Interreg Danube Region

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Fem2forests

D 2.2.1 Transnational Innovation Roadmap

This document is issued by the consortium formed for the implementation of the Fem2forests project by the following partners:

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- Foundation for Improvement of Employment Possibilities PRIZMA (PRIZMA), Slovenia
- University of Ljubljana, Biotechnical Faculty (UL(BF)), Slovenia
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- Forest Trainings Center PICHL (FAST Pichl), Austria
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Disclaimer

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1 Introduction

1.1 Background and Objectives

The forestry sector in the Danube region faces the challenge of ensuring sustainable personnel development and improving access for underrepresented groups, especially women. Despite positive developments, the proportion of women in forestry education pathways and careers remains low. At the same time, the shift towards sustainable, modern forestry opens new opportunities to attract more young women to this profession and retain them in the long term.

Against this background, the Fem2forests project pursues an innovative, transnational approach to strengthening gender equality in the forestry sector. The goal is to strengthen the capacities of education systems through innovative measures, promote interest in forestry education and career paths, and improve gender equality at all levels of the training and education system in the Danube region. To achieve this, recommendations are developed to increase gender awareness in educational and training institutions. Research shows that increased gender awareness is necessary to foster willingness and commitment to implement equality measures.

The transnational innovation roadmap serves as a strategic instrument to promote gender equality and increase the proportion of women in forestry education and career paths. The transnational roadmap builds on the findings of SO1, facilitates the connection to SO3, and enables co-creative development of activities and results with a variety of partners and at different levels. The roadmap incorporates insights and recommendations from a cross-country alumni study (O2.1), which analyzed the career paths of female graduates of forestry study and training programs. The results of this study directly feed into the development of the roadmap and provide concrete recommendations to remove gender-specific barriers to access to forestry professions and career opportunities, as well as to increase overall interest in forestry careers. The transnational innovation roadmap focuses on success factors and best practice examples that schools, universities, and training centers can use to attract more women to the forestry sector and to inspire more girls and young women to pursue a career in forestry. The roadmap integrates knowledge and innovative solutions from key project results (including D1.3.1 and D2.1.1).

Project partners are encouraged to use the roadmap as a methodological and substantive basis for planning and implementing pilot actions within their National Action Plans (NAPs). The national action plans serve as instruments to plan concrete measures that increase the interest of girls and young women and improve their representation at different levels of the forestry education and training system. Selected pilot actions will be implemented at national or subnational levels. A common evaluation methodology ensures that insights and learning experiences can be collected and transferred consistently.

1.2 Relevance and need for innovation

The necessity to attract more young women to a career in forestry and to secure equal access is a central area of action for a sustainable forestry sector in the Danube region and beyond. As the transnational alumni study of female graduates (O2.1) clearly shows, the proportion of female professionals in forestry education pathways and careers remains low despite positive developments. In many countries, traditional role models, structural disadvantages, and stereotypical ideas about the "male" profession of forestry influence perceptions and actual career paths for women.

The results of the preliminary study (Fem4Forest) and the current needs and barriers analysis (D1.1.1) emphasize that the fundamental motivation or qualification of young women is not lacking. Rather, as country-specific analyses also show, they face various obstacles: lack of visibility of female role models, insufficient information about career paths, stereotypical ideas of physically demanding "men's work," lack of practical training, low flexibility of work models, and insufficient institutional support for balancing work and family.

In order to address this problem and improve the situation for women in the forestry sector, it is necessary to resort to innovative concepts and approaches. To this end, the definition of innovation developed by Fem4forests is used:

An **innovation concept,** therefore, means: New to the forest sector, new to the place, new for the country; A best practice, an institution, collective actions, governance arrangements, special financing/educational/ informational/organizational means; a transfer of knowledge from other sectors to forestry sector; creation of forest female professional organization/ representation/ department.

Innovation needs are particularly evident in the following areas:

- **Structural Change and Visibility:** Forestry must present itself as a modern, sustainable, and diverse sector that welcomes women at all levels. This includes consciously showcasing female success stories and integrating role models into educational landscapes and public relations.
- **Innovative Communication and Support Formats:** Digital tools, social media campaigns, storytelling formats, and peer-to-peer networks open new ways to target, connect, and retain young women long-term. Examples from good practice analysis show that — especially innovative, participatory, and cross-media approaches are particularly effective.
- **Dispel the prejudice that forestry is mainly a physical demanding field of work:** Forestry has through the occupational field a wide breadth (e.g. research, inventory, wildlife management, etc.) and the technological advances (timber harvesting machines, drones, etc.) significantly facilitate demanding work. The changed perspective on the forestry profession is intended to make it more attractive to women and encourage them to work in the field.
- **Early and Continuous Career Orientation:** As the good practice analysis (O1.2) demonstrates, low-threshold, continuous measures — from kindergarten through school to university — could have a positive impact for attracting more girls and young women to forestry. Innovative formats such as mentoring programs, Girls' Days, summer camps, digital information platforms, and practical workshops can break stereotypes and create real decision-making space for girls.

- **Practical Training and Mentoring:** From the perspective of surveyed graduates and students, expanding practical experience, targeted mentoring programs, and networks are identified by students and alumni as the most important levers to reduce uncertainties, build confidence, and facilitate the transition into the workforce. There is a transnational need for catch-up, especially at the interface between training and the labor market.
- **Flexibility and Compatibility:** The results of the preliminary studies recommend flexible work models, part-time options, family-friendly structures, and transparent career paths make a decisive difference — not only in attracting women but also in their long-term retention in the forestry sector. Innovative employer strategies addressing these aspects are rare so far and mostly limited to individual pilot projects.
- **Systematic Promotion of Gender Awareness:** As has become apparent during the project so far: without conscious awareness and structural embedding of gender perspectives in educational institutions and companies, equality remains partial. Gender awareness training, gender-sensitive teaching materials, targeted support measures, and the consistent involvement of girls and women in decision-making processes are indispensable drivers of and gender equality.

The varying degrees of deficiency become apparent when looking at the national framework conditions. The circumstances described in the report on career orientation practices view gender equality as an underdeveloped dimension in forestry and call for innovative approaches as a solution.

This cross-country analysis underscores both the **diversity and convergence of career orientation** systems in the Danube Region. While countries such as Austria, Germany, and the Czech Republic exemplify mature, structured approaches — with well-resourced counselling services, national qualifications frameworks, and stakeholder coordination — others like Bosnia and Herzegovina and Ukraine are still grappling with institutional fragmentation, regional disparities, and capacity gaps.

One of the recurring **strengths across several systems** is the integration of career orientation within national employment and lifelong learning strategies. For instance, Romania's Law 198/2023 mandates individualized counselling and structured school-based guidance, while Serbia's Rulebook on Career Guidance Standards emphasizes measurable outcomes and practitioner competencies. Croatia's system features strong partnerships between schools and employment services, reinforced by the *National Curriculum Framework* and strategies for lifelong career development.

