

THE SCIENCE AND TECHNOLOGY PROFILE OF THE REPUBLIC OF COTE D'IVOIRE

List of abbreviations

ADRAO:	Association pour le Développement de la Riziculture en Afrique de l'Ouest (WARDA)
AISA:	Association Ivoirienne des Sciences Agronomiques
CEMV:	Centre d'Entomologie Médicale et Vétérinaire
CES:	Centre d'Enseignement Supérieur
CIRAD:	Centre de coopération Internationale pour la Recherche Agronomique et le Développement
CIRT:	Centre Ivoirien de Recherche Technologique
CSRS:	Centre Suisse de Recherches Scientifiques
CTFT:	Centre Technique Forestier Tropical
ENSA:	Ecole Nationale Supérieure d'Agronomie
ENSTP:	Ecole Nationale Supérieure des Travaux Publics
IAB:	Institut Agricole de Bouaké
IDEFOR:	Institut des Forêts
IDESSA:	Institut des Savanes
IEMVT:	Institut de l'Elevage et de la Médecine Vétérinaire Tropicale
IITA:	International Institute for Tropical Agriculture
INSET:	Institut National Supérieur de l'Enseignement Technique
INSP:	Institut National de la Santé Publique
IPR:	Institut Pierre Richet
IRAT:	Institut de Recherche en Agronomie Tropicale et cultures vivrières
IRCT:	Institut de Recherche sur le Coton et les Textiles exotiques
LANADA:	Laboratoire National d'Appui au Développement Agricole
LBTP:	Laboratoire du Bâtiment et Travaux Publics
ORSTOM:	Office de la Recherche Scientifique et Technique Outre Mer

General introduction to the country and the S&T system

Côte d'Ivoire borders Liberia and Guinea

to the west, Mali and Burkina Faso to the north, Ghana to the east, and the Gulf of Guinea to the south. The country has at its disposal many natural resources and is divided into two climatic zones: a tropical climate and savannahs in the North and a subequatorial climate in the South with large forests.

Côte d'Ivoire has got some industrial and mining companies such as the Société Ivoirienne d'Aquaculture Lagunaire, the Société de Développement de la production Sucrière, the Société des plantations d'hévéa du Grand Béréby, the Société de Distribution des Eaux de Côte d'Ivoire, the Société de Développement des Forêts, the Société Géologique de Côte d'Ivoire, the Société Ivoirienne de Raffinerie, the Société des Mines d'Ity, the Société des Mines de l'Afferma, the Société du Développement Minier, the Société d'Exploitation Pétrolière (PETROCI). Some important foreign companies as Blohorn, Nestle, Hydrochem, Rhône-Poulenc, and Sofaco also settled in the country. Tertiary industries count approximately 650 businesses employing 100,000 people.



Despite an important industrial sector, Côte d'Ivoire remains essentially an agricultural country. The economy relies on two major products: cacao and coffee, of which the country has been respectively the first and fifth exporter. Economic growth reached an average of 7% of GDP per year during the two first decades of independence from 1960 to 1979. A deep economic crisis then hurt the country the consequences of which are still visible. Financial difficulties began with the increase in interest rates that caused external debt and public expenses to grow. Thanks to a great harvest, the situation improved but in 1987, the decrease in prices of raw materials caused a deeper state of depression. Consequently, secondary and tertiary sector received a smaller share of GDP than before.

Table 1: Demographic indicators

Indicators 1975-2003	Total population (2003) ⁽¹⁾	Population under age 15 (2003) ⁽¹⁾	Urban population (1975) ^{(1) 1 2}	Urban population (2003) ^{(1) 1 2}	Migration stock (2000) ⁽²⁾	Annual population growth rate (1975-2003) ⁽¹⁾	Population living below \$2 a day (Data refer to the most recent year available from 1990 to 2003) ⁽¹⁾
Measure	Million Inhab.	(% of total)	(% of total)	(% of total)	(% of population)	%	(%)
	17.6	42.4	32.1	44.9	14.8	3.5	38.4

Source UN (United Nations). World Urbanization Prospects. Department of Economic and Social Affairs, Population Division. New York.

(1): UNDP Human development indicators

(2): world development indicators

1 - Because data are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

2 - Data refer to medium-variant projections.

