

Thursday 27 June 2024

08:30 - 10:30 T5.18 Initiatives and Equity for Forest Education in a New Era, T3

Chair: John Innes

08:30 - 08:32 Opening Remark By John Innes, Chair, APFECM

08:32 - 08:40 Forestry Education in the AI Era: Challenges, Opportunities, and the Transformative Impact of AI on Teaching and Learning
Guangyu Wang¹, Suzy Zeng¹, Joris Jun¹, Anil Shrestha¹, Kebiao Huang², Cao Long²
¹ APFECM, Faculty of Forestry, University of British Columbia, Vancouver, BC, V6T 2E9, Canada
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08:40 - 08:48 EUROSILVICS: Open-access repository for education support in silviculture and forest ecology
Frits Mohren¹
¹ Department of Environmental Sciences, Wageningen University and Research, Wageningen, The Netherlands

08:48 - 08:56 Developing an inclusive and interdisciplinary training program on “forest-based climate solutions”
Jacob Bukoski¹, Loren Albert¹, Quintana Clark^{2, 3}, Erica Fleishman⁴, Reem Hajjar¹, Suhyun Jung¹, David Lewis², Rajat Panwar^{1, 5}, Chris Still¹, Martin Storksdieck⁶
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08:56 - 09:04 Innovative Sustainable Forest Management Education in the Asia-Pacific Region
Suzy Zeng¹, Guangyu Wang¹, Anil Shrestha¹, Hailan Chen², Chris Crowley², John Innes¹, Shiyi Zhang³
¹ Asia Pacific Forestry Education Coordination Mechanism (AP-FECM), Faculty of Forestry, University of British Columbia (UBC), Canada
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- 09:04 - 09:12 Proposing innovative competence-based training experiences to enhance forest management through a blended approach.
Elena Andriollo¹, Thomas Campagnaro^{1, 2}, Lisa Wolf³, Jana Baumgartner³, Mauro Masiero¹, Neil McIntosh⁴, Tommaso Sitzia^{1, 2}
¹ Department of Land, Environment, Agriculture and Forestry, Università degli Studi di Padova (Italy)
² National Biodiversity Future Center (Italy)
³ E.C.O. Institut für Ökologie (Austria)
⁴ EUROPARC Federation (Germany)
- 09:12 - 09:27 Panel Discussion
- 09:27 - 09:35 High-Quality Education Equity in China Forestry Higher Education: A Practical Research from the Perspective of Sino-Foreign Cooperation in a New Era
JIN WANG¹, RUOYI CHEN¹, YIZHONG FU¹
¹ International relations office, Beijing Forestry University
- 09:35 - 09:43 Current Status of Forest Science Education in Undergraduate Universities in Japan
Mariko INOUE¹, Katsuaki SUGIURA², Sumire KAWAMOTO³
¹ Tama Forest Science Garden, Forestry and Forest Products Research Institute
² Nihon University
³ Forestry and Forest Products Research Institute, retired
- 09:43 - 09:51 BioEquality – gender equality in the Nordic bioeconomy
Sofie Andersson¹, Mimmi Blomquist¹, Anna Meisner Jensen¹, Tatiana Proisy², Elsa Ramberg¹, Jonas Rönnberg¹, Annie Roos³, Maria Tunberg^{1, 2}
¹ Swedish University of Agricultural Sciences (SLU, Sveriges lantbruksuniversitet)
² Analysys Mason
³ Linnaeus University (Linnéuniversitetet)
- 09:51 - 09:59 Forestry Capacity Building in Climate Change
Soozin Ryang^{1, 2}, Yeongjoo Lee^{1, 2}
¹ Asian Forest Cooperation Organization (AFoCO)
² AFoCO Regional Education and Training Center
- 09:59 - 10:07 INTERNATIONAL COLLABORATIONS TO COPE CHALLENGES OF FORESTRY EDUCATION IN NEW ERA: A SUCCESS STORY
Mohammed Al Amin¹
¹ UNIVERSITY OF CHITTAGONG, INSTITUTE OF FORESTRY AND ENVIRONMENTAL SCIENCES

