

Assessment Report

Agriculture, Forestry, Fishery

Estonian University of Life Sciences

2016

Contents

INTRODUCTION	3
GENERAL FINDINGS AND RECOMMENDATIONS	7
ASSESSMENT REPORT OF SPG AT ESTONIAN UNIVERSITY OF LIFE SCIENCES.....	7
1.1. INTRODUCTION	7
1.2. GENERAL FINDINGS AND RECOMMENDATIONS AT THE STUDY PROGRAMME GROUP LEVEL	10
1.3. STRENGTHS AND AREAS FOR IMPROVEMENT OF STUDY PROGRAMMES BY ASSESSMENT AREAS	14
1.3.1. HORTICULTURE (B, M); PRODUCTION AND MARKETING OF AGRICULTURAL PRODUCTS (B, M)	15
1.3.2. FORESTRY (B); FOREST MANAGEMENT (M); FOREST INDUSTRY (M)	22
1.3.3 ANIMAL SCIENCE (B, M).....	34
1.3.4 AQUACULTURE (M).....	41
ANNEXE: AGGREGATED ACTION PLANS AS PROPOSED IN THE SELF-EVALUATION REPORT	46

Introduction

Quality assessment of a study programme group involves the assessment of the conformity of study programmes and associated studies and development activities on their basis to legislation, national and international standards and developmental directions with the purpose of providing recommendations to improve the quality of studies.

The goal of quality assessment of a study programme group is supporting the internal evaluation and self-development of the institution of higher education. Quality assessment of study programme groups is not followed by sanctions: expert assessments should be considered recommendations.

Quality assessment of a study programme group takes place at least once every 7 years based on the regulation approved by EKKA Quality Assessment Council for Higher Education *Quality Assessment of Study Programme Groups in the First and Second Cycles of Higher Education* (13.06.2012).

The assessments areas and standards are:

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.

- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognized foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

The aim of the assessment team was the evaluation of the Study Programme Group (SPG) of Agriculture, Forestry and Fishery in the Estonian University of Life Sciences (EMÜ).

The team was asked to assess the conformity of the study programmes belonging to the study programme group and the instruction provided on the basis thereof to legislation and to national and international standards and/or recommendations, including the assessment of the level of the corresponding theoretical and practical instruction, the research and pedagogical qualification of the teaching staff and research staff, and the sufficiency of resources for the provision of instruction.

The following persons formed the assessment team:

Ole Martin Eklo (Chair)	Professor, The Norwegian Institute of Bioeconomy Research (Norway)
Birgitta Malmfors	Associate Professor, Swedish University of Agricultural Sciences (Sweden)
Bengt Johan Kriström	Professor, Department of Forest Economics, Swedish University of Agricultural Sciences, Centre for Environmental and Resource Economics (Sweden)
Paavo Pelkonen	Professor Emeritus, University of Eastern Finland, School of Forest Sciences (Finland)
Stephen Hall	Professor Emeritus, University of Lincoln (UK)
Olev Kalda	Deputy Director General, Veterinary and Food Board (Estonia)
Talvi Pihl	Student, Tallinn University of Technology/University of Tartu (Estonia)

The assessment process was coordinated by Liia Lauri (EKKA).

After the preparation phase, the work of the assessment team in Estonia started on Monday, November 14, 2016, with an introduction by EKKA, (Estonian Quality Agency for Higher and Vocational Education) to the Higher Education system as well as the assessment procedure. The members of the team agreed the overall questions and areas to discuss with each group of the interviewees. The distribution of tasks between the members of the assessment team was organized and the detailed schedule of the site visits agreed.

Meetings were held with the representatives of EMÜ from Tuesday, 15th to Thursday, 17th of November. In all cases, the schedule for discussion on site for each of the various study programmes only allowed for short time slots to be available for team members to exchange information, discuss conclusions and implications for further questions.

On Friday, November 18th, the team held an all-day meeting, during which both the structure of the final report was agreed and findings of team meetings were compiled in a first draft of the assessment report. This work was executed in a cooperative way and the members of the team intensively discussed their individual views on the relevant topics.

In the following sections, the assessment team summarize their general findings, conclusions and recommendations which are relevant across the whole Study Programme Group (SPG). The team provides an external and objective perspective on the programmes and the contexts within which they are delivered. The intention is to provide constructive comment and critique which may form the basis upon which improvements in the quality of the programmes may be achieved.

General findings and recommendations

Assessment report of SPG at Estonian University of Life Sciences

1.1. Introduction

Eesti Maaülikool, the Estonian University of Life Sciences (EMÜ) was founded in 1951 and is registered as a public legal entity – public university.

According to *QS World University Rankings by Subject*, EMÜ is one of the top universities in the world in the field of agriculture and forestry, ranked in the group “51 to 100”. The *Thomson Reuters Essential Science Indicators* database places EMÜ in the top 1% most cited research establishments in the world in the field of plant and animal science, and environment and ecology.

In 2012–2015 the number of students studying at Estonian universities decreased from 16,305 to 14,138. At EMÜ the number of students has fallen in the same proportion, from close to 5,000 to under 4,000 from 2011 to 2015, with the number of students in agriculture, forestry and fisheries suffering a loss of around 350 students. Students (undergraduate and graduate) of this study programme group constitute 22% of the total number of EMÜ students.

Structural reforms at EMÜ in 2004/5 led to the formation of five Institutes from the pre-existing 14 entities. The study programme group under consideration here is the responsibility of three of these institutes, namely Institute of Agricultural and Environmental Sciences (IAES), Institute of Forestry and Rural Engineering (IFRE), and Institute of Veterinary Medicine and Animal Science (IVMAS). The scientific areas of interest of the Institutes are as follows:

IAES	Plant cultivation and plant biology	Horticulture	Plant health	Soil science and agrochemistry	Landscape and environmental management	Landscape architecture	Biological diversity	Applied hydrobiology
IFRE	Silviculture and forest ecology	Forest management	Forest and wood processing technology	Geomatics	Rural building	Water management		
IVMAS	Animal genetics and breeding	Animal nutrition	Aquaculture	Morphology and physiology	Environment, animal welfare and herd health	Veterinary microbiology and physiology	Clinical veterinary medicine	Food science and food hygiene

Statistical data of the study programme group

Source: EMÜ Self-evaluation Report, 2016

Curriculum: Horticulture

Institute of Agricultural and Environmental Sciences (IAES)

Level	Academic year	Admission	Graduates	Drop out cases	Students
BA	15/16	14	-		39
	14/15	19	-	7	30
	13/12	18	-	7	17
	12/11	-	-	-	-
	11/12	-	-	-	-
MA	15/16	21		-	30
	14/15	3	10	1	19
	13/12	15	14	5	32
	12/11	15	10	5	33
	11/12	15	13	1	32

Curriculum: Production and Marketing of Agricultural Products

Institute of Agricultural and Environmental Sciences (IAES)

Level	Academic year	Admission	Graduates	Drop out cases	Students
BA	15/16	42	-		101
	14/15	54	-	30	80
	13/12	57	-	29	55
	12/11	-		3	-
	11/12	-		-	-
MA	15/16	21		-	63
	14/15	16	14	7	61
	13/12	25	14	7	66
	12/11	14	11	15	68
	11/12	33	15	-	71

Curriculum: Forestry (BA)

Forest Management (MA) Forest Industry (MA)

Institute of Forestry and Rural Engineering (IFRE)

Level	Academic year	Admission	Graduates	Drop out cases	Students
BA	15/16	67	-	-	209
	14/15	57	26	50	211
	13/12	68	35	74	255
	12/11	75	38	45	262
	11/12	92	36	64	264
FM MA	15/16	10	-	-	26
	14/15	5	10	6	30
	13/12	8	8	6	38
	12/11	20	15	5	50
	11/12	20	15	1	43
FI MA	15/16	14	-	-	39
	14/15	18	11	4	42
	13/12	14	7	3	33
	12/11	6	9	6	34
	11/12	20	14	9	47

Curriculum: Animal Science

Institute of Veterinary Medicine and Animal Science (IVMAS)

Level	Academic year	Admission	Graduates	Drop out cases	Students
BA	15/16	27		-	81
	14/15	28	18	30	99
	13/12	37	14	37	116
	12/11	38	20	42	133
	11/12	43	41	39	168
MA	15/16	10		-	19
	14/15	6	10	8	27
	13/12	13	6	4	31
	12/11	12	7	3	27
	11/12	11	6	4	25

Curriculum: Aquaculture(MA)

Institute of Veterinary Medicine and Animal Science (IVMAS)

Academic year	Admission	Graduates	Drop out cases	Students
15/16	3		-	7
14/15	1	2	2	8
13/12	0	5	4	16
12/11	8	4	5	25
11/12	7	3	7	25

1.2. General findings and recommendations at the study programme group level

EMÜ has a special place in Estonian society. It is the primary provider of higher education in support of industries that are profoundly important to the economy and to national identity. EMÜ also has world status in research in agriculture and forestry. It could be seen as, effectively, a national monopoly provider in several areas yet it does not “rest on its laurels” and it continues to strive for excellence. EMÜ has a positive relationship with its alumni, with over 3,000 attending a reunion in September 2016.

