



MALI

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KEY INDICATORS, 2000–2011

Total Public Agricultural Research Spending	2000		2008		2011
CFA francs (million constant 2005 prices)	8,353.7		6,072.3		8,064.3
PPP dollars (million constant 2005 prices)	33.5		25.3		33.6
Overall Growth		-24%		33%	
Total Number of Public Agricultural Researchers					
Full-time equivalents (FTEs)	232.8		318.7		307.0
Overall Growth		37%		-4%	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	1.01%		0.51%		0.61%
FTE researchers per 100,000 farmers	9.80		10.95		9.83

Note: Acronyms, definitions, and an overview of agricultural R&D agencies are available on page 4.

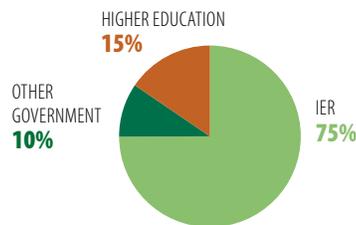
- ▶ Strong dependence on short-term projects funded by donors and development banks, combined with modest levels of public funding, have caused considerable yearly fluctuations in both agricultural research expenditures and human resource capacity over time.
- ▶ Although Mali's 2011 agricultural research intensity ratio (0.61 percent) was higher than the average for Africa south of the Sahara (0.51 percent), it still falls well below the recommended 1-percent target set by NEPAD and the United Nations.
- ▶ The aging of agricultural research staff, many of whom will reach retirement age in the next decade, is a major cause for concern.

FINANCIAL RESOURCES, 2011

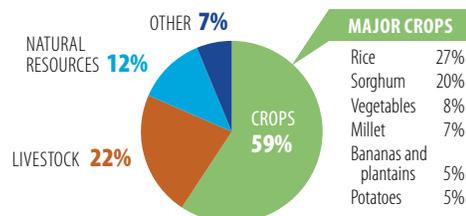
Spending Allocation	
Salaries	24%
Operating and program costs	67%
Capital investments	9%
Funding Sources	
Government	36%
Donors and development banks	63%
Sales of goods/services	1%

Note: Shares are based on data for IER only.

INSTITUTIONAL PROFILE, 2011



RESEARCH FOCUS, 2011

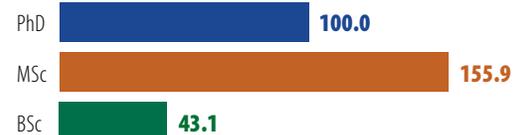


Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 29 percent of total crop researchers focused on a wide variety of other crops.

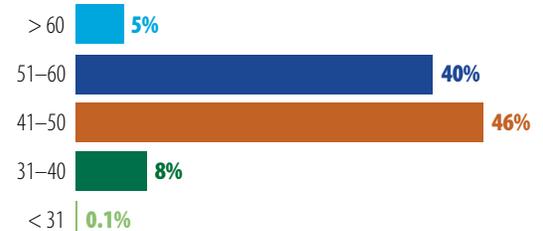
RESEARCHER PROFILE, 2011



Number by qualification (FTEs)



Share by age group (years)



Note: Data exclude expatriate researchers.

