

# MALI

## RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

Gert-Jan Stads and Aliou Maïga

Country Note • March 2011

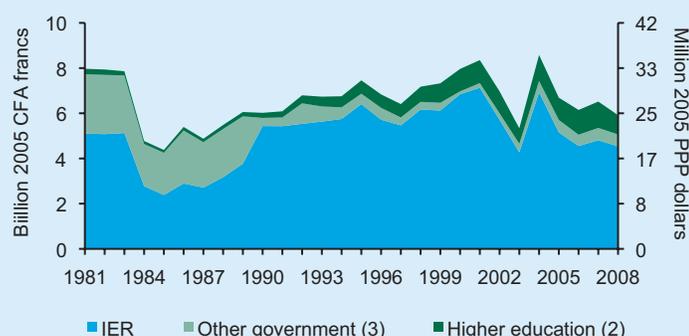
### LONG-TERM INVESTMENT AND CAPACITY TRENDS IN AGRICULTURAL R&D

Mali's agricultural sector plays a dominant role in the national economy. It accounts for close to half of the country's gross domestic product (GDP) and employs 70 percent of the active population. In its bid to stimulate agricultural production and thereby improve living conditions for the country's farmers, the national government assigns high priority to research and development (R&D). Following a period of steady growth that lasted from the mid-1980s to the turn of the millennium (Stads and Kouriba 2004), total agricultural R&D spending levels in Mali have since exhibited an erratic trend. In 2008, R&D investments totaled 5.9 billion CFA francs, or 24.6 million PPP dollars, both in 2005 constant prices (Figure 1; Table 1). Unless otherwise stated, all dollar values in this note are based on purchasing power parity (PPP) exchange rates.<sup>1</sup> 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. Mali's total agricultural research capacity levels also present an irregular trend: since the turn of the millennium, important annual variations have been recorded,

### Key Trends Since 2000

- In Mali, the erratic trends exhibited by the levels of public agricultural research expenditure and capacity reflect annual fluctuations in donor funding and the ensuing waves of recruitment and layoffs.
- The Rural Economy Institute (IER) is the country's principal agricultural research and development (R&D) agency, accounting for 80 percent of agricultural R&D capacity and investments.
- The bulk of IER's agricultural R&D activities are funded by external donors and development banks.
- The aging of Mali's agricultural research staff, many of whom will reach retirement age in the next decade, is a major cause for concern.

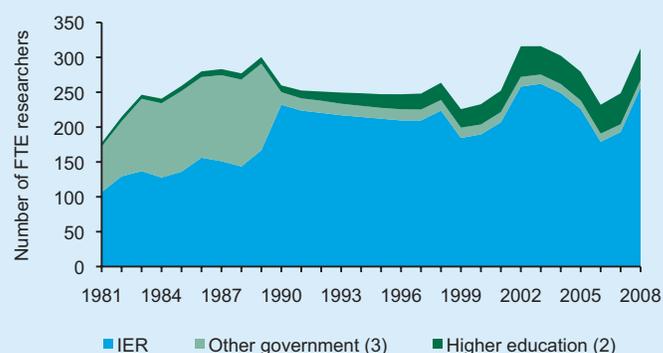
**Figure 1—Agricultural R&D spending adjusted for inflation, 1981–2008**



Sources: Calculated by authors from ASTI–IER 2009–10 and Stads and Kouriba 2004.

Notes: Figures in parentheses indicate the number agencies in each category. "Other government (3)" includes the National Institute of Zootechnic, Forestry, and Hydrobiological Research (INRZFH) and the Agricultural Mechanization Division (DMA), which merged with IER in 1990 and 2001, respectively. For more information on coverage and estimation procedures, see the Mali country page on ASTI's website at [asti.cgiar.org/mali](http://asti.cgiar.org/mali).

**Figure 2—Agricultural research staff in full-time equivalents, 1981–2008**



Sources: Calculated by authors from ASTI–IER 2009–10 and Stads and Kouriba 2004.

Notes: Figures in parentheses indicate the number of agencies in each category. "Other government (3)" includes INRZFH and DMA, which merged with IER in 1990 and 2001, respectively. FTE totals include expatriate researchers temporarily assigned to IER and the higher education agencies, as well as IER's fixed-term contractors.

**Table 1—Overview of 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)	(%)
IER	4,534.6	18.9	76.6	257.0	82.2
LCV	527.8	2.2	8.9	10.5	3.4
Higher education (2)	854.5	3.6	14.4	45.2	14.4
<b>Total (4)</b>	<b>5,916.8</b>	<b>24.6</b>	<b>100</b>	<b>312.7</b>	<b>100</b>

Source: ASTI–IER 2009–10.