The panel received the self-evaluation report in good time and responses were received to preliminary, pre-visit questions. During the visit of the panel, supplementary material was provided and used.

The panel used the interviews with management, academic staff, students and stakeholders, and the supplementary material, to clarify various points made in the self-evaluation report. Interviewees were encouraged to be discursive in order to produce a comprehensive set of general findings and assessments of study programmes.

The self-evaluation report covers a wide range of curricula rather than a single discipline, yet its style is coherent, complying with the EKKA specification. The report is informative and in excellent English. It is in three parts – a general overview (section 1), a set of sub-reports on the different curricula (section 2), and an aggregated analysis of these sub-reports. A set of 11 appendices follows.

The general overview, which was usefully supplemented by a presentation on the opening day of the panel’s visit to EMÜ, set the scene effectively. There are two minor criticisms of the general overview. Some metrics could have been included and briefly discussed, such as comparisons with other institutions in relation to student-staff ratios. While these are not specifically required by EKKA they would have helped the panel in its assessments, especially in view of the aspirations of EMÜ to international status. Secondly, the workings of the ÖIS academic information system were not made clear or demonstrated.

Sub-reports followed the standard format. These differed to minor extents in various attributes. Those for Horticulture and for Production and Marketing of Agricultural Products were effectively supported by well-designed tables. Those relating to forestry were presented as three separate reports and justifications for this subdivision should have been provided. The six sections (curricula and curricular development, resources, teaching and learning process, academic staff, students, aggregated analysis of the course) were each followed by a self-analysis (strengths, areas for improvement, action plan). Graphics were used in sub-reports but were not, in general, well captioned or particularly informative. Style and content of the sectional self-analyses varied and in many areas the

claimed "strengths" could have been better supported by the foregoing text. One view might be that many of the "strengths" identified merely draw attention to human and infrastructural resources which any university would be expected to possess, and these may be better described as "opportunities". However, the panel considers that in many cases the resources are of such excellence that they should be highlighted.

The aggregated action plans for each sub-report were coherent and realistic but were not, in general, expressed in quantitative terms - the aim was often simply for an unquantified "increase". This can be confirmed by reference to the action plans which have been reproduced, for convenience, in Annexe 1. Justification of a separate action plan for each of the three forestry curricula was not given.

In general EMÜ has, in our view, identified most of the "areas for improvement" and we have few to add to those already identified. The "action plans" at all levels are generally well conceived and suitably formulated, with those for the forestry programmes being less thoroughly elaborated. In all action plans, some steps had been taken to assign responsibility to particular staff.

For convenience, we reproduce the action plans proposed in the SER as Annexe 1 and recommend that they be revised in the light of our comments. Consideration should be given to involving relatively junior lecturers in formulation and delivery of the action plans. Regarding the periodicity of actions, "regular" is not an adequate description. We suggest that any action plan should be broken down into specific time-limited tasks leading to measurable results and involving all academic staff.

The findings of the panel relevant to all programmes are as follows.

Study programme and study programme development

There are areas of excellence, and almost all other areas are fully up to international standards. Mechanisms exist for curricular development, and these are mainly informal in nature. There are some innovative cross-disciplinary developments and some examples of contribution of stakeholders to programme development. Principal areas for improvement are in relation to feedback given by staff to students, and by students to staff. While most aspects of course structure are well described, there is a lack of adequate documentation on some aspects of course content (see 'Teaching and learning' below). There is also a lack of evidence of a systematic collection and utilization of feedback. The requirement that students have to give feedback to at least 4 courses at the end of each term applies to all curricula taught at the University. Reliable feedback should, in our view, be available for all courses and the current feedback system should be improved.

Resources

Resources are superior to international standards with excellent provision of labs, classrooms, and especially, field stations. Finance and support appear to be readily available for off-site activities. There are numerous collaborative agreements with other universities and industry partners. There is some excellent stakeholder involvement in provision of placements. However, more use could be made of existing international collaborative agreements. Some course reading lists require updating, with reference to the availability of textbooks in the Estonian language, the cost of textbooks generally, and the ambition to increase the extent of teaching in English.

Teaching and learning

Curricula are highly flexible, in respect of timetabling and in availability of freedom to choose specific courses. Practical training is integrated into many courses. Some, but not all, courses are taught by the full range of teaching methods and there are examples of institute-level coordination of course content. There do not seem to be any systems whereby assessments set by lecturers (whether exams, lab reports, presentations, reviews etc.) are scrutinized (internally verified) by other lecturers, either within EMÜ or externally. This means that all courses risk failing to meet the 'Teaching and Learning' standard that requires 'assessment of learning outcomes [to be] relevant, transparent and objective'. Student satisfaction with the feedback they receive on their submitted work is very variable; it is clear that this feedback is frequently absent or uninformative. Indeed, staff feedback on some of the marked student work that was provided for the panel to inspect, was clearly deficient. However, there is one aspect of curriculum flexibility which we consider unjustified, in its present form. This is the choice that final-year BSc students have, of either submitting a thesis or sitting a final year exam. In our view, these cannot address the same learning outcomes.

Teaching staff

The personal enthusiasm shown by many lecturers for their subjects is very evident. There was also appreciation, by the students, of the personal support given to them by many lecturers. An effective system of annual personal development discussions is in operation, and informal, but effective, mechanisms exist for making time for personal research. There are many opportunities for pedagogical training but usage of these is very variable. There is a procedure, based on the ÖIS system, for collecting feedback from students about their courses, but it is stated by staff and students to be unreliable and ineffective, and some lecturers operate their own personal systems.

Students

There are many highly motivated students and much evidence that graduates, at both bachelor and master level, are successful on the jobs market. While there is awareness of opportunities to study abroad and appreciation of their value, many students are otherwise committed (for example, to family farms) and cannot make use of them. The support system, using student "buddies" (known as tutors) and a number of study support advisers, is generally effective. High dropout rates are attributable to a variety of causes, many of them not within the control of EMÜ, and preventive measures require further investigation.

1.3. Strengths and areas for improvement of study programmes by assessment areas

We used the Self-Evaluation Report (SER) and our interviews with staff, students and alumni, together with our site visits, to investigate whether the standards as listed in 'Quality Assessment of Study Programme Groups in the First and Second Cycles of Higher Education' (version dated 07.12.2015), are being met in this study programme group.

We express our overall opinion on compliance with these standards. We then reproduce as bullet-pointed lists the strengths, areas for improvement and proposed action plan as characterized in the SER and follow each list with our own views on these characterizations. We conclude with a discussion of the aggregated analysis of the study programmes, as presented in the SER.

1.3.1. Horticulture (B, M); Production and Marketing of Agricultural Products (B, M)

Study programme and study programme development

Self evaluation

The SER identifies the following strengths:

- *Competence in agronomy, animal husbandry, agro-economy and horticulture is aggregated in EMÜ and all four curricula are unique in Estonia giving broad-based knowledge by well-recognized experts. The curricula are very interdisciplinary as the students learn about the entire production chain from the field to the supermarket;*
- *There is a close collaboration with employers. Curricula have a wide selection of companies on each topic, where to conduct the practical training;*
- *Curricula have a well-balanced theoretical and practical part that complement each other;*
- *The staff cooperate with the vocational educators and students get certificates of accredited soil samplers and plant protection users upon the completion of certain practical courses (soil survey, Plant protection) that will benefit the students and prepare them for their future careers;*
- *Curricular development is in constant progress according to the changes in the society and in the agronomical/horticultural production.*

The SER identifies the following areas for improvement:

- *The curricula are mostly focused on the local needs, but they should include more global issues, such as irrigation, so that our graduates would be more competitive at the European job-market and they would be better prepared for the potential climate- change issues. It would also attract more foreign students;*
- *Increase the cross-talk between different courses to further integrate the knowledge from different fields and also to improve the different interpersonal skills (i.e. different presentation options);*
- *Feed-back from students in electronic form ÖIS and its analysis.*

The SER proposes the following action plan:

- *Have regular round-table discussions with the curriculum staff to further improve the curriculum;*
- *Arrange yearly round-table discussions with the BSc and MSc students in their final year to get their feedback on the curriculum for further improvement;*
- *Have regular round-table discussions with the alumni as well as agricultural employers to get their feedback;*
- *Include globally relevant agronomic issues in the curricula;*
- *Start using on-the-spot questionnaires upon the completion of the course to get more detailed feedback.*

Comments of the panel on compliance with standards

The panel agrees with the strengths and areas of improvement that have been identified, and that the action plan is well conceived. The curricula are well adapted to current conditions. The transition has been made from a traditional Agronomy programme to encompass the entire production chain from land management through to marketing. Due account is taken of the requirements of individual students, who are encouraged to match their studies to their particular areas of interest. We confirm that the relevant standards are being met.

In the stakeholders' interview it was pointed out that practical field work in Estonia takes place from April to October. A reduction of the proportion of academic work taking place during this period might encourage more potential students to apply to agricultural programmes.

