

4. MONOGRAPHS OF THE NATIONAL AGRICULTURAL RESEARCH SYSTEMS OF NORTH AFRICA

ALGERIA

LIBYA

MOROCCO

TUNISIA

THE NATIONAL AGRICULTURAL RESEARCH SYSTEM OF ALGERIA¹

1. HISTORICAL BACKGROUND

The NARS of Algeria has about 30 autonomous institutions, the most important of which are affiliated to the Ministries of Agriculture and Fisheries (MAP) and Higher Education (MES).

The evolution of the agricultural research (AR) structure of MAP has been marked by the reorganization of the National Institute of Agricultural Research of Algeria (INRAA: *Institut National de la Recherche Agronomique d'Algérie*) and the creation of research–extension institutes, called "technical" institutes (ITs), mainly from INRAA's human and physical capacities. There were six crop production ITs created in 1974 and five livestock ITs founded later; their mandate included applied research and technology transfer through extension activities and development support (mainly seed production, control and certification). This mandate was successfully carried out during the first years despite the youth of the ITs and their senior staff's low qualifications.

Over the years and until 1982, extension and seed production became the main activities of the ITs, and research activities became almost marginal. From 1982 to 1986, research was abandoned. After 1986, it was decided to apply a process of reorganization, which took place in 1987.

2. ANALYSIS OF THE NATIONAL RESEARCH–DEVELOPMENT SYSTEM

NARS organization is characterized by significant fragmentation and total compartmentalization between different institutions of different sectors. This fragmentation originated from inadequate coordination and insufficient regional and national integration. Structural mutations of the ITs led to the predominance of administrative over scientific hierarchy. Being edged out, the role of researchers became marginal.

In the NARS institutions affiliated to MAP, the number of available research years is relatively low. Moreover, the scientific level of their graduate staff members remains very low (most of them are BS holders) because hiring conditions (salaries, scheme of career) are far below those of the academic institutions. This also explains the lack of integration of academic staff members in research activities of the MAP institutions.

3. CURRENT NARS RESEARCH ACTIVITIES

AR is essentially linked to MAP and MES. At the national level, the High Commissariat of Research (HCR: *Haut Commissariat à la Recherche*), affiliated to the Presidency of the Republic, has the mandate to coordinate research programs of all the sectors and ministries.

3.1 Institutes Affiliated to the Ministry of Agriculture and Fisheries

The MAP AR system is made up of complementary public autonomous institutions: INRAA, six technical institutes, two prevention and protection institutes, and one fishery research and study center (CERP). Coordination is handled by two councils run by MAP Education–Research–Extension Directorate (DFRV: *Direction de la Formation, de la Recherche et de la Vulgarisation*): the Scientific Council of Agricultural Research–Development (CSRDA) and the National Council of Agricultural Extension (CNVA).

For research implementation, the MAP institutions have research stations and laboratories and 61 experimental stations. Their budget is allocated by the Government.

For extension activities, the institutions are supported by the National Agricultural edagogic Center (CNPA: *Centre National de Pédagogie Agricole*), the Agricultural Training and Extension Center (CFVA: *Centre de Formation et de Vulgarisation Agricoles*), local agricultural development public structures (agricultural directorates, services, projects), specialized cooperatives, and pilot farms affiliated to MAP directorates (185 farms covering 190,000 ha).

National Institute of Agronomic Research (INRAA)

With its five departments (soil/bioclimate, phyto-genetic resources and crop breeding, animal husbandry and selection, rural economics and sociology, biometry and computer science) and a documentation and external relations service, INRAA is in charge of basic research. It develops scientific programs of common interest to the technical

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institutes, which currently focus on agronomy (soil fertilization, mineral amendment of saline soils), genetic resources (cereals, legumes, forages), and tissue culture (date palm).

Technical Institutes

There are six technical institutes (ITs) specialized in field crops (ITGC), vegetables and industrial crops (ITCMI), fruit trees (ITAF), bovine and ovine (ITEBV), small livestock (ITPE) and Saharan agriculture (ITDAS).

These institutes have stations and laboratories working on production constraints. They are also in charge of applied research activities induced by the agricultural intensification program, mainly the elaboration of norms of production factors, adaptation and development of efficient techniques, production and conservation of genetic crop and animal resources, control and certification of these resources, training of extension staff, etc.

Each IT is organized into specialized units (in the crop IT: seed/seedling production, applied research, studies and programming, extension support) assisted by an administrative/financial department. The ITs are supported in their scientific and resource management affairs by scientific councils and "orientation/management" councils.

