



**Bonn Experts Workshop on
“Forest sector employment, green jobs and forest education”
held 18.-19.11.2019**

What is the future of forest-related employment and education in different countries around the globe? What are green jobs? Are there changes in forest sector employment? What are the major drivers of these changes – and how does tertiary education respond to them? These questions were discussed at the Bonn expert’s workshop that took place from the 18th to 19th November 2019 at the European Forest Institute (EFI) Bonn Office.

The workshop was organized within the joint EFI-IFSA-IUFRO (European Forest Institute - International Forestry Students’ Association - International Union of Forest Research Organizations) project “Global student Networking and Green Jobs in the forest sector”. The aim of the joint [EFI-ISFA-IUFRO project](#) is to gain insight in the forest sector labour market with a special focus on the students’ perspective. It employs a 4-step research approach:

Literature review → Expert workshop → Global student survey → Employer interviews.

Furthermore, the project aims to facilitate global networking amongst the young generation of future forest leaders and develop capacities of current forest students and young scientists in necessary skills (bridging science, education and policy making) via a traineeship and outreach/dissemination programme.

The Bonn experts’ workshop aimed to (i) elicit overall trends in forest sector employment, including green jobs, in different focus countries and regions of the world, and (ii) gain insights into forest education and possible responses to employment trends. To achieve that, the workshop involved some renowned general experts on forest education and employment, as well as national experts on the issues from a selected set of seven countries. These included Brazil, China, Finland, Germany, Indonesia, South Africa and the United States of America. The selected countries are covering all continents, represent some of the key players in regard to forests, and provide for substantial sources of data on employment and education. The seven countries represent 42.7 % of the global forest cover; and six out of the seven countries were among the top producers of forest products globally in 2018. From each country, a senior expert was involved on employment issues, and a junior expert on education issues. The senior experts presented an overview of the current forest sector employment and green jobs in their respective countries, while the junior experts offered insights into the state of higher and technical forestry education.

General employment trends in the forest sector

Juliet Achieng (EFI) presented preliminary results of a literature review on trends in forest employment covering the period between 1998 to 2019. The results are summarized in a working paper that also includes outcomes from exploratory interviews with experts on forest-related labour and education. Some limitations encountered from the existing literature include: scarcity of systematic and recent

literature, most of the studies are focused on one country only, and a lack of information on regions beyond Europe and at a global scale. Several general macro drivers on employment were identified, including: globalization, demographic changes, digitalization and technological advancement and aspects of the informal economy. These drivers lead to a number of changes in employment that can be observed, like expanding scope and diversity of the roles in forest sector jobs, decreasing numbers of forestry graduates and skilled workers, emergence of research and non-governmental organizations as employers and employment opportunities in the wider green economy, among others.

Based on inputs from Peter Poschen, Honorary Professor for Socio-Economic Sustainability at the University of Freiburg and invited as a “general expert”, the participants discussed general trends in the forest sector employment. They stated that the forest sector – and especially forestry – are relatively small employment sectors and show difficulty in measurement. As drivers for changes in forestry workforce, he identified globalization (restructuring of value chains), climate (how to guarantee resilient forests) and both demand for and supply of forest products. Considering the latter, Peter foresees that societal demands will increase because forests provide certain services, like “forest kindergarden”, which did not exist 30 years ago. He pointed out that the overall forestry workforce will probably decline but forest-based jobs in areas like education and health will gain in importance.

From the UNECE/FAO Team of Specialists on green jobs in the forest sector, Andreas Bernasconi (Pan Bern AG) elaborated on the definition of green jobs, green forest jobs and their relation to forest-based bioeconomy. He anticipated a rise in green forest jobs in the future, a wider variety of themes and topics and a shift from primary production towards diverse forest-based services. Andreas also shared some examples of working fields from Switzerland, including forest therapy, firefighting, adventure park foresters, and funeral forests.

Forest sector employment in selected countries

A main session was dedicated to reports on national employment trends by the senior experts, beginning with Fernando Esteban Montero (University of Eastern Finland) from Brazil. He gave a general overview of the forest sector in Brazil, stating that plantation forestry plays an important role, especially Eucalyptus Spp and other trees used for charcoal production. Furthermore, he informed the participants that over the past years, Programme for the Endorsement of Forest Certification (PEFC) and Forest Stewardship Council (FSC) certified areas have increased. In general, jobs in the forest sector have decreased, but the number of women engaged in the forest sector is rising. One factor that might have contributed to this development, is the gender agenda promoted by FSC, committing to implementing a system-wide gender equality strategy. Fernando concluded that overall employment conditions are improving as the certified areas grow and non-wood ecosystem services like ecotourism continue to gain more importance.

The next presentation was from South Africa by Francois Oberholzer (Forestry South Africa). He mentioned that charcoal, forestry and saw milling industries are shrinking while pulp and paper industry is expanding. The total number of employees in the forest sector in 2018 was 157,500, with 59,800 being directly employed. However, 70 % of the workforce is unskilled. In terms of certified forests, South Africa is the world leader with over 80 % of industry certified by FSC. Francois stated that the concept of green jobs in South Africa is not well known but emphasized on the need for this to change, as such jobs will become increasingly important in the future.

