

GABON

RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

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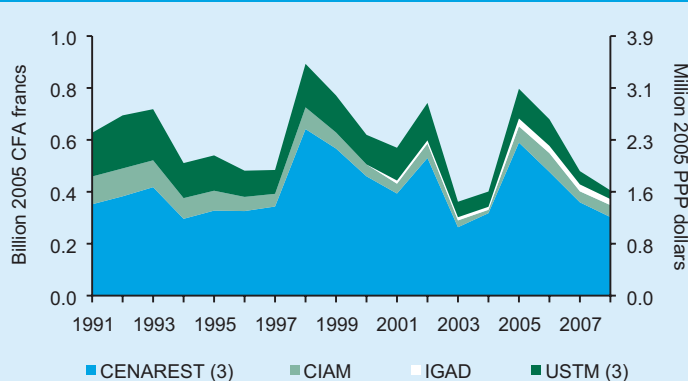
LONG-TERM INVESTMENT AND CAPACITY TRENDS IN AGRICULTURAL R&D

Agriculture in Gabon has traditionally been overshadowed by more attractive economic sectors such as forest exploitation, mining, and oil extraction. As a result, agricultural research and development (R&D) spending and capacity levels have remained low compared with other African countries. However, as a response to dwindling natural resource reserves in the mining and oil sectors, agriculture has recently gained prominence (Stads, Obiang Angwe, and Ngoye 2004). Agricultural researcher numbers have almost tripled since the early 1990s—from 23 full-time equivalent (FTE) researchers in 1991 to 61 in 2008 (Figure 1; Table 1). Nevertheless, for the same period, agricultural R&D spending levels show an exceedingly erratic trend, which largely reflects the annual variations in investment levels of the institutes under the authority of the National Scientific and Technological Research Center (CENAREST). In 2008, Gabon's investments totaled 405.5 million CFA francs, or 1.6 million PPP dollars, in 2005 prices—an extremely low level compared with most other African countries. Unless otherwise stated, all dollar values in this note are based on purchasing power parity (PPP) exchange rates.¹ PPPs reflect the purchasing power of currencies more effectively than do

Key Trends Since 2000

- Gabon's agricultural research and development (R&D) expenditure levels reveal an erratic trend, whereas capacity levels increased steadily.
- In 2008, the three agricultural research institutes under the National Scientific and Technological Research Center (CENAREST) jointly employed 83 percent of the country's agricultural researchers and accounted for three-quarters of R&D spending.
- In the same year, Gabon spent \$0.20 for every \$100 of agricultural output, which is one of the lowest-intensity ratios in Sub-Saharan Africa.
- The country's agricultural research is largely financed by the national government. Yearly allocations are frequently adjusted downwards during the budgetary year.

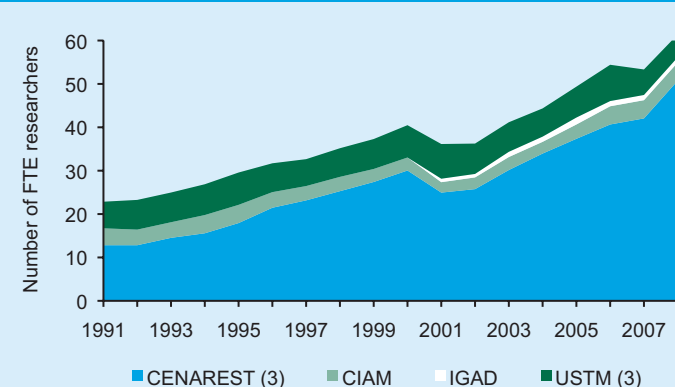
Figure 1—Agricultural R&D spending adjusted for inflation, 1991–2008



Sources: Calculated by authors from ASTI–IRAF 2009–10 and Stads, Obiang Angwe, and Ngoye (2004).

Notes: Figures in parentheses indicate the number agencies in each category. For more information on coverage and estimation procedures, see the Gabon country page on ASTI's website at asti.cgiar.org/gabon.

