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Training Agronomists and Veterinarians in Mediterranean Countries: A General Presentation

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These twelve national reports presented at the Rabat symposium constitute a basic set of documents on training systems for agronomists and veterinarians in Mediterranean countries.

It is a great step forward to have such a collection of information at our disposal.

Varying terminology is often used in these reports, and it would be advisable to work on clearing things up in this regard so as to make sure that everyone is indeed talking about the same thing. This, however, does not diminish the importance of these documents.

The reports were supposed to be short: they could not include either the history of the development of training systems, nor the mutations occurring at the present time. They are, in fact, a snapshot taken at a given moment (December 1986). Nevertheless - and this is a further encouragement for thought and action - the Italian, Portuguese, Greek, French and other reports allude to reflections, sometimes even to reforms, that are taking place. It is therefore important to keep in mind the fact that the situations described are subject to change.

In reading the reports and listening to the speakers, one is struck more by their diversity than by their convergence. So as to account for this in an orderly fashion, this presentation will be presented under seven headings.

I - A possible typology

In terms of organization, Mediterranean countries offer agronomic and veterinary training systems that are as varied as those encountered all over the world. Two ideal types emerge from this variety, making it possible to establish a rough classification centered on two axes.

On the one hand, a structure bearing the definite stamp of ancient French tradition, characterized in particular by the *Grandes Ecoles*, the preparatory classes, the tutelage of the ministry responsible for agriculture, and a strong identification of the agronomic and veterinary training systems within the general educational system.

On the other hand, an academic type of system applied to these same programs, with its faculties, the tutelage of the ministry responsible for education, and a strong overlapping of these programs with other existing programs.

It can be observed that France (obviously), Morocco, Algeria and Tunisia are attracted to the first axe, with Morocco being a more integrated example than the French example. The second axe more aptly characterizes Spain, Italy and Yugoslavia, and to a lesser extent, Greece and Portugal. Egypt offers an intermediary configuration, and Lebanon stands alone as the point of convergence of these two axes, with its particularity consisting of pairing the public and the private sectors.

To this first hasty classification, one may add a second; based on the age of national agronomic and veterinarian training institutions and policies. This second point of view reveals that more recent systems apparently offer a greater coherence or clarity, whereas systems inherited from a sometimes century-old past and made up of successive strata, none of which cancel out the previous one nor leave it untouched, are more difficult to understand.

This first characterization comes close to that proposed by J. Casas in Istanbul in speaking of national research systems. On the one hand, he spoke of the group of countries with a highly structured training system and a weak research apparatus, where training institutions bear the brunt of the research effort, namely Morocco, Tunisia and Algeria.

In the other group of countries, training and research are separate, with separate means. In these countries, (Italy, Yugoslavia, Spain and Portugal) integration is being attempted, more or less successfully, according to his own words.

Another aspect was mentioned, comparing countries where research resources are, or wish to be, centered in the universities, as is the case in Turkey and Greece.

Finally, one country was found to have a strong research apparatus and a strong training apparatus with multiple junctions - the case of France, whereas Egypt, France's symmetrical axe, disposes of two large apparatus with few relations existing between them.

The above rough distinctions, although they have the defects of any binary or possibly even Manichean contrast, are not without heuristic value. They make it possible to grasp a series of significant differences between countries with regard to the number of graduates, selection processes, programs, and ties with the research and economic sectors.

My aim here is not to repeat what has already been said in the lectures, but to propose a series of common questions that, in my opinion, deserves to be dealt with thoroughly.

II - What profiles are sought ?

This, of course, is the first question to ask. What profiles for engineers or veterinarians - what kinds of product, some would say - are being aimed at? There is little mention of this in the reports, although the issue was dealt with at a roundtable.

What kind of specialists will be needed in thirty years, in the agronomic sector itself, but also in transformation, quality control, rural and forest planning, and hydraulic works? This question obviously remains unanswered. In northern European countries, specialists in the study of the future tell us that we cannot imagine, much less specify, so much as half of the professions that will exist in twenty years. What is true for society as a whole is also valid for the sector we are concerned with and that which is true for some of our countries has every chance of being so in the others. And yet the question is important: the student who starts his or her studies in 1990 will retire in 2035, a third of the way through the next century.

Is it our aim, furthermore, to train civil servants, teachers and researchers, executives and entrepreneurs?

In the absence of an answer to this question, let us at least examine the current situation:

In Morocco, 92% of higher education graduates are employed by the public sector - 19% of them in the areas of research and training, and 8% in the private sector.

