

REPORT

5th Edition of the Forest Innovation Workshop “The role of innovation in managing new challenges in the forest-based sector at regional level in the EU”

The 5th Edition of the European Forest Innovation Workshop took place on January 18th, 2023, at the Representation of the Free State of Bavaria to the European Union in Brussels.

With around 180 registrations and 130 participants, the event offered an important occasion for discussing the challenges and the innovation needs of the forest-based sector from a regional perspective. The programme offered six different sections with a rich panel of speakers of different background and expertise: EU Institutions, Banks and Finance, Regional Authorities, Industry, Academia, and Knowledge Transfer Organizations.

Section 1 - Opening remarks

Barbara Schretter (head of the Representation of the Free State of Bavaria to the EU in Brussels) and **Clara Sandamian** (head of the regional Delegation of Castilla y León in Brussels) opened the event. They pointed out that also in times of crises, there is a clear reference to forests. The concern for forests in terms of restoration and sustainable management is still shared throughout the European regions. They highlighted the opportunities for innovations that can fulfil the needs of the changing context.

Section 2 - European framework for innovation in the forest-based sector

Four keynote speakers presented relevant aspects of the framework at EU and regional levels to support forest-related innovation.

Sergiu Didicescu (Head of Division in the Support Facility for Innovation and Knowledge Exchange including EIP-AGRI) addressed in his presentation on [Support for social and technological innovation in the forest-based sector](#) the importance of the forest practices on the ground and knowledge needs to make forest practices more sustainable. He recalled the activities of the European Innovation Partnership on Agricultural Productivity and Sustainability in supporting forest innovation, for example with Operational Groups. He referred to EU research projects addressing different forest innovation topics and presented some of the information activities of the European CAP Network. the annual work program of EU CAP Network, winter and spring time was mentioned to be for looking for discussion points and The Forest Innovation Workshop will provide inputs to the elaboration of the work programme of this network for the next year that starts in spring 2023.

Xabier Goenaga (Head of Innovation Policies and Economic Impact in the Joint Research Centre of the European Commission) described in his presentation on [Partnerships for Regional Innovation \(PRI\), Influence on innovation in forest-based sector](#) the new strategic approach to innovation-driven territorial transformation. An EU toolbox of policies was presented as a policy experimentation to support regional cooperation for EU objectives. The toolbox is not a strict guideline, but an assisting framework which tools could be implemented depending on the context. He stressed that regional cooperation would need to be supported by long-term political commitment in the involved regions. Such partnerships for regional

innovation take place on territorial level. Therefore, the different capacities of regions need to be respected in order to have efficient implementations of common policies. He sees room for improvement in utilizing existing funding sources and increasing the number of policies to be mobilized. Often funding relies on EU sources, but regions should remain open to utilize funding mechanisms of the region. Interregional work demands active participation of the regions. The European Commission provides a mapping of instruments that can be used. Instruments and tools to help thrive interregional cooperation are under further development. It is important to involve the right stakeholders to have efficient results and therefore the number of sectors included need to be increased step by step.

Felipe Ortega (Head of Division Bioeconomy in the European Investment Bank) pointed out in his presentation on [Financial context for innovation in forestry: European view](#) that financing by the European Investment Bank (EIB) comprises different activities such as lending credit-based finance, blending and/or advisory. In aligning with EU policy objectives, the EIB is supporting the forest-based bioeconomy. About 7 billion Euros has been provided to the sector in 2017–2021. Some of the key focus areas for investments were sustainable forest management, ecosystem services and innovation. Investments on the ground level also have other effects to the area, for example in the form of recruitment and development of sustainable practices. The role of regulators is important when evaluating the impact on ecosystem services when making financial decisions.