CHALLENGE

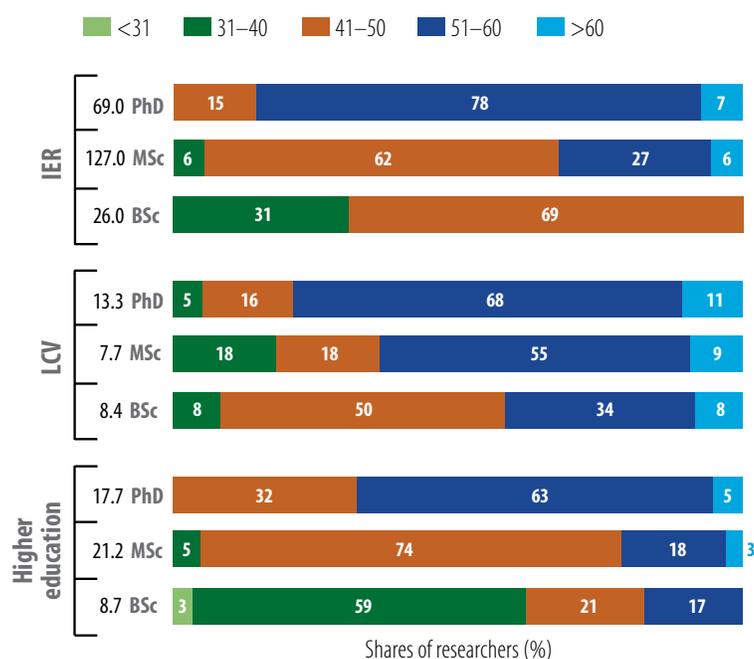
- ▶ IER, LCV, and the higher education agencies are severely challenged in having aging pools of agricultural researchers, particularly among those qualified to the PhD level. Close to half the country's agricultural researchers will reach retirement age in the coming decade. While IER has the autonomy to recruit junior researchers, it requires adequate and stable levels of donor funding in order to do so, and such funding is generally both ad hoc and short-term.

POLICY OPTIONS

- ▶ In order to secure a critical mass of agricultural scientists at the national level, the government of Mali will not only have to recruit and train young researchers without further delay, but also ensure that sufficient financial resources are available to maintain them over time and provide the necessary conditions to motivate them.

In 2011, 86 percent of IER's PhD-qualified researchers were over 51 years of age, as were 79 percent of LCV's, 64 percent of IPR-IFRA's, and all of ISFRA's scientists with PhD degrees. Given that the retirement age is 65 for PhD-qualified researchers (and 62 for all other researchers), the vast majority of Mali's senior researchers are set to retire within the coming decade.

Distribution of agricultural researchers by age bracket, 2011



▶ PREPARING THE NEXT GENERATION OF AGRICULTURAL RESEARCHERS

Maintaining a critical mass of highly qualified researchers and a balanced age structure is essential to ensuring the long-term continuity of agricultural research. Sufficient levels of sustainable long-term government and donor funding need to be made available in the coming years to improve the qualification levels of the nation's agricultural researchers through MSc and PhD training and to allow further recruitment of junior scientists over time. Recruitment and training requirements will need to be clearly defined based on a thorough analysis of the skill set of existing researchers, and how capacity losses over time are likely affect the implementation of future research programs.

Four IER researchers received PhD degrees from IPR-IFRA and from universities in France and the Czech Republic during the first phase of WAAPP (2008–2012). In addition, WAAPP financed local MSc-level training for five more researchers and for a number of short-term training events. USAID and the PAPAM project have also funded some degree-level training in recent years. Much more training and recruitment is urgently needed, however, given that 59 of IER's 69 researchers with PhD degrees are more than 50 years old and will retire within the next 15 years. Consequently, sufficient levels of sustainable long-term government and donor funding will be needed to ensure the recruitment and training of the next generation of Mali's agricultural researchers.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS

	Total number of researchers, 2011 (FTEs)	Growth in number of researchers, 2008–2011	Share of PhD researchers, 2011 (FTEs)
Mali	307.0	-4%	33%
Senegal	112.2	-16%	70%
Burkina Faso	218.0	-12%	48%
Mauritania	62.9	-12%	25%