Protection and Prevention Institutes

Besides their research missions, the National Institutes of Crop Protection (INPV) and Animal Health (INSA) are in charge of crop and animal protection from diseases and pests; this includes sanitary control and protection, product control at the borders, certification of chemicals and pesticides, and epidemiology and pest control against the main predators (locusts, cereal aphids, animal tuberculosis and brucellosis, etc.)

3.2 Agricultural Graduate Training Institutions

Among the graduate training institutions, the most committed to AR are the National Agricultural Institute (INA) of Algiers, with its AR unit (URSA), and the University of Sciences and Technology of Algiers (USTHB), with its arid zones research and biology units (URZA and URBT, respectively).

The research units are coordinated by a research directorate set up by MES. Each one has a scientific council and manages financial resources provided by its institution (INA, USTHB).

4. NARS RESOURCES

4.1 Human Resources

NARS qualified human resources are very limited and anarchically mobilized. There is a total of around 350 research years (RYs) distributed between the institutions affiliated to MAP (INRAA, IT, ITAS, ITA, BNEDER, with 175 RYs), MES (INA, other graduate agricultural schools, universities, etc.), and the Ministry of Water and Environment (ANRH, ANPE).

The highest qualified human resources are available mostly at the universities, which, on other hand, suffer limited physical resources and relations with development organizations. More than 50% of the RYs are concentrated in and around Algiers. In most cases, research stations located in other areas have very few qualified human resources.

The qualifications and research mobilization of the senior staff of the MAP institutes are low: only 6% of the graduate staff members have a PhD. The time allocated to AR varies from 15% at the ITs (such as ITGC) to 2 to 5% in other sectors.

	Staff categories	Number	% of total staff
Graduate staff	PhD	28	2.8
	Veterinary specialists	47	4.7
	<i>Ingénieur d'Etat</i> (MS/BS)	156	15.8
	<i>Ingénieur d'application</i> (BS)	233	23.7
Other staff	Technicians	396	40.0
	Clerks, laborers, etc.	75	7.7
Total		985	100.0

4.2 Physical Resources

The national network of experimental farms contains 58 sites with a total area of 6,599 ha. This network is oversized and characterized by many duplications, which implies expensive operation and capital costs. This situation is a result of the current organization of the research system of MAP and compartmentalization at the regional level. The network is also concentrated in some regions and weak or absent in others.

Such a set-up of research sites, in isolation from each other, does not allow organizing research programs that mobilize sufficient qualified human resources nor developing an integrated approach to the regional farming systems in each region.

4.3 Financial Resources

The main financial resources come from the state budget with few external grants (through collaboration with national and international organizations). These resources are made up of operation subsidies and equipment allocations.

5. CONCLUSION

This short analysis of the Algerian NARS clearly shows that the system cannot be totally operational unless its structure reaches a certain degree of stability and the situation of the researchers is improved.

In the future, leading research by INRAA must permit rationalizing AR policies and should provide a significant boost to the support and development activities carried out by the technical institutes.

Complementary Information on the Algerian NARS¹

1. HISTORICAL BACKGROUND

The first institution of agricultural sciences in Algeria was the *Institut Agricole Algérien* (IAA) of El-Harrach/Algiers, created by France in 1889 to train French and European technicians and, later, agricultural engineers, who would contribute to the agricultural colonization of the country. IAA had modern laboratories and services; it remained for a long time the unique agricultural research (AR) center acting in the whole country to support regional services in agriculture.

In 1943, the Agricultural Experimentation Service (*Service de l'Expérimentation Agricole*) was created and endowed with central laboratories associated with those of IAA, and 11 stations well distributed throughout the country. This Service largely concentrated its work on cereal improvement. A few years later, new services (plant protection, livestock, hydrology, fisheries, etc.) created many other specialized research and experimental units². In 1959, the main AR units affiliated to the General Directorate of Agriculture of the "Algerian Government" (which ran the country as a French region) were attached to the National AR Institute of France (INRA), but INRA did not have time to fulfill its mandate of restructuring and reinforcing the existing system (which had only 72 scientists, including 32 academic staff members of IAA) and to hire Algerian researchers who were totally absent up to that time.