Yet, **key challenges persist**: the lack of systemic gender mainstreaming in forestry-related career guidance; insufficient monitoring and evaluation tools; underinvestment in school counselling staff; and the limited involvement of private-sector or local actors in some contexts. Ukraine's resilience in adapting career services during wartime—through IT studios, online Digigram certifications, and hybrid guidance models—offers valuable insights into the role of digital innovation in ensuring continuity.

Critically, **gender equality remains an underdeveloped dimension** in most systems. While Austria's *Girls'_Day* and Germany's *Klischeefrei* initiative offer transferable models, other countries lack targeted actions to address gender stereotypes or support women's leadership in sectors like forestry. Bosnia and Herzegovina, for example, has ratified key gender equality conventions, but its forestry education laws do not yet integrate youth support measures like internships or mentorships.

The roadmap addresses this need for innovation with a transnational, participatory approach that systematically combines scientific evidence, best practices, and the experiences of target groups. It offers a catalog of recommendations and measures that can be adapted not only at the national level but also jointly developed and advanced by educational institutions, employers, and policymakers.

In this way, the roadmap contributes to sustainably strengthening the innovative capacity and future viability of forestry in the Danube region — through greater diversity, gender equality, and targeted inclusion of young women at all levels of education, training, and professional practice.

1.3 Structure of the Roadmap

The roadmap is divided into the following key chapters:

- Introduction and Objectives
- Methodology and Empirical Basis (including data foundation, study design, evaluation)
- Cross-country Analysis of the Initial Situation and Challenges
- Re-evaluation of innovation areas identified in Fem4forest project
- Empirical ideas and recommendations out of Fem2forests
- Success factors and Good Practice Examples for training and education institutions
- Recommendation of innovative measures to increase interest in forestry jobs
- Synthesis

The following section describes the methodological foundations and the empirical basis on which all further analyses and recommendations are built.

2 Methodology and Empirical Basis

2.1 Research Design and Data Sources

The development of the transnational innovation roadmap is based on a mixed-methods approach that integrates quantitative and qualitative data from multiple survey and evaluation steps. The following key data sources were used:

- Results of Fem4Forest, especially the transnational innovation roadmap.
- Barriers and needs for inclusion of girls and young women (D1.1.1): Participatory needs and barriers analysis using questionnaires and roundtables with female students, university students, teachers, and employers.
- Report on career orientation practices (D1.2.1).: The study examines national career orientation systems and explores shared challenges, emerging good practices, and transferable elements across different national contexts, with the aim of enhancing the effectiveness and inclusiveness of career orientation systems—particularly through a gender-sensitive lens.
- Promoting forestry careers to girls and young women (D1.3.1): Provides innovative solutions for promoting forestry careers to girls and young women.
- Compilation of Good Practice Examples (O1.2): The described good practices are centered around career orientation, demonstrating how it can serve as a powerful tool to broaden the career choice spectrum, and support the development of career paths for girls and young women in forestry.
- Capacity building for gender awareness and competencies in forestry education (D2.1.1): The report pulls knowledge and experience together to develop innovative concepts and feasible strategies.
- Transnational alumni study (O2.1): Online survey of 633 female graduates of forestry education pathways from nine countries in the Danube region, as well as 90 qualitative interviews with forestry professionals (2025).

The transnational innovation roadmap is drafted and discussed with project partners at early stage to ensure its adoption to National Action Plans. This comprehensive data basis and participatory approach ensures high empirical validity and enables a differentiated, country specific as well as transnational analysis.

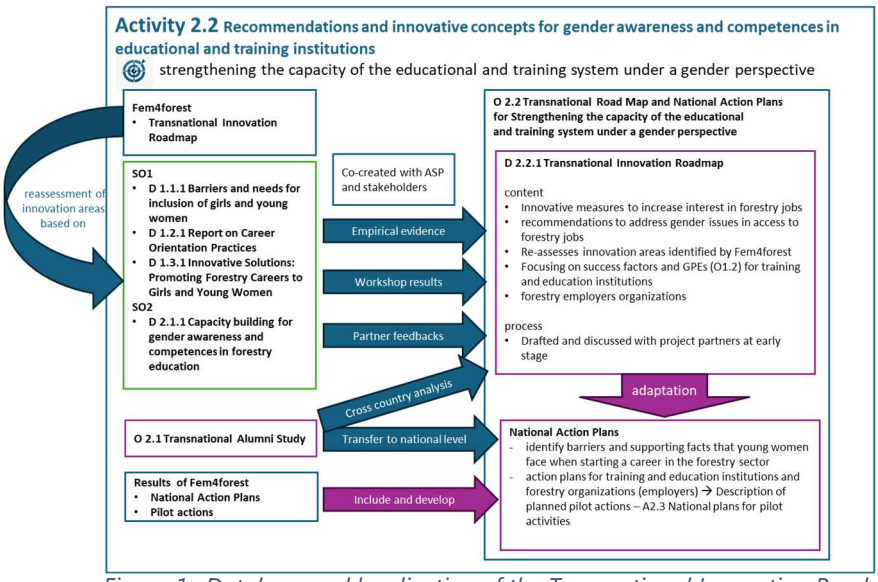

Figure 1 : Database and localization of the Transnational Innovation Roadmap (source: own elaboration)

2.2 State of research

In order to design the transnational innovation roadmap and develop innovative ways to increase equality in the forestry sector, it is necessary to examine the current state of research and build on this knowledge. For this reason, we consider the elaboration and assessment which was already used for the D.2.1.1.

The topic of mainstreaming gender awareness into forestry education is fairly new to science and the existing research is primarily focused on Scandinavia and North America. Recent publications suggest ways how to promote gender equality and increase gender awareness in forestry education. The main recommendations of these publications include ideas for trainings and courses, mentoring, networks, awareness-raising initiatives and role models (Table 1).

Measure	**Description**	**Source**
Trainings and courses	Increase the gender equality competence among leadership and teachers through trainings	Andersson and Lidestav 2015
	Gender equality trainings for people in leadership levels of educational institutions	Grubbström 2020
	Bystander training for employees and students to change behavior of people witnessing an event to intervene in a positive way	
	Counteract structural discrimination through establishing courses on gender awareness within the forestry sector	Öllerer et al. 2022
Mentoring	Central component of supporting and promoting women in leadership positions in the (forestry) timber industry, particularly in terms of networking, sharing experiences and targeted career advancement by experienced individuals.	Larasatie et al 2019
Networks	Networking as a career strategy and as a channel for accessing information, mentoring and job opportunities.	Öllerer et al. 2022, Larasatie et al 2019
Awareness-raising	Creation of information material on gender awareness for companies where students have study visits	Wickman et al. 2013

	Increase existing knowledge on gender awareness	Öllerer et al. 2022
Role models	Introduce and highlight role models for FINTA*[1] students	Öllerer et al. 2022

Table 1: Ways to increase gender awareness in forestry education – Key findings from recent publications (source: table 12 of D.2.1.1) (with own additions)

In the Danube Region, publications and data about gender awareness in forestry education is scarce. Therefore, it is essential to draw up a transnational innovation roadmap based on the research results of Fem4Forest and the findings obtained so far from work packages SO1 and SO2.

