actionaid

Meals per gallon

The impact of industrial biofuels on people and global hunger

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"I don't have a farm, I don't have a garden, because the only land that I have has been destroyed."

Elisa Alimone Mongue, mother and farmer, Mozambique. Her land was taken by a biofuel company.

PHOTO: JAMES OATWAY/PANOS/ ACTIONAID

ACRONYMS AND ABBREVIATIONS

ACP	African, Caribbean and Pacific countries
CO_2	Carbon dioxide
CPRs	Common Property Resources
EC	European Commission
EPA	Economic Partnership Agreements
EU	European Union
FAO	Food and Agriculture Organization
G5	The G5 group of developing countries (India, Brazil, China, Mexico and South Africa)
G8	The G8 group of developed countries (UK, Russia, US, Italy, France, Germany, Japan and Canada)
GHG	Greenhouse gases
IFPRI	International Food Policy Research Institute
ILUC	Indirect land use change
IMF	International Monetary Fund
JRC	Joint Research Centre of the European Commission
NAP	National Action Plans (shortened version of NREAP)
NREAP	National Renewable Energy Action Plans
N_2O	Nitrous oxides
OECD	Organisation for Economic Cooperation and Development
ODI	Overseas Development Institute
RED	Renewable Energy Directive
UN	United Nations
UNEP	United Nations Environment Programme

Executive summary

Industrial biofuels – fuels made on an industrial scale from agricultural crops – have been put forward as an answer to energy security, climate change and rural development. ActionAid believes they are unlikely to be the solution to any of these challenges.

In fact they have been a major cause of the food and hunger crisis, which is set to get worse.

Industrial biofuels are currently made from maize, wheat, sugar cane and oil seeds such as palm oil, soy and rapeseed. The rapidly rising demand for crops for fuel has put them into competition with those grown for food, driving food prices higher and affecting what and how much people eat in developing countries. This is a significant issue in a world where a billion people are already going hungry.

Despite this, in 2008 European Union (EU) member states committed themselves to obtaining 10% of transport fuels from renewable sources by 2020. Member states will fill almost all of this commitment through industrial biofuels, meaning the 10% target is, in effect, a biofuels target. Consumption of industrial biofuels in the EU will jump four-fold. As much as two-thirds are likely to be imported, the majority from developing countries.

The 10% target is not the only driver of increased consumption in the EU. In 2006, it was conservatively estimated that the EU biofuel industry was supported by financial incentives to the sum of €4.4 billion. Assuming the same level of subsidies continues, the industry would be subsidised to the tune of about €13.7 billion per annum to meet the 2020 target.

The case against industrial biofuels has been mounting for a number of years. This is borne out by evidence in this report, collected from the countries in which ActionAid works. This report focuses on three main broad impacts.

1. Implications for food prices and hunger

Biofuels are conservatively estimated to have been responsible for at least 30% of the global food price spike in 2008. It was estimated in 2008 that the food crisis had already pushed a further 100 million people into poverty and

"While many worry about filling their gas tanks, many others around the world are struggling to fill their stomachs. And it's getting more and more difficult every day."

Robert Zoellick, President of the World Bank, 2008

driven about 30 million more people into hunger. If all global biofuel targets are met, it is predicted that food prices could rise by up to an additional 76% by 2020. An estimated 600 million extra people may be hungry because of industrial biofuels by this date.

2. Local impacts and hunger

Industrial biofuels are having disastrous local impacts on food security and land rights in many of the communities where they are grown.

The scale of the current land grab is astonishing. In just five African countries, 1.1 million hectares have been given over to industrial biofuels – an area the size of Belgium. All of the biofuel produced on this land is for export. EU companies have already acquired or requested at least five million hectares of land for industrial biofuels in developing countries – an area greater than the size of Denmark.

The local impacts range from the displacement of people, rising local food prices and food scarcity, broken promises by the companies about job opportunities and lack of consultation and compensation. Some have described this land grab as the next era of colonialism in poor nations.

3. Making climate change and hunger worse

Many industrial biofuels do not have lower greenhouse gas (GHG) emissions compared to fossil fuels. This is because:

- converting forests, peatlands or permanent grasslands to grow biofuel crops is an important cause of GHGs (direct land use change);
- converting existing food crop land to biofuel crops often has a displacement effect; the original land use is pushed onto land in new areas, such as forests (indirect land use change). The new land use may have a GHG emission impact, much the same as with direct land use change;
- nitrous oxides (N_20) are released by the fertilisers required to grow industrial biofuels. N_20 is 300 times more powerful as a GHG compared to carbon dioxide.

"They actually took the land when it was already tilled... They haven't paid us anything... What we want is to get our farms back, because that is what our livelihood is dependent on... we are dying of hunger and there is nothing that we have that is actually our own."

Matilde Ngoene, mother and farmer, Mozambique, November 2009

Industrial biofuels are also not good value for money. In fact, they are the least cost-effective way of saving GHG emissions compared to other uses of the feedstock (the crops that go to make biofuel). Industrial biofuels are therefore a red herring in the fight against climate change, and will compound hunger and poverty for the poor in the future.

THE FUTURE – THE ALARMING SCALE OF THE LAND GRAB

Global biofuel consumption is estimated to jump from about 70 billion litres in 2008 to 250 billion litres in 2020. For the EU, the increase will be steeper – from 13 billion litres to about 55 billion litres.

To meet the EU 10% target alone, the total land area directly required to grow industrial biofuels in developing countries could reach 17.5 million hectares, well over half the size of Italy. Additional land will also be required in developed nations, displacing food and animal feed crops onto land in new areas, often in developing countries.

We are at a turning point. Renewed commercial interest in industrial biofuels is beginning to emerge now that the price of oil has reached about US$80/ barrel. Either we recognise the problems inherent in industrial biofuels now, or we open the door to a future for the world's poor where the hunger and climate crises continue to grow. To stop this trend, the EU and member states must:

- place a moratorium on the further expansion of industrial biofuel production and investment;
- ensure that member states do not lock-in industrial biofuels to their 2010 national action plans;
- reduce transport and energy consumption;
- end targets and financial incentives for industrial biofuels;
- support small-scale sustainable biofuels in the EU and abroad.

Florence Minj, Director of People's Action for Development, an ActionAid partner working with poor communities in northeast India.

PHOTO: ATOL LOKE/PANOS/ACTIONAID

A CALL TO ACTION: FLORENCE MINJ

Florence Minj is Director of People's Action for Development, an ActionAid partner working with poor communities in northeast India. He is part of a growing movement of people and organisations campaigning against industrial biofuels.

"In the UK they want to go for more biofuels. But they should not. They should campaign against biofuels. We have seen the reality. The impact will be worst among the *adavasi* [indigenous] community and marginal farmers.

"Only a global campaign can stop this – by ourselves it is difficult. In collaboration with other countries we can reduce the impact of *jatropha* [a biofuel crop] – then more food production can happen. Ultimately, if you promote biodiesel, it is all for the rich people, not the poor."

1. Introduction

The energy crisis of the 1970s provided the initial impetus for the search for new energy sources. Countries had become increasingly dependent on oil at a time of rising and volatile oil prices. More recently, oil production is said to have peaked, and the fight against climate change has become the environmental and developmental issue of our time. The scramble for a cleaner and more secure energy source is on.

Close to the top of the list of alternatives are industrial biofuels, which, in small quantities, can be easily and quickly integrated into the existing transport infrastructure. Only a few years ago, they were seen by many as an innovative, environmentally friendly and relatively simple step in the right direction; a new, 'green' fuel simultaneously solving the energy and climate crises by replacing the 'dirty' fossil fuels of the past.

Others, particularly in developing countries, saw industrial biofuels as a means of promoting development, securing an energy supply and alleviating poverty in rural areas. In Europe, the EU has pushed a similar argument; that biofuels would give a much-needed boost to farmers and rural communities in terms of livelihoods and new markets after years of low prices for agricultural crops.

Rich nations jumped on the bandwagon, setting ambitious targets for increased biofuel consumption and supporting their industries with generous financial hand-outs.

After this first flush of enthusiasm, the reality of industrial biofuels is starting to sink in. The evidence now shows that industrial biofuels are having negative impacts on people, farmers and workers, as well as on hunger, the climate, biodiversity and on habitats such as forests. Across the developing world, local communities are realising that industrial biofuels are not living up to their promises.

If produced sustainably and for local markets, biofuels grown on a small scale can help create energy security, increase local incomes and even reduce greenhouse gas emissions. But this isn't happening. Biofuels, like many cash crops before them, are following the traditional large-scale, industrial, monoculture and export model. In the rush to get industrial biofuels onto the market, the full impact has not been recognised. Some have even described the biofuel land grab as a new era of colonialism for poorer countries.

If they are so bad, why are so many governments continuing to endorse them? Industrial biofuels allow rich countries to avoid some urgent and difficult decisions, such as reducing consumption of transport fuels and energy more generally, and forcing companies to invest in cleaner and alternative technology. All in all, liquid industrial biofuels let us continue our love affair with the internal combustion engine while providing the illusion of action from the car and oil industries.

The focus of this report – industrial biofuels and hunger

ActionAid works with people, communities and partner organisations across the developing world to realise their right to food and to address any factors that undermine or deny it. Farmers themselves want to build on existing knowledge and resources to develop sustainable approaches to local production as a means towards self reliance and combating hunger.

Today hunger is increasing sharply, especially in the world's poorest countries. According to recent figures from the Food and Agriculture Organization (FAO), the number of chronically

"I and the community expected to increase our cash income and revenues by working on the plantation. Our food is insufficient because we gave away our land. We have to fight for our rights and find alternatives to fill the gap in food and livelihoods."

Mamadou Bah (alias), male farmer, Senegal, October 2009

hungry people has reached just over a billion compared to 913 million in 2008. One in six people in the world are now hungry.[1] Yet, only ten years ago, governments committed themselves to halve world hunger by 2015 as part of the Millennium Development Goals (Goal 1).

The scientific evidence is steadily moving against industrial biofuels and the link between biofuels and hunger is strong. This report examines the connections between the two, particularly from a women's rights perspective, and the extent to which the right to food is being undermined by industrial biofuels. It will explore whether hunger is increasing as a result of this additional demand for fuel and whether this is pushing up food prices. It looks at whether land grabs by industrial biofuel companies are having localised impacts, for example on food security and the displacement of people. It also examines the link between greenhouse gas (GHG) emissions from industrial biofuels and the impact on hunger from climate change.

"My family believes that they can never come out of poverty."

Ban Van Tuan, farmer, Vietnam.

PHOTO: ACTIONAID

RISING FOOD PRICES: BAN VAN TUAN'S STORY

"We take a small portion of boiled rice and seasonal vegetables we collect from the hills. Now we have learned to live without meat, oil and other necessary food as my family believes that they can never come out of poverty.

"I feel that the price hike has now really shattered all our hopes and put us in a difficult situation. We have to borrow, borrow and borrow.... but, for how long? Even my brothers will refuse one day as we have no means to repay loans."

Ban Van Tuan lives with his wife and two daughters. The family has been trapped by global food price rises. Everyone has to skip at least one meal a day to cut costs. He worries that his daughters will have to stop going to school because the family can no longer afford it.

2. Industrial biofuels – the context

Biofuel is fuel obtained from biological material. But the term 'bio' also implies some sort of environmental benefit (for example the French word for organic is *biologique*) and the term has been hijacked by the biofuels industry to portray a green image.

The term biofuel, by itself, should only refer to fuel produced from waste processes such as landfill off-gassing, recycled vegetable oil or small scale sustainable production for local use.

Agrofuels are also biofuels but refer to the fact that the biological material is an agricultural crop, produced intensively by agribusiness, in large-scale monoculture plantations and which compete, directly or indirectly, with food (see Box 1). These are agrofuels produced on an industrial scale. The term 'industrial biofuel' rather than agrofuel is used in this report.

