15}N-labeling methods of measuring nitrogen fixation (commonly used with grain and pasture legumes) with other methods for Nitrogen Fixing trees. In addition to the isotopes of nitrogen and phosphorus, I had developed interest in the use of ^{15}N and $^{13}C/^{12}C$ ratios at the natural abundance for nitrogen fixation and organic matter turnover studies.

1986–1987: Postdoc Research Fellow, Dept. of Biological Sciences, University of Zimbabwe, Harare/Zimbabwe

Worked under Prof. M.J. Swift on amelioration of soil by trees, a 1-year program sponsored by the Commonwealth Research Council. This coincided with the initiation of TSBF and as a Postdoc Research Fellow I was exposed to all TSBF research hypotheses developed during that period. This helped a great deal to shape the way I approached agricultural research in the future. While in Zimbabwe I was able to write a research proposal on soil fertility and trees and this was funded by IDRC for 4 years after I left Zimbabwe for a job with IAEA in Austria.

1981–1984: Research Fellow, IITA Resource and Crop Management

This was intensive post-graduate training at PhD levels at IITA, primarily on *Rhizobium* ecology. My PhD research program was based on the observations made on the poor establishment of *Leuceana leucocephala*, the most important agroforestry tree species during that period, in some parts of Nigeria. I studied rhizobia requirements, nitrogen fixation by *L. leucocephala*, and its effect on subsequent crop performance.

ADDITIONAL EXPERIENCE

- Board member of the Forum for Agricultural Research in Africa (FARA) to date
- Board member of the Scientific and Technical Advisory Panel, administered by UNEP; advises the Global Environment Facility
- As an expert (1989-1997) for the International Atomic Energy Agency (IAEA) Vienna, Austria, I worked closely over a period of several months with different agricultural research institutions in Southeast Asia (Malaysia, Sri Lanka) and sub-Saharan African (Sierra Leone, Cote d'Ivoire, Uganda, Morocco, Tunisia, Kenya) strengthening the human capacity, enhancement of laboratory equipment and research programs on the use of nuclear and related techniques for soil fertility studies. These programs were funded by the technical cooperation division of the IAEA. I continue serving as a research agreement holder and resource person in three of the coordinated research programs of IAEA across the world.

- From 2001 to 2002, I was part of a six-member team of the Rockefeller Foundation, reviewing and proposing recommendations on all aspects of institutional arrangements for research and delivery of Integrated Nutrient Management in Kenya, Uganda, Malawi, and Zimbabwe.
- Member of the editorial board of Applied Ecology Journal, Chairman of the IITA Publication Committee, Occasional editor for Soil Biology and Biochemistry, Biology and Fertility of Soil, Plant and Soil, Nutrient Cycling in Agroecosystems, Soil Science Society of American Journal., African Crop Science journal, Nigeria Journal of Soil Science.
- As a lecturer at the University of Congo for over 5 years (1977 to 1982) and a seminar lecturer for one year (1985-1986), I was responsible for teaching Soil Science, Soil Biology, Soil Fertility, and Plant Nutrition courses to graduate and undergraduate students of the Faculty of Agriculture.