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"Reconcile land system changes
with planetary health"

Sustainability standards for novel macauba value chains in Brazil for energy transition: a framework proposal

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Abstract

Vegetable oils represent an essential biobased resource worldwide. In the European Union (EU), they are a key element for the bioeconomy in manifold sectors, such as food, chemistry, cosmetics, and bioenergy. Vegetable Oils are increasingly used in the production of biofuels such as biodiesel, Hydrotreated Vegetable Oil (HVO), and Sustainable Aviation Fuels (SAF). The African oil palm (*Elaeis guineensis*) is currently the main vegetable oil source worldwide. Sustainability considerations and the growing demand for vegetable oils, particularly for biofuels, have led researchers, governments, and private sector to focus on alternative crops with high potential for sustainable production, such as the macaúba palm (Acrocomia aculeata) in Brazil. This palm is described as a multipurpose crop with potential for cultivation in low-productive lands in subtropical areas and inclusion of smallholder farmers in its novel value chains. Advances in the domestication of macaúba have leveraged its initial cultivation, positioning it as a great alternative oil crop. In addition to technical advances, value chain governance and market development are essential steps for introducing this novel crop. Considering the dynamic development pace of macaúba value chains (MVC) and its webs in Brazil, the private sector interest, and its great potential as a novel multi-purpose crop, research is needed on relevant topics, such as sustainability standards, and sustainable value chain governance with the purpose of steering MVC development in a sustainable direction. Assuming the EU as a market target, our objective is to conceptualise a framework for the sustainable and inclusive development of the MVC in Brazil (focusing on biofuels) in three steps: Using a systematic literature review, we (1) analyse the EU policy framework for energy transition (e.g., ReFuelEU Aviation regulation, Renewable Energy Directive) and supply chains (e.g., EUDR, supply chain act), havig the African oil palm case as a benchmark, (2) evaluate current sustainability standards of relevance for macaúba, alternative crops and biofuels; and (3) identify and assess current practices in MVC through key informant interviews. Our framework proposes a sustainability standard scheme for commercialisation in the EU of macaúba-based biofuels outlining strengths, risks and opportunities for sustainability governance.

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