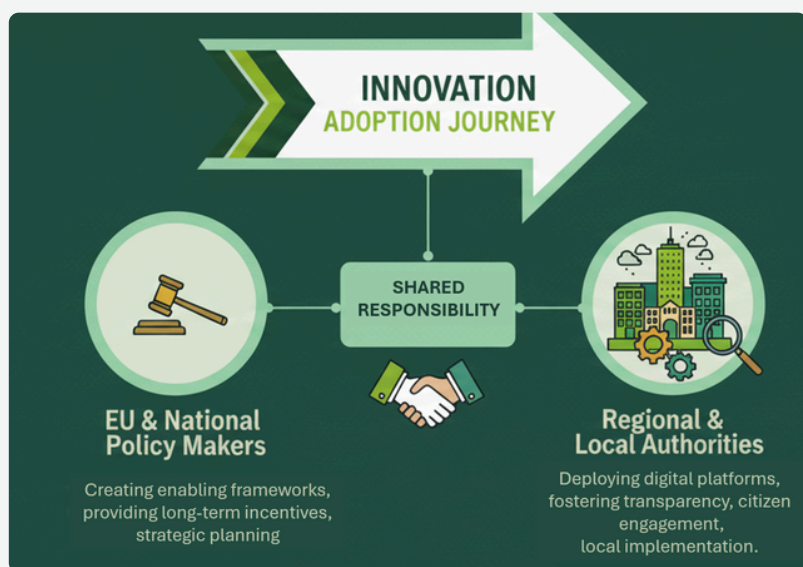


Innovating Forest Management and Silviculture: Enhancing All Ecosystem Services through Local and EU Policies

Why innovations matter for ecosystem services in forest management

Europe’s forests are central to climate mitigation, biodiversity conservation, support of rural economies, and human wellbeing. They provide an array of ecosystem services (FES) often not traded on markets. At present, carbon sequestration is the only ecosystem service with a formal market, while biodiversity and other services remain excluded, creating a major disincentive for managing forests in multifunctional ways. Innovations are salient to incentivize forest owners to manage their forests in an integral way by creating credible and transparent markets for various ecosystem services, supporting the design of digital monitoring systems (such as UAVs, LiDAR, and decision-support platforms), and providing adaptive silvicultural tools. In the context of highly fragmented forest ownership, digital tools that reduce management costs are indispensable. However, these tools must be tailored to the real needs of forest managers and owners, and in line with forest legislation, to respond effectively to practical challenges. Moreover, innovations are also essential for improving the safety, and attractiveness of forest work, as well as for strengthening policy integration across sectors that often operate in silos



Who can act and how

The responsibility for innovation adoption lies across multiple levels. EU and national policy makers can create enabling frameworks that reward ecosystem services, also essential for adaptive silviculture, especially closer-to-nature models that prioritize resilience and biodiversity conservation.

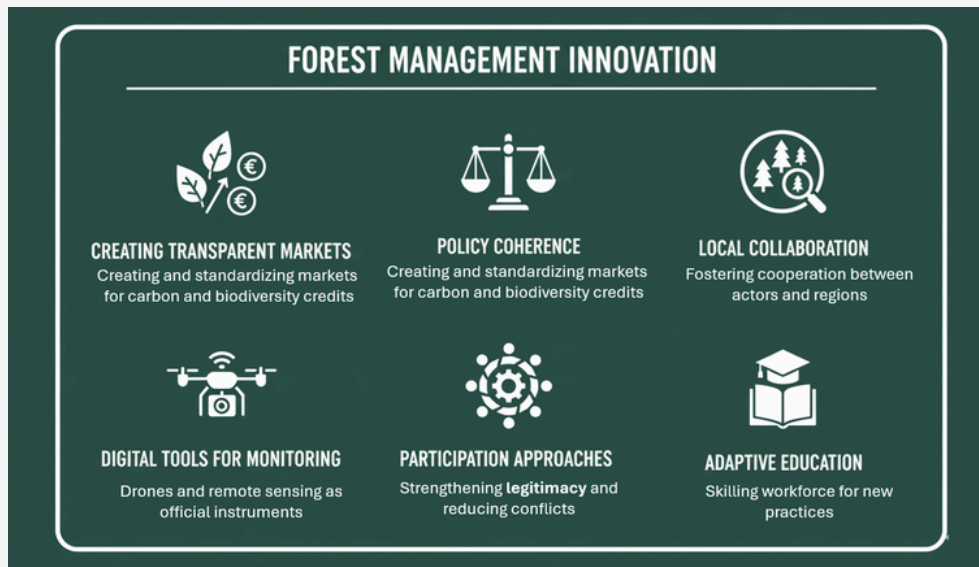
Regional and local authorities play a role in deploying digital platforms, supporting participatory governance, and fostering transparency. At the operational level, forest owners and managers can adopt adaptive management. Research and academia along with practitioners can co-develop innovations ensuring transferability, while updating forestry education to address new challenges. Finally, the private sector and NGOs can accelerate the scaling of digital solutions, innovative business models, and awareness-raising activities.

Policy implications

Innovation cannot succeed without policy coherence: contradictions between energy, biodiversity, and forest policies undermine credibility and hamper multifunctional forest management.

- Carbon and biodiversity credit markets must be created and standardized in a way that ensures transparency, EU-wide harmonization, and future expansion to other ecosystem services.
- Equally important is the recognition and adoption of digital tools, as official monitoring instruments in European governance.
- Local incentives that foster collaboration among actors, such as Operational Groups where forest owners, practitioners, and researchers from the same region work together, are key to generating effective and practical innovations.
- Participatory approaches should be incentivized to strengthen legitimacy and reduce conflicts among stakeholders. Finally, modern education and training systems are needed to ensure a skilled workforce capable of adopting new practices safely and effectively.





Europe’s forests face increasing risks from climate change, disturbances, and fragmentation. Innovations in the sector can help forests become powerful allies in achieving EU climate goals securing carbon storage capacity, protecting biodiversity, and revitalizing local economies.

Innovations for sustainable forest management are no longer about balancing wood production and conservation. Instead, a multidisciplinary and participatory paradigm is required where digital technologies, adaptive silviculture, and governance reforms converge to secure the constant provision of multiple ecosystem services.

The message is clear:

“Forestry innovations are not optional. They are essential for resilient forests that provide multiple ecosystem services for future generations.”

Conclusions

Providing financial incentives to forest owners for multiple ecosystem services can promote closer-to-nature silviculture. Digital platforms for data extraction and monitoring play a critical role in this process as they enable precise mapping of forest resources and ecosystem services, allow integration of local and regional data for monitoring, certification, and policy compliance, support adaptive management and decision-making and allow integration of local and regional data for monitoring, certification, and policy compliance reduce costs and improve transparency for forest managers and owners.

About FOREST4EU

The key objective of FOREST4EU, funded by the Horizon Europe program, is to connect Operational Groups across Europe, fostering synergies and facilitating the exchange of best practices. The project is actively collecting and disseminating valuable information developed by these OGs, creating a central resource for the forestry community.



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