

FORESTS FOR UNIVERSITY EDUCATION: THE EXAMPLE OF ESTONIA

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Abstract

Teaching methods change during times. The authors consider it essential to anchor the theoretical part of studies with practice in the natural environment. Therefore, to ensure the achievement of learning outcomes, practical training is included in a number of courses in Estonian academic forestry education.

The history of academic forestry education in Estonia starts in 1920. The Experimental Forest District at Järvelja was established in 1921. Since 1997 its name is the Foundation Järvelja Experimental and Training Centre and it belongs to the Estonian University of Life Sciences.

The Järvelja Center's total area is 10 553 ha. Forest land comprises 6 626 ha, of which 2 723 ha are protected. Bogs form 3 147 ha of the Järvelja Centre's land. Järvelja Experimental and Training Centre is the only one in Estonia which has complete infrastructure for accommodation and catering.

Every year Estonian forestry students have various practical training courses in Järvelja. In most cases, practical training is held in summer, but some courses are offered in winter (e.g. forest and timber measurement) as well. Also every year some graduation theses are defended on themes done in Järvelja forests. Forests in Järvelja are used to carry out several research projects, too.

Keywords: Estonia, forestry, practical training, field practice base.

Introduction

Previously the main focus has been on lectures and seminars, new methods include e-learning, project-based studies etc. Although e-learning is an important part of the teaching process, it does not replace "old-fashion" part of higher forestry education – practical training. The need for practical training as a part of higher forestry education has been a topic for discussion. While without doubt forest workers need practical experience which is provided by vocational education through more hands-on practice, the authors have seen that most of the universities in Europe offering higher forestry education involve practical training in their curricula. The authors don't know any university in Europe offering higher forestry education not involving practical training. They can not imagine it is possible to obtain basic forestry knowledge or deeply understand the processes in forestry only by learning theory. Traditionally theory is supported by practical training. When the first year

BSc forestry students in Estonia were asked at enrolment, whether or not they plan to continue in a MSc programme or start working, 71% of all respondents did not know their future plans (Teder and Reisner, 2017). During studies the students are expected to find their way. According to Rekola *et al.* (2017) the expectations of students have developed for a greater diversity of experiences and skills. Therefore students have to have a wide variety of possibilities based not only on theory but also on practical aspects of the possible future profession.

So it is usual that practice in an enterprise is included in the curriculum. To provide that, quite often there is a special location outside of university campus. For example in the case of the University of Applied Sciences Weihenstephan-Triesdorf in Freising, Germany, the forest faculty can use a 1500 ha teaching forest, starting at a distance of 500 m from the faculty. The forest is managed by the Bavarian State Forest Company (Rothe, 2014). In Estonia there is the Järvselja Training and Experimental Forest Centre/Järvselja Õppe- ja Katsemetsakond, which is used in higher forestry studies. Having such centre ensures that the forestry curricula in Estonia respond to the needs of the labour market (Tullus, 2013).

History and management

The history of the Järvselja Training and Experimental Forest Centre goes back to 1921. With a decision of the Government of the Estonian Republic in April 1921, the former Kastre-Peravalla forest area was given to the University of Tartu to be used as an independent training forest district (Kusmin and Kusmin, 2013). In 1951 this training forest district was transferred to a new university – the Estonian Agricultural Academy, comprising the “rural” departments of the University of Tartu and granted the right to teach higher education in forestry. The training centre has had several names and belonged to different owners, but since 1997 its name has been the Foundation Järvselja Experimental and Training Centre and it belongs to the Estonian University of Life Sciences (EMU, Eesti Maaülikool). The University is the owner of the land, the forest and infrastructure belong to the Järvselja Training and Experimental Forest Centre. The Järvselja Centre is a self-financed enterprise without any financial support from the University. The head of the Järvselja Centre is the Chief Forester who reports to the Council of the Järvselja Centre. The Council is formed by the director of the Institute of Forestry and Rural Engineering and consists of representatives of the Institute (four members), the Ministry of Environment (one member) and the State Forest Management Centre (one member). The Board of the Järvselja Centre consists of only one member who is also its Chief Forester.