Notes: Figures in parentheses indicate the number of agencies in each category. Total staffing includes expatriate researchers temporarily assigned to IER as well as IER's fixed-term contractors; total spending includes their salaries.

which are largely due to alternating waves of hiring and laying-off staff at the Rural Economy Institute (IER), the country's principal agricultural R&D agency. In 2008, Mali employed a total of 313 researchers expressed in full-time equivalents (FTEs) (Figure 2).

In 2008, IER accounted for approximately 80 percent of Mali's agricultural R&D expenditures and capacity. IER was established in 1960 and is placed under the Ministry of Agriculture (MA). Its scientific portfolio consists of 17 research programs addressing five themes: crops, livestock, forestry and fisheries, production systems and natural resource management, and the economics of agricultural networks. The institute is headquartered in Bamako and runs six regional centers spread over the country's various agroclimatological zones (Sotuba, Kayes, Sikasso, Niono, Mopti, and Gao). The majority of its staff is located in Sotuba, in the suburbs of Bamako.

During the period 2001–08, a high degree of fluctuation characterized both research staff and expenditure levels at IER. With regard to staff, the movements concerned both state-employed researchers (*"fonctionnaires"*) and contract researchers (*"contractuels"*); they reflected either extended leaves taken by state-employed researchers (or their temporary relocation), or the many contract terminations that affected nonpermanent research staff. Such layoffs occurred when the completion of large donor-funded projects (financed by the World Bank, the Netherlands, or the Syngenta Foundation) brought on financial difficulties. In 2008, IER employed 257 FTE researchers, including 79 contract researchers. This total represents a marked increase on the total recorded at the beginning of the decade (207 FTEs in 2001), and even on the 2007 total (193 FTEs). The significant growth in permanent staff numbers noted during the period 2007–08 stems from the government's response to IER's request that it address not only the problem of IER's staff shortfall but also the issue of its aging pool of researchers. During that two-year time period, a considerable number of contract researchers were rehired as state employees (including a group of researchers that Dutch government funding had helped train to the PhD level and that IER stood to lose due to lack of funds).

The Central Veterinary Laboratory (LCV), also placed under MA, is the only other government agency involved in agricultural

## ASTI Website Interaction

 More details on the institutional developments in agricultural research in Mali are available in the 2004 country brief at [http://www.asti.cgiar.org/pdf/MALI\\_CB17.pdf](http://www.asti.cgiar.org/pdf/MALI_CB17.pdf).

 Underlying datasets can be downloaded using ASTI's data tool at [asti.cgiar.org/data](http://asti.cgiar.org/data).

 This brief presents aggregate data; additional graphs with more detailed data are available at [asti.cgiar.org/mali/datatrends](http://asti.cgiar.org/mali/datatrends).

[www.asti.cgiar.org/mali](http://www.asti.cgiar.org/mali)

R&D in Mali. In 2008 LCV employed 11 FTE researchers, a slight drop in capacity compared with 14 FTEs in 2001. LCV's Diagnostics and Research Division aims to prevent and eradicate animal diseases, and protect public health by detecting animal-borne diseases. It also focuses on microbiological analysis of foodstuffs and beverages.

Accounting for just 14 percent of the total national research capacity in 2008, the higher education sector's participation in Mali's agricultural R&D is relatively small compared with many other African countries. Two higher-education agencies are involved in agricultural R&D: the Rural Polytechnic Institute for Training and Applied Research (IPR/IFRA) and the Higher Institute of Training and Applied Research (ISFRA), both placed under the University of Bamako. Located in Katibougou, about 60 kilometers from Bamako, IPR/IFRA constitutes an important link in Mali's agricultural research system since it provided training for most of IER's researchers. In addition, IPR/IFRA conducts research in areas such as plant agrophysiology and biology; soil science; crop protection; renewable energy; ethnobotany; animal production; forestry production; agroforestry; and environmental conservation. In 2008, IPR/IFRA employed 42 FTE researchers. ISFRA's 3 FTE researchers focus mostly on animal husbandry and forestry.