Martin Kihlberg (General Counsel and Chief Sustainability Officer at the Swedish Landshypotek Bank) addressed in his presentation on [Financial context for innovation in forestry: Regional view](#) some of the challenges for financing the forest sector. The focus of relevant EU policies is on preserving forests rather than managing them. However, management of forests is important in order to have innovations. The EU Taxonomy will have a significant impact on financing in the forest sector. Although its purpose as assisting framework for banks to contribute to climate mitigation and adaptation is positive, it creates challenges to finance private forest owners, who play a major role in the value chain. Their resources to report according to the framework with its administrative burden are not the same as for larger companies. If the EU Taxonomy determines the way funding is received, it may put new pressure on how funds are allocated and to whom. The existing uncertainties on the implementation of the EU Taxonomy are not helpful for banks. But there is a high interest from institutional investors in forestry. Asked from the audience if EU Taxonomy would impact the current portfolio of banks or only the future one, Kihlberg suggested that this will depend on how the market will react.

Section 3 - European framework for innovation in the forest-based sector

Álvaro Picardo Nieto (Junta de Castilla y León) and **Tiia Talvisara** (East & North Finland EU Office) presented results of a survey on “Priority challenges of regions for Innovation in the forest-based sector”. All regions responding to the survey have innovation actors, more than half of the regions have their own funding instruments in addition to ones from EU. Both technology and social innovations were seen as important. Improving sustainable forest management and landscape resilience were highlighted as important areas for innovation. National and regional research and innovation programmes were mentioned as valuable instruments in relation to innovation in the forest-based sector. A comment from the audience reminded on the importance to address both environmental and socio-economic resilience of a landscape.

In the following roundtable debate, moderated by **Inazio Martinez de Arano** (EFI Bioregions Facility), six representatives from EU regions discussed the priorities for forest innovation: Kurt Amereller (Bavarian State Institute of Forestry, Germany), Roser Maneja (Forest Sciences Centre of Catalonia, Spain), Markus Hirvonen (Regional Council of North Karelia, Finland), Leire Barañano (Basque Institute for Agricultural Research and Development, Spain), Rastislav Raši (National Forest Centre Slovak Republic, Slovakia) and Martin Schwarz (Landesbetrieb Wald und Holz North Rhine-Westphalia, Germany).

Kurt Amereller addressed the need to improve communication on forestry. For this, **Roser Maneja** urged to build communication around key messages and avoid increasing confusion. **Leire Barañano** added that communications need new efforts from different actors within the entire sector. People of the regions needs to be involved in the discussions of the forest sector and its impacts in their region. Education and knowledge about forests should be increased in order to have more holistic understanding on the value of landscape, but also on possible innovations in the forest sector. It was seen important to focus on the views and mindset on forest in general. **Rastislav Raši** confirmed the need to clearer communicate on sustainable, multifunctional forest management and on how innovations can improve the social dimension of sustainable practices. **Markus Hirvonen** mentioned that innovation addresses the development of practices in the entire supply chain and that using wood-based materials as replacement for fossil-based materials should be the pathway. A stronger focus on developing higher value products that are recyclable is important. **Raši** added that funding schemes and investments have leading role in innovation. **Martin Schwarz** pointed out that the region's specific objectives need to be considered. He also highlighted the need to take a whole supply chain perspective on the matter. **Maneja** addressed the number of different policy frameworks and how these are applied to the region in practice. Collaboration of different stakeholders on different levels is crucial, including for example private forest owners, municipalities and science institutions. From the innovation point of view, forests pose opportunities to tackle issues of sustainability. A comment from the audience recalled that communication is also about listening and that we need to ask ourselves whether there is more talking than listening.

Section 4 and 5 – Breakout sessions

Two rounds of breakout sessions followed with three discussions tables, each dedicated to one overarching innovation theme. Each session started with 3 presentations about innovation cases on the respective topic. In the following discussions, participants had the opportunity to

- 1) improve their understanding of the cases presented;
- 2) identify opportunities to spread the idea or establish cross-border cooperation through relevant EU initiatives, for example activities within the European CAP Network, but also through other programmes/instruments at national or regional level;
- 3) propose other ideas related to the topic/innovation challenge, in addition to the aspects of the presented cases.

Table 1 – Carbon Market, Bioeconomy, Climate Smart Forestry and Rural Development

Chair and note taker: Fabio BOSCALERI and Davide ONOFRI

This table had around 70 participants along the two rounds of discussion.

