

BOOK OF ABSTRACTS

FORESTS & SOCIETY
TOWARDS 2050



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Unlocking the Potential of Sweet Chestnut Stands: Sustainable Management, Carbon Sequestration and Revenue Generation

T2.26 Silviculture for the Bioeconomy and Ecosystem Services in Castanea Forests

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Abstract: The sweet chestnut (*Castanea sativa* Mill.), a species common in European forest ecosystems, provides numerous ecosystem services including landscape diversity, supporting biodiversity and enhance resilience to forest wildfires in Mediterranean regions. While climate change poses challenges to this species, it also presents opportunities to leverage its ecosystem services that have been overlooked in the potential incomes on chestnut management. Carbon sequestration is one such service that can revitalize chestnut areas. By exploring carbon storage as a passive income stream, profitability in chestnut areas can be enhanced beyond traditional revenue sources like timber and nuts. A comparative analysis is carried out to assess the potential of carbon sequestration in diverse cultural systems of chestnut stands during the juvenile phase (up to 24 years). The analysis is based on data of field permanent plots used to estimate biomass and carbon levels. The estimation of carbon value is based on EU Carbon Permits. To effectively mitigate greenhouse gas emissions, it is crucial to strike a balance between carbon sequestration and the duration of carbon retention in wood products. By emphasizing the production of high-quality wood and incorporating it into long-lived products, significant environmental benefits can be achieved by storing carbon outside the atmosphere for extended periods of time. Furthermore, the silviculture practices related to this innovative approach are also discussed. By transferring the significant value of Carbon Permits for carbon ecosystem services, we can demonstrate the potential impact of carbon sequestration as a compelling factor for revitalizing the chestnut forests. The most carbon-sequestering chestnut forest areas are productive sites, including high forest stands and coppices. These areas exhibit an average annual CO₂ sequestration ranging from 12.7 to 13.6 Mg ha⁻¹ year⁻¹ over a period of 23-24 years, with carbon values exceeding €900.00 per hectare per year and possibly reaching €1,150.00 per hectare per year. When combined with the quality and durability of wood products and the opportunity to substitute alternative materials like plastics and steel in construction, the environmental and economic benefits become even more pronounced. This presentation highlights the potential of chestnut in mitigating climate change, generating revenue and fostering sustainability.