Further strengths identified by the panel

- The programmes emphasize a degree of practical involvement in the curriculum which is unique compared to many other universities;
- More environmental friendly methods are adopted, developed and included in the curriculum;
- The curriculum encourages awareness of wider environmental and societal issues and is effectively linked with research activity.

Further areas of improvement and recommendations identified by the panel

- The panel has no areas of improvement to add to those identified in the SER.

Resources

Self evaluation

The SER identifies the following strengths:

- *Small and compact campus eases the access to different lecture halls and makes collaboration between institutes easier;*
- *As staff is in the same building/campus there are more opportunities for collaboration;*
- *Students get to the auditoriums on time;*
- *Auditoriums, laboratories and the library are modern and equipped with computers and screens;*
- *well-equipped laboratories for research and teaching;*
- *well-equipped practical work stations and experimental fields for study and research.*

The SER identifies the following areas for improvement:

- *Update the apparatus and technologies used in labs and field-stations;*
- *Refresh the list of electronic databases;*

- *Improve information communication as often large groups are scheduled for small seminar rooms due to the lack of information during scheduling;*
- *Refurbish relaxing/studying areas for students in the buildings.*

The SER proposes the following action plan:

- *Initiate the development of a scheduling system that would take into account the entire campus to guarantee optimal use of facilities according to the number of students;*
- *Continue to seek opportunities for improving the technological park intended for studying;*
- *Monitor new databases and make proposals to the library for necessary updates;*
- *Continue to have discussions with students to organize studying/relaxing areas that would bring more students together.*

Comments of the panel on compliance with standards

The panel agrees with the strengths and areas of improvement that have been identified, and that the action plan is appropriate. Discussions with staff and students indicated that the programme is well resourced and the panel confirms that the relevant standards are being met.

Further strengths identified by the panel

- The resources currently available are clearly at least equal to, and in some respects superior to, international standards.

Further areas of improvement and recommendations identified by the panel

- Detailed examination of the situation was not possible but the panel suggests that in view of the comparatively healthy numbers of students, an increased allocation of resources may become necessary.

Teaching and learning

Self evaluation

The SER identifies the following strengths:

- *Theoretical and practical teaching are very well combined and they complement each other well;*
- *Practical work, especially at the companies, is well organized and this helps to achieve the aims of the curricula;*
- *Thesis research and practice of scientific work is conducted within scientific projects in experienced researcher groups;*
- *Subjects have e-modules to support the auditory teaching;*
- *Practical training and seminars are conducted in small groups, which enables more individual feedback.*

The SER identifies the following areas for improvement:

- *Increase the number of longer excursions to the companies that are at present decreasing due to financial constraints;*
- *Optional courses offer great opportunities for extra knowledge, yet the time schedule does not always allow their realization;*
- *Students make little use of ERASMUS+ exchange opportunities due to their need to work full- or part-time.*

The SER proposes the following action plan:

- *Seek financial aid opportunities to organize longer excursions;*
- *Make proposals and suggestions to improve schedule organization and management;*
- *Create supportive means to agitate more students to use ERASMUS+ (i.e. additional funds for stipends, travel grants).*

Comments of the panel on compliance with standards

Field trips are extensively used as a part of the teaching process and the panel welcomes EMÜ's commitment to this activity in the form of provision of resources. There is a list of companies that have concluded a cooperation contract with the University to supervise students, but students can find a place for their traineeship on their own as well. International companies have also been chosen as training places.

All courses have clear description of the content but the expected outcomes and methods of assessment are not as well documented as they should be. This means that compliance with the fourth standard ('assessment of learning outcomes [to be] relevant, transparent and objective') could be improved (see section 1.2 of this report, subsection "Teaching and learning"). All courses have textbooks or electronic notes. The trend is to increase the use of electronic study materials that can be renewed easily and quickly, which will further improve the study quality. Electronic opportunities are used to complement the subjects (e-courses, e-modules).

The study process is closely linked to research, with topical subjects being proposed for BSc and MSc theses. The panel have seen good examples of stakeholder involvement in the teaching and learning process via Young Farmers' club.

Further strengths identified by the panel

- Good balance between theoretical lectures, practical training, laboratory work, seminars and excursions;
- Problem based education giving a good understanding and real life situation;

- Good reputation and attractive university, thanks to qualified lecturers and good vocational connection;
- Including alumni in the process of helping students with their career planning;
- Practical training and work provide useful good contacts and contribute to understanding of the subject under study. This is particularly important for students with limited experience of agriculture;
- An introductory course has been added to the first year BSc curriculum, explaining the main aims of the programme, what is expected of students, and the relevance of the courses that students follow to their employment opportunities;
- Bachelor and Master theses are linked to ongoing research projects;
- Students generally felt that they had adequate feedback on their assessed work.

Further areas of improvement and recommendations identified by the panel

- The team might consider a larger representation of social sciences and economics in the curricula, in view of current industry trends.

Teaching staff

Self evaluation

The SER identifies the following strengths:

- *Great balance of age-groups [sic] among lecturers – there are lecturers from each age-group and the progeny is present as the number of PhD students and successful graduates is increasing, so there are more young and motivated lecturers;*
- *The lecturers are experts in their field, knowing theory and practice, and they are highly motivated. They are also acknowledged by the society and they are opinion leaders;*
- *Lecturers attend courses to improve their skills.*

The SER identifies the following areas for improvement:

- *Engage more experts from abroad;*
- *Increase the number of lecturers with a PhD.*

The SER proposes the following action plan:

- *Invite more lecturers via ERASMUS+ programme and the Development Fund;*
- *Encourage lecturers to get a PhD degree by 2020;*
- *Continue training PhD students to guarantee highly qualified staff for the future.*

Comments of the panel on compliance with standards

The panel agrees with the strengths and areas of improvement that have been identified, and that the action plan is appropriate. We confirm that the relevant standards are being met.

Further strengths identified by the panel

- Staff interviews indicated that lecturers participate in international educational projects and give lectures during international courses;
- PhD students are being used as assistant lecturers;
- Staff offices are located close together and the panel gained the impression that communication among colleagues was particularly strong and effective.

Further areas of improvement and recommendations identified by the panel

The panel has no areas of improvement to add to those identified in the SER.

Students

Self evaluation

The SER identifies the following strengths:

- *Motivated students who come from family farms and special nature-oriented high school classes and have high expectations of the curricula and lecturers;*
- *Most alumni are successful at the job market;*
- *Students are active and have launched their own student organization to practise leadership and management and to train social skills;*
- *Students are active in several boards and they have initiated several projects to improve the campus life.*

The SER identifies the following areas for improvement:

- *The number of dropout students;*
- *Student motivation is low, especially when lacking previous experience;*
- *Opportunities to spend a semester abroad are little used.*

The SER proposes the following action plan:

- *Develop distant learning opportunities to enable studying for those who have to work full-time;*
- *Use different means for information distribution and discussions with students (for example Facebook) to keep their motivation high;*
- *Motivate students to use the semester abroad opportunity by offering special consultations (perhaps with the help of Young Farmers' Club);*
- *Involve more alumni to introduce their work and motivate students;*
- *Market the curricula through alumni;*
- *Continue to further analyse the reasons for dropouts and try to find solutions to the problem;*
- *Make more use of social media to reflect the importance and relevance of the speciality in the society to the potential students.*

Comments of the panel on compliance with standards

The panel agrees with the strengths and areas of improvement that have been identified, and that the action plan is appropriate. We confirm that the relevant standards are being met.

Further strengths identified by the panel

- In Horticulture MSc, the opportunity of distance learning has attracted more students who are coming back to university after doing something else or to get an additional degree (lifelong learning), the motivation and quality of this kind of students are very high;
- During the interviews the panel was informed that on the Horticulture programmes there is a committee that discusses each dropout case and the reasons for it;
- In Horticulture BSc, effort has been made to reduce dropout rate by introducing more speciality subjects in the first year of study and adding "Introduction to speciality" course to first year in order to keep students motivated;
- In "Production and marketing of agricultural products", the panel was informed by the academic staff that over the years they have seen a rise in the number of very bright students, who are highly motivated and demand more from themselves and also from the teaching staff;
- The education from the EMÜ is successful and fitting well into the society as none of the recent graduates is currently unemployed;
- A lot of measures started to follow up students with financial problems, part time students, maternity leave, tutor system launched, more information about expectation from the University, stipend to master students, scholarships, individual study plans, Estonian language courses for Russian speaking students, joining research teams.

Further areas of improvement and recommendations identified by the panel

- During the interviews the panel was informed that in Horticulture, the reasons for dropping out are usually rooted in the student not being aware before admittance what the programme is actually about and low motivation in the first year of studies due to many basic courses which students don't see the need for;
- Introduce measure to reduce the numbers of students with low motivation lacking previous experience. In "Production and marketing of agricultural products", the panel was informed during the interviews that there have been many students admitted to the programme who drop out early due to realizing that it is actually not what they want to study.

1.3.2. Forestry (B); Forest Management (M); Forest Industry (M)

Bachelor and Master programmes have been considered separately in the SER. Here, we have aggregated the SER statements as to strengths, areas of improvement and action plans, as there is considerable overlap.