After independence in 1962, most of the administrations bequeathed by France subsisted, but were not operational because of the massive departure of Europeans and the absence of national qualified staff. The Ministry of Agriculture and Agrarian Reform (MARA) created the Algerian Center of Agronomic, Sociologic, and Economic Research (CARASE: *Centre Algérien des Recherches Agronomiques, Sociologiques et Economiques*) that recovered the existing AR units. In 1966, this Center was replaced by the National Institute of Agricultural Research of Algeria (INRAA: *Institut National de la Recherche Agronomique d'Algérie*). However, in the agricultural sector, priority in

¹ This note was prepared (almost two years after the previous monograph) by **Dr Joseph Casas**, Research Director, INRA, Montpellier, France based on bibliographical references and personal communications mentioned at the end of the note, with the collaboration of **Dr Mohamed El Mourid**, Regional Coordinator of the ICARDA North Africa Regional Program.

² Stations of Boufarik and Sidi-Aïch of the Fruit Service, stations of Tadmit and Khroub of the Livestock Service, station of Hammadenas of the Colonization and Hydraulic Service, station of Bou-Ismaël of aquaculture and fisheries, etc.

allocating the few qualified national staff and the numerous expatriates provided by foreign assistance was given to administration and graduate agricultural education institutions: the National Agricultural Institute (INA: *Institut National Agronomique*), which took over IAA¹, was highly reinforced, and the Institute of Agricultural Technology (ITA, 1969) of Mostaganem and other institutes were created.

From 1974, MARA reorganized its research–development system by setting up specialized "development institutes" (ID) in charge of supporting development (through seed/seedling/vaccine production, crop and animal protection, extensionists' training, applied research, etc.) in the domains of field crops (IDGC), vegetables (IDCM), industrial crops (IDCI), fruit trees (IDAF), small ruminants (IDEO), cattle (IDEB), equines (IDEE), small livestock (IDPE), plant protection (INPV), and animal health (INSA)². The creation of these institutes involved a large transfer of human and physical resources from INRAA, which was left with very few researchers and research domains (soils, Saharan agronomy, medicinal/herbaceous plants, etc.).

The Ministry of Education and Scientific Research (MESRS), established in 1970, set up the National Council of Scientific Research (CNRS) in 1973, which was replaced in 1975 by the National Office of Scientific Research (ONRS), to be in charge of vitalizing the national research policy; but because of many conflicts between ministries, its activity was limited to creating, at the Universities of Algiers, Constantine, Oran and Annaba, many university research centers run by academic staff members³. New graduate education institutions were created, mainly the National Veterinary Institute of Algiers (1972) and the Institute of Veterinary Sciences of Constantine (1975), then several national agricultural schools (Batna, Blida, Chlef, Mascara, Taf, Tiaret, Tizi-Ouzou).

The creation of the State Secretariat of Forestry and the Ministry of Water, later merged into what became the Ministry of Water and Environment (MHE), induced the establishment of three new institutions: the National Institute of Forestry Research (INRF, 1981), the National Institute of Hydraulic Research (INRH, 1984) and the National Institute for Irrigation and Drainage (INSID, 1984).

The MARA specialized development institutes showed their first weaknesses: they neglected research and could not coordinate their activities at the national and regional level. Therefore, new development organizations emerged in 1981–1982 at both levels (several regional agricultural development *offices/projects*, High Commissariat of Steppe Development). The period 1982–1986 was a stagnation period for the MARA specialized institutes, basically for two reasons: first, their financial resources decreased due to the economic crisis in the country and, second, qualified staff conditions were not attractive and their qualifications not sufficient⁴.

In 1984, ONRS was replaced by the Scientific and Technical Research Commissariat (CRST), affiliated to the Prime Minister. This new body was rather active: it prepared a national AR program in 1985 covering the agricultural and agro-industry sectors, which was a significant effort for inter-institutional planning and coordination of AR activities. In 1986, it designed a national statute for research staff. In 1987, CRST was replaced by the High Commissariat of Research (HCR: *Haut Commissariat à la Recherche*), affiliated to the Presidency of the Republic.

From 1986 to 1988, the Ministry of Agriculture and Fisheries (MAP, previously MARA) implemented some changes. The Technical Institute for Saharan Agronomy Development (ITDAS) was created in 1986. The development institutes acquired a common statute and were renamed "technical institutes" (IT) and some were merged⁵. In 1988–1990, a reorganization project of the MAP AR system was proposed with the support of the World Bank, without any significant consequences.