In 2008, 13 percent of Mali's agricultural researchers were female. While relatively low, this percentage nevertheless represents a slight improvement compared with 2001 (11 percent) (ASTI–IER 2009–10; Stads and Kouriba 2004). At LCV, the proportion of female researchers was much larger than at IER and the two higher-education agencies. At IER, women are especially underrepresented, with the exception of the Food Technology Laboratory where women (one of whom is the director) form the majority. In 2008, the support-staff-to-researcher ratio averaged 2.4, consisting of 1.9 technical, 0.4 administrative, and 0.1 "other" support staff, which comprises laborers, guards, drivers, etc. (ASTI–IER 2009–10).

Mali's total spending as a percentage of agricultural output (AgGDP)—a comparative indicator of agricultural R&D spending

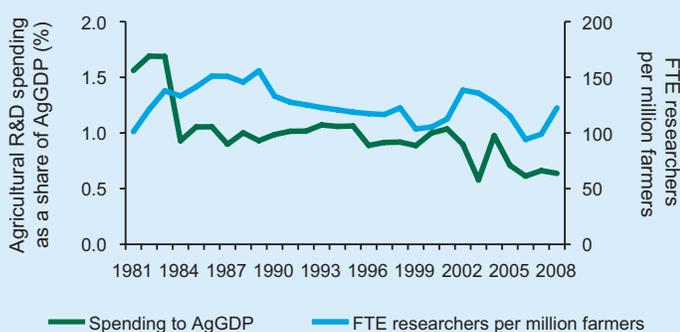
across countries—was \$0.64 for every \$100 of AgGDP in 2008 (Figure 3), which is much lower than the intensity ratio noted at the turn of the century. This sharp drop is due to a rapid rise of the country's AgGDP combined with a decline in agricultural R&D spending. The number of FTE researchers per farmer has varied from year to year since 2000. In 2008, Mali employed 123 FTE agricultural researchers for each million farmers.

## INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT

In the 1990s, Mali's government launched a major initiative to restructure the national agricultural research system. Following the development of a strategic plan for agricultural research, IER was merged with the National Institute of Zootechnic, Forestry, and Hydrobiological Research (INRZFH) in 1990 and with the Agricultural Mechanization Division (DMA) in 2001. In addition, the restructuring process entailed creating governance bodies and stimulating users to participate in the research process. The National Council for Agricultural Research (CNRA) was established in 1995 to improve agricultural R&D by increasing the country's agricultural research system's effectiveness and making it more demand driven. CNRA is responsible for coordinating and financing Mali's agricultural research. It evaluates research proposals and funds the selected projects, the majority of which are carried out by IER (the remainder is implemented by LCV, IPR/IFRA, and ISFRA). CNRA's website serves as an information and exchange platform to be used by all actors in the national agricultural research system. As CNRA manages the lines of credit (competitive funding) required for implementing applied and strategic research projects as well as R&D projects directly requested by users, it uses its website to publish reports, calls for proposals, and bid assessment outcomes.

Although various authorities have expressed a strong interest in developing Mali's agriculture, the results of the policies, strategies, and programs that were carried out in recent decades have fallen short of the rural population's expectations. In 2006, while acknowledging and emphasizing the paradox of Mali's lack of food sovereignty despite its abundant resources,

**Figure 3—Intensity of agricultural research spending and capacity, 1981–2008**



Sources: Calculated by authors from ASTI–IER 2009–10; Stads and Kouriba 2004; FAO 2009; and World Bank 2010.

## ASTI Website Interaction

-  A list of the 2 government and 2 higher education agencies included in this brief is available at [asti.cgiar.org/mali/agencies](http://asti.cgiar.org/mali/agencies).
-  Detailed definitions of PPPs, FTEs, and other methodologies employed by ASTI are available at [asti.cgiar.org/methodology](http://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/mali/datacoverage](http://asti.cgiar.org/mali/datacoverage).
-  More relevant resources on agricultural R&D in Mali are available at [asti.cgiar.org/mali](http://asti.cgiar.org/mali).

[www.asti.cgiar.org/mali](http://www.asti.cgiar.org/mali)

Mali's president made a break with earlier approaches and expressed his firm intention to radically transform living and production conditions in the agricultural sector by launching an agricultural guidelines act, i.e. the *Loi d'orientation agricole (LOA)*. This framework law aims to guarantee Mali's self-sufficiency in food and to make the agricultural sector the driving force of the national economy, as a means to ensure the entire population's well-being. Adopted in 2006, LOA provides an agricultural policy framework that covers all of the agricultural sector's economic activities, including their social and environmental aspects. The guidelines act recognizes that research plays a crucial role in developing the agricultural sector and enhancing its competitiveness. The creation of a National Agricultural Advisory System is meant to facilitate the dissemination of research findings and technical innovations and to encourage users to adopt them (ROPPA 2006). A Higher Agricultural Council (CSA), which includes a national executive committee and regional executive committees, was set up to ensure proper implementation of LOA.