Study programme and study programme development

Self evaluation

The SER identifies the following strengths:

Bachelor Forestry / Master Forest Management:

- *The only Bachelor's/Master's curriculum focusing on forest environment and sustainable forest management in Estonia;*
- *The best researchers are involved in the study process;*
- *Bachelor's level curriculum provides basic knowledge, which enables to choose between many different curricula at the Master's level;*
- *Cooperation with leading employers of forestry sector in developing curriculum;*
- *Master's curriculum equips students with courage and competence to take responsibility and make decisions.*

Master Forest Industry:

- *The only curriculum in Estonia in the field of forest industry;*
- *A stable demand for specialists in forest industry;*
- *Cooperation with Tallinn University of Technology and Võru County Vocational Training Centre, including the Centre of Competence for Wood Processing and Furniture Manufacturing;*
- *Effective international cooperation (for example with University of Helsinki since 1998)*

The SER identifies the following areas for improvement:

Bachelor Forestry /Master Forest Management:

- *It is necessary to increase the coherence between the courses taught by lecturers from different structural units of the University;*
- *Communication between lecturers from different departments should be improved;*
- *The Bachelor curriculum includes two speciality modules, one in forest management and the other in forest industry. To give better knowledge according to the specialization, the share of these speciality modules should be increased in the curricula.*

Master Forest Industry:

- *Feedback from employers;*
- *Modernization of teaching techniques;*
- *Regularization of the work of the curriculum development committee to identify shortcomings in course content or teaching methods;*
- *Cooperation with universities and research institutes in other countries.*

The SER proposes the following action plan:

Bachelor Forestry/ Master Forest Management:

- *Follow and analyse the feedback given via ÖIS and, if necessary, make changes in the curriculum;*
- *Motivate more graduating students to give feedback on the curricula via ÖIS.*

Master Forest Industry:

- *Improve young lecturers' foreign language skills to promote international cooperation and develop study modules in English;*
- *Follow and analyse feedback given via ÖIS and if necessary, make changes in the curriculum;*
- *Motivate more graduating students to give feedback on curricula via ÖIS;*
- *Hold a meeting with the academic staff providing teaching at the end of every semester;*
- *Develop modules in English to offer better study opportunities for foreign students;*
- *Invite visiting lecturers from abroad;*
- *Develop the curriculum 'Wood Processing Technology' in cooperation with the Võru County Vocational Training Centre;*
- *Seek for additional opportunities for research projects in the field of forest industry, which would contribute to the effectiveness of doctoral studies.*

Comments of the panel on compliance with standards

Training in forestry is composed of a three-year Bachelor's degree (Forestry (401) followed by a choice of two two-year Master's degree in accord with European norms; Forest Management (460) and Forest Industry (461). There are plans to redesign the curriculum of 460 (see p. 37 of the SER); our understanding is that also 461 is being assessed for the future. The Forest Industry Curriculum covers a wide range of subjects, from assessment of forest resources to harvesting technologies and to processes and economics of mechanical wood industries including forest based bioenergy production and conversion. In addition to the many teaching areas there is a great demand both for practical and vocationally oriented training and for high quality academic education. The panel acknowledged the great importance of studies related to forest industries and use of wood. IFRE's self-evaluation report placed emphasis

on this matter by referring to the remarkable share of this sector for the GDP of Estonia. The use of wood is also one of the priority areas of EMÜ. Academic education in this field is extremely important for strengthening the innovation system of the country. For meeting the needs of these two different targets IFRE has cooperation, for instance, with Tallinn University of Technology and Võru County Vocational Training Centre.

The above standards applicable to the domain of 'Study programme development' are all met, with the understanding that significant changes are under way. Many-sided practical training is properly integrated with theoretical education. Processes for curriculum development and quality assurance are in place, and take into account feedback from the university and key stakeholders of society.

Further strengths identified by the panel

Given the panel's investigations, the following areas are commended as particular strengths: It is the impression of the panel that the programmes of study are held in high regard by all those associated with them. This includes students and alumni as well as employers and other stakeholders. All the actors are highly committed to strengthen the education based on the precondition of a rapidly fast developing forest sector. The process of programme and curriculum development has enabled the maintenance of good, in some cases outstanding, academic standards amidst a range of pressures such as uncertain funding and heavy workload faced by lecturers.

There are areas of excellence, such as silviculture research and the Järvselja field station, both of which are usefully being mapped into the education programmes.

Mechanisms, which are predominantly informal, exist for curricular development. Forestry education produces able students with good labour market prospects.

Further areas of improvement and recommendations identified by the panel

- Documentation on course content (in the self-evaluation report, but also in terms of student understanding of course requirements)
- Systematic collection and utilization of feedback (it is impossible, in the limited time-frame, to assess each and every course). This assessment is based on the report and our interviews, so it should not be understood as being necessarily valid for all courses in the programme
- The programmes are not as popular as they used to be, a characteristic that Forestry shares with many similar programmes across the world. This makes it more difficult to get the top-students into the programme.
- The studies are predominantly focused on local and regional aspects of forestry and forest industries. With regard to the stage of development of the Estonian forest sector this approach is relevant. However, the sector is

- developing and needs to meet the international trade and policy demands. IFRE's curriculum development might place more emphasis on increasing global demands related to forests and forest industries.
- IFRE has had difficulties to develop a consistent master's programme to meet the requirements of science based academic education together with various needs of vocationally oriented training. To find an optimal solution the tasks and roles of various educational institutions should be defined and discussed thoroughly.
 - Possible development process should consider a profound cooperation with institutes of neighbouring countries.

Resources

Self evaluation

The SER identifies the following strengths:

- *Financial resources enable to do research work, science based teaching and graduation theses;*
- *High research potential;*
- *Good research and teaching laboratories;*
- *Excellent practical training base and research stations at Järvselja.*
- *Master Forest Industry:*
- *The good level of information technology, modern equipment in wood science and wood fuels laboratories;*
- *Reconstructed rooms in Technology building allow the construction of wood processing laboratory;*
- *The main research directions (wood science, forest operations, wood processing technologies, properties of wood fuels) are not priorities in other universities in Estonia;*
- *The use of wood belongs to the list of priority areas in the EMÜ Development Plan «Long-term research and development goals (up to 10 years)».*

The SER identifies the following areas for improvement:

Bachelor Forestry/ Master Forest Management:

- *Due to architectural reasons there are not enough facilities for individual and group work.*

Master Forest Industry:

- *Instrumentation and laboratory base needs to be broadened, the existing funding does not allow to acquire modern wood processing equipment;*
- *Shortage of qualified researchers to apply for larger projects («critical mass»).*

The SER proposes the following action plan:

Bachelor Forestry/ Master Forest Management

- *In cooperation with the administrative office and institutes situated in the Forestry building identify the possibilities for creating facilities for students' individual and group work.*

Master Forest Industry

- *Submit applications to buy scientific equipment and equip scientific laboratories;*
- *Raise the interest of forest industry companies in research and development activities, offer cooperation possibilities in applied research;*
- *Actively apply for finances from Estonian local funds (EIC, EE, etc.) for applied research;*
- *Use the opportunities to be involved in international projects and apply for finances from the EU.*

Comments of the panel on compliance with standards

The above standards applicable to the domain of 'Resources' are typically met and in some cases exceeded, although the supply of textbooks is not extensive on an international comparison. The panel found the physical and technological resources available to the forestry programme group to be of a very high standard. The lecture rooms that the panel visited are spacious and well-equipped ensuring that lecturers can be heard and students can benefit from clear presentation of slides and other supporting resources.

In relatively small units a key of success is efficient joint use of laboratory equipment. The needs of teaching and learning shall be assured in the planning processes and development in the discussions within the Institute of Forestry and Rural Engineering.

Further strengths identified by the panel

- Some resources are well above international standards (Järvselja training bases, exquisite research laboratories);
- The 4 forestry labs that we visited are all modern and well-integrated into the operations. It appears that the labs are used extensively. In short, the infrastructure resources related to natural science research in the forestry and rural engineering institutes are at a high international level. Especially, the research unit studying biosphere-atmosphere relation can be without any doubt characterized as doing world-class research. The planning processes of IFRE shall put emphasis on optimizing the use of this outstanding resource for the needs of high-quality educations;
- Various funding resources such as EMÜ, EIC and EU were combined and utilized efficiently for purchasing modern laboratory equipment. The Institute had realized the need to utilize infrastructure resources both for teaching and research whenever possible. The lecturers the panel met were enthusiastic and committed to develop the interactive use of the laboratories for the success of both research and education;

- Membership of the transnational EUROFORESTER programme is a strength.