3 Alumni Study Fem2forests: Cross-country Analysis of the Initial Situation and Challenges

In order to understand and justify the situation and the need for innovation empirically throughout the Danube Region, it's necessary to first take a look at the forestry graduates who participated in the quantitative part of the transnational alumni study, which was conducted between December 2024 and March 2025. Detailed analysis on transnational level can be assessed in O2.1. Here, a short cross-country analysis of the initial situation regarding barriers and solutions for women in forestry education is carried out.

[1] FINTA is the abbreviation of Female, Inter-sex, Non-binary, Trans and A-gender.

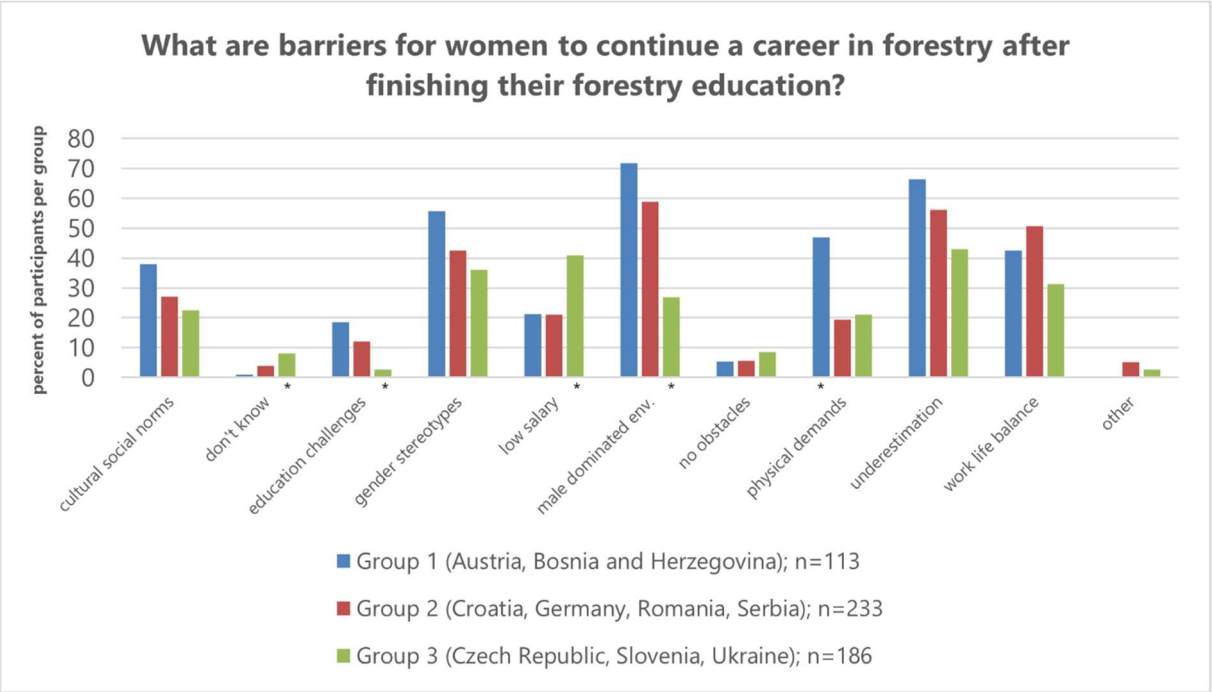

Figure 2: What are barriers for women to continue a career in forestry after finishing their forestry education? (source: own evaluation); (results significant by omnibus-test)

Participants in different countries highlight different barriers. For the analysis groups of countries with a similar pattern of answers are formed by using hierarchical clustering. To evaluate whether the pattern of answers are significantly different omnibus and post-hoc chi-square tests are conducted.

Figure 2 illustrates the perceived barriers for women to continue a career in forestry after completing their education, broken down by regional groups. Across all groups "underestimation" and "gender stereotypes" are among the most frequently cited barriers, while "male dominated environment" seems less important in Group 3 (Czech Republic, Slovenia, Ukraine). Significant differences between groups are marked for "education challenges", "low salary" and "physical demands". This indicates that while some barriers are universal, their intensity and relevance vary by region, with structural and cultural factors playing a key role.

In addition to the quantitative questionnaire, the work package with the transnational alumni study also includes a qualitative survey. The resulting key findings on possible measures for progress are taken up from the elaboration made in D.2.1.1:

The results of the interviews with 90 forestry professionals back the findings of the survey. Interviewees were asked to name their ideas on how to include gender awareness in forestry education. These responses, along with the recommendations from project partners of the Fem2forests research group, were clustered in categories. The findings of this qualitative analysis underscore the recommendations from previous research but also complement them with additional new ideas based on the analysis of existing literature and the results of the Fem2forests research. In table 2 new ideas which are complementing the findings from previous research are in blue and the most important concepts for mainstreaming gender awareness into forestry education are in green. The first six concepts in table 2 were identified as the most important for strengthening gender awareness in forestry education.

MEASURES	AT	BA	CZ	DE	HR	SI	RO	RS	UA
Mentoring programs									
Role models									
Trainings									
Awareness raising									
Gender equality courses (in curricula)									
Networks									
Early education initiatives									
Gender sensitive communication									
Institutional measures									
Interactive Formats									
Funding opportunities									
Support systems									
Collaborations									

Monitoring systems									
Scientific Data									

Table 2: Recommendations for gender awareness
Recommendations have been collected from forestry professionals during interviews for the transnational alumni study and Fem2forests project partners across the Danube Region (source: table 14 of D.2.1.1)

The new ideas identified in the Transnational Alumni survey and the recommendations for the educational systems of the Danube Region include the following:

- Interactive formats: Discussion groups for mutual support and the exchange of experiences
- Funding opportunities: Scholarships and grants to support female forestry students
- Support systems of educational institutions: Equal opportunities officers should be integrated in training and educational facilities and visible for students
- Collaborations: Integrative approaches to foster collaboration between women and men
- Monitoring systems: Establishing the creation of mechanisms that track the effectiveness of promotional efforts and educational reforms in increasing female enrolment and retention. These could help as a starting point to monitor the impact of implemented initiatives and become a useful indicator for decision-makers to adjust the strategies as needed.
- Scientific Data: Promotion of studies on gender disparities in the forestry sector to develop evidence-based policies.

