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Biofuel production models in developing countries: An assessment of potential and shortcomings

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Biofuels have been gaining increasing global attention largely because of the need to both reduce dependence of fossil fuels and mitigate greenhouse gases emissions. In contrast, in developing countries, particularly in Sub-Saharan Africa (SSA), the main drivers of biofuel expansion are the pursuit of energy security as these countries depend mostly or exclusively on fossil fuel importation, and poverty alleviation through economic growth. However, biofuel projects in SSA have often been unsuccessful due to several reasons including poor planning, lack of governmental policies and differences among the stakeholder's interests. The aim of this work was to assess bioenergy systems in developing countries under the point of view of the different stakeholders involved in the project in order to evaluate the prospects and shortcoming of biofuel projects in SSA. Existent biofuel projects in SSA were assessed in order to understand their dynamics and opportunities. Then, bioethanol production models based on the Brazilian experience were proposed taking into consideration the particularities of SSA countries. Moreover, the possibility of products diversification through integrated food/fuel systems was also of main interest in the assessment. Models were evaluated in terms of technical-economic, social and environmental parameters. The success of bioenergy models of production intended to local communities in developing countries aiming the intensification of social benefits including employment creation, rural development and energy/food availability, depend not only on the prospects of economic viability of the general project but also on the particularities and impacts of the community and on policymaking.

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