ForestValue

NEWSLETTER #10

DECEMBER 2022

Picture by Gabriel ALENIUS via www.unsplash.com

CONTENT

GREETINGS FROM THE COORDINATOR

Dear ForestValue Friends,

this is now the last newsletter we will publish from the ForestValue project. There are only a few remaining tasks left until the project will be officially finished at the end of March 2023.

The ERA-NET Cofund Action 'ForestValue – Innovating forest-based bioecomy' was officially started five years ago, on the 1st of October 2017. We then announced that "*the aim of ForestValue is to comprise the joint implementation of a trans-national call for proposals for research, development and innovation in the forest-based sector with a clear financial commitment from the participating national (or regional) research programmes and the EU*" and with the help of all of you as our stakeholders we did succeed in this, actually, we even exceeded expectations by having two trans-national calls successfully launched.

However, let us not forget that this is not just a single Horizon Europe project but a part of series of steps in the process of building up a European-wide partnership for the forest-based sector. Just to remind you, this European success story we are writing was initiated back in 2004 when we started with the very first ERA-NET in the forest-based sector, called "Networking and Integration of National Programmes in the Area of Wood Material Science and Engineering", better known as WoodWisdom-Net. After 6 individual ERA-NET projects and 8 joint calls with total investments of more than EUR 100 million, we can definitely say that we have made an impact, on various levels.

In our previous newsletter edition, I was telling you that SCAR FOREST (the Strategic Working Group on Forests and Forestry Research and Innovation of the Standing Committee on Agricultural Research) had been working on a fiche document describing a possible European Partnership on Forestry. Now in September, the Partnership Knowledge Hub has been discussing the bottom-up proposals for partnerships and, based on the initial timeline, in April 2023 we could expect for advice from the Partnership Knowledge Hub on the identification of potential new partnerships. There are still multiple steps before anything is confirmed for the new partnership portfolio but like I was telling previously, we are carefully monitoring the developments and will make every effort to support the process in a way that a European Partnership on Forestry would be one of the new European Partnerships starting in 2025.

A positive signal for our efforts is that on 01/11/2022 we have started with a new four-year Horizon Europe project EUFORE (European Forest Research and Innovation Ecosystem). In short, the overarching aim of EUFORE is to develop a sustainable, trans-national environment for co-defining, implementing and evaluating R&I agendas and roadmaps for forestry and the forest-based sector in Europe. This will support the preparation for a possible European R&I Partnership on Forestry under the Horizon Europe Programme. The project consortium consists of 15 partner organisations from 10 countries and is coordinated by the European Forest Institute. For more information, please see EFI's news announcement and a short article later in this newsletter.

Moreover, what is especially good news for the research community is that on 01/01/2023 we will start with another new Horizon Europe project, called ForestValue2. As the name already implies, it is a continuation of

ForestValue aiming at implementing at least one joint call for RDI proposals, this call dedicated to the forest-based sector. We will start defining the call topics early next year and if no major surprises, the first call should be launched in the summer of 2023. ForestValue2 will be a 5-year project, coordinated by the Ministry of Agriculture and Forestry of Finland. More information will follow on this, too.

Finally, as the project coordinator for ForestValue, I would like to express my sincere gratitude to all of you who have been involved in making ForestValue a success: of course, first of all to you ForestValue funders and all your representatives, but also to the evaluators involved in our two calls and to all other experts and stakeholders. To the researchers and their project stakeholders I would like to say that you are doing most valuable work: collecting latest scientific evidence, thus supporting European decision-makers to base their decisions on the latest scientific evidence. My sincere thanks and congratulations to you all.

But the story continues, so we will keep in touch. Stay tuned!

Take care, all the best,

Mika

Robert MAVSAR, European Forest Institute:

"ForestValue is an excellent example how to build a vibrant international and multi-discipline network. Bringing together, researchers, policy makers and practitioners to create and disseminate new knowledge on different aspects of the forest value chain. ForestValue has shown the path to follow by upcoming initiatives (e.g., European Forest Partnership), which aim at strengthening the European forest research and innovation area."

Project Officer Nicolas FAIVRE, European Research Executive Agency:

"The projects funded under ERA-NET Cofund ForestValue contributed to several targets of the new EU Forest Strategy for 2030 while promoting innovation and competitiveness of the forest-based sector in Europe. Ensuring the multi-functionality and sustainable management of forests is essential to achieve the ecological transition and climate neutrality objectives set by the European Green Deal."

EUFORE (European FOREST Research and Innovation Ecosystem)	**ForestValue2 (Innovating forest-based bioeconomy)**
4 years (11/2022 – 10/2026) * Research and innovation action (RIA)	5 years (01/2023 – 12/2027) * Coordination and support action (CSA)
PARTNERS: FINLAND: **Coordinator European Forest Institute (EFI)** & Natural Resources Institute Finland (LUKE) & Ministry of Agriculture and Forestry (MMM) AUSTRIA: University of Natural Resources and Life Sciences (BOKU) BELGIUM: The International Union for Conservation of Nature (IUCN) & INNOVAWOOD ASBL & Forest-Based Sector Technology Platform (FTP ASBL) CROATIA: Croatian Forest Research Institute (CFRI) DENMARK: University of Copenhagen (UCPH) FRANCE: National Research Institute for Agriculture, Food and the Environment (INRAE) & GIP ECOFOR (Affiliated Entity) GERMANY: Agency for Renewable Resources (FNR) ITALY: Ministry of Agricultural, Food and Forestry Policies (MIPAAF) SLOVAKIA: National Forest Centre (NFC) SPAIN: Forest Sciences Centre of Catalonia (CTFC) & Tecnalia Research & Innovation	**PARTNERS:** FINLAND: **Coordinator Ministry of Agriculture and Forestry (MMM)** ESTONIA: Ministry of the Environment (MoE EE) GERMANY: Agency for Renewable Resources (FNR) IRELAND: Department of Agriculture, Food and the Marine (DAFM) ITALY: Ministry of Agricultural, Food and Forestry Policies (MIPAAF) & Council for Agricultural Research and Economics (CREA) LATVIA: Latvian Academy of Agricultural and Forestry Sciences (LAAFS) NORWAY: The Research Council of Norway (RCN) POLAND: National Science Centre (NCN) ROMANIA: National Institute for Research and Development in Forestry (INCDS) SLOVAKIA: National Forest Centre (NFC) SLOVENIA: Ministry of Education, Science & Sport (MIZS) SPAIN: State Research Agency (AEI); Spanish Foundation for Science & Technology (Affiliated Entity) (FECYT)
OBJECTIVES: Supports the preparation for a possible European research and innovation partnership on forests under the Horizon Europe Programme. It aims to develop a sustainable, transnational, co-creative environment to define, implement and evaluate research and innovation (R&I) agendas and roadmaps for the entire forest-based value chains in Europe.	**OBJECTIVES:** 1) Identification of common research & innovation priorities in the area of forest-based bioeconomy; 2) Implementation of a joint call(s), resulting in the funding of transnational collaborative R&I projects; 3) Implementation of other joint activities supporting the market, regulatory or societal uptake 4) A multi-actor approach in addressing Global Challenges, incl. relevant contribution to the SDGs.
Join us! In 2023: • Stakeholder ENGAGEMENT HUB • Regional WORKSHOPS • Development of European Strategic Research and Innovation Agenda • WEBINAR SERIES on economic, environmental and policy aspects of the forest-based sector	**Join us! In 2023:** • Joint CALL for Research proposals • ONLINE Breakfast club • Scientific aperitif event
CONTACT: Marko LOVRIC, EFI	**CONTACT:** Mika KALLIO, MMM

