

OPINIONS

Are new biofuels the ethical answer?

Joyce Tait and Banji Oyelaran-Oyeyinka

10 March 2010 | EN | 中文

New biofuels offer a sustainable source of energy but we must consider the ethical and social implications, say *Joyce Tait* and *Banji Oyelaran-Oyeyinka*.

Biofuels were first pioneered in the early days of car manufacturing. Cheap fossil fuels soon overtook them as our fuel of choice, but concerns about climate change have revived interest in them — global biofuel production doubled between 2000 and 2007, and is expected to double again by 2011.

'First generation' biofuels, mainly produced from food crops, were initially regarded as a potential renewable and sustainable source of energy. But hopes faded as researchers found biofuels offer small or even negative greenhouse gas emission savings across their life cycle compared with fossil fuels.

Problems associated with environmental impact have also arisen. In Indonesia, for example, large areas of rainforest have been cleared to plant palm oils for biofuels. The country's total rainforest area will soon be about half of what it was in 1990 if current trends continue.

There have been social and economic effects too.

On the plus side, biofuel production has helped some farmers and workers boost their incomes and develop their businesses. But, as with many other types of agriculture, other workers and farmers have experienced inadequate working conditions and negative health effects from pesticide use, for example.

In Colombia, local communities have reportedly lost control of — or even been evicted from — their land to make way for biofuel production.

There is also an ongoing debate among campaigners and scientists about whether biofuel production diverts land and water away from food



Poplar trees could be genetically modified to provide a more accessible source of cellulose for bioethanol production
Flickr/Robert Crum

production, potentially limiting local food supplies and driving up prices.

A new generation of biofuels

Scientists are developing a new generation of biofuels to help avoid such problems. For example, research is exploring the use of plants' inedible, woody parts for biofuel production that would allow non-food crops such as bushes, trees and agricultural waste to be used. Trials are also underway in the United States on using algae to produce biodiesel.

Genetic modification is being used to introduce favourable traits into biofuel crops, such as higher yields or the ability to grow on non-arable land. For example, scientists are developing a genetically-modified poplar tree that is a more accessible source of cellulose for bioethanol production.

And the emerging field of synthetic biology is aiming to develop entirely new means of generating biofuels, for example by building microbes that produce hydrocarbons.

Stumbling blocks

Before we bring these new biofuels into wider use we must consider potential stumbling blocks.

One possible area of concern is intellectual property. Several of the new biotechnology techniques being developed for biofuel production have been, or will be, patented. If researchers or companies want to use these technologies, they will have to apply and pay for a licence.

Although patents protect the commercial interests of the patent holder and encourage investment, they can hinder further research and create barriers to using the technology particularly for poorer populations and countries.

The appropriation of traditional or local knowledge should also be carefully monitored as this has proved to be a problem in the past. In 1994, a US company was awarded a patent for neem oil as a method of controlling fungi yet this tree has been used in Indian agriculture for centuries. The patent was later revoked.

There are also governance issues to consider. Biofuels represent an opportunity to help control greenhouse gas emissions, improve rural employment, and provide new sources of much-needed energy. But the interrelated nature of these benefits can bring complex risks if we do not think carefully about the governance of these new technologies.

Small scale bio-energy production might benefit poor rural communities but if it becomes sufficiently profitable, communities risk losing control of both the production and their land to more powerful commercial interests. Most of Indonesia's palm oil plantations are subject to disputes, mainly because of conflicts between customary and state land ownership laws.

Environmental impacts also need to be considered. Some new biofuels have been specifically developed to address these. For example, higher-yielding biofuel crops that might reduce the need for resources such as water and land. On the other hand, biofuel production from non-food crops

could put biodiversity at risk because they can be planted in biodiversity-rich areas previously unsuitable for crops.

Next steps

Much of the research into new types of biofuels is at an early stage. But it is important that we consider the potential ethical, environmental and economic issues now to avoid the problems associated with their predecessors.

To this end, our new Working Party of the Nuffield Council on Bioethics is asking for people's views on the potential of new biofuels to meet our energy needs, support economic development and help address climate change in an ethical and sustainable way.

All the responses to our consultation will be carefully considered and a report of our findings will be published in early 2011. We hope to be able to advise policymakers on the most effective policies to promote, incentivise and regulate the ethical development of new biofuels. We very much look forward to hearing from you.

Joyce Tait is chair of the Nuffield Council on Bioethics Working Party on Biofuels. She is scientific adviser to the Innogen Centre (ESRC Centre for Social and Economic Research on Innovation in Genomics) at Edinburgh University.

Banji Oyelaran-Oyeyinka is director of the Monitoring and Research Division at UN-Habitat in Nairobi and a professorial fellow at UNU-MERIT, Maastricht University.

COMMENTS

Tom Hennessy (Canada)

10 March 2010

The result of this should at the very least be a byproduct which can be turned into food to be distributed at no or very low cost .. imho ..

megan courtney (United States of America)

12 March 2010

This was a very informative article about the dispute over biofuel on an environmental level. I think it's important for society and companies to understand the importance and relevance of using biodiesel fuel. People looking for more information should definitely check out www.greencollareconomy.com.

FIONA MUMOKI (CNHR- Consortium for National Health Research | Kenya)

16 March 2010

I think that microalgae would form a very efficient source of biofuels (With a little more research).

The reasons being, they require very little space for cultivation so they do not have to compete with food crops for land suitable for agriculture and can even be produced using ocean and waste water, plus, they yield almost 30 times more energy per unit area than most biofuel plants.

Betty Adjei (Netherlands)

21 March 2010

I think looking for alternatives for biodiesel other than palm oil is in the right direction. However there seem to be very little information on jathropas and whether they could be promoted in areas where small farmers livelihoods are threatened because of expansion of plantation oil palms production.

<http://www.scidev.net/en/opinions/are-new-biofuels-the-ethical-answer-.html>

Printed on: Saturday, September 4, 2010 03:10

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