The main agricultural crops used for industrial biofuels (ie agrofuels) are:
– vegetable oil/oil seeds – such as palm, soy, sunflower, rapeseed and jatropha which can be used to produce biodiesel;
– starches – maize (corn) and wheat – and sugars are used to make ethanol (ethyl alcohol) which can be used in petrol.

In small quantities, they are fairly easily blended with existing fuels with little if any modifications to existing vehicle engines or transport infrastructure (currently about 3.3% of EU road fuel comes from biofuels[2]). Thus they are well suited for use in transport. They are also used in

BOX 1: COMPETITION BETWEEN FOOD AND INDUSTRIAL BIOFUELS

Maize and wheat are important food staples in the developing world. Vegetable oils such as palm oil are also important food ingredients and can be used to cook other food.

Many rich-country producers, and particularly those manufacturing ethanol from maize (corn) and wheat, argue that their feedstocks (ie the crops used to make biofuels) do not compete with food because they are different varieties.

Take maize as an example: some proponents argue that US ethanol is produced from field corn (yellow maize) which is used to feed animals. It is sweetcorn that is consumed by people. However, about 10% of field corn is still used in the US food chain and some exports of field corn are consumed by people, particularly in exports to the developing world. It is currently the same in the EU: the wheat varieties that are likely to be turned into ethanol are also consumed by people. So contrary to their arguments, there is a direct and strong link between crops that are used both for fuel and food.

There are other 'competing' links that are perhaps more important. Greater demand for maize or wheat – as a fuel – drives maize and wheat prices higher, as described in Chapter 3. This in turn has a direct bearing on the quantity and quality of food consumed in developing countries.

The argument is also flawed because of the issue of land. Much of the land used for wheat and maize for animal feed and/or ethanol could also be used to grow food. And turning millions of hectares of agricultural land over to fuel (for example in the EU) will often shift the crops they've displaced onto land somewhere else (for example outside the EU).

"It is a crime against humanity to divert arable land to the production of crops which are then burned for fuel."

Jean Zeigler, (speaking in 2007) United Nations Special Rapporteur on the Right to Food 2000-2008

Busiswe Mpulo, maize farmer in Kwa-Zulu Natal, South Africa.

PHOTO: JAMES OATWAY/PANOS/ACTIONAID

power/heat units, such as power plants, boilers and cooking stoves. If industrial biofuels are produced unsustainably, the same issues will occur regardless of whether the fuel is used in transport or in a power station.

First, second and third generation industrial biofuels

First generation refers to industrial biofuels that are produced using conventional technology, that are currently in commercial production and compete with food such as maize, palm oil and rapeseed oil. Jatropha also falls within this category because although it cannot be eaten, it uses current technology, is in the early stages of development and competes with agricultural – ie food – land.

Second generation industrial biofuels are made using new technological processes and non-food crops, and are currently being investigated for their commercial viability. These include biofuels from forestry and agricultural by-products such as stalks from wheat/maize, from wood waste or specifically grown crops such as poplars and micanthus. There remain doubts as to whether they will ever be commercially viable.[3] Even if they do get onto the market, this is unlikely before 2018.[4]

The benefits of second generation biofuels are still disputed. But concerns have been raised that land to grow them would displace food crops and drive deforestation to create more farmland,[5] making climate change worse (see Chapter 3).

Even more advanced biofuels from algae are being researched (commonly called third generation). However, commercial viability and production of third generation biofuels is a long way off.

WHAT'S DRIVING THE EU INDUSTRIAL BIOFUEL BOOM?

The EU and member states have already sent out signals that companies should go out and invest in industrial biofuels, for example in new refineries and land acquisitions. Billions of euros have already been spent – privately and publicly – on supporting the EU industrial biofuels industry.

In 2006, EU farmers received €1.4 billion to produce biofuels. At this rate, biofuels could cost EU taxpayers up to €4.2 billion annually by 2020

The inter-relationship between industrial biofuels and different sectors and issues – agriculture, energy, transport, the environment and trade – means a wide variety of policy instruments are being used to promote them.

The EU's 10% target

By far the most important development is the recently adopted EU Renewable Energy Directive (RED).[6] ActionAid wholeheartedly supports the general thrust of this directive – that by 2020, 20% of all EU energy must come from renewable sources. However, there is a sub-element to this directive that will have the effect of increasing hunger while failing to meet the EU's stated aims of reducing GHG emissions. It covers the transport sector and says that by the same date, 10% of transport fuels must also be from renewable sources. Member states will meet almost all of the 10% obligation through industrial biofuels, meaning that it is, in effect, an industrial biofuels target.

Domestic agricultural subsidies

EU farmers receive subsidies for all crops they produce, including those that can be processed into industrial biofuels – sugar beet, maize, rapeseed oil, soy, sunflowers and wheat. The farmer will sell to an ethanol or biodiesel processor so long as the price is better than could be obtained from a food processor or grain animal-feed operator. In 2006, ActionAid calculated that EU farmers received €1.4 billion to produce industrial biofuels. Although subsidy rates are likely to change, given current support levels and predicted EU production levels, the 10% target could end up costing taxpayers as much as €4.2 billion a year by 2020 in agricultural support (see Table 1).[7]

Tax exemptions

By far the largest element of support to the EU biofuel industry is exemption from excise duties. For example, the duty on UK biofuels at the pump is 20 pence less per litre compared to conventional fuels although this is due to end in 2010. From 2009, the duty on low-sulphur petrol and diesel in the UK was 54.19 pence per litre; for biodiesel and ethanol it was 34.19 pence per litre.[8] In Sweden there are no energy taxes on biofuels.[9] ActionAid calculates that in 2006, EU tax exemptions were worth about €3 billion. Although excise duties are likely to change, given current support levels and predicted EU consumption levels, the 10% target could end up costing taxpayers as much as €9.5 billion in tax exemptions a year by 2020 (see Table 1).[10]

European subsidies are very important (as in the US) because biofuels in developed nations are, in the main, uneconomic without subsidies. This is particularly true when the price of oil falls below US$60-100/barrel depending on the biofuel and the price of the feedstock in question.

Table 1: Main EU industrial biofuel subsidies in 2006 and 2020[11]

€ millions	2006 costs to the EU taxpayer	2020 projected costs to the EU tax payer
Tax exemptions for producers	2,960	9,506
Agricultural support	1,448	4,216
Total subsidy	4,408	13,722

This assumes that payments and exemptions continue at the same level from 2006 to 2020. While the rate of tax exemptions is already falling in some countries, this is countered in part by increased volumes.

"I don't have a farm, I don't have a garden, because the only land that I have has been destroyed. We are just suffering with hunger, because even if I go to look for another farm, they will just destroy it again."

Elisa Alimone Mongue, mother and farmer, Mozambique, November 2009

Elisa Alimone Mongue, mother and farmer, Mozambique. Her land was taken by a biofuel company.

PHOTO: JAMES OATWAY/PANOS/ ACTIONAID

Trade and investment incentives

It is no coincidence that industrial biofuel companies are focusing overseas investment opportunities in Africa, parts of Asia and south and central America. Many of these countries benefit from preferential trading access back into the EU. This means biofuel and feedstock traded into the EU either have lower tariffs or are exempt from tariffs. These include African, Caribbean and Pacific countries under Economic Partnership Agreements (EPAs), least developed nations under the 'everything but arms' initiative; and 13 developing countries (Bolivia, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mongolia, Nicaragua, Paraguay, Peru, Sri Lanka and Venezuela) under the General System of Preference+ scheme.[12, 13] There are additional benefits for companies as well; some of these trade deals – for example EPAs – also often cover inward investment whereby companies' access to developing countries is made easier; for example previous restrictions on foreign land ownerships or leases may be eased or lifted all together.

This preferential access has also stimulated a new series of south-south co-operation agreements. Companies in Brazil for example have restricted access to the EU for Brazilian ethanol because of higher tariffs. But since 2007, the Brazilian government and Brazilian company Empresa Brasileira de Pesquisa Agricola (Embrapa) have signed a number of agreements with other developing countries as a means of facilitating Brazilian co-operation and investment. Embrapa is the main agent for investment in Africa; and projects have been established in Libya, Morocco, Mozambique, Ghana, Kenya, Tunisia, Benin, Togo and Angola under its leadership, many of which have preferential access to the EU.[14]

The EU will meet almost all of the 10% target for transport fuels from 'renewables' through industrial biofuels – in effect, making it a biofuels target

3. What's wrong with industrial biofuels?

The sheer scale of industrial biofuels – from large-scale intensive agricultural plantations to the export of the raw material – is not sustainable. Yet the allure of apparently easy solutions has led politicians and corporations to push ahead with industrial biofuels without heeding the many warnings about their negative impact, including the following.

Global food prices

- Industrial biofuels have contributed to the food and hunger crisis. Diverting land and food crops into fuel production has contributed to rising international food prices.

Local issues such as land, food security and labour conditions

- Local food prices are also increasing.
- Industrial biofuel production is encouraging a land grab and the (sometimes violent) displacement of people.
- Income levels for biofuel plantation workers are low and labour conditions are poor.
- Local environmental impacts are becoming increasingly evident, from a reduction in soil quality to the depletion of water resources.

Climate change, habitats and biodiversity

- Industrial biofuels are no longer seen as a solution to climate change; in fact most biofuels release more GHG emissions compared to fossil fuels.
- There are massive impacts on habitats and biodiversity. Some biofuels – such as sugar cane, soy and palm oil – are either directly grown in tropical forest areas and other high biodiversity hotspots, or are displacing other activities such as cattle ranching into these areas.

Energy security

- Industrial biofuels will do little for energy security – indeed crops have their own insecurity through droughts and disease.

INDUSTRIAL BIOFUELS INCREASE FOOD PRICES, DRIVING MORE PEOPLE INTO HUNGER

Many talk of the food crisis as something that happened in 2008. While global food prices fell back in the latter part of 2008, domestic prices have proved 'stickier' and remained resolutely high. Riots over food shortages no longer hit the headlines, but for millions of people the food crisis is still with them.

The food crisis, and skyrocketing demand for industrial biofuels, are exacerbating the situation

Table 2: Causes of the 2008 global food price increase

Causes of the 2008 global food price increase	**Study by Don Mitchell (see footnote)**[15]	**Purdue University study**[16]
Shifting commodity consumption patterns	Little impact	An impact but mainly due to oil demand from China
Rising oil prices	10%	Significant impact because linked with biofuels and costs of food production
Climatic events	Little impact	No in the short-term
Decline of the US dollar	15%	Significant impact
Speculation	Little impact	Inconclusive
Biofuels	75%	Significant impact and strong links with rising oil prices

"No one will buy jatropha. People said if you have a plantation then surely you have a good market, but we didn't see such good market. When I got the message that there was no market, I got discouraged. I was very upset. I felt very bad. I expected profit. I threw it [the seeds] away."

Raju Sona, farmer, India, November 2009

In 2008 the food crisis pushed 100 million people newly into poverty. Biofuels alone pushed 30 million people into hunger

for poor people and undermining their right to food. The World Bank estimated in 2008 that the crisis had already pushed a further 100 million people into poverty. ActionAid estimated at the time that 30 million more people were now hungry as a result of biofuels.

The causes of the rise in food prices are clearly complex, but a number of authoritative sources have confirmed that industrial biofuels were one of the main causes of the food price hike.

The study by Purdue University for Farm Foundation is in fact an evaluation of 25 different surveys. It essentially supports Donald Mitchell's (and other institutions') analysis without attributing statistical importance – that biofuels, linked to rising oil prices, are a major contributor to rising food prices. Oil prices are predicted to be higher in the medium to longer term as we come out of the global recession. So we will see a dramatic increase in food prices and hunger.

Raju Sona, farmer, northeast India. He gave up food production to grow jatropha which failed to give him an income. His family is much happier now that he is growing food again.

PHOTO: ATOL LOKE/PANOS/ACTIONAID

And it is the poor and poor countries that will suffer most. Many low income developing countries are net food (and fuel) importers; most households in developing countries are net food buyers; and the poorer you are, the greater the percentage of your income spent on food (in some households it is as much as 80%).