FORESTVALUE FINAL CONFERENCE MADRID

The ForestValue Final Conference was held at the Royal Botanical Garden in Madrid on 28-29 of September 2022. The conference brought together around 100 participants from all over Europe to learn about the final outcomes of the 17 RDI projects funded under the ForestValue Joint Call 2017 and to kick-off the planned activities of the granted RDI projects of the Joint Call 2021.

Interested stakeholders from the forest-based sector were able to learn a lot from the various presentations on "Sustainable Forest management" on day one or "Building with wood" on day two. The presentation of the projects was highly informative, exciting results were found and passionately presented. Inspiring was the very active participation of industry stakeholders in the projects (e.g. FunEnzFibres, FIRENWOOD). Networking between the projects of the two calls was also very effective; direct opportunities for cooperation were found or results were shared and used in other partner projects CLICKdesign/WoodLCC).

Among the various keynote speeches, it was especially interesting to listen to Mr Nicolas FAIVRE. Besides illustrating the EU investments in forest R&I, Mr Faivre discussed the different impacts of ForestValue, ranging from improving resilience of forests to climate change to promoting the bio-economy while preserving biodiversity. Mika KALLIO, Project Coordinator of ForestValue, gave a great insight by informing the audience that ForestValue is currently the 6th ERA-NET project after predecessors like WoodWisdom or Sumforest, and that all together have launched 8 joint calls with total investments of more than EUR 100 million in the forest-based sector. The first day of the ForestValue Final Conference was closed by Dr Mariano FUENTES SEDANO, Counsellor of the Municipality of Madrid who introduced the Madrid Metropolitan Forest Project. Dr FUENTES pointed out: "*the forest is a tool to fight against climate change, against desertification and against pollution. In Madrid, a space like this is life insurance*". After the presentation, more than 80 attendees visited two different areas of the Metropolitan Forest, where it has been possible to restore a highly degraded environment in a semi-arid climate.

Our final keynote speaker, Dr Andreas KLEINSCHMIT VON LENGEFELD, highlighted and discussed the major developments in the European context in the forest-based sector in respect to the transnational RTDI funding during the past two decades. After this, Dr Kleinschmit von Lengefeld moderated a panel discussion involving six distinguished experts representing different ForestValue stakeholder groups. The lively discussion focussed, among

Some of the speakers at Final Conference; Pictures by FNR

other things, on discussing any individual turning points in/for forest-based research in the last 20 years. One of the issues raised was understanding the importance of communication, not only about communicating forest-based research to society but also about communicating with other sectors.

The conference closing speech was given by Mr Mika KALLIO, also in which he announced two new projects which will soon be launched to further support to development of the forest-based sector in Europe (EUFORE & ForestValue2, please see page 4).

For recordings and more info, please check the event website https://forestvalue.org/final-conference/.

Final conference at Botanical Garden und field trip to Metropolitan forest; Pictures by FNR

SCAR POLICY BRIEF AGAINST IMPORTED DEFORESTATION

SCAR (Standing Committee on Agricultural Research) POLICY BRIEF:

Picture by Karsten WINEGAART via www.unsplash.com

Imported deforestation is defined as the loss or degradation of forest in producing countries caused by the European Union's (EU) agricultural imports (agri-food, biofuels, aquaculture and forestry). The EU's import of these so-called forest-risk commodities contribute to about 16% of the global deforestation due to trade, placing Europe in second position after China (WWF, 2021). Globally, forest area continued to decline at a rate of 4.7 million hectares per year over the decade 2010-2020 (FAO, 2020). Net deforestation is now highest in Africa, followed by South America. This net decrease in global forest area corresponds to gross deforestation of 10 million hectares per year (over the period 2015-2020), mainly in tropical areas, half of which is offset by an expansion of forest area by 5 million hectares per year, mainly in temperate areas. Commodities put on the European market may not only require additional cropland and trigger deforestation, but may also be responsible for forest degradation, either because these commodities are grown under the cover of a forest that was initially undisturbed (e.g., coffee, cocoa), or because they consist of wood products. Forest degradation impacts forest ecosystems in tropical, temperate, and boreal biomes alike.

The objective of the SCAR policy brief is to provide guidance on existing knowledge gaps and how these gaps can be addressed in the design of research programs to combat imported deforestation. The brief primarily targets R&I policymakers and funders in the European Commission and national ministries. It is also intended to provide advice to researchers and their institutions in conducting research in this field.

https://scar-europe.org/images/FOREST/Documents/Policy-brief-Combatting-imported-deforestation.pdf

Alicja DYLAG, Lidia TROCHA, National Science Centre, Poland

"ForestValue Programme has created many opportunities in forest-based research support. Partners identified common R&I priorities and created funding instruments, namely joint international calls for research projects, where applicants were expected to use interdisciplinary approach. Many innovative & promising projects were funded, which will surely be of great benefit to people & environment.

