Challenges for the european higher education, with special reference to forestry

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Abstract

The ongoing discussion about the future of the forestry education can be considered as a part of the present intensive discussion on the European Higher Education System. Both the Sorbonne and the Bologna declarations are calling for the harmonisation of the higher education systems in Europe. The reality, however, is that the existing structures show an extreme complexity and diversity of curricular and degree structures, due to major differences in several key factors.
Forestry education in Europe reflects quite well the features of the Higher Education in Europe. Curricula strongly differ, forestry as a science has thoroughly evolved during the last decades, foresters are faced to new challenges and the labour market offers other opportunities. As a result, there is both the need for harmonisation and for increased mobility, meaning that there are several reasons for changing forestry curricula. Fundamental changes in the field of profession and didactic requirements are major reasons to revise the forestry curricula. The shift from developing mainly the professional qualifications of the students to a stronger emphasis on the formation of the personal qualifications are considered as the main general issue in the changes of the forestry curricula.

Key words: *higher education, forestry education, forestry curricula, Bologna declaration, Sorbonne declaration.*

1. Introduction

In 1997 a workshop was held in Wageningen on the subject "new requirements for University education in Forestry" (Schmidt et al., 1998). This workshop was preceded by a meeting of the Vocational High Schools in Göttingen on the subject "Forestry education in Europe" and with subtitle "Quality in Mobility" (Schmidt, 1998). In September 1999 an international conference on "Forestry education and research in the context of environment and development problems: strategies for the XXI century" was organised in Lviv.
The above actions prove that **forestry education is strongly discussed** within the sector. It is to be considered, however, as an element of the intensive discussion on the European Higher Education System, which is presently focused around the Sorbonne and Bologna declarations.

2. General trends in higher education in Europe

2.1. The objective of harmonisation

The Sorbonne Declaration of May 1998 called for the harmonisation of the architecture of higher education qualification systems in Europe (Sorbonne declaration, 1998). **Its main purposes are to map areas of convergence between these systems in Europe, to identify trends affecting them and to indicate ways towards greater convergence in the future** (Haug, 1999). It recommended that studies should be organised in an undergraduate and a graduate cycle, but did not provide an indication of their duration. The debate that followed, however, focused on the alleged existence (or emergence) of a European "model" with 3 main levels of qualifications requiring 3, 5 or 8 years of study. This model, mainly based on the Anglo-Saxon system, was suggested by the Attali commission, which analysed in charge of the French Minister of Education the French higher educational system. It is clear, that one of the underlying goals of that proposal is to improve the competitivity of Europe towards the USA by generalising the American diploma system of higher and university education.
The Sorbonne agreement contains several other key words, such as:

- systems which enhance mobility and an ever closer co-operation;
- recognition and external and internal readability of the systems;
- access to a diversity of programmes;
- facilitating employability;
- training throughout life.

2.2. How convergent are the European systems?

A survey of the existing structures shows the extreme complexity and diversity of curricular and degree structures in European countries (Haug, 1999). It is clear that no significant convergence towards a 3-5-8 model can be found. There is little convergence towards a first degree after 3 years (bachelor). There is however a high degree of convergence towards a duration of about 5 years for master level studies. But there is no 8-year standard duration for doctoral degrees. This is an area of high volatility, with actual duration varying more according to discipline than to national degree systems.

One of the key conclusions of the survey carried out by Kirstein (1999) is, that **the overall picture of studies, curricula and degrees is extremely complex** and varies, as a consequence of major differences in several key factors.
1. Diversification of institutions
Two tendencies prevail:

- A unitary system, with one main type of higher education institutions encompassing all types of study programmes leading to a variety of qualifications at different levels.
- A binary or dual system, consisting of two different types of higher education institutions: Type A which is the classical university education combining higher education and research

and type B presenting more professionally oriented higher education with or without a more applied research profile.

2. Access and admission requirements

There are major differences in the actual requirements for being admitted to a programme. In some countries applicant with final secondary school qualifications have free access to most university programmes. In other countries admission is fairly or highly competitive.