The interaction between industrial biofuels, higher food prices and hunger arises because:

- fuel, energy and food prices are now increasingly linked;
- at a global level, a relatively small change in agricultural supply or demand has a large and disproportionate effect on food prices, and so the increased demand for biofuels has driven food prices higher;
- higher global food prices have been transmitted through to the national level;
- higher national food prices have filtered through to the local level where the majority of households are net buyers;
- this has been compounded by food growers changing over to biofuels in anticipation of higher returns, and farmers leaving their own land uncultivated in order to work on biofuel plantations.

The FAO estimates that in 2008/9, 125 million tonnes of cereals were diverted into biofuel production. In this year, as shown in Table 3, at a time when hunger was escalating and riots over food shortages were common, more cereal production was diverted into animal feed and industrial uses (1,107 million tonnes) than feeding people (1,013 million tonnes). 2008/9 was a record global grain harvest, up 7.3 % from the previous year (which was also at a record level).[17] The cereal market is geared more towards feeding animals and industrial uses than feeding people (see Box 1, page 8).

Around 30% of maize production in the US is

Around 30% of maize production in the US is now being converted into ethanol

Table 3: World cereals production and 'end use'

Million tonnes	2007/08	2008/09	% change	Change 07/08–08/09
Total production	2,132	2,287	+1.3%	155 million tonnes
Total utilisation of which*	2,120	2,202	-	-
To food	1,013	1,029	+1.5%	+16 million tonnes
To animal feed	748	773	+3.3%	+25 million tonnes
To other uses	359	401	+11.7%	+42 million tonnes

*Utilisation is a combination of production and the use of stocks from the previous year (stocks of cereals went up from 2007/08 to 2008/09 by about 80 million tonnes)

now being converted into ethanol.[18] Putting the energy markets into competition with food markets will inevitably result in higher food prices.[19] Industrial biofuels are placing a massive and additional demand on agricultural production. Not only will extra agricultural supply simply not respond quickly enough, but there are well grounded fears that there will not be enough land or resources such as water to meet future demand for food, let alone biofuels, as shown in Chapter 4. All this is driving prices up.

The increase in prices is not just confined to prices of maize, wheat, vegetable oils and sugar – ie biofuel feedstocks themselves. Close food substitutes are also affected. For example, as prices of maize rise, consumers will look to purchase cheaper substitutes. This extra demand in turn increases the price of substitutes. It also has knock on effects on animal feed prices which in turn will affect the livestock and poultry industries. The link between food and fuel prices is also evident in that energy is required to make fertilisers and for use in machinery and transport, thereby increasing costs of farming.

Rising prices and hunger at a global level

From 2006 to the middle of 2008, the global prices of nearly all major food and feed commodities skyrocketed. Overall, world food prices increased by 75%, yet the price for staple food grains (such as wheat, rice and maize) increased by a staggering 126% over the same period.[20] For the 82 low income food deficit countries, import bills (in comparison to export revenues) went up. Each 10% increase in the prices of cereals (including rice) adds nearly US$4.5 billion to the aggregate cereals import

Table 4: 2008 food price rises due to industrial biofuels[22, 23, 24]

Agency/Institution	Date	% rise in food prices due to biofuels
IMF	April 2008	20-30%
IFPRI	May 2008	30%
FAO	June 2008	'A significant factor'
OECD	July 2008	'A significant element'
Donald Mitchell	April 2008	75%

"Rapidly growing demand for biofuel feedstocks has contributed to higher food prices, which pose an immediate threat to the food security of poor net food buyers in both urban and rural areas."

Food and Agriculture Organization, 2008

Between 2006-08, global food prices rose by 75%. The costs of staple grains that poor people rely on rose even higher, by 126%

cost of those developing nations that are net importers.[21]

There has been some controversy regarding the extent that industrial biofuels were responsible for the rise in global prices in 2008 (see Table 4). Those with a vested interest, such as the US and the EU, have tended to play down the role of biofuels. Independent observers have concluded that industrial biofuels have played a more significant role, probably in the range 30-75%.

The exact figure probably lies somewhere within this range. Assuming the lower figure of 30%, ActionAid conservatively calculated in 2008 that 30 million more people are now hungry as a result of industrial biofuels and a further 260 million are at risk of hunger. ActionAid's figure was vindicated last year when the FAO confirmed that between 2008 and 2009, a staggering 100 million more people were pushed into hunger within a year.

According to the Organisation for Economic Cooperation and Development (OECD), a third of the rise in agriculture prices foreseen for the next ten years (2008-2017) will be caused by increased demand for industrial biofuels.[25]

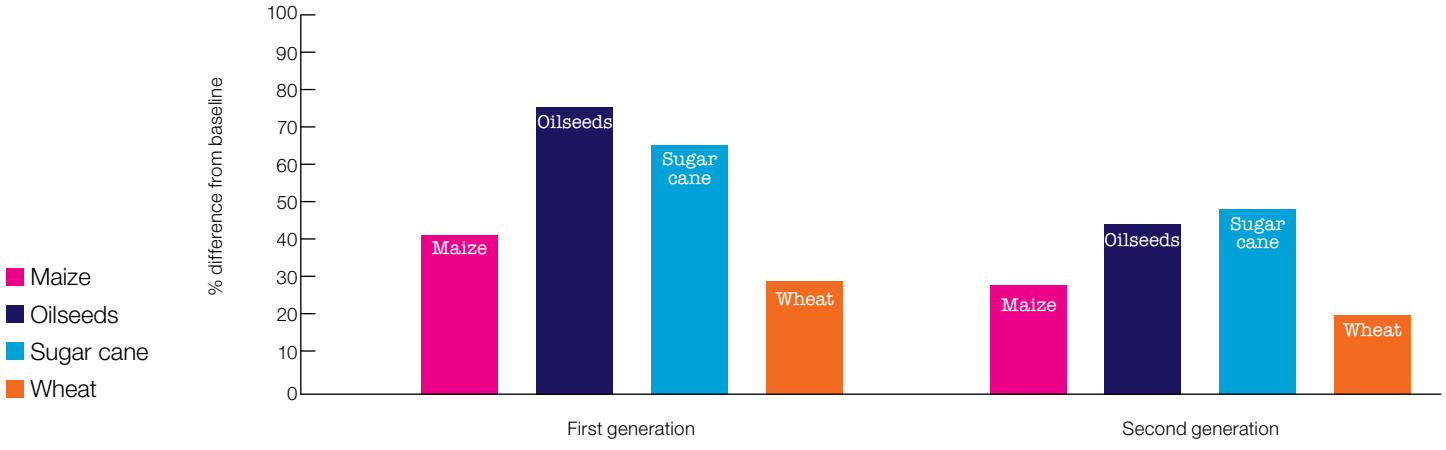
Box 2: The EU 10% target and hunger

The European Commission has forecast that its own target would increase world cereal prices by 3 to 6%.[29] Following the same argument as outlined below – that the number of hungry people could increase by 16 million for every 1% price rise – the EU could be responsible for an extra 50-100 million people going hungry by 2020.[30]

Many other studies have attempted to project future price rises due to biofuels if consumption targets are met. The Overseas Development Institute (ODI) has summarised 11 of these studies and for almost every product studied, the impact on food prices was up, sometimes significantly.

The ODI describes the International Food Policy Research Institute (IFPRI) model as 'typical' of these studies; that by 2020 prices would rise between 21 and 30% for wheat, 29-41% for maize and 45-76% for oilseeds (see Figure 1).[26] This is in keeping with other estimates. But the lower end of the IFPRI estimates is based on the assumption that second generation will be available. ActionAid

Figure 1: Changes in commodity prices in response to global biofuel expansion in 2020

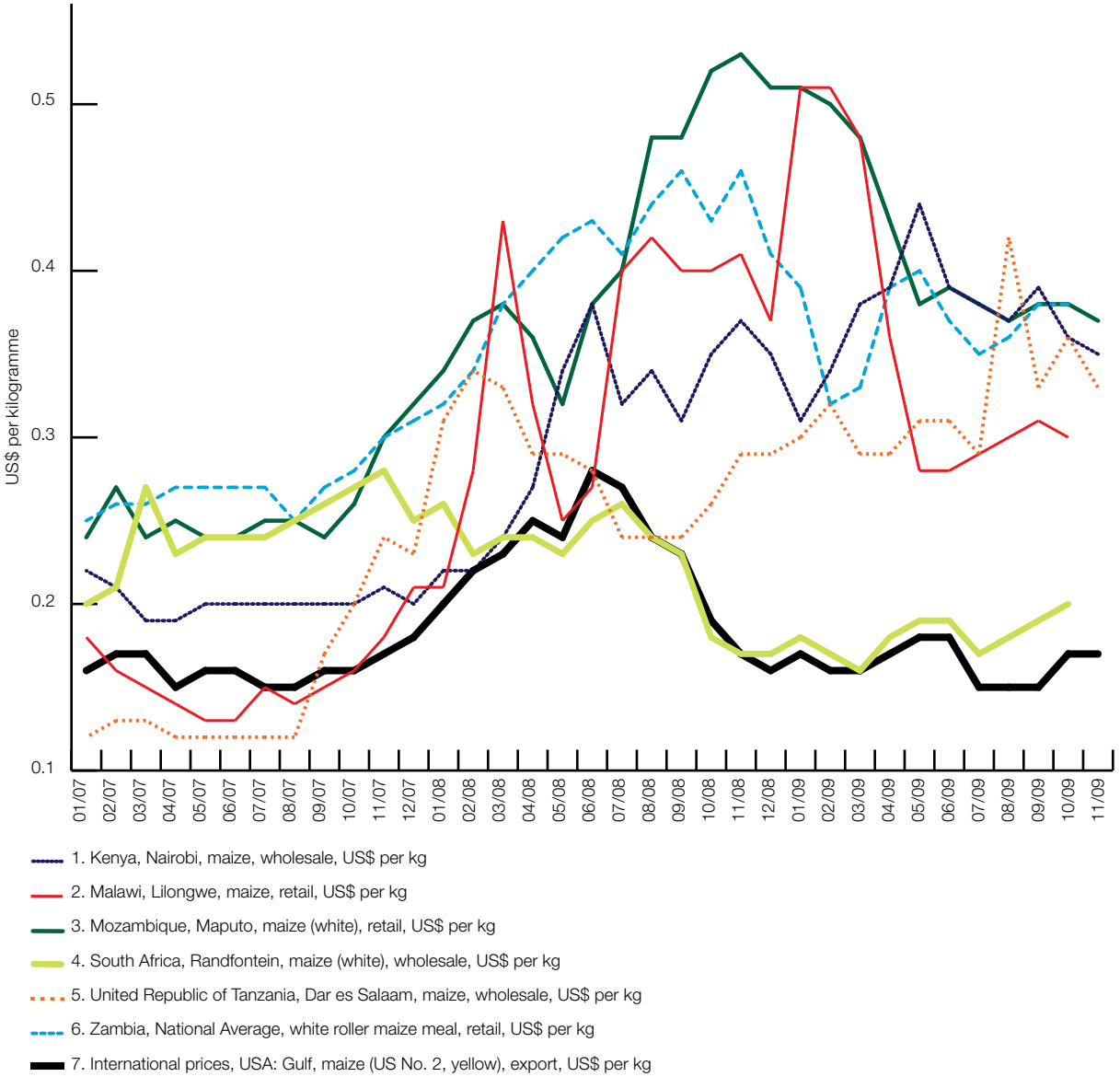


By November 2009, maize prices in Zambia, Kenya, Malawi and Mozambique were still around 60% higher than at the start of 2007; in Tanzania it was 150%

believes that this is unlikely to be the case; and that IFPRI's price rises for first generation are likely to be more realistic.

