

Statistical Brief

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Statistical Brief on the National Agricultural Research System
of
BURKINA FASO

Valentina Mazzucato

ISNAR INDICATOR SERIES PROJECT: PHASE II
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ISNAR INDICATOR SERIES PROJECT PHASE II

Decision making in the agricultural research policy area in either domestic, regional, or international fora can only be aided by access to reliable and comprehensive data on these systems. It is for this reason that ISNAR initiated its Indicator Series Project in 1986. The major objective of this project is to collect, process, and analyze reliable and comprehensive time-series data on national agricultural research systems (NARSs) throughout the world in order to identify and report on major trends and emerging policy issues with regard to the development of NARSs. To this end a database has been developed that contains time-series data on agricultural research expenditures and personnel for more than 150 developing and developed countries. These data provide a quantitative basis for more in-depth research policy studies by ISNAR and others.

During the first phase of the project (1986-91), the Indicator Series project team produced two major publications published by Cambridge University Press, namely:

Pardey, P.G., and J. Roseboom. (1989) *ISNAR Agricultural Research Indicator Series: A Global Data Base on National Agricultural Research Systems*, 547 pp.; and

Pardey, P.G., J. Roseboom, and J.R. Anderson, eds. (1991) *Agricultural Research Policy: International Quantitative Perspectives*, 462 pp..

The first publication is a statistical reference volume that provides system-level data on agricultural research personnel and expenditures for 154 countries. The second publication draws on the database to report on the major policy dimensions of agricultural research, with a primary focus on less-developed countries.

Phase II of the Indicator Series Project was initiated in 1992 and seeks to update the database and the policy analyses that accompany it. New ISNAR survey data are being used in conjunction with a large variety of published and "informal" reports in order to produce reliable as well as up-to-date information and statistics about the NARSs.

The country-level data are being published in a series of NARS Statistical Briefs. These briefs include more detailed descriptive information about the institutional structure of the NARS as well as a more comprehensive set of statistics than were reported in the 1989 Indicator Series volume. It is envisaged the country-level data will be assembled and analyzed in a series of regional research reports.

These statistical briefs are not official ISNAR publications; they are not edited or reviewed by ISNAR. The information and data presented have been collected and compiled with due care and all reasonable efforts have been made to ensure their accuracy. Comments, corrections, and additions to the material reported in this brief are welcomed. These briefs may be cited with due acknowledgment.

ISNAR ★ P.O. Box 93375 ★ 2509 AJ The Hague, The Netherlands.
Tel: (31) (70) 349-6100 ★ Fax: (31) (70) 381-9677
Email: Internet: ISNAR@CGIAR.ORG

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Acronyms

ADRAO	Association du Développement du Riz d'Afrique de l'Ouest (WARDA)	IITA	International Institute for Tropical Agriculture
AgGDP	Agricultural Gross Domestic Product	INERA	Institut d'Etudes et Recherches Agricoles
CESAO	Centre d'Etudes Economiques et Sociales d'Afrique Occidentale	ISN	Institut des Sciences Naturelles
CEDRES	Centre d'Etudes, de Documentation, de Recherches Economique et Sociale	IRA	Institut de la Recherche Agricole
CERCI	Centre d'Expérimentation du Riz et des Cultures Irriguées	IRAT	Institut de Recherches Agronomiques Tropicales
CGIAR	Consultative Group on International Agricultural Research	IRBET	Institut de Recherche en Biologie et Ecologie Tropicale
CIEH	Comité Interafricain d'Etudes Hydrauliques	IRCT	Institut de Recherche du Cotton et des Textiles Exotiques
CILSS	Comité Permanent Inter-états de Lutte Contre la Sécheresse dans le Sahel	IRFA	Institut de Recherche sur les Fruits et Agrumes
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement	IRHO	Institut de Recherches pour les Huiles et Oléagineux
CNRST	Conseil National pour la Recherche Scientifique et Technologique	IRSN	Institut de Recherche sur les Substances Naturelles
CNSF	Centre National de Semences Forestières	IRSSH	Institut de Recherche en Sciences Sociales et Humaines
CRAF	Centre de Recherche-formation	ISN	Institut des Sciences Naturelles
CRRA	Centre Régional de Recherches Agricoles	ISNAR	International Service for National Agricultural Research
CRTA	Centre de Recherche sur les Trypanosomiasis Animales	ISP	Institut Supérieur Polytechnique
CTFT	Centre Technique Forestier Tropical	IVE	Institut Voltaïque pour l'Energie
CVRS	Centre Voltaïque de Recherche Scientifique	IVRAZ	Institut Voltaïque de la Recherche Agronomique et Zootechnique
DGRST	Direction Générale pour la Recherche Scientifique et Technologique	LBTA	Laboratoire de Biochimie et Technologie Alimentaire
DPVC	Direction de la Protection des Végétaux et du Conditionnement	LDRV	Laboratoire de Diagnostic et des Recherches Vétérinaires
EIER	Ecole Inter-Etats d'Ingénieurs de l'Équipement Rural	LNE	Laboratoire National d'Élevage
ETSHER	Ecole des Techniciens Supérieurs d'Hydrologie et d'Économie Rurale	MAE	Ministère de l'Agriculture et de l'Élevage
FSU	Farming Systems Unit	MESRS	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique
FTE	Full-Time Equivalents	NARS	National Agricultural Research System
IBE	Institut Burkinabé d'Énergie	ORSTOM	Office de la Recherche Scientifique et Technique Outre-Mer
IFAN	Institut Français d'Afrique Noire	PNRA	Programme National de Recherches Agricoles
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics	SAFGRAD	Semi-Arid Food Grain Research and Development
IDA	International Development Association (World Bank)	SRA	Service de la Recherche Agronomique
IDR	Institut du Développement Rural	UNESCO	United Nations Educational, Scientific and Cultural Organization
IEMVT	Institut d'Élevage et de Médecine Vétérinaire des Pays Tropicaux		
IIMI	International Irrigation Management Institute		

1. Introduction

The primary purpose of this brief is to provide various statistical and institutional details on the development and current status of the public agricultural research system in Burkina Faso. This information has been collected and presented in a systematic way in order to inform and thereby improve research policy formulation with regard to the NARS of Burkina Faso. Most importantly, these data are assembled and reported in a way that makes them directly comparable with the data presented in the other country briefs in this series. And because institutions take time to develop and there are often considerable lags in the agricultural research process, it is necessary for many analytical and policy purposes to have access to longer-run series of data.

NARSs vary markedly in their institutional structure and these institutional aspects can have a substantial and direct effect on their research performance. To provide a basis for analysis and cross-country, over-time comparisons, the various research agencies in a country have been grouped into five general categories; government, semi-public, private, academic, and supranational. A description of these categories is provided in table 1.

Table 1: *Institutional Categories*

Category	Description	Examples
Government	Agencies directly administered by government.	Research department within a ministry
Semi-public	Agencies not directly controlled by government and with no explicit profit making objective.	Research institute under a commodity board
Private	Agencies whose primary activity is the production of goods and services for profit.	Agricultural machinery or chemical company
Academic	Agencies that combine university-level education with research.	Faculty of agriculture
Supranational	Agencies whose mandate covers more than one country.	CGIAR institutes

Note: Adapted from OECD (1981).

The concept of a NARS used throughout this report includes only those institutes that can be classified as government, semi-public, and academic agencies. Where it is useful to do so, private and supranational research agencies have been discussed, but for reasons of comparability they are not included in the NARS data reported here. More detailed information on the definitions and concepts used in this brief is provided in appendix 2.

Section 2 provides a brief description of the institutional development and current structure of the NARS. Section 3 presents a statistical overview of the longer-run investment trends in agricultural research along with a more detailed look at contemporary investment orientations. The appendices provide further descriptive details and present the basic research personnel and expenditure data in disaggregated fashion. For general background information and statistics on Burkina Faso we refer to appendix 1.

2. Agricultural Research Institutions

2.1 Historical Development¹

Government Sector

During colonial times the area that now constitutes Burkina Faso was part of French West Africa, under a confederation of French colonies and protectorates with a governor based in Senegal. Although brought under colonial rule in 1892, Burkina Faso was not created until 1920 when it was formed from parts of Niger, Côte d'Ivoire, and Mali. In 1932, however, it was dissolved but recreated in 1947 and called Upper Volta (Europa Publications 1992). Burkina Faso was given its present name in 1984.

The first institutions to conduct agricultural research in Burkina Faso were created under colonial rule. The station at Saria is probably the oldest agricultural experiment station in the country. It was set up as an experimental cotton farm in 1923. During the colonial period most of the research activities in the country were linked with federal agricultural research stations based in Bambey (Senegal) and Kankan (Guinea), which in turn were backstopped by tropical agricultural research agencies in France. At independence in 1960, Burkina Faso inherited four research stations (Farako-Ba, Niangoloko, Saria, and Kamboinsé) but no national institutional structure. The only research institutions at that time with a national statute were the Institut Français d'Afrique Noire (IFAN), created in 1950, and the Laboratoire Vétérinaire, created in 1954.

