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Government officials in Algeria (Central Committee of the FLN/National Liberation Front Party) have definitively rehabilitated agricultural policy, which is now expected, first and foremost, to ensure the production of our food needs. The drastic drop in price of hydrocarbons has made us face up to certain harsh realities which, although we were always aware of, we nonetheless thought to be somewhat remote from our own doorstep.

We are thus obliged to make the right choices in full cognizance of the very narrow margin of error open to us.

In the field of agriculture, offering as it does our main substitute resource for reducing the country's dependence on food imports, we need to generate and promote a dynamic that will result in a modern, scientific production tool capable of improving performance and increasing production capacity.

The estimated needs for qualified personnel in this context are set forth in reports presented to the Government under various agricultural headings (intensification of grain production, development of cattle and sheep raising, market gardening, Saharan agronomy, mountain agronomy, etc.).

The sections of these reports concerned with training have been summarized in the report on agricultural training approved by the Government on 10 April 1985. It contains most of the information concerning our agricultural training system that I have the pleasure and the honor to present to you here.

I - Conditions of access to higher agronomic training

The prerequisite for all higher education (understood as two or more years after the Baccalaureate) is clearly the secondary school Baccalaureate.

There are several Baccalaureate streams in Algeria, and not all of them, of course, lead to the same higher education programs. These streams are as follows:

- Letters, which provides access to programs in the Human and Social Sciences;

- Mathematics, which allows the graduate to pursue technological and scientific studies;

- Sciences, which opens the door to all scientific programs (with only a few exceptions); and

- Technical studies, which provide access to the respective higher technical programs; the range of which is necessarily narrower than the other types.

Most recently, a Baccalaureate in agricultural sciences was also created. The first students will graduate in June 1988 and will qualify for access to:

1. the core curriculum in the natural sciences (which constitutes the first year in many areas of higher training in agronomy, bachelor's degree in biology, etc.);

2. the first year of veterinary medecine;

3. the bachelor's degree for teaching in the agricultural sciences.

Until the graduation of the first students with a Baccalaureate in agricultural sciences, access to the training programs for agronomic engineers and veterinarians is generally restricted to holders of the science or mathematics Baccalaureate.

This condition, however, is not sufficient for automatic entry entitlement to agronomic or veterinary training programs and the institutions often demand, over and above the Bac, a minimum level in terms of scholastic showing. At times, a selective entrance test is even organized. The reason for this is the limited number of places available to handle the large number of applications.

It should be noted that agricultural technicians and senior technicians may be allowed access to applied engineering programs under certain special conditions which we shall examine further on.

During a transitional period, students in the third year of secondary school who fail to pass the Baccalaureate are permitted to apply for advanced technician training within the limits of available space (holders of the Baccalaureate having priority) and after a special examination held for this purpose.

II - Profiles of higher agro-veterinarian training

There are currently three levels of advanced agro-veterinarian training offered by the national advanced training system:

1. State engineer, also called design engineer (five years after the Baccalaureate;

- Veterinary doctor (five years after the Baccalaureate);

2. Applied engineer (four years after the Baccalaureate);

3. Senior technician (five semesters after the Baccalaureate) or, during the transition, after the third year of secondary school plus an examination.

Table 1 shows the various profiles for the three levels listed above:

Speciality: State Eng.(1), Applied Eng.(2), Senior Technician.(3)	1	2	3
P.V. or Phytotechnology	*	*	*
Plant Protection	*	*	*
P.A. or Zootechnology	*	*	*
Animal Hygiene and Health			*
Accounting	*		*
Rural Eng. Hydraulics	*	*	*
Forestry	*	*	
Agro-food Technology	*	*	

Table 1

III - Statutory basis of advanced agronomic training

Advanced agro-veterinarian training is governed by five presidential decrees and numerous interministerial and ministerial executive decrees. Knowledge of these texts is instrumental for a good understanding of the national system of higher agronomic and veterinary training:

1. The most important text is the decree dated 28 May 1983 concerning pedagogic responsibility for advanced training establishments.

