ASTI Agricultural Science & Technology Indicators
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DGRST
General Delegation of Scientific and Technical Research

REPUBLIC OF CONGO

RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

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Country Note • December 2010

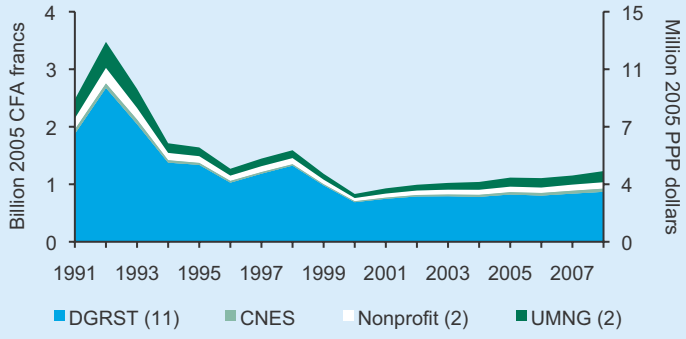
LONG-TERM INVESTMENT AND CAPACITY TRENDS IN AGRICULTURAL R&D

As the economy of the Republic of Congo (hereafter Congo) is heavily dependent on oil revenues, agriculture never ranked very highly in the national government's economic priority setting. Congo has been using no more than 2 percent of its arable land while its annual food imports totaled more than 100 billion CFA francs in recent years (FAO 2008). However, with food prices on the rise and with the prospect of declining oil revenues, the Congolese authorities have signaled an understanding that they must make agriculture a top priority and that increased investments in agricultural research and development (R&D) are likely to have a positive impact on the agricultural sector's future productivity. As a consequence of the civil wars that shook the country in the 1990s, Congo's agricultural research expenditures decreased significantly. The level of donor funding dropped rapidly, many research laboratories were severely damaged, and the country became increasingly isolated from the international scientific community (Stads, Bani, and Itoua-Ngaporo 2004). After 1999, when the sociopolitical tensions subsided, agricultural R&D spending picked up marginally, but current levels remain far beneath those recorded before the wars. In 2008, Congo invested 1.2 billion CFA francs, or 4.6 million PPP dollars (both in 2005 prices), which represents an increase when compared to the spending levels in previous years (Figure 1; Table 1). Unless

Key Trends Since 2000

- In the Republic of Congo—notwithstanding the slight improvement recorded in recent years—overall agricultural research and development (R&D) spending levels remain far below the levels recorded before the civil wars of the 1990s.
- Total agricultural research capacity has gradually decreased as a result of the retirement of a large number of researchers in the centers under the General Delegation of Scientific and Technical Research (DGRST), combined with a public-sector hiring freeze.
- The country's agricultural research is primarily funded by the national government. Donors play only a very modest role compared with the level of external funding many other African countries receive.
- Sixty percent of the DGRST centers' staff are expected to retire between now and 2016. In order to maintain its level of agricultural R&D capacity, the DGRST centers must not delay the recruitment and training of young researchers.

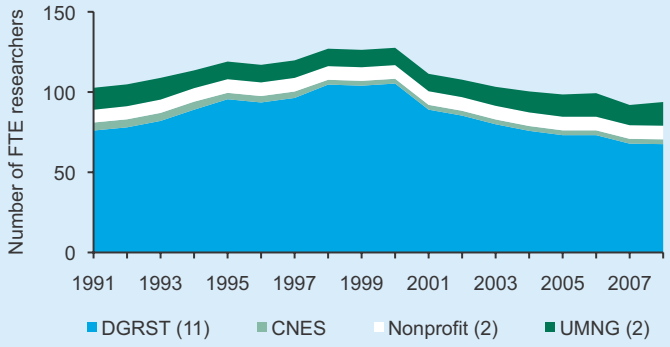
Figure 1—Public agricultural R&D spending adjusted for inflation, 1991–2008



Sources: Calculated by authors from ASTI–DGRST 2009–10 and Stads, Bani, and Itoua-Ngaporo 2004.