Other recent developments with regard to Mali's agricultural science and technology (S&T) policies include raising IER to the status of a public-sector scientific institute, which gives it a certain degree of scientific and administrative autonomy, as well as introducing a performance contract between IER and the Mali government. Under this contract, IER can count on receiving government funds as pledged, for three-year periods, without further annual negotiations, allowing the institute to better plan its research program. On the other hand, the formalization of research contracts means that researchers are required to deliver results within given time frames. Finally, the researcher status was confirmed in 2001 with the publication of a set of decrees and

bylaws detailing the promotion requirements for various ranks. This status, however, does not take into account the situation of researchers employed as contract workers (Teme 2003).

## RESEARCH STAFF QUALIFICATIONS AND TRAINING

As previously mentioned, 30 percent of IER’s researchers are contract employees (“*contractuels*”), who do not have an official researcher status. They are different from state-employed researchers (“*fonctionnaires*”) as they do not fall under the Malian civil-service administration. Contract researchers are not granted the same training and career opportunities in the civil-service system as are state-employed researchers. Unfortunately, data were unavailable with respect to the distribution by highest degree of IER’s contract researchers, meaning that the data presented in this study relate only to the state-employed researchers.

In 2008, 97 percent of Mali’s FTE state-employed agricultural researchers were trained to the postgraduate level and 35 percent held PhD degrees (Figure 4). The proportion of researchers employed by higher-education agencies and holding PhD degrees (38 percent) is similar to the corresponding share recorded at IER (35 percent) and at LCV (38 percent). At IER, the share of state-employed researchers trained to the post-graduate level recently increased from 26 percent in 2001 to 35 percent in 2008. In the 1990s, the National Agricultural Research Project (PNRA), largely funded by a World Bank loan, had made it possible for 17 IER researchers to complete their PhD-level training, and for 34 researchers to obtain a Master/MSc-level degree (Stads and Kouriba 2004). Since the closure of PNRA in 2001, no project with an equally strong training component has filled the breach. During 2001–07, IER’s PhD-level staff numbers remained relatively stable, at around 45 FTEs; a subsequent rise brought the level to 61 FTEs in 2008. The number of researchers holding MSc degrees also increased, from 97 FTEs in 2007 to 115 FTEs in 2008. In addition to research staff, IER employed

494 (state-employed or contract-based) technicians in 2008, many of whom hold “*diplôme d’études approfondies (DEA)*”, “*ingénieur*”, or other degrees.

During the past decade, several (sub)regional networks and donors (such as the West and Central African Council for Agricultural Research and Development (CORAF/WECARD), the Alliance for a Green Revolution in Africa (AGRA), and the governments of the United States of America and of Brazil) supported IER staff through scholarships. While most recipients were trained in Mali, a few completed their studies abroad. State-employed research staff are eligible first.

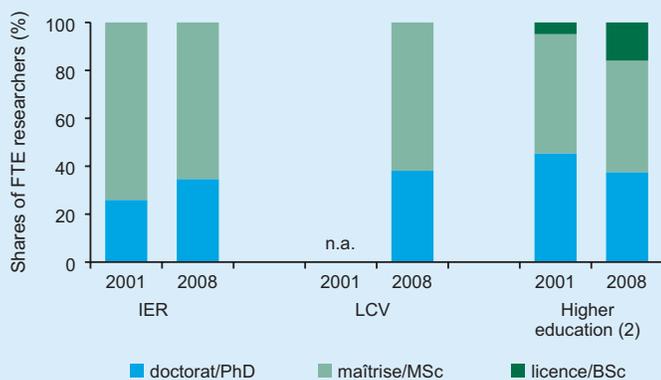
In Mali, the average age of researchers exceeds 50 years, resembling the trend in the subregion. Despite the fact that many contract workers have recently joined the ranks of IER’s state-employed researchers, an aging pool of scientists remains a major challenge to IER in the very near future. The institute will have to simultaneously recruit suitably qualified senior-level researchers and ensure that existing researchers can pursue further training and obtain the degrees they require to be promoted. Furthermore, IER has to address its shortfall of specialists in certain crucial areas if it wishes to carry through its research program successfully (in particular, experts in biometrics, cartography, genetics, ethnobotany, and plant pharmacy).

