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## **Transformations in higher education in Agricultural and Food Sciences in Central and Eastern Europe**

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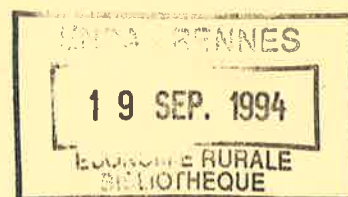
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**TRANSFORMATIONS IN HIGHER EDUCATION  
IN AGRICULTURAL AND FOOD SCIENCES  
IN CENTRAL AND EASTERN EUROPE**

SECOND EUROPEAN CONFERENCE

ON HIGHER EDUCATION IN AGRICULTURE

*MANAGING CHANGE IN THE FOOD-CHAIN AND ENVIRONMENT :*

*THE ROLE OF HIGHER AGRICULTURAL EDUCATION*

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## **ABSTRACT :**

Current transformations in higher education in agricultural and food sciences in Central and Eastern Europe render it interesting for the analysis of repercussions of post communist economic and social transition, particularly in the adaptation and restructuration of scientific and technical education.

Using an institutional approach and referring to their experience of these educational systems, the authors provide a western view of current transformations and areas of development of higher education in agricultural and food sciences in the countries concerned. The emergence of a new social demand and of new systems of access to employment implies re-evaluation and adaptation of former training models. Current study of the question should focus on three key areas :

- redefiniton of the role and function of managers in the agricultural and food economic sector.
- replacement of a production orientated approach by an overall approach to the problem of rural development.
- recognition of the educational value of biological sciences as both models and tools in the acquisition of knowledge and the management of complex systems.



## I - INTRODUCTION

Central and Eastern Europe have emerged from decades of centralised economic planning and political dictatorship and are moving towards democracy and a market economy. The great economic, social and political importance of the food-chain and the rural world in these countries means that they are particularly affected by current changes.

According to the country, agriculture employs between 10 and 27% of the working population, represents 7 to 20% of the gross national product ; 25-64% of the population is of rural origin ; agricultural and food products contribute to 15-35% of exports. Moreover, the agricultural and food sector, one of the major areas of experimentation for the communist production model, had a specific structure and organisation resulting from this : collective ownership of land and means of production, industrialised agriculture, division of labour, vertical integration of the different activities of the food-chain...

It is essential that higher education in agricultural and food sciences should undergo rapid adaptation, for three reasons :

- Like technical education and the training of engineers in general, it was strongly influenced under the previous regime by political pressure towards a certain type of organisation and operation, which was the condition for generosity in allocation of resources.

- The traditions and tasks of the food-chain, its specific character and that of the rural world, its institutional organisation into universities or faculties covering a wide range of disciplines (from social sciences to pure and applied sciences) make the agricultural sciences a key area for new thinking and the innovation of new types of training offering an **integrated approach** to economic, social and technical development.

- The agricultural sciences offer an interesting subject for analysis of the impact of economic and social transition on **the adaptation of scientific and technical education**. Science and technology are the results of a society's history, and the transmission of knowledge is strongly linked to social and political context.

This study examines the current transformations and principal areas of development in higher education in the agricultural and food sciences in Central and Eastern Europe. It draws on the authors' experience of these university systems acquired through the setting-up of joint projects, through numerous contacts with teachers and researchers and through consultancy missions carried out for the European Commission, particularly in POLAND, HUNGARY and RUMANIA.

This is a western view of what must remain, in part, a reality foreign to our own experience. The more so, as that personal experience concerns teaching and researching in western, and more particularly French, institutions, given the specific character of French higher education (split between universities and "écoles d'ingénieurs").

We shall first recall the general context of restructuring of higher education in these countries, then analyse the specific case of the agricultural sciences, and define priority areas for development in this type of education. We shall pay particular attention to long study courses (more than four years), which should be the point of departure for an overall reorganisation of studies in the field of agriculture.

The situation is obviously not identical from one country to another, but beyond national variations there exist strong common factors we wish to underline.

For convenience, we shall frequently use the term agricultural sciences to refer to the range of disciplines commonly taught at university level in this sector : the agricultural production sciences, including horticulture and forestry, food science and technology...

## II - THE GENERAL CONTEXT OF REFORM IN HIGHER EDUCATION

Higher education in Central and Eastern Europe is the object of attention from international organisations (World Bank, European Union), Ministries and professionals, in an attempt to determine the conditions and characteristics of its short and long-term development. It is recognized (Commission des Communautés Européennes, 1993) that higher education has a part to play in the reform of these countries.