Recently, some changes have been made. In 1993, INRAA was designated as the main body responsible for AR within MAP. In 1994, the Research Center for Agro-industry of Blida (CRIAA: *Centre de Recherche sur les Industries Agro-alimentaires*) and the National Agency for Research Development (ANDRU) were created,

¹ When changing its name, the Institute passed from the governance of MARA to that of the Ministry of Higher Education.

² To this list we should add the Institute of Vineyards and Wine (IVV: *Institut de la Vigne et du Vin*) created in 1968 from the existing Vine Institute established in 1963.

³ Among these units are the Biological Resources Research Center (CRBT: *Centre de Recherche sur les Ressources Biologiques Terrestres*), the Applied and Basic Biology Research Unit (URBFA: *Unité de Recherche en Biologie Fondamentale et Appliquée*), and the Arid Zones Research Unit (URZA: *Unité de Recherche sur les Zones Arides*), all created in 1974 by the University of Algiers, and the Research Center of Applied Economics for Development (CREAD: *Centre de Recherches en Economie Appliquée pour le Développement*), established in 1975.

⁴ In 1985, INRAA and the development institutes had 43 and 224 graduate staff members, respectively (of whom only 5 and 33 were PhD holders), working mostly in development/extension, and 25 and 72 technicians.

⁵ Merging of ITCM (horticulture) and ITCI (industrial crops) into ITCMI (horticulture and industrial crops) and of ITEBO (cattle) and ITOVI (small ruminants) within ITEBO (cattle and small ruminants), and integration of IVV (vineyards and wine) within ITAF (fruit trees).

respectively by the Ministry of Light Industries and MESRS. In 1988, INA of Algiers became the National School of Agricultural Sciences (ENASA). According to the latest data, a national-policy program on scientific research and technology is being prepared that would have positive impact on the NARS situation.

2. THE CURRENT NARS

The current (1998) NARS of Algeria is very complex. It is composed of three large groups of institutions (see [Table 1](#)).

- AR institutes: INRAA and CRIAA that have AR as their first mandate; they accumulate only 41 potential research years (pRYs or equivalent full-time researchers), which represent 7% of the total pRYs of the NARS, and mobilize 13% of the total AR financial resources.
- 13 agricultural graduate schools affiliated to the Ministry of Higher Education and Scientific Research (MESRS): they employ 720 academic staff members who represent 160 pRYs and 27% of the total pRYs and mobilize 21% of the total financial resources (see [Table 2](#)).
- The other institutions of NARS, where AR covers only a minor part of their mandate: they represent the major part of the NARS resources (66% of the total pRYs and financial resources). These include:
 - 11 research–development institutes: 8 agricultural institutes within MAP complementary to INRAA, one fishery institute also attached to MAP, and 2 agricultural institutes linked to MHE (INRF, INSID) (see [Table 3](#));
 - other institutions from universities and other sectors (CDTN, CREAD, BNEDER) (see [Table 4](#)).

MESRS, being officially responsible for the national research policy, has some influence on the AR national policy, essentially through its own NARS institutions; but its impact on the other NARS institutions (affiliated to MAP and other ministries) is very limited.

3. AR RESOURCES

3.1 Human Resources

The Algerian NARS mobilizes around 2110 scientific and technical graduate staff members (gsm), all national, who count for about 580 pRYs. Currently, the best-trained gsms are those of ENASA and other MESRS units that benefited earlier from a favorable statute (career scheme which took into account the academic diploma, higher salaries). The gsm of the institutes of INRAA and MAP received comparable conditions much later (in 1987), which explains their low level of academic qualification.

More than 50% of the RYs of the country are concentrated in and around Algiers. Most of the MAP research centers and stations located "inside" the country have few qualified research teams.

Almost all of the NARS institutions are suffering a large deficit of technicians and other support staff (clerks, laborers, etc.).

3.2 Financial Resources

Since only limited data related to the financial resources of the many institutions are available, AR financial resources of the NARS were very roughly estimated. In 1997, they amounted to around 760 billion dinars (US\$ 13.7 million), funded mostly by the Government (foreign contributions were negligible), and would represent about 0.25% of the AGDP (estimated at US\$ 5.4 billion), a ratio which is much less than what is recommended by international institutions (World Bank, European Union, etc.).

At the MAP institutions, a large part of the budget is allocated to salaries. Therefore, the operation and equipment budget is insufficient relative to the potential RYs. At the other institutions, the situation is even worse. Under these conditions, the NARS human resources are only partly mobilized due to the lack of means. The Algerian NARS would therefore represent, at best, 130 to 170 actual research years.