The IFPRI model shows that the impact on food supply and malnutrition, particularly in Africa, could be alarming. It is also estimated that the number of hungry may rise by 16 million for every 1% rise in food prices.[27] Assuming a conservative rise of 35-40% by 2020, this suggests that some 600 million more people may be hungry within 10 years because of industrial biofuel expansion. This is similar to another finding – that a 20% increase in food prices in 2025 would increase the number of undernourished people by 440 million.[28]

Figure 2: Maize prices in east and southern Africa between 2007 and 2009[31]



"We deeply regret we agreed on letting [the biofuel company] operate on our land."

Rashidi Omary Goboreni, farmer, Tanzania, September 2009

Rising prices and hunger at a national level

Whether poorer nations and poorer people suffer from price rises depends not just on whether countries are net food importers but also whether households are net buyers or sellers.

Figure 2 shows that global maize prices peaked in the summer of 2008 and fell back to levels experienced at the start of 2007 as the world went into recession and oil prices fell. Yet for east and southern Africa, the global increases in maize prices from mid 2007 onwards was transmitted almost immediately into higher domestic prices, both wholesale and retail.

However, while global prices fell, domestic prices have proved 'stickier'. Prices in much of east and southern Africa continued to rise. By November 2009, maize prices in Zambia, Kenya, Malawi and Mozambique were still around 60% higher than at the start of 2007; in Tanzania the figure was 150%. The magnitude of the price rises, and subsequent volatility, is also alarming although sharp price movements are to be expected pre and post harvest time. The only country in the survey that appears to buck this trend is South Africa.

Domestic prices have remained higher in part due to more localised issues such as climatic events (droughts), currency fluctuations and civil strife. But high prices have another effect. In developing countries, farmers are increasingly switching away from food crops into other cash crops as the price for the latter rises. For example, by mid 2009, global sugar prices had reached a 28-year-high on the back of crop failures in India and increased demand for ethanol. Farmers in Swaziland are cultivating sugar cane at the expense of staple food.[32] But at the same time, the country is suffering massive food insecurity because of exceptional shortfalls in food production and supplies.[33]

The massive rise in maize prices from late 2006 had an immediate effect on farmers and consumers in central America. The region is closely linked with the US market. In 2007 tortilla prices almost doubled and there was a public outcry – resulting in protests and riots – among the tens of millions of poor Mexicans who rely on tortilla as their main food.[34] The maize crisis spilled over into other countries in central America. Again, maize prices hit the poorest hardest as tortilla prices rose. Costs in the livestock industries, where maize is used as feed, rose by 15-20% in 2007 alone.[35]

Small wonder that the food crisis sparked riots across the globe from the Philippines, Bangladesh and India; to Egypt and Senegal; and to Mexico, Haiti and El Salvador. In 2008, food price inflation in Latin America and the Caribbean was running at 20%[36] while in parts of Africa – Zambia, Kenya and Ethiopia – it ranged from 16 to 47%.[37]

Impacts on households, women and the poor

The majority of households in urban and rural areas are net buyers of food and consequently they are the most vulnerable to rises in food prices. In a World Bank survey of seven countries (Bolivia, Ethiopia, Bangladesh, Zambia, Madagascar, Vietnam and Cambodia), only in Asia are there a greater number of net selling households; but even here it was only just over 50%. In both Bolivia and Bangladesh, about 85% of households are net buyers; in Zambia it is 65%; and in Madagascar and Ethiopia it is about 52%.[38] Another study found *"empirical evidence from a number of sub-Saharan countries…[that] in no case finds a majority of farmers or rural households to be net food sellers".*[39]

Purchasing of food with 5,000 Kwacha (US$1) in Lusaka, Zambia in February 2008 (left) and February 2009 (right).

PHOTO: MWILA MULUMBI

Not only are most households in developing countries net buyers but poor families spend a greater percentage of their income on food, as much as 80% in some cases.[40] Of the households that are net sellers in developing countries – which we have established are the minority – most tend to be farmers that are better off, and on farms with larger areas of land. Poorer, small-scale farmers are invariably net buyers and are most likely to be negatively affected.[41]

In a survey of seven different countries, the FAO estimated the welfare gains or losses from a 10% increase in the price of the main food staple. In urban areas, every household will experience a net welfare loss (ie they will be worse off). In rural areas, it is the poorest quintiles that are the biggest losers (with the exception of Ghana and Mozambique which experienced small welfare gains).

And the impacts fall heavily on women who are responsible for 60-80% of food production in developing countries yet own less than 10% of the land.[42] Land being turned over to industrial biofuels is also particularly important to women. They may not own the land but it has often been 'allocated' to women by their husbands so they can grow crops, collect nuts, graze animals or collect firewood. This has knock-on impacts for food security and hunger. As food prices rise, women reduce their nutritional intake sharply so as to feed the rest of the family.[43] As UNICEF says: *"A growing body of evidence... suggests that when resources are scarce women generally prioritise the nutrition of family members above other personal and household issues."* [44]

This is well illustrated in Indonesia. When prices rose, mothers in poor families invariably responded by reducing their food intake in order to feed their children. In the same FAO study, even though female-headed households were not over-represented among the poor in the seven countries, they invariably suffered either greater welfare losses or smaller welfare gains. The FAO concluded that female-headed households fare worse when the price of staple crops rise because they spend a far greater share of their income on food. In rural contexts, women have less access to land and participate far less in agricultural income-generating activities, and therefore do not benefit from crop price rises.[45]

What many of these studies do not consider is whether farmers in developing countries produce more when crop prices rise. However, ActionAid's own surveys and analysis confirm that smallholder farmers in many countries, who produce the bulk of food, have not been able to respond to higher prices by bringing more food into production. Much of west and east Africa, as well as south and central

"Filling the 25-gallon tank of an SUV with pure ethanol requires over 450 pounds of corn – which contains enough calories to feed one person for a year."

Professors Ford Runge and Benjamin Senauer, 2007

EU companies have already acquired or requested at least five million hectares of land for industrial biofuels in developing countries

America, are forecast to experience cereal production declines in 2009.[46] But there are clearly many factors behind this production shortfall.

INDUSTRIAL BIOFUELS ARE FAILING LOCAL COMMUNITIES WHERE THEY ARE GROWN

To meet the demand for biofuels in developed nations, significant land area is already being acquired in developing countries. That puts land and land rights at the centre of the industrial biofuels debate:

- Land is being taken out of food production and replaced with fuel production.
- Less land for food will have a direct impact on local food prices and hunger.
- Land rights are being violated as investors seek new areas for production.
- Land use issues will also have a major impact on whether industrial biofuels contribute to fighting climate change (see next section).
- Labour conditions and incomes for plantation workers are often poor.

Grabbing land – the 'new gold'

Land grabs for commodities have gone on for centuries. Rich nations have a long history of plundering the resource base of developing nations – from precious metals, minerals, oil and other fossil fuels to forest products and cash crops. But the recent rise in both food and fuel prices has turned land itself – a finite and increasingly pressured resource – into a valuable commodity which investors and speculators are keen to exploit. Some have described the industrial biofuel scramble as the latest chapter in the long-running colonial land grab in poorer countries.

Access to land and other resources is a fundamental precondition in the fight against rural hunger and poverty. But access and tenure to land is often poorly protected, particularly for women who produce 60-80% of food in developing countries. Compared to men, they own very little land. Instead, women often use communal land to grow crops, collect nuts, graze animals or collect firewood. But this very same land is being targeted for biofuel expansion.

Scale of the current land grab

ActionAid is campaigning against industrial biofuels in a number of countries – from Guatemala and Ghana to India. What we are witnessing is a land grab – the displacement of vulnerable communities, often without any prior community consultation or decision making.

The scale of the land grab is astonishing. In a study of just five countries – Ethiopia, Ghana, Madagascar, Mali and Sudan – some 2.5 million hectares have been given over to food and fuel with 90% of it under private (mainly foreign) investment. Of the 2.5 million hectares, 1.1 million is for industrial biofuels (an area the size of Belgium). Incredibly, all the biofuel production would be exported.[47]

At a global level, ActionAid has surveyed existing and potential EU company biofuel land investments in developing countries. ActionAid calculates that EU companies have already secured or requested at least five million hectares of land for industrial biofuels in developing countries. This is equivalent to an area greater than the size of Denmark. It will be mainly for growing jatropha, but also sugar cane and palm oil where it is known that these are being used as a biofuel source. Because crops like sugar cane and palm oil can be used in a variety of ways, it is difficult to get an exact figure. There is also a scarcity of data on some projects. So, though five

"Our livelihood was dependent on the farms – and they've taken the farms."

Julio Ngoene, village chief and farmer, Mozambique, November 2009

Julio Ngoene, village chief and farmer, Mozambique.

PHOTO JAMES OATWAY/PANOS/ACTIONAID

LAND GRAB – JULIO NGOENE'S STORY

Julio Ngoene is fighting to save not only his community's farmland, but also its way of life. Julio is the village chief for approximately 100 households, totalling over 1,000 people. Their agricultural livelihood is critical to them.

However, a biofuel company is setting up a project near his village and has taken over – without permission – 85% of the village farmland and destroyed its crops.

At the onset of the project, the company promised to resettle the village but, two years later, Julio and the villagers have heard nothing more. Despite the lack of permission for the farmland that was taken, no-one in the community has received any compensation.

million hectares is a crude estimate, it is also likely to be a conservative one.

Over the past 18 months, ActionAid has been looking into the local impacts of this land grab in the countries where we work (and this research is continuing). The following sections reveal some of our findings. Almost without exception, the respondents had negative experiences of biofuels in their areas.

The displacement of people and local communities

Even where consent to use land for biofuels has been sought and given (after often cursory consultation), it is little more than a subtle form of land dispossession, particularly of women. Communities are invariably fed the positives of industrial biofuels (high yields, prices and prompt returns), and offered compensation and promises by the company in the form of

60 million indigenous people are globally at risk of displacement because of industrial biofuels

jobs, incomes, schools etc. But some of these may never materialise. At the same time, local authorities often allocate land to companies without any consultation with affected communities at all.

In Colombia, NGOs have documented land rights' violations due to the massive expansion of palm oil and sugar cane plantations.[48] In Indonesia, in the village of Aruk, villages and people have come into direct confrontation with palm oil plantations. Twenty-five plots were cleared without their permission. One villager lost his 10-acre plot. *"I went to my land one morning, and found it had been cleared. All my rubber trees, my plants had been destroyed… Now I have to work as a builder in Malaysia, so I can feed my three children."* His cousin said: "*This is our ancestors' land which we have had for years, and now we have lost it."*[49] The Chair of the UN Forum on Indigenous Issues has estimated that 60 million indigenous people are globally at risk of displacement because of industrial biofuels.[50]

The situation is similar in Tanzania. In one case where ActionAid has conducted interviews, 175 villagers have been displaced. Clearly, there is anger about what is happening, not just in Tanzania but throughout Africa.

"We deeply regret we agreed on letting [the biofuel company] operate on our land. Now we think the employment and the possibility to use their tractors was only their strategy to get the agreement … We realised we did not know if we had agreed on selling our land or leasing it for 50 or 99 years. A neighbour told us he had leased his land for 99 years and we got worried. What is hiding behind the 6,000 schilling [about €3 as an initial payment], we wondered? If we do not get employed then how will we make our living? Without land we will not be able to farm and our children will have nowhere to settle down when they grow up. I've heard stories about other villages who have leased their land and the villagers there are now not even allowed to pass their land. If they pick up firewood, someone from the company will tell them to put it back." **Rashidi Omary Goboreni, farmer, Tanzania, September 2009**

"Land is generally given to wealthy people at the expense of local people whose ancestors have used the land for generations. There will never be development if they give land to the rich and ignore poor people. If this trend continues, there will be no more small-scale farmers in this area. I believe it is my land and I do not want to lose it. I want my children to stay and inherit the land and not move away." **Gora Thiam, farmer and village chief, Senegal, October 2009**

Food security is being compromised because land for food is being used for fuel

In parts of Africa, some companies have secured land that was used for growing crops for the production of jatropha (see Box 3) and sugar cane.