Further areas of improvement and recommendations identified by the panel

- While there exist many collaborative frameworks, it is not clear how (with the exception of EUROFORESTER) this body of resources is mapped into improvement of the curricula and the enhancement of student knowledge.
- Textbooks are not in extensive supply on an international comparison. This is a standard that has to be evaluated, yet the existing supply of textbooks may not be a problem in any given case.
- Life cycles of modern laboratory devices are short. It is necessary that research based education may rely of sustainability, renewal and proper maintenance of the infrastructure resources. Especially, for an undisturbed teaching and learning process it is important that trained backup personnel is available. Enhanced cooperation between laboratories of different institutes is a cost efficient solution. This can be well utilized and further developed since on the basis of discussions during the assessment an important strength of EMÜ is non-bureaucratic and flexible partnership of various institutes.

Teaching and learning

Self evaluation

The SER identifies the following strengths:

Bachelor Forestry/ Master Forest Management:

- *Learning outcomes are set for all courses and they are introduced to students at the beginning of the course;*
- *Procedures for APEL are in place and support students' mobility;*
- *Field trips supporting theory are organized;*
- *In many courses learning process takes place in the natural environment;*
- *The Institute has a practical training base with modern infrastructure – Järvelja Training and Experimental Forest Centre;*
- *Access to national and international databases.*
- *Most of the Master's theses are connected to research projects.*
-

Master Forest Industry:

- *The study process has been made clear to students and all relevant information can be found on the home page of the Institute and in ÖIS;*
- *The study process includes the use of software used by forestry and environmental organizations. New programmes are also taught, so that after graduation students become innovative users of these programmes;*
- *Flexible proportions of different study forms throughout different courses are implemented;*

- *The material basis (new hardware) is quite good for applying IT methods in teaching and research;*
- *APEL procedure has been worked out and it supports student mobility;*
- *Students' opinions of the study-process are analysed and effort is made to put good ideas into practice;*
- *Theory is supported by field trips;*
- *Access to databases;*
- *Some courses are taught in English, which allows access for foreign students.*

The SER identifies the following areas for improvement:

- *Providing teaching staff with continuous training opportunities for professional training and self-improvement;*
- *Regular work with feedback.*
- *Limited financial opportunities inhibit the use of modern teaching methods and technical equipment.*

The SER proposes the following action plan:

- *During the evaluation of teaching staff to assess the application of effective and modern teaching methods in the classroom;*
- *Hold meetings between teaching staff of different departments regularly (after each semester) to find out problems and, if necessary, react immediately;*
- *Use funds for the implementation of modern teaching methods and buying technical equipment more efficiently.*

Comments of the panel on compliance with standards

The above standards applicable to the domain of 'Teaching and Learning' are in many cases met and in some cases exceeded. Student learning is, for the most part, well managed. There is continual ongoing reflection on teaching and learning in meetings. The panel found that programme managers work hard to find ways to deliver programmes in ways that facilitate the achievement of planned learning outcomes. It is also clear that the variety of teaching methods used is acceptable and the development of digital culture is supported through the use of IT in a range of contexts as part of the learning process. There is a connection between theoretical and practical learning, in some cases introducing the latest discoveries at basic levels. There is a good fit between the competency profile of graduates and the needs of the labour market, although it is unclear if this situation will be stable over time. It is unclear to what extent future visions regarding the labour market relevance of teaching takes place in IFRE. The level of student mobility could be improved, yet students are well-informed about existing opportunities and encouraged to take them up. Assessment procedures are generally acceptable, but there is room for improvement (see section 1.2 of this report, subsection "Teaching and learning")..

Further strengths identified by the panel

- Committed, enthusiastic enterprising lecturers and students with confidence-inspiring cooperation;
- Flexibility of curricula (course selection and timetabling). This provides possibilities for a student to study courses, supporting personal study outcomes, even in other universities (although it does seem as though students often work on the side);
- Practical training effectively integrated into many courses. As noted, the Järvselja station is one of the comparative advantages of the Institute. Unfortunately, time did not allow the panel to visit the station, but it clearly is a resource for the future in an expanding market of learning;
- Teaching supported by very high quality research in many areas;
- There are good examples of how top-notch research is displayed in the lab and implemented in courses.

Further areas of improvement and recommendations identified by the panel

- Some course lists need to be updated. All course lists should be subject to scrutiny in relation to the key strategic items of "Bioeconomy" and "Sustainability";
- Homogenize the approach to internal and external validation/verification of student exams/coursework. In the interviews, students expressed dissatisfaction with feedback they get in some courses (for example on written assignments), although this is very much dependent on course;
- Enhance qualified teaching resources for Forest Industry (master's programme 461), since this has been defined as an area of strategic development. Consider developmental actions utilizing opportunities of cooperation with the HEIs neighbouring countries;
- Internal development processes including formal meetings for optimizing consistence of programmes and efficient use of limited resources;
- Increase the role of programme managers in facilitating the developmental process for continuous improvement of the scientific and professional consistency of the programmes;
- Use the capacity of students to participate in the developmental processes and enhance the relevance of regularly collected feedback;
- Recognize the important value of the positive feedback from students. Students seemed not to see this point of view.

Teaching staff

Self evaluation

The SER identifies the following strengths:

Bachelor Forestry/ Master Forest Management

- *Lecturers have strong scientific background;*

- *Academic staff numbers are sufficient, there are enough young researchers and lecturers involved in the study process;*
- *The age structure is good;*
- *Research work and teaching is balanced, scientific work is valued.*

Master Forest Industry

- *The teaching staff has been quite innovative when implementing new study and evaluation forms;*
- *Invited guest lecturers are involved in study process, international cooperation is encouraged.*

The SER identifies the following areas for improvement:

Bachelor Forestry/ Master Forest Management

- *Too few external lecturers are involved in the study process;*
- *The teaching skills of lecturers can be improved more actively;*
- *Both incoming and outgoing staff mobility is low.*

Master Forest Industry

- *The mobility of lecturers is low;*
- *The number of lecturers with a PhD is low;*
- *The foreign language skills of young researchers are not sufficient to develop international cooperation and courses in English;*
- *Low salaries of lecturers – foreign and local forest industry enterprises offer a higher salary, which can become more attractive to young researchers and lecturers.*

The SER proposes the following action plan:

Bachelor Forestry/ Master Forest Management

- *Include the application of modern teaching methods as one of the indicators in the evaluation of teaching staff;*
- *Increase lecturers' mobility for teaching in other universities;*
- *Encourage lecturers to make use of the available mobility opportunities and financing.*

Master Forest Industry

- *Motivate the lecturers to take part in trainings to improve teaching skills;*
- *Motivate the lecturers to improve their study materials more often and ensure that the updated materials are also available on the homepage;*
- *Increase lecturers' mobility by promoting mobility possibilities and existing finances;*
- *Apply for long-term research projects to create permanent jobs for researchers and academic staff;*
- *Make more active use of invited guest lecturers.*

Comments of the panel on compliance with standards

The above standards applicable to the domain of 'Teaching Staff' are met to a great extent and in some cases exceeded. The panel found the number of teaching staff and the level of their qualifications to be mainly in line with standards and the sustainability of programmes. The evaluation report put emphasis on the need to provide lecturers holding a lower degree with the opportunities to study for PhD. The panel encourages IFRE to further develop lecturers' qualifications according to the goals of the self-evaluation report. The panel agrees with the self-evaluation report regarding the "balanced" age-structure, but there is still a possible concern regarding the long-run competence supply and sex ratio of teaching staff. There is room for improvement regarding the utilization of various resources and courses available to lecturers such as pedagogical training.

Further strengths identified by the panel

- Personal enthusiasm of many lecturers for their subjects, demonstrating how cutting-edge research is being transferred to students;
- The holistic approach of many lecturers, taking into account the various dimensions of forest related sustainability challenges of Europe and Estonia;
- Examples of useful feedback loops between lecturers and students on how courses are improved in a continuing discussion;
- Informal, but effective, mechanisms exist for making time for personal research.

Further areas of improvement and recommendations identified by the panel

- Limited usage of the many opportunities for pedagogical training;
- Coordination of courses that potentially overlap;
- Relevance and usability of students' feedback for lecturers;
- Long-term planning based on the use of lecturers from other countries to increase relevance and consistence of programmes.

Students

Self evaluation

The SER identifies the following strengths:

Bachelor Forestry/ Master Forest Management

- *cooperation with Estonian Forestry Students' Association;*
- *MSc students have ample opportunities for mobility.*

Master Forest Industry

- *There is competition for admission for studying Forest Industry because of great job opportunities;*

- *Students have high motivation to study.*

The SER identifies the following areas for improvement:

- *Low mobility of students;*
- *Feedback from employers and alumni.*

The SER proposes the following action plan:

- *Encourage mobility through discussing the benefits of student exchange;*
- *Prepare the system of collecting feedback from employers and alumni in the next few years;*
- *Regularly analyse feedback on curricula.*

Comments of the panel on compliance with standards

The above standards applicable to the domain of "Students" are mainly met. The self-evaluation report placed emphasis on high dropout rate amongst the students of IFRE, especially during the first year of their studies. This was confirmed by the various actors of EMÜ during the interviews. Clear reasons for dropouts could not be presented and the reasons varied from lack of motivation to attractive job markets and to shortages of funding. IFRE has tried to decrease the number of dropouts by developing teaching and personal support of students in many ways. The panel expects that the number of dropouts will slightly decrease in the near future. There was a great satisfaction among panel members after meeting six students. Their communication, professional and social skills were clearly higher than the EU average among forestry students. The group of students was selected and the panel can't say anything about Estonian average. The stakeholders of IFRE were satisfied with the overall skills and competences of IFRE alumni.