CHALLENGE

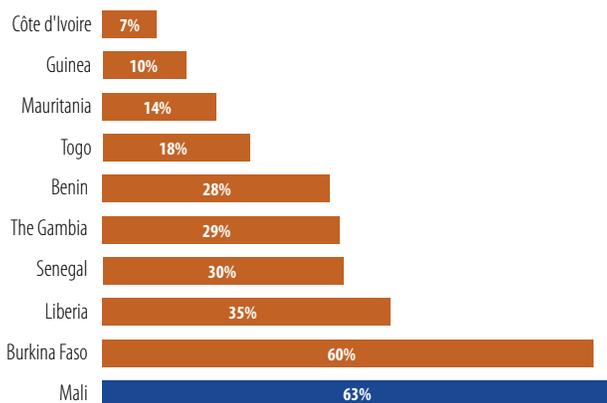
- ▶ Mali's agricultural R&D remains largely dependent on the support of donors and development banks, in particular through a series of projects led by the World Bank, USAID, and the Syngenta Foundation. This dependence on short-term foreign aid projects, combined with modest levels of public funding, creates a great deal of financial uncertainty for the country's agricultural R&D agencies.

POLICY OPTIONS

- ▶ Increased and consistent levels of government support are needed, not only to cover the cost of salaries, but also to allow sufficient funding for the day-to-day running of R&D programs, as well as necessary investments in infrastructure. Donor and development bank funding needs to be better aligned with long-term government priorities, which could potentially be achieved through the CAADP process. Finally, creative mechanisms should be explored to stimulate private-sector R&D funding beyond what is already generated through the cotton industry.

During 2005–2011, on average, the Government of Mali funded 41 percent of IER's total expenditures, the bulk of which was allocated to salaries. Little remained to cover the day-to-day costs of running R&D programs or maintaining laboratories and research equipment, which (as a result) are largely funded through donors, development banks, and contributions from the Malian Company for the Development of Textiles. Compared with national agricultural research institutes across West Africa, IER is extremely dependent on donor and development bank funding.

Comparison of donor and development bank shares of funding to national agricultural research institutes in West Africa, 2011



Note: Data are for the principal agricultural R&D agency in each country. Mauritania data include the National Agricultural Research and Development Center, the National Livestock and Veterinary Research Center, and the Mauritanian Institute of Oceanographic Research and Fisheries.

▶ AID SUSPENSION CAUSES SEVERE FUNDING SHOCKS

Together with Ghana and Senegal, Mali was among the first countries in West Africa to implement the World Bank loan-funded, CORAF/WECARD-administered WAAPP project, which aims to generate and disseminate improved agricultural technologies in alignment with both national and regional priorities. Under the project, centers of excellence for specific crops are established in each participating country; Mali was assigned responsibility for rice. After some initial delays, the first funds of the five-year, US\$15 million project were released in 2009. Between 2009 and 2012, WAAPP assisted IER in implementing 8 strategic research programs, 8 development projects, and 11 smaller projects through a competitive fund. However, the 2012 military coup and conflict in the north of the country caused a suspension of all European Union, African Development Bank, and World Bank aid to Mali. Given IER's substantial reliance on funding from WAAPP (and to a lesser extent PAPAM^a), the institute's research programs were significantly affected. To absorb some of the funding shock, CNRA disbursed about 10 percent of the budgeted project funding under WAAPP as a lump sum, which—needless to say—was insufficient. Such events highlight institutes' vulnerability to shocks in donor and development bank funding, and consequently the need for funding diversification.

Activities under WAAPP and PAPAM were able to continue with funds already disbursed, but in the case of WAAPP little funding actually remained because Phase I was near completion at the time of the aid freeze. PAPAM (2011–2016), on the other hand, had sufficient funds to continue its activities, and so in March 2013 the government decided to continue WAAPP activities under the PAPAM umbrella (for the time being) to provide ongoing continuity and prevent any progress made from being eroded.