"I and the community expected to increase our cash income and revenues by working on the plantation. Our food is insufficient because we gave away our land. We have to fight for our rights and find alternatives to fill the gap in food and livelihoods." **Mamadou Bah (alias), farmer, Senegal, October 2009**

BOX 3: MARGINAL LANDS AND JATROPHA

Jatropha has been sold as a miracle biofuel. Native to central America, jatropha produces seeds that contain oil, which can be used as biofuel.

One of its supposed advantages is that it can be grown on 'so called' marginal land, and not compete with food. Jatropha, it is claimed, can also be grown in semi-arid areas, on poor soils with limited water use. It will therefore provide livelihoods and promote rural development.

Most of the evidence to date suggests that this is too good to be true. For a start, companies would like the crop to be grown on fertile land with the requisite amounts of water to bring higher yields and returns. But this would put it into direct competition with land that could, and often is, used to grow food. In Tanzania, jatropha is being targeted at areas with good rainfall and fertile soils. In Sahel areas of Senegal, jatropha will only survive with irrigation; it's a similar story in Swaziland, which is suffering from persistent drought.[51]

Jatropha is also being sold on the basis that the crop will offer employment and livelihoods. But the ODI concludes that "as the mainstay of people's livelihoods, [jatropha] looks distinctly marginal."[52] This is because:

- employment is often sporadic – it is labour intensive during planting (year 1) and then very little until harvesting (years 4+);
- in India, where jatropha is becoming well established, the promise of high yields has never been proven regardless of whether they are gown on fertile or poor soils. The initial forecast was that it would only be cost-competitive if yields reached 3-5 tons of seeds per hectare per year. Private firms have now had to scale down projections to 1.8-2 tons per hectare per year, and even this has yet to be achieved.[53]

These are some of the other reactions to jatropha from ActionAid's field visits:

"Until now I haven't got any seeds from this jatropha. I feel bad. Now it is almost four years and I am not getting any income. There is no improvement." **Wanjang Agitok Sangma, India**

"I don't think the jatropha will be profitable." **Matilda Sangma, India**

"I don't have any interest in jatropha. It's a loss to us, there are no benefits." **Mamadou Bah (alias) Senegal**

"We do not want jatropha here." **Sophie Mbodj, Senegal**

The concept of marginal lands has now become synonymous with other terms – for example land that is idle, exhausted and/or degraded. The whole idea that jatropha (or any industrial biofuel crop) should be targeted at these lands is an insult to those that ActionAid works with in developing countries. Communities would dispute whether most, if any land would fall into these categories, even if definitions could be agreed. Communities use this land and massive numbers would be displaced.

A jatropha seed

PHOTO: ACTIONAID

"What we want is to get our farms back, because that is what our livelihood is dependent on... we are dying of hunger and there is nothing that we have that is actually our own."

Matilde Ngoene, mother and farmer, Mozambique, November 2009

"I don't have a farm, I don't have a garden, because the only land that I have has been destroyed ... We grew maize, groundnuts, beans, pumpkins, watermelons... I have given up: I am staying helplessly, because we don't have anything to eat. We are just suffering with hunger, because even if I go to look for another farm, they will just destroy it again." **Elisa Alimone Mongue, mother and farmer, Mozambique, November 2009**

"I clearly refused all the initial propositions that I received for starting to grow jatropha because I do not want us to become farm workers at the mercy of a few companies. I prefer to continue to increase my production of rice and corn. Imagine what would happen if the world demand falls and the price of agro-fuels collapses, after we have concentrated all our efforts on it? Our situation would be even worse than now, and there would be famine. We can't eat jatropha, but we can eat rice."**Abdou Tall, farmer, Senegal, 2008**

"Farmers that now work on the plantations have neglected their own land and crops. It was hard last year because most farmers went to the plantation to work. However, the company could not employ them. It was the middle of the rainy season, so too late to go back and plant crops. Food prices are generally the same in the market. But there are shortages of millet and less income. Even this year, there are farmers who haven't grown crops." **Khady Diop (alias), mother, Senegal, October 2009**

One of the supposed advantages of jatropha is that it doesn't compete with food and can be grown in semi-arid areas. ActionAid's findings on the ground reveal a very different picture. In Tanzania, jatropha is being targeted by companies, not at the semi-arid parts of the country, but at areas with adequate and reliable rainfall, fertile soils, and relatively well developed infrastructure such as roads, railways and port facilities that favour exports. This is land that could be used to grow food.

In northeast India, local farmers and communities were being enticed to experiment with jatropha. Raju Sona grew jatropha for one year on land he otherwise uses to grow vegetables for his family.

"If we plant jatropha we will have a problem because [it means] we have to buy food from outside. If there is no market [for jatropha] then there will be a big problem. This will cause great loss to me. Vegetables are very expensive [so] we can save money with all the things we grow – we are cultivating potatoes and cabbages. If the land is planted professionally, it could grow 4,000 to 6,000 cabbages in six months to sell in the market. This is good land for growing ginger, onions and garlic." **Raju Sona, farmer, India, November 2009**

Food security is compromised because local food prices are rising

ActionAid is beginning to see evidence that food prices in local markets are beginning to increase because of the industrial biofuel companies in their locality.

"Instead of farming their land, people go to work for the [biofuel] company.

So then they are not involved in their activities at the farm. There are now fewer farmers involved in farming their own land. Food is becoming a problem… The price of food has been increasing every now and then. The increasing food prices have to do with food shortages within the village due to lower production on the farms." **Aailyah Nyondo (alias), farmer, Tanzania, February 2009**

When asked whether less food is produced since the biofuel company arrived, Fatuma Omari responded:

"Yes that is true… there is little activity on the farms and then the consequence is low production. I am alone and have to go to the farm daily. I never used this [jatropha] area for firewood collection. I buy it. I use charcoal. It was 100 shilling but now it is 200 shilling. That's because of the company – the company is using charcoal. [Food] prices are increasing because of low production in the village and we are depending on food from neighboring villages." **Fatuma Omari, farmer, Tanzania, February 2009**

Broken promises

In parts of west Africa, ActionAid has witnessed what is little more than a subtle form of land dispossession, where communities are offered promises from companies that are not being met.

One company has secured land from farmers, in local currency, at about €30 per hectare – a very small amount of money. But some farmers have agreed to sell the land on the condition that they were employed by the company on the 'plantation' at a rate of €130/month. However, having acquired the land, the company said that it would only pay about half the amount, €2.30/day or €70/month. While this is at the minimum wage for the country, the ActionAid office confirmed that this is simply not a living wage. For those that have given away all their land, €70/month is not sufficient for everyday needs, including the purchase of food.

"When the company came, they made a promise; if you want to work with us, you have to give up your land and you can work on the plantation. They reneged on their promises; we had already given up our land and now they reduced the hours on the plantation. In the beginning they gave us [€30/hectare]. If you work on the plantation, the company would pay us [€130/month]. I worked 2-3 months and then the company started to reduce the salary. Finally, it came down to [€70/month] and that is when the problems started. I lost my land. They did not respect me. They betrayed me. They reduced the people on the plantation and I lost my job. Almost all the people in the village have lost their jobs. The company brought their own staff from elsewhere [in the country] but not from the village." **Kwame Sarpong (alias), farmer, west Africa, 2009**

Loss of income, livelihoods and community resources

More often than not, those affected are women, because they are the ones most frequently 'displaced'. So-called marginal land is often used by women, and is critical to their livelihood as a place to grow food and subsistence crops, gather fuel, use for grazing or even as a source of medicinal herbs. As local land is taken over for industrial biofuel production, women are forced to spend more

time walking further afield to do other chores such as collecting firewood.

"It is the woman who is affected most because she is the main producer of food for the household. The woman is feeding the household. We normally used to go there [to the former community land on which the biofuel company is now growing jatropha] for farming and collecting firewood. Now we cannot go there anymore. They are prohibiting it. Now I have to go to another forest [to collect firewood]. This is a little bit far away. I would have to leave here now at ten o'clock and would be back at two o'clock. It is heavy. It is now harder work for me to go as compared to the other area. Because of this I can spend less time on my farm because the work time has been reduced." **Aailyah Nyondo (alias), farmer, Tanzania, February 2009**

"It would have major impacts for the village [if the company cut down the forest]. Now we depend as much on the forest as we do on the farm land. We use it for charcoal making, collecting firewood, mushrooms, timber of which we build houses, benches and other things. We also collect materials of which we make mats that we sell in the market." **Mwanahawa Abdala, farmer, Tanzania, September 2009**

In Ghana there are similar stories. Women have traditionally harvested nuts from shea trees to make shea butter – an important commodity in cosmetics and soaps, and used locally in cooking. Shea nuts have therefore been an important source of supplementary income for poor rural women, particularly during the rainy season. But in some areas, the shea trees have been destroyed to make way for jatropha plantations.

"The shea nuts I am able to pick during the year help me to have my children in school, to buy cloth and also to supplement the household's food needs when the harvest from my husband's farm runs out. But this year I could not get much because of the trees that have been cut. Now they have destroyed the trees so we have lost a good source of income forever, yet we have not been paid anything in compensation. That is why I confronted the white man at the meeting." **Sanatu Yaw, Ghana, 2008**

Those planting jatropha in northeast India are not getting a decent income. Most of them are getting no income at all. The main problems are low yields and a lack of market for seeds.

"No one will buy jatropha. People said if you have a plantation then surely you have a good market, but we didn't see such good market. When I got the message that there was no market, I got discouraged. I was very upset. I felt very bad. I expected profit. I threw it [the seeds] away. They were no use to me. I destroyed the plants because of lack of market. The thing is that we have land, but if I use it for jatropha and I don't get good production after spending money, it will be a great loss for me." **Raju Sona, farmer, India, November 2009**

"Until now we have had no income from the jatropha plantation. They told me it would be two years before we would have income, but it is already three years. People are a little down now

Matilde Ngoene, Mozambique. Her land was taken by a biofuel company.

PHOTO JAMES OATWAY/PANOS/ACTIONAID

because the whole project is already four years running and there is no income. I still hope that I will get profit otherwise I will pull up the plants." **Parindra Gohain (alias), farmer, India, November 2009**

In the sahel region of Senegal, ie the driest part of the country, much of the land earmarked for industrial biofuel production is also used for grazing animals. Each animal requires about 12 hectares of grazing which will be completely impossible if land is given over to biofuels.

Lack of consultation and compensation

The issue of compensation – or the lack of it – runs through many of the testimonies collected. In Tanzania, companies have been offering compensation to people where they had been displaced from their land. In one location, 60% rejected the compensation as inadequate.

In parts of west Africa, the scale and speed of the land handout has meant that those most directly affected by the biofuel boom have not even been consulted.

"They actually took the land when it was already tilled…They haven't paid us anything, they haven't told us anything. Some of the people in the town have received money, but in our case they haven't given us anything... They haven't offered any job, they haven't employed us. They haven't given us any alternative farms. What we want is to get our farms back, because that is what our livelihood is dependent on... we are dying of hunger and there is nothing that we have that is actually our own." **Matilde Ngoene, mother and farmer, Mozambique**

"Many things will be affected – health clinics, wells, roads, villages, people.

"The balance of evidence shows a significant risk that current [biofuel] policies will lead to net greenhouse gas emissions."
Ed Gallagher, Renewable Fuels Agency, 2008

In Africa, yields from rain-fed agriculture are predicted to drop by as much as 50% by 2020 because of climate change

This needs a lot of consultation. But there wasn't any consultation and there hasn't been any compensation." **Mustafa Lo, farmer, Senegal, October 2009**

Labour conditions

Brazil is the largest industrial biofuel producer in the developing world, where the sugar cane (ethanol) plantation industry is well established. However, working conditions are often poor.[54]

Of one million cane workers, about half are employed as cutters – most of which they do by hand. Because of the heat and long hours to meet quotas, it is not surprising that a number of deaths have been reported. The government's own investigations have found virtual slave labour conditions, exploitative sub-contracting systems, poor sanitation and quality of food, unfit drinking water and overcrowded living conditions. In one investigation, the team rescued 11,000 labourers working in unacceptable conditions.[55]

INDUSTRIAL BIOFUELS ARE NOT A SOLUTION TO CLIMATE CHANGE

Climate change is not just an environmental and developmental issue; it's also about injustice. The impact of climate change will be felt unevenly between and within countries, reinforcing existing inequalities, between women and men, rich and poor, and between the north and south.

