

USING A SYSTEMS APPROACH TO IMPROVE BIOENERGY SUSTAINABILITY ASSESSMENT

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The current focus on sustainable development and the goal to move from a fossil fuel to a renewable-based economy brings with it the challenge of assessing the sustainability of the wide array of different potential bioenergy systems. Concern about the impact of growing biomass for energy on food security in the poorest regions of the world intensifies the need for reliable, manageable, comprehensive approaches to assessing the sustainability of biomass systems at all scales. Efforts to develop, implement, and revise criteria and indicators to assess the sustainability of forest management provide a foundation for building strong bioenergy sustainability assessment approaches. However, the forest management effort encompasses only one type of feedstock, woody biomass, from one source, naturally occurring forests. It also focuses on only one portion of bioenergy systems, biomass production. While discussion continues, no clear consensus has yet been reached for how to assess bioenergy sustainability. The assessment must focus on all components of the system, from biomass production through useful energy products, and encompass social and economic values. In this paper, we propose a systems approach to more comprehensively inform the development of sustainability criteria and indicators, and to synthesize the many insights from wide-ranging research on biomass-to-energy as well as the associated ranges of social and economic values. Specifically, we present a five-step process for how to use a participatory, systems approach to assess bioenergy sustainability. We suggest that this approach is more comprehensive than the dominant economy-environment-social assessment approach, which is largely ad hoc in nature.

KEY WORDS: sustainability, systems approach, bioenergy

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