

# An Institutional Analysis of Biofuel Policies and their Social Implications Lessons from Brazil, India and Indonesia

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United Nations Research Institute for Social Development





Social Dimensions of Green Economy and Sustainable Development

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#### Acronyms

NREGA	National Rural Employment Guarantee scheme (India)
OPEC	Organization of the Petroleum Exporting Countries
PNPB	National Programme on the Production and Use of Biodiesel (Brazil)
R\$	Brazilian real

#### Summary

Biofuels production has quickly expanded worldwide as part of strategies to make energy economies "greener". Climate change mitigation and energy security have been frequent rationales behind biofuel policies, but developing countries have also emphasized the social dimensions of this new sector, flagging the inclusion of smallholder farmers in fuel production chains and the potential for poverty alleviation and rural development. However, most studies on biofuels remain focused only on the economic and ecological aspects of biofuel production and utilization, often leaving social and equity dimensions overlooked or understudied—and claims of "pro-poor" development largely unchecked. This paper therefore sets out to examine how different developing countries have attempted to promote rural development through biofuel production, what social outcomes those strategies have created, and what lessons can be learned, such as in terms of biofuel policy design. This is done through a comparative analysis of the contexts of Brazil, India and Indonesia; three countries with important agricultural sectors that have put large-scale biofuel programmes in place.

Brazil has built its biofuels policy primarily on a well-established sugarcane-ethanol industry and on an emerging biodiesel sector. As a way to stimulate those sectors, the government has put in place regulatory and economic incentives such as tax breaks, cheap credit through public banks and blending mandates<sup>1</sup> to secure captive markets. In the case of sugarcane-ethanol, despite its success from an economic and an emissions reduction perspective, its social implications are grim. A highly concentrated ownership pattern and an imbalanced allocation of burdens and benefits mean that the sugarcane agribusiness captures all value-addition while the rural poor participate only as seasonal migrants working under harsh and insecure conditions. In addition, its expansion over smallholder farms and indigenous peoples' lands has further tarnished the social profile of this sector. Brazil has attempted to compensate for these issues through a socially oriented biodiesel programme that promotes feedstock cultivation (primarily castor bean) among smallholders and the establishment of contract farming schemes with biodiesel industries. Initially, a design that made smallholders dependent on one crop and one buyer, plus poor implementation, led to broken contracts and abandoned smallholders who felt cheated and left with a crop they could not eat or sell. Only the mobilization of rural social movements and the government's commitment to a social agenda could force a revision of the biodiesel policy. This included the creation of the subsidiary Petrobrás Biofuels to engage with smallholders, the distribution of higher quality seeds, and changes in the contract terms to give more leverage to smallholder farmers and guarantee their food security. As a result, the programme has met with increasing success in terms of income generation and number of affiliated smallholders.

India's biofuel policy has also relied on an established sugarcane agroindustry while promoting smallholder integration through new biodiesel value chains. On the one hand, India utilizes similar policy instruments such as tax breaks and blending mandates, but unlike Brazil it utilizes only sugarcane molasses (and not sugar juice) as a feedstock, due to tight sugar supplies. Besides, in India the chain has a much larger participation of smallholder farmers cultivating sugarcane. Nevertheless, all value-addition is captured by the industry, which now benefits from incentives to produce for a new market, while the conditions of poor sugarcane growers remain basically unchanged. Therefore, there is hardly a socially transformative element to the Indian ethanol policy. The biodiesel policy, on the other hand, has attempted to incorporate the rural poor through the promotion of non-food feedstock cultivation (mainly *Jatropha curcas*) on what the government regards as "marginal lands". However, disappointing yields, lack of agreement with customary land users for cultivating jatropha and lack of committed buyers to make the value chain viable led to a huge failure. In the end, most smallholders who had been persuaded into growing jatropha ended up being worse off.

<sup>&</sup>lt;sup>1</sup> Blending mandates consist of policies that determine an obligatory mixing of a certain percentage of biofuels in liquid fossil fuels commercialized (ethanol in gasoline and biodiesel in mineral diesel).