Further strengths identified by the panel

- Motivated and qualified students;
- Many students committed to EMÜ since they follow parents' study path;
- Students generally appreciate EMÜ and teaching staff of IFRE;
- Principally open to study abroad. The reasons hindering realization of exchange were many: lack of funding, working, delay to graduation, need to concentrate on Estonian forestry and industries;
- Excellent opportunities for practical training and exercises;
- The students the panel interviewed were all sincerely interested in forestry and many of them also had a family background and/or previous work experience in the field;
- The students are very satisfied with the practical training they get during their BSc at Järvselja (6 weeks in the summer after 1st year, 8 weeks in the summer after 2nd year), although it was mentioned that the time gap between theory and practice is quite long;

- The panel was informed during the interviews that there are plans to increase the MSc internship duration from 4 weeks to 6 weeks, which will provide students even more practical experience at companies;
- The students appreciate the field trips to companies very much and would be happy to have even more of these;
- The students are generally satisfied with their experience at EMÜ and they have noticed that their study programmes are under constant development.

Further areas of improvement and recommendations identified by the panel

- Some lecturers need to develop their skills of communication with students;
- Encourage students to provide lecturers with positive feedback after good learning experiences;
- Curricula require continuous development with a substantive contribution from students;
- Better integration between theoretical learning and practical training. Järvelja training as soon as possible after classroom education;
- Number of students is rather low in some courses;
- The number of dropouts during first year of BSc is very high. The panel was informed during the interviews that the main reasons for dropping out seem to be that early on in the studies a student realizes that forestry is not actually something they are interested in or that the student is not really motivated enough to pursue an academic higher education. It should be investigated whether this dropout rate could be lowered with more information provided to students before admittance.

1.3.3 Animal Science (B, M)

Study programme and study programme development

Self evaluation

The SER identifies the following strengths:

- *The curricula are the only ones preparing specialists in animal husbandry in Estonia;*
- *Subjects are taught in a logical sequence;*
- *Theoretical subjects are supported by practical training;*
- *Some courses in the curriculum are taught in English, which allows the students to improve their English language skills and creates opportunities for engaging exchange students from other countries (ERASMUS+).*

The SER identifies the following areas for improvement:

- *The system for collecting feedback from the graduates on the curricula is weak;*
- *There are some overlaps in the content of different subjects;*
- *There is no possibility for specialization in the MSc curriculum.*

The SER proposes the following action plan:

- *Improve the feedback system for graduates;*
- *Regularly analyze the coherence of various subjects and programs;*
- *Have regular round-table discussions with the curriculum staff to further improve the curriculum.*

Comments of the panel on compliance with standards

In general, from our meetings with academic staff, students and stakeholders the impression was that the Animal Science programmes are under pressure due to societal changes, notably declining interest in livestock production. It should be noted, however, that Animal Science is listed by the Ministry of Education and Research as one of the specialities that Estonia greatly needs.

The general scope of the programme is wide, but we formed the opinion that individual lecturers did not have a complete view of what their colleagues were actually teaching. We were left with the impression of a rather diffuse management model.

Further strengths identified by the panel

- *The bachelor programme provides a generally well balanced introduction to the subject and is a firm foundation for master level study or for employment;*
- *The genetics element is particularly praiseworthy for its topicality.*

Further areas of improvement and recommendations identified by the panel

- Flow charts are provided in the SER giving a general overview of the Animal Science programmes, and these would be improved if the ECTS points were given and it were indicated which courses are optional;
- While the content of the programme is indeed aligned with the learning outcomes, the assessment regime is not demonstrably linked with learning outcomes. A system should be developed to ensure this;
- The impression was received that staff would welcome diversification of the Animal Science programme to capitalize on, and develop, current teaching in companion animal studies, and ethology and welfare of husbanded animals, perhaps leading to degree programmes where these are the prime topics;
- The SER does not include comparisons with curricula on offer in competing institutions in other countries.

Resources

Self evaluation

The SER identifies the following strengths:

- *Optimal use of study space;*
- *Optimal use of facilities and human resources due to cooperation between institutes in studies;*
- *Märja Dairy Research Farm makes it possible to carry out practical training;*
- *Cooperation with entrepreneurs enables to carry out practical training on farms;*
- *Study materials are available to students on ÖIS;*
- *Sufficient number of well-equipped study rooms;*
- *A library and a variety of electronic databases are available to students.*

The SER identifies the following areas for improvement:

- *Not enough funds for large-scale investments to improve the learning process;*
- *In some subjects, teaching materials are not available electronically;*
- *Bad microclimate (no forced ventilation) in Zoomeedikum;*
- *Limited dining facilities.*

The SER proposes the following action plan:

- *Apply the EMÜ budget committee for funds for the repairs in Wing A in Zoomeedikum;*
- *Allocate the students a recreation room with dining facilities;*
- *Improve the access to learning materials via ÖIS.*

Comments of the panel on compliance with standards

All these standards are met but there must be some uncertainty in relation to the last mentioned, particularly in relation to the Märja dairy unit. This is clearly a well-run but expensive operation, and given the economic pressures on dairy

farming generally EMÜ would be well advised to capitalize visibly and effectively on this asset.

Laboratories are used for teaching, for research and for revenue-earning, with some equipment being assigned exclusively to students. The genetics lab provides services in support of livestock breeders while the feeds analysis lab provides analytical services to farmers. It is not clear from the SER how many students actually use the Märja Dairy Research Farm.

EMÜ researchers have the possibility to use data from their clients for the purpose of research. The publications record of certain members of staff shows that research can proceed in harmony with teaching work and this testifies to the dedication and initiative of staff members.

Reading lists for students vary considerably; some cite modern textbooks and other sources while others list very old works, including several from the last millennium. Some reading lists are far too short.

Further strengths identified by the panel

- The Animal Science programmes are exceptionally well resourced in terms of infrastructure.

Further areas of improvement and recommendations identified by the panel

- Given current commercial trends, ways to ensure the economic sustainability of the Märja dairy unit may well need urgent consideration at some point.

Teaching and learning

Self evaluation

The SER identifies the following strengths:

- *Existence of the study information system that allows to manage the teaching and learning process;*
- *Application of a study plan, which ensures the coherence between subjects and distributes the students' workload between the semesters;*
- *Feedback on the teaching and learning process can be given in ÖIS;*
- *Engagement of students in research projects while compiling their final papers;*
- *Existence of courses supporting the preparation of research projects;*
- *Good cooperation with farms and enterprises offering placements for students;*
- *Good balance between practical training and theory;*
- *Application of APEL towards completing the curriculum.*

The SER identifies the following areas for improvement:

- *Student feedback on teaching materials and teaching quality is unevenly distributed and the number of students assessing each course is low;*
- *The share of e-learning in teaching is low.*

The SER proposes the following action plan:

- *Improve the course evaluation system;*
- *Make the follow-up of students on the curriculum and teaching in curriculum development more systematic.*

Comments of the panel on compliance with standards

The flexibility of the teaching and learning processes is well demonstrated, but the use of modern teaching methods is not sufficiently widespread and there does not appear to be a transparent method of assessing learning outcomes, with individual lecturers operating their own systems.

A wide variety of teaching methods is used, such as lectures, group work, problem solving, labs, seminars, report writing and homework tasks. Exercises in genetic analysis and feed formulation are also conducted. An example was given of how students were asked what were their expectations of a specific topic, and how these were used to devise a teaching approach. Some lecturers give out paper handouts; some publish their lectures on ÖIS, either before or after the lecture. One lecturer has received an EMÜ prize for developing e-learning.

There is no clear protocol for the provision of feedback to students and apparently no central record is easily accessible to staff on what assessments (exams, coursework) have been assigned to students. Similarly, students tended not to be able to give any specific details on what assessable exercises they had been set, or expected to be set. The limited information provided seemed to indicate that the essays or reports students were assigned consisted of reviews of material and there was little if any emphasis on developing powers of criticism.

Further strengths identified by the panel

Some courses are taught in English and this is of particular appeal to international students.

Further areas of improvement and recommendations identified by the panel

A review system should be introduced so that before students are given assessable work to do, the requirements are specified in detail and reviewed by colleagues.

Teaching staff

Self evaluation

The SER identifies the following strengths:

- *Most of the staff hold a doctoral degree*
- *The vast majority of lecturers in animal science teach their subjects in English as well*
- *Courses are taught by competent lecturers from different institutes*
- *Researchers, practitioners and visiting lecturers are involved in teaching*

- *Faculty members participate actively as members or experts in the work of the national and international professional associations and, if necessary, provide expert assessments to the state*

The SER identifies the following areas for improvement:

- *A modest number of visiting staff is involved in teaching*
- *Allowing the staff a free semester is complicated because a large number of courses is taught by one professor only*

The SER proposes the following action plan:

- *Increase the involvement of foreign lecturers in the teaching through ERASMUS+ programme or development fund*
- *Allow a free semester to lecturers by reorganizing the studies*

Comments of the panel on compliance with standards

There is variation among teaching staff in ability to enthuse and motivate students. Overall, the high performance of the best lecturers probably counterbalances that of the poorest.

