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Economic and social rationale of biofuels in India

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Abstract
Energy choices and decisions impact on economy and environment. It is essential that to choose energy sources carefully. Concerns about environment protection and achieving energy security, production of biofuels has rapidly expanded around the globe as part of strategies to make green economy. In India the chain has a much larger participation of smallholder farmers cultivating sugarcane. The biodiesel policy, on the other hand, has attempted to incorporate the rural poor through the promotion of non-food feedstock cultivation on what the government regards as "marginal lands". 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. A government subsidy is essential for the biofuels industry's viability; nevertheless, the techniques of assistance must be carefully screened, and a scheme of policy instruments must be implemented. Most existing incentive programs in India are outrageously costly and benefits such as improvement in energy security and reduction GHG emissions have not been realized in cost-effective ways.

Keywords: biofuels policy, ethanol, biodiesel, India

Introduction

Energy is indispensable to life and all living organisms. Today energy choices and decisions impact on economy and environment. It is essential that to choose energy sources carefully. Concerns about environment protection and achieving energy security, production of biofuels has rapidly expanded around the globe as part of strategies to make green economy. The true cost of energy is more than monetary value, there are important economic, political and social factors and consequences should be considered as well. Climate change mitigation and energy security have been frequent rationales behind biofuel policies, but many developing countries like India emphasized the social dimensions of this sector, failing the inclusion of smallholder farmers in fuel production chains and the potential for poverty alleviation and rural development. Hence, India's biofuel policy has relied on an established sugarcane agro-industry while promoting smallholder integration in the course of new biodiesel value chains. On the one hand, India utilizes a policy instruments such as tax breaks and blending mandates. 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 etc.,) on what the government regards as "marginal lands". 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. Major & relevant 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 consequently sets out to examine how India have attempted to promote rural development through biofuel production, what social and economic outcomes those strategies have created. This is done through an analysis of the contexts of India: a country with a large agricultural sector that has a potential to put large-scale biofuel programmes in the place.

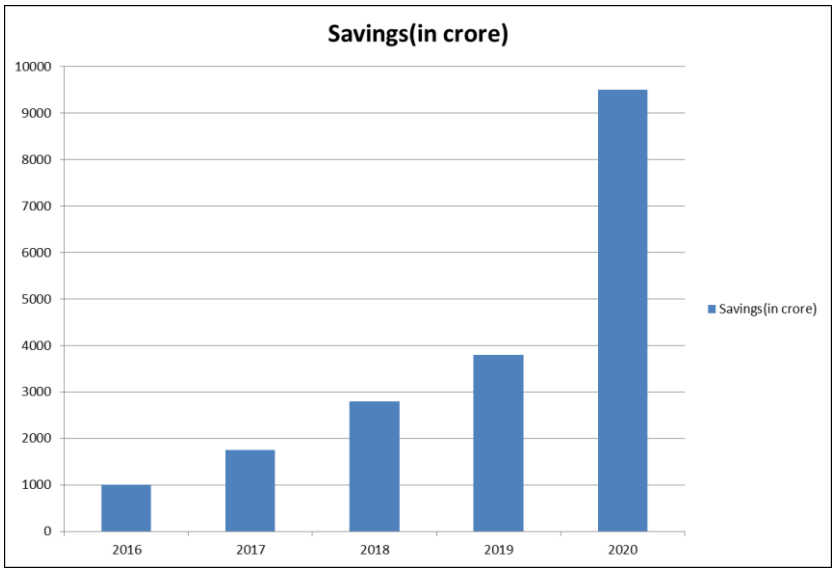
Related Literature

Meeting up the global energy demand in accordance with climate change standards is a vital aspect for every country.Hence, Biofuels part of renewable energy sector considered as a solution-oriented science (Kazuhiko Takeuchi, 2019).Biofuels are considered as the key driver of the economy these days. The major ideology behind the adoption of bioenergy is the holistic growth in the economy. Biofuels offer the possibility of new economic opportunities for people living in rural areas in both oil-importing and developing countries. The central policy of biofuel is one of job creation, increased efficiency in the general business environment, and environmental protection (Demirbas, 2009) [2].There is a rapidly expanding economic and policy literature that analyses the various effects of biofuel production from both the local and global level, but there are several gaps (Rajagopal, 2007) [4]. A bewildering array of policies, including those guiding energy, transportation, agriculture, trade, and the environment, are influencing the evolution of biofuels. However, the policies and rates of subsidies do not recognize the marginal impact on welfare or the environment. To conclude, not all biofuels are created equal. They generate with important spatial and temporal heterogeneity. The impact of biofuels will also be unbalanced, to winners and losers. The paper's findings point to the importance of biomass in rural areas of

developing countries.