Efi Yuliati Yovi (Bogor Agricultural University, IPB) reported that in Indonesia timber is considered as one of the main forest products although the extraction from natural forests is decreasing. Non-Timber Forest Products (NTFPs) also play an important role in the country but have not been optimally managed for employment. Efi predicted that employment will increase in the forestry sector and absorb a large number of the working age people. However, intensive education and training needs to

be facilitated, especially for frontline workers. Finally, Efi emphasized that in the future, local communities will have a stronger involvement and more access to forest management.

Xiaoqian Chen (Beijing Forestry University, School of Economics and Management) was supposed to share insights on the state of forest sector employment in China. Unfortunately, she was unable to attend the workshop. However, her contribution will be included in the ongoing project work.

Based on Germany's employment status report, Edgar Kastenholz (Kuratorium für Waldarbeit und Forsttechnik e.V. (KWF)) highlighted that employment in the whole forest sector has been continuously declining and it is not yet clear if the trend will continue or slow down to a "bottom line". He noted that the apprenticeship programmes offer a potential for recruiting more workers into the sector. Moreover, the concept of "green jobs" has not yet been adopted in German politics, and initiatives on green jobs in the forest sector are not visible to the public. He pointed out education, recreation and health as sub-sectors with emerging job opportunities. New green jobs could offer employment opportunities especially for older workers with reduced or altered performance.

Finnish senior expert Marja Kallioniemi (Natural Resource Institute Finland, LUKE) reported that forests cover 75 % of the total area of Finland and the volume of growing stock in forests is 2,473 million m³. The forest sector also plays an important role for the Finnish bioeconomy. During the time period from 2008 to 2018, employment in the forest industry sector decreased by 29 % (17,000 workers) as a significant number of paper mills closed. Employment in forestry as well declined in the 1980s and 1990s but stabilized in recent years, with employment in timber harvesting surprisingly increasing. By 2018, forest industry employed 42,000 people accounting for 66 % of all the workers in the forest sector.

Research Professor Terry Sharik from Michigan Technological University, United States of America (USA), gave the final report on employment. He pointed out that Oregon, Washington, Wisconsin, California and Minnesota are the states with the highest employment numbers in forestry. In the USA, foresters make up only 0.7 % of jobs in forest sector, and professionals with tertiary level of education are relatively small proportion of the work force compared to technicians with less than a bachelor's degree. Foresters are far fewer than zoologists and wildlife biologists, conservation scientists, and environmental scientists and specialists (including health). He also introduced the green jobs initiative by the US Bureau of Labour Statistics (BLS). The initiative commenced in 2010 with the goal to gather information on trends on green jobs but was discontinued in 2013. Results from the initiative show that 10 % of the green jobs in private industry are in the forest sector. Employment projections for conservation scientists and foresters estimates is expected to rise modestly from 34,200 jobs in 2012 to 35,000 jobs in 2022.

Forest education and general employment needs

On the second workshop day, the focus shifted from forest employment to forest education.

Dianne Wästerlund (Swedish University of Agricultural Sciences, SLU) elaborated on how curriculum could be adapted to both students' expectations and markets' needs, emphasizing that the application numbers of students to forestry programmes in Sweden is decreasing. One reason is that Swedish forestry students are expected to have a specialization in sciences as high school background, thus limiting the pool of potential students. Another reason is the traditional approach to forestry studies, hesitating to integrate more social sciences aspects. According to her, this leads to a discrepancy between students wishes and expectations of the employment sector, implying that social competences play an increasing role – or, as she puts it: "Forest is about trees, whereas forestry is about people."

Siegfried Lewark (professor emeritus at Freiburg University) reported from his long-standing experience on the relationship between forest education and employment. He highlighted the importance of skills, such as (multilingual) communication, teamwork, networking, problem solving, creative, analytical and client-oriented thinking, for increased employability. According to him, another important aspect is digitalization and the question how universities could use E-Learning in a sustainable manner. Furthermore, he touched upon questions regarding Gender and Diversity and the role these questions play for curricula, forest education and forestry in practice.

Forest education developments in selected countries

Another major session was dedicated to reports from the junior experts on forest education in their respective countries, starting with a presentation by Camila Maciel Viana (Erasmus Mundus MSc student at University of Natural Resources and Life Sciences (BOKU)) from Brazil.

In Brazil, enrolment of students in forest engineering has increased from 1995 to 2017. In general, a bachelor's degree programme takes 5 years. Besides that, it is also worth mentioning that students are encouraged to focus on extracurricular activities. According to Camila, in her university this means students have one day off per week to work in a company to gain practical experience. In Brazil, there are annually around 1,000 graduates from forest-related studies especially at Bachelor level.