Presentations

1.1 The forest digitalization test laboratory Leena Leskinen (Finnish Forest Centre)

It is a best practice to combine research, development, and practical co-creation with citizens through top-down and bottom-up approaches. The top-down component relates with existing infrastructure, global priorities and the institutional advisory services. The bottom-up component relates with the actual needs from local stakeholders and citizens. The idea is to tackle the lack of data, and knowledge, on the side of the private owners by giving them access to an open-source digitalised forest database. This led to the establishment of a broad network of local stakeholders interested in the forest sectors as well as endless possibilities for experimentation and innovation. Some proposals for collaborations in the area of data collection and management were made, such as the development of terrestrial LiDAR for reference data supply to improve remote sensing data, the updating of Enterprise Resource Planning (ERP) for management operations with geospatial database, and other software and digital services for food production and biodiversity management.

1.2 Circular use of engineered wood by a general take back obligation (Markus Stepler, DERIX)

DERIX is a timber construction company that decided to adopt a policy of reusing their construction wood several times through contractual take-back obligations. This creates a virtuous cycle that allows timber to be reused several times by the company, reducing the pressure on the biological cycles and optimising the capture of CO₂. Wood is the best material for reuse. With high tech engineering processes, wood can be reshaped and adapted after every use in new products. The energy production is the very last use in this long cycle, that can last hundreds of years. The take back obligation could be applied by EU wood-industries and, as a general sustainable practice, it could be applied by every industry that produces goods. The adoption of “material passports” for all new (timber) buildings was also introduced to the discussion.

1.3 Sustainable forest management of Alpine forests in North-East Italy Giorgio Alberti (Free University of Bolzano)

Two case studies on new approaches for sustainable forest management applied in mountain areas in two different locations in Italy were presented. In Italy, more than 60% of forests are private, the percentage of harvest is very low, there is a great fragmentation of forest properties, and forest owners generally live away from rural areas. The innovation focuses on specific measures and technologies to provide better and accessible information to forest owners:

- The integration of data collected through airborne LiDAR in the forest management plan of the Autonomous Province of South Tyrol to produce high accuracy maps of forest resources.
- The integration of LiDAR and other conventional data with UAV high resolution photogrammetry coverage of steep forested areas to feed with accurate information a Decision Support System (DSS) at the regional scale in the Autonomous Region of Friuli-Venezia Giulia.

Main conclusions from the table discussions

All the presentations had an important component related with access to data and data management. The following take home messages were agreed by the participants:

- ✓ Make data flowing: accessing knowledge and data by forest owners and practitioners is key for the adoption of innovation and sustainable forest management practices.
- ✓ Digitalization is not just about collecting data but organising and processing them along the value-chain till they are actually useful for the end user.
- ✓ It is extremely important to work on the harmonization of data at EU and global level. There is a fragmentation in the institutional landscape concerning who collects, produces and manages data (States, Local authorities, or the EU).
- ✓ The development of better and valuable services requires more accurate data from satellites.

Other common points raised during the discussion were focusing on the importance of maintaining a lively rural and forest community:

- ✓ There has been a general agreement that forest owners frequently are no longer in rural areas. This is an important social challenge that hinders the use of many opportunities presented and discussed at the table. The issue is particularly relevant in areas with high degree of ownership fragmentation and scarce forest accessibility.

Finally, the presentation from DERIX raised many questions and comments related with the use of wood as a valid bio-based alternative in the construction sector. Main shared remarks are:

- ✓ Carbon market opportunities and the bioeconomy require long term strategies to generate benefits. Today there are many barriers for the forest and wood industries to adopt and consolidate this long-term approach.
- ✓ Life cycle evaluations of stored carbon should take into consideration the re-use option to better represent the qualities of wood compared to other materials.

One quote from a participant summarizes well the general view of the session:

«The prerequisite for rural and urban living spaces within a carbon-regulated market is to have accurate and reliable data for mapping, modelling and planning, based on multi-stakeholder cooperation».

Table 2 - Forest Degradation and Nature Restoration

Chair and note taker: Tim HARTL and H el ene KOCH

This table had around 45 participants along the two rounds of discussion.