Four missions have been defined for the university :

- to facilitate the transition towards a market economy and the restructuring of different sectors of the economy through **initial and continuing** education producing a qualified workforce, adapted to the needs of the labour market,

- to participate in the overall renovation of education and training by producing competent and highly motivated teachers responsible for the education of new generations,

- to contribute to the evolution towards a pluralistic and democratic society. Beyond its activities of teaching and research, higher education has a role to play in socio-political changes. It acts as guardian and communicator of social values, contributes to social cohesion, political stability and the development of knowledge, and humanity.

- to play a leading role in **regional** economic, social and cultural development.

In the majority of these countries reforms are already under way in the legislative and institutional framework. All the governments concerned have begun work on the question and changes are under discussion or already in place, although education is rarely an immediate priority, and pressure of other business often causes delays.

**The objectives are known** : increase in the number of graduates to attain western levels; prevention of the brain drain (emigration from Central Europe, internal movement towards more attractive or better paid professions, lack of interest in university careers among young people) ; development of the non-university sector.

### **The directions of development have been defined :**

- decentralisation and autonomy of the universities,
- improvement in system productivity and institution management,
- more democratic access,
- development of continuing education,
- diversification and flexibility of training,
- application of new teaching methods encouraging initiative, autonomy, synthesis and reasoning, aimed at decision-making,
- closer relations between teaching and research and an the end of to the split between universities and Academies of Science,
- strengthened contacts between teaching and industry, which provides both employment and funds for research and financing institutions,
- links between secondary and higher education...

### **The difficulties have been identified :**

- severe budgetary constraints which appear in poor maintenance of equipment and premises, lack of funds for modernisation and purchasing of teaching material, low salaries and purchasing power of academics and other staff,
- human problems caused by an ageing academic staff, poorly motivated and sometimes resistant to change,
- institutional problems arising from a hierarchical structure not disposed to call its own existence into question.

Given these circumstances, it is obviously useless to propose radical reforms which are highly unlikely to succeed : progress will only come from steady pressure for restructuring from the inside, relying on existing resources and finding means of motivating the different protagonists (students, teaching staff, administrators and economic partners). The limited public resources available make it essential that quality and efficiency should be priorities.

## **III - CRISIS IN THE TEACHING OF AGRICULTURAL AND FOOD SCIENCES :**

Central and Eastern Europe possesses a considerable educational infrastructure, (Commission of the European Communities, 1993 ; I.C.A., 1991) with over 40 universities teaching agricultural and food sciences, horticulture and forestry. They have an impressive student/teacher ratio (5-10 students per teacher) catering for high numbers of students (usually 3-5000 students per institution). Local competence and experience in **technical** education and **applied** research are beyond question and well-known.

This educational potential is currently experiencing problems of adaptation. The difficulties are frequently similar to those encountered in the whole of higher education, as we have stated. Nonetheless, they are particularly acute given the current economic, social and technical transformations in the food-chain.

These appear at different levels :

- a fall in recruitment (also affecting some western universities), both in student numbers and in quality of candidates, affecting this area of education while competition is increasing in new university sectors (economic and social sciences, law...). The social origins of students contribute to this problem in that the majority (50-80%) come from a rural world currently in recession.

- a decrease in employment, made worse by low professional mobility. In the past, as many as 60% graduates worked for large state farms or agricultural cooperatives. Highly qualified and technically specialised, they supervised the process of agricultural production and the transformation of products. The dismantling of these large organisations and the progressive appearance of smaller units of production is rapidly reducing an employment sector which was formerly large, protected and often state-controlled. However a new demand for other qualification profiles is emerging but is very often not yet financially viable (see below);

- difficulty in meeting strong potential demand for continuing education and retraining of managers, given lack of structures, funding and organisation of the market;

- lack of specific competences, notably in new disciplines (law, management, economics, social sciences) but also in traditional subjects which have failed to keep pace with progress in science and research, and in those linked to new concepts (product quality, protection of the environment, land use management...);

- a training model poorly suited to the needs of the moment. Graduates with a high level of technical specialisation need to be replaced by multi-skilled design engineers with high professional mobility, trained in technical and economic management. The technical profile should become the responsibility of technical schools or colleges, offering shorter courses and requiring less public funding. Teaching methods should change, placing less importance on rote-learning, erudition and applied problems, and greater emphasis on active learning and preparation for responsibility-taking.

- the necessity of undertaking or participating in the reconstruction of technical education in agriculture (teacher training, redefinition of course contents and teaching methods...) for which there is a high social demand owing notably to the emergence of a new class of small farmers. The development of this type of intermediate qualification is not generally looked on with much favour by universities, which prefer the prestige element attached to higher level studies. Yet this type of strategy should encourage the restructuring of the universities by offering interesting prospects for those members of the academic staff whose technical knowledge is no longer indispensable in university courses;

– the emergence of competition from other types of education delivered in different institutions, which threatens the traditional monopoly of agricultural universities in the rural and agricultural world. We may mention in particular courses in economics, pure and applied biological sciences and food technology.