Table 2: Social indicators

Indicators 2000-2003	Life expectancy at birth (2003) ⁽¹⁾	Infant mortality rate (2003) ⁽¹⁾	Adult literacy rate (2003) ⁽¹⁾	Net secondary enrolment ratio (2002/2003) ^{(1) 1 2 3}	Public expenditure on education (2000-2002) ^{(1) 5}	Public health expenditure (2002) ⁽¹⁾
Measure	Years	(per 1,000 live births)	(% ages 15 and above)	(%)	(% of GDP)	(% of GDP)
	45.9	117	48.1	21 ^{6 4}	4.6 ⁶	1.4

(1) : UNDP Human development indicators

(2) : world development indicators

Source: UNESCO Institute for Statistics

1 - The net enrolment ratio is the ratio of enrolled children of the official age for the education level indicated to the total population of that age. Net enrolment ratios exceeding 100% reflect discrepancies between these two data sets.

2 - Enrolment ratios are based on the new International Standard Classification of Education, adopted in 1997 (UNESCO, 1997. International Standard Classification of Education 1997. [http://portal.unesco.org/uis/TEMPLATE/pdf/iscd/ISCED_A.pdf]. Accessed March 2005.), and so may not be strictly comparable with those for earlier years.

3 - Data on net enrolment ratios refer to the 2002/03 school year, and data on children reaching grade 5 to the 2001/02 school year, unless otherwise specified. Data for some countries may refer to national or UNESCO Institute for Statistics estimates. For details, see <http://www.uis.unesco.org/>. Because data are from different sources, comparisons across countries should be made with caution.

4 - Preliminary UNESCO Institute for Statistics estimate, subject to further revision.

5 - Data refer to the most recent year available during the period specified.

6 - Data refer to a UNESCO Institute for Statistics estimate where no national estimate is available.

Table 3: Economic indicators

Indicators 1975-2003	GDP per capita annual growth rate (1975-2003) ⁽¹⁾	GDP per capita (2003) ⁽¹⁾	GDP (2003) ⁽¹⁾	Structure of output (2003) ⁽²⁾		
				Agriculture	Industry	Services
Measure	%	(PPP US\$)	(PPP US\$ billions)	%	%	%
	-1.9	1,476	26.8	26	19	55

(1) : UNDP Human development indicators

(2) : world development indicators

Sources: World Bank. World development indicators 2005

The unemployment data are from the ILO database *Key Indicators of the Labour Market*, third edition.

From 1970 to 1985, the country worked towards the institutionalization and nationalisation of research. Benefiting favourable economic conditions, training and financing strongly improved but the crisis stopped the expansion and caused the degradation of research conditions. The elaboration of the national scientific research system was progressive and led to the current privatization of agronomic research, the creation of a Centre National de Recherche Agronomique and the project of a strategic plan for research.

1. History of science

Modern science was, as in many African countries, introduced by colonists. First recorded research activities concerned agriculture and were performed in trial gardens created at the end of the 19th century. By the 1920s, they were transformed in experimental stations, each one specializing in a type of crops. Information there recorded was then analysed in France by research institutes. From 1942 to 1958, research institutes were created in the country and other ones after the independence in 1960. They were mainly focused on agricultural sciences but research activities also expanded to the domain of geosciences.

At the end of the colonial era, agricultural research started to focus on food crops and on not only export products - but it was still entirely controlled by French institutions. This situation lasted until 1971 and the creation of the ministry of scientific research. This was the start of permanent reforms of the system and also the beginning of a real national research policy. The ministry was commissioned to provide for necessary human and material resources, direct research towards economic and social development and to take the control of research infrastructures on the territory. The period of great economic growth was also a time of prosperity for research. It became a major interest and many debates were organised on its management. Since the end of the 1970s, national institutions have led and controlled research while creating new research centres, defining programmes and orientations, managing training and supporting research output. A specific ministry dedicated to research was created in 1971: it embodied the recognition of research as a sector of activity as such. Its great stability until 1983 corresponded to the prosperous period of research in Côte d'Ivoire. Nevertheless, this institution neglected an important factor of research prosperity: the linking with higher education, which trains researchers. It was indeed the centre of the reform of 1981 that created a Ministry of Higher Education and Scientific Research. Despite many name and role changes designed to adapt to the situation, the system remained quite stable and efficient because men in power remained the same. In 1984, an agreement with France was signed asserting the sovereignty of Côte d'Ivoire as far as every building of French research structures on the territory. At the same time, the university was decentralized. However, this great involvement in research disappeared when economic crisis occurred.