10:07 - 10:15 Opportunity and Obstacle: Women in Forestry Education at Kasetsart University, Thailand

Rachanee Pothitan¹, Damrong Pipatwattanakul¹

¹ Faculty of Forestry, Kasetsart University, Thailand

10:15 - 10:30 Panel Discussion

Abstract

BioEquality – gender equality in the Nordic bioeconomy

T5.18 Initiatives and Equity for Forest Education in a New Era

Sofie Andersson¹

Mimmi Blomquist¹, Anna Meisner Jensen¹, Tatiana Proisy², Elsa Ramberg¹, **Jonas Rönnberg¹**,
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Abstract: The BioEquality project addresses gender inequality in the Nordic bioeconomy, it focuses particularly on forestry and agriculture which are two of the region's most gender-segregated sectors. Digitalisation and increased automation of heavy work could benefit gender equality in the sectors. However, this has not yet happened. The project therefore aims at exploring how the digital transformation impacts gender equality among young individuals in the Nordic bioeconomy and how digital development can be leveraged to advance gender equality.

It is believed that to create opportunities for influence and participation in the digital development of the bioeconomy, it is necessary for tomorrow's employees -whom are today's students- to gain a deeper understanding of this problem and be involved in identifying and implementing solutions. To support this objective, various methods were implemented. A systematic literature review, interviews and focus groups with experts led to the redaction of an academic article as well as a handbook. It is specifically designed for teachers and students in forest and agricultural education. The method handbook consists of easily accessible texts, videos, podcasts and other material aiming to create a common understanding of the subject and its challenges and facilitate conversations to create participation and ownership over the issue.

A second phase of this project, currently in its pilot phase, aims to invest further in the future of forestry and agriculture by focusing on a younger audience, namely students between 12 and 15

years old. Study visits are offered to learn more about how AI is used in agriculture and forestry. The visits are organised at technology testbeds for the digital bioeconomy, i.e. environments where businesses, academia and other organisations can interact in the development, testing and introduction of new products, services, processes, or organisational solutions. By visiting the testbed and experiencing digital innovations pupils will get a deeper understanding of what it means to work with AI and digitalisation in the bioeconomy. Expected results are an increase in young girls' interest in studies in digitalisation and hopefully in the future, a decreased gender gap in the sectors.

Current Status of Forest Science Education in Undergraduate Universities in Japan

T5.18 Initiatives and Equity for Forest Education in a New Era

Mariko INOUE¹

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¹ Tama Forest Science Garden, Forestry and Forest Products Research Institute

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Abstract: In the new era, where global trends are shifting towards sustainable forest management, this study highlights the current state of Japanese forest education to introduce regional differences worldwide.

The Japanese school education system has been controlled by the Ministry of Education, Sports, Science and Technology. In 1991, universities underwent educational reforms that were implemented by the Ministry. This study conducted a nationwide survey in 2021 to investigate the status of forest science education in universities and colleges.

The survey included faculty members from 27 schools, with 25 having existing forestry curricula and two being newcomers. These schools were categorized into three types based on their education system for university faculties and departments: eight schools had specialized forest science divisions within departments, ten schools had dedicated forest science courses in departments of agriculture, and seven schools had forest-related specialized subjects in comprehensive divisions in departments of agriculture.

Approximately 6,000 (0.2% of the total number of university students) students were enrolled in forest science-related programs, with a male-to-female ratio of 6 to 4. Around 400 teachers, including those specializing in wood science, were involved in forest science education. Roughly half of the graduates entered the workforce, while about 40% continued their studies in graduate school. Around half of the graduates from forest science courses pursued careers in forest management, including positions in government agencies, forestry associations, and private companies, such as forestry extension supervisors and professional engineers.

