

AGRICULTURAL R&D IN BENIN

An Assessment of the National Institute of Agricultural Research of Benin

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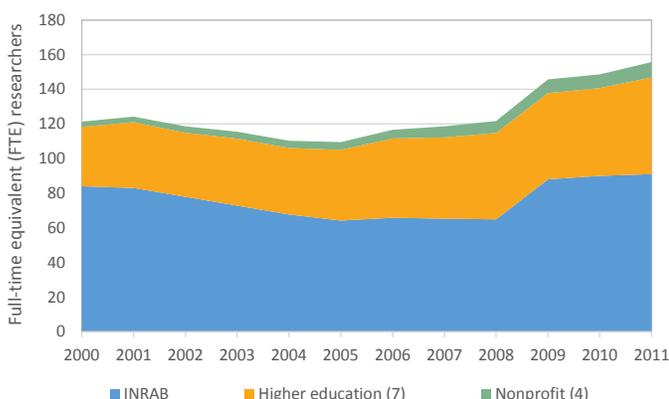
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OVERVIEW OF NATIONAL AGRICULTURAL R&D

Twelve public agencies conduct agricultural R&D in Benin. The National Institute of Agricultural Research of Benin (INRAB) is by far the largest, employing close to 60 percent of Benin’s full-time equivalent (FTE) agricultural researchers in 2011 (91 FTEs), as well as being the only government agricultural R&D agency.¹ INRAB falls under the Ministry of Agriculture, Livestock, and Fisheries (MAEP), is headquartered in Cotonou, and operates three regional centers (in the Center, North, and South) and two commodity-based centers (one focusing on cotton and other fibers, the other on perennial plants). INRAB’s scientists conduct research on crops, livestock, postharvest technologies, socioeconomics, forestry, agricultural engineering, and natural resources.

Benin’s higher education sector plays an important role in national agricultural R&D. Seven units under the University of Abomey-Calavi (UAC) are actively engaged in agricultural R&D, the largest of which is the Faculty of Agricultural Sciences (employing 22 FTEs in 2011). The Faculty of Agronomy of the University of Parakou (8 FTEs in 2011) is the only non-UAC higher education agency that conducts agricultural R&D. Four nongovernment organizations also conduct agricultural R&D in Benin and together employed 9 FTEs in 2011, largely focusing on research related to socioeconomics, but also concerning agricultural issues. Agricultural research conducted by the private for-profit sector in Benin is negligible.

Figure 1. Agricultural researchers by institutional category, 2000–2011



Source: Compiled by authors from ASTI–INRAB data.

Note: For full details of the agencies included in the dataset, see www.asti.cgiar.org/benin.

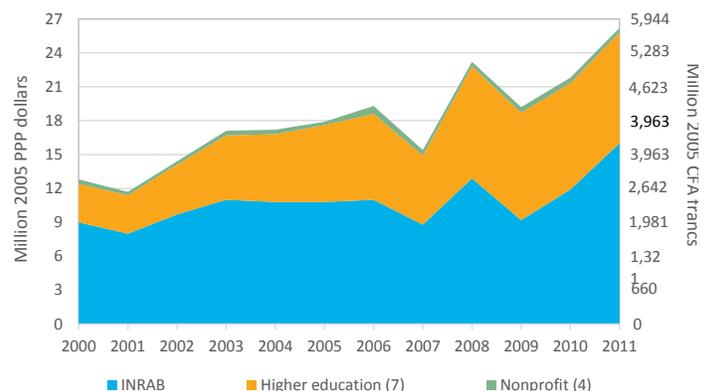
After a period of stagnation, the national number of agricultural researchers grew from 121 in 2000 to 156 in 2011 (Figure 1), representing overall growth of 28 percent. Agricultural R&D spending more than doubled from 2,827.2 million CFA Francs in 2000 to 5,756.3 CFA francs in 2011. This was largely driven by the combined effect of growth in internally generated revenues at INRAB, and greater involvement in agricultural R&D by UAC (Figure 2). Agricultural research spending as a share of agricultural GDP increased from 0.43 percent in 2000 to 0.62 percent in 2011; the number of FTE researchers per 100,000 farmers remained fairly stable over the same timeframe at around 8 to 9.