Figure 2—Agricultural research staff in full-time equivalents, 1991–2008



Sources: Calculated by authors from ASTI–IRAF 2009–10 and Stads, Obiang Angwe, and Ngoye (2004).

Note: Figures in parentheses indicate the number of agencies in each category.

Table 1—Overview of agricultural R&D spending and research staff levels, 2008

Type of agency	Total spending			Total staffing	
	CFA francs (million 2005 prices)	PPP dollars	Shares (%)	Number (FTEs)	Shares (%)
CENAREST (3)	302.7	1.2	75	50.8	83
CIAM	46.1	0.2	11	4.2	7
IGAD	23.3	0.1	6	1.2	2
USTM (3)	33.4	0.1	8	5.3	9
Total (8)	405.5	1.6	100	61.4	100

Source: ASTI–IRAF 2009–10.

Note: Figures in parentheses indicate the number of agencies in each category.


standard exchange rates because they compare the prices of a broader range of local—as opposed to internationally traded—goods and services.

CENAREST is Gabon’s principal research agency. It comprises five institutes, three of which are involved in agricultural R&D: the Agricultural and Forestry Research Institute (IRAF), the Technological Research Institute (IRT), and the Tropical Ecology Research Institute (IRET).² In 2008, these three institutes jointly accounted for 83 percent of Gabon’s total agricultural research capacity and three-quarters of its total agricultural research expenditures. CENAREST was created in 1976 under the authority of the Ministry of Higher Education, Scientific Research, and Technological Development. The center’s mandate is to design and carry out research programs, to ensure that all research activities are well coordinated, and to establish a scientific and technical information network. CENAREST institutes are semi-autonomous and manage their own budgets (Nzang Oyono 2003).


With 34 FTE researchers in 2008, IRAF is the country’s most important agricultural R&D agency. Its mandate comprises crops, livestock, forestry, fisheries, as well as economic and social development studies. IRAF consists of four departments (General Agriculture, Animal Production Science, Plant Technology, and Rural Economy), each of which run several research units and laboratories. Besides its headquarters in Libreville, IRAF operates a research station in Ndouaniang. It shares its Libreville administrative facilities with IRT. In 2008, IRT employed 5 FTE agricultural researchers whose work focused on post-harvest activities such as conservation and crop processing technologies. IRT is severely constrained by weak infrastructure; the lack of laboratories prevents it from fulfilling its mandate. IRET conducts research on forest soils, fauna, and flora. In 2008, its agricultural research capacity totaled 12 FTEs. Most of its research takes place at its experimental station in Ipassa-Mokokou.

The Crop Material Introduction, Adaptation, and Multiplication Center (CIAM) is the only government-run agricultural research agency that is not linked to CENAREST. CIAM was created by the Ministry of Agriculture, Livestock, Fisheries, and Rural Development. Its 4 FTE researchers are involved in limited crop research. The Gabonese Institute for Agricultural Development (IGAD) is the only not-for-profit agency

ASTI Website Interaction

 More details on institutional developments in agricultural research in Gabon are available in the 2004 country brief at asti.cgiar.org/pdf/GABON_CB23.pdf.

 Underlying datasets can be downloaded using ASTI’s data tool at www.asti.cgiar.org/data.

 A list of the 4 government, 1 nonprofit, and 3 higher education agencies included in this brief is available at asti.cgiar.org/gabon/agencies.

www.asti.cgiar.org/gabon

institute involved in agricultural R&D in Gabon. In 2008 it employed just 1 FTE researcher.