Although IFAN had a national statute, it collaborated closely with the Organization de la Recherche Scientifique et Technique Outre-Mer (ORSTOM), a French research organization. Most of IFAN's research was on issues unrelated to agriculture and involved disciplines such as anthropology, botany, entomology, geography, history, and sociology. In 1965 IFAN was renamed the Centre Voltaïque de Recherche Scientifique (CVRS).

In 1960 the Laboratoire Vétérinaire became the Laboratoire de Diagnostic et des Recherches Vétérinaires (LDRV), while in that same year a Service de la Protection des Végétaux was created. Crop protection research was included in the mandate of this service. Both agencies were part the Ministère du Développement Rural.

Along with most of the other former French colonies in West Africa, Burkina Faso signed bilateral agreements with France at independence to secure on-going French support for agricultural research. This agreement enabled France to continue as the main executor of agricultural research in the country. In practice France developed, managed, and implemented agricultural research projects through her specialized tropical research institutes. Prior to independence the Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (IRAT) (food crops), the Institut de Recherches pour les Huiles et Oléagineux (IRHO) (oil crops), and the Institut de Recherche du Cotton et des Textiles Exotiques (IRCT) (cotton) managed their research activities in Burkina Faso primarily through their regional centers in Senegal. After 1960, these institutes significantly strengthened their base of operations in Burkina Faso. Forestry research activities were initiated in 1963 by the Centre Technique Forestier Tropical (CTFT). The Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVT) (veterinary research) began conducting research in Burkina Faso in 1972,

¹ This section draws largely from World Bank, FAO, and ISNAR (1983) and UNSECO (1986).

while the Institut de Recherche sur les Fruits et Agrumes (IRFA) (fruit) was another French institute that initiated research in Burkina Faso in 1977. As a consequence of these institutional arrangements, virtually all researchers in the country up until the 1970s were French.

In addition to its close collaboration with CVRS, ORSTOM was involved in several other research activities in Burkina Faso. As of 1961, ORSTOM provided OCCGE (an inter-governmental organization to combat plagues based at Bobo-Dioulasso) with a team of about eight specialists in onchocercosis and entomology. In 1967, ORSTOM opened its own office in Ouagadougou. Initially, it primarily supported the development efforts of the Direction pour l'Hydraulique et d'Ingénierie Rurale as well as those of the Comité Inter-Africain d'Etudes Hydrauliques (CIEH) and the Ecole Inter-Etats d'Ingénieurs et de l'Équipement Rural (EIER), which both were established in Ouagadougou in 1970. CIEH conducts research on hydraulic engineering and trains students through the EIER school.

Throughout the 1960s France was virtually the only external source of support for agricultural research in Burkina Faso. During the 1970s several additional international agencies provided support for research. In 1973, the Centre d'Expérimentation du Riz et des Cultures Irriguées (CERCI) was created with the support of UNDP/FAO and the Association du Développement du Riz d'Afrique de l'Ouest (ADRAO). That same year ADRAO set up a subregional office in Burkina Faso. In 1975 the Centre de Recherche sur les Trypanosomiasis Animales (CRTA) was established with assistance from France (IEMVT) and Germany (GTZ). Two international research centers, ICRISAT and IITA, initiated research activities in Burkina Faso in 1975 and 1977, respectively. SAFGRAD, a regional research project coordinated by the Organization for African Unity, began research on cereals and grain legumes in 1977. In 1979 SAFGRAD established a Farming Systems Unit (FSU) in collaboration with Purdue University of the United States. CILSS also initiated research at this time.

During the 1960s and early 1970s, the official local counterpart for the French and international agricultural research agencies was the Ministère de l'Agriculture et de l'Élevage (MAE). But in fact little coordination or joint work actually took place. In 1974 a Service de la Recherche Agronomique (SRA) was created within the new Ministère du Développement Rural (formerly the MAE) but it did not improve this situation. Meanwhile, CVRS and UNESCO initiated several national consultations concerning the country's science and technology policy. This eventually led to the creation of the Ministère de l'Enseignement Supérieur et de la Recherche Scientifique (MESRS) in 1978. Within MESRS the Direction Générale pour la Recherche Scientifique et Technologique (DGRST) became responsible for developing the government's science and technology policy. Subsequently, the responsibility for the research activities of IRAT, IRHO, IRCT, and CTFT was transferred from the Ministère du Développement Rural to DGRST. At that time, it was anticipated that the activities of these institutes would merge into a new institute, namely the Institut de Recherche Agronomique. However, this institute never became operational.

In 1981 the MESRS was reorganized and the Centre National de la Recherche Scientifique et Technologique (CNRST) was created to supervise five new research institutes, namely (1) the Institut Voltaïque de la Recherche Agronomique et Zootechnique (IVRAZ), which regrouped the French institutions IRAT, IRCT, and IRHO, the CERCI project, and the network of research stations (Saria, Kamboinsé, Farako-Bâ, and Niangoloko), and acted as the main coordinating body for these different structures. The activities of international and regional agencies such as IITA, ICRISAT, FSU, and SAFGRAD were also affiliated with IVRAZ; (2) the Institut de Recherche en Biologie et Ecologie Tropicale (IRBET), which was formed by regrouping CTFT

with the Département des Sciences de la Nature et Environnement of CVRS; (3) the Institut de Recherche en Sciences Sociales et Humaines (IRSSH), which replaced the Département de Sciences Sociales et Humaines of CVRS; (4) the Institut VoltaVque pour l'Energie (IVE); and (5) the Institut de Recherche sur les Substances Naturelles (IRSN). Although IRBET was created as one of the five CNRST institutes, it remained under CTFT's management until 1990. ORSTOM's activities in Burkina Faso were not formally integrated into CNRST but remained loosely connected to DGRST. In 1991 the Laboratoire de Biochimie et Technologie Alimentaire (LBTA) was created as the sixth CNRST institute.

In 1983 a Programme National de Recherches Agricoles (PNRA) was developed to formulate a general agricultural research policy that would encompass all the different research activities being conducted throughout the country. This marks the first time that the government of Burkina Faso clearly expressed its desire to take charge of the planning, implementation, and evaluation of the nation's agricultural research program (Ouali 1987). The adoption of the PNRA in 1985 marks a turning point for the Burkinabé research system. IVRAZ became responsible for managing all the research activities brought under its mandate, including those of the French institutes. To consolidate the further integration of the different entities under IVRAZ, the institute was reorganized in 1986/87 and renamed Institut d'Etudes et de Recherches Agricoles (INERA). INERA consists of a center for research and training in Kamboinsé and five regional stations.

In addition to the institutes under CNRST, several other government agencies undertake agricultural research in Burkina Faso. Within the Ministère de l'Agriculture et des Ressources Animales the most important units that conduct agricultural research are the Laboratoire National d'Elevage (LNE, formerly LDRV), the research laboratories of the Direction de la Protection des Végétaux et du Conditionnement, the soils laboratory of the Bureau National des Sols, and CRTA. The responsibility for this latter institute is shared with DGRST. Within the Ministère de l'Environnement et Tourisme is the Direction des Pêches (which was created in 1976 but did not initiate fisheries research until 1990) and the Centre National de Semences Forestières (CNSF), which was established in 1983.

Academic Sector

The creation of the Ecole Normale Supérieur in 1965 marks the beginning of the development of an academic sector in Burkina Faso. The school was renamed Centre d'Enseignement Supérieur in 1969 and became the Université de Ouagadougou in 1973. The university comprises several centers and institutes that are similar in many respects to faculties. In 1973, diploma- and degree-level education in agriculture and forestry was initiated with the establishment of the Institut Supérieur Polytechnique (ISP) within the Université de Ouagadougou. In 1985, the ISP was partitioned into the Institut des Sciences Naturelles (ISN) and the Institut du Développement Rural (IDR). ISP's agricultural research activities were continued by IDR, while ISN, which in the early 1990s became the Faculty of Science, took over the more basic research in the field of biology. In addition to these two institutes, the Centre d'Etudes, de Documentation, de Recherche Economique et Sociales (CEDRES) was established in 1977 as part of the Ecole Supérieure des Sciences Economiques of the Université de Ouagadougou.

As well as these national academic institutes, Burkina Faso is host to three regional academic institutes, namely the EIER (see above), the Centre d'Etudes Economiques et Sociales d'Afrique Occidentale (CESAO), and the Ecole Inter-Etats des Techniciens Supérieurs de

l'Hydraulique et de l'Équipement Rural (ETSHER). The CESAO is associated with the Centre d'Études Économiques et Sociales pour l'Afrique de l'Ouest in Switzerland. It was founded in 1960 and offers postgraduate courses in the social sciences. ETSHER was established in 1972 and trains hydraulic and rural engineers. It reports to the ministry in charge of water.

2.2 Present Structure

The CNRST institutes comprise the largest part of the Burkinabé NARS. Together, they account for 79% of the FTE researchers in the government and academic sectors (table 2). CNRST is a semi-autonomous, government agency administered by the ministry in charge of higher education and scientific research. Its mandate is to contribute to the creation of national scientific policy, ensure research-development linkages, design and execute scientific research programs, diffuse scientific information, and assist in scientific training of researchers. CNRST engages in research related to physical, human, and socioeconomic environments, sustainable management of natural resources, desertification, traditional medicine, cash crops, renewable resources, energy saving, conservation and transformation of food products, and postharvest technology.

