

Biofuel Energy Option and Future Food Security Threats**Umesh Chandra Kulshrestha**

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At present, the coal and petroleum are the major global energy sources. Crude petroleum accounts for about 0.045% of global trade.¹ According to data, Saudi Arabia is the top crude exporter representing around 15% of global oil export. India is one of the major importers of crude oil. Around 80% of petroleum energy demand is fulfilled by import of crude oil. In 2021, India had \$93.5 billion import of crude oil. In order to cater energy demand of, India needs to look into the fuel substitutes that can confer environmental and economic benefits while maintaining the efficacy of traditional fossil fuels. The growing concern about the import dependence for fuel requirement with environmental pollution issues have driven the authorities to come up with mitigation measures which address our energy interests.

As an alternative to the crude oil, biofuels have potential to reduce import dependency on energy. A number of options of biomass feedstock for biofuel production are available such as i).sugar crops (sugar cane, sugar beet, sweet sorghum), ii).starchy crops (maize, wheat, barley, rye, potatoes), iii). cellulosic material (switchgrass, willow, poplar, crop stover) and iv). oil crops (palm oil, groundnut, rapeseed, jatropha, soybean, sunflower). The Ministry of Petroleum and Natural Gas has started an Ethanol Procurement Policy on a long-term basis under the 'Ethanol Blended Petrol (EBP) Programme' in October 2019. This policy provides modalities for long-term procurement of ethanol.

In blending, the traditional fuels are mixed with alternative fuels in required percentages. The pure (100%) biodiesel is called B100 while up 5% biodiesel blending is termed as B5 and 6% to 20% biodiesel blending is called as B20. In case of bio-ethanol, the Ethanol Blended Petrol (EBP) Program has been launched by government across India (with the exception of Andaman Nicobar and Lakshadweep islands), which has the provision for sale of petrol blended with 10% ethanol by OMCs.

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There have been a number of initiatives on biofuel production. Government of India has signed a MoU with the government of Brazil and government of Republic of South Africa on establishing a trilateral task team on biofuels. Biofuels may reduce emissions of some pollutants. For example- due to complete combustion, ethanol may reduce emissions of carbon monoxide.² This paves way for a strategic role of biofuels in the Indian energy basket. According to IEA 2021, the biofuel demand forecast is to increase 28% over the next 5 years.³ But by 2030, the government aims to progressively increase the blending percentage of bio-ethanol upto 20% in India.

In 2015, GOI allowed direct sale of bio-diesel (B100) to bulk consumers such as railways, state road transport corporations, whereas in 2017, the sale of biodiesel was allowed to all consumers for blending with diesel.⁴ During 2019-20, the procurement of biodiesel from oil marketing companies (OMCs) reached about 10.56 crore liters.

Biofuel production may be good for direct economy indicators helping in increasing remuneration for farmers, decline in imports, thereby, consolidating foreign exchange savings, waste and agri-residue management by using agricultural waste products as feedstock. However, the biofuel production has some problems e.g. biofuel production will require fertilizer and land. The fertilizer production will need energy. Another problem is associated with use of water for biofuel crops. We already have scarcity of water. According to UN Water (2021) report, 72% of water is withdrawn for agriculture, 16% for household services and 12% for industrial purposes.⁵⁻⁶ The scarcity of water for irrigation and drinking purposes due to decrease in water table in villages might trigger a serious problem of population migration.⁷ Other problems include- need for vast arable land and food security.⁸ According to Hill and co-workers, biofuel cannot replace petroleum without having adverse impacts on food supplies.⁹ Their estimates show that even if all the corn and soybean crops of USA are used for biofuel production, will meet only 12% of gasoline and 6% of diesel demand. In order to match the projected demand, plants which yield biofuel need to be grown by farmers at a large scale. A shift from production of food crops such as grains and pulses to fuel-based production can lead to multiple issues threatening its long-term feasibility. If it is strictly followed, there seems no problem of land for food but fear is that being a cash crop, farmers will also opt to use agricultural land for fuel crop.

References

1. OEC, 2023. <https://oec.world/en/profile/hs/crude-petroleum>. Accessed on April 23, 2023.
2. USEPA. 2021. Economics of Biofuels, <https://www.epa.gov/environmental-economics/economics-biofuels>, Retrieved on December 28, 2021.
3. IEA, 2021. <https://www.iea.org/fuels-and-technologies/bioenergy>, Retrieved on December 28, 2021.
4. Ministry of Petroleum and Natural Gas, 2021. Bio Diesel. <https://mopng.gov.in/en/refining/bio-diesel>. Retrieved on 24-12-2021.
5. UN Water. Water scarcity, 24-11-2014. Available on <https://www.un.org/waterforlifedecade/scarcity.shtml>. Accessed on October 25, 2021.
6. PIB. 2021. Per Capita Availability of Water. PIB, New Delhi. <https://pib.gov.in/PressReleaseSelfFramePage.aspx?PRID=1707522>. Accessed on October 23, 2021.
7. Kulshrestha U. and Katoch A. Human Induced Water Crisis in Climate Change Era: Implications for Population Migration (under publication).
8. Ravindranath, N.H. Sita Lakshmi, C. Manuvie, R. and Balachandra P. 2011. Biofuel production and implications for land use, food production and environment in India Energy Policy, 39(10):5737-5745, DOI:10.1016/j.enpol.2010.07.044.
9. Hill J., Nelson E., and Tilman D. 2006. Environmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels. PNAS, <https://www.pnas.org/doi/10.1073/pnas.0604600103>. Accessed on April 23, 2023.