Presentations

2.1 Restoration activities in two areas affected by wildfires Paolo Battelli (Unione Dei Comuni Mediavalle Del Serchio)

The organisation of the response by the community following to main wildfires in Calci and Massarosa (IT) was presented. Different prevention, preparedness, and restoration measures were taken (incl. creation of urban protection strips, clear cutting on water knots and forest road recovery, and awareness raising in at risk communities) which have been summarised in a technical handbook for practitioners and managers.

2.2 Use of LiDAR and satellite for forest health assessment and monitoring Tristan Perret (Forestry Club de France)

SaniLidar was presented, a forest health assessment and monitoring tool based on modelling of Lidar and satellite data. SaniLidar provides information on, for example, the segmentation and identification of trees, the quantification and qualification of trees and the risk of propagation (e.g., of diseases). SaniLidar is a decision support tool which includes the assessment of propagation risk, as so to support locally suited management decisions.

2.3 Programmes to support biodiversity in Finnish forests Timo Lehesvirta (Mets a Group)

The comparison of different wood production systems and their impact on biodiversity was presented as well as the Mets a Group's concept of regenerative forestry and its role in safeguarding biodiversity. Main targets of this concept are to increase the provision of all ecosystem services, while keeping a steady wood supply. By implementing the concept, Mets a Group succeeded to create new habitats for red-listed species in logging areas with fallen retention trees.

Main conclusions from the table discussions

Main take away messages

“As a common challenge, we have to face complexity. We need to be innovative to find common indicators translating through all type of forests.”

“SFM is the common denominator of all cases we discussed. We face a need to manage, and management requires access to forest.”

“Local forest management plans need to anticipate long term climate change at global, regional, and local levels as a basis for adapting forest composition, enhanced biodiversity, and evolving markets. For this multi-level survey systems are essentials tools.”

Regarding communication, definitions and terminology

The terms used (e.g., “regenerative forestry”, and “commercial forestry”) are not a common terminology all over the EU. The question was raised why these terms were chosen and how they are defined. SFM has been the common denominator of all presentations and that it might be beneficial to keep such common terms.

Communication is essential and should build on analyses of restorative business with corporate responsibility, with the aim of bringing more services to society.

Further development on the concept of PES would be needed.

Further discussion took place on the definition of the term ‘forest degradation’. The content of the EU's Deforestation Regulation which is expected to enter into force later this year, was discussed. It was pointed out that the problem of deforestation and forest degradation is more urgent in third countries than in Europe.

Regarding cross-border actions and exchanges on the presented case studies it was stated that

- SaniLidar is already the result of cross-border partnership. Furthermore, the operators would be open to widen the partnership.
- on the two cases of forest fires in Italy, exchange with other Mediterranean countries would be easily possible. Application of similar measures should be beneficial.
- For the experiences on forest management practices for wood production and development of ecosystem services, exchange across borders was seen as very important. However, the risk was pointed out that the supply of wood needs to be kept out from provision of ecosystem services.

The following innovations challenges were identified:

Forest management in changing climatic conditions: forest roads and infrastructure need to be restored and maintained as a necessary means to carry out forest management measures. The corresponding fundamental question on this was how to innovate access to forests and at the same time support and improve all forest services and to reach restoration goals.

Financing: On the topic of Lidar being financially feasibly applied in practice, the operators of SaniLidar have experimented with different tools (such as drones which turned out to be too expensive). However, there are already examples for financially feasible applications, such as national level acquisition for a longer period in Finland. An issue that still needs to be worked on is that data needs to be kept up to date. Additionally, the price of technology is steadily decreasing whilst the quality of the data gained is increasing, which is providing for a more accessible use in the future.

Monitoring, reporting and comparability for improved cross-border exchange: The European forest sector faces a general challenge: complexity. Common indicators should be used to better communicate this challenge to the general public. This will be challenging but it's an important task to be achieved.

Technical feasibility of monitoring with Lidar to analyse indicators below tree canopy: Different tools can deliver different information (e.g., drones can provide photorealistic maps, but not much information of understory; Lidar in turn can go through branches, however with limitations). The key message was that different tools need to be combined in order to have comprehensive data.