## 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 each of the cost categories were collected from IER and LCV as part of this study. Given that contract staff are not on IER’s payroll and that their salaries are paid out of the institute’s operating budget, it was very difficult to make a distinction between salary spending and operating costs. Salaries and operating and program costs have therefore been lumped together. During the period 2005–08, IER allocated 86 percent of its budget to staff salaries, operating, and program costs, and 14 percent to capital investments (Figure 5). Over

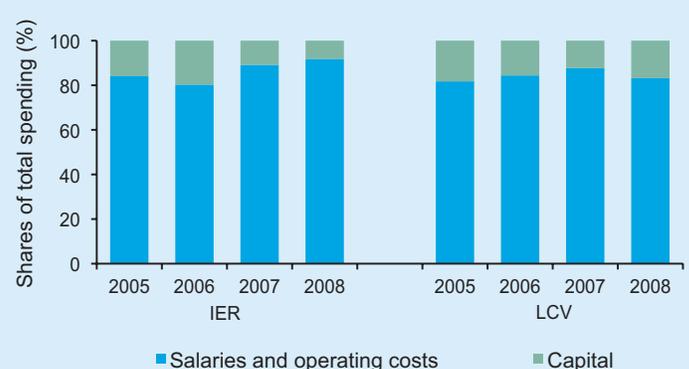
Figure 4—Degree level of state-employed researchers by institutional category, 2001 and 2008



Source: ASTI–IER 2009–10.

Notes: Figure in parentheses indicate the number of higher education agencies. Contract researchers and technicians holding degrees were excluded. “n.a.” stands for “not available.”

Figure 5—Cost category shares of IER and LCV, 2005–08



Source: ASTI–IER 2009–10.

Note: Salaries exclude those of expatriate researchers.

the past few years, IER has invested considerable sums of money in planning and laying out plots of agricultural land, in building laboratories, and rehabilitating some of its research infrastructure. During the same period, LCV allotted 26 percent of its budget to salary costs, with operating costs accounting for 59 percent and capital investments for 16 percent.

## Funding Sources

Agricultural R&D in Mali derives its funding from three primary sources: the national government; donors, development banks, and regional or subregional networks; and internally-generated resources. During 2004–08, government grants accounted for 41 percent of IER’s total income, donor contributions equaled 53 percent, and internally-generated resources (mainly through the sale of seeds and the delivery of services) represented 6 percent (Figure 6). This last category also includes the contributions made by the Malian Company for the Development of Textiles (CMDT), a state-owned company that is in the process of being privatized. IER carries out some research on behalf of CMDT. Research topics include cotton variety improvement, disease control, soil-related issues, and the quality of fertilizers and other plant-care products used for cotton.

IER sets aside the largest portion of its annual grant from the Ministry of Agriculture to pay the salaries of the state-employed research staff. It draws the sums required to cover the contract researcher salaries on its operating budget. MA does not earmark funds for IER’s research activities. In fact, the institute’s research is mostly financed through donor funding and development bank loans, such as those provided by the World Bank and the African Development Bank (ADB).

The World Bank’s involvement in developing Mali’s agricultural sector dates back to the 1970s. Since the turn of the millennium, World Bank loans and grants have supported the implementation of three agricultural research-based projects: the National Agricultural Research Project (PNRA; 1994–2001); the Agricultural Services and Producer Organizations Project

(PASAOP; 2002–09); and the West Africa Agricultural Productivity Program (WAAPP; 2007–17).

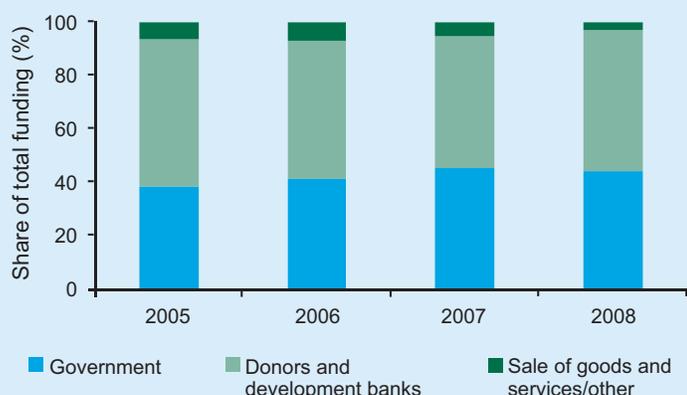
The objective of PNRA (through which US\$19 million were allocated to IER) was to strengthen IER’s institutional framework and improve the quality of its research programs. PNRA support made it possible for IER to part with its status as an ineffective, administrative institution and become a true public research and technology agency. However, serious delays in implementation negatively influenced the results of the project components that focused on strengthening IER’s human resources and financial management (Stads and Kouriba 2004).