Notes: Figures in parentheses indicate the number agencies in each category. For more information on coverage and estimation procedures, see the "Republic of Congo" country page on ASTI's website at asti.cgiar.org/republic-of-congo.

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



Sources: Calculated by authors from ASTI–DGRST 2009–10 and Stads, Bani, and Itoua-Ngaporo 2004.

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

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

Type of agency	Total spending			Total staffing	
	CFA francs	PPP dollars	Shares	Number	Shares
	(million 2005 prices)		(%)	(FTEs)	(%)
DGRST (11)	868.9	3.2	70.7	67.5	72.0
CNES	55.3	0.2	4.5	3.0	3.2
Nonprofit (2)	111.4	0.4	9.1	8.5	9.1
UMNG (2)	193.4	0.7	15.7	14.8	15.7
Total (16)	**1,229.0**	**4.6**	**100**	**93.8**	**100**

Source: ASTI–DGRST 2009–10.

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

ASTI Website Interaction

- More details on the institutional developments in agricultural research in Congo are available in the 2004 country brief at http://www.asti.cgiar.org/pdf/CONGO_CB20.pdf.
- Underlying datasets can be downloaded using ASTI's data tool at asti.cgiar.org/data.
- A list of the 12 government, 2 nonprofit, and 2 higher education agencies included in this brief is available at asti.cgiar.org/republic-of-congo/agencies.

www.asti.cgiar.org/republic-of-congo

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 standard exchange rates because they compare the prices of a broader range of local—as opposed to internationally traded—goods and services. Agricultural research capacity levels in Congo reveal a negative trend: in 2008, the country employed 94 full-time equivalent (FTE) researchers, compared with 128 in 2000 (Figure 2). The decline in FTE numbers is largely due to the retirement of a large number of researchers employed by the centers placed under the General Delegation of Scientific and Technical Research (DGRST), compounded by a public-sector hiring freeze.

Placed under the authority of the Ministry of Scientific Research (MRS), DGRST supervises most of the R&D activities carried out by Congo's government agencies. DGRST is an executive body which, through its two component departments (the Department for the Management of Scientific and Technological Activities and the Department for Administration and Finances) is responsible for the implementation and management of Congo's science policy. In addition, DGRST coordinates and oversees the research activities of 14 research agencies, of which the following 11 centers are dedicated to agriculture: the Veterinary and Zootechnical Research Center (CRVZ), the Agricultural Research Center of Loudima (CRAL), the Plant Genetic Improvement Research Center (CERAG), the Soil Conservation and Restoration Research Center (CRCRT), the Coastal Forestry Research Center (CRFL), the Ouesso Forestry Research Center (CRFO), the Mossaka Hydrobiological Research Center (CRHM), the Research and Technology Project Initiation Center (CRIPT), the Center for Studies on Vegetable Resources (CERVE), the Center for Research and Studies on Social and Human Sciences (CRESSH), and the Biodiversity Research and Study Group (GERDIB). In 2008, these 11 agencies accounted for 70 percent of Congo's agricultural R&D capacity and spending. Agricultural FTE research staff totals for 2008 reveal that DGRST's largest centers are CVRZ (18 FTEs), CRAL (14 FTEs), CERVE (10 FTEs), and CERAG (8 FTEs). The remaining centers are much smaller, employing fewer than 5 FTEs each in 2008.

CRVZ was established in 1970 with support from the former Soviet Union. This center, which is DGRST's only livestock research agency, accounted for almost one-fifth of Congo's agricultural researchers in 2008. Established in 1986, CRAL is the principal crop research center. It operates five research stations located in the country's various agroclimatic zones; its primary focus is on plant breeding to improve food and fruit crops. CERVE was founded in 1985. Its mandate includes drawing up Congo's floristic inventory to identify the country's plant species; preserving specimens as reference materials for use in systematic reviews; and conducting research on the medicinal properties of plants in order to further develop the country's traditional herbal medicine. CERAG's focus is on plant breeding and genetics, primarily by applying biotechnology; most of its research is on cassava and yams.