INERA is the largest of the CNRST institutes comprising 65% of CNRST's total FTE researchers. It is concerned with crop and livestock production systems. It also offers technical advice to the extension service, and helps train researchers and extension agents. These activities are performed at five regional centers (CRRA) located throughout the country and one center for research and training (CRAF). Researchers at INERA are grouped into eight research programs: production systems; water, soil-fertility, irrigation and agricultural machinery; livestock production system; sorghum-millet-maize; oleaginous plants and leguminous grains; horticultural and tuber crops; rice; and cotton.

IRBET is the second largest CNRST institute with 12% of the agency's FTE researchers. It conducts research on forestry, biology, and ecology. It has four programs: forestry, ecology-environment, botany, and zoology. Historically, INERA and IRBET jointly accounted for approximately 90% of the total funding received by CNRST institutes (Sedogo and Belem, 1993). In fact, in 1991 they received over 93% of total funding (appendix 5b). IRSSH is primarily concerned with history, sociology, anthropology, and geography. Its projects include studies of migration and urbanization, the socioeconomic environment of the rural sector, the structure of land tenure and management of the environment, and sociocultural transformation and development. LBTA engages in research on industrial and traditional methods of food processing and conservation, and conducts quality control tests of food products. IBE conducts research on renewable energy and IRSN on natural substances.

The CNRST has various departments to coordinate these six centers. It has the Direction de l'Information Scientifique et Technique that collects management data and is responsible for publishing all scientific results; the Direction Scientifique that plans all scientific activities, recruits researchers, and coordinates staff development; the Direction de la Coopération Scientifique responsible for all official relations between the CNRST institutes and foreign collaborators as well as public relations; and the Direction des Affaires Administratives et Financières that manages administrative, financial, and human resources.

Other institutes in addition to CNRST also conduct agricultural research. The CNSF under the Ministère de l'Environnement et du Tourisme conducts research on varietal breeding for tree nurseries, natural forests, and agroforestry. The Direction des Pêches, also located under the

Table 2: Overview of Present Structure of NARS (1992)

Institutional category	Supervising agency		Executing agency		Research focus	Staffed research sites ^a	Number of researchers										
	Name	Acronym	Name	Acronym			National	Expats	Total	FTEs							
Government	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique; Centre National de la Recherche Scientifique et Technique (CNRST)	INERA	Institut d'Etudes et Recherches Agricoles	crops, livestock, soils, irrigation, socioeconomic, farming systems	8 (6)	56	17	73	73.0								
										Institut de Recherche en Biologie et Ecologie Tropicale	IRBET	botany, zoology, ecology, forestry	9 (2)	9	5	14	14.0
	Institut de Recherche en Sciences Sociales et Humaines	IRSSH	history, sociology, anthropology, geography	1 (1)	11	0	11	11.0									
									Institut Burkinabé d'Energie	IBE	renewable energy	1 (1)	9	0	9	2.3	
	Ministère de l'Agriculture et des Ressources Animales	Direction de la Protection des Végétaux et du Conditionnement	DPVC	plant protection	2 (2)	10	2	12	9.6								
										Laboratoire National d'Élevage ^b	LNE	veterinary medicine	3 (3)	4	0	4	2.8
	Ministère de l'Environnement et du Tourisme	Direction des Pêches	fisheries	1 (1)	1	1	2	1.6									
									Centre National de Semences Forestières	CNSF	forestry	6(5)	7	3	10	7.5	

Table 2: Overview of Present Structure of NARS (1992) (contd.)

Institutional category	Supervising agency	Executing agency			Research focus	Staffed research sites ^a	Number of researchers			
		Name	Acronym	Acronym			National	Expats	Total	FTEs
Academic	Université de Ouagadougou	Institut du Développement Rural	IDR		social sciences	2 (2)	14	6	20	5.0
		Centre d'Etudes, de Documentation, de Recherches Economique et Sociale	CEDRES		sociology, economics	1 (1)	19	4	23	3.5
<i>Total</i>						<i>38 (27)</i>	<i>153</i>	<i>38</i>	<i>191</i>	<i>142.5</i>

Source: 0999.

^a Figures in parentheses represent those sites staffed with full-time research personnel.

^b Part of "Direction des Services de l'Elevage et des Industries Animales".

same ministry, began conducting fisheries research in 1990 through the *Projet de Valorisation du Potentiel Halieutique* that was initiated in 1986 with European Community funds. The *Direction de la Protection des Végétaux et du Conditionnement*, which replaced the *Service de la Protection des Végétaux* in 1988, is administered by the *Ministère de l'Agriculture et des Ressources Animales*. It conducts plant protection research on sorghum, millet, rice, and horticultural crops. Under the same ministry is the *Laboratoire National d'Elevage (LNE)* created in 1988 to replace the *LDRV*. Although in the past it was also concerned with human medicine, it now concentrates only on veterinary medicine.

In the academic sector, the *IDR* conducts research in agronomy, livestock, and forestry, and also trains researchers to the *ingénieur agronome* level. The faculty of science of the University of Ouagadougou conducts some basic research in the field of biology but no agricultural research. However, students at *IDR* must first complete two years of studies at the faculty of science before they can enter *IDR*. *CEDRES* engages in agriculturally related socioeconomic research.

Since the mid-1980s, some international and bilateral organizations have closed down their operations in Burkina Faso, while some new research initiatives have gotten underway. *ICRISAT* ceased its in-country activities in 1988. *IITA* operates only through research networks, and the *SAFGRAD/FSU* project ended in 1986. *ORSTOM* continues to conduct its research separate from the *CNRST* structures while *CIRAD* researchers work through *INERA* or *IRBET*. In 1991 *IIMI* began a research program in Burkina Faso and has a permanent office located in the country. *EIER*, *CIEH*, and *ETSHER* all continue to be based in Burkina Faso. The World Bank began funding a *Projet de Recherche Agricole* in the late 1980s, and also helps coordinate the contributions of all donor agencies to the *CNRST* institutes.

3. NARS Statistics

The national research system of Burkina Faso is a fairly complex system to document because research is conducted by various institutions under different ministries, and the institutions have been restructured numerous times, changing names and accounting systems each time. All this makes data on the NARS quite sketchy and it has been difficult to construct a consistent time series of data for the entire NARS. In 1991, there were ten research institutes in the government sector located under three different ministries and two institutes/departments in the academic sector (table 2). Data from 1985-91 were obtained from questionnaires filled out by the institutes. For years prior to 1985, secondary data sources were used. Often these sources gave conflicting or incomplete data. We have sought to construct the most consistent and realistic set of data possible given these constraints.

Given our definition of a NARS (section 1), international agencies are not included in the data reported below, although donor funds received by the national institutions have been included. Regional organizations discussed in the historical section of this brief (such as *EIER*, *CIEH*, *ETSHER*, *SAFGRAD*, and *ADRAO*) are also excluded from these data. The only national organization excluded from the following discussion is the *Bureau National des Sols*. It did not return a completed questionnaire because it did not consider itself a research institution but more as a service to categorize soil types. Furthermore, as the faculty of science in the academic sector conducts basic research in biology but does no agricultural research it was also excluded from these data.

The expenditure data presented in this brief are based on the actual expenditures as reported by the various institutes. However, institutes systematically underestimate the degree of donor

support to the degree they only have information about the donor support that is channeled through their accounting system. Most importantly they often underreport or fail to report the salaries and supplements paid directly to expatriate researchers. To correct for this problem an implicit cost series was constructed for expatriate researchers (see appendix 2) and, where necessary, this was added to the expenditures reported by the various institutes.

3.1 Long-term development

The number of researchers in the NARS grew considerably between 1961-91 with the largest increase occurring between 1976-85 (table 3). In fact, the ratio of researchers per million farmers increased between 1961-91 at an annual rate of 7.8%. Although research staff has grown rapidly, the number of researchers per million farmers has remained low in Burkina Faso compared with the average for sub-Saharan Africa. In 1961-65 the number of researchers per million farmers (4.8) was only a third of the corresponding regional average of 15 (Pardey, Roseboom, and Anderson 1991). By the early 1980s this difference was less pronounced but was still considerably below the regional average of 42 researchers per million farmers.