Climate change is also a hunger issue. In some countries in Africa, yields from rain-fed agriculture are predicted to drop by as much as 50% by 2020 because of climate change, and India could lose 18% of its rain-fed cereal production in the same period. A Stanford University study forecasts that climate change could reduce maize production in southern Africa by more than 30% by 2030.[56, 57] More intense droughts and floods are recurrent in many areas. Of the 31 countries currently facing food and agriculture crises, 11 have suffered recent adverse weather conditions.[58]

Scientists working on the *Stern Review on the Economics of Climate Change* have predicted that, given current trends, up to an additional 600 million people may be hungry by 2080, as a result of climate change.[59]

Obviously action to limit climate change is imperative for development. The problem with industrial biofuels in this context is that they present a false solution. Some politicians and companies claim they emit fewer GHGs compared to fossil fuels – because they are carbon neutral (ie, as the fuel is burned it re-releases the carbon dioxide that the plant absorbed when it was growing, making a closed circuit). In truth, other resources – land, fertiliser and energy for example – are needed to grow the plants, and manufacture and transport the fuels, meaning industrial biofuels can have a large and negative climate impact.

How policy has got ahead of the science

The science surrounding the impact of industrial biofuels on climate change is evolving fast; and many scientists – some using life cycle analysis – are providing evidence that most biofuels currently being used actually release more GHGs compared to fossil fuels. Unfortunately, all of the figures currently used in EU legislation (ie in the recently agreed Renewable Energy Directive – RED) are over-optimistic about the potential for industrial biofuels to help reduce emissions. The backdrop to this is that the RED stipulates that member states' biofuels must achieve

Up to an additional 600 million people may be hungry as a result of climate change by 2080

35% GHG savings when compared to fossil fuel, and this rises to 50% by 2017.

The main policy areas where the EU is over-optimistic or currently has no policies in place are as follows.

Direct land use change

The increasing use of industrial biofuels is resulting in changes in land use. Direct land use change happens when forests, peatlands, grasslands or other non-agricultural lands are converted, cut down, or dug up for industrial biofuel production. When carbon-rich habitats are involved, this has massive implications for the carbon stored in the soil and in the vegetation. As biofuel production increases, so new land will be converted.

A recent study estimated the emissions from change in land use and compared them to potential emissions savings through the use of industrial biofuels. This gives a carbon debt and the study estimated how many years it would take to pay back this debt:[60]

- Indonesian/Malaysian peatland rainforest to palm oil biodiesel: 423 years
- Brazilian Amazon to soy biodiesel: 319 years
- US central grassland to corn ethanol: 93 years
- Indonesian/Malaysian tropical rainforest to palm oil biodiesel: 86 years
- US abandoned cropland to corn ethanol: 48 years
- Brazilian *cerrado* grassland to soy biodiesel: 37 years
- Brazilian *cerrado* woodland to cane ethanol: 17 years

This suggests that it will take many decades, even centuries, to turn any climate change benefits into a positive GHG balance profit – time we simply do not have if we are to limit dangerous climate change.

Another study by the Institute for Applied Ecology and the Institute for Energy and Environment in Germany shows that if you include direct land use change for the main EU biofuel feedstocks, none of them would achieve the required 35% GHG reduction as required by the RED.[61] This means that most EU industrial biofuel production must come from land already under agricultural production, displacing existing food and other production elsewhere – an indirect land use change (see below).[62]

Under the sustainability criteria, the RED makes some provisions that would restrict biofuels that originate from carbon rich areas such as forests and peatlands. However, there are so many loopholes that little protection is actually afforded to high carbon stock areas. Furthermore, unless the verification of sources and supply chains is robust and credible, claims that industrial biofuels are not sourced from these areas must be treated with caution.

Furthermore, in terms of GHG emissions, the criteria in the RED do not prohibit the use of grasslands, on which much of the expansion is expected to take place.[63] Much grassland is also carbon rich. The use of only a small area of permanent grasslands would emit more GHGs than the annual emissions savings as predicted by the European Commission.[64]

Indirect land use change (ILUC)

This occurs when land previously used to grow food or animal feed is turned over to growing industrial biofuels. This displaces the original agricultural land use onto land in new areas. Thus, while the biofuel crop itself may not cause new land clearance directly, it can still be held responsible because of its displacement impact. The new land use will have a GHG emission impact, much the same as with direct land use change.

For example:

- EU rapeseed oil is traditionally used as a vegetable oil in food products but is increasingly being used as an industrial biofuel feedstock. This displacement effect means the EU has to import vegetable oil to replace rapeseed oil from elsewhere, invariably extra palm oil from Indonesia and Malaysia, much of which will have been grown on converted forest and peatlands.
- Increased EU and US demand for Brazilian cane and soy as industrial biofuels is displacing other activities – such as cattle ranching – further into the Amazon, triggering indirect emissions.
- More corn is now being grown for ethanol in the US at the expense of soy. This in turn pushes up the price of soy, providing an incentive to south American farmers to expand soy production, often into forest areas.

This is why indirect land use change, as it relates to climate change, is such an important

CLIMATE CHANGE: CHELIMO'S STORY

"My name is Chelimo and I live in northern Kenya. When there was rain the land was green and our goats had grass to eat. We used to eat our goats when we were hungry. Sometimes we would sell them for food.

Now the land everywhere is very dry. My father and my uncle spend a long time looking for green land with grass for our goats. Each time my father goes looking we don't know when he will come back. My family have not been able to grow any food this year."

For poor people worldwide, the impact of climate change is already being felt. In the last few years, Kenya has suffered recurring droughts, rainfall has become more sporadic and sometimes it never arrives at all.

In the northern part of Kenya, a prolonged drought has led to 10 million people searching for food. For families like Chelimo's, hunger is a daily problem.

There is an urgent need to reduce greenhouse gas emissions to limit climate change. The scientific evidence is growing every day that most biofuels will actually make climate change worse, compared to fossil fuels they are replacing. Biofuels are not the answer to climate change and will drive more people into hunger.

Chelimo, aged nine, and her aunt Margaret, northern Kenya.

PHOTO: ACTIONAID

issue. The indirect displacement effect is substantial; and if additional rainforest or peatland is being destroyed, this will release vast quantities of GHGs into the atmosphere.

Measuring the impact of indirect land use change is critical if the GHG emissions of industrial biofuels are to be correctly assessed. The EU Commission, parliamentarians and member states must ensure that scientifically robust calculations on indirect land use change are included in calculating the GHG balance for biofuels. The precautionary principle must be used when addressing indirect land use change, particularly where data deficiencies or uncertainties persist.

Cultivation

Almost all industrial biofuel feedstocks require nitrogen fertilisers. These release nitrous oxides (N_20) to the atmosphere that are 300 times more damaging as greenhouse gases than CO_2. Scientists now estimate that previous analyses have underestimated the importance of N_20 as a GHG by a factor of between 3 and 5.[65] Even sceptics of this work, who are few, acknowledge that *"in some instances, [N_2O emissions] will result in the feedstock not achieving GHG savings compared to fossil fuels".*[66] Some even argue that *"increased fertiliser use for biofuels production will cause nitrous oxide emissions (N_2O) to become more important than carbon losses, in terms of warming potential, by the end of the century".*[67]

Given that the weight of scientific evidence is compelling, that there are no emissions savings at all for many industrial biofuels, the carbon debt will never be paid back.

The EU must urgently include revised calculations on nitrous oxide emissions in the GHG balance for biofuels.

Will second generation be any better?

Policy makers believe the climate change benefits of second generation biofuels are much greater than those of the first, but some have cast doubts on this claim: *"An expanded global cellulosic bioenergy [ie second generation biofuels] program… predicts that indirect land use will be responsible for substantially more carbon loss (up to twice as much) than direct land use; however, because of predicted increases in fertilizer use, nitrous oxide emissions will be more important than carbon losses themselves in terms of warming potential."*[68] Second generation biofuels could lead to higher GHG emissions when compared to their fossil fuel equivalent.

Good value for money?

Even if it were possible for liquid transport biofuels to achieve GHG emissions savings, two other very important issues arise:

- What are the net global welfare gains and losses from adopting this policy – in short, are industrial biofuels a cost-effective way of reducing GHG emissions?
- Is the energy pathway of growing crops and converting them into liquid transport biofuels the best approach of reducing greenhouse gas emissions?

The Joint Research Centre (JRC) of the European Commission analysed the first question. It placed a net benefit value on energy security, GHG benefits and employment gains. The benefits reached €18.4 billion. However, the costs – in terms of industrial biofuels being more expensive to produce when compared to an equivalent quantity of conventional fuel – heavily outweighs the benefits, reaching some €56.7 billion. This net cost of some US$40 billion by 2020 would have to be met by the EU taxpayer.[69] This cost might be worthwhile if it were actually contributing to a reduction in GHG

emissions, but the truth is that taxpayers will get little if any climate benefit for their money.

In answer to the second question, there is also a growing body of evidence to support the conclusion: *"Biofuels can be used far more efficiently in stationary facilities [eg power plants] to generate heat or to co-generate heat and electricity than they can as liquid transportation fuels* [eg, for cars]."[70] Electric vehicles are also more efficient in turning energy into movement.[71]

As part of a wider strategy, the then UK Department of Trade and Industry concluded that first generation transport biofuels are the least cost-effective way to lower GHG emissions.[72] The Environmental Audit Committee in the UK came to a similar conclusion: that current EU and UK policy fails to ensure the most efficient use of biofuel in terms of greenhouse gas emission potential. It does not deliver good value for the taxpayer.[73]

While there may be some benefits of using crops for heat and power generation, we need to approach this with extreme caution. If crops for heat and power are grown on large-scale, monoculture crop plantations, the problems with emissions from land use change and large releases of nitrous oxide, as well as other environmental and developmental impacts, will be the same as for transport biofuels.

CONCLUSION – THE EU RESPONSE

The impacts are significant, wide ranging and will only get worse. To answer the critics, and in support of the 10% target, the EU falls back on two main but flawed arguments. Firstly, that we can find a technological solution: ie that first generation industrial biofuels are a short-term solution and are merely a stepping stone to more 'sustainable' second and third generation fuels. But first generation biofuels are well established and as the next section shows, their production will expand massively. This argument is also misleading because second generation industrial biofuels would require new technology and an entirely different infrastructure.[74] Thus there is no stepping stone effect from the first to the second generation. More importantly, second generation biofuels may never become commercially viable. As the OECD concludes: ""*As second-generation technologies are still in the demonstration phase, it remains to be seen whether they will become economically viable over the next decade, if ever. Even with positive technological developments there are serious doubts about the feasibility of using residue material as…[a] feedstock on a large scale.*"[75]

The EU's second main argument is that all EU biofuels would have to meet sustainability criteria and standards to fill the 10% target. The criteria have already been criticised as being far too weak, particularly on developmental and social grounds. But as with all criteria that deal with commodities, verification, compliance and certification will prove very difficult, particularly given the sheer scale of production and the difficulties presented by complex supply chains.

In addition, the European Commission alone will decide, through an advisory committee, exactly what information EU member states will require operators to report on, and it must make its decision with a view to avoiding an 'excessive administrative burden'.

ActionAid fears that the criteria and verification will fail to provide anything like the burden of proof on sustainability required to ensure that industrial biofuels are actually produced sustainably. In short, criteria and standards can provide a cloak of acceptability that enables unsustainable biofuels to be produced.

4. Industrial biofuels to 2020

GOVERNMENTS ARE INCREASING BIOFUEL DEMAND

Future global biofuel demand

Industrial biofuels are not new. Brazil and the US have been producing ethanol for decades. What is new is the sheer scale of the biofuel boom. Most G8 and G5 countries (see acronyms for a list of countries) have now established mandatory biofuel blend targets – by a certain date, transport fuels must include a certain percentage of biofuels (see Table 5).