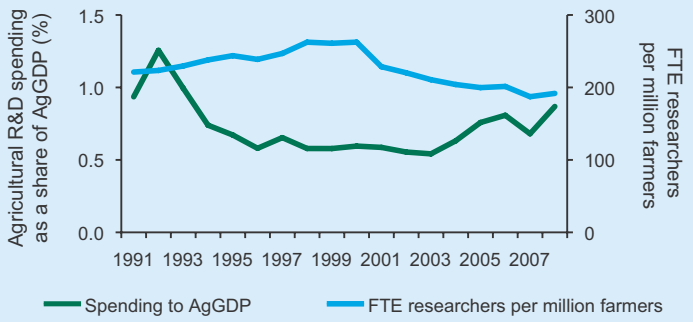
The National Soil Study Center (CNES) is not a DGRST center; it falls under the Ministry of Agriculture and Livestock (MAE). CNES' 3 FTE researchers conduct limited research on soils. Other centers placed under MAE are the National Center for Seed Improvement (CNSA) and the Center for Agricultural Extension (CVTA). Since the research work carried out by these two centers is marginal, they have been excluded from the analysis presented in this country note.

Two nongovernmental not-for-profit agencies are involved in agricultural R&D. Together they accounted for 9 percent of Congo's agricultural R&D capacity (in FTEs) and spending in 2008. The Agricultural Development Support Research Institute (Agricongo) carries out adaptive research on market gardens, food and fruit crops, as well as on fodder plants. It also takes part in training and extension activities. In 2008, Agricongo employed six FTE researchers. The Research Unit on the Productivity of Industrial Plants (UR2PI) conducts research on the forest essences of fast-growing tree species (eucalyptus, tropical pine trees, and acacias) and it manages plantations totaling over 1,000 hectares in the area surrounding Pointe-Noire. One private (for-profit) company—the Agricultural and Industrial Sugar Refinery Company (SARIS)—carries out some research on sugarcane and maize. Data for SARIS were unavailable. Analyses in this country note therefore exclude the private sector.

In 2008, the higher education sector accounted for 16 percent of Congo's overall total research capacity. This sector consists of two agencies that fall under the Marien Ngouabi University (UMNG) located in Brazzaville, i.e. the Rural Development Institute (IDR) and the Faculty of Science's Department of Plant Biology and Physiology.

In 2008, 17 percent of the total number of DGRST's agricultural researchers was female (ASTI-DGRST 2009–10). While very low, this percentage nevertheless marks an increase compared with the

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



Sources: Calculated by authors from ASTI–DGRST 2009–10; Stads, Bani, and Itoua-Ngaporo 2004; FAO 2009; and World Bank 2010.

corresponding share of 11 percent in 2001 (Stads, Bani, and Itoua-Ngaporo 2004). The support staff-to-researcher ratio averaged 1.4, consisting of 0.7 technical support, 0.3 administrative support, and 0.4 in the category "other" (comprising laborers, guards, drivers, etc.) (ASTI–DGRST 2009–10).

In 2008, Congo's total public spending as a percentage of agricultural output (AgGDP)—a comparative indicator of agricultural R&D spending across countries—was $0.88 for every $100 of AgGDP (Figure 3), a much higher ratio than those recorded in previous years. This was due not only to an increase in agricultural R&D spending but also to a 17-percent drop in AgGDP between 2007 and 2008. On the other hand, the ratio of FTE researchers to farmers has steadily declined since the turn of the millennium. In 2008, Congo had 194 agricultural researchers for every million farmers, a ratio that is much higher than those recorded in other countries in the subregion.

INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT

Congo's agricultural potential is considerable. In addition to a varied climate and abundant rainfall, the country has ten million hectares of exploitable agricultural land and an important hydrographic network. Despite this potential, the Congolese rural sector is in decline and food insecurity affects more than half of country's population. The Congolese government is aware of these problems and now ascribes a dominant role to the rural sector in its poverty reduction strategy. It acknowledges that sustained, sustainable growth of the agricultural sector is the most effective means to diversify the country's economy, create employment opportunities, combat rural poverty, and improve living conditions in the urban areas by exerting control over food prices. Therefore, in 2003, it adopted an agricultural development strategy for the decade spanning 2004–13, with the ultimate goal of reducing poverty.