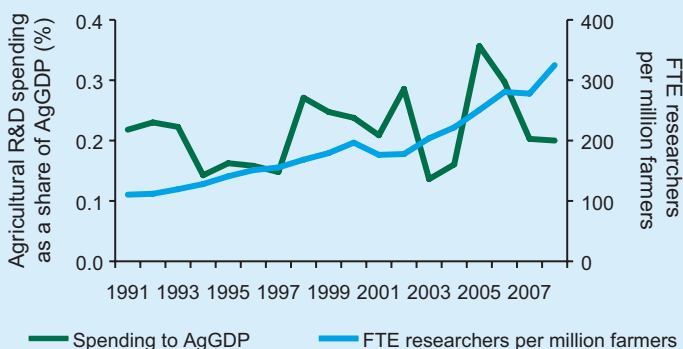
Higher education agencies play a modest role in Gabon; in 2008, they accounted for 9 percent of the country’s total FTE agricultural research capacity. The higher-education sector consists of the Higher National Agronomy and Biotechnology Institute (INSAB), the National Water and Forestry School (ENEF), and the Earth Sciences and Environment Research Unit (URESTE). All three agencies fall under the University of Science and Technology of Masuku (USTM). In 2008, research carried out by USTM’s 5 FTE agricultural scientists focused on *safou* (African pear), soils, forestry, and post-harvest activities.

No private-sector agency was found to be conducting agricultural research. The African Sugar Company–Gabon (SUCAF) and the Gabon Agricultural Development Company (AGROGABON) outsource their research—respectively on sugar and oil palm—to relevant CENAREST institutes.

In 2008, 24 percent of Gabon’s agricultural researchers were female. This represents an increase of the 17 percent share recorded in 2001 (Stads, Obiang Angwe, and Ngoye 2004; ASTI–IRAF 2009–10). The 2008 average support-staff-per-researcher ratio was 1.4, comprising 0.8 technician, 0.2 administrative support, and 0.4 categorized as “other” (laborers, guards, drivers, etc.) (ASTI–IRAF 2009–10).

In 2008, Gabon’s total public spending as a percentage of agricultural output (AgGDP)—a comparative indicator of agricultural R&D spending across countries—was \$0.20 for every \$100 of AgGDP (Figure 3). This agricultural research intensity ratio is one of the lowest in Sub-Saharan Africa and far below the 0.61 regional average (Beintema and Stads 2011). Since the 1990s, the number of FTE researchers per farmer has increased. In 2008, Gabon employed 325 agricultural researchers for every million farmers, which represents one of the highest ratios on the African continent. These two ratios reveal a true paradox: on the one hand, Gabon’s research capacity is rather high compared to the size of the country’s agricultural sector; on the other hand, the level of resources available to these researchers is extremely low

Figure 3—Intensity of agricultural research spending and capacity, 1991–2008



Sources: Calculated by authors from Stads, Obiang Angwe, and Ngoye 2004; ASTI–IRAF 2009–10; FAO 2009; and World Bank 2010.

compared with the level of resources allocated to agricultural R&D in most other African countries.

INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT

The structure of Gabon’s agricultural research has undergone few changes since the turn of the millennium. The CENAREST institutes continue to dominate the country’s agricultural R&D; the higher-education sector occupies only a modest share. Agriculture never played a prominent role in Gabon’s economy: Agricultural activity is limited to subsistence farming and the country imports 60 percent of its food. In 2009, the Minister of Agriculture declared that agriculture would become a national priority as a means to diversify the economy and reduce dependence on oil revenues. Unfortunately, there was no substantial follow-up and the declaration did not translate into action. Indeed quite the opposite: though the yearly budgets of most of Gabon’s ministries increased in 2010, the funds allocated to the Ministry of Higher Education, Scientific Research, and Technological Development on behalf of CENAREST decreased. Overall, Gabon’s agricultural research appears to be more administrative than technical, a logical consequence of the fact that the country’s technical facilities (laboratories and research stations) lack the necessary equipment necessary to function properly. For example, the funds allocated to the experimental station at Ndouaniang do not cover the cost of crop research experiments.