PNRA was immediately followed by PASAOP, which had a total budget of US\$64 million and was cofinanced by the World Bank, the Mali government, the United States Agency for International Development (USAID), the French, Swiss, and Dutch governments, and the European Union. Activities under PASAOP’s “agricultural research support” component were aimed at strengthening scientific capacity; improving IER’s and LCV’s research facilities; funding strategic and applied research projects; establishing a competitive and decentralized funding mechanism for short-term agricultural research projects in Mali’s principal agroecological zones; and improving linkages between the national and international agricultural research systems (Stads and Kouriba 2004). At the time of closure of the program, the outcome of this component was deemed satisfactory by the World Bank. Currently, Mali’s research system is better able to satisfy the producers’ technological needs. The establishment of a donor-financed competitive research fund makes coverage of all research project expenses possible. Improvement to the output and quality of research is such that the government has decided to increase its financial contributions in support of IER’s basic operations. At the time of writing, and in accordance with the stipulations of the performance contract it signed with IER, the government annually allocates to IER 1.5 billion CFA francs (current prices). Furthermore, a long-term funding plan is being prepared at the request of Mali’s prime minister.

WAAPP is financed through a World Bank loan and administered by CORAF/WECARD. Its objective is to generate and disseminate improved agricultural technologies in the participating countries’ top priority areas that are aligned with regional priorities, as identified by CORAF/WECARD. Launched in 2007, the first phase of WAAPP focused on three priority R&D areas and involved three countries, one of which was Mali. Ghana was put in charge of the commodity subsector “roots and tubers”; Senegal was made responsible for cereals; and Mali was assigned the responsibility for rice. WAAPP consists of two components—research and rehabilitation—and a competitive fund. In Mali project implementation involves IER and CNRA. For each five-year period, Mali receives US\$15 million (of which CORAF/WECARD contributes US\$1 million). Planning for the second phase of the project (WAAPP-II) was launched in 2009 and entails adding seven other countries.

World Bank funding is supplemented by the contributions of other donors, the list of which includes the Syngenta Foundation, ADB, the Dutch and Swiss governments’ development cooperation agencies, the European Union, the Rockefeller Foundation, the Bill and Melinda Gates Foundation (BMGF), the International Atomic Energy Agency (IAEA), various

Figure 6—Funding sources of IER, 2005–08



Source: ASTI–IER 2009–10.

Note: Donors and development banks include the salary costs for expatriate researchers working at IER.

centers of the Consultative Group for International Agricultural Research (CGIAR), and several U.S. universities. Most of these aid agencies provide funding through projects of a three-year duration, on average.

In recent years, the Syngenta Foundation financed several research projects on plant breeding and on the productivity of millet and cowpeas. ADB has become involved in the New Rice for Africa (NERICA) dissemination project: by allocating 30 million CFA francs over a five-year period it aims to help IER integrate the new technology into its Lowland Rice Program. Switzerland's Development Cooperation entity has funded several projects on plant disease control and agroforestry-related technologies. Furthermore, CORAF/WECARD and the Forum for Agricultural Research in Africa (FARA) support capacity-building at IER by paying for some of its researchers' long-term and short-term training courses.

During 1999–2004, the Netherlands government was one of IER's most important donors, providing a total amount of 5 billion CFA francs (current prices) through the Project to Support IER (PAPIER). This project's main objectives were to ensure that IER's activities were better adapted to its clients' needs as well as to improve cost-efficiency. Since the closure of PAPIER, the Dutch government no longer provides direct funding for IER (it only provides counterpart funding under PASAOP).

LCV research is essentially funded by a national government grant, which is supplemented by contributions from several donors, including USAID, the United Nations Food and Agriculture Organization (FAO), the International Livestock Research Institute (ILRI), the International Center for Livestock Research and Development in the Subhumid Zones (CIRDES), the Agricultural Research for Development Agency (CIRAD), and the French and Swiss governments' development cooperation agencies. ISFRA reports having received funds from the United Nations Development Program (UNDP) in support of its research on indigenous vegetation as well as from the Research for

Development Institute (IRD) for its irrigation research. IPR-IFRA research is funded by the Ministry of Education through its Higher-Education and Scientific Research Department; other contributors are the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the World Agroforestry Centre (ICRAF), the International Liaison Committee for Food Corps (CILCA), and the *Unité Service Coopération–Canada/Mali*.