Notwithstanding this agricultural development strategy, the structure of Congo's agricultural research system has barely changed since the turn of the millennium. The government of Congo has frequently been criticized for lacking vision on agricultural research: it has failed to set out a clear national agricultural research policy that is supported by strategic planning and long-term programs. Congo's research centers are characterized by a lack of coordination, which is linked to the absence of national guidelines as well as to the limited power of DGRST's leadership and management, even

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 note 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/republic-of-congo/datacoverage.
- More relevant resources on agricultural R&D in Congo are available at asti.cgiar.org/republic-of-congo.

www.asti.cgiar.org/republic-of-congo

though DGRST is officially listed as the center of decision making and guidance (FAO 2008). Indeed, though responsible for coordinating all research projects at the national level, including agricultural R&D projects, DGRST's capability to take action is very weak. Because the centers placed under its supervision are financially and administratively autonomous, DGRST's influence on the allocation and execution of their budgets is very limited.

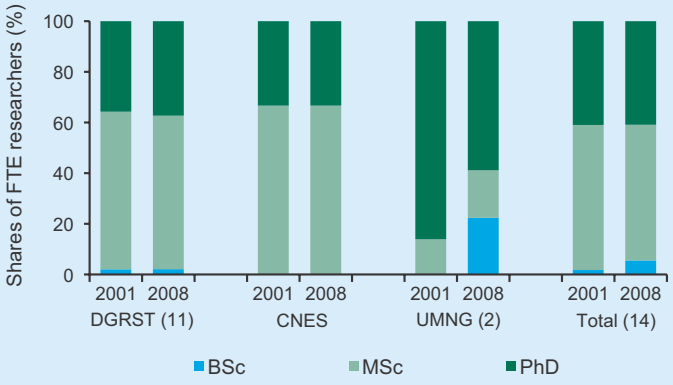
However, the government is currently implementing in-depth reform: it is grouping centers together to form research institutes. One such decision, to create the Forest Research Institute (IRF) by merging CRFO and CRFL, has already been adopted in a cabinet meeting. IRF headquarters will be set up in Ouesso. A bill pertaining to the creation of another institute is currently being studied by the council of ministers: it entails regrouping CRAL, CERAG, CRVZ, and CRHM to form the Agricultural Research Institute (IRA). Compared with the current centers, IRF and IRA will have far more financial and administrative autonomy: they will have control over research staff salaries, sign contracts, etc. At this stage, it is too early to foresee to which extent DGRST's coordinating role will change, and if so, in what way.

RESEARCH STAFF QUALIFICATIONS AND TRAINING

In 2008, nearly all of Congo's FTE agricultural researchers were trained to the postgraduate level and 37 percent held PhD degrees (Figure 4). These relative shares remained stable during the period 2001–08. A comparative analysis reveals that the higher-education agencies have a higher proportion of researchers holding PhD degrees (59 percent) than do the DGRST centers (37 percent) and CNES (33 percent). This finding matches the trend observed in many other African countries. It should however be noted that in 2008, all the researchers employed by CRIPT and 83 percent of GERDIB's researchers were trained to PhD level.

DGRST has no training budget of its own, but depends primarily on the grants received from regional and subregional networks such as the Forum for Agricultural Research in Africa