While Gabon has successfully established a number of agricultural research facilities, the accompanying levels of capacity and funds are insufficient to enable them to achieve their mandates and ease the country’s dependence on imported food. In fact, the country’s agricultural policy does not include details about the programs needed to achieve the objectives outlined in the national agricultural development plan. It also overlooks the necessary financial and human resources. Though several major rice, banana, cassava, and nonligneous forest studies do exist, their management is dispersed between the research agency concerned and the Ministry of Agriculture without proper coordination or a mechanism to ensure that the research carried out will meet the country’s objectives. Furthermore, with few or

ASTI Website Interaction

- Detailed definitions of PPPs, FTEs, and other methodologies employed by ASTI are available at asti.cgiar.org/methodology.
- The data in this brief are predominantly derived from surveys. Some data are from secondary sources or were estimated. More information on data coverage is available at asti.cgiar.org/gabon/datacoverage.
- More relevant resources on agricultural R&D in Gabon are available at asti.cgiar.org/gabon.

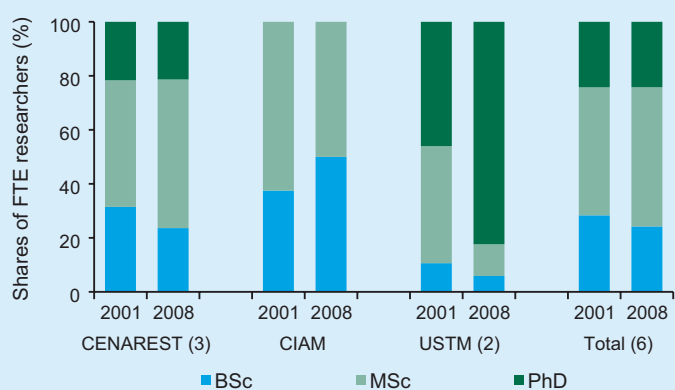
www.asti.cgiar.org/gabon

weakly organized farmer organizations, Gabon’s farmers have negligible influence on the country’s agricultural research agenda.

RESEARCH STAFF QUALIFICATIONS AND TRAINING

In 2008, more than three-quarters of agricultural researchers (in FTEs) were trained to the postgraduate level and 24 percent held PhD degrees (Figure 4). The share of researchers holding PhD degrees is larger in the higher-education agencies (82 percent) than in CENAREST institutes (21 percent). This trend is consistent with findings in many other African countries. While the relative

Figure 4—Degree level of researchers by institutional category, 2001 and 2008



Source: ASTI–IRAF 2009–10.

Notes: Figures in parentheses indicate the number of agencies included in each category. Two smaller higher education agencies were excluded due to data unavailability.

share of PhD-qualified researchers employed by CENAREST institutes remained practically unchanged during 2001–08, absolute numbers doubled, increasing from 5 FTEs in 2001 to 11 in 2008. Researchers with MSc-level and BSc-level qualifications exhibit the same upward trend during the same period: MSc-qualified researchers increased from 12 to 28 FTEs, and the number of BSc-qualified researchers from 8 to 12 FTEs.

Universities in Gabon do not offer PhD-level programs (other than in the field of medicine). Agricultural researchers who wish to pursue their PhD studies abroad must obtain official permission from the civil service before applying for a scholarship either from the government or a donor. In recent years, several CENAREST researchers have been able to complete MSc or PhD studies abroad, mainly in France and Belgium. For example, some ten IRET-employed researchers completed postgraduate training through the European Union-funded and CIFOR-executed *Programme Sectoriel de Valorisation des Aires Protégées* (PSVAP).³ Many researchers, however, leave CENAREST after having been trained abroad (to seek employment in the private sector or with a subregional organization). This lack of resources creates an environment lacking incentives, which leads to discouragement among the researchers. Many CENAREST researchers decide to leave their institute due to boredom or the absence of career advancement opportunities. Unlike many other countries in the subregion, Gabon is not faced with the problem of an aging pool of agricultural researchers. On the contrary, with an average age of about 30 years, Gabon's researchers are among the youngest in Africa.