Even if science remained a priority in the official line, public funds and real policies for research support were considerably reduced.

Table 4: Research institutions during the colonisation in Côte d'Ivoire

Year founded	Name	Fields	Location	Administrative supervision
1893	trial garden	palm trees	Dabou	
1900	trial garden	cocoa, coffee	Biengerville	
1903	trial garden		Hann	
1942-1958	Institut de Recherche sur les Huiles et Oléagineux	edible oil		
1942-1958	Institut de Recherche sur le Coton et les Textiles exotiques	cotton, textile		
1942-1958	Institut des Fruits et Agrumes	Fruits		
1942-1958	Institut de Recherche sur le Café et le Cacao	cocoa, coffee		
1942-1958	Centre de Recherche Océanographique	oceanography		ORSTOM
1942-1958	Institut de l'Elevage et de la Médecine Vétérinaire Tropicale	animal production		
1942-1958	Office de la Recherche Scientifique et Technique Outre Mer	soils, plants		
1960	Institut de Recherche en Agronomie Tropicale et cultures vivrières	tropical agriculture, food crops	Bouaké	

Table 5: Higher Education institutions in Côte d'Ivoire

Year founded	Name	Fields	Location	Notes
1959	Centre d'Enseignement Supérieur	sciences, law, humanities	Abidjan	
1963	Abidjan university	sciences, law, humanities, medicine	Abidjan	ex CES
1977	Ivory Coast university	sciences, law, humanities and social sciences, medicine, dentistry, pharmacy (1985)	Abidjan	
1992	University centre		Abidjan	renamed Cocody university in 1995
1992	University centre		Abobo-Adjamé	
1992	University centre		Bouaké	
1996	Institut National Polytechnique Félix Houphouët-Boigny	Technology	Yamoussoukro	ENSTP + IAB + ENSA + INSET
	Ecole Normale Supérieure			
	Ecole Normale Supérieure des Travaux Publics			
	Ecole Normale Supérieure Agronomique			

Table 6: Research governing authorities in Côte d'Ivoire

Year founded	Name
1971	Ministère de la Recherche Scientifique
1981	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique
1983	Ministère de l'Education Nationale et de la Recherche Scientifique
1986	Ministère de la Recherche Scientifique
1989	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique
1993	Ministère de l'Enseignement Supérieur et de l'Innovation Technologique
1998	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique

2. Governance of science

The creation of the Ministère de l'Éducation Nationale et de la Recherche Scientifique in 1983 originated the current style of organisation. Research programmes are submitted to the agreement of an institution. Two main structures control research : the Direction de la Programmation, du Financement, de la Formation et de la Promotion du Personnel de la Recherche Scientifique and the Direction de la Valorisation de la Recherche et de l'Information Scientifique et Technique. The latter is supposed to help researchers to succeed in their applications. The way of managing and financing research structures under the administrative supervision of the Centre International de Recherche Agronomique pour le Développement was specified in a bilateral agreement with France.

2.1 R&D Performers

The university, the Centre National de Recherche Agronomique and the National Polytechnic Félix Houphouët-Boigny are the three major R&D performers of the country. Since 1996, they all have evolved in different ways, each one experimenting with new ways of linking research and teaching, and research and development.

Cocody University tried to elaborate new relationships between research and teaching structures while integrating research centres to training units. This experiment has been much contested in the country. It has been by far the oldest and the main university of the country. It has 13 research and training units, 12 research centres and institutes, 2 autonomous research centres and 1 school. In each unit research activities are supervised by a scientific commission. The specificity of Cocody university is that some research institutes running with full time researchers are part of it. It is the case of the Centre Universitaire de Recherche Appliquée en Télédétection, which is integrated in the geosciences and mining resources unit and of the Centre National de Floristique depending on biosciences unit. However, this organization does not match everybody's attempts. The academic community wants to keep a clear distinction between the different types of structures, especially concerning budget allocations. Indeed, this integration is seen as the first step towards a merging of the structures designed to address the lack of human resources. Abobo Adjamé University experiments with a new type of recruitment. Academic staff no more belongs to civil service but signs a contract with the university.