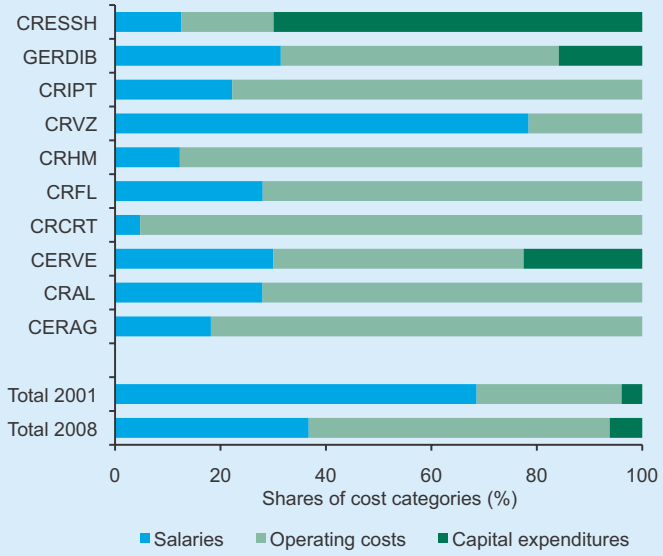
Figure 4—Degree level of researchers by institutional category, 2001 and 2008



Source: ASTI– DGRST 2009–10.

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

Figure 5— Cost category shares of the DGRST centers adjusted for inflation, 2001 and 2008



Source: ASTI–DGRST 2009–10.

Note: CRFO was excluded due to data unavailability.

(FARA) and the West and Central African Council for Agricultural Research and Development (CORAF/WECARD). In 2007, for example, some ten researchers benefited from CORAF/WECARD and FARA grants. While most of Congo's senior-generation researchers with PhD degrees completed their studies at universities in the former Soviet Union, younger PhD-level researchers were trained locally, at UMNG.

Ever since the World Bank and the International Monetary Fund (IMF) launched a structural adjustment program in 1986, Congo's government banned the permanent-contract recruitment of state employees and, as a result, DGRST can only offer fixed-term contracts. In 2010, DGRST centers (including the nonagricultural ones) employed 122 contract workers versus 293 permanent employees. It is widely admitted that this weakens DGRST's position: the centers stand to lose many of their contract workers as this difference in status means that contract workers are offered far fewer training and promotion opportunities than permanent workers.

In recent years, the total researcher numbers of DGRST centers have gradually decreased as a consequence of the nonreplacement of retiring researchers. The average age of researchers, which already exceeds the 50-year mark, is increasing rapidly. The hiring freeze (which since 2010 affects contract workers as well) only makes matters worse. Given that 175 permanent DGRST employees are expected to go into retirement between 2010 and 2016—which amounts to 60 percent of its current capacity—DGRST finds itself in a tight situation. It has no choice but to immediately recruit and train young researchers if it is to maintain a critical mass of agricultural scientists at the country level and meet the technological demands that are triggered by Congo's current agricultural development ambitions.

The irregular flow and insufficiency of project funding combined with limited training possibilities have caused a widespread loss of motivation among DGRST researchers, many of whom find themselves under-employed and are on the look-out for opportunities elsewhere. Young scientists do not consider DGRST to be an appealing employer, but this is actually of little relevance since the nearly 25-year-long hiring freeze seriously restricts their chances of joining DGRST anyway. On the whole, agricultural scientists perceive universities (which offer salaries up to three times higher) to be far more attractive employers.

INVESTMENT TRENDS

Expenditures

The allocation of research budgets across salaries, operating costs, and capital investments affects the efficiency of agricultural R&D, so detailed data on cost categories were collected from DGRST centers as part of this study. In 2008, salaries accounted for 37 percent of the combined DGRST centers' expenditures, with operating and program costs representing 57 percent, and capital investments representing 6 percent (Figure 5). The relative share representing salary costs decreased between 2001 and 2008, while that of the operating and program costs grew, which is not surprising in light of the fact that staff numbers went down. These averages, however, hide some important differences across the centers. For example, in 2008, close to 80 percent of CRVZ's expenses were absorbed by salaries, while salary costs accounted for less than 20 percent of the total amounts spent by CRCT, CRHM, or CERAG. Capital investments represented a much higher share of CRESSH and CERVE's expenses than was the case for the other centers. Most DGRST centers did not report any capital expenditure at all in 2008.