Research expenditures grew in real terms by 7.7% per annum since 1961. The ratio of research expenditures to AgGDP grew by 6.5% per annum. But this was from a very low base of 0.12% in the early 1960s, so that by 1991 Burkina Faso's research intensity ratio (i.e., agricultural research expenditure as a percentage of AgGDP) had only reached 0.84%. The heavy expatriate presence in Burkina Faso's research system in the early 1960s meant that spending per scientist figures were high by contemporary international and regional standards. Subsequently, the growth in research expenditures failed to keep pace with the growth in personnel so that spending per scientist declined, on average, by 2.0% per annum since 1961. In 1991, however, spending per scientist grew to above its 1971-75 level as INERA, the largest component of the

Table 3. *Researcher and Expenditure Series, 1961-91.*

	1961-65	1966-70	1971-75	1976-80	1981-85	1986-90	1991	annual growth rate ^a
								%
Researchers	11.8	21.2	37.2	64.5	105.8	113.1	142.4	9.7
Expenditures (million 1985 CFA)	228	355	473	735	993	1,409	2,209	7.7
Expenditures (million 1985 PPP dollars) ^b	1.910	2.982	3.968	6.168	8.333	11.820	18.535	7.7
Expenditures per researcher (1985 PPP dollars) ^b	163,000	141,000	108,000	96,000	79,000	104,000	130,000	-2.0
Number of farmers (millions)	2.5	2.7	2.9	3.2	3.5	3.9	4.1	1.8
Researchers per million farmers	4.8	7.9	12.7	20.0	29.9	29.2	35.0	7.8
AgGDP (millions 1985 PPP dollars)	1,650	1,641	1,609	1,698	1,877	2,221	2,198	1.1
Expenditures as a % of AgGDP	0.12	0.18	0.25	0.36	0.44	0.53	0.84	6.5

Source: See appendices 5 and 6.

Note: Includes INERA, IRBET, LBTA, IRSSH, IBE, IRSN, LNE, DPVC, CNSF, IDR, and CEDRES.

^a Compound annual growth rate 1961-91.

^b For information about "PPP dollars" see appendix 2.

Burkinabé NARS, slowed the rate of growth of its research staff, while at the same time a number of new, donor-funded projects got underway.

3.2 Human Resources

Degree and Nationality Status of Researchers

It has not been possible to compile a detailed, longer-run data series on the degree status of research personnel working in Burkina Faso. But it is known that until 1985 the research system was dominated by French researchers working in French institutes. Increasingly, during the 1970s and 1980s, with the help of donor funding, an increasing number of Burkinabé researchers were trained so that by 1985-91, Burkinabé researchers comprised over 80% of the researchers working in the government sector (table 4). The majority of these researchers had an MSc degree but the largest increase was among those with a PhD degree, their number grew from 22 to 39 between 1985 and 1991. The share of total researchers with PhDs is high compared with the rest of Francophone West Africa. Researchers trained to the PhD level are found within both the academic and government institutions. In CEDRES, for example, all national researchers have a PhD degree. All of the researchers with BSc degrees work for the CNRST institutes.

Table 4. *Educational and Nationality Status of Researchers*

Researchers	1985	1986	1987	1988	1989	1990	1991
	<i>(full-time equivalents)</i>						
Nationals							
PhD	21.9	25.3	24.5	28.1	32.1	35.7	39.2
MSc	39.0	46.0	42.4	40.6	42.2	55.7	55.7
BSc	1.5	1.5	1.5	2.5	2.5	3.5	3.5
Subtotal	62.5	72.8	68.4	71.2	76.8	94.8	98.3
Expatriates	14.2	13.4	14.9	15.2	17.9	18.7	21.7
<i>Total</i>	<i>76.7</i>	<i>86.2</i>	<i>83.2</i>	<i>86.4</i>	<i>94.7</i>	<i>113.5</i>	<i>120.0</i>

Source: 0999.

Note: Figures do not include IRBET, CEDRES and IDR.

CIEH and EIER are excluded from the figures in table 4 given the regional rather than national character of the work done by these institutes. But it is noteworthy that in 1991 CIEH had four researchers, all of whom were expatriates, and EIER had 30 researchers of whom 28 were expatriates. The faculty in both schools dedicated about 15% of their time to agricultural research. IIMI personnel are also excluded from table 4 given that they work for an international organization. In 1991 IIMI had seven full-time researchers located in Burkina Faso, two of whom were expatriates.

Gender

In 1991, 12 of the 101.2 FTE national researchers in the government sector were women. Although this figure is low, it represents a significant increase over the 3.2 women present in the system in 1985.

It is noteworthy that in 1991 the five national researchers working at IIMI were female.

Staff Composition

Table 5 shows the staffing structure for nine institutes in the government sector. The number of support staff per researcher was calculated for each institute. This ratio was highest for the Direction des Pêches, which had six support staff for each researcher in 1991. INERA had almost five per researcher, while the lowest level of support staff was reported by IRSSH which had less than one support staff per researcher.\

Table 5. *Staffing Structure, 1991*

	Government								
	INERA	IRBET	IRSSH	LBTA	IRSN	CNSF	D. des P.	DPVC	LNE
	<i>(number of personnel)</i>								
Research ^a	73	14	11	5	8	10	2	12	4
Support ^b									
Technical	126	18	6	3	14	13	5	12	12
Administrative	69	5	2	2	5	5	3	4	2
Other	158	21	1	2	6	11	4	15	4
<i>Total</i>	<i>426</i>	<i>58</i>	<i>20</i>	<i>12</i>	<i>33</i>	<i>39</i>	<i>14</i>	<i>43</i>	<i>22</i>
Support/Researcher	4.8	3.1	0.8	1.4	3.1	2.9	6.0	2.6	4.5

Source: 0999.

^a May not correspond with researcher totals in other tables as these figures represent the total number of staff and are not in FTE terms.

^b Technical and administrative support staff are defined as those staff that have a secondary education plus additional professional training or equivalent experience. The other support staff category comprises agricultural laborers, watchmen, drivers, and so on.

3.3 Financial Resources

Expenditures

The government sector continues to account for an overwhelmingly large share of Burkina Faso's agricultural research expenditures (table 6). Since 1961, government sector expenditures grew by 7.4% per annum, and 10.4% annually since 1985. The large increase experienced in the late 1980s is largely because of the World Bank funded National Agricultural Research Project which amounted to a five billion CFA loan for the period 1989-94. In 1993 48% of CNRST funding came from this IDA loan (Sedogo and Belem, 1993). Further events that led to an increase in government-sector expenditures were the creation of a research unit in the Direction des Pêches in 1990 (through the Projet de Valorisation du Potentiel Halieutique au Burkina Faso) and the establishment of LBTA in 1991.

Research expenditures by the academic sector grew from the early 1970s to the early 1980s, but have declined since the mid-1980s.

Although regional and international institutes are not included in table 6, it is worth noting that while EIER was completely financed by foreign donors in 1991, CIEH and IIMI both received one quarter of their total funding from the Burkinabé government.

Table 6. *Agricultural Research Expenditures*

Institutional category	1961-65	1971-75	1981-85	1986	1987	1988	1989	1990	1991
	<i>(million 1985 CFA)</i>								
Government	228	450	919	1,200	1,157	1,200	1,411	1,756	2,154
Academic	0	23	74	91	72	65	49	43	55
<i>Total</i>	<i>228</i>	<i>473</i>	<i>993</i>	<i>1,291</i>	<i>1,230</i>	<i>1,264</i>	<i>1,460</i>	<i>1,799</i>	<i>2,209</i>
	<i>(million 1985 PPP dollars)</i>								
<i>Total</i>	<i>1.910</i>	<i>3.968</i>	<i>8.333</i>	<i>10.835</i>	<i>10.316</i>	<i>10.608</i>	<i>12.248</i>	<i>15.095</i>	<i>18.535</i>

Source: See appendix 5.

Factor Mix

Only two institutes (INERA and LNE) reported expenditures by cost category but, as they account for over 60% of government sector researchers, they were taken to be indicative of the general pattern of government-sector spending on research. The share of INERA's total spending going to personnel ranged between 46.6% and 71.4% over the 1985-91 period (table 7). Personnel salaries comprised their lowest share of total research expenditures in years when there were substantial capital expenditures as is the case in 1991 when much of the IDA loan went for capital purchases. The same is true for LNE, where personnel expenditures accounted for only 35.4% and 34.0% of total expenditures in 1989 and 1990 respectively. In those years large capital expenditures were made. In 1988 and 1991, years in which there were no capital expenditures, 94.6% and 78.6% of research expenditures went for paying personnel salaries, respectively.

Table 7. *Cost Categories*

Institute	Cost category	1985	1986	1987	1988	1989	1990	1991
		<i>(percentages)</i>						
INERA	Personnel	66.1	66.1	71.1	71.5	66.0	53.5	46.6
	Operating	31.6	25.4	26.7	26.4	21.4	28.0	18.3
	Maintenance	0.0	0.0	0.0	0.0	3.1	6.4	4.7
	Training	0.0	0.0	0.0	0.0	0.9	1.2	1.1
	Capital	2.2	8.5	2.2	2.1	8.6	10.9	29.2
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
LNE	Personnel	na	na	na	94.6	35.4	34.0	78.6
	Operating	na	na	na	5.4	11.1	9.8	21.4
	Maintenance	na	na	na	0.0	8.5	0.0	0.0
	Training	na	na	na	0.0	0.0	0.0	0.0
	Capital	na	na	na	0.0	45.0	56.2	0.0
	<i>Total</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Source: 0999.

Source of Funds

Government-sector research institutes get most of their funding from international donors (table 8). Over the period 1985-91, the donor share of agricultural research spending grew from 58% to 77%, mainly as a consequence of to the aforementioned National Agricultural Research Project. Additionally, in 1991 IRSN received US\$ 333,000 in 1985 PPP dollar terms from donors to establish a unit on medicines made from naturally occurring substances.

