# Socioeconomic and environmental assessment of biodiesel production in Brazil

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The scarcity and the growing oil prices, climate change and energy security are issues that have motivated the international community to seek alternative sources of energy; among them, biofuels have been considered as an option in recent years. Biodiesel is a biofuel that can potentially bring environmental, economic and social benefits compared to fossil diesel oil, especially in developing countries, considering the land availability. The objectives of this study are the evaluation and the comparison of socioeconomic and environmental impacts of the main routes of biodiesel production in Brazil. Five routes of biodiesel production were evaluated, defined taking into account the profile of this industry in Brazil – two from soybean oil, one from beef tallow, one from cotton oil and other from sunflower oil based on family farming production. The evaluation was performed using the input-output analysis; the Brazilian economy was aggregated in 73 productive sectors and 120 commodities. Impacts and indicators were quantified regarding the level of the total output, jobs created (including the assessment of their wages), the value added (GDP), the energy balance and greenhouse gases emissions. For this purpose, it was developed and implemented a mixed technology based input-output model to combine different routes of biodiesel production. Among the various results obtained, it is worth to mention the need of subsidies over biodiesel production, except for the production route from beef tallow. Considering the scenario in which part of the exported soybeans is driven to biodiesel production (to replace all imports of diesel oil), even with the need for subsidies, there would be an economic benefit estimated at US$ 0.60/L of biodiesel produced. Concerned to the production based on sunflower family farming route, the benefit in a B1 scenario would be US$ 1.71/L, but by means of an average wage 87% lower than the Brazilian average.