Article I provides that those establishments not attached to the MHE (Ministry of Higher Education) are nevertheless subject to the pedagogic authority of this Ministry, with a view to better coordination and unification of the national system of advanced training.

This pedagogic responsibility confers very broad supervisory powers upon the MHE for establishments over which it has no formal authority.

In this respect, the MHE participates in all aspects of the operation of these establishments (conditions of admission, student orientation, program content, length and intensity of studies, opening of streams and electives, issuing of diplomas, etc.).

In addition, the pedagogic directors of these establishments are designated by joint decree of the ministry involved and the MHE.

For the implementation of these far-reaching prerogatives, sectorial pedagogic tutelage committees are set up.

Thus, for agronomic training, a pedagogic tutelage committee has been installed for establishments attached to the Ministry of Agriculture and Fishing. It is composed of the appropriate central officials and of the heads of the agronomic and veterinary training institutions.

2. Next in order of importance is the decree dated 21 May 1983, creating a Central Advisory Board for coordinating relations between advanced training institutions and the user sectors. This coordination board views itself as a planning instrument for advanced training whose purpose is to adapt the outflow to the labor market.

With regard to agro-veterinarian training, this will be co-ordinated by a special committee of the advisory board having three main tasks:

- proposing training profiles and structures;

- organization of practical training sessions; and

- setting up continuing education programs, etc.

This coordination committee, consisting of pedagogic as well as economic decision makers, calls in turn upon numerous technical groups in charge of designing programs, training sessions and structures decided upon by the coordination committee which, at the final stage, submits them to the Central Advisory Board for approval.

3. Two decrees, dated 24 September 1983 and 1 October 1985, have set forth the model statutes for establishments of higher education and advanced training. It might seem that the distinction between these two types of institutions is purely formal. However, the NIHE (National Institute of Higher Education) falls exclusively under the responsibility of the MHE, whereas the NIAT (National Institute for Advanced Training) is subject to twofold control: the MHE on the pedagogic side and the sectorial ministries on the administrative side.

Actually, the terms 'education' and 'training' have been consciously chosen to reflect a perceptual difference between professional training at universities, on the one hand, and users on the other. This is of course a throwback to the old debate on the logic of education versus vocational training.

4. Finally, a decree dated 17 December 1985 created a general inspector's office for pedagogy attached to the MHE. This office is responsible for pedagogic activities at both NIHE and NIAT establishments, implementing the ministry's authority over these institutions.

This decree supplements the charter of the MHE with respect to pedagogic activities at advanced training establishments falling under the other ministries. This does create some problems. The human component of the inspector general's office consists solely of academics, so that one might fear a certain incomprehension between the inspectors and the people they deal with. All the more so since the logical distinction referred to above goes beyond mere academic speculation.

This text being of such recent date, it would be risky to criticize it unduly at this point on purely theoretical grounds.

IV - The program approval and adaptation process

The process for approving and adapting programs is very much a timely topic. The implementation of pedagogical responsibility presupposes recognition by the MHE of all types of advanced

training coming under other ministerial departments.

To ensure such recognition, across-the-board negotiations are under way to have program content, curricula and profiles of advanced training accepted by all parties concerned - university and MHE, on the one hand, and NIAT and sectorial pedagogic decision makers on the other.

An approval and adaptation process was promptly established within the framework of the bodies described in Section III above (Central Advisory Board, coordination committees).

The coordination committees have set up a number of mixed technical groups keyed to training streams.

These technical groups have had to perform, and still do, a considerable job of profile comparison, definition, and redefinition, as well as redesigning courses and reshaping curricula.

At the final stage, draft profiles and programs are discussed at the level of the national pedagogic committee of the stream, which is the representative body of the university community, and if the national pedagogic committee gives its approval, the drafts are submitted to the sectorial pedagogic tutelage committee for official adoption by decree, and thence they become statutory for the NIHE and NIAT establishments.