## 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, 45 percent of Mali's agricultural researchers were involved in crop research. An additional 21 percent focused on livestock research, 15 percent on forestry research, 8 percent on pastures and forages, and 8 percent on natural resources (Figure 7). The category labeled "other" includes researchers involved in fisheries research or working on socioeconomic and post-harvest issues.

In Mali, the most intensively-researched crop is rice. As previously mentioned, Mali is in charge of WAAPP's "rice component" and it also receives large sums of money from ADB under the NERICA Rice Dissemination project. In 2008, rice research accounted for 21 percent of all resources allocated to crop and livestock research. Other important crops were cotton (12 percent), vegetables (8 percent), millet (7 percent), potatoes (6 percent), and sorghum (5 percent). The principal livestock commodities are sheep and goats (11 percent), beef (10 percent) and poultry (7 percent).

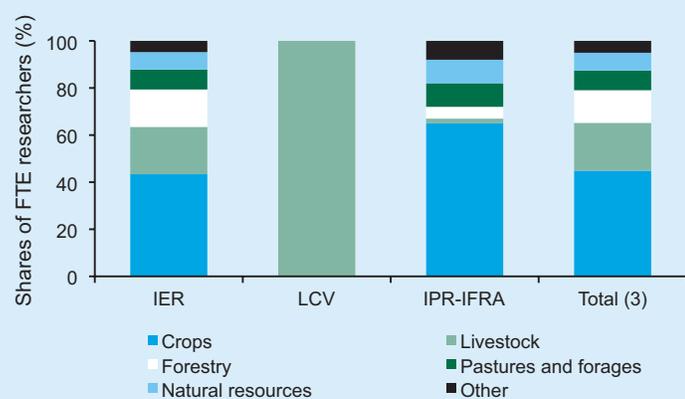
**Table 2—Crop and livestock research focus by major item, 2008**

	IER	LCV	IPR-IFRA	Total (3)
<b>Crop items</b>	Shares of FTE researchers (%)			
Rice	25.0	—	7.5	21.2
Cotton	11.7	—	14.9	11.5
Vegetables	6.7	—	14.9	7.5
Millet	8.3	—	—	6.7
Potatoes	3.3	—	22.4	5.8
Sorghum	3.3	—	14.9	4.8
Bananas & plantains	1.7	—	7.5	2.4
Maize	1.7	—	7.5	2.4
Other crops	6.7	—	7.5	6.4
<b>Livestock items</b>				
Sheep and goats	11.7	35.0	—	11.2
Beef	8.3	50.0	3.0	9.8
Poultry	8.3	5.0	—	7.0
Other livestock	3.3	10.0	—	3.2
<b>Total crop and livestock</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: ASTI–IER 2009–10.

Notes: Figure in parentheses indicate the total number of agencies. Data relating to ISFRA were unavailable.

**Figure 7—Research focus by major commodity area, 2008**



Source: ASTI–IER 2009–10.

Notes: Figure in parentheses indicate the total number of agencies. Data relating to ISFRA were unavailable.

## CONCLUSION

Although the political authorities have taken great pains to promote agricultural development during the past few decades, Mali's R&D remains largely dependent on the support provided by donors and development banks, in particular through a series of projects led by the World Bank, the Netherlands government, and the Syngenta Foundation. During 2001–08, this dependence on short-term foreign aid projects combined with modest levels of public funding led to considerable annual fluctuations in both research expenditures and research capacity. It also brought financial uncertainty to the country's R&D agencies. In 2008, Mali's investments totaled approximately 5.9 billion CFA francs, or 24.6 million PPP dollars, both in 2005 constant prices and the country's overall staff total stood at 313 FTE researchers (including the many contract researchers whose status differs from that of the state-employed *fonctionnaires*).

A number of donor-supported training programs played a crucial role in increasing IER's number of PhD-qualified researchers, from 41 FTEs in 2001 to 61 FTEs in 2008. In the higher-education sector, the overall level of qualifications of the scientific staff also rose. At the time of writing, the average age of IER's research staff exceeds the 50-year mark, notwithstanding the fact that many of its contract employees recently joined the pool of state employed researchers. In a few years from now, this reality will prove to constitute a major hurdle, as an increasing number of highly qualified and experienced researchers are due to retire. Recruiting and training young researchers is, therefore, a matter of utmost urgency if Mali wishes to maintain a critical mass of agricultural scientists.