Economic and political prudence and Social judiciousness of biofuels production in India

India is one of the major consumer countries and importing of fossil fuels. In 2020 India has imported crude oil valued $64.6 billion, become third highest crude oil importing country and which is an amount to 9.5% in world's total imports (Workman, 2021) [7]. India has imported motor spirit valued Rs. 581 crore and high speed diesel Rs.4229 during 2017-18. In this period 1 crore litter of E10 saves Rs.28 crore of forex at current rates. The ethanol supply year 2017-18 is likely to see a supply of around 150 crore liters of ethanol which will result in savings of over Rs.4000 crore of forex.



Source: www.cbic.gov.in

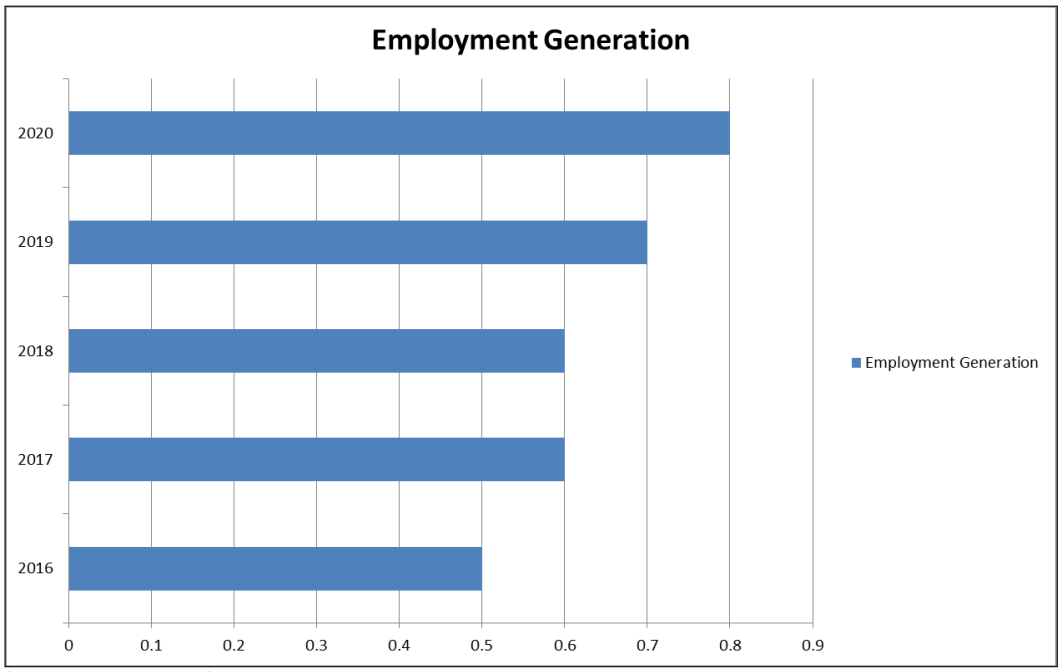
Fig 1: Total Forex savings after adoption of Biofuels

Biofuels and renewable energy in general, are being supported by many governments for a range of perceived benefits including improved domestic energy security, reduced GHG emissions, the creation of local environmental and health benefits, and economic development and employment generation. In India, the primary concerns are energy access and social and economic development. Perhaps the key driver underlying biofuel policies adopted is to enhance national energy security and reduce dependence on imported fossil fuel sources. The declaration about encouraging the use and trade of biofuels is one possible strategy to attain greater energy security in the region. Another common motive for framing national biofuel policies is to reduce GHG emissions from the energy sector as a means to tackle climate change. On a regional basis, Asia and the Pacific is the largest emitter of GHGs in the world. Since 1960, CO2 emissions per capita have grown by an average rate of 3.2 percent per annum. Total regional emissions of CO2 are projected to increase by almost 80 percent between 2007 and 2030. In its 2011 special report on renewable energy sources and climate change mitigation, the IPCC found that "most bioenergy systems can contribute to climate change mitigation if they replace fossil-based energy that was causing high greenhouse gas emissions and if the bioenergy production emissions – including those arising due to land use change or temporal imbalance of terrestrial carbon stocks – are kept low. The IEA has found that using bioenergy in heat and power generation is a more cost and land efficient way to reduce greenhouse gas emissions than producing biofuels for the transport sector; particularly if coal is the fuel replaced. National policy on biofuels-2018 expected to one crore litre of E-10 saves around 20,000 ton of CO_2 emissions. For the ethanol supply year 2017-18, there will be lesser emissions of CO_2 to the tune of 30 lakh tonne. By reducing crop burning & conversion of agricultural residues/wastes to biofuels there will be further reduction in Green House Gas emissions. In general, capturing the potential emissions benefits of bioenergy systems is highly dependent on avoiding direct and indirect land use changes and reducing the use of fossil fuels in the biomass conversion process. Meeting these requirements necessitates effective policy frameworks underpinned by suitable governance structures, incentives and enforcement mechanisms to curb unsustainable practices. Another advantage is identified with generation of biofuel using Prolonged reuse of Cooking Oil for preparing food, particularly in deep-frying is a potential health hazard and can lead to many diseases. Used Cooking Oil is a potential feedstock for biodiesel and its use for making biodiesel will prevent diversion of used cooking oil in the food industry.