V - Transfers between levels of advanced training

Transfers between various levels of advanced training are few and far between at the university. There is no opportunity for such movement between two levels, except in the case of going from graduate training (second cycle) to post-graduate training (third cycle). This passage is very closed. The student enters university with a Baccalaureate under the conditions mentioned above and may apply for the third cycle (post-graduate work) only after completion of the first and second graduate cycles (at least the Bac + 4).

It should be noted, however, that transfers (from one stream to another in the same cycle) are normally allowed as long as conditions for access to the streams remain the same.

On the other hand, transfers are much easier in NIAT institutions. Maintaining such mobility involves a certain amount of wrangling between the parties involved in pedagogic affairs.

As for agronomic training, there now exists a procedure calculated to motivate students. Thus:

- the first two students of the graduating classes of medium-level technicians (three school years plus one year) are promoted to the first year of applied engineering if their general average is above 12/20;

- those ranking third to seventh in the same classes are admitted directly into the first year of advanced agronomic technician study without examination;

- likewise, those ranking first to fifth in the graduating classes of senior technicians are admitted to the third year of the engineering cycle.

One may wonder if the curricula of the different cycles are mutually compatible so as to allow for such a system. Are the first two years of the engineering cycle simply the senior technician cycle? Certainly not: successful performance by students profitting therefrom necessitated personal efforts on their part to adapt and raise themselves to the requisite level. But these transfers are precisely intended to encourage an especially high degree of individual initiative.

Furthermore, by keeping these opportunities open, we avoid letting younger students in the lower cycles feel that they are nearing the end of the road.

VI - The Algerian system for agro-veterinary training

The Algerian agro-veterinary training system possesses, as we have seen in the case of higher education, the distinction of introducing several operators at each level (see **Annex 1,** p. 15).

1. Thus, for avanced training: the MHE, the MAF (Ministry of Agriculture and Fishing) and to a certain extent the MEHF (Ministry of Environmental Hydraulics and Forests) participate jointly in the training of professionals

at levels 6 and 5, that is, engineers and senior technicians.

2. For secondary training, the MNE (Ministry of National Education) and the MAF participate in the training of agricultural technicians and agricultural professionals (level 4).

3. For vocational training: the MVTL (Ministry of Vocational Training and Labor) and the MAF train supervisors and CAP graduates (Vocational Aptitude Certificate) in all specialities directly or indirectly linked to agricultural activity (levels 2 and 3).

The following commentary on the synoptic table showing the national apparatus of agro-veterinary training gives an idea of the various operators and their relations having to do with the training of professionals for Algerian agriculture.

Commentary on the "Organization of agricultural training" (see Annex 2, p. 16)

First section:

Agriculture is introduced into teaching programs from the basic or primary cycle onward, inasmuch as beginning with the third level of basic school, that is, the 7th, 8th and 9th years of basic schooling, students are given an introduction to agricultural technology. At school, basic agriculture and greenhouse farming are taught and numerous excursions to farms are organized for the students.

By this means, at the end of the 9th basic year (end of compulsory education) students oriented toward secondary agricultural studies will naturally follow the program of this stream. The same is true of those who opt for the agricultural technician training offered over three years by the IMATs (Institutes of Medium-level Agricultural Technology) under the MAF.

Those who lack the opportunity to attend secondary schools or an IMAT may either:

- pursue training in specific agricultural trades (supervisors) as offered by the ATPC (Agricultural Training and Popularization Centers) of the MAF; or
- prepare various CAPs in support trades for agricultural production (agricultural mechanics, agricultural accounting, blacksmith, etc.).

Finally, for those unable to find room in an institution, there are opportunities for periodic training or apprenticeships, a kind of training *in situ* backed by alternating theoretical and technological instruction offered by the agricultural training centers.