Table 3 – Provision of Ecosystem services

Chair and note taker: Ana ROCHA (ELO) and Pauline PIRLOT (ELO)

This table had around 35 participants along the two rounds of discussion.

Presentations

3.1 Multi-objective Decision Support System for forest management (CAFE) Maurizio Cocchi (EUBIA)

Forest management often focuses on a single ecosystem service. Yet, several ecosystem services can be optimised through forest management. The added value of developing several ecosystem services in an optimal manner are numerous. For instance, one can diversify their income. CAFE project promotes forest management approaches to improve forest resilience to climate change. Its overall objective is to develop a Decision Support System (DSS). Using the DSS, forest managers will be able to optimise forest management to achieve several ecosystem services concomitantly. The tool works as follows: by entering a series of quantifiable data in a software, forest managers will be proposed a model, a scenario to follow (for instance: what species to plant, where, how much they should intervene), as a combination of several solutions. The model focuses on the selected ecosystem services forest managers wish to emphasise. The result is a spatially distributed data and thinning maps.

The software is free to use; it can provide models for any forest type; it can combine up to five ecosystem services at the same time. Forest quantitative data must be collected before initiating modelling. So far, the model has been used predominantly in Spain, and will be replicated in Portugal and Germany. CAFÉ should provide templates of case scenario once enough cases will be generated.

3.2 Photogrammetry using drones under canopy and prototype in the form of a backpack with a stereotypic camera Rodrigo Gómez (CESEFOR)

Ecosystem services are often coined as natural capital stock. There is a need to know better these stocks. Artificial Intelligence (AI) can help to collect and digitise forest data. Four services were presented. (1) measuring trees under canopy height with drones is a cheap way to make exact forest inventories. (2) measuring trees with a depth sensor stored in a backpack computes automatic forest inventories and determines the exact position of each tree. (3) IA recognises and classifies images, and ensures timber traceability, from the wood to the sawmill. (4) IA classifies images open to all events in a forest (forest fire, wood theft etc.). It is associated to a system alerting foresters and forest guards in real time. These solutions are made for the industry and can work in forests that are not mono-species, as the AI can differentiate between species.

3.3 ONEforest Martin Brunsmeier (Technische Hochschule Rosenheim)

Forest decision-making is ever more complex, as it entails several interests (ecosystem services, timber production etc). The way we can orchestrate them, and with what expected results, needs attention. ONEforest project issues a platform that helps foresters in taking long term forest management decisions, aggregating different factors. It forecasts what forests will look like in 30 to 40 years, according to pre-set criteria. The tool is the Multi-Criteria Decision Support System (MCDSS): based on data and indicators, it generates management options, scenarios, through forest simulations. Interdependencies between different factors are highlighted. The tool also enables risk assessment. The target group is local policymakers, forest owners and forest managers. To ensure the broadest dissemination of the tool, two versions are available: one very user-friendly, the other one more detailed and technical.

Main conclusions from the table discussions

The three presentations and follow-up discussions stressed the need to optimise forest data collection with the aim of guiding forest management towards the decided direction (in our case: enhance forest ecosystem services). Accurate and timely forest data is vital for forest monitoring, risk assessment and optimising forest ecosystem services.

Challenges

Technicalities of the tools proposed: DSS and MCDSS require forest managers to collect data and enter them into a platform. While data collection remains up to forest managers, collecting them in an accurate manner and computing them is challenging.

Finance: All three speakers claimed that their solution is cheap. But who finances these technologies (a company? Public authorities? Private forest managers? A tax on citizens?) remains unclear. Projects 1 and 3 will be (and already are) self-supportive once the platforms are well established. Concerning project 2, AI use has the potential to be much cheaper than regular forest inventories and forest monitoring systems. Yet, having access to these technologies and mastering their use is still unclear.

End-users of the solutions proposed: While forest managers clearly are end-users, political authorities are sometimes welcomed (such as in project 3), sometimes not (such as in project 2).

Measures

Continuity of the presented projects after the lifespan of the projects is needed.

Create some sort of incubator to establish a link between projects and companies. It would also ensure financial continuity.

Cross-border cooperation is important.

The source of finance is crucial: who is paying influences the use of the innovation as much as who is using it.