In Tunisia, it is estimated that 83% of the graduates go into the public sector - 11% of them in research and training, and 37% in the public economic sector. About 5% go into the private sector *sensu stricto*, and 11% into the international and other fields.

The Italian report notes that with 13% of the graduates going into agricultural production, the

question arises as to the use of diplomas in agriculture.

Yugoslavia emphasizes the need to increase the flow of trained professionals into the agro-food industry.

In France, "one may observe a diversification of job opportunities, with a general trend towards the reduction of sectors directly tied to agriculture and an increase in other sectors such as agricultural and food industries". This "diversification" has a corollary, namely that graduates from other schools, in particular business schools, are competing with agronomists and veterinarians in the job market.

The figures for France - which should be read as indicators for future trends in the period from 1980 to 1985 - are the following:

- Administration, official bodies: 12%
- Education-Research: 22%
Total: 34%

- Agro-food institutions: 7%
- Non-food industries and commerce: 19%
Total: 26%

- Professional and interprof. groups: 13%
- Credit unions, mutual societies, banks: 10.4%
Total: 23,4%

- Farmers, entrepreneurs: 10%
- Liberal professions, research companies, consulting: 6%
Total: 16%

These indications have many significant consequences.

To this one should also add the way in which the managers of private companies regard graduates: the issue was summarized in four points in a report written by one such manager and submitted to the French Ministry of Agriculture in 1984.

a) "The most positive aspect of higher education is that it selects students (hence a definite preference for the *Grandes Ecoles*, which have a tougher selection process than the universities)".

b) "This selection process leads us to suppose that students entering the job market have an open mind and good assimilative and adaptation abilities".

c) "That is what is most important to us, much more so than the actual content of their knowledge, especially since the latter is far removed from the concrete realities which concern us".

d) "We must beware of those who pursue their education for too long: it may be that such people are intimidated by action."

The above comments on profiles cannot be dissociated from a consideration on the number of graduates.

An estimated 16,000 students (agronomists, applied engineers, veterinarians) graduate every year, among them 3,700 veterinarians in countries of the Mediterranean region.

The data collected do not make it possible to present more specific figures.

Egypt alone trains almost one third of the yearly number of graduates (4,800). Turkey and Italy are next in line as large suppliers with a production of 2,000 and 1,700 graduates respectively. These three countries alone train half of all graduates.

Two main problematiques emerge in determining this production: on the one hand, countries establish specific goals for agricultural production and thus for the number of professionals required to achieve these goals. Morocco insists on the need to increase the number of technicians and engineers.

Algeria estimates its need for agronomic engineers as being 3,200 for 1989 and 4,100 for the year 2000. The speaker estimates that in 1989, the deficit will reach 50% in comparison with requirements, and that the deficit will be filled by the year 2000.

In the same way, Turkey trained 1,140 graduate agronomic engineers in 1984-1985, compared with 728 in 1982-1983.

In reading these reports, it can be noted that these countries have set objectives for a significant increase in the training of engineers and veterinarians, in order to modernize their agriculture. But such a rapid increase in outflow is limited by three factors:

a) equipment,

b) the teaching body (Tunisia increased its teaching personnel from 148 to 269 between 1983 and 1986, with a budgetary increase that can hardly be repeated, and runs a risk with regard to the quality of personnel recruited with such suddenness),

c) employment of graduate engineers, since the State or public institutions alone have job openings of this type.

On the other hand, countries such as France, Spain, and Italy have to face not so much a brutal increase in the training of graduates, but rather possible reorientation. As economic officials suggest, should these countries not first and foremost train engineers... agronomic engineers to be sure, but engineers first of all. The proof of the matter is given by the government of one of the above-named countries, which decided in 1984 to increase the training of engineers of all categories by 15%. In these countries the debate on training/jobs is far from over.

Some consider that one should train agronomists for civil service, while others consider that one should train engineers who would be capable of fitting into a number of sectors.

The discussion is open, and it would at this point be interesting to collect the main points as presented by each country - since this first exchange of information did not make it possible to deal with the issue.

III - What kinds of selection and recruitment processes?

Generally speaking, with Italy as the only exception, admission into advanced training cycles is granted on the basis of a competitive exam. Tunisia recruits on the basis of dossiers. In Turkey, Egypt and Yugoslavia, the procedure of the competitive examination applies in the same way as in other advanced academic programs. In Spain, it is required to successfully pass a competitive exam in order to enter veterinary faculties and higher technical schools of agronomic engineering, but not for entry into agricultural technician schools.

Greece has set up an examination procedure which does not apply to graduates of the agronomic department of vocational high schools.

