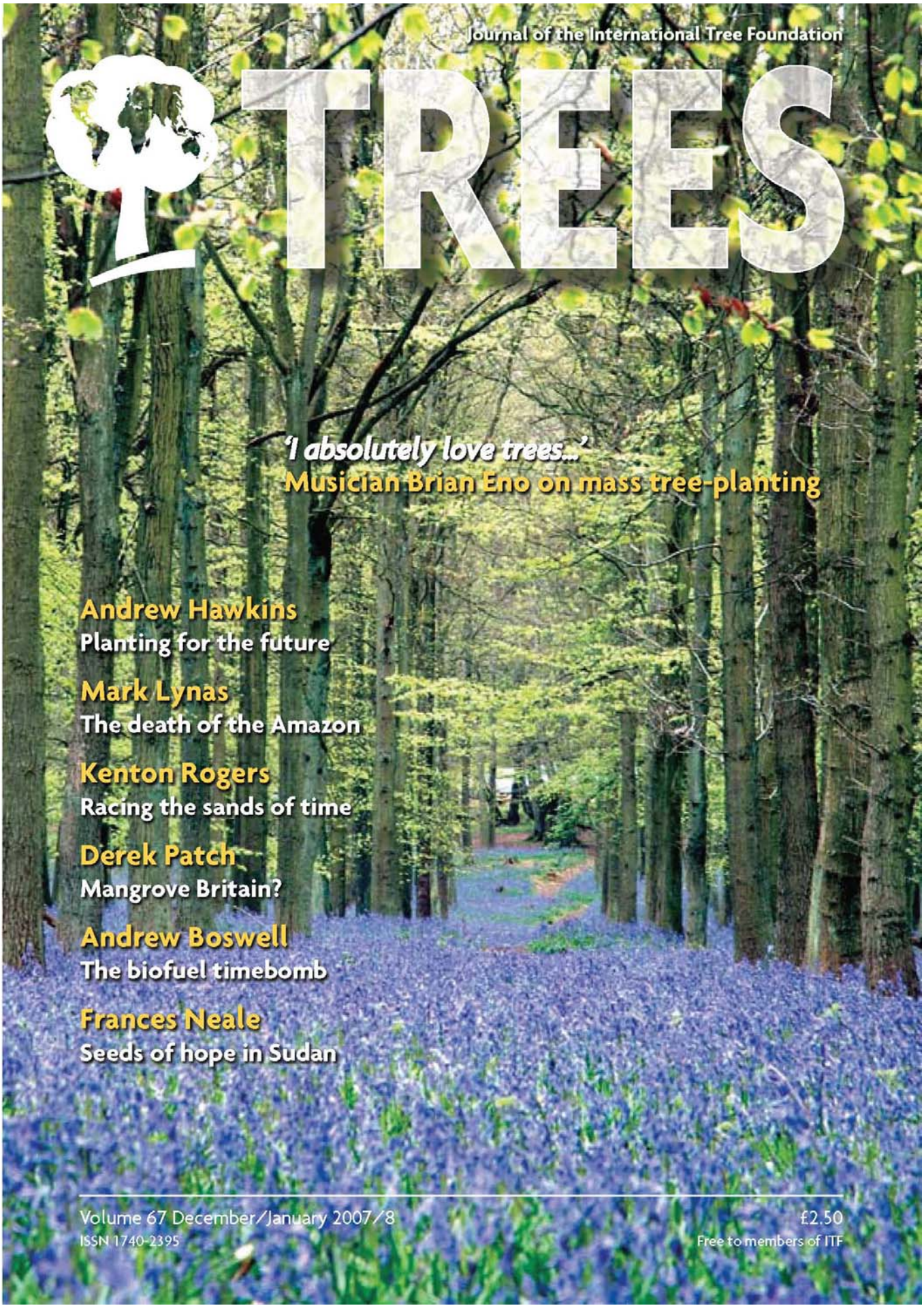
A fully reference version of 'The Biofuel Timebomb' by Dr Andrew Boswell, www.biofuelwatch.org.uk.

First Published in Journal of the International Tree Foundation, December 2007.