Taking into account the experiences and benefits of participation in the ForestValue Programme, NCN decided to continue this cooperation within ForestValue2. We would like to still create the funding opportunities for Polish researchers in this area and we believe that the international cooperation – especially now, in these difficult times – is of great value. That is why we are already looking forward to future joint activities!

Last but not least, we would like to take this opportunity to thank the whole ForestValue network for a wonderful cooperation and a valuable experience. We wish all the partners best of luck in their future efforts to make the world a better place."

FOREST TECHNOLOGY PLATFORM - HAVE YOUR SAY

Describe the research and innovation topics that have the highest priority for the forest-based sector in 2025-2027

End of October 2022, FTP (the Forest-based Sector Technology Platform) launched its Topic Prioritisation Process, an open consultation to stakeholders of the forest-based sector. This consultation aims to establish which new R&I priorities to highlight in the discussion on the European Union R&I Funding Programmes 2025-2027.

The objective is to collect new ideas and ambitious research & innovation strategies with high potential to realise the FTP Vision 2040 and its ten Vision Targets. This survey is the first step in FTP's Topic Prioritisation Process preparing for Horizon Europe Work Programmes 2025-2027 and will result in a collection of topic ideas/case studies to be brought to the European Commission, the Horizon Europe Programme Committees as well as European Partnerships and National Funding Agencies.

In the survey, we ask the stakeholders to describe (as clearly as possible) a **scope and strategy**, **positive impacts** for the environments, the competitiveness and the society in Europe, assuming that the R&I strategy is successfully implemented and the results adopted more widely. We also ask to estimate the **funding needed**, as well as **required competence and time** to implement. Especially the description of the potential impact on different time horizons is important if we want to better understand which topic to prioritise.

Link to the survey: https://forms.gle/Eeb9JFrwsrj7Aa8s7

Please feel free to share the consultation link with your colleagues or members. The consultation phase is open until the **end of 2022** but **we would be grateful if you can provide your input as soon as possible.**

Should you have any questions, do not hesitate to contact Mr Johan Elvnert (johan.elvnert@forestplatform.org).

More information about FTP: www.forestplatform.org/

Andreas KLEINSCHMIT VON LENGEFELD | Homo Silvestris Europae)

"The strategic evolution of transnational cooperation reached a new phase, as ForestValue has successfully taken all thresholds to boost an innovative and smart European Research Area for the forest-based sector. Based upon actual knowledge and former achievements, the selection of topics addressed well the needs of the sector to enhance its multiple roles for achieving the objectives of the Green Deal. The diverse fruitful partnerships funded between industry and academia were matched by spot-on coordination to complete the triple-helix. "There is a new DNA of forest knowledge in Europe."

BarkBuild – Tree bark as a renewable source of wood protection materials for building applications

Forests cover 159 million hectares or 43% of Europe's surface. In addition to their recreational value, forest are gaining importance as renewable resources that will enable the transition to a self-reliant circular economy. Climate change and transition from fossil-based to bio-based economy are obvious driving forces that pose the challenge of more efficient management and use of forests. Today, the EU's forest industry produces a broad range of products such as wooden building materials, pulp and paper products, and biochemicals.

Pictures by Vince VERAS & Clay BANKS via www.unsplash.com

A common theme in their production is the stripping of wood of bark, which is the outermost protective layer of trees. As a result, there is approximately 23 million metric tons of tree bark available as a lignocellulosic side-stream that does not compete with food production from arable land in the EU-27. However, the majority of bark is destined for combustion or landfilling.

Inspired by the natural protective function of bark, six partners from Sweden, Poland, Finland, Norway, Latvia and Slovenia have joined forces within the BarkBuild project to develop new and sustainable use for bark in wooden building materials. The consortium combines expertise in materials chemistry, engineering, technology and sustainability assessment of wood processing along with linkages to the bio-based industry. We use industrially sourced softwood and hardwood bark as resources to develop new bark-based composites and protective formulations for wood treatment.

In practice, we will attempt to fractionate bark into its main components and recombine these fractions in order to produce functional formulations for wood treatment. In line of this approach, we will carry out fractionation of bark into polyphenols, polysaccharides, and lipophilic extractives, all of which have their unique properties that can be used in a beneficial way. For instance, the bark polyphenols and extractives are promising components for wood preservatives (coatings and impregnation) owing to their protective properties and activity against microorganisms and insects. Additionally, we will exploit the fire-retardant properties of bark and develop new biodegradable polymer composites reinforced by processed bark for improved indoor air quality. Characterization of the bark-derived chemicals and materials is another challenge addressed by the project. This way we wish to contribute to improved understanding of structure-properties-performance relationships of these complex materials. Finally, sustainability and safety of the materials, and possibilities for cascading use of the modified wood products will be assessed and demonstrated.

This way, the BarkBuild project tackles the societal challenge of climate change by developing new, long-lasting wood building materials with low environmental impact that will have more favourable carbon footprint and environmental soundness merits compared to existing commercial products. The demonstration materials will facilitate increased use of wood for construction and building uses, while ensuring safe indoor spaces and preservation of the environment. The project gains valuable steering from an Industrial Advisory Board represented by Holmen Wood Products AB, Koskisen Oy, Lumir Oy, and Latvijas Finieris AS. Alongside with technical impacts, the project will be central in training of students and early-career researchers who have a unique opportunity to create strong European networks for their future careers. **More information: www.barkbuild.net/**

LEARNFORCLIMATE Learning to realize multiple forest policy objectives under climate related stress and disturbance

LEARNFORCLIMATE addresses the urgent need to implement the Sustainable Development Goals (SDGs) by promoting multifunctional management of forests in times of rapid socio-ecological change. The aim is to support learning that enables concurrent achievement of multiple forest related objectives while responding to climate change related stress and disturbances. Previous research highlights goal conflicts between biodiversity-, climate-, and forest policy objectives, and new ways to handle goal conflicts and promote synergies are called for. Learning, understood as changes in key actors' beliefs and behavior, is key to handling the combined pressures of these challenges. Climate related disturbances and stress, such as droughts, fires and storms, can be disastrous but they can also open opportunities for learning and change. However, the knowledge about the preconditions and outcomes of such learning processes is limited. LEARNFORCLIMATE develops innovative methods for collaborative science-, practice-and policy learning. The project investigates the connections between disturbances and stress, policy change, forest owners' and managers' behavioral responses, and ecosystem services outcomes. An interdisciplinary team of social and natural scientists in four European countries apply an integrated, cross-country comparative and transdisciplinary research approach in collaboration with key actors in each country. LEARNFORCLIMATE identifies factors enabling and constraining learning and goal-achievement; develops innovative methods for promoting learning; and provides decision support and policy recommendations on how to realize multiple objectives and SDGs under climate related stress and disturbance.

