Biofuels have a role in future energy production. However, the way in which they are produced and managed can determine if they benefit society, the economy and the environment, concludes a recent report on the sustainable production and use of biofuels.

The report examined the life cycle of biofuels for impacts on the climate and environment, focusing on first generation biofuels, such as ethanol from sugar cane. Some biofuels can substantially reduce greenhouse gas (GHG) emissions: using sugar cane for ethanol production in Brazil, for example, can produce GHG savings of 70-100 per cent compared with fossil fuels. In contrast, deforestation of land in the tropics for palm oil production to make biodiesel can increase overall GHG emissions by up to 2000 per cent.

However, the report suggests that life cycle analysis falls short in assessing other impacts of biofuels, such as those on water and biodiversity. For example, eutrophication and acidification of water have become worse for some regions growing biofuels. Additionally, water used to irrigate biofuel crops can reduce water supplies for food crops in dry areas.

Increasing amounts of land are required to grow crops for biofuels: 2.3 per cent of global cropland in 2008 was covered by biofuel crops, up from 0.9 per cent in 2004. Displacing food crops with crops used to produce biofuels can have serious consequences, especially as the world’s population is increasing and more land is needed to grow food. In addition, converting natural land to biofuel production can release carbon stored in vegetation and soils, and destruction of natural habitats can lead to a significant loss of biodiversity.

In 2007, 1.8 per cent of global transport fuel (by energy value) was derived from biofuels: 17 billion litres of bioethanol were produced in 2000; by 2007 this figure had shot up to 52 billion litres. Biodiesel production has increased from less than 1 billion litres to almost 11 billion litres in the same time.

The growth in biofuel production has largely been driven by policy targets and quotas for blending biofuels in vehicle fuels. In the coming years, international trade in biofuels is expected to grow as biofuel consumption increases in the USA, the EU, Brazil and China.

The authors make a number of recommendations to reduce the environmental pressures of biomass production. These include:

- enhancing the efficiency of biomass production through better yields and improved agricultural technologies
- growing biofuel crops on degraded, marginal or abandoned land, although further research is needed on the potential environmental costs and benefits
- using waste and residues from municipal, agricultural and forestry sources
- the multiple use of biomass ('cascading use'), including energy recovery from the waste residue of biomass processing
- generating electricity and heat from biomass instead of converting it to a liquid fuel.

In addition, the authors suggest that biofuel policies should limit quotas and targets to levels that can be supplied in a sustainable manner. Production standards for biofuels should be encouraged and economic measures, such as reforming subsidies including for fossil fuels, can be used to increase biofuel productivity.


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