The situation is all the more serious that development prospects in the agricultural and food sectors are still not easy to define. The lack of an agricultural policy in the majority of these countries, the difficulty of forecasting how these economies will dovetail into the western agricultural nations leave many professionals and leaders perplexed. They also serve as a useful excuse for inertia and lack of vision.

In our view, it is indeed possible to identify guidelines for the future, at least to the extent of defining the direction which thinking on future higher education in the agricultural sciences should take in these countries.

#### **IV – NEW PRIORITIES FOR TEACHING IN THE AGRICULTURAL SCIENCES :**

Within the general context described above, three major preoccupations should, in our view, guide the actions of those in charge of reorganising teaching in the agricultural and food sciences.

##### ***1 – Redefinition of the role and function of managers in the food-chain :***

The situation in the food-chain has been the subject of study by experts in the last few years. Their conclusions underline shortcomings in agricultural production and transformation (farm structures and industrial equipment and labour...) which appear outworn and obsolete, with a poor level of technical and economic performance, producing goods whose quality does not conform to current Western European norms. They also point out the poor structuring of the food-chain, resulting from lack of organisation among producers, difficulties in storage and packaging, disorganised and inefficient distribution, changing types of consumption, the ever-present role of the state...

With the setting-up of new structures of agricultural production and transformation, the need for highly specialised technicians familiar with the technical management of large production units will begin to fall (BARLOY et al., 1992; RUFFIO et al., 1993). Little by little there will emerge a demand for executives capable of taking responsibility for the technical and economic management of agriculture ("agricultural development"). In the same way, the application of market economy rules will oblige all those concerned in the food-chain to be actors in the market. Their organisation will require managers capable of coordinating activities at different stages in the chain (agriculture/industry relations, extension services, structuring of farmer's production groups...), the organisation and logistics necessary for the marketing of products and the creation of essential services (financing of activities, insurance of goods and persons, risk insurance, health and unemployment cover...)

The reorganisation of new production units, both agricultural and industrial, will require specialists able to participate in the planning of those reforms which they will be responsible for putting into practice. They will have to define their legal, economic, social and technical aspects.

Since the nature of their work will be changing, university graduates in agricultural sciences will have to possess new skills. The political criteria of "loyalty and docility", and economic criteria of "high-level technical specialisation" which used to determine recruitment will have to give way to new demands :

- the possession of new areas of competence : economics, management, law, social sciences...
- greater professional mobility, in a context where the horizon is not limited to public service and a single unit of production.
- polyvalence, flexibility, autonomy in action and decision.

Three principles should therefore guide decisions concerning students' education. They are far more important than the frequent debates focussed on subjects and teaching hours, rather than on the content of teaching and on its ultimate objectives.

These principles are :

- a **strong basic scientific training**, sufficiently broadly based to give future graduates the capacity for abstract thought, rigorous reasoning and a greater facility in building theoretical concepts, preparing their formulation and expressing technical problems in scientific terms,
- a more limited technical training, crucial indeed but not aiming at encyclopaedic knowledge. It should be based on **models** illustrating the fields of application of knowledge, giving working methods, developing a sense of reality, an open mind and an awareness of the complex nature of biological, technical and economic problems.
- the development of personal qualities essential in positions of responsibility : communications and management skills, ability to organise and adapt, to work hard and rapidly... The student's personality may be developed along these lines by various types of exercises : individual or group projects, written and spoken communication, language learning and training periods...

## ***2 - Replacement of a production orientated approach by an overall approach to the problem of rural development.***

Beside the questions raised above concerning the primary production domain, the whole of the rural world is also suffering from a geographic and social structure inherited from the period when agriculture was becoming industrialised. The results are a lack of land management, a low development of rural areas, unsuitable or non-existent public services and equipment, hidden unemployment and damage to the environment...

Quite apart from the strong public pressure on the question, there exist considerable employment opportunities and needs for specific skills in the areas of rural planning, the protection and development of the countryside...

Universities of agricultural sciences must take up this challenge if they are to continue to justify the resources currently at their disposal, given the impossibility of predicting strong growth in employment opportunities in the food-chain at the present time. The situation is all the more worrying that the annual output of graduates in this domain is traditionally high, and many of them are already seeking employment and in need of retraining and career advice and assistance.