Picture in Madrid, 09/2022 by Carina Lemke

Academic Partners:

- Luleå University of Technology (SWEDEN)
- Swedish University of Agricultural Sciences (SWEDEN)
- Forest & Environmental Policy, University of Freiburg (GERMANY)
- European Forest Institute Bonn (GERMANY)
- IFiS PAN Institute of Philosophy and Sociology Polish Academy of Sciences (POLAND)
- University of Agriculture in Krakow (POLAND)
- University of Ljubljana, Biotechnical Faculty, Department of Forestry and Renewable Forest Resources (SLOVENIA)

www.ltu.se/research/subjects/Statsvetenskap/Forskningsprojekt/Learnforclimate?l=en

FORECO – The role of forest recovery from biotic and abiotic threats for risk resilient management

The aim of FORECO is to provide tools for identifying and operationalizing sustainable and multifunctional forest use and management strategies, which simultaneously consider ecological and economic risks arising from biotic and abiotic threats in the coming decades (i.e., drought, storm, bark beetles) and take into account forest recovery from disturbances. In close collaboration with local, national and EU-level stakeholders, we will identify needs of forest practitioners, advisors and policy makers for evidence to inform adaptation strategies in face of increasing vulnerability of forests and uncertainty about the future.

The core of our methodological approach is a systematic analysis of remote sensing and ground-based monitoring data, and a process-based modelling platform for managed forests coupled with a multi-objective, risk-sensitive optimization model to schedule potential trends in forest ecosystem functioning, ecosystem service provisioning and optimal management regimes under changing biotic and abiotic threats and timber markets. We will combine LiDAR observations of forest structure with a recently published remote-sensing derived disturbance map, develop new remote sensing approaches for mapping recovery, and apply process-based vegetation modelling. The outputs of the vegetation model (i.e., harvest, carbon storage, stand composition, stand structure etc.) will serve as input for the optimization. The optimization approach builds on a recently developed robust and multi-objective method, which is a dynamic approach and allocates proportions of forestland in an optimal way to various forest activities.

With this unique combination of data, economic and ecological modelling and the involvement of expert knowledge, we expect novel insights into the dynamics of forest responses to biotic and abiotic threats with important implications for sustainable management of forests and their contribution to the SDGs.

Picture: Cross-project modeller meeting in Freising *© FORECO*

ForestMap – The next generation of forest maps – adapting a Nordic success story across the globe

Forests provide countless values to people and society, both in developing as in developed countries. For the developed countries, the main value has been from wood and products from wood. In many developing countries, the forest is still seen as a common right of access, supplying firewood, food and building material. Today, new societal values are provided by the forests, important to human well-being. Presumably, the most important value of the forests is that they have been identified to have a major role in global climate change, where deforestation, afforestation and new strategies to actively increase carbon sequestration, are very important processes. Moreover, the forests are critical habitats for biodiversity and there is increasing evidence that biodiversity contributes to forest ecosystem functioning and the provision of ecosystem services.

However, there is very little global discussion on how improved management of productive forests could contribute to mitigation of climate change and enrichment of biodiversity. If forest owners could utilize efficient decision tools for improved management and precision forest management, they would benefit with higher yield and net turnover, which in turn motivates them to further improve the management. Higher net turnover is also a motivating factor to reinvest in additional management and afforestation, hence, creating a positive loop that mitigate climate change by increased carbon sequestration and is beneficial to biodiversity. Extrapolated to the global forest estate of 3.9 billion hectares, these data suggest that about 77% of the world's forest is owned and administered by governments, about 4% is reserved for communities, about 7% is owned by local communities, and about 12% is owned by individuals.

Research partners: Linnaeus University, Swedish University of Agricultural Sciences, University of Helsinki, Marmara University / Istanbul Technical University

Industry partner: Katam Technologies AB

Test areas: Sweden, England, Turkey, Uganda, Chile

In the above context, a fundamental need from forest stakeholders is data about the forest state and change in terms of biomass, tree species composition, and forest cover. However, depending on the stakeholder, the need of data, required accuracy, willingness to pay and need of decision support is very much variating. When also considering that many stakeholders are illiterate and may not have adequate competence to interpret data into management decisions, there is a clear need for a solution that also can strengthen equality (including gender equality) among stakeholders.

The ForestMap project will provide new means for forest mapping globally and provide new open data crucial for sustainable forest management and mitigation of climate change. The overall objective is to advance the societal values of forest use by developing and evaluating a new methodology to produce forest maps across the globe. The project will develop easily applicable methods for forest map production using crowd-sourced data from smartphones and remote sensing data from space- and airborne systems. Artificial Intelligence (AI) algorithms will be developed in order to produce tailor-made forest maps to stakeholder's needs, corresponding to their willingness to pay. The societal value of the forest maps used in existing and new business models will also be explored.

WOODforHEALTH – Promoting safe and extended use of wood products in health buildings through development of antimicrobial surfaces, hygiene concepts, and guidelines

Wood calms us down, affects indoor air quality and sequesters carbon. To support the natural good properties of wood, new coatings that prevent the growth of microbes and improve cleanability of wooden surfaces are needed. The aim of the WOOD for HEALTH project is to promote the use of wood in healthcare buildings and to propose new European guidelines for that purpose.

The project is led by University of Oulu from Northern Finland. The partners include three institutes from Latvia, Norway and Germany focused solely on wood research, two companies from Latvia and Germany manufacturing coatings and a Swedish architecture firm with acknowledged expertise in healthcare buildings. To support the project operators, both national groups and an international expert group will be set up.