The biofuel timebomb

Biofuels – petrol and diesel substitutes extracted from plants – are increasingly presented as an environmentally friendly alternative to fossil fuels. Yet, writes DR ANDREW BOSWELL, the rising demand for biofuel crops by industrialised countries poses the greatest threat so far to forests and trees worldwide.

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Large areas of Malayasian forest are being cut down to make way for industrial-scale palm plantations.

Humans are hungry for more and more power and transport energy, with a predicted global energy increase of 71 per cent by 2030. This demand is driving the planting of massive monocultures of biofuel crops and trees globally for industrialised countries to use in addition to fossil-based energy sources. But in 2007, the world woke up to the environmental and social damage that this is causing worldwide.

As the non-governmental organisation GRAIN puts it: "We believe that the prefix bio, which comes from the Greek word for 'life', is entirely inappropriate for such anti-life devastation... Agrofuels is a much better term, we believe, to express what is really happening: agribusiness producing fuel from plants as another commodity to sustain a wasteful, destructive and unjust global economy."

Well-documented concerns for the boom in agrofuel production range from food security, displacement of indigenous peoples and abuse of land and human rights to threats to biodiversity, the use of GM technology and the lack of credible certification schemes.

A major concern is the impact on forests and trees. Forest survival, forest ecology (biodiversity and large-scale monocultures) and the very nature of trees are all threatened.

EMISSION TRICKERY

The European Union (EU) has set targets for member states to achieve large increases in agrofuel usage – largely biodiesel – by the end of the decade. The United States has set similar goals for ethanol use. The huge surge in EU demand cannot be sourced from European-grown crops. The result is the large-scale clearing of forests in key biodiversity hotspots such as Indonesia, for palm oil, or the Brazilian Cerrado (savanna) for soy oil and sugar cane (and also for US ethanol). In Indonesia, there are plans to convert a further 20 million hectares for palm oil plantations in the next 20 years. Up to 9 million hectares of forests in Papua and West Papua have been identified by the Ministry of Forestry for conversion to oil palm plantations.

The Stern review on the economics of climate change shows that change in land use (mostly deforestation caused by encroachment of agriculture and plantations) causes 18 per cent of the global total of greenhouse gas emissions, causing catastrophic climate change. Such massive land clearances often involve burning the land, so any emission savings made by burning small percentages of biodiesel with diesel in European cars are lost, as much greater emissions are made through land-use changes in the global South. The result is that while biofuels may look good in

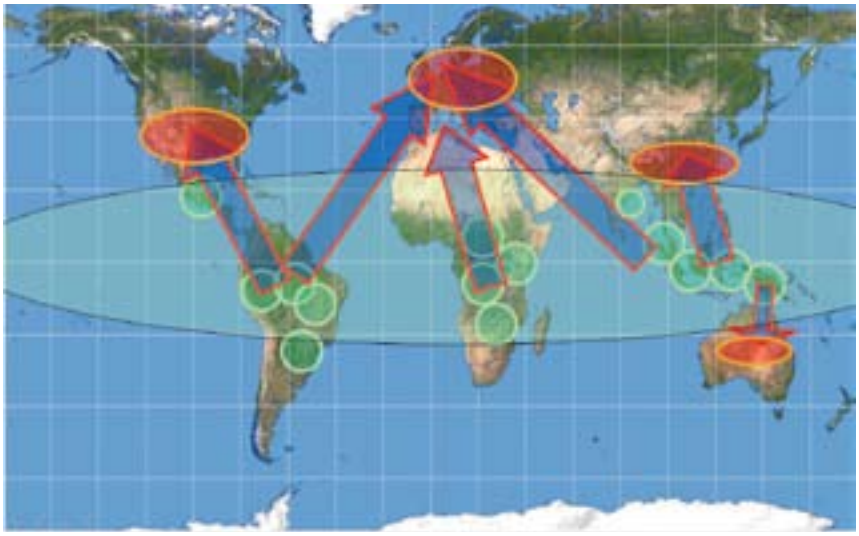
WHAT ARE AGROFUELS?

