


ISSUE SHEET 5



ENHANCING UNIVERSITY FORESTRY TEACHING: LEARNING THROUGH EXCHANGE

What makes a successful, productive exchange between different countries on the way that forestry is taught in their respective contexts? This issue sheet explores a ten-year collaboration between the Hans Em Faculty of Forest Sciences, Landscape Architecture, and Environmental Engineering (HEF) in Skopje and the Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences (HAFL in its German acronym). Facilitated through the Nature Conservation Project, NCP, the collaboration evolved into a truly mutual learning exchange between students, professors, and practitioners in North Macedonia and Switzerland. A topic of particular importance throughout was the integration of biodiversity into forestry teaching.

"I would say that Macedonian forestry teaching has tended to be quite academic and theoretical, whilst the Swiss give greater emphasis to practical application. The two approaches are thus very complementary, with opportunities to learn from each." Cvetan Nikolovski, Forestry Specialist at Farmahem and former NCP Programme Officer.

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KEY LESSONS LEARNED

- Modern forestry teaching must adopt a holistic and interdisciplinary approach; a focus on silviculture for timber production alone does not meet current needs.
- With an interdisciplinary approach comes a need for a new range of know-how, skills, and training.
- Since “seeing is believing”, study tours and opportunities for in-depth field observations are very helpful for integrating new concepts into a curriculum – in this case, biodiversity and integrated forest management aspects.
- Enhancing a faculty curriculum is invariably a long process that requires the “ownership” and understanding of all those concerned in the decision-making structure.
- Collaboration between students, professors and practitioners can accelerate the translation of scientific research into practical application.
- Mutual learning can take different forms; in this case in addition to technical aspects, it included a heightened understanding of the different histories and cultures that shape forestry in the respective countries.

AN ENHANCED FORESTRY CURRICULUM

Evaluation of the existing Bachelors level forestry curriculum at HEF began in 2014. The aim was not to develop an entirely new curriculum (which would have entailed complex administrative procedures), but rather to insert integrated forest management and biodiversity conservation within the existing curriculum. Twelve HEF professors were actively involved in this two-year process. With the support of HAFL, forestry curricula from various European universities were analysed and compared – most notably those of Switzerland and ex-Yugoslavia countries including Slovakia and the Czech Republic. The enhanced curriculum that was eventually produced in 2016 incorporated biodiversity and integrated forest management into 19 subjects.

“At the beginning of the curricula development process, it was challenging to break the ice and to gain the trust of the lecturers. Some of them were keen and open to learn about curricula content at other faculties and to discuss improvement options. Others were rather cautious and reserved towards new ideas. Slowly, by collecting positive experiences in different segments of the NCP programme, the ice melted, and interest grew. It was very exciting to observe this transformation and how motivation gradually increased. The most rewarding for me was to learn, at the latest stage in the programme, about the continuous implementation of new contents in the teaching, which all started with NCP.” Jelena Markovic, Research Associate HAFL, responsible person from HAFL for NCP.

Integrated forest management aims to balance the economic, social, and ecological aspects of sustainable forest management and conservation - accommodating the needs and interests of all forest stakeholders as far as possible. In the Macedonian context, these stakeholders include local residents, private and state forest owners, hunters, bee-keepers, forest-based industries, government agencies, NGOs, conservation organizations and tourist agencies. Integrated forest management draws on a range of approaches including ecosystem analysis, landscape planning and a variety of participatory tools.

“An additional support for the enhanced curriculum provided through the NCP was a set of some 29 recently published reference books that were not available at the faculty, and for which download fees apply online. These represent an important resource for both students and professors.” Prof. Vlatko Andonovski, April 2023.

The provision of literature in line with the improved curriculum was a significant step, as these educational materials were made available within the framework of NCP, despite the primary focus being on knowledge exchange. This effectively addressed concerns among HEF staff that arose from the very beginning during the curriculum improvement process about introducing new topics without adequate educational materials and equipment.

TAILOR-MADE BLOCK LECTURES

The enhanced curriculum required the development of new teaching in a variety of fields. Accordingly, HAFL professors developed in total 9 tailor-made block lectures, covering topics indicated in the text box. Integrated forest management in the context of climate change attracted high interest. Also, entirely new to the Macedonian curriculum were the topics of deadwood management and its importance for biodiversity; nature-based solutions to managing soil erosion on slopes; and urban forestry. Teaching statistics was enhanced through the introduction of R software. Students from other faculties – including Agriculture, Natural Sciences and Biology - were free to attend the block lectures. Their participation introduced a further level of interdisciplinarity as indicated in the observation of one of the students, Julijana Arsovska.