The National Centre for Agronomic Research was created in 1998 after the merging of agronomic research institutes: the Institut des Forêts (forestry), the Institut des Savanes (savannah areas) and the Centre Ivoirien de Recherche Technologique. Its management introduces a great innovation: this centre has a private status and a mixed capital: it is partly public (40%) and partly private (60%). The National Centre for Agronomic Research led a policy of privatisation of research much observed by Western and Central African countries interested in this kind of strategy. Researchers have signed a contract with the institution, of which the general policy is to run according to the laws of economics. It is designed to adapt to the global market and to reinforce the relationships with private partners and development. Besides, the mixed capital will ease the Institute from the dependence upon public funding. It is managed by two structures: a General Assembly and a board of directors.

The National Polytechnic Institute Félix Houphouët-Boigny from Yamoussoukro is going to be the centre of a technologic pole developing privileged relationships with the economic sector and promoting technological applied sciences. It was created in 1996 from the merging of four grandes écoles. Thus, running costs were reduced and a global policy could emerge.

Table 7: Agricultural R&D performers

Category	Supervising agency	Executing agency	Research focus	Researchers		
				Head count	FTEs	Year
Government	Ministère de l'Enseignement Supérieur et Recherche Scientifique	Centre de Recherche Agronomique (CNRA)	Crops, livestock, fisheries, forestry	105	105.0	2001
		Centre de Recherches Océanographiques (CRO)	Marine fisheries	24	24.0	2001
	Ministère de l'Agriculture	Laboratoire National d'Appui au Développement Agricole (LANADA)	Livestock	10	2.5	2001
		Laboratoire Central de Nutrition Animale (LACENA)	Livestock	2	0.5	2001
Higher Education	Institut National Polytechnique Félix Houphouët-Boigny	École Supérieure Agronomique (ESA)	Crops, livestock	40	12.0	2001
	Université d'Abidjan-Cocody	UFR Biosciences				2001
		UFR Sciences de la Terre et des Ressources Minières				2001
		Centre Ivoirien de Recherches Economiques et Sociales (CIRES)	Socio-economics	10	4.0	2001
		Centre National Floristique (CNF)		na	na	
	Université d'Abobo-Adjamé	UFR Sciences de la Nature				
Private Sector		Société Ivoirienne de Technologie Tropicale (I2T)	Manioc, coconuts, cassava, millet	7	3.5	1998
		Société Hévéicole du Gô	Hevea	1	0.5	

2.2 S&T Human Resources

Cocody University, which is the oldest one, has the benefit of a large teaching staff. These numbers are unequally dispatched. Three units shared almost half of the teachers in 1999: medical sciences, social sciences, humanities and languages, which represented only 44% of the students. The discrepancy was particularly high in medical sciences: 29% of the teachers trained 9% of students.

Table 8: Numbers in Cocody University in 1999

Training and research units	Teachers	Senior lecturers	Lecturers	Junior lecturers	Total teachers	Researchers	(%)	Part of total student population
Medical sciences	45	71	55	128	299		29%	9%
UFROS	5	6	2	31	44		4%	1%
UFRSPB							4%	3%
Biosciences	6	9	40	27	82	3	8%	6%
UFRSTRM	1	3	11	1	16		2%	
UFRMI	8	11	21	NA	40		3%	4%
UFRSSMT							9%	6%
Humanities and social sciences							11%	14%
Languages	4	14	42	21	81		10%	21%
UFRICA	1	1	8	7	17		1%	1%
Law & Politics	7	12	12	55 (2)	86	6	9%	17%
Economy & Management	3	6	27	54(3)	80		9%	14%
Criminology	1	1	2	1	5		1%	4%
Research Centre								
Centre Ivoirien de Recherches Economiques et Sociales	3	7	14	17	41			

From 1987 to 1997, the scientific personnel number increased slightly despite the creation of jobs. That can be explained because of a cut in financial resources and a lack of attractiveness of the profession due to low salaries and quite difficult working conditions. The administrative staff, for its part, decreased during the same period from 677 in 1988 to 412 in 1997. Teachers of the *grandes ecoles* are considered as teacher-researchers: as such, they have to perform research activities but they are not at all the priority of these schools. Contrary to the teaching staff, student numbers increased considerably. They were 11,655 in Cocody faculties in 1984 and 37,312 in 1997.

In 1985, it was said that academic research already concentrated 50 per cent of national research potential. However, research activities were not coordinated at an academic level so that they were sometimes disconnected with the scientific programme especially concerning social sciences. This potential was also underused because of insufficient facilities and general lack of maintenance of the laboratories.