3. Quality assurance and accreditation/recognition procedures

Procedures for recognising higher education institutions and degrees differ to a large extent from country to country. The degree to which the State regulates and controls the institutions and the academic activities varies.

The diversification of institutions and qualifications and growing international competition seem to further a need at the level of the individual institution to improve information and documentation on the quality and standards of the institution. These tendencies have resulted in the establishment of various external quality assurance procedures and arrangements. More and more countries establish external evaluation or quality assurance bodies or agencies.

4. International credit transfer and recognition systems

A national or institutional credit system is in use in many countries. However, there are major differences in the actual implementation of credit systems.

In most countries with credit systems they are relatively easily used as a means of credit transfer from one programme to another or from one institution to another and/or they are used as well developed credit accumulation system. Relatively large national differences are to be found in relation to recognition of prior learning and exemption from studies when changing from one institution to another. Especially there seems to be problems in some countries to obtain any credit transfer when transferring from a non-university programme to a university programme.

5. Organisation of the academic year

The organisation of the academic year is often fundamentally rooted in national, social and cultural traditions. These differences may to some extent create an obstacle to smooth and easy student mobility. Studies show a wide diversity both in relation to the start of the academic year and the organisation of studies in semesters, term or even more modulised structures. Examination periods and vacation periods also differ considerably.

6. Tuition fee systems

The system of tuition fees varies and it may have consequences for the further development of a European higher education space as it may be beneficially more attractive to some students to go to countries with no tuition fees than to countries with high fees.

7. Student support systems

Considerable differences appear between national student systems and criteria for eligibility and capacity. Comparisons between the different systems are fairly complicated as it is necessary to

include analyses of the actual grant and/or loan systems as well as of their interaction with family burden equalisation systems and taxation systems.

A major conclusion is that comparisons between degrees and degree structure made within such an environment can only be meaningful within certain limits.

Haug (1999) proposes four main avenues of combined action which may foster the desired convergence and transparency in qualification structures in Europe:

- The gradual adoption of an ECTS-compatible credit accumulation system.
- The adoption of a common, but flexible frame of reference for qualifications. A rigid, uniform model (like the 3-5-8 model) is neither desirable nor feasible in Europe.
- An enhanced European dimension in quality assurance, evaluation and accreditation:
  - compatible quality assurance systems, especially regarding the setting of threshold standards;
  - independent evaluation leading to European quality labels in broad subject areas;
  - a co-ordinated approach to quality standards for transnational education;
- Empowering Europeans to use the new learning opportunities.

Based on the above mentioned documents **the Bologna "Joint declaration of the European Ministers of Education" aims to reach within the first decade of the third millennium the following objectives** (Bologna declaration, 1999):

- Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens employability and the international competitiveness of the European higher education system.
- Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access of the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years.
- Establishment of a system of credits- such as in the ECTS system- as a proper means of promoting the most widespread student mobility.
- Promotion of mobility by overcoming obstacles to the effective exercise of free movement with particular attention to:
  - for students, access to study and training opportunities and to related services;
  - for teachers, researchers and administrative staff, recognition and valorisation of periods spent in a European context researching, teaching and training, without prejudicing their statutory rights.

3. Specific challenges of forestry education

Forestry education in Europe reflects quite well the features of the overall Higher Education in Europe. The curricula strongly differ, forestry as a science has thoroughly evolved during the last decades, foresters are faced to new challenges and the labour market offers other opportunities. As a result, **there is both the need for harmonisation and for increased mobility**, meaning that there are several reasons for changing forestry curricula.

3.1. Current state and objectives of forestry curricula

Schmidt et al. (1998) point out that, due to their history and to the local forestry situation, the various **forestry curricula in Europe diverge in a number of aspects**:

- objectives: varying between producing forest managers and forest researchers and between teaching forestry only and paying equal attention to forestry and nature management;
- structure and content: from a single and pure forestry curriculum with one or more specialisations inside forestry to a specialisation in forestry and related sciences in a curriculum mainly oriented on agriculture;
- duration: four to five years, with an intermittence (with or without an examination accepted by the labour market) after one, two or more years;
- academic year: divided into semesters, trimesters, five periods or even shorter blocks; each institute starts the year on a different date;
- practical training period: either compulsory, lacking, or, if it is not officially included in the curriculum, it may be strongly advised to do a practical training period during holidays.