These financial insufficiencies are emphasized by the complicated/slow administrative management procedures and the difficulties in procuring hard currency to buy equipment and spare parts from outside the country.

4. RESEARCH ACTIVITIES

4.1 Research Activities and Coordination

Since 1989, there has been no precise inventory of the AR programs carried out in the country, therefore, it is difficult to comment on the current breakdown of the scientific potential by main research sectors and commodities, and on how it fits the country's needs. However, some observations can be made:

- Within MAP, the Directorate of Education–Research–Development (DFRV) and the Scientific Council of Agricultural Research–Development (CSRDA) have not been able up to now to fulfil their missions of planning, coordinating and evaluating research programs and activities of the MAP institutions concerned (INRAA, 10 technical institutes, BNEDER) at the national and regional level. The lack of coordination between these institutions and their numerous research sites leads to the juxtaposition of AR programs with obvious gaps and overlaps. It also does not allow using an integrated approach for the necessary intensification of the farming systems in each region. Work on cropping systems in the high cereals plains carried out by ITGC and integrated regional development studies undertaken by BNEDER are good exceptions, but the first could not fully consider livestock systems, and in the latter, there was no follow-up of its studies.
- In most institutions affiliated to MESRS, research programs are mainly individual (conducted either by experienced scientists or young scientists preparing their PhD degree), and the existing scientific councils are ineffective (limited financial resources) or not operational.
- For the two major sub-groups of the NARS, well-planned research programs, implemented with enough human and financial resources needed to achieve significant results, seldom exist.

4.2 Linkages with Development and International Scientific Cooperation

Relationships between the NARS institutions and extension organizations at the national and regional level are greatly hampered by:

- the NARS structure (large fragmentation and lack of efficient coordination bodies), the high concentration of human and material resources in and around Algiers, and the relatively low scientific productivity;
- the fragmentation and instability of extension organizations, and the lack of well-organized professional organizations in agriculture in most regions and production sectors.

The relatively large increase in national agricultural production observed since 1980¹ is certainly due less to technical innovations proposed by the NARS institutions than to other factors (privatization of the socialist and cooperative farms, liberalization of agricultural marketing, easier import of inputs and technologies).

International scientific cooperation, which was rather well developed in the 1970s and 80s (FAO, UNDP, CIHEAM, CIMMYT, ICARDA, France, etc.), is currently very limited.

5. CONCLUSION

The large fragmentation and lack of integration of the NARS are responsible for many deficiencies reported earlier:

- Weakness of the national mechanisms for planning–programming–evaluation.
- Duality and segregation between the two main NARS sub-groups: MAP institutions with their limited qualified human resources and important physical resources, on the one hand, and MESRS institutions with opposite characteristics, leading to low valorization of all the available resources, on the other.
- Excessive concentration of human and material resources in and around Algiers.
- Insufficient financial resources allocated to AR.

However, the Algerian NARS has accumulated an important human scientific potential that should be manifested as soon as the expected organizational measures are taken (particularly the integration of INRAA and the technical institutes affiliated to MAP).

¹ Since 1980, the agricultural gross domestic product has been almost doubled, which means a 25% increase of agricultural production per capita (source: FAO).

Main Acronyms

MAP: Ministère (Min.) de l'Agriculture et de la Pêche (Ministry of Agriculture and Fisheries). **MESRS:** Min. de l'Enseignement Supérieur et de la Recherche Scientifique (Ministry of Education and Scientific Research). **MHE:** Min. de l'Hydraulique et de l'Environnement (Ministry of Water and Environment). **DFRV:** Direction de la Formation, de la Recherche et de la Vulgarisation (MAP Education–Research–Extension Directorate).

ENASA: Ecole Nationale des Sciences Agronomiques (Alger) (National School of Agricultural Sciences). **INRAA:** Institut National de la Recherche Agronomique d'Algérie (National Institute of Agricultural Research of Algeria). **ITGC:** Institut Technique des Grandes Cultures (Technical Institute of Field Crops).

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Table 1 - The National Agricultural Research System (1996)

Italics: Approximate/incomplete data. ...: Data not available. °: Rounded numbers. *: See footnotes. All human and financial resources are national.