Figure 3 explores which additional study contents would have better prepared young professionals for a forestry career. "More field work" is consistently rated as most needed across all groups. Group 1 (Austria, Germany) highlights "mentorship" while Group 2 (Bosnia and Herzegovina, Croatia) places particular emphasis on "access to new technologies". The differences suggest that practical experience, networking, and mentorship are seen as crucial gaps in forestry education, but the specific needs vary by region.

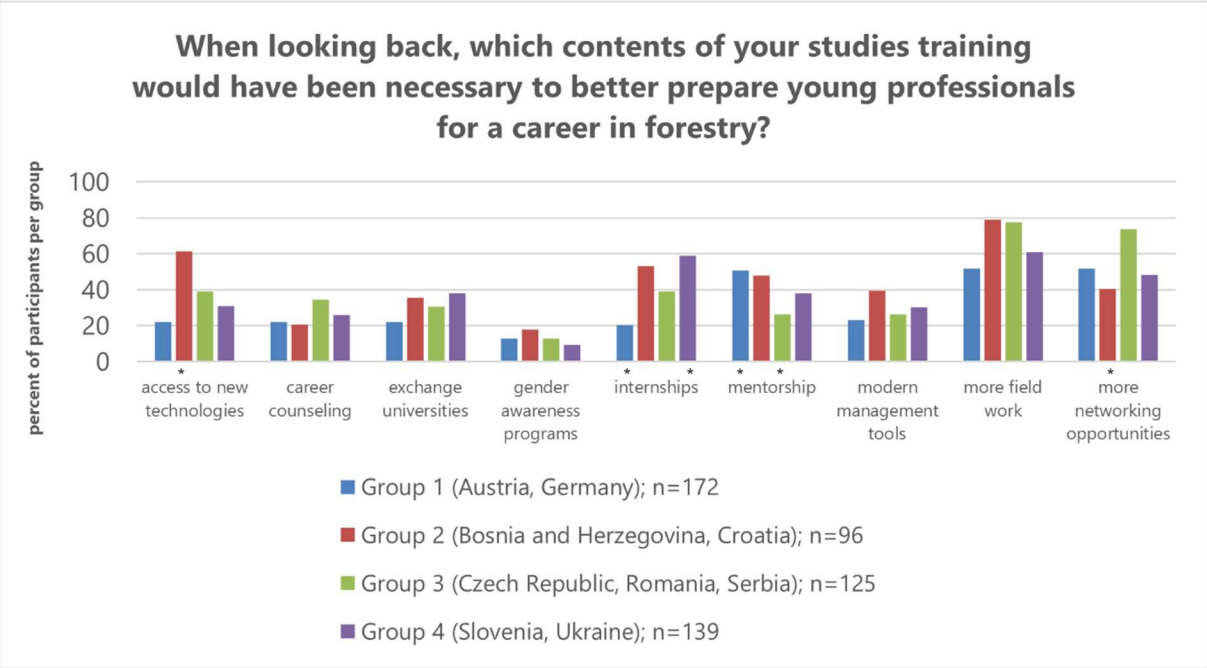

Figure 3: When looking back, which contents of your studies training would have been necessary to better prepare young professionals for a career in forestry?
(source: own evaluation); (results significant by omnibus-test)

Figure 4 highlights which skills and competences were considered important for finding a job. "Communication", "professional specialization", "teamwork," and "self confidence" are valued across all groups. Group 3 (Czech Republic, Germany, Ukraine) values "graduation grade" more highly while Group 4 (Romania) places particular emphasis on "technical knowledge". "Personal contacts" and "leadership skills" also show significant regional variation. The data indicate that while soft skills are universally important, the weight given to academic performance, leadership, and technical skills varies by country, reflecting different employer expectations and labor market conditions. We also can observe the impact of national differences in the forestry and the forestry labour market. While some countries have the structure of a rigid employment system in the public sector with a high proportion in the public sector, other countries are marked by private forestry.

The cross-country analysis of forestry graduates in the Danube Region reveals that women face persistent barriers to pursuing a career in forestry, including underestimation, gender stereotypes, and male-dominated environments. While these challenges are common across countries, their intensity and specific relevance differ by region due to cultural and structural factors. Additionally, graduates identify a lack of practical experience, mentorship, and networking opportunities as significant gaps in their education, which vary in importance depending on the country.

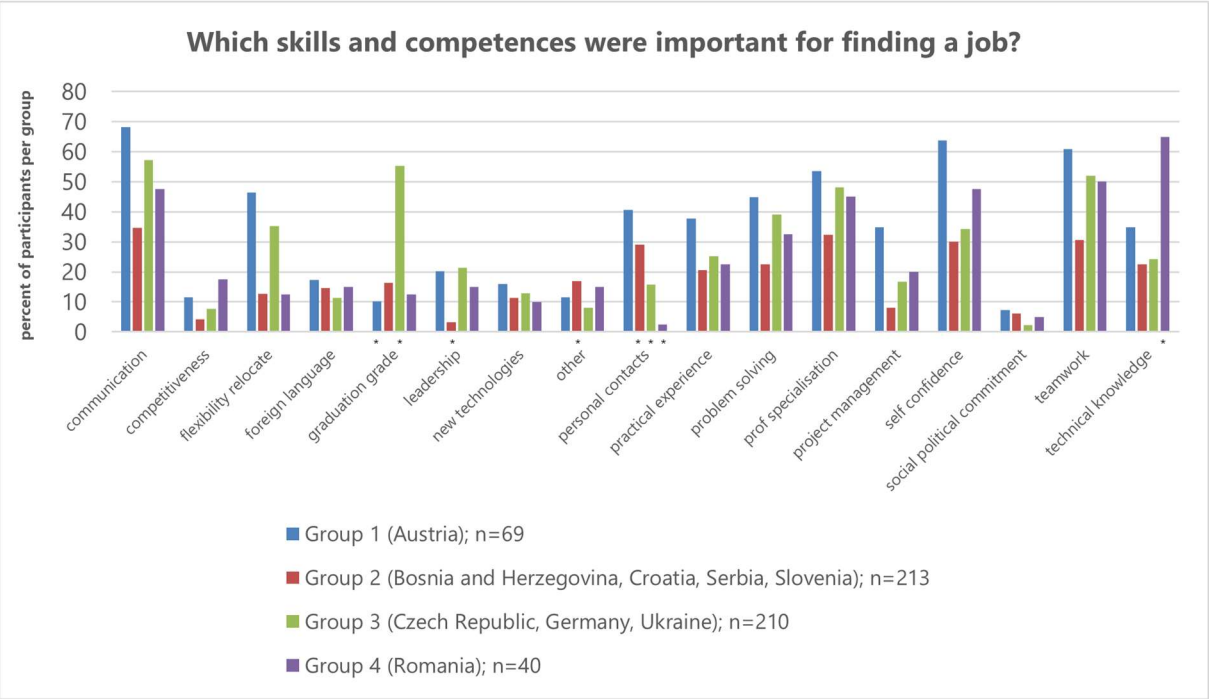

Figure 4: Which skills and competences were important for finding a job? (source: own evaluation); (results significant by omnibus-test)

Soft skills such as communication, teamwork, and self-confidence are universally recognized as important for job entry, but the emphasis on technical knowledge, academic performance, and leadership skills differs regionally, reflecting diverse employer expectations.