Finally, in Indonesia there have again been incentives to cultivate feedstock on "marginal lands" and for established agroindustries to start producing biofuels. These incentives have included: subsidies and tax cuts for the sugarcane industry to produce ethanol and for the palm oil industry to produce biodiesel, facilitated legal conditions for long-term corporate investments on land and blending mandates to guarantee markets. Despite these efforts, other end-markets remain more attractive to the sugarcane industry and so fuel-ethanol is not being commercialized. In turn, the cultivation of "marginal lands" with jatropha faced the same problems as in India; the lack of a viable and established market chain and the problem of smallholders being abandoned without a buyer and without a use for those seeds. Only palm oil biodiesel has been viable, but with very mixed social implications. On the one hand, the sector counts on the large participation of smallholders and creates an income that alleviates rural poverty, but there are important limitations when it comes to: no ascension in the valuechain (farmers remain only at the least valuable stage of the chain, selling palm fruit bunches to private mills); little bargaining power in the face of the industries and no voice in decisionmaking; and loss of control over the land in the long term, for which only a small compensation is given. In this, as in the other cases of already established crops such as sugarcane in Brazil and India, biofuel policies may not create additional social issues but they can still be perceived as socially neglectful, failing to improve the inequitable structures and outcomes of the sectors they build upon.

The comparative analysis indicates a mismatch between the social discourse and the biofuel policy instruments usually adopted. In reality, benefits to the rural poor have been very limited, and far too often they have been left worse off after being incorporated into biofuel production chains under disadvantageous conditions. The examined experiences show that better outcomes depend crucially on: (i) building upon traditional livelihoods, rather than attempting to replace them; (ii) paying heed to the views, needs and interests of the rural poor in the making of such rural development strategies; and (iii) inserting policy provisions that allow smallholders to climb up the value-chain, thus addressing the inequality structures that keep the poor poor.

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#### Introduction: "Green Economy" of Biofuels

The concept of green economy has emerged in recent years and gained large usage in the lexicon of sustainable development, not replacing this other, previously established concept, but rather emphasizing in it the need for an economic transition toward more resource efficient, lowcarbon and socially inclusive patterns of production and consumption (UNEP 2011). In this context, the energy sector plays a crucial role, as it is the largest emitter of greenhouse gases that lead to climate change; therefore, it has become imperative for societies to undertake a (fast) transition from fossil fuels to renewable energies (IPCC 2007). However, while many alternative energy options exist to replace sources of *power*, there are few renewable alternatives to *liquid* fossil fuels such as the petroleum products used in transportation. It is in this context that biofuels appear as an attractive option at hand. Ethanol can be easily produced from any starch or sugar crop and be blended with or used as a replacement for gasoline, and biodiesel can be produced from any vegetable oil, animal fat or waste oil and be used blended with or as a replacement for mineral diesel (Sagar and Kartha 2007; Koh and Ghazoul 2008). Their manufacturing technology is well-established, it is easily replicable using a number of different feedstocks (raw materials), and a transition would require minor to no changes in vehicle engine technology or in the existing transportation infrastructure (Pacala and Socolow 2004; Matthews 2007).

However, the environmental rationale is only part of the biofuels story. Shifting energy sources naturally creates not only ecological but also socioeconomic and geopolitical outcomes. Many countries have started pursuing biofuel programmes partly as a way to avoid trade relations seen as unfavourable, such as those of net oil importers with the handful of oil-exporting countries (Farrell et al. 2006; Hira and Oliveira 2009). This comes along with the possibility of creating jobs domestically and providing the agricultural sector with a new market—one of large and elastic demand. Developing countries, in particular, have identified in biofuel production a major opportunity to promote social inclusion, poverty reduction and rural development (Biswas et al. 2009; Garcez and Vianna 2009). Power generation from indigenous biomass sources can overcome many of the obstacles impairing access to modern energy for two billion of the world's poorest, such as the costs and frequent logistical difficulties of extending a centralized grid (Kuik et al. 2011). In addition, feedstock cultivation and biofuel production can create jobs in agriculture, provide an income to smallholders and foster new "green" industries, eventually helping those countries leapfrog carbon-intensive energy development.<sup>2</sup>

But while these opportunities have been praised by advocates of biofuels, critics have warned against important social and environmental risks. For instance, the actual environmental benefits of biofuels have been recently brought into question due to the energy and water inputs needed for their production, or to eventual emissions from land use changes that could negate any climate benefits (Fargione et al. 2008; Searchinger et al. 2008). In addition, unfettered expansion of feedstock cultivation can seriously threaten traditional rural livelihoods

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