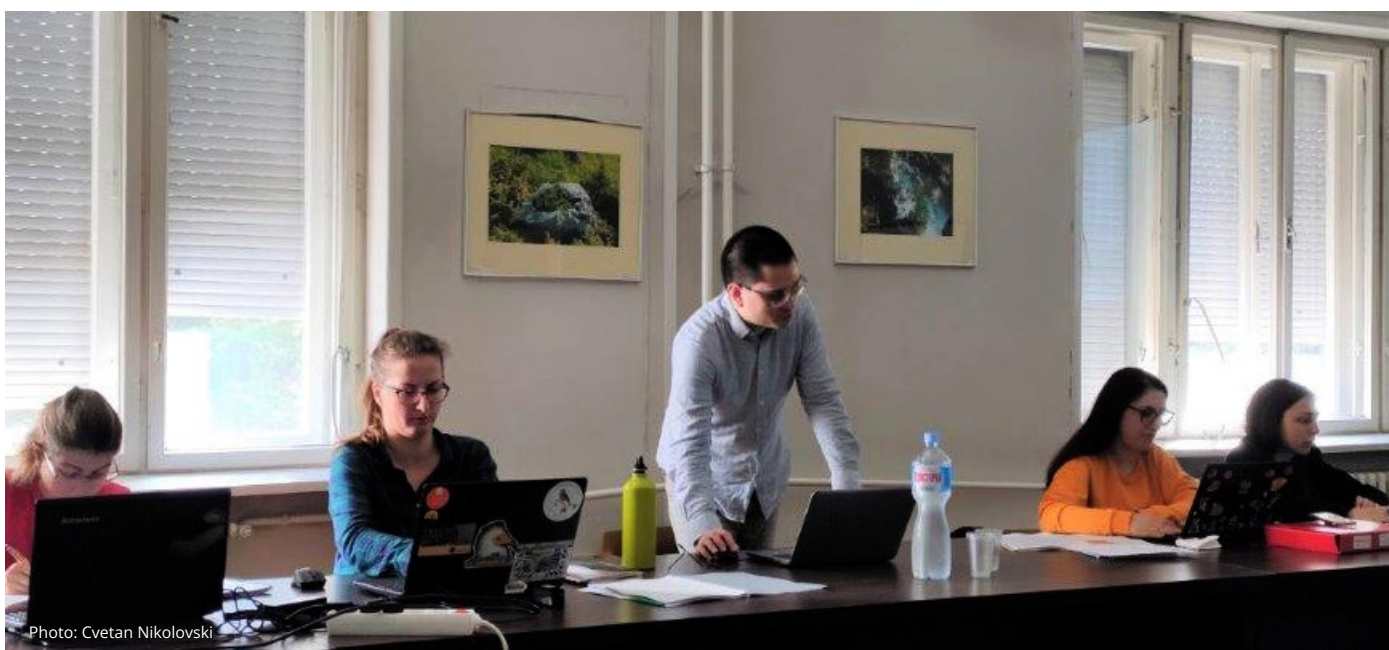


Photo: Cvetan Nikolovski

"The training on R software was very productive. I am an active researcher of fish population in the country and the common language of statistics that all the participants used was very important. We discussed the numerous challenges when we need to draw conclusions about an entire population based on a limited sample of species. Answering these questions through the widely applicable R software may be the greatest challenge and of course, it was a pleasure to start mastering it. I am grateful to the team behind this idea as well as to the lecturer who made it possible for us to enter the so-called R world." Julijana Arsovska, Ph.D. student, Faculty of Natural Sciences and Mathematics in Skopje.

TOPICS COVERED IN THE TAILOR-MADE BLOCK LECTURES

- Integrated forest management and climate change;
- Forest management for biodiversity;
- Forest planning, silvicultural methods, and techniques; Presentation of the mobile applications Moti and Sylvotheque;
- Classification of Swiss forests in Switzerland according to their conservation value and management for biodiversity;
- High nature value forests;
- Deadwood management and silviculture for biodiversity;
- Inventory of deadwood and habitat trees;
- Conservation of monumental trees;
- Ecological importance of deadwood and habitat trees for the conservation of saproxylic species (those dependent on dead or decaying wood) in the forest ecosystem;
- Silviculture to enhance biodiversity and spatial heterogeneity in a multifunctional context;
- Benefits of close-to-nature silviculture: concepts and applications;
- Training on didactics;
- Hillslope processes and ecological mitigation;
- Root-soil mechanics and interactions;
- Risk-based management of protection forests and debris flows;
- Training on R software for statistics;
- Urban forestry.