Agrofuels are industrial-scale biofuels grown in large monocultures. First generation agrofuels include:

- **Bioethanol** – alcohol-based fuel derived by fermentation of sugar or starch crops such as sugar cane, beet, corn, wheat, barley and maize. It can be blended with petrol – for example, to produce E5 (5 per cent ethanol) and E85 (85 per cent ethanol)
- **Biodiesel** – a fuel made from oilseeds, such as palm, rape and soy, and blended with conventional diesel.

Whereas the United States is largely developing ethanol, to blend with petrol, the European market is, so far, based primarily on biodiesel, which can be added to diesel.

There is currently massive investment into **second-generation fuels** that will apply chemical and/or genetic engineering techniques in the hope of better yields or carbon balances.



Massive land-use change in global South, and crop commodity traffic.

climate change terms from a Western perspective, globally they lead to higher carbon emissions. Effectively, agrofuels provide a mechanism for industrialised nations to export emissions to the developing South.

Although governments such as that of Malaysia admit that palm plantations have led to the cutting down of large areas of forests, threatening rich biodiversity in their ecosystems, deforestation is often 'officially' hidden when state or commercially owned forest reserves that are not protected are converted to palm oil plantations. In Malaysia, protected forest comprises only 10 per cent of the total, with many ecologically sensitive areas excluded from protection.

A considerable volume of the palm oil sold by Malaysian companies is produced in Indonesia, where the land rights of indigenous and other local communities are routinely ignored, and where human rights violations are common.

The pattern is repeated elsewhere as natural forest and savannah in many tropical countries, including Cameroon, Colombia and Ecuador, are being destroyed for palm oil – or else are under threat, as in Uganda (see factbox on page 15).

PEATLAND

In South-East Asia, thirst for the so-called 'green fuel' is driving another climate chaos timebomb. Millions of hectares of the region's peatland are being drained for oil palm plantations, as most mineral soils areas have now been planted. These peatlands are among the world's most important carbon sinks, storing at least 42 billion tonnes of carbon – the equivalent of about six years' global fossil-fuel emissions. Once the peat is drained, all of this carbon will eventually be released into the atmosphere through slow oxidation, with peat fires greatly speeding up that process.

ENERGY FROM OIL CROPS

Another trend is the use of liquid biofuels (LBFs), mostly sourced from the global South, in Europe's power stations. The Finnish energy company Wärtsilä claims that in Italy, 620 megawatts of LBF power are either in operation, under construction, or on order. Some plants burn mainly palm oil imported from Malaysia, such as a 100 megawatt plant at Monopoli run by ItalGreen Energy – the world's largest palm oil-fired power plant. Germany used 40 per cent of its 0.8 million tonnes of palm oil imports in 2006 in power generation, with market prices causing the switch from locally produced rapeseed oil.

Pyrolysis Oil (BioOil), produced from forest and agricultural waste such as sugar cane bagasse, is also expected to greatly expand in Europe in coming years. Demand for this wood-based LBF is predicted to grow fivefold between 2009 and 2012. Such agricultural 'waste' has been traditionally left behind as soil nutrients. This rapid growth in BioOil could have a massive impact on soil quality as well as the biodiversity and deforestation risks of monoculture agribusiness.

PULP FRICTION

While first-generation biodiesel is derived from seed oils, such as palm, rape and jatropha, a new generation of wood-based biodiesel technologies is planned. Through chemical engineering, vast quantities of wood will be consumed. Like seed oils, it is cheaper to grow the raw material in massive industrial plantations in the South rather than in Europe, as trees can grow more than ten times as fast in Brazil as in Sweden. Even if some biodiesel based on wood pulp is sourced from European forests, this will displace EU stocks previously used for pulping, thus creating overall greater demand for wood from the South.

Scandinavian companies Stora Enso and Neste Oil are integrating biorefining with pulping, and expect new processing of forest biomass to provide about half of European biodiesel by 2020. Although the pilot Varkaus Mill plant will use Finnish stocks of wood, in the long term biomass is also expected to be sourced from Russia and Latin American plantation forests. One likely source is bleached eucalyptus pulp from the Brazilian manufacturer Aracruz Celulose, which supplies 27

Massive emission exports from industrialised nations to global South.

per cent of the global supply – 39 per cent for Europe – and has a special port capable by 2009 of shipping 7.5 million tonnes of pulp per year. Local and indigenous peoples, once again, have a strong ongoing campaign against these activities.