Picture: project meeting in Göttingen ©WoodforHealth

The increasing popularity of wood construction is boosted in particular by environmental factors. The most significant of these might be the fact that a wooden building sequesters carbon from the atmosphere for decades. However, there is a common fear that wooden surfaces get dirty easily and are hard to clean, which has limited their use in premises with high hygiene requirements. This is unfortunate because the beneficial effects of wood on indoor air quality are known, as is the fact that wooden surfaces are considered calming and warm. Therefore, the WOOD for HEALTH project is directly based on the needs of constructors, the wood industry, and developers & owners of hospital buildings.

WOOD for HEALTH will use a fictional re-design of Queen Silvia Children's Hospital in Gothenburg as a point of departure for the experimental development. The questions asked are:

- How has wood been used and what can be learnt from experience?
- What are the opportunities to use more wood in healthcare buildings?
- What new knowledge is needed to use more exposed wood?
- What requirements need to be met by new products to facilitate the use of more wood in a fictional re-design of Queen Silvia Children's Hospital?

The project will study the cleanliness and cleanability of wooden surfaces, develop innovative antimicrobial and breathable coatings and compile the first European guidelines on using wood in different premises and surfaces of health care buildings. Three different approaches have been planned for the development of new coatings, and coatings that create a film as well as completely breathable coatings without films are included. Natural polymers are also being experimented with in the coatings as antimicrobial factors instead of traditional toxic chemical compounds. Processed and unprocessed wooden surfaces are being studied in terms of hygiene, mechanical and chemical durability, light resistance, flammability and water vapour permeability. All of these are significant properties in health care premises.

The project has web pages at www.woodforhealth.eu. It had its first face-to-face project meeting in September, in Göttingen, Germany, in connection of the Annual Meeting of the Northern European Network for Wood Science and Engineering where the project was also introduced by a poster presentation.

WoodLCC – Enhanced Life-Cycle-Costing in wood construction by novel methods for service life planning

Under the 2014 EU procurement directive (EU 2014) a contract must be awarded based on the most economically advantageous tender. The directive further "*…promote the development and use of European approaches to life-cycle costing as a further underpinning for the use of public procurement in support of sustainable growth*". Life-Cycle-Costing (LCC) is one of the basic indicators for sustainability and cost effectiveness applicable in construction and the LCC standards with buildings in focus are EN 16627 (assessment of economic performance of buildings) and EN 15643-4 (framework level for the economic performance assessment). The LCC user software utilised today are based on the European Standards and LCC is being applied by an increasing number of public authorities across Europe. Hence, LCC results are already of great importance for national decision making. However, a severe weakness in LCC is the lack of detailed and relevant information on service life estimates and the expected maintenance intervals of wood products and structures.

Pictures: Illustrating the importance of moisture safety during the construction phase. Left & centre: Rainwater ingress; Right: Installation of WoodLCC test house. ©WoodLCC

The novelty of WoodLCC is to optimise the input data for LCC for wood-based building products. WoodLCC will take full advantage of results from novel methods for detailed service life performance specification established through extensive research over the last years on dose/response functions for exterior wood elements.

The overall objective of WoodLCC is to enable robust and precise LCC based on input from novel models for detailed service life performance specification for wooden components and buildings. The key scientific and technological objectives of WoodLCC defined to provide optimised input data to LCC for wood-based materials are to:

1. Utilize novel service life prediction models to provide reliable service life estimates for LCC of wooden components & buildings.
2. Quantify the effect of different maintenance, replacement & repair schedules on service life and the effect on LCC of buildings.
3. Survey service life and cost acceptance of stakeholders at a European scale.
4. Determine LCC of wooden components and buildings in comparison with competing alternatives.
5. Analyse cost benefits of moisture safety measures during the construction phase.
6. Quantify the impact of imperfect design details on LCC.
7. Identify and analyse potential risks related to the use of mass timber in the climate envelope as well as the costs associated with damage and mitigating measures.
8. Validate service life and LCC estimates based on real-structure inspections.

The project will deliver digital specification added value for forest products and ensure an efficient use of resources by optimising the wood product to the end user performance requirements. This innova-tion is the main deliverable, the WoodLCC data platform. The delivery of reliable timber products meeting aesthetic and functional serviceability and LCC expectations will consequently improve the wood materials life cycles environmental, societal and economic impacts, reducing the cost burden (economic and societal) of premature failure in service and replacement due to obsolescence. This will enhance competitiveness in construction, ensuring product solutions overcome current challenges of inappropriate specification, premature failure in service and uncertain reliability fostering low confidence of performance that is mismatched with end users' expectations in the building trade.

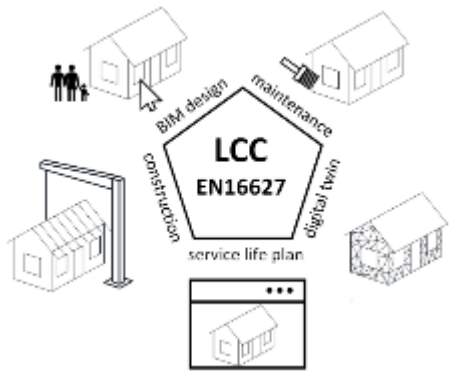

Figure: Core elements of WoodLCC ©WoodLCC

WoodLCC web link: www.nibio.no/en/projects/WoodLCC?locationfilter=true

SustMultBiomass – Sustainable and multifunctional use of forest biomass

We aim to identify pathways of sustainable future forest management that develops the bioeconomy and multifunctional forests by mitigating climate change, delivering non-woody forest ecosystem services (FES) and preserving biodiversity. This will be based on analyses of synergies and trade-offs of alternative uses of forest biomass for the coming 30 and 100 years.

Our methodological approach is to simulate a large number of forest management alternatives and then apply multi-objective optimization to identify future pathways that fulfil objectives to be specified for the forest. This optimization will include harvest and forest variables, FES, biodiversity and climate impact assessment based on Life-Cycle Assessment (LCA), all handled by an optimization tool to be further developed.

We will further investigate uncertainties and sensitivities of the results to different assumptions, particularly in the LCA. We have a particular interest in the potential for substitution of fossil-based products for bio-based products. This includes investigating how the impact of this substitution may change in the future, as the world decarbonizes resulting from societal actions to reduce the use of fossil-based products. Next, we optimize the forestry to reach specified targets on harvest levels, climate change mitigation, FES delivery and biodiversity conservation. The optimization tool and models for projecting FES, biodiversity were developed within earlier ERA net research projects (BiodivERsA, Sumforest, ForestValue).