In term of agricultural policies, several recent initiatives—such as the change of not only IER's status but also that of its researchers, as well as the 2006 adoption of a framework law, LOA—leave room for hope that Mali's authorities will be assigning an ever-higher priority to agricultural R&D. Nevertheless, as long as the national government is not committed to financing agricultural R&D in a more intensive and sustainable way, it remains to be seen whether Mali will succeed in leading a successful and effective battle against hunger and poverty.

## NOTES

<sup>1</sup> 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](http://www.asti.cgiar.org/data).

## REFERENCES

- ASTI–IER (Agricultural Science and Technology Indicators and Rural Economics Institute). 2009–10. Agricultural Science and Technology Indicators Survey. Unpublished surveys. Washington, D.C. and Bamako.
- CNRA (National Agricultural Research Committee). 2010. Comité national de la recherche agricole. <<http://www.cnra-mali.org/>>. Accessed December 8, 2010.
- FAO (Food and Agriculture Organization of the United Nations). 2009. FAOSTAT. <<http://faostat.fao.org/site/452/default.aspx>>. Accessed November 20, 2009.
- IPR–IFRA (Rural Polytechnic Institute for Training and Applied Research). 2010. La recherche. <[http://www.ipr-ifra.org/article.php3?id\\_article=21](http://www.ipr-ifra.org/article.php3?id_article=21)>. Accessed December 13, 2010.
- ROPPA (West African Farmer Organizations and Producers' Network). 2006. Loi d'orientation agricole. <[www.roppa.info/.../Loi\\_d\\_Orientation\\_Agricole\\_promulgu\\_e-1.doc](http://www.roppa.info/.../Loi_d_Orientation_Agricole_promulgu_e-1.doc)>. Accessed December 10, 2010.
- Stads, G. J. and A. Kouriba. 2004. *Mali*. ASTI Country Brief No. 17. Washington, D.C. and Bamako: IFPRI and IER.
- Teme, B. 2003. *La réforme de la recherche agricole au Mali : Bilan et perspectives*. Bamako: IER.
- World Bank. 2010. World Development Indicators (WDI) & Global Development Finance (GDF). <[http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI\\_Series](http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI_Series)>. Accessed January 10, 2011.
- \_\_\_\_\_. 2010. *Implementation completion and results report on a credit in the amount of SDR 34.2 million (US\$ 43.5 million equivalent) and on an additional financing in the amount of SDR 13.3 million (US\$ 20 million equivalent) to the Republic of Mali for an agricultural services and producer organizations project*. Report No. ICR000243. Washington, D.C.

#### **IFPRI-ROME**

Agricultural Science and Technology Indicators (ASTI) initiative  
c/o ESA, Food and Agriculture Organization (FAO)  
Viale delle Terme di Caracalla • 00153 Rome, Italy  
Telephone: +39-06-570-53192 / 56334 • Skype: ifpriromeoffice  
Fax: +39-06-570-55522 • Email: [asti@cgiar.org](mailto:asti@cgiar.org)  
[www.asti.cgiar.org](http://www.asti.cgiar.org)



*Facilitated by:*

**INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE**  
2033 K Street, NW • Washington, DC 20006-1002 USA  
Tel: +1-202-862-5600 • Skype: ifprihomeoffice  
Fax: +1-202-467-4439 • Email: [ifpri@cgiar.org](mailto:ifpri@cgiar.org)  
[www.ifpri.org](http://www.ifpri.org)

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](http://www.cgiar.org)).

IER is Mali's principal agricultural R&D agency. The institute was established in 1960 and falls under the administrative coordination of the country's Ministry of Agriculture. IER holds a broad mandate covering crops, livestock, forestry, fisheries, natural resources, and socioeconomics. To learn more about IER visit [www.ier.gouv.ml](http://www.ier.gouv.ml).

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](http://www.asti.cgiar.org).

The authors thank the 4 agencies that participated in the ASTI survey in Mali; without their commitment this country note would not have been possible. The authors also thank Michael Rahija for his research assistance, and Nienke Beintema and Aly Kouriba who provided comments on an early draft of the note. ASTI gratefully acknowledges the generous support from the Bill & Melinda Gates Foundation.

Copyright © 2011 International Food Policy Research Institute and Rural Economy Institute. Sections of this report may be reproduced without the express permission of, but acknowledgement to, IFPRI and IER. For permission to republish, contact [ifpri-contact@cgiar.org](mailto:ifpri-contact@cgiar.org).

This country note has been prepared as an output for the ASTI initiative and has not been peer reviewed. Any opinions stated herein are those of the authors and do not necessarily reflect the policies or opinions of IFPRI and IER.