To make forestry education and the sector more inclusive and equitable, participants of the study recommended to integrate gender awareness into curricula through courses, awareness-raising activities, and gender-sensitive communication. Expanding mentoring programs and highlighting female role models can support young women entering the field. Increasing practical training, internships, and networking opportunities during studies will better prepare graduates for their careers. It is also important to establish visible support systems, such as equal opportunities officers, and to foster collaboration between women and men. Monitoring and evaluating the effectiveness of gender equality initiatives will help refine strategies over time. Finally, promoting research on gender disparities and providing scholarships or grants for female forestry students can further support diversity and equal opportunities in the sector.

4 Re-evaluation of innovation areas identified in the Fem4forest project

As the previous project Fem4Forest in some aspects formulated recommendations regarding the educational and professional field, it is important to draw on these findings and the expertise gained from this when creating the transnational innovation roadmap. For this reason, the Fem4Forest transnational innovation roadmap will first be presented and evaluated at this point. After that in chapter 6 will be done a synthesis of the Fem4Forest roadmap with the findings from the various work packages of Fem2forests.

The Fem4Forest roadmap to innovation has different paths:
- **Changes in Political** framework – implement, monitor, new approaches
- **Changing Society** and people´s **attitudes** – awareness raising, promotion, networking
- **Improving Education** – new approaches, mentoring, training
- **Facilitating the Personal development** and private support for family care
- **Enhancing Economic** and entrepreneurial gender-sound environment – needs organisational changes

Policy and legislative support is needed, from setting advancement measures specific to women, to monitor the implementation of existing legal mechanism in organisation or to include reference to gender issue in the forest-based programmatic documents. The action needed is to benefit from mechanisms and experiences from other sectors male dominated that are more advanced in implementing gender-related policies (according to the country, it can be IT sector, public administration, security, research). Policy and legislative paths are in the background of any other type of innovation. Thus, roadmaps to innovation should identify if something has to be changed to improve women´s conditions in the forest sector, and how this can be done.

Following innovation areas, in which women should be empowered, were identified by Fem4Forest:

1. Private life / family (regarding female farmers, forest owners and professionals) – needs societal change and innovative approaches from policy side/organisational side:

- *Men and women should be strengthened in their professional skills regardless of gender – that would be positive for both.*
- *It is important to secure each other by passing on information about family needs and prepare agreements in time (agreement with colleagues or with family*

members or with friends) so that everyone can continue operations in emergency situations related with children or family care.

- *State or private support with kindergarten, support for small kids, such tickets for nurseries, private kindergartens.*

2. Personal development: encourage women and show their skills, competences and power – multiple possibilities of innovation - organisational, new coaching/training opportunities, new educational techniques, networking and promotion of lessons learned from the role-models experiences;

- *Women need more encouragement to go for leading positions in the sector. Often, male dominated environment is not the only reason for women to stay in their comfort zone. Women themselves need awareness-raising and encouragement about their abilities.*
- *Show more positive examples of good careers for women.*

3. Education – needs changes in the educational system, with different approaches in education, but also with important changes in mentoring and training:

- *The gender issue should be carried out in schools and in training and education, adapted to the forest sector.*
- *Best practice examples and role models are important for female students and young women.*
- *Boys should also be made aware of the topic.*
- *We need a well organised set of educational activities, custom-made (different skills are needed for women at early and later stage of their career).*
- *change existing images/attitudes connected to women in forestry.*

4. Working world and environment – need organizational and institutional innovation from companies and authorities:

- *Offer institutionalized opportunities to point out injustices (equality bodies in companies started to be implemented in different countries) and create contact points for women.*
- *Increased communication of the importance and opportunities of equality between men and women in forestry.*
- *Set advancement measures specific to women.*
- *Wording and photographic material are essential to make women visible (e.g. in information materials).*
- *Women should be highlighted in events and media (for example in films on television) to show their competences and skills.*

- *The enrichment that arises from differences or different approaches between men and women should be investigated and emphasized – the results should be communicated transparently.*
- *Women should be explicitly invited to excursions and events.*
- *It should be ensured that role models serve both genders (e.g. on excursions also visit forest enterprises which are led by women).*
- *Forest organizations must be more active in hiring women in their companies.*
- *Organizations must take into account female professional success and personal qualities.*
- *Providing internships in companies for both boys and girls at the end of their education.*
- *The job market has become more diverse for foresters. Forestry administration and state forest company are challenged to seek for talents.*
- *Be aware that forestry employers offer good opportunities for work-life balance, but not for career-life balance.*
- *Respect colleagues and nurture teamwork.*
- *Have a collegial approach in relation to all colleagues – in many cases forestry is a small world and such a relationship should be nurtured.*

5. Entrepreneurship environment

- *Mapping and association of female forest owners and professionals.*
- *Providing education and support to female forest owners in the process of management of their forests.*
- *Strengthening entrepreneurship at the local level (knowledge, connection with buyers of the forest products, consulting services).*
- *Digitalization (creation of the platform to promote sustainable use of the forest products from small female forest owners, local small business).*
- *Finding funds to help female entrepreneurs in the forestry sector.*
- *Entrepreneurship programs that are only dedicated to women, especially in the sectors where the number of women is lower, such as forestry.*
- *Young graduates' women from rural areas need encouragement from experienced women, we put them in contact, to facilitate the knowledge transfer and social integration.*

5 Fem2forests: empirical ideas and recommendations

The research in SO1 and SO2 produced empirical ideas for the innovative integration and advancement of women in the forestry sector, from which recommendations can then be derived. First, findings on the promotion of forestry careers to young girls and women (D1.3.1) will be presented. This will be followed by a presentation of the results from capacity building and the implications derived from this for the challenges and opportunities for improvement in the educational systems (D2.1.1).

5.1 Increasing the appeal of forestry for women and necessary improvements in the education system

The first step in this chapter is to draw ideas from the project's research process that will make a career in forestry accessible and attractive. Therefore, we make use of the findings from D1.3.1. This statement describes six areas that are linked to concrete proposals for action to improve the situation and accessibility.