Table 8. *Source of Funding*

Institute	Source of funding	1985	1986	1987	1988	1989	1990	1991
		<i>(percentages)</i>						
INERA	Government	48.7	48.8	47.5	46.4	40.9	28.6	20.5
	Sales	0.9	0.9	1.0	1.0	1.0	1.2	1.1
	Donor	50.4	50.3	51.4	52.6	58.1	70.2	78.3
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
IRSHH	Government	13.5	17.0	12.9	13.3	13.0	12.7	12.7
	Sales	0.1	0.3	0.1	0.2	0.2	0.1	0.1
	Donor	86.4	82.8	87.0	86.5	86.8	87.2	87.2
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
IBE	Government	na	21.5	23.6	24.7	28.9	30.8	46.1
	Sales	na	0.0	0.0	0.0	0.7	1.5	4.9
	Donor	na	78.5	76.4	75.3	70.4	67.7	49.0
	<i>Total</i>	<i>na</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
IRSN	Government	na	na	na	na	100.0	100.0	9.8
	Donor	na	na	na	na	0.0	0.0	90.2
	<i>Total</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>100</i>	<i>100</i>	<i>100</i>
CNSF	Government	24.0	16.9	16.7	15.3	33.7	18.6	32.2
	Donor	76.0	83.1	83.3	84.7	66.3	81.4	67.8
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
Direction des Pêches	Government	0	0	0	0	0	26.4	21.6
	Donor	0	0	0	0	0	73.6	78.4
	<i>Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>100</i>	<i>100</i>
DPVC	Government	18.0	17.7	15.2	15.4	15.0	16.9	17.5
	Donor	82.0	82.3	84.8	84.6	85.0	83.1	82.5
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
TOTAL	Government	41.7	38.2	37.1	36.3	36.2	26.1	20.7
	Sales	0.7	4.7	4.4	4.1	3.2	2.8	2.0
	Donor	57.6	57.2	58.5	59.7	60.6	71.2	77.2
	<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Source: 0999.

3.4 Research Focus

In 1991 about one-third of the FTE government sector researchers' time was spent on crop research, followed by natural resources (20.9%), forestry (12.5%), livestock (8.5%), and fisheries (2.4%). The other category, which accounted for 23.2% of total FTE researchers, includes some 12 researchers at INERA conducting farming systems research. The rest of the researchers in this category conduct non-allocatable socioeconomic and some anthropology and geography research.

The research focus of international and regional institutes working in the country vary by institute. IIMI works on irrigation management issues with about 30% of its time dedicated to rice in 1991. Most of the work conducted by ORSTOM relates to the forestry and "other" categories while SAFGRAD works exclusively on cereals and grain legumes.

Table 9. *Research Focus, 1991.*

Institute	Research orientation						Total
	Crops	Livestock	Forestry	Fisheries	Natural resources	Other	
INERA	31.4	7.3			15.3	19.0	73.0
IRBET			9.8	0.8		3.4	14.0
IRSSH					3.7	7.3	11.0
LBTA	3.2			1.0			4.2
IBE					2.3		2.3
IRSN					8.0		8.0
CNSF			7.5				7.5
DP				1.6			1.6
DPVC	9.6						9.6
LNE		2.8					2.8
IDR	2.0	2.0	0.5		0.5		5.0
CEDRES						3.5	3.5
<i>Total (FTEs)</i>	<i>46.2</i>	<i>12.1</i>	<i>17.8</i>	<i>3.4</i>	<i>29.8</i>	<i>33.2</i>	<i>142.5</i>
<i>Total (%)</i>	<i>32.4</i>	<i>8.5</i>	<i>12.5</i>	<i>2.4</i>	<i>20.9</i>	<i>23.2</i>	<i>100</i>

Source: 0999.

Note: The "natural resources" and "other" categories include research that could not otherwise be allocated to a specific commodity or commodity group. The natural resource category refers to unallocatable soils, land use, and water research.

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This bibliography comprises three different sets of references. The “references” section relates to references cited in the text, the “data sources” to references from which data have been extracted to construct the time series (see appendices 5 and 6), and “other references” to references that have been consulted in the process of data collection but not used explicitly.

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- 1292 Sedogo, M.P., and C.P. Bélem. "Le Financement Public de la Recherche Agricole: Cas du Burkina Faso." Paper presented at the FAO/SPAAR Expert Consultation on Funding Agricultural Research in Sub-Saharan Africa, Nairobi, Kenya, 6-8 July 1993.
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Appendix 1: Country Background Information



Geography

Area: 27.4 million ha

Location: West Africa; Land-locked state bordered to the south by Côte d'Ivoire and Ghana, by Niger to the east and by Mali to the north and west.

Agroecological features: mainly influenced by low and erratic rainfall and poor soils. Entire country in semi-arid tropics subdivided into 3 zones: Sahelian with low rainfall (300-600 mm) July till mid-September; North Sudanian with medium rainfall (600-900 mm) June till mid-September; South Sudanian with relatively high rainfall (900-1200 mm) end May till mid-October. The amount of rainfall tends to diminish over the years during the last 2 decades. In Sahel nomadic livestock + subsistence farming; in South Sudanian mixed subsistence and commercial (cotton) farming.

Population

Total (1991): 9.3 million

Annual growth rate (1981-90)^a: 2.6%

Literacy (1990): 18.2%

Life expectancy (1991): 48 years

Economy (values reported in 1985 PPP dollars)

Gross Domestic Product (1990): 5,454 million dollars

Per capita GDP (1990): 605 dollars

Agricultural GDP (1990): 2,166 million dollars

Share of agriculture in GDP (1991): 39.7%

Annual growth rates (1981-90)^a

GDP: 3.7%

GDP per capita: 1.1%

AgGDP: 2.9%

Trade (values reported in current dollars)

Net surplus total trade (1991): -358 million dollars

Net surplus agricultural trade (1991): 34 thousand dollars

Percentage of agricultural imports in total imports: 18.1%

Percentage of agricultural exports in total exports: 36.8%

Major import commodities (1991)^b: rice (38%), concentrated milk (11%), and wheat (10%)

Major export commodities (1991)^b: cotton lint (80%), and bovine cattle (14%)

Agriculture

Agricultural land (1990): 13.6 million ha

Annual growth rate (1981-90)^a: 0.7%

Percentage arable: 26.2%

Percentage permanent crop: 0.1%

Percentage permanent pastures: 73.7%

Percentage irrigated arable and permanent cropland: 0.6%

Economically active agricultural population (1991): 4.1 million

Annual growth rate (1981-90)^a: 1.8%

Percentage in total economically active population: 84.2%

Fertilizer use per ha arable land (1990): 3.9 kg

Annual growth rate (1981-90)^a: -6.7%

Major crops (in order of importance): sorghum, millet, cotton lint, groundnuts, seed cotton, maize.

Sources: Europa Publications (1992), FAO (1993), and World Bank (1992).

^a Least squares growth rate.

^b Bracketed percentages represent value share of the respective total.

Appendix 2: Definitions and concepts

NARS

The construction of quantitative and internationally comparable expenditure, personnel, and related measures of a national agricultural research system (NARS) requires a precise idea of what, in fact, is being measured. Since the term NARS is subject to a variety of interpretations, it is necessary to define rather precisely the NARS concept used here. Our approach adheres, wherever possible, to the internationally accepted statistical procedures and definitions developed by the OECD and UNESCO for compiling R&D statistics (OECD 1981 and UNESCO 1984). For statistical purposes a NARS is defined in terms of the following characteristics:

(a) *National*. The concept of a “national” system used in this report refers to domestically targeted research activities funded and/or executed by the *public* sector of a particular country. A relatively broad concept of the public sector is taken to include government, semi-public, and academic research institutes. However, private, for-profit research as well as the research activities of supranational research agencies that are not executed through national institutes are excluded. Also excluded is research undertaken by short-term development projects.

(b) *Agricultural*. Agricultural research, as defined here, includes crop, livestock, forestry, and fisheries research, as well as research on agricultural inputs, the natural resource base, and socioeconomic aspects of primary agricultural production. It excludes, where possible, research concerning the off-farm storage and processing of agricultural products, commonly referred to as post-harvest research and food-processing research. This delineation corresponds with the national accounts definition of the agricultural sector.

(c) *Research*. Research is often performed in conjunction with other activities such as extension, education, and production. To the extent possible, research activities (in terms of expenditures and staff) are differentiated from these other activities. However, if non-research activities were an integral part of an institute’s research activities and accounted for less than 20% of the resources of the institute, it was expedient to classify all the activities of the institute as being research-related.

Full-Time Equivalent (FTE)

A full-time equivalent researcher year is taken to be a person who holds a full-time position as a researcher during the whole year. Adjustments to full-time equivalents have only been made when: (a) a research position was part-time; (b) a research position was not

filled for the whole year; and (c) if the position explicitly involved tasks other than agricultural research. In the latter case an estimate was made of the time spent on agricultural research. No adjustments were made, however, for vacation or sick leave nor for time spent on administration, meetings, travel or other activities that form part of the normal duties required to support a research endeavor. Following this line of reasoning, professional staff in management positions were classified as researchers.