By 2020, global consumption will more than triple, increasing from about 70 billion litres in 2008 to an estimated 250 billion litres in 2020, assuming current targets are met. Of this, the EU would consume about 55 billion litres in 2020, Brazil approximately 45 billion litres, both behind the US at about 110 billion litres. Predictions are that other countries will consume relatively small amounts of biofuels by 2020 – about 20% of the total consumption. Thereafter, the amount they consume will grow much faster.[77]

Clearly this could be just the start of it.

Assuming that all countries blend 10% of their transport fuel by 2030, consumption could reach around 400 billion litres (about 340 million metric tonnes).[78]

THE ALARMING SCALE OF INDUSTRIAL BIOFUEL LAND EXPANSION

In an era of climate change, water stress and competing land uses (particularly for food), where is all this biofuel land going to come from?

Global land requirements and availability

It is difficult to predict how much land will be needed by 2020 to produce this quantity of industrial biofuels, and the following figures should be treated as indicative only. One authoritative study estimates that the additional agricultural land required would range between 118 and 508 million hectares by 2030. This is dependent on the crop type and productivity level and assumes that all countries would substitute 10% of transport fuel with biofuels by this date.[79] Other scientists have concluded that because of critical constraints on the

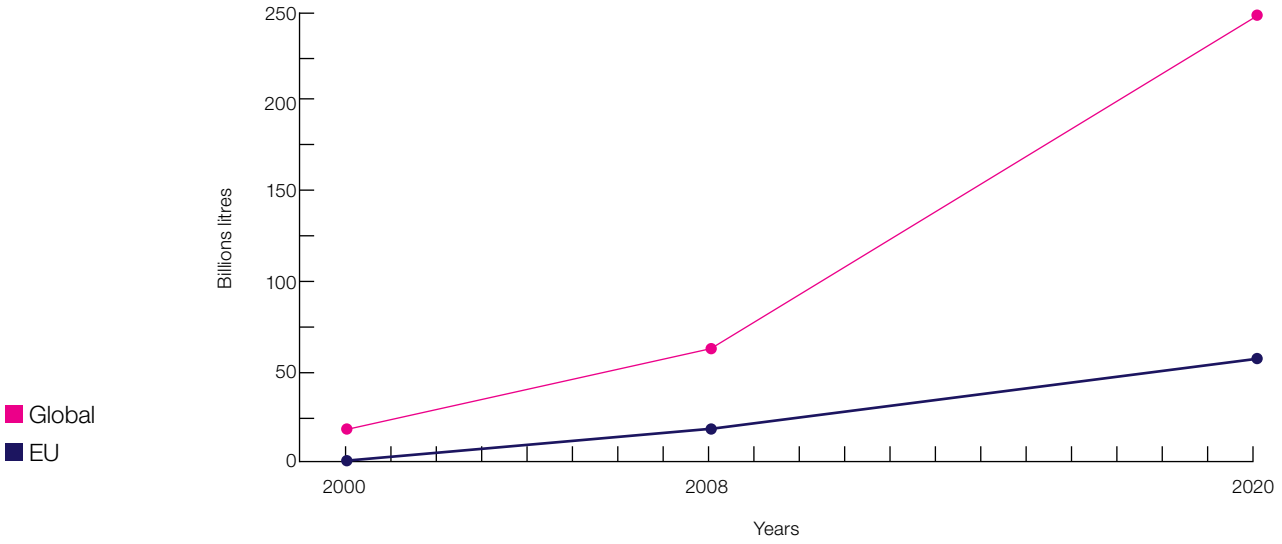
Table 5: Biofuel targets in the G8 and G5 countries (mandatory unless specified otherwise)[76]

Country	Biofuel target (ie % blend in transport fuels)
EU	10% 'renewable content' by 2020 but most, if not all of this, will come from industrial biofuels
US	36 billion gallons by 2022
Canada	5% renewable content in petrol by 2010 and 2% in diesel by 2012
Russia	No targets
Japan	500,000 kilolitres by 2010 (voluntary)
Brazil	5% biodiesel by 2010; 25% ethanol blend in petrol
China	10 and 2 million tonnes of ethanol and biodiesel respectively by 2020
India	20% biofuels by 2017 (national policy)
South Africa	4.5% biofuels by 2013 (national strategy)
Mexico	Targets under consideration

"Current mandates and targets for liquid biofuels should be reconsidered in light of the potential adverse environmental consequences, potential displacement or competition with food crops, and difficulty of meeting these goals without large scale land conversion."

Proceedings of the Scientific Committee on Problems of the Environment (SCOPE), 2008

Figure 3. EU and Global biofuel consumption in 2008 and 2020[81]



Indicative only: Quantities in 2020 will vary according to a host of factors, for example whether targets are met or new ones introduced, GHG saving targets to be achieved from biofuels, the availability of second generation and so on.

productivity of biofuel crops, such as water availability, the higher end of estimates for the amount of agricultural land that has to be given over may be more realistic.[80]

Another study gives a lower range of between 56 and 166 million hectares by 2020. The range takes into consideration yields, 'co-products'[82] and the uptake of second generation biofuels within the next 10 years[83] which, as explained earlier, remains very unlikely.

This compares with the estimated amount of land under industrial biofuels in 2007 of about 27 million hectares.[84] Assuming 100 million hectares for industrial biofuels by 2020 – which is roughly twice the size of France – this is four times the current land use. But this has to be taken together with other projected increases in demand for land and land availability, particularly for food.

Competing global land use requirements

The expansion of biofuels is happening at a time of massive competing land uses – including forestry, agriculture for food, animal feed, fibres and fuels, and the expansion of urban areas. One of the largest competing uses will be food for a growing population. In 2007, the United Nations Environment Programme (UNEP) calculated that by 2020 an extra 200 to 700 million hectares of additional land will be required to grow food, animal feed and provide pasture for animals.[85] These figures are backed by similar findings from other studies.

The Gallagher report looked at three different land requirement scenarios for food, feed and fuel by 2020:[86]

- an optimistic scenario where only 60 million hectares of land are required for industrial biofuels, and 200 million hectares for food and feed;
- a mid-range scenario where 100 and 400 million hectares are required respectively;
- a pessimistic scenario where 200 and 500 million hectares are required respectively.

Carlotta Machaule lost her land with a farming association to a biofuel company in Mozambique, and is now fighting to reclaim her rights.

PHOTO: JAMES OATWAY/PANOS/ACTIONAID

The mid-range scenario assumes that, by around 2020, some 500 million more hectares of crops may have to be brought into agricultural use to meet global demand. This is an area roughly half the size of Europe. The current area of arable land in the world is about 1.5 billion hectares. This means that 500 million hectares – 33% more land than is currently under cultivation – would have to be found.[87]

Global land use availability

The Gallagher report also summarised various studies in an attempt to estimate land suitable for global agricultural expansion. This ranged from 50 million to 1.2 billion hectares.[88] With such a large range, any analysis of requirements versus availability becomes hypothetical. But even towards the lower end of these estimates, grassland and so-called marginal land (see Box 3) are likely to be brought into production. Even woodlands, forests and other natural habitats are likely to be lost.

This is unsustainable because:

- forests and other natural habitats – such as wetlands – are important carbon sinks and biodiversity hotspots;
- grassland will be a primary target for industrial biofuel expansion[89] because they are considered low carbon stock areas. But even here, grasslands – particularly permanent grasslands – are important carbon stores;
- even if land were available, there are other factors that make expanding intensive agriculture, including biofuels, unrealistic;
  - water accessibility will impose constraints on land use. This is likely to be made worse by climate change. The scarcity of resources, particularly land and water, will be a key issue in many parts of the

developing world earmarked for industrial biofuel expansion, where the fight against hunger must take precedence.

– by 2020, because of climate change, there are likely to be strenuous attempts to place agriculture on a sustainable basis, both to mitigate the effects of climate change, and to help people adapt to them. Intensive agriculture and associated land use is already responsible for 30% of global GHGs.[90] All the major industrial biofuel feed stocks, with the exception of soy, require significant amounts of nitrogen fertilisers; nitrous oxides released into the atmosphere are one the most potent GHGs.[91] The idea that we can increasingly intensify agriculture – ie to get greater biofuel yields from a hectare of land – is continually untenable.

In conclusion, land is becoming an ever-more pressured resource, particularly in an era of water stress and climate change. Massive competing land use raises doubts as to whether we have enough land to feed the world in the future. Land for food must be prioritised over land for fuel.

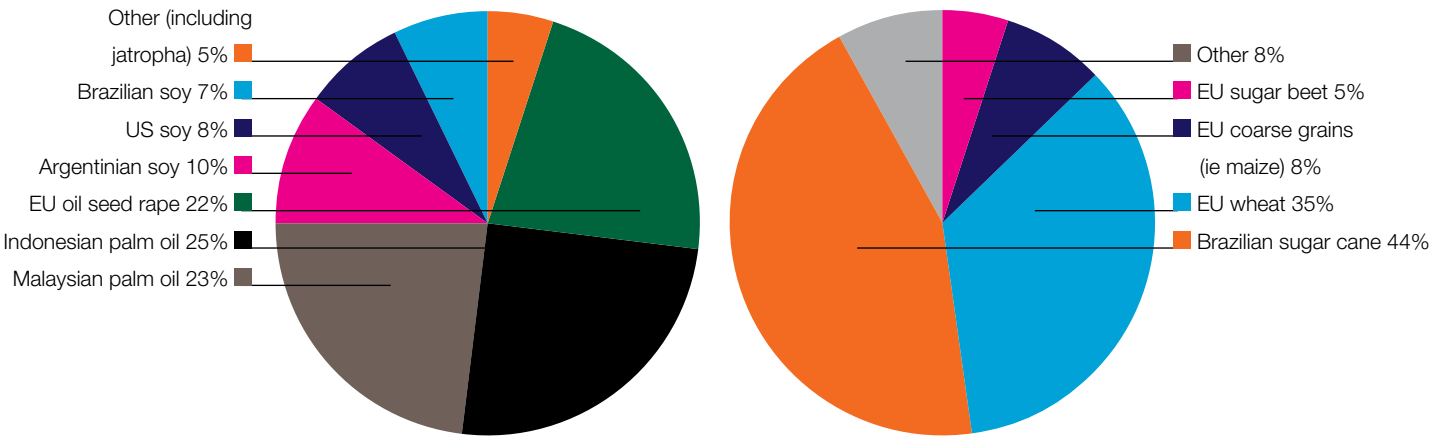
EU land requirement

Buoyed by the fact that the mandatory 10% target has provided the assurance and confidence it needs, and backed by generous subsidies, EU agribusiness is scouring the world for future industrial biofuel investment opportunities. Four crops dominate the new EU biofuel colonial frontier in developing countries – sugar cane to make ethanol and jatropha, and palm oil and soy for biodiesel.

Direct land use issues

Where will the 55 billion litres of biofuel required by the EU by 2020 to meet its 2020 target originate from? And how much land to grow it would be required from developing countries? By way of illustration, the Dutch Environment Assessment Agency estimates that globally, some 20-30 million hectares will be required if biofuels are used to meet the EU 10% target.[92]

Figure 4: EU biodiesel and ethanol consumption by source in 2020[96]



EU biodiesel consumption by source in 2020 (Total = 27.5bn litres)

EU ethanol consumption by source in 2020 (Total = 27.5bn litres)

Sources: UK government/ author's own calculations. These graphs should be used as indicative only. They are based almost exclusively on economic assumptions (costs, prices, tax incentives etc) as well as production and consumption targets. They do not consider other assumptions such GHG savings/losses, trade restrictions, blend characteristics, technical specifications etc.

Jatropha plantation, northern Senegal.

PHOTO: TIM RICE/ACTIONAID

For reasons explained below, ActionAid believes that the higher end of this estimate is likely to be more realistic, if not higher.