NARS Institutions				AR Graduate Scientific & Technical Staff (Units) Total - (PhD - MS)		AR Potential Res. Years (pRY)	Total Budget (million dinars)	AR Expenditures/Resources (E) (million dinars)
No.	Name - Acronym Head Office - Year Established	Mandates* AR Fields	Govern. Ministry					
a	b	c	d	e	f	h	j	l
1.1	Inst. Nat. de la Rech. Agronom. d'Algérie Algiers	INRAA 1914/66 All	MAP	35	15	32	90	85
2.1	Centre Rech. Industries Agro-Aliment. - Blida	CRIAA, 1994 Food technol.	MIL	11	...	9	...	15
1-2	Total Agricultural Research Institutes			46	...	41	...	100
3.1	Ecole Nationale des Sciences Agronomiques Alger-El-Harrach	ENASA 1898 AHE - (AR: 25%) All	MESRS	170	30 - 120	40°	125	30
3.2	7 Inst. Nat. Enseig. Sup. Agro. Batna, Blida, ..., Tizi-Ouzou	ENESA AHE - (AR: 25%) All	MESRS	200	47	50	565	85
3.3	Inst. Nat. Formation Sc. Agro. - Mostaganem	INFSA, 1969 AHE - (AR: 10%) All	MAP	150	15	15	110	10
3.4	3 Inst. de Sciences Vétérinaires Algiers, Batna, Constantine	INV 1972/89 AHE - (AR: 25%) Animal prod./health	MESRS	180	38	45	140	30
3.5	Ecole Nat. des Pêches - Algiers	ENP, 19... AHE - (AR: 25%) Fish.	...	20	...	5	30	5
3	Total Agricultural Sciences Higher Schools (see Table 2)			720	270°	155	970	160
4.1	8 Inst. tech. de rech.-développement agricole 7 in/around Algiers + 1 in Batna (see Table 3)	IT... 1974/87 AD - AR (25%) All	MAP	604	100	151	640	260
4.2	Cent. Et., R. Appl., Doc. Pêche - Tipaza	CERP, 1953/76 AD - AR (25%) - Fisheries	MAP	17	1	4	15	40
4.3	Inst. Nat. Rech. Forestière - Algiers	INRF, 1981 AD - AR (25%) Forestry	MHE	43	8	11	70	
4.4	Inst. Nat. Sciences Irrigation Drainage - Algiers	INSID, 1981 AD-AR (25%) Water manag.	MHE	30	4	8	20°	
4.A	Total Ag. Research and Research-Development Institutes			694	113	174	755	300
4.5	University of Algiers: URBFA, CRBT, URZA	USTH/BA HE - R (AR: Diverse)	MESRS	90	...	45	...	200
4.6	Other universities (Constantine, Oran, etc.)	HE - R (AR: Diverse)	MESRS	320	...	80	...	
4.7	Other scientific institutes (CDTN, CREAD, BNEDER)	R - (AR: Diverse)		240	...	80	...	
4.B	Total Other Institutions (see Table 4)			650	...	205	...	200
4	Total Other Institutions 4.A + 4.B			1344	...	379	...	500
5	Total NARS (approximate)			2110	...	575	...	760
Exchange Rate: 100 Algerian dinars = US\$ 1.80 (1997 average rate)				Actual Research Years (Estimate) --->		130-170	AR Expendit. (US\$ million) - -->	13.7

MAP: Ministry of Agriculture and Fisheries. **MHE:** Min. of Water and Environment. **MESRS:** Min. of Higher Education and Scientific Research. **MIL:** Min. of Light Industries.

***Mandates:** **AR** (... %): Approximate average % of resources devoted to ag. research (AR); **AHE:** Ag. higher education; **AD:** Ag. development/services (for AR and AHE institutes: seeds production, soil analysis, extension, studies, etc.).

Total AR expenditures: **0.25%** of the Agricultural Gross Domestic Product (AGDP: US\$ 5.4 billion in 1996).

Table 2 - The Graduate Agricultural Schools (1997)

Italics: Approximate data.: Data not available. °: Rounded numbers. *: See footnotes. All human and financial resources are national.