The curricula of 30 educational courses across 24 schools offered a variety of subjects, with 400 required subjects and 714 elective subjects. Educational programs were classified into three types based on their inclusion of forest science content: 12 schools offered diverse forest science content as required subjects, 10 schools provided various forest science content as electives, and 4 schools offered only a limited number of forest science subjects. Determining the key elements of forest science education was challenging due to the differing approaches.

In conclusion, it is necessary to reexamine forest science education in undergraduate universities and include essential content that aligns with social demands, particularly in the context of professional human resource development.

Developing an inclusive and interdisciplinary training program on “forest-based climate solutions”

T5.18 Initiatives and Equity for Forest Education in a New Era

Jacob Bukoski¹

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Abstract: Forest-based climate solutions are being promoted globally to provide benefits such as sequestration of atmospheric carbon, habitat for species, and improvement of rural livelihoods. Yet scientific uncertainties, governance challenges, and a limited workforce constrain the development and implementation of effective policies and initiatives for forest-based climate solutions. To address these challenges, we are developing an inclusive, interdisciplinary training program on forest-based climate solutions at Oregon State University. In this talk, we will describe the design of this program, including our incorporation of current pedagogy on inclusive and effective education in science, technology, engineering, and mathematics (STEM), as well as the expected learning outcomes for participants. Key features of the program include i) cohort- and team-based learning focused on research projects relating to forests, society, and climate change, ii) the engagement of faculty and participants from five different colleges across the university (the Colleges of Forestry; Earth, Ocean, and Atmospheric Sciences; Agricultural Sciences; Business; and Education), iii) field-based workshops and intensive bootcamps to develop key skills, and iv) internships at policy and research institutions. We will also discuss our plans to make the program inclusive and accessible, including recruitment, retention, and support of students from under-represented groups, and engaging Oregon State University’s online education platform, the Ecampus. Our talk will exemplify our efforts to create a modern, inclusive, and interdisciplinary program that is responsive to a growing theme (forest-based climate solutions) within global forest education.

EUROSILVICS: Open-access repository for education support in silviculture and forest ecology

T5.18 Initiatives and Equity for Forest Education in a New Era

Frits Mohren¹

¹ Department of Environmental Sciences, Wageningen University and Research, Wageningen, The Netherlands

Abstract: Increasingly, academic teaching in silviculture and forest management is part general BSc and MSc programmes in environmental sciences, land use, and resource conservation and management. As a result, dedicated teaching and disciplinary knowledge in silviculture and forest management may receive less attention. While this allows emphasis on problem solving skills and academic competences, it also calls for alternative means to provide access to classical forestry topics such as silviculture and forest management. The EUROSILVICS project, funded by the Erasmus+ Collaborative Partnership programme, is carried out to make traditional, disciplinary knowledge in silviculture and forest management available for use in a wide array of teaching, ranging from academic programmes in forestry and forest management, to professional teaching and vocational training in forest ecology, silviculture and forest management.

EUROSILVICS creates a common digital resource for higher education in forestry, based on a repository with educational material of the participating institutions made available as an Open Access Library for Learning. Education material in national languages will be reviewed, and translated into English to allow for international use. The project involves 6 European universities: Leuven University (prof. Bart Muys, BE), Ghent University (prof. Kris Verheyen, BE), the Austrian University of Life Sciences BOKU (prof. Hubert Hasenauer, AT), Eberswalde University for Sustainable Development (prof. Peter Spathelf, DE), and the Swedish University of Agricultural Sciences SLU (prof. Gustaf Egnell, SE), and is coordinated by Wageningen University and Research WUR (prof. Frits Mohren, NL).

The project is centred around the establishment of a dedicated open access platform for forestry education material, both basic and applied, including supplementary material as exercises, excursions, and links to relevant websites. The project includes a robust review and editing procedure for quality assurance, links to other open sources and to repositories of professional associations, and outreach to individual users as well as other institutions involved in forestry-related education.