Second section:

Section two of the table shows the programs for the first and second university agronomic cycles. One of three situations may prevail:

1. The student passes the Baccalaureate, sciences, math and soon agricultural science;

2. The student fails the Baccalaureate;

3. The student gets his agricultural technician diploma. In this case, as we have seen, access to upper cycles proceeds via the transfers organized by the NIAT under the MAF.

- First case: in principle, admission is granted to the various cycles for senior technicians, applied engineers, design engineers and veterinarians.

- Second case: admission is granted by competitive examination to senior technician cycles with all options.

The final section of the table shows the post-graduate (PG) organizational scheme in Algeria as it will look a few years from now when the second PG and the SPG (specialized post-graduate) systems have been set up.

The PG system is governed by a decree dated 17 March 1987, whereby it is broken down into two levels plus a separate level that is vocational in character. This constitutes an updating of the PG system as previously spelled out in a 1976 decree. In fact, this latter text was already a departure from the French system, opting for the Anglo-Saxon PG approach.

The innovative aspect of the 1987 text is the creation of an SPG system. The first level is the master's, prepared in two years after five years of graduate study. This means that applied engineers (Bac + 4) must do one preparatory year

in order to enter the first year of the master's. The second level is the Doctor of Science, with enrolment open to holders of the master's degree. At least three years enrolment in the cycle is required to defend the doctoral dissertation.

Finally, the professional level is the SPG or DESS (Degree in Advanced Scientific Studies), open to graduates (Bac + 5 or Bac + 4) who have a number of years of professional experience. The DESS, which requires one year of training, may under certain highly restrictive conditions enable entry into the second year of the master's program.

Actually, post-graduate training is particularly weak in Algeria; training abroad is still an important avenue of recourse. Suffice to say that the MAF alone sends some 200 post-graduates to study in foreign countries each year, as well as trainees in the various agro-veterinary specialities.

At the present time, only the El Harrach NIA (National Institute of Agronomy) provides training for the Master of Science in Agronomy.

Nonetheless the beginning of the academic year in September 1987 looks promising for post-graduate training. Specifically:

1. The National Veterinary School plans to launch a master's program in veterinary medicine.

2. The first one-year DESS ou SPG students will be placed in two agronomic specialities (grain farming and dairy cattle breeding).

3. The first experiment in training for the Doctor of Science in Agronomy or the PG will be started at the NIA.

VII - Planning of advanced agro-veterinary training

Planning for advanced agro-veterinary training brings four operators into the picture:

- the MP (Ministry of Planning) as the agency responsible for planning human resources;

- the MHE in its training capacity;

- the MAF and the MEHF as users of trained personnel and as trainers.

These operators have worked hard to map out the advanced training program in agronomy and veterinary medicine. It was their task to put the fine points on the overall requirements stipulated in the five-year plan with respect to manpower on levels 6 and 5.

At the same time, they had to pinpoint by level the various streams to be organized, as well as reach a decision concerning installation of the various institutes nationwide.

This work ran into quite a few problems, for example, the difficulty of defining the proportions of engineers and veterinarians in the number of senior technicians, or that of determining relative strength among the different training streams.

With the exception of forestry requirements, the projections for the number of engineers, veterinarians, and senior technicians to be trained have been set as follows:

Specialities	Level 6	Level 5
Agronomy (all specialities)	5,900	5,430
Veterinary	2,000	2,200

Table 2

Present capabilities for advanced agro-veterinary training are shown in **Tables 3, 4** and **5** which give the number of students enrolled in advanced training establishments.

1. Agronomy

Establishments	Level 6	Level 5
NIA	1,100	
NIHE Blida	417	201
NIHE Tiaret	275	106
NIHE Batna	412	
NIHE Mascara	85	
NIHE Chlef	144	
IAT + ISAT	1,075	
NIAT/HT (MAF)	1,385	1,385
TOTAL	3,568	1,692

Table 3

2. Veterinary medicine

Establishments	Level 6	Level 5
ENV	430	
Blida	100	
Constantine	513	139
Tiaret	191	90
Batna	38	225
TOTAL	1,272	454

Table 4

The following establishments, which will train senior technicians as of September 1987, should be added to the list below (**Table 5**).