In **SustMultBiomass** we aim to make synthesis studies combining knowledge gained from these past projects. In parallel to the interdisciplinary scientific work, we conduct transdisciplinary work with stakeholders. Specifically, we simulate/optimize the forest use that they advocate.

One aim with this work is for them to obtain an understanding of the long-term consequences of the forest use that they advocate on forest(ry) variables, climate change mitigation, FES and biodiversity. Finally, we will write a synthesis report on the climate, FES and biodiversity impacts of alternative forest uses in the Nordic countries. The report is intended for a broad range a knowledge users, and will facilitate application of the new knowledge in practical forestry, conservation and environmental policy development.

Seeing trees and forests for the future: assessment of trade-offs and potentials to breed and manage forests to meet sustainability goals

Sustainable management of forests is challenging but of utmost importance not only for bioeconomy but also for mitigation of climate change effects. In sustainability studies, the impacts of tree breeding, genetic diversity and regeneration methods on growth and resilience of forests have not been fully acknowledged. Tree breeding and utilization of genetically enhanced forest regeneration material has already impact on present forest productivity, and other traits such as wood quality and resilience can be improved when the genetic basis of traits are known. Effects of climate change can be mitigated by good combinations of tree breeding, adaptation-based deployment and silviculture if crucial changes in climate can be predicted and the genetic basis of adaptation to climate is understood. However, trade-offs at biological level (genetic correlations between traits) and at SDG level need to be addressed when assessing different regeneration methods.

In Assess4EST, we use novel genomic breeding tools and introduce new features to national growth and yield simulators to assess possibilities to combine sustainability goals in forest management by studying the impacts of genetic variation in the regeneration methods: even-aged planting with advanced generation improved material vs. natural regeneration in even and uneven aged stands. We will concentrate on assessing traits important for sustainability goals: growth, increasing resilience & adaptability of forests to rapid climate change, as well as wood quality suitable for products that store carbon and substitute more emission-intensive non-renewable products.

We will produce scenarios for forest management concentrating not only on yield, carbon sequestration and biodiversity, but also resilience of forest in a changing climate and quality of the biomass produced. Furthermore, this project will create a novel platform for discussions between researchers, tree breeders and stakeholders on the future use of forests and wood, building joint insight on how trees and forests should be bred and managed to meet sustainability requirements.

Website: www.luke.fi/en/projects/assess4est

Seeing trees and forests for the future, what are the future uses of wood?

ONLINE WORKSHOP 25th of January 2023 9:00 - 11:00 CET +1 - Joint discussions of researchers and stakeholders

The forest resources are also raw material for future industry

- Use of wood in the future?
- Quality vs volume? What properties will be important? What tree species will be important?
- Tree breeding for future climate and future uses of trees and wood

For registration and link, please contact
Knut Magnar Sandland knut.magnar.sandland@nibio.no or
Arne Steffenrem Arne.Steffenrem@nibio.no

MultiForest final policy recommendations - Better policies and management for sustainability transformations: How can expectations for forests be met?

Summary: Forests play an important role in climate change mitigation, with potential synergies with biodiversity conservation and the provision of other ecosystem services. However, prioritizing only climate change by carbon sequestered in forest as a resource may cause trade-offs with other objectives. Diversifying forest management will alleviate trade-offs between ecosystem services. Policy planning should incorporate a thorough and transparent analysis of interactions and trade-offs between different forest ecosystem services. The targets of the EU Biodiversity Strategy for 2030 can be achieved without major negative impacts on the timber production.

Actions:

- Promote interaction across policy domains to improve policy coherence.
- Develop and implement ambitious biodiversity policies to secure ecosystem sustainability.
- Develop a strategy to guide diversification of forest managements to sustain multiple ecosystem services at the landscape level.

This policy brief is aimed at specialists, policy makers, professionals and the general public interested in the societal meanings, roles and functions of forests. At the time of grand sustainability challenges, we want to encourage constructive dialogue. We seek ways to consider the role of forests in providing multiple ecosystem services. Multi-disciplinary science can offer toolsets that support long-term decision-making.

Curious? :) Please READ MORE UNDER: https://forestvalue.org/wp-content/uploads/2022/11/FINAL_MultiForest-policy-brief.pdf

Dynamic response of Tall Timber Buildings under Service

The DynaTTBs webpage www.dynattb.com has worked as a hub for spreading news about the project and the work conducted within the project. The news page shows short glimpses of the activity in the project and has links to papers published within the project. For those interested in more results from the project there will be several presentations from the project at the WCTE 2023 in Oslo, Norway.

During the final project meeting in Skellefteå in June 2022 the project group also had the possibility to visit the 20-storey tall timber building. During the meeting details regarding the final guidelines were discussed. The plan is for publishing the guidelines during 2023. Results will also be presented and discussed during the COST Action Helen (CA20139) led by the project partner Iztok Šušteršič from InnoRenew CoE.

Picture: Final project meeting in Skellefteå June 2022, on top of Sara Cultural center, a 20 storey tall CLT building. *©DynaTTB*

InnoCrossLam - Innovative Solutions for Cross Laminated Timber Structures

After three and a half years, InnoCrossLam has reached its final phase. The impact of the project in terms of publication has been the following: 35 peer-reviewed research articles (10 of which are still in the review phase), 2 books for dissemination, 3 dissertations, 23 master or bachelor theses, and many articles for dissemination to lay audiences. You can download these publications on the project website and explore the project findings. Recently, however, short articles for stakeholders have also been published; one on the innovative multifunctional CLT and the other describing the experimental and numerical investigations of CLT. The project will be more extensively presented also on the next year's World Conference on Timber Engineering in Oslo, Norway (WCTE 2023).