The project runs from 2022 and 2025, and aims to contribute to education in forestry in Europe and elsewhere, and to wise and sustainable management and use of forests as nature-based solutions for resource supply in the bioeconomy and for climate mitigation.

Forestry Capacity Building in Climate Change

T5.18 Initiatives and Equity for Forest Education in a New Era

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Abstract: With the Paris Agreement on Climate Change becoming effective in 2016 with the membership of 195 nations, the global society firmly entered the epoch of climate change. Nations initiated the setting of voluntary greenhouse gas reduction targets, subsequently necessitating the development of reduction strategies tailored to each sector. Globally, major greenhouse gas emitters encompass electricity and heat production, agriculture, forestry, land use, construction, transportation, industry, and various other energy sectors. Currently, the forestry sector contributes to 14% of the total carbon emissions, a relatively modest percentage compared to other sectors. However, it is also among those sectors with the most significant potential for reduction, anticipated to decrease present emissions by 75% by 2030. Indeed, the forestry sector stands as the solitary mitigation agreement achieved during the Paris Agreement, and it remains the only greenhouse gas sink acknowledged by the United Nations. In a carbon-neutral scenario projected for 2050, the forestry sector is expected to generate approximately two million new jobs. Although modest when compared to other sectors, this figure underscores the importance of human resource development, particularly given the anticipated impact of the forestry sector on climate change. Therefore, as each country develops climate change and carbon-neutral scenarios, addressing the issue of human resource development for the forestry sector becomes crucial. Grounded on this premise, this paper intends to articulate how future talent development in the forestry sector can be approached, employing AFoCO's roadmap as a guiding framework.

Forestry Education in the AI Era: Challenges, Opportunities, and the Transformative Impact of AI on Teaching and Learning

T5.18 Initiatives and Equity for Forest Education in a New Era

Guangyu Wang¹

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Abstract: In the rapidly evolving era of Artificial Intelligence (AI), forestry education faces both challenges and opportunities. This talk will explore the implications of AI and online teaching methods on forestry education, highlighting the potential for transformative learning experiences and the need to address associated challenges. The presentation will discuss the role of AI in forestry education and its impact on traditional teaching approaches- how AI technologies, such as machine learning algorithms and data analytics, can enhance forest-related research, management, and decision-making processes; how AI can assist in bridging gaps in access to education, facilitating remote learning, and fostering collaboration among students and professionals; and how AI-based tools can enhance forest monitoring, conservation planning, and sustainable management practices. Additionally, the talk emphasizes the importance of adapting forestry education to leverage the benefits of AI while mitigating potential risks. It calls for a balanced approach that combines technical skills, critical thinking, and ethical considerations in preparing future forestry professionals for the challenges and opportunities in the AI era.

High-Quality Education Equity in China Forestry Higher Education: A Practical Research from the Perspective of Sino-Foreign Cooperation in a New Era

T5.18 Initiatives and Equity for Forest Education in a New Era

JIN WANG¹

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Abstract: Teaching quality is the key to talent cultivation in universities. The past decade has witnessed the trend of the China higher education from popularization to universalization, thereby the focus of forestry higher education in China has been transitioning from education equality to education quality. Based on collaborative cultivation of international innovative talents and international collaborative innovation in scientific research, Chinese forestry-related universities are striving to promote the adjustment of the connotation, form, and global layout of Sino-foreign cooperative education. And by establishing a Sino-foreign cooperative education platform, efforts have been made to introduce international advanced discipline construction experience and achievements, strengthen the construction of basic disciplines, emerging disciplines and interdisciplinary disciplines, ensuring the continuous improvement of the quality of world-class forestry higher education in line with China's national conditions and benchmarks. Via the integration, coordination, and exploration of not only local consciousness and cultural feelings, but also global perspective and modern concepts, a set of high-quality teaching quality assurance system, which is generally recognized by students and their parents, has been established for the entire process of student development, in response to new challenges of imbalanced and insufficient forestry higher education, helping to promote the comprehensive green transformation of economic and social development in a new era.