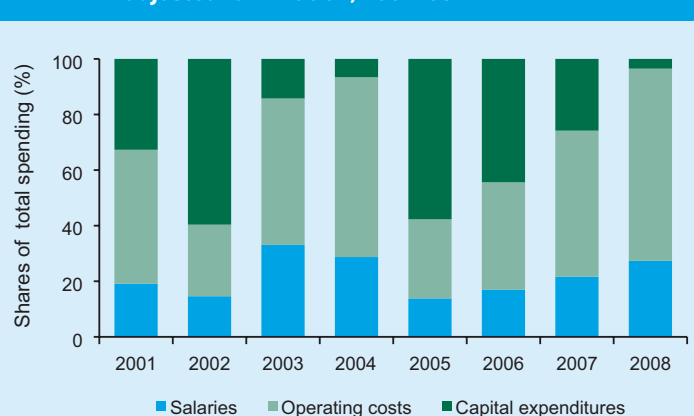
Once recruited by the civil service, researchers retain “researcher-lecturer” (*enseignants-chercheurs*) status for the duration of their professional lives—whether they are employed by CENAREST or a higher education agency. The civil service terms and conditions require that each newly recruited lecturer or researcher-lecturer must perform his or her duties for at least a five-year period. They also stipulate that to be eligible for longer-term degree training, a person must be in possession of a certificate of admittance to the civil service and a certificate of tenure. The latter requirement is frequently disregarded due to ten-year or more waiting periods. This leads to a situation resembling “detention”: researchers cannot further their professional development. IRAF sometimes works around this bureaucratic bottleneck by authorizing researchers who have received scholarships from donors to travel abroad. This, however, is risky as the civil service will not recognize a degree obtained without formal government approval.

INVESTMENT TRENDS

Expenditures

The allocation of research budgets across salaries, operating costs, and capital investments affects the efficiency of agricultural R&D so, as part of this study, detailed data on each of the cost categories were collected from the three CENAREST centers. During 2001–08, combined total salaries of these three centers accounted for 20 percent of their combined total expenses; operating and program costs represented 44 percent and capital investments represented 36 percent (Figure 5). These averages mask important yearly fluctuations. Particularly high capital investments were recorded in 2002 and 2006–07, mainly because of the construction of IRET's new research station in Makokou. As mentioned previously, the government disburses salaries and

Figure 5— Cost category shares for CENAREST institutes, adjusted for inflation, 2001–08



Source: ASTI-IRAF 2009–10.

funds towards operating costs directly. However, disbursements to support research programs are highly erratic, and are frequently much lower than planned. This makes it difficult for the institute to carry out its research, let alone make long-term plans. For example, in 2009, IRAF anticipated 100 million CFA francs (current prices) to cover its program costs but at the end of the budgetary year, it had not received any funds. Its principal research station in Ndouaniang, which is about 80 kilometers from Libreville, is difficult to reach due to poor road conditions and does not have running water, electricity, internet access, or sufficient research facilities. IRAF's sole four-wheel drive vehicle is insufficient for carrying out laboratory or field work. As a result, many researchers find themselves in a state of underemployment. At IRT, conditions are practically identical; IRET's situation is slightly better.

Funding Sources

Government grants and donor contributions provide the bulk of the funding that the CENAREST institutes receive. CIAM is supported not only by the government, but also by the Food and Agriculture Organization of the United Nations (FAO). As for USTM, the national government funds most of its agricultural R&D activities, with France taking on a smaller proportion, channeling funds through its Research for Development Institute (IRD) and the Ministry of Foreign Affairs' budget line devoted to development co-operation (FAC).

Each year, CENAREST's Chief Administrator requires all institute directors to draw up a research budget proposal. First submitted to the Ministry, the final budget proposal is voted on by the National Assembly in December. At the beginning of the next year, budget estimates are made based on the anticipated oil revenues. Because the income derived from oil has been low in recent years, the budgets assigned to the research institutes have frequently been adjusted downwards during the budgetary year, causing the institutes serious budgetary problems. As mentioned above, in 2009, the government provided no support to IRAF's research programs; the institute had to make do with the limited contributions from donors and regional networks. However, over the past few years, the regional networks and IRAF have been less successful in collaborating with one another and, as a consequence, IRAF missed out on funding opportunities.