It is impossible to gauge with any certainty as to 'what' will be grown 'where' to meet this increased EU biofuel use. Much will depend, for example, on the profitability of different types of biofuels (the major factors being the price of oil and the feedstock price), their blend characteristics and technical specifications, yield changes and the level of climate change savings or losses for biofuels compared to fossil fuels.

That said, some modelling has been done to ascertain what feedstocks could be grown where. The UK Renewable Energy Association predicts that the EU could produce up to 80% of its own biofuel needs by 2020.[93] However, the majority of estimates, for example that conducted by the JRC, conclude that the EU will have to import between a half and two-thirds of its consumption by 2020 assuming that second generation biofuels are not available by this date.[94]

Despite the uncertainties, some member states are also attempting to map out this information. Most of these models assume that EU consumption in 2020 (by volume) will be fairly evenly split between biodiesel and ethanol. Again, imports would comprise about 60% of EU consumption. These figures should be used as indicative only (Figure 4).

Using the graphs in Figure 4, the following is a crude estimate of what land may be required from developing countries to meet the EU 10% industrial biofuels target in 2020:

- Some 2.5-3 million hectares in Indonesia and Malaysia may be required to supply palm oil.
- Some 2-2.5 million hectares in Brazil may be required to supply ethanol from sugar cane (to reach this level would require changes to the level of import tariffs on Brazilian ethanol

Both directly and indirectly, the total land required to met the EU 10% target in developing and developed countries will run into the tens of millions of hectares

which are currently high to protect the ethanol industry in the EU).

- Assuming that jatropha makes up 5% of EU biodiesel consumption in 2020, this may also require between 1-2 million hectares of land depending on final yields. A key location for production is in Africa and south Asia where it is deemed that so-called idle and marginal land is available (see Box 3).
- Other sources – such as soy from Argentina and Brazil – may require 8-10 million hectares.

This all adds up to some 13.5-17.5 million hectares of developing country land. The top end of this figure is well over half the size of Italy. Millions of hectares will also be required in developed nations, principally the EU and US.

Indirect land use issues

A significant amount of land in the EU formerly used for food is also being diverted into biofuel production. For example, EU rapeseed oil has traditionally been used in the food industry as a vegetable oil, but increasingly large amounts are now being used as a feedstock for industrial biofuels. The food industry has had to turn to a different source, and invariably this is oil palm from southeast Asia. If 22% of biodiesel in 2020 comes from domestically produced edible oils, this suggests a shortfall – which will be filled by palm oil – of about six billion litres of edible oil requiring another 1-2 million hectares of land in developing countries.[95]

But this is a conservative estimate. For example, it is very difficult to quantify the impact of higher maize production and prices, say in the US. Here farmers are switching to maize at the expense of soy, which in turn drives up the price of soy; this gives an incentive for an increase in land grabbing for soy production in south America, which is associated with tropical deforestation.

Conclusion

Both directly and indirectly, the total land required to met the EU 10% target in developing and developed countries will run into the tens of millions of hectares. As shown in Chapter 3, this will have disastrous impacts on food prices, hunger, climate change and land rights for many of the communities where they are grown.

5. Biofuel use – a suggested way forward

The way forward for biofuels should be built around three core principles. Firstly, that there is a role for biofuels so long as they are produced sustainably, do not compete with food and genuinely contribute to reducing GHGs (see Box 4). These biofuels could potentially be used in a number of ways – heating, power, cooking, transport etc. Secondly, that a more sustainable society must reduce energy consumption so that many of the impacts identified in this report can be minimised, or even avoided. Thirdly, alternative and more sustainable transport modes must be prioritised such as public transport, electric vehicles (assuming that the electricity source is decarbonised) and cycling.

Alongside this, the rush to industrial biofuels must be reined in, and ultimately stopped.

1: THERE SHOULD BE A MORATORIUM ON THE FURTHER EXPANSION OF INDUSTRIAL BIOFUEL PRODUCTION AND INVESTMENT

The moratorium would have the effect of reducing impacts by limiting further expansion. All governments, both north and south, are culpable in allowing and even encouraging harmful biofuel investments to go ahead. Much of the expansion taking place in developing countries is happening with little regulatory control over company operations and unsustainable land use.

The moratorium should remain in place until:

- the UN reports on a full and global assessment of the impacts of industrial biofuels;
- national legislation and regulatory frameworks are in place and enforced that:
  - implement a sustainable land use plan that prioritises sustainable local food production before sustainable local biofuel needs;
  - protect access to resources, particularly land rights, for both men and women (this would include the principles of free, prior and informed consent and greater transparency where contracts with companies are involved);
  - ensure that all workers enjoy decent standards of work as defined by the International Labour Organisation;
  - ensure that overseas companies are held legally accountable for their impacts on human rights and the environment.

2: NATIONAL ACTION PLANS MUST NOT LOCK IN BIOFUELS

The Renewable Energy Directive requires that EU member states must each produce, by June 2010, a National Renewable Energy Action Plan (NREAP or NAP for short) which will set out the targets for the share of renewable energy in transport, electricity, heating and cooling sectors by 2020. The directive also includes a review of the 10% transport target in 2014.

Because of the growing evidence against industrial biofuels, ActionAid believes that, when drawing up NREAPs in 2010, EU member states must not introduce or increase targets for the proportion of energy that comes from industrial biofuels – a stream that is likely to be deemed economically, environmentally and developmentally unviable in the future. In the run up to the 2014 review, we believe the evidence will confirm, even to sceptics, that industrial biofuels are not a sustainable way to reach even the current 10% transport target (by volume), and that EU members states should abolish all volume targets, certainly no later than 2014.

ActionAid believes that it is currently impossible to meet the EU target sustainably.

"A more effective way to reduce greenhouse gases and secure energy supply is to reduce demand, improve efficiency and develop sustainable transport and energy systems."
Friends of the Earth, 2008

The current 10% target for transport should be replaced by a renewables target based on GHG reductions.

This would include:

- that all GHG emissions are calculated robustly and credibly, using a precautionary approach. In particular, direct and indirect land use change and nitrous oxide emissions must be properly included.
- that sustainability criteria are strengthened and include developmental issues. The verification and certification of the criteria must be transparent, credible and robust.

3: TRANSPORT AND ENERGY CONSUMPTION MUST BE REDUCED

The simplest and cheapest way for EU member states to reduce the impact of their transport and energy sectors – whether in relation to GHG emissions, hunger or other issues – is to embark on a drive to reduce transport fuel and energy demand.

For this to happen there needs to be much more EU support given to:

- investment in public transport and other more sustainable forms of transport such

BOX 4: SUSTAINABLE AGRICULTURE AND SUSTAINABLE BIOFUELS

Sustainable agriculture integrates three main goals – environmental stewardship, farm profitability and prosperous farming communities. It refers to the ability of farms to produce food indefinitely, without damaging soils and ecosystems, or people, their communities and livelihoods. It would aim to maintain healthy soils while reducing reliance on external 'inputs' – such as fertilisers, pesticides and herbicides.

Sustainable production of biofuels from land should follow similar principles. However, in addition:

- biofuels should not compete with food;
- they should prioritise the greatest GHG savings;
- they should be controlled by and for the benefit of local communities;
- they should prioritise small-scale production targeted at local energy needs;
- where companies and investors are involved, they should have obtained the free, prior and informed consent of local communities and people.

ActionAid Brazil has been looking into the potential of small-scale sugar cane production in the south of the country. One example shows how smallholder farmers are taking into account social and environmental considerations, for example energy self-sufficiency, non-competition with food crop production as well as adding value to their products. Each small sugar mill is managed by 10-15 smallholder farming families, each having two to six hectares of sugar cane. They work collectively and divide the work, such as cutting and crushing the sugar cane, and the production of brown sugar, ethanol and *cachaça* – a strong and traditional Brazilian alcoholic drink. According to demand and prices, each mill can decide what product they are going to produce. They also use the crushed sugar cane *(bagasse)* to produce animal feed.

However, other forms of sustainable biofuels are also available – ie those fuels produced from waste processes such as landfill off-gassing and recycled vegetable oil.

as electric vehicles and cycling;
- more ambitious vehicle efficiency standards;
- more 'efficient' driving such as reducing speed limits;
- investment in energy efficiency.

4: FINANCIAL INCENTIVES FOR INDUSTRIAL BIOFUELS MUST END

As well as the 10% target, other policy drivers within the EU are stimulating the unsustainable boom in industrial biofuels. The EU and members states must end all subsidies and other financial incentives to these fuels.

5: SMALL-SCALE SUSTAINABLE BIOFUEL PROJECTS SHOULD BE SUPPORTED IN THE EU AND ABROAD

ActionAid believes sustainable smallholder agriculture offers a key solution to tackling hunger, as well as addressing poverty and tackling GHG emissions from agriculture. Mounting evidence shows sustainable agriculture is highly productive in poor countries and has other social and environmental benefits.

While ActionAid would argue that sustainable agriculture must prioritise food before other uses, there are situations where farming for food, animal feed, fibres and fuel (ie sustainable biofuels), could exist side-by-side. Where produced and consumed locally, this would have additional benefits in terms of fighting hunger and energy poverty, and promoting climate mitigation and adaptation, employment and incomes.

But the scale will be nothing like that proposed by rich nations. Most, if not all, sustainable production of biofuels would be consumed locally in developing countries and would not be for export.

To that end, the EU should support small-scale, sustainable biofuel projects controlled by and for the benefit of local communities. This should prioritise local energy needs, the preservation of natural resources and the greatest GHG savings. Such projects should not displace food production, or impact on biodiversity and habitats. Where companies and investors are involved, they should have obtained the free, prior and informed consent of local communities and people.

Support should also be given to fuels produced from waste processes such as landfill off-gassing and recycled vegetable oil.

6. Conclusion and recommendations

Industrial biofuels do not offer a solution to the two main aims of EU biofuel policy – to combat climate change and increase fuel security. Rather, industrial biofuels are fuelling poverty and hunger because they are now competing with food crops, dramatically increasing the prices that poor people pay for food worldwide. At the same time, biofuels are having disastrous local impacts on food security and land rights for many of the communities where they are grown.

Industrial biofuels are the main cause of the food crisis and recent rises in hunger. Despite this, political action on hunger and biofuels has been minimal. Industrial biofuels provide a false solution that allows rich nations to continue their love affair with the internal combustion engine, and industry to continue its business-as-usual approach. It has allowed developed countries to avoid the urgent and difficult realisation that our current levels of transport fuel consumption (and energy more generally) are unsustainable and need to be reduced. Meanwhile, the costs of these policies – in terms of hunger, poverty, climate change, environmental degradation and on people – are being felt mainly in the developing world.

Oil prices are once again increasing, and unless the industrial biofuel boom is reined in (and targets for the proportion of our energy that comes from them dropped), hunger is in danger of spiralling out of control and climate change will worsen. The hunger and climate crises require immediate and sustainable responses – and industrial biofuels are not the answer.

The easiest and best way to reduce the impact of the transport sector on hunger and GHG emissions, as well as improve our energy security, is to reduce the overall consumption of energy by transport. In terms of climate change, this will yield immediate and guaranteed reductions in GHGs. Once land-use changes, fertiliser use and other factors are taken into consideration, it is clear that many industrial biofuels do not have a role to play in the fight against climate change.

Recommendations

ActionAid is in favour of sustainable biofuels. But industrial biofuels – large-scale, intensive monocultures – are clearly unsustainable and in ActionAid's view, their expansion should be stopped. The EU and member states must:

- place a moratorium on the further expansion of industrial biofuel production and investment;
- ensure that member states do not lock industrial biofuels into their 2010 national action plans;
- reduce transport and energy consumption;
- end targets and financial incentives for industrial biofuels;
- support small-scale sustainable biofuels in the EU and abroad.

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“They took the land when it was already tilled... they haven’t paid us anything. We are dying of hunger and there is nothing that we have that is actually our own.”

Matilde Ngoene, (front cover) a farmer in Mozambique.
Her land has been taken by a biofuel company and she has not been compensated.

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