The degree status of researchers is determined on the following basis: 3-4 years full-time university education (BSc), 5-6 years (MSc), and more than 6 years plus doctorate thesis (PhD). The following is the equivalence between degrees from a French and United States system: Diplôme d’Ingénieur des Travaux, des Sciences Appliquées = technician; Licence, Maîtrise = BSc; Diplôme d’Etudes Approfondies, Diplôme d’Ingénieur (Agronome, Vétérinaire, etc) = MSc; Doctorat (de IIIème Cycle, d’Ingénieur, de Thèse Unique ou d’Université), Doctorat d’Etat = PhD.

Expatriate Researcher Costs

Many expatriate researchers working on donor-supported projects in NARSs are paid their salaries and living expenses directly by the donor agency. All (or some substantial fraction) of these costs do not get included in the financial reports of the agricultural research organizations. To calculate these *implicit* costs we took the average cost per researcher in 1985 to be 167,000 “1985 PPP dollars”. This figure represents the costs of expatriate researchers working in Niger under USAID contracts as estimated by Mazzucato and Ly (1993) using detailed USAID expense accounts. It includes the costs of salaries and benefits such as housing, shipping, travel to and from country, and so on. This approximation makes the assumption that the personnel-cost for expatriates in Niger is a reasonable proxy for the cost of internationally recruited staff working in the NARSs throughout Francophone West Africa.

Deflators and Exchange Rates

All expenditure figures were first compiled in current local currency units (appendix V). In order to facilitate comparisons over time and across countries these figures are deflated with a local GDP deflator to base year 1985, and then converted to a common currency (US dollars) using the 1985 purchasing power parity (PPP) over GDP. PPPs are synthetic exchange rates that attempt to reflect the purchasing power of a country’s currency. The PPPs used here are derived from the Penn World Table (Mark 5), which is based on the

benchmark studies of the International Comparison Project (Summers and Heston 1991). For additional information on currency conversion methods in this context see Pardey, Roseboom, and Craig (1992).

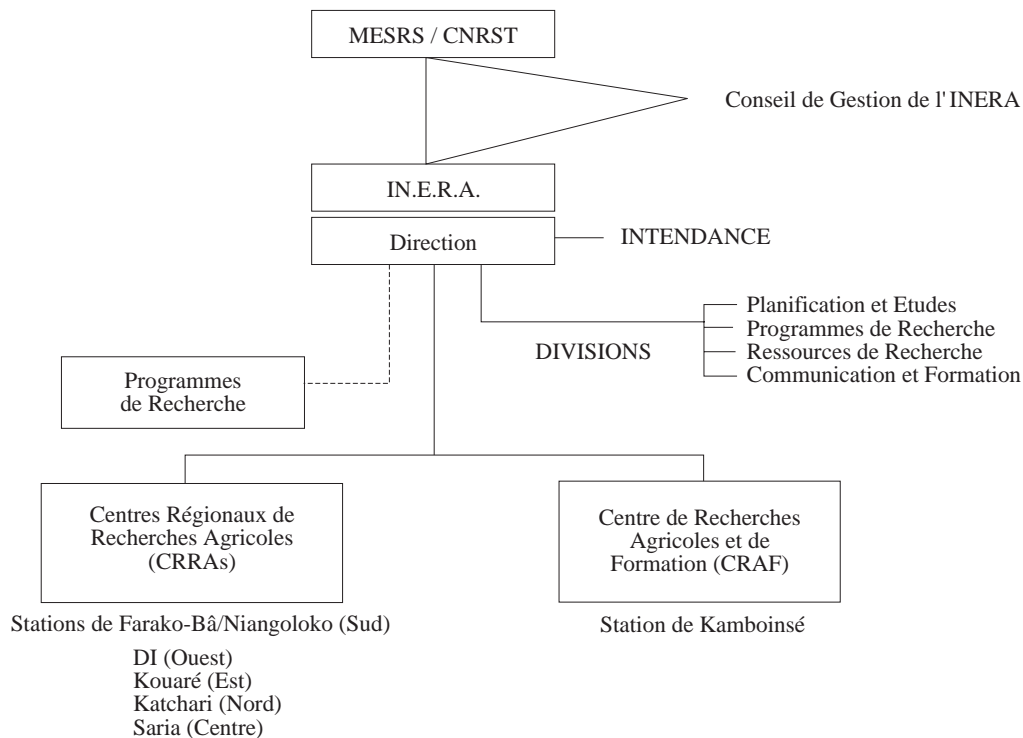
Nomenclature for tables in text

A zero indicates an actual observation of zero, a dash indicates an observation is not relevant (due to institutional mergers, closures, and so on), while “na” indicates an observation that is not available.

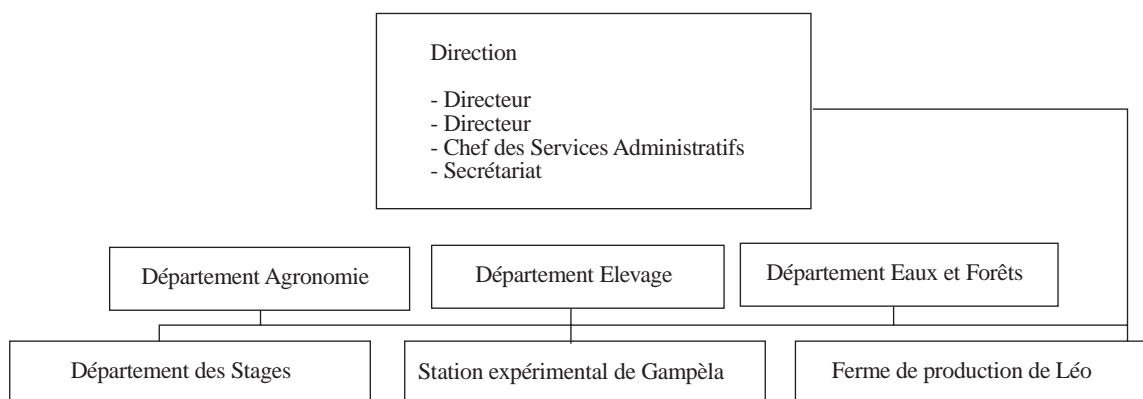
In the text we note any marked deviations from these data compilation norms and include points of clarification if warranted.

Appendix 3: Organizational charts of the agricultural research institutes

Institut d'Etudes et Recherches Agricoles (1992)

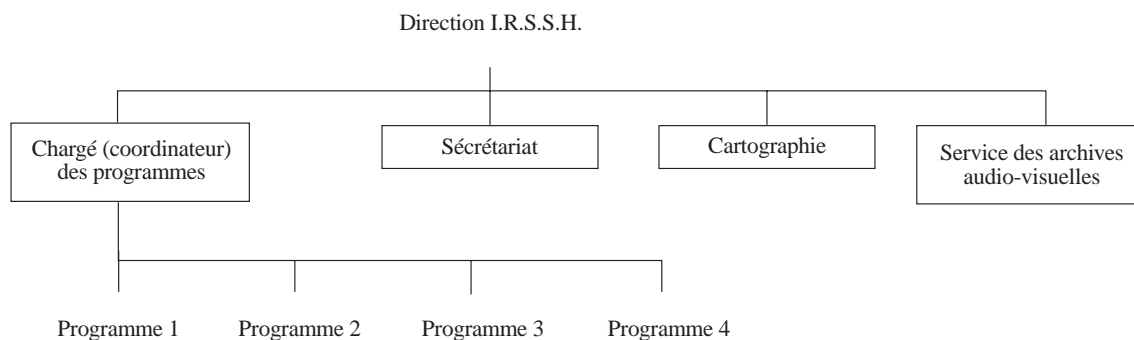


Institut du Développement Rural (1992)



Appendix 3: Organizational charts of the agricultural research institutes (contd.)

Institut de Recherche en Sciences Sociales et Humaines (1992)



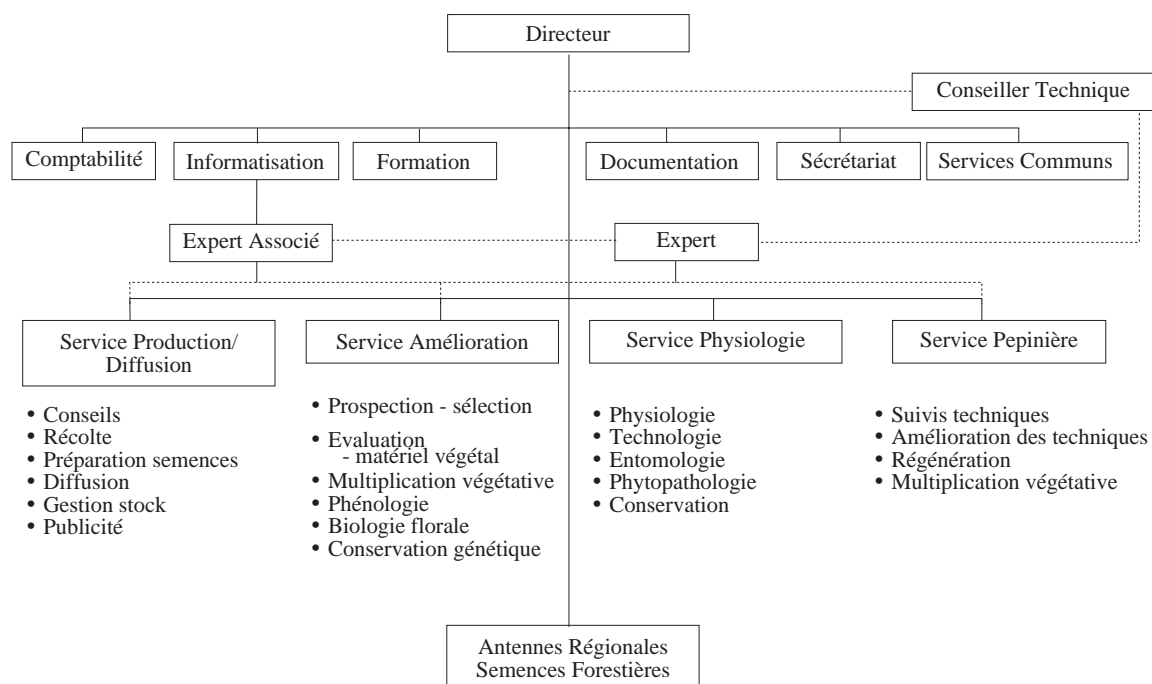
Programme 1: Connaissance socioéconomique du monde rural au Burkina Faso

