Strengths, weaknesses, opportunities and threats in coppice forest management: Insights from the Croatian Dinarides

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Sustainable management of coppice forests represents a critical challenge in the Dinaric region of Croatia. Historical overexploitation has reduced resource availability, while accelerated climate change has further contributed to structural degradation, reduced stand stability, and low economic viability. The research applied an integrated scientific and professional approach that combined field investigations, analyses of technological processes, international benchmarking, and a comprehensive SWOT assessment to support the development of adaptive silvicultural strategies. The objective was to evaluate existing management conditions and to identify opportunities for enhancing the resilience, productivity, and multifunctional role of these forest ecosystems.

The analysis revealed several important strengths associated with the long tradition of organised forest management in Croatia, including the inherent adaptability of coppice ecosystems and their considerable biomass potential. Coppice forests were also recognised for their high biodiversity, favourable species composition, and their capacity to provide a wide range of ecosystem services, such as carbon sequestration. At the same time, numerous weaknesses were identified, including the high cost and operational complexity of silvicultural interventions, limited accessibility of forest areas, insufficient forest road infrastructure, and challenging terrain conditions. Additional challenges included low stand productivity and timber quality, insufficient implementation of silvicultural treatments, limited availability of high-quality forest reproductive material, and inadequate planning of nursery production. Socio-economic constraints – such as labour shortages, depopulation of rural areas, and limited transfer of scientific knowledge into operational practice – further complicated management activities. Silvicultural measures such as thinning and structural improvement were shown to significantly enhance stand vitality, productivity, and timber quality. The identification of priority management areas could increase the economic value of timber resources while maintaining forest ecosystem services. Opportunities included improved data management, the integration of new technologies, identification of priority restoration areas, and stronger collaboration with scientific institutions. The main threats were associated with increasing climatic extremes, shifts in species distribution, and the growing risk of pests, diseases, and invasive species. Economic uncertainties and the shortage of qualified labour also represented significant risks for sustainable management. Through the SWOT analysis, strategic combinations of internal and external factors were evaluated within several key development perspectives, including forest management, climate neutrality, biodiversity conservation, rural development, and scientific research. Although the number of identified weaknesses exceeded the strengths, the opportunities clearly outweighed the threats, indicating substantial potential for improving coppice forest management in the studied region.