Picture: InnoCrossLam members at Skelleftea meeting; From left to right: Henrik Danielsson, Daniel Asp, Pi Ekblom, Philipp Dietsch, Thomas Demschner, Erik Serrano, Markus Lukacevic, Matthias Arnold, Boris Azinović, Martin Schenk, Josef Füssl and Stefan Winter

©InnoCrossLam

Link to project website: www.innocrosslam.zag.si/

Boris AZINOVIC, Slovenian National Building and Civil Engineering Institute (ZAG)

"InnoCrossLam and the Forestvalue ERA-Net pro-gramme have given me the opportunity to work as a project coordinator for the first time, making a huge impact on my career as a PostDoc researcher."

AVATAR - Advanced Virtual Aptitude and Training Application in Real Time

To achieve the projects' goals of reduced training and skill demands as well as mental workload for machine operators during harvesting and forwarding operations and make the work place more attractive, the project partners investigated beneficial work practices and support systems to develop virtual assistance and feedback systems in forest machines. A couple of short result communications are already available online (https://forestvalue.org/funded-projects-jc-2017/) or in selected scientific journals. Some of the project partners agreed continuing to analyse forest machine data from the field trials in Germany beyond the official project duration to get a better understanding of work practices of forest machine operators and related effects on productivity and resource efficiency.

Furthermore, based on the established collaboration & meaningful outcomes of AVATAR, several project partners are now searching for new funding opportunities using project findings as a base for future research. During the project, the international consortium of experts from Germany, Sweden & Norway allowed for comprehensive insights into challenges & opportunities, which forest machine operators are facing in central and northern Europe.

SMALLWOOD: Small diameter wood utilisation with innovative stand management for multifunctional forests and a growing sustainable bio-economy

The Komatsu 901.4 that was used in field studies in Sweden, Finland, Slovenia and Spain now has a new home! The last demonstration within the Smallwood project was at the 100-year anniversary for project partner company Bracke Forest. Boom corridor thinning was demonstrated, and a Danish contractor in the audience was so impressed that he bought the machine and transported it to Denmark. The machine operator at the demonstration (the same as in all tests and studies on this machine within the Smallwood project) was also recruited for teaching a couple of Danish operators on how to work efficient with the machine and with its upgraded C16c felling head. This can be considered as the last extension activity within the Smallwood project, and the hope is that it make a difference in the area of small diameter wood harvesting!

www.smallwood.eu/

Pictured: Komatsu and the upgraded Bracke C16c felling head ©Tomas NORDFJELL

I-MAESTRO: Projecting the future of our forests

The future of our forests is uncertain, especially with disturbances, like windstorms, wildfires and bark beetles, which are increasing due to climate change. In the I-Maestro project, researchers investigated how we can adapt our forests and their management to reduce the impacts of climate change and disturbances – while still be able to use wood and benefit from other forest ecosystem services. To fully understand the dynamics that are happening, we would need to do an experiment lasting maybe a hundred years, which would need to be replicated in different places. Since this is impossible and we do not have enough time due to the pressing challenges of today, forest researchers use models to make projections for the future. In this short documentary (Link) we produced for the I-Maestro project, you will learn what models can do, and how they can predict forest functions under disturbances. You will also explore the modelling of different climate and forest management scenarios – and find out how modelling actually works, and why not only researchers should be excited about it.

Picture: I-Maestro researchers collecting data for modelling © I-MAESTRO

Link to project website: https://i-maestro.inrae.fr/

Check out the I-MAESTRO policy brief!

Decision making in forest policy and practice requires a solid evidence base. To contribute to this need, I-Maestro also published key results and policy recommendations derived from the project work in a policy brief with the same title as the video „Projecting the future of our forests“. In addition to the recommendations, the policy brief sheds light on the disturbance risks evolution in European forests, informs about forest recovery after disturbances, and discusses the role and contribution of forest simulation modelling to make our forests more resilient.

https://i-maestro.inrae.fr/wp-content/uploads/2022/12/I-Maestro-Policy-Brief_2022.pdf

Picture: From left to right: Raphaela Ivanica, Daniel Ridley-Ellis, Marlene Cramer, Bahareh Nasiri, Annette Harte, Karin Sandberg, Janina Östling, St John Walsh, Elizabeth Shotton, Ylva Sandin during the Forest Value conference at Skellefteå, June 2022, ©InFutUReWood

InFutUReWood

The InFutUReWood project aimed to answer the question: **"How should we build today to be able to circulate tomorrow?"** covering both the design of new buildings, and the reuse of timber from buildings already at the end of their life.

The compilation of the main results is found in the "Summary report InFutUReWood – Innovative Design for the Future – Use and Reuse of Wood (Building) Components" , Sandberg et al. 2022 DOI: 10.23699/p41e-ae46, published at DiVA - Search result (diva-portal.org).

The project has also several accepted contributions to the WCTE, World Conference on Timber Engineering Conference, in Oslo 2023.

The ForestValue Conference, 21-22 June 2022 in Skellefteå, is accessible at RISE YouTube: www.youtube.com/playlist?list=PLqLiVcF3GKy3aUzhufoEjqBJx12VRiBLY,

An interview with three of the industry partners who worked on new design solutions can be found in: https://forestvalue.org/wp-content/uploads/2021/12/InFutUReWood-article-Nov18-2021.pdf.

Results were also presented in seminars and conferences.

FIRENWOOD – Improved fire design of engineered wood systems in buildings

Benefiting from the close collaboration between adhesive manufacturers, engineering wood providers, research institutes, and universities, FIRENWOOD delivered more than 2000 experiments using eighteen selected adhesives. Many adhesives were studied using different experimental methods and at different scales. To our knowledge, such a comprehensive experimental campaign has never been performed and reported openly. Several fire design models for CLT, GLT, glued-in rods, and I-joists were proposed, some of which have been included in the new draft of European standards for the design of timber structures (CEN/TC 250/SC 5 - Eurocode 5). New adhesive classification methods using only small-scale apparatus were also proposed in FIRENWOOD, which will be considered by the European Committee for Standardisation (CEN/TC 193/SC 1) in developing future European standards for wood adhesives.