INRAB’S CURRENT STATUS

Institutional Issues

- Unlike their university-based counterparts, INRAB’s scientists are classified as public servants, not researchers. As a result, their salaries are significantly lower, creating a challenge for INRAB to attract and retain well-qualified researchers. In addition, university-based scientists are enrolled in the African and Malagasy Council for Higher Education (CAMES), which offers them greater international recognition and better career opportunities.
- Another aspect of INRAB’s current institutional status is the government’s ability to second highly qualified researchers to other departments at will, depleting INRAB of much-needed expertise each year.

Figure 2. Agricultural research spending by institutional category, 2000–2011



Source: Compiled by authors from ASTI–INRAB data.

Note: For full details of the agencies included in the dataset, see www.asti.cgiar.org/benin.

- The Government of Benin is currently considering modifying INRAB's status to give it greater autonomy and hence flexibility in its funding and recruitment practices, which will enable the institute to offer its researchers more competitive salaries and conditions. A final determination is expected in 2014.
- Government support for agricultural R&D has been low because policymakers lack appreciation of its importance to agricultural productivity and economic development. In addition, INRAB has not yet adequately demonstrated the impact of its research outcomes.
- Linkages between INRAB and the national provider of extension services the Regional Centers of Action for Rural Development (CARDER) are weak. CARDER no longer has sufficient staff to effectively collaborate or respond to farmers' needs.
- INRAB is lacking in efficient centralized administration systems and practices. Data management, for example, is weak, with each center managing its own financial and human resource databases. INRAB's headquarters is hence not always apprised of what is happening at centers in remote areas.

Human Resources

- Given large salary and benefit discrepancies between INRAB and the higher education sector and international organizations, large numbers of well-qualified researchers have left the institute in recent years. In addition, the benefits inherent with CAMES membership further attract researchers away from INRAB to the higher-education sector. Universities, however, have much weaker linkages with farmers given their academic focus on scientific research and publications compared with applied research of relevance to the needs of producers.
- Civil service recruitment restrictions were in effect from 1986 until very recently. During this time, INRAB could only appoint contract-based researchers, but lack of project funding made this problematic. Consequently, many research positions have been vacant over a long time span.
- As a side-effect of the recruitment restrictions, 70 percent of INRAB's PhD-qualified researchers are more than 50 years old, and given an official retirement age of 60 years, many researchers will retire in the next decade.
- Another consequence of the recruitment restrictions and salary discrepancies is that INRAB currently lacks a critical mass of scientists in a number of key disciplines. For example, the single researcher working on plant breeding has no assistant and will retire soon; the only researcher working in the area of soil science retired in 2013; and the only researcher focused on weed science is on secondment to the Food and Agriculture Organization of the United Nations.
- As of 2012, 37 percent of INRAB's researchers held PhD degrees, and 63 percent were qualified to the MSc level.

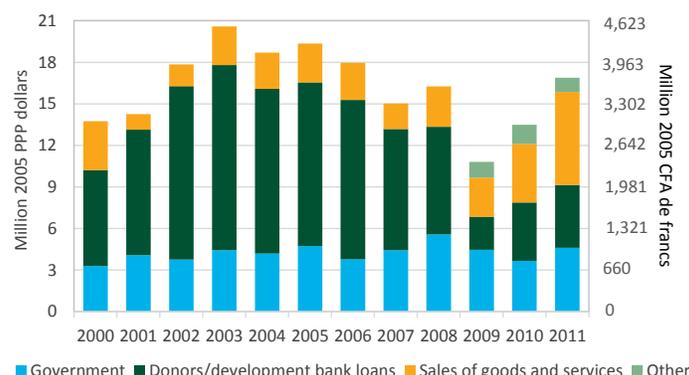
Further capacity building is needed focusing on developing career paths and recruiting young researchers.