Description

The aim of the Järvselja Training and Experimental Forest Centre is to guarantee opportunities for training and experiments, mainly in forestry. The total area of the Järvselja Centre is 10 553 ha. The forest land area is 6 626 ha, from which 2 723 ha

are more or less protected. Bogs form 3 147 ha of the Järvelja Centre's total area. Approximately 4 000 ha of forest land area are for timber production. In Järvelja, most of the Estonian forest site types are represented. Also there are some of the tallest trees in Estonia – birch (*Betula pendula*), aspen (*Populus tremula*), black alder (*Alnus glutinosa*), grey alder (*Alnus incana*) and bog birch (*Betula pubescens*). In 1924, 12,8 ha of the forest land area was designated as nature protection area and since then no cuttings, cleaning of dead wood or non-timber use of forest have taken place. Nowadays the forest land area, on which the human activity is absolutely forbidden, is already 187 ha.. In Järvelja there is also the Agali arboretum (established in 1968) with 80 tree and shrub species.

The average annual increment of the forests is $7 \text{ m}^3 \cdot \text{ha}^{-1}$. The distribution of the standing volume of the main tree species in Järvelja is shown in Figure 1.

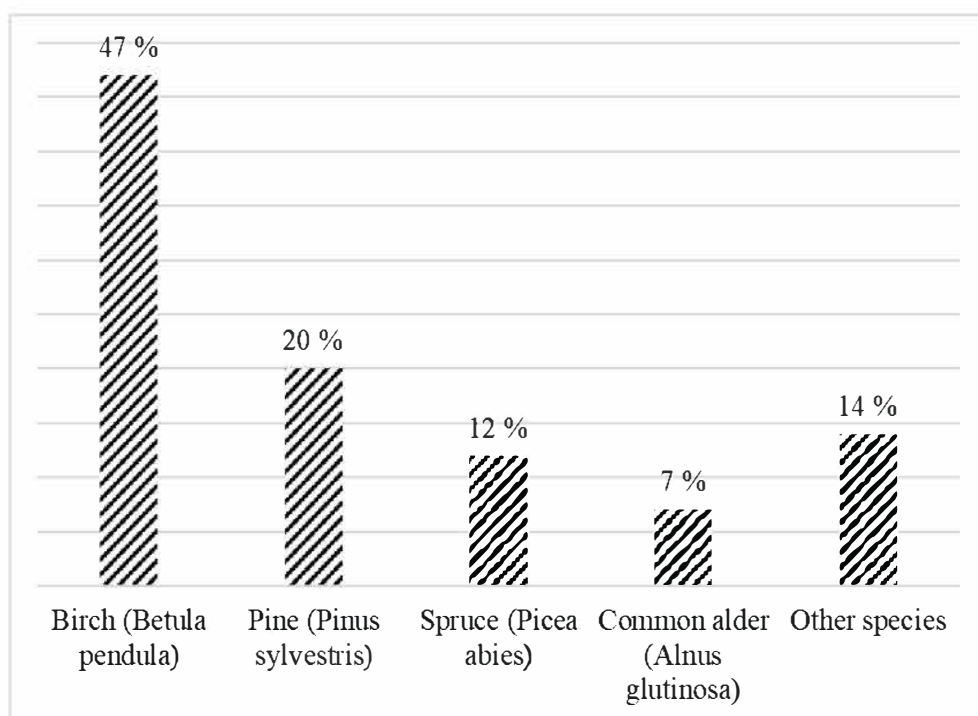


Figure 1. The distribution of the standing volume of the main tree species in Järvelja.

Nowadays there is a complete infrastructure in Järvelja to carry out practical forestry-related trainings. There are hostels for 100 students, a room for seminars, a computer class and a dining room. For 30 professors and guests there is a special building called "Hunting house". Also there are two saunas.

Forest Management

As the Järvelja Experimental and Training Centre is self-financed, it has to find its own ways to cover all expenses. The main income is received from cuttings. The

average cutting volume is 16 000 m³ from clearcuttings and 4 000 m³ from thinnings. The average price for all assortments at the wood mill was 37 €/m³ in 2017. A small income is generated from the nursery and from recreation management. Every year the Järvselja Centre reforests about 30 ha of land, mainly by planting (spruce, pine and birch). As the main income is received from forest management activities, the main expenditure is also connected with these. In addition to that, in accordance with the aim of the Järvselja Centre, it covers almost all costs of students' field practices and it supports various experiments.

