

Wood K plus

WOOD: next generation materials and processes – from fundamentals to implementations

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WOOD FROM AGRICULTURE – SOCIAL BENEFIT OR BURDEN?

SOCIAL, ECOLOGICAL AND ECONOMIC EFFECTS OF NEW VALUE CHAINS IN THE BIOECONOMY

The establishment of new value chains for the bioeconomy raises expectations of economic as well as social benefits for the society. For a comprehensive assessment of sustainability, the social dimension must be covered in addition to the environmental and economic dimensions. While the assessment of environmental impacts has become increasingly important in recent years and the method of life cycle assessment is already established, social assessments are less frequently applied. Social Life Cycle Assessment is being developed as an equivalent to LCA – however, other methods such as economic cost-benefit-analysis are also available for assessing the viability of projects. The large spectrum of potential social impacts of new value chains present a particular challenge in the application of social sustainability assessments.

Cost-Benefit-Analysis

Methodological development of cost-benefit-analysis to include social assessment has already been called for by several authors (e.g. Bruce, 1976, Hoogmartens et al. 2014). A first concept was proposed by Ziller & Phibbs (2003), however, case studies are missing so far. This was taken up here in a case study to assess the establishment of short rotation coppice on agricultural land and the associated land use change from annual crops to perennial poplar plantations with an extended cost-benefit-analysis covering social and ecological aspects too. The involvement of relevant stakeholders along the value chain is essential to not only prioritise overrepresented topics from literature, but also to identify neglected topics and include them in the assessment (Fürtner et al. 2021).

SUCCESS STORY

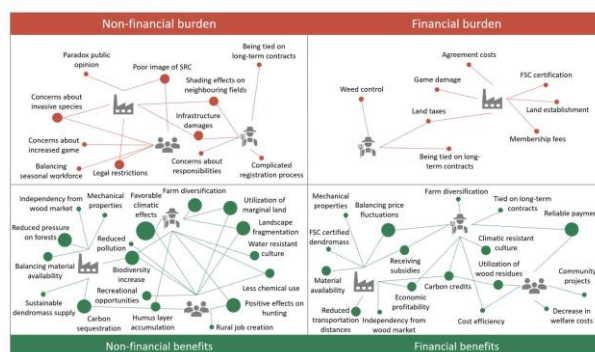
In addition to the conventional economic indicators (net present value, payback period, etc.), ecological impacts were modeled using the potential of soil organic carbon accumulation, and socio-economic impacts were calculated using regional value added. Qualitative interviews with plantation managers were additionally conducted to capture the non-quantifiable impacts through a social cost-benefit-matrix. It should be kept in mind that welfare effects and the goals of a bioeconomy cannot be captured solely by the monetary economic performance.

Estimation of benefits and burdens

The results of the interviews are divided into non-financial and financial benefits and burdens. Although, a number of non-financial as well as financial benefits are expected from short rotation coppice (SRC), the negative image of plantations as well as legal regulations hampers the successful implementation. Non-financial benefits are mainly seen in agricultural diversification, favorable climatic effects due to plantations, an increase in biodiversity, and a reduced pressure on natural forests.

Financial benefits of the plantations can be drawn for the wood processing industry as a compensation for price fluctuations on the wood market as well as for land owners, who can rely on reliable payments through partnerships with the industry.

This study shows the relevance of considering non-economic parameters for the sustainability assessment of new value chains. The demand for quantifiable representation of social impacts for the bioeconomy is high and must be addressed in future research for the achievement of bioeconomy goals.



Perceived financial and non-financial benefits of SRC by plantation managers (the bigger the dots, the more mentions). Source: Fürtnner, D.; Perdomo Echenique, E.A.; Hörtenhuber, S.J.; Schwarzbauer, P.; Hesser, F. Beyond Monetary Cost-Benefit Analyses: Combining Economic, Environmental and Social Analyses of Short Rotation Coppice Poplar Production in Slovakia. *Forests* 2022, 13, 349. <https://doi.org/10.3390/f13020349>

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