These differences appear also in the current objectives of forestry curricula (Huss & Schmidt, 1998). They cover on the one hand the entire area between practical forest (single function) manager, forest (multiple use) manager, staff specialist in a given discipline and forest researcher (ecology, economics, sociology, ...) and on the other hand the whole range from practical, factual knowledge to methodological approaches, from design- and art-like qualifications to analytical and conceptual thinking. The attention paid to personal (communication and transferable) skills is growing.

3.2. Challenges of forestry

With respect to the ongoing changes in forestry, Schmidt (1998) stresses four points:

- the changed relations between forest owners, forest managers and forest users; the latter group gets a strong impact on the decision making system;
- the retreat of governments as owners and managers of forests, resulting in the privatisation in different ways and forms of many of the activities traditionally carried out by the state forest services; this will surely lead to other types of forest managers;
- the continuing changes in forestry techniques;
- the blurring of the borders between forestry and other forms of land use like nature management and conservation on the one side and urban forestry and agro-forestry on the other side.

Referring to the new educational requirements for the foresters of the future Pelkonen (1998) underlines the importance of recent developments in the forestry sector, especially in the Nordic countries.

- Rural development

  The authorities have initiated many development programmes, which aim to create new alternative jobs for the population. The main areas of development are a new mechanical wood processing industry and energy production from wood-based fuels.

- The effect of a new agricultural policy on forest management
  The share of forest owners who do not live on farms will continue to increase. Forestry must be prepared for these new owners, who are rapidly likely to find the grounds for the current forest management practices strange and even difficult to accept.
- The increasing role of environmental organisations
  For decades forest owners and the forest industry have been responsible for the general principles of forestry. It has been the task of the government to maintain the forests and to support the increase of the production potential. During the last decades, however, the development of forestry has been influenced by environmental organisations independent of the government, the forest owners' interest groups and industry. Environmental organisations, implementing a completely new kind of forest policy, have been able to change the methods of practical forestry.
- An internationalised forest industry
  The forest industry has in recent years been concentrated among a few large companies. Operating in a strongly liberalised world trade environment the international forest industry has become less and less dependent on national political factors, even to the extent that it can ignore national politics or by its own actions influence the very shaping of those politics.
- The origin of raw materials and the life cycle products
  The necessity to know the origin of raw materials and the analysis of the life-cycle of products, in addition to production following the principles of sustainable development, are new demands set on the forest sector and fulfilling these requirements will demand many changes to the old methods of operation.

Based on the evaluation of the problems of the past, **Buttoud** (1998), mainly thinking at the Mediterranean regions, **formulates the present forestry challenges as follows**:

1. Develop a higher consciousness for forest and natural resources.
   The more people will be conscious of the need for preserving the forests, the more the forests will be effectively maintained. So, one of the main objectives for foresters is to bring users and stakeholders, but also people in general, to more conservationist practices.
2. Ensure a better linkage between rural and forestry activities and practices.
   There is an urgent need for planning of the forests sector to be systematically integrated with those of other related sectors, including agriculture, rural and regional development, environmental protection, but also industry and tourism. Foresters have to consider the particular network of relations existing between forest land and its rural environment.
3. Minimise risks with multiple use and non-wood products.
   Forestry decisions have to minimise the global risk of degradation of natural resources. In this framework, special directions may be:
   - refusing exclusive productive measures;
   - promoting non-wood products and services.
4. Ensure a better linkage between forestry conservation and production
   The conservation of forestry ecosystems will not proceed from the exclusion of all human activities, but on the contrary from a negotiated regulation of these human activities in order to orientate them towards conservation.

5. Replace technique by a more social approach of forestry problems
   Forest management is not only the foresters' preoccupation. It implies various actors with different interests which need to be led towards a common solution, or at least a balance based on a complementarity more than on competition between them.

