

Optimizing the Cooperated “Multi-Countries” Biodiesel Production and Consumption in Sub-Saharan Africa

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Abstract:

Sub-Saharan African countries present chronic energy shortages and heavy reliance on oil imports for diesel. The small demand and high production costs in some countries have compromised the economic feasibility of the biodiesel industry in the region. Therefore, to overcome these limitations a model of “multi- countries” cooperated production and consumption of biodiesel was proposed for a group of seven neighboring countries. The model explored linear programming and simulations to the problem of minimizing biodiesel production costs considering different types of production and demand restrictions. The data processing was realized using the Solver and Linear Interactive Discrete Optimizer software (LINDO). The simulations and scenarios revealed that palm oil is the crop that minimize the production costs (US\$0.82/L) and that, although jatropha was classified in the second place (US\$1.05/L), it is the crop with the biggest job creation potential (5.0 times that of the palm oil seeds). These results reveal the presence of a trade-off in the strategy and the choice between different oilseeds: (a) to produce biodiesel from the crop with minimal costs (palm oil) or (b) to choose the one that has the biggest potential for job creation (jatropha). Considering the diesel price between US\$0.60 and US\$1.14/L at service stations in the region in 2016, both the biodiesel from palm oil and jatropha will need subsidies and fiscal incentives (tax reductions) to be competitive in the fuel market (diesel). The volume of biodiesel to supply the B10 demand in 2031 has the potential to reduce US\$ 1.98 billion/ year of the expenses on oil imports. It is worth observing that this decision-support model adds the “multi- countries” cooperation perspective as a contribution to the methodological and political approaches about biofuels production and consumption and can be exploited as a starting point for the formulation of policies, strategies, and investment decisions for the establishment of biodiesel production programs.

Biography

Tito Francisco Ianda has his PhD at the Federal University of Bahia, Brazil. He has published 20 papers in refereed journals. He makes use of a wide range of techniques for studying biodiesels. His researches include biofuels, bioenergy and he participated in international conferences.