“Starting in 2013 and held over several years, various distinguished block lectures were organized on international forest policy and climate change with emphasis on the implications for Macedonian and Swiss forestry. What struck me was the interest not only of professors and students of the faculty, but also of forest practitioners, at looking over the edge and reflecting on new ideas to value forests in the future. This was enjoyable and something I will always remember.” Prof. Jürgen Blaser, retired professor of international forest management and climate change at HAFL.



Photo: Ljubomir Stefanov

To enhance the learning experience, theoretical lectures were complemented by field exercises, allowing students to apply their knowledge in practical settings. For instance, following Prof. Thibault Lachat’s lectures on deadwood, students gained knowledge on process for deadwood inventory adhering Swiss norms. Additionally, they studied bark beetles and other saproxylic invertebrates while evaluating the habitat value of old-growth trees.

“This training allowed me to acquire theoretical and practical knowledge about the importance of dead wood, habitat trees and forest biodiversity. This was an excellent first step to introducing a forestry discipline that was not previously part of our forestry education.” Blagoj Shurbevski, HEF post-graduate student speaking in 2019. Reflecting in 2023 on the training, he added, *“This marked the beginning of my interest in forest entomology and my current work on this topic.”*



Photo: Cvetan Nikolovski

PAIRING MACEDONIAN AND SWISS STUDENTS IN THEIR THESIS WORK

Bachelor and Master level students at both the HEF and HAFL are required to conduct a research assignment, written up as a thesis, as part of their overall assessment. Clearly, the expected standard of this research is higher at Master than Bachelor level. Through NCP, a system of pairing Macedonian students from HEF and Swiss students from HAFL was instigated, under which the paired students worked on complementary aspects of the same broad topic.

Over the period of 10 years, the NCP supported 24 Bachelor and Master theses on various topics related to integrated forest management and biodiversity. They included forest health, invasive species, pasture and landscape management, silviculture, forest fire management, deadwood management and habitat trees. The collaboration and the international exchange not only broadened the horizons of the students; it also gave them the opportunity to be involved in a wider process of environmental conservation and to discuss with forestry professionals. Staff of the Public Enterprise National Forests (PENF) took part in field visits and discussions, raising their interest in integrated forestry and biodiversity conservation and sometimes changing their practices.

"After attending the trainings organized by the Nature Conservation Programme in North Macedonia on silviculture to enhance biodiversity, close-to-nature silviculture, and deadwood management, I have gained profound insights and practical knowledge that have significantly influenced my approach as a forester. These training programs have provided me with valuable tools and strategies to effectively promote biodiversity, implement sustainable silvicultural practices, and manage deadwood for ecological benefits. I am grateful for the transformative experience that has enabled me to make a meaningful impact in conserving and managing our forests." Goran Belcovski, a forest engineer from the PENF forestry branch in Berovo.

One of the silvicultural practices that is highly valued nowadays based on the students' research is the preservation of monumental trees, which are afforded greater respect in terms of conservation. A significant part of the students' research findings contributed to the development of the Regional Forest Development Plan for Maleshevo region and the designation of Osogovo Mountains and Maleshevo as protected areas. Additionally, the findings of the students engaged in research on forest fires played a crucial role in shaping the "Landscape Fire Management in the Western Balkans".

STUDENT RECOLLECTIONS OF BACHELOR FIELDWORK CONDUCTED IN SUMMER 2015, BREGALNICA

Patrick Schwab, HAFL student: *"We spent two months in North Macedonia. Some things, such as the site conditions of the forests that we analysed, were comparable to Switzerland. The rest, on the other hand, was often very different. For example, I didn't find out until the very end how Macedonian forestry really works. What impressed me most was the hard life of the people. I felt as if I had been transported back to another era."*

Marija Sterjovska, HEF student: *"We conducted our research in an ancient, coppiced beech forest on the upper slopes of the Bregalnica watershed. As we walked under the thick canopy, we analysed the stand structure and tried to build up a picture of the forest dynamics. Each pair of Bachelor students had a different hypothesis to test in the same forest stand. We allocated our roles in taking measurements to ensure that we were as effective, efficient, and precise as possible. Through the exchange, I became more aware of how Swiss forestry works in comparison to the forestry system in Macedonia. I was impressed by the Swiss mindset and the connection of the people to the forest. The interactions and the collaboration with my Swiss thesis partner gave me new professional perspectives and broadened my horizons on various forestry topics. The quality of my thesis research was also enhanced."*



ATTRACTING GREATER STUDENT NUMBERS

Despite widespread recognition of the importance of forests in mitigating climate change, forestry as a discipline fails to attract large numbers of students in many countries. This is especially true in North Macedonia, where forestry tends to be associated with tree felling, rather than sustainable forest management. Furthermore, most students applying to study forestry come from rural backgrounds where teaching standards tend to be lower than in urban areas. There are also more men than women. To combat the trend of declining student numbers and attract a more diverse student body, NCP supported the HEF to completely redesign its website and logo and conduct a social media campaign championing forestry as a choice of study. Creating the new logo was made into a competition, with students voting for the best design. Although it is too soon to measure clear results, in the year immediately following the social media campaign student enrolment in forestry increased from 20 to 25 students.