Moreover, this field of investigation does not come within the area of competence of most universities of agricultural sciences, and there is a considerable risk of seeing competition appear in this area from rival institutions : faculty of biological sciences, of economics and social sciences...

Finally, the appearance of new social preoccupations, for example the protection of the environment, oblige the agricultural scientist to think on a wider scale, beyond the level of individual plots, to consider the farming system beyond the individual production unit and concern himself with how they fit into a larger agrarian system, a catchment basin or a particular chain of production, for instance.

In other words, we should no longer approach agriculture and the food-chain in terms of production and productivity : instead we should encourage notions of quality, coordination and an outward-looking approach.

On a yet wider level, this means that the universities can and must become privileged partners in **local and regional development**, in partnership with local authorities and professionals from the business world, within structures yet to be created. They will be able to mobilise their specialised knowledge and profit from the experience in training opportunities for their students. Material questions and the search for financial resources to complement state funding should form part of this action.

### ***3 - Recognition of the educational value of biological sciences as both models and tools in the acquisition of knowledge and the management of complex systems.***

Questions concerning the future of agricultural higher education in Central and Eastern Europe are also a manifestation of the identity crisis affecting this sector of education in Western Europe.

Indeed, the lessening political and economic importance of the food-chain in industrialised countries, together with the recession in the sector and the calling into question of its way of producing (notably in the context of the Common Agricultural Policy reform) lead to questions on the very continuation of this type of education. Falling recruitment and fewer job opportunities in several Western European countries are the outward manifestation of this, sometimes masked by particular local institutional cases (some establishments being very firmly entrenched indeed), or by the persistence of a particular social standing or recognition attributed to the holders of a particular qualification (often linked to a title or membership of a professional body).

On a deeper level, we are no doubt confronted with an epistemological crisis in the discipline, which can be summed up in the question "do the agricultural sciences exist ?" or "how can one justify the existence of teaching and institutions specialised in agricultural sciences ?". Progress in pure and applied sciences has been so rapid that frontiers between disciplines are disappearing, as demonstrated by the appearance of the bio-sciences (bio-chemistry, bio-technology, bio-mathematics, bio-economics...). Universities teaching agricultural sciences have long been justifying their existence by public demand (specialist advice to agriculture) and the practice of objective-orientated teaching and research, according priority to the **object** rather than the **methods** of study. This situation has been called into question by an overall orientation towards the pure sciences over the last twenty years, particularly in Northern Europe, and indeed at times by questions concerning the nature of the qualification itself. The replacement (or suggested replacement) of the traditional agricultural sciences degree by biology or bio-engineering diplomas is indicative of current thinking in some universities (in Belgium, France and the Netherlands, for example).

These questions are central to a debate in Western Europe which will also affect the countries of Central Europe. In our view, the most fruitful prospect involves taking our universities and our training out of the agricultural "ghetto". This strategy implies improving the **recognised** value of this education in the eyes of society and of employers. The agriculture and food sector must be acknowledged as a pertinent basis and model for intellectual training in the application of specific analytic approaches. In our society, the management of complex problems is at the heart of all contemporary problems, whose terms of reference are notions of balance, regulation and feedback, whether one is managing a company, government economic or social policies, ecosystems, or individual or public health... Who better than the agricultural scientist knows how to approach complex biological systems and apply integrated and interdisciplinary approaches?

Managers qualified in agricultural sciences are better placed than others to act outside their specific domain in positions which demand the skills and the aptitude to manage **complex problems**.

In these conditions, the future of agricultural higher education requires a determined effort of explanation and demonstration towards the society and an ambitious adaptation of the type of education offered. Widening of the social origins of students, a wider range of career opportunities and priority given to general basic intellectual and scientific training are necessary conditions for success.

It is certain that social demand in Eastern Europe is still likely to be formulated, for some time, in terms of skills in the agricultural and food sector, if only because of the desperate need to restructure this sector. However, given the considerable existing infrastructure of higher education, whose financing will increasingly have to be justified in a context of shrinking state budgets, it seems essential for agricultural higher education to broaden its area of activity as of now.

## **V - CONCLUSION :**

Restructuring agricultural higher education in Central and Eastern Europe poses a threefold problem. It is involved in overall reorganisation of higher education in these countries but also in certain specific aspects of the economic, technical and social situation of the sector, as well as in defining the position this type of education will occupy within higher education as a whole.

These questions affect both institutions (their continued existence, their organisation and running), study programmes (in terms of objectives, structuring, content and teaching methods) and actors, be they teachers or students (motivation, ability to accept change, expectations...).

Some of these questions are also at the heart of current or recent reforms in several Western European countries (Spain, Italy and Portugal for example).



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