Innovative Sustainable Forest Management Education in the Asia-Pacific Region

T5.18 Initiatives and Equity for Forest Education in a New Era

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Abstract: The concept of Sustainable Forest Management (SFM) has emerged globally as an essential element for the sustainability and conservation of the world's forests. Regional gaps exist in how to continually and equitably update forestry professionals and practitioners around the world with new knowledge of SFM and new technologies to manage natural resources and implement effective policies. Providing global access to open and credential high-quality education resources and opportunities becomes extremely important to narrow the regional gaps and improve SFM practices.

To address the challenges, a joint educational online program entitled Innovative Sustainable Forest Management Education in the Asia-Pacific Region was initiated in 2014. Content experts from regional forestry universities in the Asia Pacific Forestry Education Coordination Mechanism (AP-FECM) network were invited to develop coursework and formed an international collaborative development team with broad knowledge of SFM. A total of 14 online graduate certificate courses were developed with their fundamental content as Open Educational Resources (OER).

As the only SFM online program of its kind, since 2016, the joint educational program provides world-class forestry education resources created and supported by leading professors and experts from internationally recognized universities around the world. Its OER courses reached out to over 15,000 learners from over 90 international economies and its instructor-led repurposed OER Courses by AP-FECM had over 3800 learners from over 135 universities, based on our records before and during Covid-19 Pandemic until 2020.

As a key unit to operate and manage the project, the Executive Office (EO) of the AP-FECM is responsible for continuously encouraging global utilization of the curriculum and increasing international recognition of the project. Phase III of the project will be on agenda in 2023 to have another handful of courses developed. More relevant content experts are sincerely invited here to join the great effort toward promoting Sustainable Forest Management and increasing equity in forest education around the world.

INTERNATIONAL COLLABORATIONS TO COPE CHALLENGES OF FORESTRY EDUCATION IN NEW ERA: A SUCCESS STORY

T5.18 Initiatives and Equity for Forest Education in a New Era

Mohammed Al Amin¹

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Abstract: This study examines international collaborations on forestry education of Bangladesh and focused the contributions on gender equity and strengthening the capacity of students to cope the challenges of forestry sector from local to global scale. Forestry education of Bangladesh had a serious setback on gender equity before 1985. As no female student was admitted in Institute of Forestry and Environmental Sciences, University of Chittagong (IFESCU), the pioneer national institution on forestry education. A paradigm shift of forestry education took place in 1985 when FAO and UNDP lead initiatives came enforce as a collaboration project at IFESCU. The collaboration opens the door for female students successfully and introduced a new curriculum to meet the demand of pro-people forestry as earlier forestry education of Bangladesh built on British colonial regimented, white-collar mechanism. On the other hand, another serious impediment faced by the forestry education at IFESCU during COVID19 pandemic, when all the (in person) class room activities were stopped for 565 days and lead the academicians to think alternate ways like using online platforms particularly accustomed to flipped classroom (good example(s) google classroom, zoom platform). Again, IFESCU embraces collaboration initiative with Asia Pacific Forestry Education Coordination Mechanism (APFECM) and participated APFCEM designed and University of British Columbia delivered online courses particularly on sustainable forest management, geospatial sciences and helped to redesign new curriculum introducing new arena of knowledge on global change, biodiversity conservation, forest-people conflict management, landscape level restoration, geo-spatial technological interventions, invasive species management, carbon management and trading, panel wood and wood processing to meet the global to local demand. More than 2000 graduates with 367 females were passed from IFESCU, employed and successfully served at home and abroad. This study discussed all prospects and constraints of collaborations. And concludes that international coordinated collaboration mechanisms may pave the way of success for developing nations to get global standard of graduate to meet the future demand in new era, The collaborations act as knowledge bridge between developed and developing world with generic nature, may be implemented another part of the world.