Gabon is a middle-income country and, therefore, has never been a high priority on foreign donors' agendas. Since the turn of the century, IRAF has only benefited from a few small-scale projects that are funded by FAO, the French government, and the World Agroforestry Centre (ICRAF), which supports the country's research on nonligneous forest products. Gabon has also received funding for its rice research from the West and Central Africa Rice Research and Development Network (ROCARIZ) and for its banana and plantain-related R&D activities from the African Center for Research on Banana and Plantain (CARBAP). The European Union and the Central African Economic and Monetary Community will fund a cassava research project that is to be launched in 2011.

Until 2005, IRT counted on structural government funding; in recent years, however, this funding has been irregular and insufficient. Furthermore, IRT has not been successful in attracting donor funds. As a result, the planned construction of a new building for the institute is still on hold.

IRET has had more success in attracting donor funds because climate change is a high priority for many donors. It is estimated that 70 percent of the institute's field activities are funded by foreign donors; the national government contributes the rest. The primary foreign donors include the European Union (through CIFOR) and the Japan International Cooperation Agency (JICA, through the University of Kyoto). Between 2004 and 2010, IRET was granted 3 billion CFA francs (current prices) by the European Union/CIFOR. The first few years of the project enabled IRET to rehabilitate the Ipassa-Makokou research station and its equipment. Funded by the Japanese government, the rehabilitation of the microbiology laboratory is soon to be completed. An increasing number of scientists from a variety of countries spend sabbaticals at the Makokou station to carry out scientific research on ecosystems and on biodiversity and climate change topics.

Future funding to CENAREST institutes remains uncertain. CENAREST is increasingly turning towards (sub)regional and international agencies to request funding for its research. Many of the experimental stations need major renovation. Once the stations' infrastructure is restored and they are up and running again, it will be easier for them to generate their own resources. The CENAREST institutes have also begun involving farmer organizations in financing research projects.

RESEARCH ALLOCATION

Given that the allocation of resources across various lines of research is a significant policy decision, detailed information was collected on the number of researchers (in FTEs) working in specific commodity and thematic areas. In 2008, 41 percent of the Gabonese agricultural researchers were involved in crop research. Forestry research occupied 24 percent of the scientists, while natural resources accounted for 11 percent, fisheries for 6 percent, and livestock for 3 percent (Figure 6).

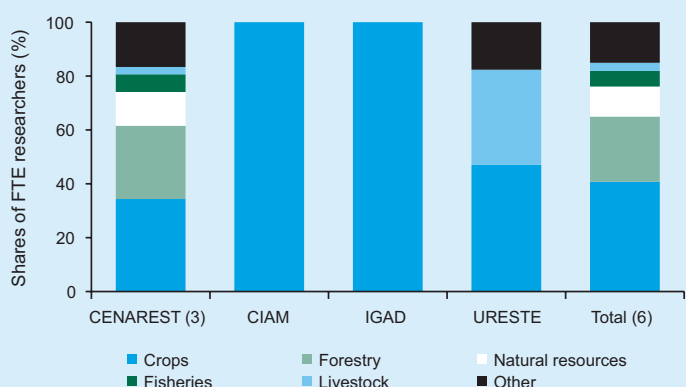
The most intensively researched crops are banana and plantain. In 2008, research on these crops accounted for 29 percent of all resources allocated to crop and livestock research. Other important crops were cassava (21 percent), coffee (9 percent), cocoa (7 percent), and sugarcane (5 percent) (Table 2). Research on livestock commodities plays a minimal role in Gabon. Fish and fishery research has gradually been expanding, mainly in the provinces of the Ogooué-Ivindo and of Moyen-Ogooué, in collaboration with JICA.