- During 2008–2012, 34 researchers were undertaking MSc- or PhD-level training (or equivalent), mostly through self-funding, although funding from AfricaRice, CIRAD, and Danida has also provided training opportunities. A large number of INRAB's young researchers received PhD training at UAC (often funded by Danida), but upon graduation many of them chose a career at UAC instead of returning to INRAB.
- Unions have blocked merit-based promotion; currently, all promotions are based on seniority. Productive researchers who generate funding and whose work gets published advance no faster than scientists who do not. Obviously this is serious impediment to motivation and job satisfaction.

Financial Resources

- Government funding to INRAB is only sufficient to cover salaries and related expenses. The institute's ability to operate research programs and build and maintain infrastructure is extremely dependent on donors and the funding INRAB generates internally through the sale of goods and services (Figure 3).
- In 2009, INRAB's funding drastically declined due to the cessation of Danish funding and a significant reduction in the contribution from the national budget for agricultural research. INRAB is no longer able to conduct all of its activities, including those relating to the management cycle of agricultural research and competitive funds.
- With the decline of donor funding, INRAB has had to develop alternative funding sources. As of 2011, two-thirds of the institute's program costs were funded internally, predominantly through the sale of germinated palm oil seeds by the Perennials Center (CRA-PP) and the sale of rice, maize, and cowpea seed by the Research Center for the South (CRA-Sud).
- Funding to INRAB has increased since 2012, when the West Africa Agricultural Productivity Program (WAAPP) was

Figure 3. INRAB's funding sources, 2000–2011



Source: Compiled by authors from ASTI-INRAB data.

launched (with a budget of over 8 billion CFA francs for five years). Under WAAPP, Benin will be the home of a center of excellence in maize research, so associated funding will largely be allocated to the rehabilitation of maize-related research infrastructure and equipment, as well as those of the Soil, Water, and Environmental Science Laboratory (LSSEE). WAAPP includes a small competitive fund, which has financed 13 research projects since 2013. WAAPP also funded 26 PhD and 21 MSc courses during the 2013/14 academic year.

R&D Infrastructure

- All of INRAB's research facilities are old and run down. Most laboratory lack up-to-date research equipment, hardware, software, and servers, and the number and quality of vehicles are inadequate. With such low levels of capital investment, R&D infrastructure has deteriorated over time and this has had understandable impacts on quality of research and the resulting outputs.
- In 2012, the government funded the construction of new INRAB headquarters in Agonkanmey and a greenhouse at the plant physiology laboratory in Pobè. The new headquarters are scheduled to become operational in the near future. The Agonkanmey research center (CRA-A) will be rehabilitated under WAAPP, but no other centers will benefit from WAAPP funding.
- In 2011, the NERICA Rice Development Project (PDRN) funded the acquisition of eight small combine harvesters, five rice mills, weed control equipment, and six power generators.

Table 2. The condition of INRAB's research laboratories

Center	Laboratory	Condition
CRA-Sud Niaouli	Micro-organism/virology laboratory	Nonfunctional due to derelict equipment
CRA-Nord Ina	No laboratories	–
CRA-Centre Savè	No laboratories	–
CRA-CF Parakou	Cotton fiber analysis laboratory	Functional
CRA-CF Cana	Pathogenic and cotton entomology laboratory	Partially functional (equipment is derelict and serious electricity and water issues exist)
CRA-PP Pobè	Plant physiology laboratory	Functional
CRA-A Agonkanmey	Soil science laboratory	Functional, but equipment is derelict
	Food technology laboratory	Partially functional, but equipment is derelict
	Biometric analysis laboratory	Nonfunctional due to lack of biometricians
	Laboratoire de défense des cultures	Partially functional, but equipment is derelict

Source: Compiled by authors based on ASTI/IFPRI–CORAF/WECARD survey data.

- The Research Center for the North (CRA-Nord) does not have access to electricity, raising questions as to limitations on the research it conducts.