Opportunity and Obstacle: Women in Forestry Education at Kasetsart University, Thailand

T5.18 Initiatives and Equity for Forest Education in a New Era

Rachanee Pothitan¹

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Abstract: Gender plays a crucial role in forestry education and policy-making, impacting sustainable management of natural forest resources. Ensuring fair accessibility for all, considering lessons from the Covid-19 pandemic and the need for climate change mitigation, requires a comprehensive reconsideration of opportunities and obstacles for women in forestry education.

Traditionally, forest work has been seen as physically demanding and reserved for men. However, recognition of women's rights and sustainable forest management has led to a paradigm shift in Asia-Pacific, exemplified by women in forestry education at the Faculty of Forestry, Kasetsart University in Thailand.

KUFF's history of women in forestry education can be divided into three periods. The first (B.E. 1936-1976) admitted only male students recruited by the Royal Forest Department. The second period (B.E. 1977-1996) marked progress with women comprising about 15% of forestry students, though more improvement was needed. The third period (B.E. 1997-present) emphasizes fairness, driven by human rights and gender equality. Forestry education now welcomes all based on learning ability. Female students currently constitute 60% of admissions, projected to increase. Challenges include teacher preparation and curriculum development to accommodate this shift, particularly in field practical courses. While public organizations provide equal employment rates, forest-based organizations still favor male candidates.

To address the gender imbalance and adapt to impacts of climate change on forest resources and environment, lifelong learning (SDGs), and the challenges posed by Covid-19, capacity building becomes crucial in forestry education. It is essential to enhance teaching skills, develop relevant curriculum, and integrate digital technologies to expand educational outreach. Promoting student mobility and leveraging shared resources are also important aspects. The Asia-Pacific Forestry Education Coordination Mechanism (AP-FECM) plays a vital role in facilitating networking and cooperation for sustainable forest management in education. By implementing these measures, we can foster a more inclusive and resilient forestry education system.

Proposing innovative competence-based training experiences to enhance forest management through a blended approach.

T5.18 Initiatives and Equity for Forest Education in a New Era

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Abstract: Biodiversity loss is one of the most pressing environmental challenges that humanity is facing. Within the European context, the Bird and Habitats Directives are pivotal to preserve and restore biodiversity by creating a network of protected areas across the EU territory, called Natura 2000. These Directives have been recently strengthened through the EU Biodiversity Strategy to 2030 which commits to restore forest ecosystems and protect old-growth forests. Nevertheless, their implementation state is considered insufficient due to the lack of skills to plan, manage, and restore Natura 2000 sites. Increasing the capacities of protected area managers through training is seen as a crucial aspect to achieve effective biodiversity governance. LIFE ENABLE (LIFE20 PRE/DE/00009) project aims to build practical skills among Natura 2000 and Protected Areas managers to address current and future challenges in nature management by creating a European competence-based training system called “European Nature Academy”. Through the analysis of previous learning activities, the identification of knowledge and skill gaps, and the acknowledgement of the most successful training approaches, LIFE ENABLE aims to create new training opportunities to empower managers to address their needs. One of the courses developed within LIFE ENABLE is the “Forest Course” which aims to increase the capacities of managers working in forest habitats. The course is focused on forest ecosystems, including forest species and habitats and their ecology, and considering the planning and management of Natura 2000 sites. The initiative aims to develop, deliver, and test innovative training approaches, which combine blended learning with field experiences. Learners can improve their knowledge on jurisdictional, managerial, and ecological aspects characterizing forest-protected areas and apply newly acquired knowledge practically in the field. Additionally, the course allows learners to meet other managers working across the EU territory, exchange ideas or experiences, establishing a new expert and peer-to-peer network from which future collaborations opportunities might emerge across Europe.

The course is designed to meet the needs underlined by managers, such as ensuring learner-provider interactions, proposing replicable and scalable solutions, fostering a proactive role by local actors, sustaining collaborations across Europe, and ultimately supporting an effective implementation of biodiversity-oriented policies.