Field practices and students' graduation theses

During spring and summer each year 425 students on average take part in different field practices in Järvselja. For example, Practical trainings are offered in dendrology, forest botany, forest site types, forest entomology and game ecology, silviculture, forest and timber measurement, wood harvesting and machinery, forest pathology, forest tree breeding, forest regeneration, forest ecology etc. All together the number of credit points for field practices held in Järvselja is at Bachelor level 18 ECTS and at Master level 8 ECTS. Not only forestry students have their field practices in Järvselja. The Järvselja Centre is used also by the students of other curricula, for example Environmental Planning and Landscape Design, Land Surveying and Land Management, Nature Based Tourism and Applied Biology of Aquatic and Terrestrial Ecosystems. They all have their basic forestry course and, as a part of the studies, the field practice in Järvselja. All these study programmes are taught by the Estonian University of Life Sciences. Students of University of Tartu, also located in Tartu, use the Järvselja Experimental and Training Centre for their field practices in courses on insects, mushrooms etc. as well.

Not only field practices are held in Järvselja. Many students choose the possibility to do the research for their graduation thesis in Järvselja. Themes cover very broad field, for instance description and analysis of the pruned stands (Prants, 2016; Tirmaste, 2016), growth of various tree species in different conditions (Kusma, 2016; Kaasiku, 2017), damages by insects (Ojalo, 2017) or even visitor load assessment (Lipmeister, 2017).

Experiments

Soon after the establishment of the experimental and training forest district, large forestry experiments were launched. Due to World War II, experimental work at Järvselja was stopped and restarted in 1947 (Kusmin and Kusmin, 2013). Nowadays in Järvselja there are several long-term experiments and demonstration areas, for example the geographical experimental stands and tree selection experiments of Scots pine, comparative experiments of non-native tree species, sample plots to measure the growth and yield of forest stands, permanent sampling plots for thinning, fertilisation sample plots etc. All these are supported in larger or smaller amount by the Järvselja Centre. The support is mainly financial, but sometimes the Järvselja Centre helps with workforce as well. The previously mentioned

experimental plots are all classical types in forest research. In Järvelja two world level modern experiments are going on: FAHM – Free Air Humidity Manipulation (<http://fahm.ut.ee/main?lang=en>) and SMEAR – Station for Measuring Forest Ecosystem Relations (<http://smear.emu.ee/>).

Challenges

Some problems related to the Järvelja Experimental and Training Centre should also be mentioned. Comparing its forest management with that of the State Forest Management Centre, the effectiveness is much lower. However, keeping in mind that the aim of the Järvelja Centre is to support both students' field practical training and forest-related experiments, the extra expenditures here are justified and even necessary. The location is one of Järvelja's major problems. For practical training of students it is favourable that there is no other entertainment in Järvelja, so students can focus on their training. But it is difficult to find local workforce because people do not want to live so far away from larger towns. Nowadays not even a school is located in Järvelja. At the moment one of the most important problems is the increasing area of protected lands. There is a strong pressure from society to protect more and more forest land. The Ministry of the Environment, through its subunits, decides on establishing protected areas or protection of key habitats. Therefore the area of managed forest land is decreasing also in Järvelja, diminishing the income of the Järvelja Centre. As the University is not supporting the Järvelja Centre financially, it is a challenge for the Chief Forester to find solutions and guarantee the Järvelja Centre's operation.

The specific value of practical training sites

In spite of the problems mentioned above, all forestry-related researchers and professors consider it very useful to have such a base for experiments and students' practical field training. Everybody is free to make decisions, everything must be coordinated with only one person – the Chief Forester. In a study on forestry training in 23 countries (Bernasconi and Schroff, 2011) it is pointed out that many of the forestry and forestry-related training courses are cost-intensive, whereas the market for these courses is small (small number of students in comparison with other courses). In Estonia, where some of these costs are covered by the Järvelja Experimental and Training Centre, it is somewhat easier to continue giving higher forestry education, even if the number of students is continuously decreasing.

Even years after graduation, students who have had weeks of practical training in Järvelja come back with pleasure to Järvelja, to hold their course reunions there. Järvelja is a place where foreign foresters are shown the experimental plots and discuss further cooperation possibilities. This is a place not only for students, but for all whom forestry concerns – pupils, private forest owners and also politicians.

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