Table 9: Breakdown per rank of the scientific staff in 1999

Structures	Research manager	Senior researcher	Researcher	Junior researcher	Teacher	Senior lecturer	Lecturer	Junior lecturer	Others (engineers, secondary teachers, executives)	Total
Cocody university	1	6	38	35	91	134	302	349	-	956
Abobo Adjamé University	-	-	5	2	4	5	14	33	-	63
Bouaké university	-	1	3	1	2	14	9	54	-	84
Ecole Normale Supérieure	-	-	-	-	4	4	43	31	40	122
Ecole Normale Supérieure d'Economie Appliquée	-	-	-	-	-	-	2	-	8	10
Institut National Polytechnique Félix Houphouët-Boigny	-	-	1	-	-	7	32	-	292	332
Institut National de la Santé Publique	-	-	2	3	-	-	-	-	-	5
Centre de Recherches Océanologiques	-	1	16	2	-	-	-	-	-	19
IRD P Bassam	1	2	4	-	-	-	-	-	1	8

Researchers in the National Centre for Agronomic Research are for the majority those who worked in the former research institutes but they do not enjoy the same status any more. Some of them left to join the teaching staff at university. Even if agronomic research is the most financed and developed domain, the National Centre for Agronomic Research constituted only 6.8% of national research human resources.

The Institut National Polytechnique Félix **Houphouët-Boigny** is a major institution of training of researchers. It has led a specific policy consisting in a practical and applied orientation of training. The Polytechnique employs 332 teacher-researchers but only 40 ones passed a graduation.

3. Sources of research funding

Research in Côte d'Ivoire received the highest support from 1980 to 1985 - 13.1 FCFA milliard was spent per year. The funds were received as follows: 23% came from public funds, 32% from the selling of results of research activities and 45% from external aid. For 5 years, 107 scholarships for students in higher education were allocated, which represented FCFA 1,253,437,350. Despite these great efforts, operating budget and equipment grants were considered as slender.

The economic crisis considerably reduced public investments. The share of the state in research activities, which was already low (0.3% of GDP) declined to 0.24% in 1996. Even in its golden era, the state contribution never reached 1% of GDP, the amount recommended by the Lagos action plan. Even in agronomic research, which is by far the most subsidised domain, the allocation never exceeded 0.33 % of agricultural national product. Besides, the numerous reforms and the will to nationalize research got external financial backers to reduce their aid. Hence, a reform of the system and a growing will of research performers to look for other sources of funding. The National Centre for Agronomic Research embodies this trend: it is a private institution that gets 60% of its capital from the private sector (the World Bank is the first financial backer) and runs like a private company. Furthermore, the state officially stands against market economy and competition. Thus, it never took into account the consequences of globalization on research, which encourages research institutions to ease from the public sphere. Funding remains one of the biggest problems for research in Côte d'Ivoire. It induced researchers to look for other sources of income. Hence a great development of all the activities of expertise, which for some researchers threaten and compete with research activities and for other ones consist of a first step for a further research development. However, time and energy spared by researchers to find ways to earn more money are not spent on research activities. This situation caused a slowing down of research activities in the last years. Besides, the little money available for research has been poorly managed because of unnecessarily bureaucratic procedures. That is why research performers demanded a private management system. Due to the relative stagnation of state funding, equipment cannot be replaced. Thus, self-financing also decrease; however, Côte d'Ivoire remains one of African countries where it is the most developed. It has to be qualified because this budget mainly comes from the Institut Des Forêts (more than 60%). Furthermore, national research is more and more depending on external funding which compromises the national policy.

Table 10: Evolution of the part of public funds allocated to research (thousands FCFA)

Years	Global funding (operating budget and equipment grants)	Funding allocated to research	
		Amount	%
1987	660,056,000	2,192,000	0.33
1988	642,948,000	2,155,000	0.33
1989	586,196,000	2,074,000	0.32
1990	576,378,000	2,664,077	0.46
1991	559,042,000	2,441,713	0.43
1992	561,774,000	2,533,345	0.45
1993	583,774,000	2,247,991	0.38
1994	720,728,000	2,567,190	0.36
1995	820,728,000	2,882,213	0.35
1996	1,750,400,000	4,212,939	0.24

Table 11: Sources of research funding (thousands FCFA)