CONCLUSION

Over the past few decades, Gabon's agricultural research spending levels have exhibited a highly volatile trend. In 2008, the country invested 406 million CFA francs, or 1.6 million dollars (in PPP 2005 prices), which represents an extremely low level compared with most other African countries. Spending just 0.2 percent of its AgGDP on agricultural R&D, Gabon's intensity ratio is one of Africa's lowest. In contrast, the total number of agricultural researchers has been steadily increasing over the past few decades. In 2008, the country's research capacity totaled 61 FTEs. These indicators bring to light a true paradox: on the one hand, Gabon employs an increasing number of agricultural researchers; on the other hand, the resources needed to carry out the research responsibilities are extremely low and erratic.

Another paradox appears when one considers that—despite its status as one of Africa's most developed countries—Gabon is of the world's least developed countries in terms of its agricultural R&D facilities. The agricultural research agencies lack staffing, equipment, programs, and funding. Government grants allocated to the CENAREST institutes are irregular and frequently adjusted

Figure 6—Research focus by major commodity area, 2008



Source: ASTI-IRAF 2009–10.

Note: Two smaller higher education agencies were excluded due to data unavailability.

Table 2—Crop research focus by major item, 2008

Crop items	CENAREST (3)	CIAM	IGAD	URESTE	Total (6)
Shares of FTE researchers (%)					
Banana and plantain	36.9	—	75.0	—	31.5
Cassava	29.6	—	5.0	—	22.4
Cocoa	9.9	—	—	—	7.4
Coffee	9.9	13.7	—	—	9.9
Sugarcane	6.9	—	—	—	5.2
Other crops	6.9	86.3	20.0	100	23.6
Total	100	100	100	100	100

Source: ASTI-IRAF 2009–10.

Note: Two smaller higher education agencies were excluded due to data unavailability.

downwards as the budgetary year progresses, which leaves the institutes in dire financial straits. This has led to situations where CENAREST researchers find themselves underemployed, which negatively impacts their motivation. In addition, Gabonese researchers feel discouraged or disinterested in the face of the rigidity marking the civil service and the obstacles standing in the way of obtaining tenure or permission to travel or study abroad.

Since Gabon is a middle-income country, it is not attributed a high level of priority by foreign donors, whose attention is captured instead by many of its neighbors. The responsibility to endow the country's research agencies with the tools and funds they need to be fully operational is in the national government's hands. In order for Gabon's agriculture to become a prominent sector that will help lead the country towards food sovereignty, the national government will have to increase its level of funding to support agricultural R&D – considerably so, and without further delay.

NOTES

- ¹ Financial data are also available in current local currencies or constant 2005 U.S. dollars via ASTI's Data Tool, available at www.asti.cgiar.org/data.
- ² The other two CENAREST institutes are the Institute of Pharmacopoeia and Traditional Medicine (IPHAMETRA) and the Institute of Human Science Research (IRSH).
- ³ PSVAP is an EU-funded program designed to help develop protected areas through institutional development, scientific research, and sustainable tourism.

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IFPRI is one of 15 agricultural research centers that receive their principal funding from governments, private foundations, and international and regional organizations, most of which are members of the Consultative Group on International Agricultural Research (www.cgiar.org).

IRAF is Gabon's principal agricultural research agency. Its mandate comprises crops, livestock, forestry, fisheries, as well as economic and social development studies. The institute was established in 1976 and is placed under the Ministry of Higher Education, Scientific Research, and Technological Development.

The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on institutional developments, investments, and human resources in agricultural R&D in low- and middle-income countries. The ASTI initiative is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies, as well as international institutions. The initiative, which is funded by the Bill & Melinda Gates Foundation with additional support from IFPRI, is widely recognized as the most authoritative source of information on the support for and structure of agricultural R&D worldwide. To learn more about the ASTI initiative visit www.asti.cgiar.org.

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