CHANGING NATURE

Delivery of the aggressive EU Biofuels Directive will create European demand for genetically modified (GM) cellulosic ethanol as a petrol substitute, as well as biodiesel. This demand for agro-ethanol, requiring billions of tonnes of wood stock, is already driving genetic techno-fix 'solutions' in the United States and the European Union – GM trees are being engineered to exhibit unnatural traits, such as herbicide tolerance, insecticide production and reduced lignin content – the substance that makes trees strong but must be denatured to produce ethanol.

In July 2007, the US Department of Agriculture approved a request by forestry giant ArborGen to allow a field of GM eucalyptus trees flower and produce seeds. Concern over the risks, including GM trees interbreeding with wild ones, led to a large alliance of NGOs and indigenous peoples calling for ban on GM trees for agrofuels at the 2007 Paris meeting of the United Nations Convention on Biological Diversity.

REGULATION FAILURE

Regulatory systems are being designed to encourage the agrofuel industry. These give wholly inadequate protection to the global South from the massive social and environmental impacts of an industry that is already operating at the bottom level of environmental and social ethics and standards. The UK passed a policy in October to mandate 2.5% biofuels from April 2008 rising to 5% by 2010 without any sustainability standards until after 2011. Due to market blending based on commodity price fluctuations, British motorists will have no choice but to be complicit in displacing forest people, and causing starvation, deforestation or peat destruction.

It is essential that voices for social and environmental justice combine to protect global ecosystems, including old growth forests, peatlands and natural grasslands, as well as biodiverse non-monoculture sustainable agricultural systems. An equitable and evidence-based means of protecting these ecosystems and carbon sinks is needed that does not involve the commoditisation of nature. Facing up to stopping massive agrofuel expansion is part of this challenge.

Matthew Berry, Creative Commons: www.flickr.com/photos/matthwberry

Many species of birds and butterflies were endangered by plans to convert Uganda's Mabira Forest Reserve to a sugar plantation for bioethanol production.

UGANDA LEADS AFRICA IN GRASSROOTS PROTEST

A high-profile campaign to save a forest reserve from an agrofuel corporation has taken place in central Uganda, where the Mabira Forest Reserve was under threat from a sugar plantation proposed by sugar company Scoul/Mehta Group for bioethanol production. Uganda's National Forest Authority has said that logging in the reserve would have endangered 312 species of trees, 287 species of birds and 199 species of butterflies.

In early 2007, local people organised a number of boycotts, using internet petitions and text messaging via mobile phones to organise protests with massive worldwide support. On April 11 2007, Kampala police shot dead two protesters when they opened fire on hundreds of peaceful demonstrators.

The Mabira reserve is only one of a number of 'giveaways' proposed by the Ugandan government, which may change laws to de-gazette protected forests without first going through Parliament. However, protests worked this time and the Ugandan government decided to drop the plans in October. In May, protests also led Uganda to scrap plans to convert thousands of hectares of rainforest on Bugala island in Lake Victoria into a palm oil plantation for Kenyan company Bidco.

REDUCING DEMAND

Unless governments take rapid action to set policies to address these issues, we risk many centuries of climatic instability. The agrofuel craze is currently increasing climate damage, adding to unsustainable pressures for land, water and resources, and threatening tree life as we know it.

Yet, there is a simple solution. We need to abandon the notion of sustaining energy growth at projected rates. Instead, we need to cut consumption and reduce carbon emissions by 90 per cent by 2030 in industrialised countries. This is both technically and socially feasible, and can be achieved both by sensible policy decisions and people themselves at the grassroots.

Dr Andrew Boswell is a member of Biofuelwatch, a volunteer-led group campaigning for a full public policy debate on biofuels. It is calling for a moratorium on EU biofuels targets and imports to prevent accelerating climate change, starvation, deforestation, biodiversity loss, human rights abuses, water and soil degradation. For more information about Biofuelwatch, go to www.biofuelwatch.org.uk. A fully referenced version of this article is available at http://tinyurl.com/yup52q.

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