Angel Aphelele Goldsmith (MSc. Student Stellenbosch University) presented that in South Africa there are five universities offering forest related study programmes. Statistics show that for the last 15 years not only the number of Bachelor students has risen significantly, but also applications for Master and PhDs programs. Nelson Mandela University provided statistics demonstrating that over the last three years, there was a growth in female students (both white and black). Nelson Mandela University also offers a new wildfire management Master programme, where gender equality has (almost) been achieved.

For Indonesia, Pipiet Larasatie, currently a PhD candidate at Oregon State University, USA, reported on behalf of the Indonesia. She started with highlighting that there are 68 Universities offering forestry studies in Indonesia, mostly located on the major islands. However, according to her, there are mainly – or only – two universities IPB: Bogor Agricultural University and UGM: Gadjah Mada University that are highly acknowledged for nature related studies. These two universities also offer vocational school programmes.

Jiacheng Zhao, PhD candidate from Göttingen University as well as from Renmin University of China, presented the state of forestry education in his China. Following his overview, there were 228 universities and 248 colleges with degree-granting programs in forestry-related majors in 2017. With 19% of forestry undergraduates and 72% of postgraduates mainly concentrated on six forestry universities and one forestry research institute. All the later 7 institutions are located in major forest areas in China, except for Beijing Forestry University and the Chinese Academy of Forestry which are in the capital. In the school year 2017–2018, there were 4,404 postgraduate students in forestry, 33,998 undergraduate students in universities, and 16,697 undergraduate students in colleges. Although the number of forestry students is rather steady, the proportion of them in all students is declining in forestry universities while the number of students not majoring in forestry-related programs has continued to increase. Numbers in forestry vocational and technical education are declining due to conversion into colleges. Notably only 37 % of the 2018 undergraduate graduates from Beijing Forestry University chose to work in forestry and agriculture.

Jannis Schwärzli (BSc. Graduate from University of Applied Forest Sciences, Rottenburg a. N.) focused on the state of forest education in Germany. Germany has a total 30 Universities offering forest-related programs and nine have a distinct focus on forestry. A Bachelor's programme takes 3–4 years while a master programme takes 1–2 years, depending on the institution. According to Jannis, there is an apprenticeship type technical forest education in Germany called "Forstwirt*in" which generally takes three years and can be complimented with three different types of further training.

Alina Lehikonen (BSc. student at Forest Sciences, University of Helsinki) reported on Finland's broad offer on forest sciences and forest engineering study programmes. In Finnish universities, it is common to study both Bachelor's and Master's degrees subsequently. Interestingly, when applying to a university for a Bachelor's programme, the applicant is automatically granted the right to pursue both degrees. While forest engineers can get employment with a Bachelor's degree, forest science students tend to require a master's degree. In addition to universities, there are many vocational and other technical education programmes, where education mainly takes three years.

On behalf of Tara Bal (Research assistant at Michigan Technological University) Terry Sharik presented on forest education in the United States of America. In the US, there are 1,270 natural resources-related institutions, 80 of which are organized under the National Association of Universities Forest Resources Programmes (NAUFRP). From 2013–2018, a steady number of ca. 1,000 bachelor's degrees in forestry was awarded. In the same timeframe, the number master's degrees awarded decreased by 10 % to about 320. An even higher decline of 28 % can be observed for the doctorate degrees. According to Terry various diversity issues need to be addressed, for instance there is a lack of gender and racial/ethnic diversity in the American student body and in the natural resources professions. On top of that, among the ten agriculture and natural resource sub-disciplines, forestry has the lowest percent of females in the workforce (only 17 %).

Further discussion of the global survey

The next step in the projects research approach is a global survey among students. Lisa Prior (EFI) gave a short introduction to the survey ideas, followed by a discussion round. One of the key questions discussed was the survey population. The initial starting point will be IFSA's network of forestry students. However, the project team emphasized that as the survey progresses, addressees could be broadened. The experts in the room mentioned several discussion points to be thought through for the study: what qualitative and quantitative aspects are included in the study? How does the survey approach the differences in educational backgrounds between countries? When considering this, how can data be compared? Another concern was the lack of local IFSA groups in some countries and the potential biases for the global study. Furthermore, participants agreed that the language gap could pose a real challenge on the survey. Finally, it was discussed what could be offered to attract people to complete the questionnaire for the survey.

Good basis for future steps

With the help of the different experts from each country, important facts and further details were brought together, way beyond what could be reported here. These valuable contributions by the experts will help the project team to identify existing gaps and further potentials of their work and to further refine their methodological steps.

In conclusion, in light of regionally diverse trends in forest-related employment, forest-related education, including forestry, is confronted with the challenge to modernize itself. Forest education might need to open up for attracting more public interest by the young generation and change the perception of "old days". This is an important matter as forests play a significant role in pressing

contemporary problems of whole societies, which also needs to be reflected in forest-based employment.



Figure 1: A photo with the workshop participants

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