3.3. Skills and qualities of the ideal forester

Lewark et al. (1998) identified six major trends behind the recent changes in the labour markets for forestry professionals:
1. The globalisation process is increasingly involving both the wood-working industries and the policies carried out to prevent the misuse of forests and to stimulate the sustainable management of forest resources.
2. The new policies for rural development in the European Union are directly financing and indirectly stimulating the conversion of agricultural land to forests.
3. The reduced involvement of the public sector can be characterised by various inter-linked elements: a decrease in public expenditures, a process of privatisation of many state forest enterprises, the reform of forest administrations combined, in some countries, with a process of de-regulation of forest law.
4. through the ongoing organisational changes in industrial and commercial companies organisational structures are becoming leaner and leaner mainly at the cost of middle level professionals.
5. The development of "green" markets for forest products and services could be mentioned as a notable factor behind the recent changes in the labour markets of forestry professionals. Some of the most important effects of this trend are the increased demand for "clean", nature-oriented, ecolabelled and ecocertified products.
6. There is a substantial increase of numbers of university graduates. Besides its positive impacts in opening the doors of higher education to larger groups, it has also resulted in a worsening of the employment chances for university graduates.

At the Wageningen workshop on new requirements for university education in forestry two working groups were charged to define new job opportunities both inside and outside the forestry sector and related areas. First they pointed out that the present forester has frequently a few disadvantages, making him handicapped at applying for jobs:
- being introvert, used to go around with his own business without having to motivate it all the time;
- thinking that only true forestry is worthy of his attention;
- appearing unable to tell the possible employer about his true skills, which are many.

Inside the broad forestry field, the group identified a wide range of opportunities, such as:
- nature management: environmental consultancy, education institutes or consultancies, nature organisation trusts or organisations, advisors of local communities;
- management of natural resources: national parks, watershed management, fire fighting, wildlife management, specialist fields such as GID, remote sensing, etc.;

- agro-forestry: mainly in developing countries with aid agencies;
- urban forestry: agriculture and tree surgery, city parks, establishment of new urban forests;
- tourism: there is a need for foresters to be engaged in forest planning in areas of high tourism;
- health, safety and training: following tightening of regulations on worker safety and training;
- forest and timber certification: certification agencies;
- recycling of wood residues, wood waste and paper.

Outside the forestry sector and related areas foresters should be able to find a job in several areas, such as:

- land use related activities in general;
- tourism, recreation and fishery;
- community and national planning;
- applied statistics;
- project management;
- business and real estate management;
- teaching, extension work, non commercial lobbying (conservation, etc);
- informatics in general.

It was concluded that the ideal forester possesses a number of skills and qualities attractive even in totally different job situations:

- speaking "three languages":
  - biology and sciences language;
  - management and business language;
  - and society's language;
- long term perspective and a feeling for sustainable action; competence in strategic planning;
- competence in applied statistics, data analysis and modelling , using computers;
- skill in project and business management, implementation of plans, and economics;
- various technical skills in combinations unusual in the labour market.

3.4. The need for changing forestry curricula and teaching methods

It is evident that the role of a forester has changed during the last decades and will change even more. Foresters are no longer experts who decide on their forest, but experts who, as members of a team of experts, advise a democratic decision-making body and then implement the decisions (Schmidt et al., 1998).

Forestry educational programmes traditionally have been very broad. Students were and are generally educated in basics of natural sciences, sometimes of economic sciences too, as well as in applied forestry subjects such as silviculture, forest management and exploitation techniques, wood science, forest economics and forest policy. The focus of the training has always been the management of forests.

The curricula obviously have been and are highly depending on the specific situation of forestry in the various countries at a given time and the current requirements of the society and the forest user groups in these periods.

Huss and Schmidt (1998) consider **the shift from developing mainly the professional qualifications of the students to a stronger emphasis on the formation of the personal qualifications as the main general issue in the changes of the forestry curricula** during the last years.