Reframing forestry's image and narrative

The perception of forestry as a physically demanding, male-dominated field is a major deterrent for young women. Across countries, both experts and students underscored the importance of transforming public narratives. Forestry should be portrayed not as rugged outdoor labour, but as an innovative, sustainable, and diverse sector — ranging from ecology and technology to education, policy, and conservation.

Actions:

- Develop youth-friendly, inclusive PR campaigns showcasing women in forestry.
- Highlight the sector's role in climate action, sustainability, and digital innovation.
- Share personal stories from young female foresters through social media, videos, and school visits.
- Organize Girls' Days, career fairs, and forest exploration events with strong female representation.

Start early: strengthen career orientation and role modelling

The decision to pursue forestry is often made late and without sufficient information. Early and repeated exposure to forestry —- particularly to its non-traditional roles — is crucial. Teachers, parents, and local role models play a key role in shaping girls' perceptions and confidence.

Actions:

- Introduce forestry themes in primary and lower secondary education.
- Invite female forestry professionals to speak at schools and career days.
- Create mentorship programs linking female students with professionals or peers already in forestry.
- Build networks of young women in forestry to provide peer support and advocacy.

Ensure practical, meaningful exposure and mentorship

Many girls reported feeling disconnected from the real-world practice of forestry. For example, internships were promised but not delivered. Across contexts, there was a strong demand for more hands-on, mentored experience.

Actions:

- Guarantee quality internships and job-shadowing opportunities through school–industry partnerships.
- Embed practical training into curricula and support regular field visits.
- Create structured mentoring (individual or group-based), with emphasis on female leadership.
- Develop mentoring platforms that connect students with foresters across regions and roles.

Modernize education and make it inclusive

Curricula across countries were often described as outdated, overly theoretical, and unengaging. Women frequently face unequal task assignments in classrooms or internships, reinforcing stereotypes and limiting skill development.

Actions:

- Revise forestry curricula to reflect current industry needs.
- Integrate gender-sensitive pedagogy, including balanced task assignments and inclusive materials.
- Recruit more female educators and guest speakers, especially in technical and field subjects.
- Create learning environments where girls' competencies are recognized, not questioned.

Create inclusive and visible workplace cultures

Even when women enter the forestry workforce, they often feel marginalized excluded from informal networks, limited to administrative roles, or pushed out after maternity leave. Without inclusive structures, retention remains low.

Actions:

- Use inclusive language and visuals in job advertisements.
- Offer part-time, hybrid, or localized work models for young women and parents.
- Promote women to leadership roles and highlight them in company communications.
- Train HR and management in gender sensitivity and inclusive leadership.

Policy support and institutional collaboration

Real change requires cross-sector coordination between education, industry, and government (public authorities and institutions responsible for policies, regulations, and public services). Many barriers identified — such as lack of childcare, informal hiring, or limited access to career guidance — require systemic response.

Actions:

- Design national strategies to attract girls to green careers, including forestry.
- Incentivize companies to adopt gender-equity policies through tax benefits or recognition programs.
- Fund forestry promotion in rural and underrepresented regions.
- Ensure collaboration between schools, ministries, universities, and forestry employers.

While SO1 focused on making forestry a viable and attractive career option for women, SO2 once again addressed the necessary improvements in the different levels of the educational systems in the Danube region.

The representations of D2.1.1 describe the challenges forestry educational systems across the Danube-Region are facing in addressing gender equality. These challenges mostly address gender inclusivity, stereotypes, lack of female role models, especially in leadership positions, modernization of the curricula to meet the changing demands of the forestry sector, lack of information on career opportunities, low salaries and concerns about the job chances after graduation. In Romania, frequent changes in forest legislation and government policies that disrupt academic planning and a lack of structured vocational training and continuous professional development for forestry workers were mentioned as additional challenges to the educational system, thereby hampering efforts to address gender issues systematically.

To tackle the current challenges in the educational systems of the Danube Region the transnational Fem2forests research team proposes a comprehensive set of ideas and recommendations. The most important ones are as follows:

1) **Enhancing Gender Diversity and Inclusion in Forestry Education**: Women are still underrepresented in the forestry sector, especially in leadership positions. Forestry education offers several ways to change this situation:

   a) *Mentoring programs and Networks: The creation of stronger networks for women in forestry* and the promotion of mentoring programs in forestry education are essential to help women strengthen their confidence and support for their professional life. The ideas for mentoring programs proposed in this report include the introduction or improvement of existing mentoring for students and also for young professionals starting a career in forestry.

   b) *Promotion of Female Role Models in Forestry:* Increase the visibility of successful women in forestry through guest lectures, media campaigns, networking events, and the official websites of schools and faculties as source of inspiration to encourage young women to enter forestry professions.

   c) *Gender sensitive curricula and training:* Introduction of gender-awareness contents into the curricula of forestry educational facilities and inclusive field work opportunities. Additionally, trainings that promote diversity and help young women to strengthen their self-confidence and communication skills during forestry education should be available at forestry educational institutions to help young women to prepare for work life. Forestry companies could provide leadership training for women.

   d) *Creation of funding opportunities:* Introduction of scholarships specifically for female forestry students and to fund supporting programs for women in forestry.

2) **Modernization of the existing educational curricula**: The results of this study point out that in many countries of the Danube Region the curricula at forestry educational institutions are outdated and not yet adapted to meet the challenges that the forestry sector is facing like *climate change and biodiversity loss*. New curricula should address these topics and include courses with a focus on carbon sequestration, forest resilience to climate change, and sustainable land management that will prepare graduates to deal with these challenges. The *integration of new technologies* in forestry also forms part of the curricula modernization. These include providing students with skills e.g. in digitalization and technology like remote sensing, geographic information systems, drone technology, and AI-based forest monitoring. Furthermore, *digital learning tools* like online platforms, virtual labs, and field simulations could be introduced to make education more accessible and engaging — especially in smaller, remote communities.

3) **Creation of incentives for forest entrepreneurs:** Forestry educational facilities could encourage students to start forestry-related businesses by offering courses on entrepreneurship, fundraising, renewable forest products, and market-oriented forestry innovations that provide a good starting for prospective forestry entrepreneurs. Furthermore, providing funding opportunities for innovative forestry start-ups and networking opportunities between students, investors, and forestry entrepreneurs would also trigger the development of innovation in the forestry sector.

4) **Collaboration of education and industry**: The ties between educational institutions and the forestry sector should be tighter to ensure that the educational programs align with the needs of the industry and to help facilitate the transition into the job market for students. There are multiple ways how such partnerships could look like, including e.g. internships, workshops, trainings, research projects, and so on.

5) **Creative outreach in primary and secondary schools:** Organization of school outreach events like "Forest Days" in primary and secondary schools with workshops, games, and storytelling to introduce forestry careers and raise awareness about forest-related topics for both, girls and boys, and also for parents and educators. Through the collaboration of schools with environmental NGOs, conservation centers, forest owners/ enterprises, forest advisory service, administration and state forests exciting hands-on forestry experiences can be offered as extra-curricular activities to children.