Research Outputs

- The number of improved varieties released by INRAB is limited. During 2008–2012, the institute's in-house research led to the development of just one new cotton and one new maize variety. INRAB released a number of other varieties developed by CGIAR centers and adapted to local conditions, including a number of maize varieties. Lack of access to improved seed, poor dissemination practices, and the low incomes of producers are generally seen as the major causes of low adoption.
- The number of scientific publications produced by INRAB is low as well. In 2011, INRAB scientists published just 42 articles in (national and international) journals, corresponding to a publication-per-researcher ratio of 0.4 per year.
- INRAB does play an important role, however, in producing "RTE sheets," the sale of which generates significant funding for INRAB. RTE sheets are booklets designed to present research results to farmers in a way that they can comprehend. Subjects include issues related to crops, forestry, and livestock.

CONCLUSION AND POLICY OPTIONS

- A training and recruitment plan needs to be implemented to allow INRAB to fill the large number of positions that will become vacant in the coming years. Moreover, policies need to be implemented to ensure that scientists return to INRAB upon completing their training;
- Discrepancies in the status, salaries, and retirement age of INRAB's researchers and their university-based colleagues need to be removed or overcome to improve the overall remuneration, working conditions, and incentives at INRAB so that the institute can attract, retain, and motivate well-qualified researchers.
- The institute needs to advocate for increased government funding and explore mechanisms to improve the coordination of donor funding to avoid duplication in some areas of research and underfunding in others.
- Databases and monitoring and evaluation systems need to be improved through coordination and harmonization; currently they are ad hoc and disjointed.
- It is important for the institute to be able to invest in the rehabilitation of its research centers (other than the ones that are currently being rehabilitated under WAAPP) to support the conduct of effective research, to retain and motivate researchers, and to facilitate the growth of effective research outputs that will have impact, all of which are currently hindered by inferior research facilities.

- Linkages between research and extension need to be enhanced. Until 2005, INRAB worked closely with the expert R&D (ASRD) service under CARDER, whose mission was to synergize research results and extension. With the closure of the ASRD service, relations between INRAB and CARDER have weakened.
- As previously noted, the Government of Benin is currently considering changing INRAB status of to give it greater autonomy and hence flexibility in its funding and recruitment practices. This new status will significantly assist INRAB in competing for well-qualified researchers, in securing their commitment over time, and in instituting appropriate incentives through a more attractive overall working environment. The process is currently quite advanced, and a final outcome is expected in 2014.

ABOUT THE ASSESSMENT

Given the importance of agriculture in West Africa, the Economic Community of West African States (ECOWAS) asked the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) to undertake an in-depth assessment of agricultural research capacity in the region focusing on key institutional, human resource, and financial resource issues. The assessment is a critical input into the development of national and regional agricultural policy recommendations, which will in turn feed into a regional agricultural research strategy for West Africa.

To accomplish the assessment, CORAF/WECARD requested the support of the Agricultural Science and Technology Indicators (ASTI) initiative of the International Food Policy Research Institute (IFPRI). ASTI facilitated the assessment in six countries—Benin, Burkina Faso, Ghana, Senegal, Sierra Leone, and Togo—which included a quantitative survey on human and financial resources, R&D infrastructure, and R&D outputs; a series of interviews with selected research and managerial staff; and a staff motivation survey distributed to a selected group of researchers and managerial staff.

FOR FURTHER READING

www.asti.cgiar.org/pdf/factsheets/benin-factsheet.pdf

NOTES

1. FTEs only take into account the time researchers actually spend on research, as opposed to other activities like teaching or unrelated administrative duties.



ABOUT THE AUTHORS

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ABOUT ASTI, IFPRI, AND CORAF/WECARD

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **Agricultural Science and Technology Indicators (ASTI)** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is led by the **International Food Policy Research Institute (IFPRI)**, which—as a CGIAR member—provides evidence-based policy solutions to sustainably end hunger and malnutrition and reduce poverty.

The **West and Central African Council for Agricultural Research and Development (CORAF/WECARD)** is a nonpolitical organization of the national agricultural research systems of 23 countries of West and Central Africa. It aims to increase the efficiency of agricultural research in the region in order to facilitate economic growth, food security, and export competitiveness through productive and sustainable agriculture.

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