Years	Global funding allocated to research	Public funds allocated to research		Self financing		External resources	
		Amount	%	Amount	%	Amount	%
1990	7,415,454	2,664,077	35.5	3,920,602	52.9	830,775	11.2
1991	7,206,302	2,441,713	33.9	4,035,395	56	729,194	10.1
1992	6,553,189	2,533,345	38.7	3,305,489	50.4	714,355	10.9
1993	5,674,399	2,247,991	39.6	3,020,153	53.2	406,255	7.2
1994	7,678,239	2,567,190	33.5	4,441,104	57.8	669,945	8.7
1995	7,890,503	2,882,213	36.6	4,412,349	55.9	595,941	7.5
1996	7,069,681	2,556,088	36.4	3,855,848	54.4	657,744	9.3

Table 12: Sources of research funding (except funding allocated to the Institut des Forêts) (thousands FCFA)

Years	Global funding allocated to research	Public funds allocated to research		Self-financing		External resources	
		Amount	%	Amount	%	Amount	%
1990	7,415,454	2,036,992	27.5	82,290	1.1	830,775	11.2
1991	7,206,302	1,814,628	25.2	99,310	1.4	729,194	10.1
1992	6,553,189	1,908,345	29.1	107,904	1.6	714,355	11
1993	5,674,399	1,847,991	32.6	96,111	1.7	406,255	7.2
1994	7,678,239	2,189,190	28.5	153,841	2.2	669,945	8.7
1995	7,890,503	2,382,103	30.2	125,089	1.6	595,941	7.6
1996	7,069,681	1,956,000	27.7	152,000			

More than 80 per cent of research funding is allocated to agronomic research. Until recently, it did not take place in the university at all and the state invested almost exclusively in research structures outside the academic world.

4. Research output

Research output is quite important in Côte d'Ivoire, especially in agricultural sciences. However, discoveries usually remain virtual innovations because of the difficulty to realize applications. The weakness of the industrial sector and the distrust of economic partners in national research do not encourage a real linking of research and development. Even research reports often remain unpublished if the writers cannot find a place in a foreign journal. Indeed, national journals progressively disappeared because of no funding.

From 1991 to 1996, the number of publications decreased each year (139 in 1991, 87 in 1996). In 1996, the country ranked 13th on the continent. In 1997, 149 publications were recorded. From 1987 to 1990, the mean of publications per year reached 160.

- Rank on the continent: eighth (in 1991 and 1997)
- Repartition per domain: agricultural sciences: 19 %
- Medical sciences: 63 %
- Others: 18 %

This repartition is characteristic of French-speaking sub-Saharan Africa. However, these figures are averages. Each year considered separately, medical sciences flourished when the others seriously suffered the consequences of the crisis.

- 2,530 authors published (1,942 in medical sciences, 312 in agricultural sciences, 276 in exact and engineering sciences)
- Rate of co authored publications: 2.0 %
- In agricultural sciences: 1.6 %

- In medical sciences: 2.1 %
- In other sciences: 2.2 %

In medical sciences, the great concentration is due to a real culture of publication. Two thirds of the authors have published during the past seven years.

In agricultural sciences, there are few specialists and productive researchers are mainly foreign ones. IDEFOR and IDESSA were the major sites of production but the institutional crisis hurt them and the withdrawal of foreign researchers considerably weakened the sector. Three quarters of the authors published a unique paper during the past seven years.

The Institut de Recherche pour le Développement was there the main institution with the Centre Régional d'Océanographie. There are few authors and they publish in national journals.

5. The profession of researcher

Four different types of researcher status can be discerned in Côte d'Ivoire. The academic researcher can choose between the "national" status or the one defined by the Centre Africain et Malgache pour l'Enseignement Supérieur et la recherche scientifique, which created a status applicable in most Central African countries and Madagascar. Public researchers out of the university hold the status of researcher as defined in the law of 1978. It introduced four ranks in scientific hierarchy corresponding to higher education hierarchy, which eased the passage from one to another status. The nomination of researchers is pronounced by decree. A doctorate is demanded to aspire to these jobs after a two-year period as a trainee. Promotion can be obtained once one has published and after a period of at least two years. The proceeding is complicated and not often efficient: promotions do not necessarily lead to an increase in salary. Furthermore, half-yearly research bonus is optional. This status is very much questioned by researchers: they denounce its obsolescence both in principle and in practice. They have no prerogative regarding their work and do not benefit from its results. Finally, researchers working for the Centre National de Recherche Agronomique and the HEVEGO signed contracts with those institutions.

The complexity and inefficiency of the system has encouraged researchers to leave their jobs and accelerated the brain drain.