5.2 Success factors of Good Practice Examples for training and education institutions

In order to improve the situation of women through innovative solutions, it is essential to identify success factors and present examples of good practice. First, insights and lessons learned from transnational findings on national examples of good practice (O1.2) will be described. This will be followed by a review of the strengths of national career orientation systems (D1.2.1).

The analysis of the collection of good practice examples across the Danube region, described in O12, has yielded valuable insights that can inform future career orientation initiatives in forestry. These lessons highlight what works, why it works, and under what conditions it may be successfully transferred to other contexts.

- *Start early and maintain continuity:* Early career orientation helps dismantle stereotypes and establish positive associations with forestry. Sustained engagement throughout a learner's educational journey reinforces curiosity and builds relevant skills.

- *Real-world exposure boosts engagement:* Field-based experiences and interactions with professionals bring authenticity to career guidance, helping young people better understand and connect with forestry roles.
- *Visibility and representation matter:* Showcasing women in forestry as mentors, experts, and leaders challenges gender norms and broadens career aspirations.
- *Tailoring to local realities enhances relevance:* Context-sensitive practices reflect community values, making career paths feel accessible and achievable.
- *Participatory approaches empower learners:* Youth engagement in shaping content and delivery enhances ownership and impact.
- *Interdisciplinary and cross-sector collaboration increases impact:* Partnerships between educators, professionals, and community actors bring diverse expertise into the learning process.
- *Innovation drives engagement:* Interactive formats, storytelling, and digital tools help make complex forestry topics understandable and appealing.
- *Sustainability adds meaning:* Framing forestry as a solution to global challenges reinforces its relevance and inspires value-driven career choices.

These insights collectively affirm that forestry career orientation must be holistic, inclusive, and responsive to the needs of all learners. The most promising practices integrate creativity, authenticity, and shared ownership—supported by strong systems and stakeholder collaboration.

After having focused on potential success factors of related good practice examples, we will now take a closer look at the strengths of existing national career orientation systems.

The career orientation systems across the countries examined exhibit several key strengths, particularly in the areas of vocational education and industry collaboration. Many countries, such as Austria, the Czech Republic, and Serbia, benefit from well-established networks and partnerships between educational institutions and industry players. These connections provide students with practical experiences and increase their employability, particularly in fields like forestry. Additionally, national career orientation platforms in countries like the Czech Republic offer valuable information on job profiles, career paths, and required qualifications. Countries like Austria and Germany have also implemented successful communication campaigns and local initiatives that foster direct engagement with students, such as career fairs and open days. These strengths contribute to an overall robust framework for career orientation, aiming to guide young people towards relevant career paths and skills.

5.3 Recommendation of innovative measures to increase interest in forestry jobs

This chapter provides an additional overview of recommendations designed to increase women's interest in forestry professions. These are based on the recommendations from the good practice examples (O1.2) and the catalogue of recommendations from capacity building (D2.1.1).

The first paragraph begins by setting recommendations for the various stakeholders in the education system and in the professional field to promote women's career paths, which are derived from the national good practice examples (O1.2.).

To further strengthen career orientation in forestry from a gender perspective and to promote more inclusive, appealing, and sustainable pathways for young people — especially girls and young women — this section outlines targeted recommendations for various stakeholder groups. These recommendations build upon the lessons learned from the good practices and respond to the challenges and opportunities identified across the Danube region.

For education providers and career advisors:

- Integrate forestry-related content and career role models, especially women, into curricula starting from early childhood education.
- Provide continuous, gender-sensitive training for teachers and counselors to address stereotypes and offer inclusive guidance.
- Develop and disseminate engaging, gender-sensitive educational materials and career guidance tools that showcase the diversity of forestry careers.
- Foster collaboration between schools and external forestry actors to enrich the career orientation process with real-world perspectives.

For forestry sector stakeholders and employers:

- Actively engage in awareness-raising efforts, including school visits, open days, and public events that highlight the sector's relevance and career diversity.
- Provide internships, mentorships, and site visits tailored for girls and young women to encourage early and meaningful exposure.
- Review and adapt workplace environments and recruitment practices to support greater gender inclusivity and flexible entry pathways.
- Partner with educators to co-create activities and contribute to career orientation campaigns or digital resources.

Collectively, these recommendations aim to build a supportive ecosystem that values diversity, fosters early engagement, and ensures forestry careers are visible, valued, and accessible to all.

Further recommendations for forestry education are taken from the catalogue of recommendations in the report on capacity-building for gender awareness and competencies in forestry education (D.2.1.1.).

This chapter brings together knowledge from several sources and in this way provides a catalogue of measures and ideas on how to increase gender awareness in forestry education. Educators and decision makers in forestry education can use this portfolio of recommendations when developing measures to increase gender equity and awareness in their institutions. Table 3 gives a comprehensive overview of all concepts and ideas collected in D.2.1.1.

Measure	**Description**
Awareness-raising campaigns	Actions to combat gender stereotypes and promote inclusivity.
Gender-sensitive communication	Gender-sensitive language use in organizations including equality-oriented public relations.
Role models	Featuring successful women in forestry as role models for young women.
Networks	Networking opportunities for knowledge transfer, exchange and support.
Early education initiatives	Forestry-related activities in primary and secondary education for children, parents and educators.
Mentoring	Mentoring programmes for young women in education and career starters.
Training	Training programs for women with focus on self-confidence, communication and leadership skills. Bystander trainings for employees and students to change behaviour of people witnessing an event to intervene in a positive way. Gender equality trainings for teachers and people in leadership levels of educational institutions
Courses	Courses on gender awareness as part of the curricula in forestry educational institutions.
Interactive formats	Discussion groups for mutual support and the exchange of experiences
Funding opportunities	Scholarships and grants to support female forestry students.

Support systems	Equal opportunities officers integrated in training and educational facilities and visible for students.
Collaborations	Integrative approaches to foster collaboration between women and men.
Evaluation systems	Mechanisms that track the effectiveness of promotional efforts and educational reforms in increasing female enrolment and retention.
Policy advocacy	Advocacy for policies promoting gender equality to change framework conditions.
Interaction with government bodies	Stronger cooperation of educational institutions with government bodies to develop frameworks that support diversity and inclusion in forestry education.
Scientific data	Promotion of studies on gender disparities in the forestry sector to develop evidence-based policies.
Career mapping tools	Tools developed for women to plan their career more effectively and track their personal development.

Table 3: Catalogue of recommendations (source: table 15 of D.2.1.1).