The salaries of all DGRST staff hired as state employees are paid directly by the Ministry of Finance. Moreover, this ministry transfers the sums earmarked for the centers' operating budgets directly to their individual center accounts and DGRST plays no role in managing this budget. (For the year 2010 the total amount to be paid to DGRST and all of its centers, including the nonagricultural ones totaling 3 billion CFA francs). The disbursement of the operating-budget funds is often late. Furthermore, at the level of the DGRST centers, there is no budget for capital investments. The ministry pays no heed to the centers' requests; it makes its own decisions as to when laboratories need to be rehabilitated or when new centers need to be built. Generally speaking, government funding is insufficient; it does not even cover the costs the centers incur to maintain their labs, equipment, and vehicles.

Funding Sources

Agricultural R&D in Congo derives its funding primarily from the national government and from donors and regional or subregional networks. Unfortunately, detailed data on the funding sources of individual DGRST centers were not available. Whereas 1991 figures show that the DGRST agencies obtained more than half of their funding from foreign sources, donor support subsequently evaporated with the onset of civil war. Then, as political unrest subsided from 1999 onwards, some donors returned to the scene. On the whole, however, the level of external funding remains very low compared to the support provided to most countries in the subregion. The list of primary donors includes the International Fund for Agricultural Development (IFAD), the African Development Bank (ADB), and the World Bank: the contributions are made under several larger, comprehensive programs that focus on restructuring the agricultural sector and that comprise smaller-scale agricultural research components. DGRST centers have also reported receiving considerable sums from FARA and CORAF/WECARD, primarily in support of their training programs.

Since 1983, IFAD has supported Congo by financing five projects, three of which were completed by 1998 (the La Cuvette Artisanal Fisheries Project, the Kindamba Food Crops Development Project, and the Marketing and Local Initiatives Project). In 2002, both parties adopted a program document on strategic opportunities (COSOP). The strategy that was developed aims to help producers get organized (by pooling their purchases of inputs, seeds) as well as to support the institutions involved in helping the rural population (Afrique Avenir 2010). Currently three rural development projects are being implemented under COSOP in three different regions of Congo: in the Niari, Bouenza, Lékoumou, and Kouilou departments; in the Plateaux, Cuvette, and Western Cuvette departments; and in the Pool, Sangha, and Likouala departments. Project representatives have signed an agreement with two research centers, CRAL and CERAG, with regard to the delivery of improved seeds and healthy cassava cuttings, to the selecting and breeding of cassava clones, and to the training of senior technicians.

The ADB project to support Congo's national food security program aims to increase agricultural and fisheries production in the main production zones by strengthening support services through capacity building, by promoting the use of suitable techniques, and by rehabilitating the country's marketing infrastructure. The project's capacity-building component aims to strengthen the organizations in charge of rural and agricultural development (i.e. the technical support departments of the ministries involved in the project, the research institutions, and the local operators) as a means to improve the quality of their work. The project is due to be launched in 2012.

As part of a collaborative agreement it signed with the Congolese government, the World Bank finances half of the US$ 40 million Agricultural Agricultural Development and Rural Roads Rehabilitation Project (PDARP). PDARP funding is to be used to help CRAL finance the renovation of the cold room, where it stores its seed supplies, to produce seed, and to supply healthy cassava cuttings as well as banana and plantain suckers.

In addition to IFAD, World Bank, and ADB funding, most Congolese agricultural research centers report having received contributions from various donors through short-term projects. CERVE, for example, has listed the funds the European Union and the World Health Organization (WHO) provided to help renovate its laboratories and purchase new research equipment. Furthermore, it received some funding from the governments of France and the United Kingdom in support of its biodiversity inventory activities. As for CRIPT, FAO financed some of its research on cassava in 2007.

It should however be noted that in most of these cases, contributions made to the centers' research projects are just for a limited period of time.