Programme 2: Structures foncières et gestion de l'environnement au Burkina Faso

Programme 3: Migrations et urbanisation au Burkina Faso

Programme 4: Transformations socioculturelles et développement au Burkina Faso

Centre National de Semences Forestières (1992)



Appendix 4: Addresses of the agricultural research institutes

Directeur Général
CNRST
B.P. 7192
Ouagadougou
BURKINA FASO

Directeur Général
INERA/CNRST
03 B.P. 7192
Ouagadougou 03
BURKINA FASO

Directeur
IRBET/CNRST
B.P. 7047
03 Ouagadougou 03
BURKINA FASO

Directeur
CRTA/CNRST
B.P. 454
Bobo-Dioulasso
BURKINA FASO

Directeur
LBTA/CNRST
B.P. 7047
Ouagadougou
BURKINA FASO

Directeur
IRSSH/CNRST
03 B.P. 7047
Ouagadougou 03
BURKINA FASO

Directeur
Laboratoire National d'Élevage (LNE)
Direction des Services de l'Élevage et des Industries
Animales
Ministère de l'Agriculture et des Ressources
Animales
03 B.P. 7026
Ouagadougou 03
BURKINA FASO

Directeur
Direction de la Protection des Végétaux et du
Conditionnement
Ministère de l'Agriculture et des Ressources
Animales
01 B.P. 5362
Ouagadougou 01
BURKINA FASO

Directeur
Projet Valorisation du Potentiel Halieutique au
Burkina Faso
Direction de la Pêche et de la Pisciculture
Ministère de l'Environnement et du Tourisme
03 B.P. 7044

Ouagadougou 03
BURKINA FASO

Directeur
CNSF
01 B.P. 2682
Ouagadougou 01
BURKINA FASO

Université de Ouagadougou
B.P. 7021
Ouagadougou
BURKINA FASO

Directeur
EIER
03 B.P. 7023
Ouagadougou 03
BURKINA FASO

Délégué du CIRAD
01 B.P. 596
Ouagadougou 01
BURKINA FASO

Appendix 5a: Researcher totals, 1961-91

Total Number of FTE Researchers

Category	Name institute	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Government	INERA (a)					3.0	3.6	4.4	5.3	6.4	8.0	9.2	10.6	12.2	14.0	16.1	18.5
	IRBET																
	IRSSH																
	LBTA																
	IBE																
	IRSN																
	CNSF																
	Dir des Peches																
	DPVC	3.5	3.7	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.5	5.7	6.0	6.3	6.6	6.9
	LNE	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Academic	IDR													5.0	5.0	5.6	6.2
	CEDRES																
French	CIRAD (b)	6.0	6.0	7.0	7.0	8.0	9.0	9.0	9.0	10.0	14.0	10.0	16.8	15.0	15.8	17.4	19.0
TOTAL		10.1	10.3	11.4	11.6	15.8	17.6	18.6	19.7	22.0	27.8	25.3	33.7	38.8	41.7	46.3	51.2
Sources:		10	1262	1076	1076	1076	10	10	1262	532	266;589	589	431;1262	589;1262	1262	1262	888;1262
				1262	1262	1262	1262	1262	1262	1262	1262	1262	1264	1264	1264	1264	1264

Category	Name institute	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Government	INERA (a)	21.3	24.5	28.1	32.4	41.0	42.2	43.5	44.8	46.0	55.0	50.0	47.0	56.0	72.0	73.0	
	IRBET				2.0	2.0	2.0	2.0	5.6	10.0	8.2	9.4	10.7	12.0	13.0	14.0	
	IRSSH					2.3	3.3	4.3	5.3	8.0	8.0	8.0	10.0	11.0	11.0	11.0	
	LBTA																
	IBE						1.2	1.8	2.2	2.5	2.8	2.8	2.8	2.8	2.8	2.2	4.2
	IRSN						3.0	3.3	3.6	3.9	4.1	4.4	4.7	5.0	7.0	8.0	
	CNSF							1.8	2.8	3.4	3.4	6.8	9.8	7.5	7.5	7.5	
	Dir des Peches																
	DPVC	7.2	7.5	7.9	8.2	8.6	9.0	9.4	9.8	12.0	12.0	10.4	10.4	10.4	10.4	8.8	9.6
	LNE	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.8	2.0	2.8	2.8	
Academic	IDR	6.4	6.7	6.7	7.0	6.7	7.3	7.8	8.3	9.9	9.9	7.0	6.0	4.0	4.0	5.0	
	CEDRES	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.5	3.8	3.6	3.4	3.3	3.3	3.4	
French	CIRAD (b)	20.6	22.2	23.8	29.0	27.0	36.0	30.3	36.0	100.1	108.0	103.3	106.6	113.9	133.7	142.4	
TOTAL		57.6	63.3	69.2	81.4	90.9	107.6	107.9	122.5	100.1	108.0	103.3	106.6	113.9	133.7	142.4	
Sources:		1262	1078	888	746	957	24	83; 1264	228;1264	888; 999	384	999	999	999	999	999	
		1264	1262	1262	1264	1264	1264	384;1266	1266	922	888; 999						

Note: Italicized figures represent data that are either constructed or interpolated.

(a) Includes national researchers working in CVRS, IRA, and IVRAZ, all of which are institutes that INERA inherited.

(b) After 1984 CIRAD researchers working permanently in Burkina are reported under the appropriate CNRS institute. The following CIRAD institutes are included: IRAT, IRHO, IRCT, IRFA, IEMVT, and CTFT.

Appendix 5b: Expenditure totals, 1961-91

Total Research Expenditures		Units: millions of current FCFA															
Category	Name institute	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Government	INERA					5,259	6,308	7,897	9,026	11,558	15,000	17,108	20,000	24,845	31,473	39,414	48,545
	IRBET																
	IRSSH																
	LBTA																
	IBE																
	IRSN																
	CNSF																
	Dir des Peches																
	DPVC	9,395	10,226	10,463	11,544	12,170	12,617	13,655	13,493	14,936	15,604	16,908	18,816	20,314	23,406	26,661	29,868
	LNE	0,723	0,752	0,736	0,776	0,782	0,500	0,802	0,758	0,802	0,801	0,830	0,883	0,911	1,004	1,093	1,171
Academic	IDR													12,604	13,883	16,798	19,791
	CEDRES																
French	CIRAD	45,800	45,998	52,494	55,367	63,775	72,900	73,580	69,508	81,732	110,200	78,500	110,594	107,455	124,717	149,621	175,035
Total (current FCFA)		55,919	56,976	63,694	67,687	81,986	92,325	95,935	92,784	109,029	141,605	113,346	150,293	166,129	194,482	233,587	274,409
GDP Deflator		27.4	28.5	27.9	29.4	29.7	29.4	30.4	28.7	30.4	30.4	31.5	33.5	34.6	38.1	41.4	44.4
Total (constant 1985 FCFA)		203,980	199,740	228,265	229,990	276,399	314,018	315,365	322,881	358,513	466,198	360,228	448,970	480,817	510,996	563,597	618,189
Total (constant 1985 PPP dollars)		1,711	1,676	1,915	1,930	2,319	2,635	2,646	2,709	3,008	3,911	3,022	3,767	4,034	4,287	4,729	5,187
Sources:		10				589					448	589	431,448	589			