BROADENING EXCHANGE WITH OTHER UNIVERSITIES

The HAFL – HEF collaboration has also led to wider exchange and collaboration with other forestry teaching and research institutions. For example, the work on tree root systems for soil stabilization led Bozin Trendafilov to conduct his doctoral research at the University of Sassari in Sardinia. Similarly, collaboration has grown with the University of Freiburg regarding forest fires.

CHALLENGES

As already indicated with respect to curriculum development, introducing new ideas takes time; it cannot be expected that everyone will be immediately enthusiastic about change. Perhaps this is more pronounced amongst older, more senior individuals - but more importantly, there are also cultural aspects. However, cultural and forestry differences between Swiss and Macedonians are less obvious. Two main issues can be highlighted here: a tendency in ex-Yugoslav countries to have a high respect for, and thus openness to, Western Europe practices, at the same time as a strong hierarchical culture, especially in academic institutions. Whilst the former worked in favour of curriculum changes, the latter exposed different expectations. At HAFL, lecturers are encouraged to update the content of their modules every year, their teaching is evaluated by students, and the student feedback is incorporated into annual performance reviews. Students are encouraged to express their opinions and to debate. In North Macedonia, lecturers most of the time do not expect their knowledge or opinions to be questioned; neither is the regular updating of lecture content between reforms essential but depends on the personal motivation of individual lecturers. As observed by Jelena Markovic, there are advantages and disadvantages in both systems, but it is helpful to recognize the cultural tendencies as herein lies an opportunity for greater learning.

“Swiss students question everything, and they can be very critical in their confidence. Macedonian students rarely dare to question things; they tend to observe and keep unspoken questions to themselves.” Jelena Markovic, Research Associate HAFL, responsible person from HAFL for NCP.

For the Swiss students visiting North Macedonia, the learning experience was sometimes not as immediately tangible as for the Macedonian students who were learning new techniques or subject matter. Yet the Swiss students learned other things, such as how to work in conditions where there is no internet connection and the distances without roads are long and arduous.

CONCLUSIONS

No-one who was personally involved in the HAFL - HEF collaboration expresses regret about the experience. Both Swiss and Macedonian participants hold overwhelmingly positive views about the invaluable opportunities for exchange they gained. Throughout this collaboration, numerous professional relationships have deepened, and enduring friendships have been forged over time. The widely-voiced perception is that this joint endeavor has been an enriching journey for all involved.

PRACTICAL RECOMMENDATIONS

- Even quite major revisions in university curricula are often best framed as updates or enhancements to avoid lengthy approval processes. Furthermore, it is important to gain the trust, engagement and support of all those concerned in the teaching of the curriculum when making changes.
- When revising a curriculum, consulting comparable curricula taught in other countries, especially countries with similar contexts, can give important insights and ideas.
- Pairing students from two countries to work together on complementary theses can be a very rewarding learning experience. At the same time, it is important to ensure a good match, and for supervisors to provide close guidance. In this respect, the support of a member of HAFL staff who had a cultural understanding of both Switzerland and the Balkans was a significant advantage.

"As a final comment, I would like to say that this collaboration was greatly smoothed by the existence of a separate body that managed the funds and organized everything. This was highly appreciated, and I don't think we would have had the same results without the NCP team."
Prof. Kiril Sotirovski, Dean, HEF

This Issue Sheet was produced by Cvetan Nikolovski, Marija Sterjovska, NCP's Programme Officers both from Farmahem and Jane Carter, Senior Adviser, Natural Resource Governance, Helvetas. Inputs were provided by Kiril Sotirovski, Nikolcho Velkovski, Nikola Nikolov, Vlatko Andonovski, Blagoj Shurbevski, Bozhin Trendafilov, Boris Najdovski and Viktorija Stepanovic-Brndevska, all of Hans Em and Jelena Markovic of HAFL. It entailed consultation with many NCP stakeholders, including but not limited to those quoted. For further information, please contact farmahem@farmahem.mk.

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