Morocco, Algeria, Lebanon and France use the same procedure. In France, it takes one year to prepare the competitive exam for entrance into veterinary schools and schools of technical engineering, and two years for agronomic engineering.

During the discussion, the importance of this selection procedure for the rest of the training process was stressed.

Three questions may be asked concerning this chapter, all of them unanswered by the reports.

1. What are the criteria for selection? What is aimed at through selection? What are the disciplines through which selection takes place?

2. What percentage of candidates is selected?

3. What is the connection between technical or secondary vocational education, and advanced training?

The problem of selection deserves more attention, because it is not only from the very outset an expression of the training system itself, but also constitutes the moment in time when outflows and positions offered after graduation are determined.

Who decides on the number of students and on the rate of outflow?

To what do these figures correspond, for example, in relation to the active agricultural population? Or to the number of civil servants employed in the agricultural and agro-food sectors? Or to the total university population?

Does one proceed by adjustments, automatic renewal, planned decisions?

Here we lack certain elements:

a) on the economy and demography of each country; and

b) on training systems taken as a whole.

IV - Organization and programs

At this point, there are six remarks that I would like to make.

First, almost all of the speakers, except for the Spanish and the Lebanese rapporteurs, mentioned the existence in their country of a secondary training level ending in baccalaureates or agricultural technician certificates.

The Bac + 2 courses of training were also brought up, and these I would designate as senior technician training levels, although this qualification hardly applies to the situation in Egypt or Greece.

A distinction is often made between the training of engineers in agricultural techniques (usually Bac + 4), training of agronomists (Bac + 4 or 5, or even 6) and veterinarians (Bac + 5 or 6).

One may therefore observe a relative homogeneity. To say the least, we are confronted with situations that are indeed particular to each country, but that have a few configurational modules in common to their training systems, above and beyond the general classifications given at the beginning of this presentation.

My second remark will introduce some slight distinctions into the above optimistic observations. Programs vary considerably from one country to another.

In some countries, training is organized into streams for the duration of studies (Spain, Italy, Yugoslavia, and maybe also Turkey), whereas other countries have a system made up of two distinct cycles: the first cycle for the acquisition of knowledge in basic disciplines, and the second cycle based on specialization or technical disciplines. Within the broader options, procedures exist in the form of "option blocks" or credits, which allow for transfers and a menu of programs (Tunisia, Greece, Morocco, Lebanon, and France). But generally speaking, the schools or faculties have limited specialization which results in a certain rigidity.

Although the reports most often describe specializations offered in their training streams or second cycles, they say very little about how the programs are constructed, and on the position of the basic disciplines, particularly in veterinarian training. The French report points out the eminent role of biology in training. What is the case elsewhere? During the first roundtable, it was mentioned that training programs for technical engineers include a 30 to 40% share of basic sciences, whereas the engineering program includes 60 to 70%. What is the situation in each country?

This difficulty in comparing programs leads me to my third remark.

Does each training and qualification level correspond to a program of its own, or is each level simply based on a truncated program of the next higher training level?

When a two-year technician's training program is offered, is a specific program set up for this purpose, or is this simply the first part of the four-year training program? This has not been clearly shown except in the Tunisian report, which shows a continuum from one program to the next. This is an essential point.

Many countries experience difficulties in setting up Bac + 2 programs, because of the fact they have not settled this issue.

A fourth remark about the program: what is the role attributed to practical training sessions in the training of engineers and veterinarians?

The Spanish report stresses the uneasiness caused by an excessive emphasis on book learning, the lack of contacts with economic sectors, and the misuse of geographical locations.

The Moroccan and French papers report a systematic policy of practical training, established according to the different training levels, and seeking to develop an interdisciplinary approach as well as a feeling for diagnosis.

This question ties us back in with the initial issue of training profiles for engineers and veterinarians.

The fifth remark: how do the programs tie in with each other from the intellectual point of view? The question may already be asked as concerns training agronomists. But when dealing with their training, in addition to veterinarians, foresters, specialists in irrigation and agro-food engineers,

there is a need to pinpoint the common language, the "original" concepts that tie all of these programs together. The reports do not provide an answer to this question.

Finally, a sixth remark or rather a last question: are the diplomas awarded by these training programs equivalent to each other?

V - Continuing education

Generally speaking, continuing education is still not very highly developed in Mediterranean higher agronomic training.

In Italy, the regions are responsible for this aspect; the same is true for Morocco.

In most cases, specialized associations play a role in continuing education.