The more traditional components of the courses are not always taught in a particularly innovative way. In contrast, some components are taught with a thoroughly research-led approach.

Many staff members were able to list quite extensive use of the pedagogic training on offer.

The academic staff interviewed found that in order to attract more participants, the pedagogical training courses could be organized during periods with lower teaching workload, such as August and January

Further strengths identified by the panel

- Some lecturers are enthusiastic innovators in teaching methods
- Lectures in English, which are popular with students, form an important component of the programmes.

Further areas of improvement and recommendations identified by the panel

The most traditional elements of the courses could be considered in detail and the use of innovative teaching methods thoroughly investigated.

Students

Self evaluation

The SER identifies the following strengths:

- *Best students on the undergraduate level may get a smart specialization stipend;*
- *Most of the students are from rural areas and have previous experience in the chosen field;*
- *Master's students are motivated to study in the chosen field;*
- *Students' progress is monitored flexibly and the counselling system operates well;*
- *Opportunities for teaching students with special needs have been created;*
- *There are well-functioning information systems and support services for counselling students.*

The SER identifies the following areas for improvement:

- *Agricultural specialities are not popular among young people and therefore the competition for student places is low;*
- *The students' academic level at admission is varied, which in turn leads to a relatively high dropout rate;*
- *Opportunities for studying abroad are underexploited;*
- *Alumni feedback system is rather formal.*

The SER proposes the following action plan:

- *Reduce student dropout rate;*
- *Increase the number of students seeking to study abroad;*
- *Improve the alumni feedback system;*
- *Involve alumni in marketing the speciality.*

Comments of the panel on compliance with standards

The second standard is not fully met in that dropout rates are sometimes too high, though this can be a cohort effect and is as likely to be due to poor preparation of incoming students as to any other cause. EMÜ is clearly working hard to rectify the situation but factors external to the university are highly likely to be major causes. Such factors might include poor advice from schools on course choice or on the expectations universities have of their students, or a lack of appreciation in society of what kind of work animal scientists actually do.

Staff (and, indeed, students) are clearly concerned about the high dropout rate particularly in the first year. Several causes have been cited. Some students are insufficiently motivated, some are under financial pressure, while others do not appreciate that an animal science degree course will require some classical biological learning in the first year. It appears that some, particularly from farming backgrounds, are discouraged from applying because of the current decline in pig and dairy farming in Estonia. For all these reasons, we suggest there is a strong need to reorient the study programmes towards other species and systems. Widening the companion animal, behaviour, and welfare elements of the Animal Science programmes could help to reduce dropout rates.

Further strengths identified by the panel

- Some student cohorts or groups have strong study-oriented leaders who help to keep the rest of the group motivated. Many such students come from a strong background in the field – their family has a farm, have work experience in farms, parents have studied at the same university;
- Teaching staff have a genuine concern for the wellbeing of students and many have made a habit of personally contacting students when the latter are not showing up for lectures or seminars.

Further areas of improvement and recommendations identified by the panel

- There are strong cohort effects, and while this is not totally within the control of the university there are ways of reinforcing positive consequences. To reduce dropout rate, it might be useful to encourage more groups to select a leader among themselves who could be a contact person for communication with the teaching staff and solving possible issues.
- Students are eager to get more practical experience during their studies. Märja Dairy Research Farm and the university's connections with private farms could be made better use of to provide more practical experience, and not only field trips.
- Students would like more information and encouragement to participate in conferences and other events related to their field of study. Students should be encouraged to evaluate courses they have taken.

1.3.4 Aquaculture (M)

Study programme and study programme development

We have used the Self-Evaluation Report (SER) and our interviews with staff, students and alumni, together with our site visits to investigate whether the standards as listed in 'Quality Assessment of Study Programme Groups in the First and Second Cycles of Higher Education' (version dated 07.12.2015), are being met in this study programme.

We express our overall opinion on compliance with these standards. We then reproduce as bullet-pointed lists the strengths, areas for improvement and proposed action plan as characterized in the SER and follow each list with our own views on these characterizations. We conclude with a discussion of the aggregated analysis of the curriculum, as presented in the SER.

Self-evaluation

The SER identifies the following strengths:

- *The only curriculum in Estonia that focuses on aquaculture and that is based on the best scientific knowledge from different institutes of the University;*
- *MSc level curriculum provides knowledge for working as a specialist in the field of aquaculture and/or for pursuing studies at the doctoral level.*

The SER identifies the following areas for improvement:

- *Popularization of the curriculum;*
- *Cooperation and communication between the students and lecturers from different institutes of the University;*
- *Recruitment of lecturers from Universities outside Estonia.*

The SER proposes the following action plan:

- *Popularize the studies of aquaculture;*
- *Add new courses on fisheries and more practical training to offer research-based university education and guarantee the optimal ratio between fundamental and specialized applied courses to increase the competitiveness of the graduates in the labour market;*
- *Arrange regular meetings of the development committee, teaching staff and students;*
- *Develop a system for collecting feedback from employers and alumni.*

Comments of the panel on compliance with standards

The standards are fully met. The relationship between aquaculture as it has been taught (as a part of the Animal Science bachelor's degree, as a master's degree in its own right, and as a bachelor's degree commencing in 2016-17) has not been clearly explained in the self-evaluation report. Teaching of aquaculture began in 2002, incorporated in Animal Science teaching as an elective (30 ECTS). This incorporation was found to be unsuccessful. In 2014 the animal science

bachelor's degree had been renamed as Animal Production and Fish Farming but students were not attracted. A distinct aquaculture bachelor's degree has recruited for the 2016-17 year. Recruitment onto the aquaculture master's programme has now been suspended until bachelor students have graduated. 16 students were accepted for the bachelor's degree in 2016, from 40 applications.

In Estonia, most aquaculture is in the form of breeding and multiplication for restocking rather than production of fish for the consumer chain. These priorities are reflected in the curriculum. The close involvement with conservation genetics is a very distinctive and prestigious feature.

Further strengths identified by the panel

- This is a thoroughly research-led programme. The decision to switch from aquaculture being taught as a component of animal science, to being a bachelor's course in its own right with accompanying master's level training, was clearly fully justified.

Further areas of improvement and recommendations identified by the panel

- Continuing development and improvement along the lines that have been laid down.

Resources

Self evaluation

The SER identifies the following strengths:

- *well-equipped genetics laboratory;*
- *Good library and lecture rooms;*
- *Good overall level of the IT services in the University.*

The SER identifies the following areas for improvement:

- *The experimental facility in the basement and practical training room are small and old-fashioned.*

The SER proposes the following action plan:

- *Attract more external resources for improving the department's material basis;*
- *Establish a modern experimental and practical training facility for aquaculture at the University.*

Comments of the panel on compliance with standards

No obvious deficiencies were noted in resourcing of this programme, and students did not have serious criticisms. Reading lists for the specialist units generally cite fairly recent material

Further strengths identified by the panel

- The strong research activity in this area implies availability to staff and students of a wide range of literature.

Further areas of improvement and recommendations identified by the panel

- Continuing development and improvement along the lines that have been laid down.

Teaching and learning

Our assessment of the achievement of these standards relates purely to the Master's course.

Self evaluation

The SER identifies the following strengths:

- *ÕIS allows the implementation of diverse information technology tools in the study process;*
- *APEL takes place and supports students' mobility;*
- *Good cooperation with private aquaculture enterprises, ministries, speciality associations and organizations for practical training;*
- *Access to online databases;*
- *New textbooks related to aquaculture have been published in the Estonian language lately;*
- *Research projects support practical work.*

The SER identifies the following areas for improvement:

- *Implementation of novel teaching methods and materials needs expanding;*
- *Raise the number of e-courses;*
- *Increase the number of lecturers and practising specialists outside University involved in teaching;*
- *Follow the feedback from students regularly.*

The SER proposes the following action plan:

- *Encourage lecturers to use more electronic resources in the teaching process and continue the development of electronic study environments (e.g. Moodle);*
- *Hold regular meetings between lecturers from different departments (after each semester) to unify topics of courses and to avoid duplication and gaps between courses;*
- *Involve each master's student in a research project.*

Comments of the panel on compliance with standards

Lectures, practicals, genetics exercises, reviews of published papers and seminars are all employed. One student felt that more practical work was needed while the other commented favourably on seminars as a teaching method. Students would value round table staff-student discussions on international developments and seminars including fishery managers.

Further strengths identified by the panel

- Teaching staff are, in general, involved in research, some of them at a world-class level.

Further areas of improvement and recommendations identified by the panel

- Practical facilities were described as needing improvement. However, the visit to the student labs did not reveal any obvious deficiencies and created a favourable impression.