In summary, the cross-country comparison of educational systems of the Danube Region, conducted in D.2.1.1, shows that despite differences in the educational paths, especially in secondary education, most countries face similar challenges. The biggest challenge for all countries that participated in this study is promoting Gender Diversity and Inclusion in Forestry Education. This includes especially issues on gender inclusivity, stereotypes and a lack of female role models, especially in leadership positions. The initiatives addressing gender awareness in forestry education identified in this study are part of higher education while forestry schools and training facilities in all countries completely lack strategies to address gender diversity and inclusion.

Additional challenges that many educational systems across the Danube Region are facing include a need to modernize outdated curricula to meet the changing demands of the industry and a general call for innovations. The report D.2.1.1 about the educational and training systems in the project countries provides important ideas on how to tackle these challenges in each country to inspire practitioners and decision-makers.

Gender awareness in forestry education in the Danube region is essential for fostering an inclusive and equitable environment in this vital sector. As the forestry industry faces numerous challenges, including climate change and sustainable management, it is crucial to ensure that diverse perspectives are included in decision-making processes. This report gives an overview of recommendations to increase gender awareness in forestry education and provides a comprehensive catalogue of measures that can be applied for good practice (see Table 3. Of these measures the three most feasible ones identified by the experts in the Danube Region are:

1. **Role Models**: Promoting female role models in forestry is vital for inspiring the next generation of women in the field. By showcasing successful women in various forestry-related roles, educational institutions can help break down stereotypes and encourage young women to pursue careers in this area. Initiatives could include guest lectures, workshops, and field trips featuring accomplished female professionals who can share their experiences and insights.

2. **Awareness Raising Campaigns**: Implementing awareness-raising campaigns focused on gender equality in forestry education can help challenge existing biases and promote a more inclusive culture. These campaigns could involve workshops, seminars, and social media outreach to highlight the importance of gender diversity in forestry. By educating students, educators, and industry stakeholders about the benefits of gender awareness, these campaigns can foster a more supportive environment for all individuals in the sector.

3. **Mentoring**: Establishing mentoring programs that connect experienced professionals with students and young professionals can provide invaluable support and guidance. Mentoring relationships can help women navigate the challenges of the forestry industry, build networks, and develop essential skills. By pairing mentees with mentors who understand the unique barriers faced by women in forestry, these programs can empower the next generation of female leaders in the field.

By implementing these recommendations, stakeholders in the Danube region can enhance gender awareness in forestry education, ultimately leading to a more diverse and resilient forestry sector.

The Fem2forests project is making significant strides in enhancing gender awareness in forestry education across the Danube Region. Through an innovative awareness-raising campaign and a Transnational Ambassador Program, the project aims to foster gender equality within the forestry sector.

The awareness raising campaign is already running, students from all participating countries engaged in a creative initiative where they developed graphic novels focused on promoting gender equality in forestry. This unique approach not only allows students to express their ideas artistically but also encourages them to explore and challenge existing stereotypes within the industry. By using graphic novels as a medium, the campaign aims to reach a broader audience and spark conversations about the importance of gender inclusiveness in forestry.

In addition to the awareness raising campaign, the Transnational Ambassador Program features role models from across the Danube Region who participate in various activities designed to increase the visibility of women in forestry. These ambassadors share their

experiences, insights, and achievements, serving as inspirations for young women considering careers in this field. By highlighting the contributions of female professionals, the program seeks to create a supportive network that empowers women and encourages greater participation in forestry.

Together, these initiatives under the Fem2forests project are set to make a lasting impact on gender awareness in forestry education, paving the way for a more inclusive and equitable future in the sector.

6 Synthesis: implications out of Fem2forests & Fem4Forest

This chapter synthesizes the recommendations and insights from previous deliverables and outputs of Fem2forests SO1 and SO2. At this point, the innovation areas identified in Fem4Forest are combined with the results from Fem2Forest and transferred into the extracted categories. The chapter provides a concise overview of how these recommendations contribute to the further development of the individual innovation areas and offers a clear and structured summary of the most important results and strategic proposals that have emerged from the project activities.

These recommendations, added by insights of D.1.3.1, are comprehensive and clustered into the categories of communicational, educational and institutional measures. In addition to the existing categories synthesised from the two projects, a new category, employer level, has been added to the table (table 4).

Measure	Description	Category
Awareness-raising	Campaigns to dispel misconceptions about forestry, showcasing the sector's diverse opportunities and modern practices to modernize the image of forestry. Necessity of transforming public narratives: forestry as an innovative, sustainable, and diverse sector. Awareness raising campaigns to change people´s perceptions on women role in forestry. Implement awareness-raising initiatives at educational facilities to combat gender stereotypes and promote inclusivity.	Communication

Gender-sensitive communication	Equality-oriented presentation of the fields of work in forestry and communication of equal opportunities for obtaining jobs in forestry to girls and boys. Equality-oriented public relations – being aware of language, pictures, examples.	Communication
Role models	Feature successful women in forestry to provide role models and inspiration for young women. Teachers, parents, and local role models play a key role in shaping girls' perceptions and confidence. They can provide sufficient information to encourage them to pursue forestry.	Communication
Networks	Build more networking opportunities that enable a transfer of knowledge from role models in forestry to young professionals.	Communication
Early education initiatives	Introduce forestry-related activities in elementary schools to reduce prejudices and promote forestry as a sustainable career option to girls, boys and their parents.	Education
Modern and inclusive education	Overcome outdated, overly theoretical, and unengaging curricula with unequal task assignments in classrooms or internships to overcome the reinforcement of stereotypes.	Education
Mentoring	Develop mentoring programs to help young women develop a vision for their careers and receive concrete help in realizing it. Ensure a practical, meaningful exposure: There is a strong demand for more hands-on, mentored experience.	Education
Training	Qualification programs for women for gaining security and self-confidence (regarding competencies, abilities, networking). Training programs with emphasis on social skills and communication techniques and training programs that teach leadership skills (how to lead a team, communicate with your employees).	Education
Workplace cultures	Necessity of inclusive structures: inclusive language and visuals in job advertisements, part-time/hybrid/localized work models for young women and parents, promote women to leadership	Employer

	roles, highlight in company communications, train HR and management on gender sensitivity and inclusive leadership.	
Policy advocacy	Advocacy for policies promoting gender equality to change framework conditions (e.g. working hours, flexible working conditions, care offers for children and relatives, equal pay initiatives, and supportive networks for female students and professionals). Removal of barriers like informal hiring and limited access to career guidance. Fund forestry promotion in rural and underrepresented regions.	Institution
Interaction with government bodies	Encourage educational institutions to work with government bodies to develop frameworks that support diversity and inclusion in forestry education and careers. Ensure collaboration between schools, ministries, universities, and forestry.	Institution

Table 4: Ways to increase gender awareness in forestry education – Key findings from Fem4Forest research and Fem2forests D1.1.1 (source: own adaption/ integration of D1.3.1 in table 13 from D.2.1.1)