Hopefully, the outcome of FIRENWOOD will facilitate increased production & demand of wood & glued elements, allowing for broader use of raw material and supporting regional wood processing companies. Most of the FIRENWOOD reports have been concluded and will be made public on our website shortly.
https://www.researchgate.net/project/FIRENWOOD-Improved-fire-design-of-engineered-wood-systems-in-buildings

MULTIFOREVER: FIN-FRA collaboration revealed the secrets of cold-stored spruce somatic embryos

In northern conditions, conifer seeds are subjected to low temperatures until the spring sun dries and opens the cones releasing the seed. Somatic embryogenesis, which mimics seed development, is a method of producing embryos in the laboratory, allowing tree multiplication. For flexibility in the propagation process, embryos are often cold stored before germination (Fig. 1a). Cold storage also improves the greenhouse survival of germinated embryos. A collaboration within the MULTIFOREVER project (LUKE, Savonlinna, FIN – INRAE, Orléans, FRA) has enabled a detailed study of the effects of cold storage by providing a scientific basis for the observed improvement (Fig. 1b): in Norway spruce, cold storage brings the storage compound profile of the somatic embryos closer to that of zygotic embryos. The prolonged cold storage may affect the acquisition of desiccation tolerance, which redirects the embryonic cell machinery from maturation to germination, thereby improving greenhouse survival. For the best results, this storage should be short (up to 8 weeks), but longer storage is not detrimental.

Picture: a) Spruce somatic embryos can be stored in large quantities at the cold room – even with positive effects on later germinants. b) These findings are strongly supported by spectral and chromatographic storage compound analyses (sugars, protein, starch) revealing similar profiles to their zygotic counterparts. © MULTIFOREVER

For more information, see Välimäki et al. 2022, Front. Plant Sci., https://doi.org/10.3389/fpls.2022.1031686 and our web page: https://multiforever.com/

Dr. Heino WOLF from Public Enterprise Sachsenforst, Competence Centre for Wood and Forestry, Pirna, Germany:

"As head of Department Forest Genetics / Forest Tree Breeding, I have to care about the conservation, characterization and sustainable management of our forest genetic resources in combination with the continuous supply of current knowledge and scientific news. For about 25 years, we have been working – together with partners from the Humboldt-University Berlin - on advanced technologies for the procurement of forest reproductive material with improved growth, quality and resistance features from several species. This time, the ForestValue-funded project MULTIFOREVER opened the possibility to work on this on an EU-wide scale – long overdue in these demanding times. I personally appreciated especially the involvement of 'research users' s. l. or better 'our clients' in the project events."

Cutting-Edge Forest Technologies and Management Solutions

European forestry faces a number of challenges, from lack of resource efficiency and modernisation, to decline in available skills and human resources in the sector, and not to mention the need to ensure minimal environmental impact. As a key sector, which provides rural jobs and affects other industries, innovative tools and thinking is needed to ensure the sustainability of European forest resources moving forward.

The project group on **Cutting-Edge Forest Technologies and Management Solutions** forms the projects of the ForestValue ERA-NET Cofund initiative. They have brought out innovative solutions for the sustainable management of multifunctional forests as well as innovative industrial production and processing technologies, products, concepts and services.

If you are a player in the forestry sector, then browse through our catalogue of results and see how you can benefit!

Catalogue Promotional Video: https://youtu.be/sc4VQUysl28

A separate **Catalogue Promotional Flyer** is available in PDF here.

All together, these projects bring forward the following:

- New processes for producing wood products
- Better understanding of the properties of wood and technologies for its analysis
- New techniques and technologies to support the valuation and valorisation of forests and wood
- An understanding the players in the wood economy from the grassroots and introducing methodologies and tools to improve their performance
- Research on the effects of policy on the wood economy and providing insights for improvement
- New or improved wood products for industrial application
- Methodologies and tools to improve wood economy performance
- Techniques and technologies to support the valuation and valorisation of forests and wood

Catalogue of Results

The projects have produced 49 results that are organised into the following categories:

- High-Value Added Wood Products
- Wood Grading Solutions & Technologies
- Wood Construction Material Innovations and Guidelines
- Forest Management and Logistics Solutions
- Policy Reports and Recommendations
- Wood Material Research and Insights Library

Forestry players are encouraged to browse through our catalogue and get in touch with the result owners to see how these results can benefit you!

SAVE THE DATES

25.01.2023 ONLINE: Workshop: Seeing trees & forests for the future, what are the future uses of wood? Joint discussions of researchers and stakeholders; For registration and link, please contact Knut Magnar Sandland knut.magnar.sandland@nibio.no

28.05.-1.6.2023, Cairns: IRG54 - The International Research Group on Wood Protection. *(WoodLCC participation)*

16.-21.7.23, Pasadena: IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2023 *(FORESTMAP participation with early results from the ongoing first user case)*

20.-22.8.2023, Helsinki: Sustainable Materials Research Summit *(BarkBuild participation)*

28.-31.08.2023 Helsinki: IBFRA Conference: Climate Resilient and Sustainable Forest Management (www.ibfra2023.org *(SustMultBiomass participation)*

09.-13.10.2023, Oslo: WSE 2023 Northern European Network for Wood Science and Engineering *(WoodLCC participation)*

10.-13.10.2023, Beijing: 16th International Conference on Durability of Building Materials and Components. https://dbmc2023.civil.tsinghua.edu.cn *(WoodLCC participation)*

03.-05.10.2023, Budapest:

ForestValue2 workshops in Bucharest (In person and online)

In the framework of the Project ForestValue2, the „Marin Dracea" National Institute for Research and Development in Forestry (INCDS) of Romania will organize two scientific events in Bucharest from 3rd to 5th October 2023:

- Workshop ***„Policy, science and practice together in the field of forest state monitoring on pan-European scale"*** to foster the exchange knowledge among scientists, stakeholders and policy makers in the field of forest monitoring
- Breakfast club for early-stage researchers & industry ***"Forests capacity to provide ecosystem services"*** to stimulate the emergence of new research and development topics by means of scientific debates around current and future issues of the forest-based and environment sectors

These events will take place back-to-back with the International Scientific Conference ***„Forest Science for people and societal challenges*** – the 90th „Marin Drăcea" INCDS Anniversary" dedicated to the celebration of 90 years of activity in forestry research of the National Institute for Research and Development in Forestry.

MORE INFORMATION ON FORESTVALUE:

Picture by Gabriel ALENIUS via www.unsplash.com

- https://forestvalue.org
- https://twitter.com/ForestValue2017
- www.linkedin.com/groups/12110816/

Imprint

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