Mitigating Climate Change:
The ForestLab Project

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Our forests provide important recreational, social, ecological and economic functions. The ForestLab project, led by **Dr Attila Borovics** at the University of Sopron in Hungary, has been set up to simultaneously protect and utilise this precious resource. Their recent findings point to the importance of addressing 'old wood', that is, unused wood stock that currently exists in Hungarian forests and adopting technologies for forest management in the near future.

A Valuable Resource

Forests are one of the most valuable resources on Earth. While enjoyed by humans as recreational and social spaces, forests provide critical habitats for a diverse range of species – from squirrels to grasses to soil microorganisms. The interactions among all these different species are known as forest ecosystems. An important example is carbon sequestration, in which atmospheric carbon dioxide (CO_2) is captured, stored, and exchanged for oxygen. As such, forests are one of the most effective forms of natural carbon sequestration. From an economic perspective, forests provide wood as raw material for wood products – which means cutting down trees and providing opportunities for forest regeneration and tree species replacements, which are particularly relevant in Hungary in light of the ongoing climate change.

Sustainable Forest Management

Modern forestry embraces the importance of carefully balancing social, ecological, and economic outputs. This is particularly relevant to Hungary, where forests cover more than 20% of the country. Researchers working on the ForestLab project, led by Dr Attila Borovics at the University of Sopron, are dedicated to identifying the optimal balance between carbon sequestration in the forest ecosystem, carbon storage in wood products, and the replacement of carbon-intensive materials and fossil fuels with timber as a climate-friendly resource. Dr Borovics and his team explain that we need to assess the amount of wood that can be harvested – without compromising sustainability.

Due to climate change, new and effective approaches to sustainable forest management are particularly urgent. The stability of European forest ecosystems is at risk from damage inflicted by climate change, including the emergence of less than favourable conditions for forests. At the same time, at a policy level, international agreements require countries to monitor and report on forest carbon stock change. The Paris Agreement and the European Green Deal both reflect the key expectation that forests will play an important role in mitigating climate change.

Timber is a climate-friendly resource that plays a key role in the 'circular bioeconomy', which tackles climate change and biodiversity loss in tandem with addressing important social and economic needs. The European Forest Institute argues that to maximise the potential of forest-based mitigation, different activities should be combined, taking into account co-benefits and trade-offs. A good way of implementing this would be through the separation of forests, in which forests with a high conservation value continue to protect biodiversity, provide ecosystem services, and mitigate climate change. In contrast, other forests would be better used to ensure wood product carbon storage.

Cutting Age Prescriptions and (Over) Maturity

We need to be able to assess the amount of timber that can be harvested without compromising sustainability concerns. To do this, Dr Borovics and his team used Hungary's official national forestry database, which uses detailed maps and data on the different species of trees and their age. The researchers were particularly interested in 'cutting age prescriptions', specified by the forest authority in forest management plans as the age limit above which harvesting is permitted. Stands (communities) of trees were defined as 'overmature' if they were older than the prescribed cutting age.

First, Dr Borovics and the team examined the amount of wood stock available in overmature tree stands that could be available for harvest. Second, they sought to forecast the maximum amount of timber that could be available for harvest up to 2100.

Key Findings and Implications

More than 45.62 million cubed metres (11.5%) of the ever-increasing stock of Hungarian forests were identified as being overmature. This figure reflects the fact that much of the private forest area is currently unmanaged. In addition, Dr Borovics and his team noted that the wood stock of overmature stands has increased by more than 250% in the last 40 years. This represents a significant surplus of timber ripe for use being stored in overmature stands.

The researchers explain, 'The importance of this unused wood stock reserve is enormous, as it is a basis for meeting the growing timber demand in a sustainable way.' According to their yield projection model, even without new efforts to grow and facilitate forests, more timber will become available for harvest annually in the 2024–2100 period than the average harvests of the last five years. By 2050, an additional 4,059 thousand cubed metres of timber is projected to become available for harvest annually.

Critical Challenges for the Hungarian Forest Industry

Dr Borovics and his team propose that the mobilisation of the large volumes of unused wood stock reserves and the utilisation of the additional harvest potentials will be among the most important challenges of the Hungarian forest industry in the upcoming decades.

In practical terms, the researchers further suggest that maximum harvesting potential could be unleashed through professional integration and technical assistance that could potentially be provided to forest managers and wood industry enterprises based on geographic information systems. Indeed, geographically explicit information on the amount and value of wood stocks available for harvest could form the basis of a new type of entrepreneurial culture and new ways of providing forest-related services.

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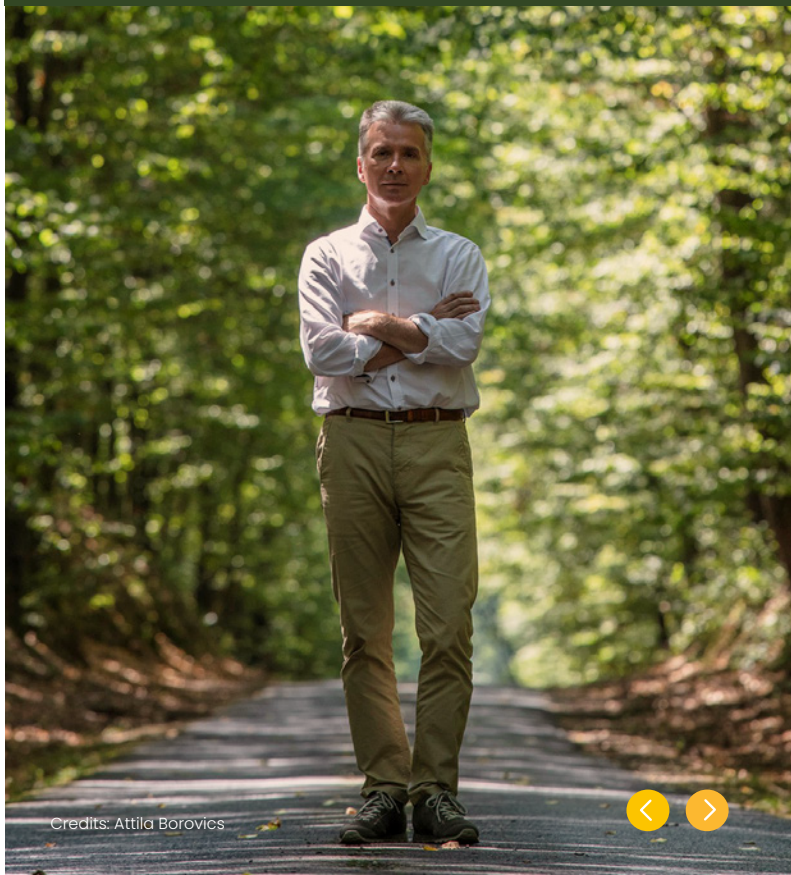

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MEET THE RESEARCHER

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Dr Attila Borovics is an expert in plant genetics, agroforestry, and climate change mitigation and adaptation in the forestry sector. He obtained a PhD in Forest Science in 2001 from the University of Sopron, Hungary. He has been working as a researcher in the Forest Research Institute of the University of Sopron since 1994. He has been director general of the Forest Research Institute for 15 years. He is currently the leader of the ForestLab project, an ambitious climate change mitigation project realised by the University of Sopron through the collaboration of several forest industry-related disciplines. The overarching goal of his work is to increase the contribution of the forestry sector in the fight against climate change, and to find the optimal climate change mitigation pathway for the Hungarian forest industry.

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FURTHER READING

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