6. Informal S&T structures

Because of the cessation in public funding, almost all national scientific journals have disappeared.

6.1 *Scientific associations and professional societies.*

Except a few local associations, such as the Association Ivoirienne des Sciences Agronomiques and the Groupement Interdisciplinaire en Sciences Sociales - Côte d'Ivoire, the other ones are subregional:

- The Réseau Africain des Institutions scientifiques et Techniques
- A branch on Chimie UNESCO
- A branch of the Société Ouest Africaine de Chimie
- A branch of the Groupement Interdisciplinaire en Sciences Sociales - Côte d'Ivoire
- The Groupe Ivoirien de Recherche sur l'Economie, la Société et la Culture Africaine
- The Association des Botanistes d'Afrique de l'Ouest
- The Société Ouest Africaine de Gynécologie et d'Obstétrique
- The Société Mathématique de Côte d'Ivoire

- The Société Africaine de Mathématiques

6.2 Journals

- Annales de l'Université (no more published)
- Agronomie Africaine, published by the AISA since 1989

National researchers also publish in Western African journals. These publications are far more numerous and visible than national ones.

7. Scientific cooperation and agreements

Scientific activity is almost exclusively financed by international cooperation. According to several estimates, this mode of funding represents between 95 and 100 % of global funding. This money is used to realize projects and programmes, salaries and operating budget being financed by the state.

The USAID, French cooperation, the ACDI and the CRDI are the most active organisations of bilateral cooperation in Côte d'Ivoire. The World Bank and the UNDP are the principal financial backers.

Cooperation also exists between national researchers. The Ministère de l'Enseignement Supérieur et de la Recherche edits an annual with the references of researchers of all sectors. Thus, finding the good partners on a specific project is easier. However, this kind of cooperation is not developed, not enough for researchers themselves. It could be interesting to multiply collaborations between researchers and teams from different institutions because they could pool their resources.

Table 13: Projects led by the World Bank and money devoted to it

Project name	Sector	Amount in \$ US Millions
Education Development Capacity Building Project	Education	18.20
CM-Community Development Program Support Project	Rural sector	20.00
Douala Infrastructure Project	Infrastructure	56.35
Railway Concession Project	Infrastructure	21.39
Multisectoral HIV/AIDS Project	Health	50.00
Cameroon Petroleum Environment Capacity Enhancement	Energy/Oil	5.77
Public/Private Partnership for Growth and poverty Reduction Project	Private sector	20.90
Total		192.61

8. Conclusion

The most striking fact concerning the national research system in Côte d'Ivoire is the ongoing reform of coordination institutions. It is the result of a constant attempt to adapt to local realities and national facilities. It is often perceived as a source of instability but it led to a stable and visible research

system. The system of national research is now composed of five types of structures each one having a specific status:

- The national public establishments: research centres, universities, *grandes écoles*.
- Institutions with a double status (public and private) : CNRA, HEVEGO
- International organisations settled in Ivory Coast specialized in agriculture (ADRAO, IITA) and medicine (IPR, CEMV).
- Foreign institutions settled in the country (IPR, CIRAD, CSRS).
- Laboratories and research units depending on the parastatal or private sector: LBTP, LANADA, INSP.

Even if the system is quite efficient it has to face major difficulties : the fact that the large majority of funding comes from external financial backers compromises its autonomy in the steering of a national research policy and increases its on uncertain funding sources. Besides, despite a quite good economic situation, Côte d'Ivoire remains one of the countries where the new technologies of information and communication are the least developed in universities and research centres.

Two reforms are scheduled: the creation of a Centre National de la Recherche Scientifique et Technique as in Burkina Faso devoted to the coordination of the whole research sector except agronomic research, which is on the way to become private.

A complete system of research planning officially exists but is not very effective because of big disagreements between the different research actors and problems to conciliate great ambitions and weak subsidies. Programmes are financed separately, independently of the structures where they are performed. Research activities are defined relatively to potential applications and this policy often bore fruits especially in agronomic research. As in many African countries, expertise and consultancy activities are growing rapidly, especially in social sciences, environment and agriculture.

In 2001, the Centre National de la Recherche Agronomique benefited three quarters of public funding for agricultural research and employed two thirds of FTE researchers but still did not manage to fulfil criteria imposed by the World Bank. Research activities notably decreased and the civil war devastating the country since 2002 has compromised the future of research structures. A few private companies have kept on leading research activities but it is not very significant.