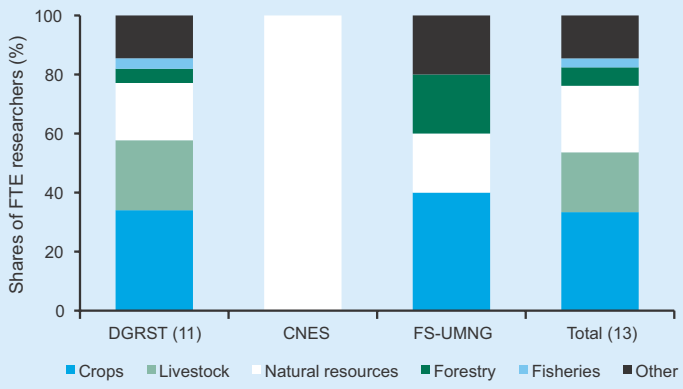
UMNG does not have a research budget. Whereas in pre-war days UMNG had no problems obtaining funding from external sources, this situation has meanwhile changed. Now, most research projects are carried out in partnership with foreign agencies. In the period spanning 2003–07, IDR was able to benefit from European Union funds attributed to a participatory membership based natural resource management project carried out in Central Africa. This project was administered by the Free University of Brussels. In addition, IDR took part in the French government's Training, Information, Research and Forests project (FORINFO), which focuses on environmental issues in the subregion of the Congo River Basin. Its overall objective is to improve natural resource planning and management by providing relevant data on the environment to all actors concerned.

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, 35 percent of Congo's agricultural researchers were involved in crop research and 21 percent in livestock research, while 20 percent focused on natural resources, 7 percent on forestry research, and 3 percent on fisheries (Figure 6). The category labeled "other" includes researchers working on socioeconomic topics or involved in post-harvest research and rural engineering.

In 2008, the most intensively researched crop in Congo was cassava. Research on cassava accounted for 19 percent of FTE crop and livestock researchers. Other important crops were vegetables (9 percent), yams (5 percent), bananas and plantains (4 percent), and maize (4 percent). The principal livestock commodity was poultry (26 percent), followed by sheep and goats (7 percent).

Figure 6—Research focus by major commodity area, 2008



Source: ASTI–DGRST 2009–10.

Notes: Figures in parentheses indicate the number of agencies in each category. IDR-UMNG and the two nonprofit institutions were excluded due to data unavailability.

CONCLUSION

The civil wars that shook Congo in the 1990s caused agricultural research investments to plummet. However, with the return of peace and the modest inflow of donor funding, agricultural R&D spending levels picked up again, albeit slightly. In 2008, Congo invested 1.2 billion CFA francs, or 4.6 million PPP dollars (both in 2005 prices); this total includes salaries, operating costs, program costs, as well as capital investments. By comparison with the situation observed in many other countries in the subregion, the level of donor funding to support Congo's agricultural R&D remains very low.

Unlike their spending levels, the DGRST centers' total research capacity levels show a decline during the period 2001–08. The drop in numbers is largely attributable to a significant number of researchers who left for retirement, compounded by the imposition of a public-sector hiring freeze. The average age of DGRST researchers currently exceeds 50 years, which places Congo's researchers among the oldest in Africa. It is expected that between 2010 and 2016, 60 percent of DGRST's permanent employees will reach retirement age. Needless to say, in the years to come, recruitment and training will constitute a major challenge.

Reviving Congo's agricultural sector is crucial. It will contribute to reducing rural poverty and help economic diversification at a time when oil production, the country's main source of income, is declining. However, Congo lacks a clear national agricultural research policy that is supported by strategic planning and entails long-term programs. The lack of coordination that characterizes the country's research centers is linked to this absence of national guidelines and reflects the fact that guidance provided by DGRST lacks energy and forcefulness. The national government is currently in the process of regrouping research centers to form research institutes, but whether or not serious issues such as coordination, funding, recruitment, and training will be adequately addressed remains to be seen. It is clear that, in order to maintain a critical mass of agricultural scientists at the national level and to meet the technology demand triggered by Congo's current ambitions to boost its agricultural development, the government of Congo will not only have to begin recruiting and training young researchers without any further delay, but it must also ensure the implementation of well-targeted, well-coordinated, and well-funded research programs.

NOTE

[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.

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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).

DGRST is an executive body responsible for the implementation and management of Congo's science policy. From its base in Brazzaville, it coordinates and oversees the research activities of 14 research centers, 11 of which are dedicated to agriculture.

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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