Category	Name institute	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Government	INERA	65,554	86,240	105,362	132,602	190,377	213,060	560,000	675,117	790,234	791,003	796,401	830,100	1,057,862	1,324,250	1,765,570	
	IRBET				14,606	16,553	17,978	18,866	56,236	105,345	85,765	105,024	120,842	141,497	154,474	233,021	
	IRSSH					6,853	10,712	14,673	19,300	37,144	29,465	38,849	37,511	38,404	39,496	39,450	
	LBTA																
	IBE						14,644	21,515	29,490	34,325	47,750	43,500	41,500	35,500	33,250	25,500	
	IRSN						10,527	12,100	14,021	15,863	17,018	19,254	21,028	15,000	6,000	51,000	
	CNSF							31,610	54,478	88,080	122,736	108,332	120,758	92,097	174,420	139,544	
	Dir des Peches																
	DPVC	36,686	43,897	48,780	55,840	66,195	75,197	82,544	92,045	98,227	100,254	106,943	117,194	123,584	112,699	133,854	
	LNE	1,375	1,573	1,671	1,829	2,729	2,951	3,092	3,271	4,741	4,890	5,282	14,322	47,190	114,252	51,995	
Academic	IDR	24,296	29,001	30,810	35,123	38,269	44,817	50,449	57,423	69,954	65,506	53,786	51,731	34,956	29,790	44,288	
	CEDRES	4,300	5,739	6,968	8,578	10,802	12,905	14,774	17,062	19,249	25,522	22,511	18,475	18,726	19,541	19,831	
French	CIRAD	222,901	274,852	313,100	331,200	341,900	343,500										
Total (current FCFA)		355,111	441,301	506,690	579,778	673,679	746,291	809,614	1,018,444	1,263,161	1,289,909	1,299,883	1,373,461	1,604,816	2,043,124	2,562,367	
GDP Deflator		52.1	59.6	63.3	69.3	78.6	85.3	89.5	95.5	100.0	99.9	105.7	108.5	109.9	113.6	116.0	
Total (constant 1985 LCU)		681,279	740,098	799,869	836,313	857,455	874,625	904,144	1,066,880	1,263,161	1,291,410	1,229,556	1,266,336	1,459,824	1,799,189	2,209,126	
Total (constant 1985 PPP dollars)		5,716	6,209	6,711	7,017	7,194	7,338	7,586	8,951	10,598	10,835	10,316	10,625	12,248	15,095	18,535	
Sources:					746	957	24	83,258	431	999	999	999	999	999	999	999	

Note: Italicized figures represent data that are either constructed or interpolated.

Appendix 6: Research staff development by institute

Institut d'Etudes et Recherches Agricoles (INERA)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	
Nationals																	
PhD																	
MSc																	
BSc																	
Subtotal										4				2			
Expatriates										4							
Total						3.0	3.6	4.4	5.3	6.4	8	9.2	10.6	12.2	14.0	16.1	18.5
Source:										266							
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	
Nationals																	
PhD									10	13	12	13	15	17	18		
MSc									25	31	27	21	25	38	36		
BSc									1	1	1	2	2	3	2		
Subtotal						27		32	36	45	40	36	42	58	56		
Expatriates						14		12		10	10	11	14	14	17		
Total	21.3	24.5	28.1	32.4	41	42.2	44	44.8	46	55	50	47	56	72	73		
Source:					957		384		999	999	999	999	999	999	999		

Institut de Recherche en Biologie et Ecologie Tropicale (IRBET)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD														3	2	
MSc														5	7	
BSc														1	0	
Subtotal							0		7					9	9	
Expatriates								2		3				4	5	
Total				2.0	2.0	2.0	2	5.6	10	8.2	9.4	10.7	12.0	13	14	
Sources:							384		922					999	999	

Institut de Recherche en Sciences Sociales et Humaines (IRSSH)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									8	8	8	10	11	11	11	
MSc									0	0	0	0	0	0	0	
BSc									0	0	0	0	0	0	0	
Subtotal									8	8	8	10	11	11	11	
Expatriates									0	0	0	0	0	0	0	
Total						2.3	3.3	4.3	5.3	8	8	8	10	11	11	11
Sources:									999	999	999	999	999	999	999	

Laboratoire de Biochimie et Technologie Alimentaire (LBTA)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD																2
MSc																1
BSc																1.2
Subtotal																4.2
Expatriates																0
Total																4.2
Source:																999

Institut Burkinabe d'Energie

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									8	9	9	9	9	9	8	
MSc																
BSc									2	2	2	2	2	2	1	
Subtotal									10	11	11	11	11	11	9	
Expatriates									0	0	0	0	0	0	0	
Total									5.0	7.0	9.0	10	11	11	9	
FTE research						1.2	1.8	2.2	2.5	2.8	2.8	2.8	2.8	2.8	2.2	
Source:									999	999	999	999	999	999	999	

Appendix 6: Research staff development by institute (contd.)

Institut de Recherche sur les Substances Naturelles (IRSN)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									2	2	2	3	3	3	3	4
MSc									2	2	2	2	2	4	5	4
BSc																
Subtotal									4	4	4	5	5	7	8	8
Expatriates									0	0	0	0	0	0	0	0
Total						3.0	3.3	3.6	4	4	4	5	5	7	8	8
Source:									999	999	999	999	999	999	999	999

Centre National de Semences Forestieres (CNSF)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									0	0	0	0	0	0	0	
MSc									3	4	7	11	8	7	7	
BSc									0	0	0	0	0	0	0	
Subtotal									3	4	7	11	8	7	7	
Expatriates									1	0	2	2	2	3	3	
Total							2.1	3.3	4	4	9	13	10	10	10	
FTE research							1.8	2.8	3.4	3.4	6.8	9.8	7.5	7.5	7.5	
Source:									999	999	999	999	999	999	999	

Direction des Peches

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD														1	1	
MSc														0	0	
BSc														0	0	
Subtotal														1	1	
Expatriates														1	1	
Total														2	2	
FTE research														1.6	1.6	
Source:														999	999	

Direction de la Protection des Vegetaux et du Conditionnement (DPVC)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Nationals																
PhD																
MSc																
BSc																
Subtotal																
Expatriates																
Total	5.0	5.2	5.5	5.7	6.0	6.3	6.5	6.9	7.2	7.5	7.8	8.2	8.6	9.0	9.4	9.8
FTE research	3.5	3.7	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.5	5.7	6.0	6.3	6.6	6.9
Source:																
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									0	0	0	0	1	2	3	
MSc									11	11	9	10	9	7	7	
BSc									0	0	0	0	0	0	0	
Subtotal									11	11	9	10	10	9	10	
Expatriates									4	4	4	3	3	2	2	
Total	10.3	10.7	11.2	11.8	12.3	12.9	13.4	14.1	15	15	13	13	13	11	12	
FTE research	7.2	7.5	7.9	8.2	8.6	9.0	9.4	9.8	12.0	12.0	10.4	10.4	10.4	8.8	9.6	
Source:									999	999	999	999	999	999	999	

Appendix 6: Research staff development by institute (contd.)

Laboratoire National d'Elevage (LNE)																
	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Nationals																
PhD																
MSc																
BSc																
Subtotal																
Expatriates																
Total	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
FTE research	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Sources:																
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									0	0	0	0	0	0	0	
MSc									5	5	5	5	5	4	4	
BSc									0	0	0	0	0	0	0	
Subtotal				3					5	5	5	5	5	4	4	
Expatriates				1					1	1	1	1	0	0	0	
Total	4.0	4.0	4.0	4	5.3	5.2	5.2	5.2	6	6	6	6	5	4	4	
FTE Research	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.9	0.9	0.9	2.1	2.0	2.8	2.8	
Sources:				746					999	999	999	999	999	999	999	

Institut du Developpement Rural (IDR)																
	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Nationals																
PhD																
MSc																
BSc																
Subtotal																
Expatriates																
Total													18.0	18.0	20.0	22
FTE Research													5.0	5.0	5.6	6.2
Source:																888
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD																4
MSc																6
BSc																4
Subtotal									20	20	14	12	12	12	14	
Expatriates									11	10	8	8	8	6	6	
Total	23.0	24.0	24	25.0	24.0	25.9	27.8	29.7	31	30	22	20	20	18	20	
FTE Research	6.4	6.7	6.7	7.0	6.7	7.3	7.8	8.3	9.9	9.9	7.0	6.0	4.0	4.0	5.0	
Source:			888						999	999	999	999	999	999	999	

Centre d'Etudes, de Documentation, de Recherches Economique et Sociale (CEDRES)																
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD									19	19	19	19	18	18	19	19
MSc																
BSc																
Subtotal									19	19	19	19	18	18	19	19
Expatriates									4	6	5	4	4	4	4	4
Total	10.0	11.7	13.3	15.0	16.7	18.3	20.0	21.7	23.3	25	24	23	22	22	23	23
FTE Research	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.5	3.8	3.6	3.4	3.3	3.3	3.4	3.4
Source:										999	999	999	999	999	999	999

Appendix 6: Research staff development by institute (contd.)

French tropical agricultural research institutes: IRAT, IRHO, IRCT, IEMVT, IRFA, and CTFT.

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Nationals																
PhD																
MSc																
BSc																
Subtotal																
Expatriates																
Total	6	6	7	7	8	9	9	9	10	14	10	17	15	16	17	19
Sources:	10	1262	1076	1076	1076	10	10	1262	532	589	589	431;1 262	589;1 262	1262	1262	1262
			1262	1262	1262	1262	1262		1262	1262	1262	1264	1264	1264	1264	1264
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Nationals																
PhD																
MSc																
BSc																
Subtotal																
Expatriates																
Total	21	22	24	29	27	36	30	36								
Sources:	1262	1078	1262	746	1265	24	1264	228;1 264								
	1264	1262		1264		1264	1266	1266								

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