^a PAPAM is a six-year, US\$160 million program focusing on four key production systems for staple foods with potential for productivity increases; the project encompasses three main components: technology transfer, irrigation infrastructure, and support for a comprehensive programmatic approach to agricultural development. Note, however, that IER is only a minor beneficiary of PAPAM.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS *continued*

	Total spending, 2011 (million 2005 PPP dollars)	Overall spending growth, 2008–2011	Spending as a share of AgGDP, 2011
Mali	33.6	33%	0.61%
Senegal	24.8	4%	0.83%
Burkina Faso	25.4	29%	0.42%
Mauritania	8.9	22%	0.80%

OVERVIEW OF MALI'S AGRICULTURAL RESEARCH AGENCIES

Four public agencies conduct agricultural R&D in Mali. IER (employing 230 FTE researchers in 2011) is the largest by far. The institute is headquartered in Bamako and runs six regional centers across the country's agroclimatological zones. IER conducts research in a variety of areas, including crops, livestock, forestry, fisheries, production systems, natural resource management, and socioeconomics. LCV (29 FTEs in 2011) is the only other government agency involved in agricultural R&D and focuses mostly on preventing and eradicating animal diseases, and protecting public health by detecting animal-borne diseases. Two institutes under the University of Bamako conduct agricultural R&D. IPR-IFRA (46 FTEs in 2011) constitutes an important link in Mali's agricultural research system because it has provided training for most of IER's researchers. In addition, it conducts research in areas such as plant science, soils, crop protection, and animal and forestry production. ISFRA (2 FTEs in 2011) focuses mostly on animal husbandry and forestry research. Agricultural R&D performed by the private sector in Mali is minimal.



 For a complete list of the agencies included in ASTI's dataset for Mali, visit www.asti.cgiar.org/mali.

ASTI DATA PROCEDURES AND METHODOLOGIES

- ▶ The **data underlying this factsheet** were predominantly derived through primary surveys, although some data were drawn from secondary sources or were estimated.
- ▶ **Public agricultural research** includes research conducted by government agencies, higher education agencies, and nonprofit institutions.
- ▶ ASTI bases its calculations of human resource and financial data on **full-time equivalent (FTE) researchers**, which take into account the proportion of time staff actually spend on research compared with other activities.
- ▶ ASTI presents its financial data in 2005 local currencies and **2005 purchasing power parity (PPP) dollars**. PPPs reflect the relative purchasing power of currencies more effectively than do standard exchange rates because they compare prices of a broader range of local—as opposed to internationally traded—goods and services.
- ▶ ASTI estimates the **higher education sector's research expenditures** because it is not possible to isolate them from the sector's other expenditures.
- ▶ Note that, due to **decimal rounding**, the percentages presented can sum to more than 100.



For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology; for more information on agricultural R&D in Mali, visit www.asti.cgiar.org/mali.

ACRONYMS USED IN THIS FACTSHEET

CAADP	Comprehensive African Agriculture Development Programme
CNRA	National Committee of Agricultural Research
CORAF/ WECARD	West and Central African Council for Agricultural Research and Development
FTE(s)	Full-time equivalent (researchers)
IER	Rural Economy Institute
IPR-IFRA	Rural Polytechnic Institute for Training and Applied Research
ISFRA	Higher Institute of Training and Applied Research
NEPAD	New Partnership for Africa's Development
LCV	Central Veterinary Laboratory
PAPAM	Mali Agricultural Productivity Support Program
R&D	Research and development
USAID	United States Agency for International Development
WAAPP	West Africa Agricultural Productivity Program

ABOUT ASTI, IFPRI, AND IER

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **Agricultural Science and Technology Indicators (ASTI)** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is led by the **International Food Policy Research Institute (IFPRI)**, which—as a CGIAR member—provides evidence-based policy solutions to sustainably end hunger and malnutrition and reduce poverty. The **Institute of Rural Economics (IER)** is Mali's principal agricultural R&D agency. The institute falls under the Ministry of Agriculture and focuses on crop, livestock, forestry, fisheries, and natural resource management research.

ASTI/IFPRI and IER gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. ASTI also thanks the Bill and Melinda Gates Foundation for its generous support of ASTI's work in Africa south of the Sahara. This factsheet has been prepared as an ASTI output and has not been peer reviewed; any opinions are those of the authors and do not necessarily reflect the policies or opinions of IFPRI or IER.