Tunisia, like France, has set up a specialized institute which provides retraining for technicians. Algeria indicates that it does not have continuing education at the advanced level. France has introduced a senior Agricultural Technician Certificate via social promotion.

Egypt is certainly the country which has developed the boldest policy in this regard: 24 centers provide training cycles for executives and engineers, not only Egyptian, but also for students from Africa, Asia, and Latin America. The subjects taught in these centers are irrigation and agricultural hydraulics.

Everything points to a considerable development of continuing education in the coming years: exchange and cooperation must therefore be particularly encouraged in this relatively new sector, where possible common procedures can be more easily developed from the very outset.

On several occasions, participants expressed the desire to deal with the issue of extension work as a whole: but this should not be considered separately from the issue of continuing education.

VI - Liaison with research

I would like to compare the figure given in Istanbul for researchers (10,000) with the total number of teachers (3,500) mentioned in these reports.

Training constitutes the link between research and developement; the quality of training is directly tied to its involvement with research.

All of the reports stressed the need for liaison with research, and this issue was both analyzed and summarized during the second roundtable. I believe there is no need to repeat what was said then.

I wish to recall the excellent debate on training "for" research.

As to training through research, given all that was said on the necessity for engineers to possess adaptation ability (they will be changing professions two or three times in their career, and changing the way in which they exercise their profession at least two or three times as well), training through research is a means by which to acquire good working habits and a capacity to adapt.

This is the very opposite of a recipe: rather, it is a summoning of method, initiative and imagination. It was stressed, however, that schools, including those which support a large part of the national research effort, could not and should not embark on full-scale research.

- One cannot do everything everywhere, it was said.

- But neither should one wait to be at the top level in terms of equipment and means before implementing a program, someone added.

Finally, it was pointed out that the training-research liaison is inseparable from the liaison with development, on the one hand, and cooperation on the other hand.

And cooperation in this field must, to be really useful, be effected on the basis of poles of excellence.

What are the strategies for excellence, the area(s) of excellence aimed at by our schools and our institutions?

And will it be possible to map out these poles of excellence in Mediterranean agronomy?

VII - Expectations, particularly with regard to ICAMAS

I use the term "particularly" because, as the Secretary General said, ICAMAS should not be looked upon as the 13th Mediterranean State, or as the "welfare State" of agronomic and veterinary training. There is a great deal of bilateral and multilateral cooperation that exists, can exist and should exist without ICAMAS involvement. There should also be a greater amount of twinning.

As for ICAMAS itself, there are four main expectations:

1. The first concerns third cycle programs, and the setting up of a common approach through research and for research. This was the issue dealt with during the second roundtable.

The idea of an international master's in Mediterranean agronomy was suggested. It is clear that many regions do not dispose of the scientific potential that would allow them to cover all specializations in agronomy, agro-food, forestry and veterinary science at the highest level. What is the latitude of potential ICAMAS involvement in this regard?

2. The second recommendation, related to the first, concerns the role which could be played by ICAMAS in improving teacher qualifications: either by setting up short improvement cycles (as is already the case) or by planning one year programs, or else by bringing together teachers and researchers for a research project. Can ICAMAS encourage the emergence of clubs for teachers and for researchers, set up on the basis of topics and disciplines?

Is it conceivable for ICAMAS to assist teams or individuals from different countries in joining efforts to, for example, respond to EEC contract bids?

What can ICAMAS do to favour teacher exchanges, and exchange visits for students? On the assumption that training sessions and foreign exchanges for students will become more widespread, it is conceivable that ICAMAS could play a role in encouraging student mobility in the Mediterranean area.

3. ICAMAS and its institutes are expected to encourage reflection and cooperation between countries with regard to training modules, to programs, to methods (practical sessions, papers), and to student profiles. There is a wish to improve the exchange of information on training programs. Can ICAMAS support the idea of setting up a joint body of documentation?

The participants attributed the role of capitalizing on and steering the reflection process to ICAMAS. It is therefore now advisable to determine the ways in which to pursue the task, already undertaken by this institution, of capitalizing on this data and experience, and animating networks. Is it possible to set up work groups?

4. It appears that ICAMAS must make itself known to, and work with, not only States and governments, not only international organizations and its own institutes, but with all of the universities and schools concerned, in every country.

It is within the training centers themselves that the concept of Mediterranean agronomy must be developed and promoted.

It is a dual movement of promotion of the international dimension of national training systems and of promotion of an international training organization that must be implemented.

This is a challenge that must be taken up if one is to create, develop and maintain a Mediterranean intellectual community.

ICAMAS could, in this adventure, be a very effective lever: all of the speakers stressed this fact.