Establishments	Ultimate capacity	Sept 1987
NIHE in Chlef	500	100
INES d'Oum el Bou	500	100
INES de Djelfa	1,000	100
TOTAL	2,000	300

Table 5

A first reading of these tables reveals a flagrant imbalance between training at level 6 (specifically by the MHE) and level 5. The reason for this is that the experience of the MHE in the matter of senior technician training is only quite recent. Furthermore, academics have always expressed a preference for level 6 training, leaving the training of level 5 up to the user sectors.

Measures have been taken, however, to redress the balance. At coordination meetings of the group charged with implementing the university agro-veterinary organizational plan, it was decided that, for the school year 1987-1988, 1,350 openings in the first year for level 6 and 1,200 openings in the first year for level 5 would be made available.

Since the outflow rhythm is twice as fast for level 5, this arrangement will allow for a greater number of senior technicians in order to reach and adhere to the norm of 1 to 2 set in February 1983 by an interministerial committee.

An analogous measure has been initiated for equalizing those training programs in animal production (zootechnology, animal health, small-scale breeding) which correspond to training programs in plant production.

This report does not deal with aspects of advanced agro-veterinary training relative to the content of programs. This omission is intentional because almost all of the programs are in the process of being reshaped by the agencies and bodies concerned. There is a very good chance that the content of programs currently being offered may become obsolete within a very short time.

Abbreviations

MAF: Ministry of Agriculture and Fishing - *MAP: Ministère de l'Agriculture et de la Pêche*

MHE: Ministry of Higher Education - *MES: Ministère de l'Enseignement Supérieur*

MEHF: Ministry of Hydraulics, Environment and Forestry - *MHEF: Ministère de l'Hydraulique, de l'Environ. et des Forêts*

MNE: Ministry of National Education - *MEN: Ministère de l'Education Nationale*

MVTL: Ministry of Vocational Training and Labor - *MFPT: Ministère de la Formation Professionnelle et du Travail*

MP: Ministry of Planning (*Ministère de la Planification*)

NIHE: National Institute of Higher Education - *INES: Institut National d'Enseignement Supérieur*

NIAT: National Institute of Advanced Training - *INFS: Institut National de Formation Supérieure*

ST: Senior Technician - *TS: Technicien Supérieur*

VAC: Vocational Aptitude Certificate - *CAP: Certificat d'Aptitude Professionnelle*

PG: Post-graduate (*Post-graduation*)

SPG: Specialized Post-graduate - *PGS: Post-graduation spécialisée*

IAT: Institute of Agricultural Technology - *ITA: Institut de Technologie Agricole*

NCAP: National Center for Agricultural Pedagogy - *CNPA: Centre National de Pédagogie Agricole*

ISAT: Institute for Saharan Agricultural Technology - *ITAS: Institut de Technologie d'Agriculture Saharienne*

TISAT: Training Institute for Senior Agricultural Technicians - *IFTSA: Inst. de Formation de Techniciens Supérieurs Agricoles*

IMAT: Institute for Medium-level Agricultural Technology - *ITMA: Institut de Technologie Moyen Agricole*

ATPC: Agricultural Training and Popularization Center - *CFVA: Centre de Formation et de Vulgarisation Agricoles*

CVTA: Center for Vocational Training and Apprenticeship - *CFPA: Centre de Formation Professionnelle et de l'Apprentissage*

DESS : Degree in Advanced Scientific Studies (*Diplôme d'Etudes Supérieures Spécialisées*)

Annex 1

Table of training levels

Level 6:
Veterinary
State engineer
Applied engineer

Level 5:
Senior technician (ST)

Level 4:
Technician

Level 3:
Supervisor
Highly qualified worker (HQW - Fr: OHQ)

Level 2:
Qualified worker (QW - Fr: OQ)

Level 1:
Specialized worker (SW - Fr: OS)

Annex 2
Organization of agricultural training