Agricultural Sciences Higher Schools					AR Graduate Scientific & Technical Staff (Units)		AR Potential Res. Years	Total Budget	AR Expenditures/ Resources (E)
No.	Name - Acronym Head Office - Year Established	Mandates* Diplomas - AR (%)	Govern. Ministry	Total - (PhD - MS)		(pRY)*	(million dinars)	(million dinars)*	
a	b	c	d	e	f	h	j	l	
3.1	Ecole Nationale Sciences Agronomiques Algiers (former INA)	ENASA 1920/98	PhD, MS, BS 25	MESRS	170	30, 120	40°	125	30
3.2	Inst. Nat. Enseig. Sup. Agro., Batna	ENSA - 1970'...	BS 15	MESRS	200	47	50	565	85
3.3	Inst. Nat. Enseig. Sup. Agro., Blida								
3.4	Inst. Nat. Enseig. Sup. Agro., Chlef								
3.5	Inst. Nat. Enseig. Sup. Agro., Mascara								
3.6	Inst. Nat. Enseig. Sup. Agro. et Vét., Tarf								
3.7	Inst. Nat. Enseig. Sup. Agri., Tiaret								
3.8	Inst. Nat. Enseig. Sup. Agri., Tizi-Ouzou								
3.9	Inst. Nat. de Format. en Sc. Agron., Mostaganem	INFSA - 1969	BS/Technician 10	MAP	150	15	15	110	10
A	Agricultural High Schools				520	212	105	800	125
3.10	Inst. Nat. Vétérinaire, Algiers (Univ.)	INV/A - 1972	MS 25	MESRS	180	38	45	60	15
3.11	Inst. de Sciences Vétérinaires, Batna (Univ.)	ISV/B - 1987	MS, BS 15	MESRS				30	5
3.12	Inst. des Sciences Vétérinaires, Constantine (Univ.)	ISV/C - 1975	MS, BS 15	MESRS				50	10
B	Veterinary Medicine High Schools				180	38	45	140	30
C	Ecole Nat. Pêche (Fisheries), Algiers	ENP/A - 19...	BS 15	20	...	5	30	5
D	Total Agricultural Sciences Higher Schools (A + B + C)				720	270	155	970	160

MAP: Ministry of Agriculture and Fisheries. **MESRS:** Ministry of Higher Education and Scientific Research.

***Mandates:** Diplomas - AR (... %): 1. Diplomas delivered by the higher schools (Doctorate, Ing. Etat/Mastere/MS, Ing. application/BS). 2. Approximate average % of resources devoted to AR.

* AR potential research years (pRY) and AR expenditures estimated on the basis of the average % of resources devoted to AR by each higher school.

Table 3 - The Other NARS Scientific and Technical Institutions (1997): The Agricultural Research–Development Institutes (1997)

Italics: Approximate data.. °: Rounded numbers. *: See footnotes. All human and financial resources are national.

Ag. Research–Development Institutes					AR Graduate Scient. & Technical Staff (Units)		AR Potential Res. Years	Total Budget (million dinars)		AR Expenditures/ Resources (E) (million dinars)
No.	Name - Acronym Head Office - Year Established	Mandates *	AR Areas	Govern. Minist.	Total - (PhD - MS)			Nat.		
a	b	c		d	e	f	h	j		l
1	Inst. Techn. Grandes Cultures, Algiers ITGC, 1974-87	AD - AR (25%)	Field crops	MAP	80	14	151	98	= 640°	260
2	Inst. Techn. Cult. Maraîch. Indust., Algiers ITCMI, 1974-87		Veget., ind. crops	MAP	50	12		92		
3	Inst. Techn. Arboriculture Fruitière, Blida ITAF, 1963/87		Fruits, vineyards	MAP	37	3		74		
4	Inst. Techn. Elevage Bovin et Ovin, Algiers ITEBO, 1976-87		Cattle, small rumin.	MAP	49	8		72		
5	Inst. Techn. Petits Elevages, Algiers ITPE, 1976		Small animals	MAP	30	2		48		
5	Inst. Nat. Protection des Végétaux, Algiers INPV, 1975		Crop protection	MAP	187	9		116		
7	Inst. Nat. Santé Animale, Algiers INSA, 1976		Animal health	MAP	150	35		100		
8	Inst. Techn. Dév. Agron. Saharienne, Biskra ITDAS, 1986		Saharan agricult.	MAP	21	2		36		
9	Cent. Etu., R. Appl. Doc. Pêche/Aqua, Tipaza CERP, 1953/76	AD-AR (25%)	Fish., aquacult.	MAP	17	1	4	15	5	
A	Total MAP Agricultural Research-Development Institutes				621	86	155	655°	265	
10	Inst. Nat. de la Rech. Forestière, Algiers INRF, 1981	AD - AR (25%)	Forestry	MHE	43	8	11	70°	30	
11	Inst. Nat. Sc. Irrigation et Drainage, Algiers INSID, 1981		Water res. manag.	MHE	30	4	8	20°	10	
B	Total Other Agricultural Development Institutes				73	12	19	90°	25	
C	Total Other Agricultural Research-Development Institutes (A + B)				694	98	174	745°	300	

MAP: Ministry of Agriculture and Fisheries. **MHE:** Ministry of Water and Environment. **MIL:** Ministry of Light Industries.