Teaching staff

Self evaluation

The SER identifies the following strengths:

- *The qualification of the academic staff members is at a high level;*
- *Department of Aquaculture has good international cooperation with many foreign universities (e.g. University of Turku, University of Poitiers, University of Eastern Finland, Technical University of Munich etc.);*
- *The numbers of high quality publications rises steadily.*

The SER identifies the following areas for improvement:

- *The average age of academic staff is high;*
- *Improvement in the teaching and pedagogic skills of the staff;*
- *Low competition in electing the teaching staff;*
- *Low international mobility of teaching staff.*

The SER proposes the following action plan:

- *Analyse the feedback from the ÖIS regularly;*
- *Involve lecturers in research activities more;*
- *Balance the workload of researchers and teaching staff members;*
- *Increase staff mobility by encouraging them to use available mobility opportunities;*
- *Involve external lecturers and producers in teaching and research;*
- *Encourage junior teaching staff to complete their PhDs in a timely fashion.*

Comments of the panel on compliance with standards

In relation to the Master's course, these standards are fully met.

Further strengths identified by the panel

- Research activity includes work on conservation genetics with a substantial production of PhD and master's dissertations and papers in world-class journals;
- Many lecturers are registered for PhD and 75% of income is from research;
- Feedback from staff to students was considered good. One lecturer described giving students a list of sample questions to help with preparation for exams;

- Regarding student feedback on staff, some staff asked students what they hoped to gain from the course, while others requested feedback at the end of the course;
- Staff participate extensively in pedagogical training.

Further areas of improvement and recommendations identified by the panel

- According to students, some lectures were hard to understand.

Students

Self evaluation

The SER identifies the following strengths:

- *The small number of students allows flexibility and individual approach during the study;*
- *Good international connections for students to seek opportunities via ERASMUS+, etc.;*
- *Possibilities for students to complete their studies outside the nominal study period of 2 years.*

The SER identifies the following areas for improvement:

- *Low number of students and a decreasing number of applicants;*
- *High dropout rate;*
- *Student mobility;*
- *Feedback from students and alumni.*

The SER proposes the following action plan:

- *Improve information about the study programme targeted to potential students;*
- *Support students and encourage them to complete their studies;*
- *Inform students more frequently about the possibilities of mobility.*

Comments of the panel on compliance with standards

16 students were accepted for the new BSc programme in 2016, from 40 applications. So far, none have dropped out (November 2016). Two students from the pre-existing master's course were interviewed.

Further strengths identified by the panel

Student support is considered adequate.

Further areas of improvement and recommendations identified by the panel

Continuing development and improvement along the lines that have been laid down.

Annexe: Aggregated action plans as proposed in the self-evaluation report

2.1.7. ACTION PLAN Production Marketing of Agricultural Products. Horticulture. Bachelor's Studies and Master's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Have regular round-table discussions with the curriculum staff, students in their final year and alumni to further improve the curriculum	Head of curriculum	regular	Regular round-table meetings; curricula that include the current issues in the society; positive feedback to the curricula by students
Improve gathering feedback from the students on individual subjects and its analysis	Head of curriculum	regular	Improved subject plans; positive feedback to the subjects by students
Initiate the development of scheduling system that would take into account the entire campus and guarantee optimal room use according to the number of students	Director of Studies	2016-2018	More flexible scheduling system
Continue to find financial opportunities to improve the technological park intended for studying and to organize longer excursions	Head of curriculum; responsible lecturers	regular	Better equipment for teaching/ studying; more long excursions
Create supportive means to agitate more students to use ERASMUS+ (i.e. stipends, travel grants)	Director of Studies	2017-2019	More students using ERASMUS+
Invite more lecturers via ERASMUS+ programme and the Development Fund	Head of curriculum; heads of departments	regular	More invited lecturers
Continue training PhD students to guarantee highly qualified staff for the future	Heads of departments	regular	All lecturers have a PhD degree by 2020
Analyze the reasons for dropouts and develop a mentoring plan for students to reduce dropout rates	Head of curriculum	2017	Higher graduation rates
Increase collaboration with agricultural companies (within the curricula and in cooperation with Young Farmers' Club)	Head of curriculum	2018	More field visits and invited speakers
Promote agricultural studies more through using different media and social-media	Head of curriculum	regular	Positive image of curricula; more motivated students entering the studies

2.2.7. ACTION PLAN Forestry. Bachelor's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Regular meetings of the development committee	Leader of curriculum	regular	There are regular meetings of the development committee
Regular meetings with teaching staff and students	Leader of curriculum	regular	There are regular meetings with teaching staff and students
During the evaluation of teaching staff to assess effective and modern teaching methods used by the teacher	Heads of the departments	regular	More lecturers are using effective and modern teaching methods
Encourage teachers to use mobility possibilities and finances	Director of studies	regular	Teachers' mobility has increased
Encourage students to use mobility possibilities and finances	ERASMUS+ coordinator	regular	The students' mobility has increased
Carry out the survey of alumni and employers	Leader of curriculum	2016/2017	The survey is carried out

2.3.7. ACTION PLAN Forest Management. Master's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Regular meetings of the development committee	Leader of curriculum	regular	There are regular meetings of the development committee
Regular meetings with teaching staff and students	Leader of curriculum	regular	There are regular meetings with teaching staff and students
During teaching staff evaluation assess the use of effective and modern teaching methods	Heads of the departments	regular	More lecturers are using effective and modern teaching methods
Encourage teachers to use mobility possibilities and finances	Director of studies	regular	The teachers' mobility has increased
Encourage students to use mobility possibilities and finances	ERASMUS+ coordinator	regular	The students' mobility has increased
Carry out the survey of alumni and employers	Leader of curriculum	2016/2017	The survey is carried out

2.4.7. ACTION PLAN Forest Industry. Master's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Regular meetings of the development committee	Leader of curriculum	regular	Regular meetings of the development committee are held
Regular meetings with teaching staff and students	Leader of curriculum	regular	Regular meetings with teaching staff and students are held
Upgrade the laboratories equipment	Head of the Dept. of Forest Industry	continuous	Laboratory equipment is new and in use
During teaching staff evaluation assess if effective and modern teaching methods are used	Heads of departments	regular	More lecturers are using effective and modern teaching methods
Promote mobility possibilities and financing among teachers	Director of studies	regular	The mobility of staff has increased
Encourage students to use mobility possibilities and finances	ERASMUS+ coordinator	regular	Student mobility has increased
Carry out an alumni and employer feedback survey	Leader of curriculum	2016/2017	The survey is carried out

2.5.7. ACTION PLAN Animal Science. Bachelor's Studies and Master's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Carry out regular round-table discussions with students and lecturers to improve the curricula	Leader of curriculum	Regular	Improved curriculum and communication. Regular meetings of the development committee, teaching staff and students
Improve the evaluation system of teaching in ÖIS	Head of curriculum; Dept. Academic Affairs	Regular	The results of feedback from students are significant
Renovate the A-wing of Zoomeedikum	Director of the Institute	2017–2018	Improved working environment
Continue developing the electronic study environments	Lecturers	Regular	More e-courses are available
Bring in lecturers from other Universities outside of Estonia	Head of dept., Head of curriculum, Lecturers	Regular	Increased knowledge and competence
Enable a sabbatical semester for lecturers	Head of det., Head of curriculum, Lecturers	Regular	Each lecturer will be allowed one free semester per five years
Increase student mobility	Head of curriculum/ ERASMUS+ coordinator	Regular	Increased number of exchange students
Develop a support and mentoring programme for reducing dropout rate	Head of curriculum	Regular	Lower dropout rate
Increase recruitment and the candidate's quality through marketing and promotion of the curriculum	Head of curriculum; Dept. Academic Affairs	Regular	Increased number of students

2.6.7. ACTION PLAN Aquaculture Master's Studies

Action(s)	Person(s) responsible	Period	Result(s)
Arrange curriculum development committee meetings and meetings with teaching staff and students regularly	Chair professor, Curriculum leader, Lecturers	From 2016 regularly	Improved curriculum and communication. Regular meetings of the development committee, teaching staff and students
Further improvement of curricula	Curriculum leader, Lecturers	2016–2019	More attractive and coherent study programme, innovative study methods are applied
Increase recruitment and their quality through marketing and promotion of the curriculum	Curriculum leader, Lecturers	From 2018 regularly	Increased number of students
Continue developing the electronic study environments	Lecturers	regular	More e-courses are available
Bring in lecturers from other Universities outside of Estonia	Chair professor, Curriculum leader, Lecturers	From 2019 regularly	Increased knowledge and competence
Develop a support and mentoring programme for reducing dropout rates and increasing the graduation rate within a two- year period	Leader of curriculum	2016	Lower dropout rates and higher graduation rate
Encourage students to use mobility possibilities and finances	ERASMUS+ coordinator	regular	The students' mobility has increased
Encourage lecturers to use mobility possibilities and finances	ERASMUS+ coordinator, Director of Studies	regular	The lecturers' mobility has increased

Assessment Report on Agriculture, Forestry and Fishery

Develop a system of collecting feedback from alumni and employers	Curriculum leader	From 2019 regularly	The survey is carried out regularly
---	-------------------	---------------------	-------------------------------------