Today forestry graduates are confronted with less opportunities to work in the traditional jobs and with many more possibilities to work in very different new fields. Therefore it has increasingly become necessary to train students as comprehensive and as broad as possible and to train them to adopt knowledge by themselves through self study and training on the job. Consequently, curricula should not aim solely at training professionals for special jobs as was done generally in the past.

Since it has become more and more obvious that graduates need special qualifications to meet the requirements of future jobs, the orientation of the courses should be changed in that direction. In this regard **the goals in teaching forestry** at the E.T.H. Zürich are defined as follows (Denzler, 1998):

- developing the ability of problem-solving with scientific methods;
- focusing on a sound professional training (increased methodological and fundamental knowledge);
- encouraging self-initiative, creativity and independence;
- training and maintaining mental flexibility;
- promoting non -subject qualities which are specially important for executives (e.g. social competence, personality-related competence);
- facilitate mobility.

The main important **reasons why forestry curricula should be revised** are defined by Huss and Schmidt (1998).

1. Fundamental changes in the field of profession

The situation in Europe with regard to the recent conditions and the future of the forestry profession is very various. However, some major tendencies to which forestry education is extending appear.

- Recreation, rural development, nature conservation and nature management have become an important task within forest education resulting in an expansion of the curricula in this direction.
- Urban forestry, a discipline still not clearly defined, is gaining increasing importance according to the growing urbanisation of our planet.
- Wood technology is developing in some areas and needs to be taught.
- Tropical forestry is coming more and more into the sight of the forester even in temperate zones.

The insecurity of the labour market, as a starting point of a very mobile career, indicates that some skills to adapt oneself to a new situation should be implanted in the student.

2. Didactic requirements

Less emphasis on relatively cheap lectures should be paid, whereas more attention to self - activation of the student, to more expensive problem solving approaches in teams and to expensive field work should be paid.

Other considerations too should be taken in mind, such as the reduction of the total workload of the students and the reduction of the drop-out rates.

Next to these, several **other considerations stress the need for revised contents and teaching methods** (Pelkonen, 1998; Buttoud, 1998).

- An inter-disciplinary education. The development from forest management to a multi-disciplinary forestry programme comprising numerous different applied sciences has been justifiable and appropriate. The basic sciences such as economics, ecology, mathematics, statistics, computer science, physics, chemistry and engineering, have developed and spread widely and should be rightly used in forestry curricula. Education in forestry will become increasingly integrated with the teaching of other sciences. .

  It is often stressed, that ecological and social aspects should be improved, as well as the linkage between these two aspects. Foresters should know more precisely the ecological conditions and potentialities, in order to built a forestry system more adapted to ecological conservation. At the same time foresters have to become more looking to human behaviour, and this is the reason why they have to master a strong background in social sciences applied to rural situations.

  Forestry curricula of the future should also include various communication skills, including traditional rhetorical skills, and a knowledge of modern information technology, multimedia and public relations.

  It is not likely that such specialised skills can be taught within forestry units and thus the teaching resources of departments specialised in these areas must be utilised.

- The growing importance of methodological subjects requires a problem-solving approach and life-long education. Since the problems facing the forest sector have become more diverse, foresters will need the support of more sciences in attempting to analyse questions and solve problems. Progress can be done with a background focusing on methods instead of pre-made solutions. Forestry curricula must bring not definitive or general solutions, but on the contrary ways of thinking, and paths for approaching the problems.

  The changing demands of the job market too require an increasingly solid basis in methodology, which provides prerequisites for life long learning and an ability to move into new and challenges jobs. There is a need to instil into the students mind a life-long learning attitude.

  In this respect Buttoud (1998) uses the term: "learning from the bottom". He derives the necessity of this system from two considerations: the challenge of partnership and the adaptation of local conditions.

- Since the internationalisation of the university education and the mobility of students and teachers is a reality, (non-European) languages and international communication will play an increasing role in forestry education. Language education must also include an increasing amount of culture studies. Business practices are often culture -bound and a good command of languages is not necessarily sufficient for carrying out international projects successfully. The European integration has had already an effect on forestry and forestry education.

4. Literature

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