*Mandates: AR (... %) = Approximate average % of resources devoted to agricultural research (AR); AD: Agricultural development/services (soil analysis, seeds, vaccines, extension, studies).

This list does not take into account the *Centre National d'Insémination Artificielle et d'Amélioration Génétique* (CNIAAG, Algiers, 1988), specialized in animal breeding, mainly involved in development; and the *Institut des Sciences de la Mer et de l'Aménagement du Littoral* (ISMAL, Tipaza), specialized in fisheries and marine environment (no data available).

Table 4 - Other NARS Scientific and Technical Institutions (1997)

Italics: Approximate/incomplete data.: Data not available. °: Rounded numbers. *: See footnotes. All human and financial resources are national.

NARS Institutions				Ag. Graduate Scientific & Techn. Staff (Units) Total - (PhD - MS)		AR Potential Research Years
No.	Name - Acronym Head Office - Year Established	Mandates AR Areas	Govern. Ministry	e	f	h
a	b	c	d			
1	Univ. des Sciences et Techniques H. Boumédienne - Algiers/Bab Azzouar: USTH/BA - 19... a. Unité Rech. Biologie Fondamentale et Appliquée, Algiers (Béni-Abbès) * URBFA - 1974 b. Unité Rech. sur les Ressources Biologiques Terrestres, Algiers (Saïda) CRBT - 19... c. Unité Rech. sur les Zones Arides, Algiers (Béni-Abbès) * URZA - 1974	HE - AR: Genetic res., fish.. HE - AR: Semi-arid zones HE - AR: Arid zones	MESRS MESRS MESRS MESRS	90	90	45
2	Univ. Constantine: Inst. Sciences de la Nature (ISN)*, Inst. Sc. Terre (IST)* UC - 1969	HE- AR: Diverse	MESRS	100	100	25
3	Univ. Annaba: Inst. Sciences de la Nature (ISN)*, Inst. Nat. d'Enseig. Sup. (INES) UA - 19...	HE- AR: Diverse	MESRS	80	80	20
4	Univ. Sc. et Tech. - Oran: Départ de Biologie Appliquée (DBA) USTO - 1975 Un. Oran Es-Sénia: Inst. Sciences Nature (ISN)*, Inst. Sciences Terre (IST)*, Inst. Géographie & Aménagement du Territoire (IGAT). UO - 1966	HE- AR: Diverse	MESRS	110	110	25
5	Univ. Bel-Abbès: Inst. Biologie Végétale (IBV) Univ. Tlemcen: Unité Biologie Univ. Tizi-Ouzou: Inst. Biologie	HE- AR: Diverse	MESRS	30	30	10°
A	Total Universities (approximate)			410	410	125
6	Centre de Développement des Techniques Nucléaires, Algiers (100 CSST) CDTN - 1974	R - (AR: Crop bio., food techn.)	HCEA*	20	...	20
7	Centre Rech. en Economie Appliquée pour le Développement, Algiers * CREAD - 1975	R - (AR: 20%: Rural econ.)	MPAT	100*	...	10
8	Bureau Nation. d'Etudes et de Développement Rural, Algiers BNEDER - 1975	AD - (AR: 10%: Rural econ.)	MAP	120	...	50
B	Other Institutions			240	...	80
C	Total Other Scientific and Technical Institutions (A + B)			650	...	205

HCEA: High Commissariat for Atomic Energy. **MIL:** Ministry of Light Industries. **MPAT:** Min. of Planning and Regional Development.

ISN: Institutes dealing with animal/human biology, etc.; **IST:** Institutes dealing with geology, soil cartography, regional development, etc. 7. **CREAD** (10 scientific/technical senior staff at Algiers + 100 academic staff members around the country working approximately 30% of their time for CREAD).

Note: This table does not take into account some other institutions (no sufficient information available on them), such as: the *Institut National des Industries Légères*, Algiers (INIL), a higher education institution run by the Ministry of Light Industries (MIL); the *Entreprise Nationale d'Etudes Hydrauliques*, Algiers (ENHYD) under MHE; the *Institut National de Vulgarisation Agricole*, Algiers (former CNPA), MAP; the *Unité de Recherche en Machinisme Agricole* of the *Entreprise Nationale de Production de Matériel Agricole* (URMA), Sidi-Bel-Abbès.