Social judiciousness of biofuel policy in India

Government of India has supported biofuels to create employment and development in rural areas. Recent studies indicate that bioenergy has a larger optimistic impact on job creation in rural areas than other energy generations. Biofuel industries have been reported to employ about 100 times more workers per unit of energy produced than the fossil fuel industry. An Asian Development Bank study has shown that development of biofuels can significantly increase prices of feedstock, land and labour, and thus can increase incomes for famers and rural communities. Government of India in adopted supportive policies for biofuels with the intention of production of biofuel and biofuel feedstock export industries to stimulate domestic employment and

economic growth. Some countries have already generated considerable employment through biofuel exports. Indonesia, which employs around 1.7-3 million people in the oil palm sector and exported 1,225 million liters of biodiesel in 2011, could generate an additional 2.5 million jobs through expansion of palm biodiesel production. As expected results of national biofuel policy-2018 one 100klpd 2G bio refinery can contribute 1200 jobs in Plant Operations. Production of biofuels paves a way to growing village Level Entrepreneurs and Supply Chain Management.



Source: www.IRENA.org

Fig 2: Employment Generation through adoption of Biofuels in India

It is estimated in national policy of Biofuel that, one 100klpd bio refinery will require around Rs.800 crore capital investment. At present Oil Marketing Companies are in the process of setting up twelve 2G bio refineries with an investment of around Rs.10,000 crore. Further addition of 2G bio refineries across the Country will spur infrastructural investment in the rural areas**.**

By adopting 2G technologies, agricultural residues/waste which otherwise are burnt by the farmers can be converted to ethanol and can fetch a price for these waste if a market is developed for the same. Also, farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Thus conversion of surplus grains and agricultural biomass can help in price stabilization.

One-sixth of India's land is either barren or overgrown with vegetation that has turned wild. These lands are called wastelands which are economically unproductive, ecologically unsuitable and subject to environmental deterioration. (Sharma, 2019) [5] The government labels 30 per cent of India's landmass as "wasteland" and wants to open it up for industry and agriculture (Varma). Oftentimes, lands that are classified as "barren" or "wastelands" actually support marginalized sections of the society for fuel wood, fodder, etc.

Evidence of such land appropriation has been reported for jatropha cultivation in India.

However, the wastelands can also be recovered by various measures after which they can contribute to the economic and social development of the country. By improving the physical structure and the quality of the soil, improving the quality of water and make it available, and by preventing soil erosion and landslides, such lands can be utilized in productive ways. Also, the wastelands have the problems of nitrogen and phosphorus deficiency that can be improved by the plantation of jatropha, curcas and other plants for biofuel feedstock.

Conclusion and Policy Implementation

A government subsidy is essential for the biofuels industry's viability; nevertheless, the techniques of assistance must be carefully screened, and a scheme of policy instruments must be implemented. Most existing incentive programs in India are outrageously costly and benefits such as improvement in energy security and reduction GHG emissions have not been realized in cost-effective ways. Similarly, whereas free trade can lead in cost-effective biofuel production, trade restrictions on both feedstock and biofuels remain in place. Some climate change measures might still limit trading relationships creating a mandated non-technical barrier to free biofuel trade.

Biofuels innovation to date has contributed in varied results this measure against their potential advantages. Moreover, if appropriately controlled they could contribute to enhanced agricultural productivity in the long run providing benefits for rural livelihoods and food security.

A Policy should be made indeed to reassess biofuels policies based on a thorough knowledge of the policy exchange. With an emphasis on the financial costs of biofuels policies, land use trends, and the cost difference between biofuels and energy sources.

An additional technique to be adopted for emerging evidence about biofuels impacts. A variety of techniques, such as appropriate policy framework, innovation, agriculture practices, regional standards, and development of next generation biofuels, can improve the sustainability of biofuels development in India.

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