

Landless campesinos make a stand against soy monoculture in Parí.



corporates  
& agrofuels

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# fuelling destruction in latin america

the real price of the drive for agrofuels

september 2008 | issue 113



**Friends of  
the Earth  
International**



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## executive summary and conclusion

Rapid expansion in the use of agricultural crops as a transport fuel has been justified in Northern countries as a pro-development policy that will help bring developing countries out of poverty. The agrofuels boom, it is said, will increase agricultural production, generate foreign revenues through export, make countries less dependent on imports of fossil fuels, and drive much needed new investments in agriculture and rural communities. No other region has embraced this idea as much as Latin America, where countries have started expanding agriculture production and putting in place the infrastructure necessary to access and supply the European and US markets. Brazil has become one of the most vocal promoters of agrofuels. In order to deflect criticisms, these countries assure the North that there is enough land available for increased production, that the local population is actually benefiting and that the crops are being grown in a sustainable way.

The crucial issue is whether these claims are correct and justified. Do the majority of farmers and peasants in these countries find themselves being assisted out of poverty and does the production of soy, sugarcane and palm oil increase employment? Are the crops really being grown sustainably and does the production of agrofuels indeed not compete with food supplies? Who really benefits from these developments? Who will be the real winners and who will be the unfortunate losers?

This report looks into these questions and issues for a number of Latin American countries namely Argentina, Brazil, Uruguay and Colombia and the Central American countries of Costa Rica, El Salvador and Guatemala. It reports on the social, environmental and human rights impacts of the current agrofuel developments. It also looks into the role of European and international companies and investors and the influence of the agrofuel business over national agriculture and energy policies of the respective governments. The report is written by authors living and working in countries where these developments are unfolding.



Sugar cane.

### brazil

Brazil is playing a central role in the new geopolitics of agrofuels. Over the last 30 years, it has achieved the lowest production costs for fuel derived from sugarcane, and became the second biggest ethanol producer in the world. Whilst it has become a strong advocate for agrofuels on the world stage, it has made little progress in making the industry sustainable. With seven million hectares of land already cultivated with sugarcane and the industry growing fast, monoculture production is causing serious environmental and social problems, including issues over land ownership and rural poverty, conversion of natural ecosystems and soil and water table contamination as a result of the intensive use of agrochemicals.

One of the most widely reported problems is the poor working conditions for sugarcane cutters - who make up more than half of the one million jobs generated by the sector - conditions akin to slave labour are still too often uncovered in a number of regions of Brazil, including on modern farms.

The growing demand for agrofuels is also displacing farming onto previously uncultivated land and forcing some cattle ranches and farms to move into new areas. Biodiversity and habitats are under threat. Studies of land use change resulting from sugarcane expansion find evidence that less land is now used for other crops, grassland and fruits. Conflicts over land use have increased rapidly over recent years.

Demand for ethanol is expected to increase massively, requiring almost 200 million tons of sugarcane by 2013, representing a production increase of 50% (from 2005). Worryingly, the current rate of mill expansion suggests an even greater increase in production. Exports of ethanol have increased by more than 600% between 2001 and 2005. Sugarcane is now spreading to regions where it has never been grown before, threatening natural sites such as the Pantanal Wetland in Mato Grosso do Sul and Cerrado in Maranhão.



Workers at burnt sugar cane fields.

## executive summary and conclusion

continued

Whilst the United States is the biggest importer of Brazilian ethanol, exports to Europe are increasing significantly, especially to the Netherlands.

Ethanol production developed initially with state support, but is now entirely in the private sector, with Brazilian companies dominating until 2000. Ethanol “fever” is now attracting more and more foreign investment looking for a chance to make high returns. Four of the ten biggest ethanol companies in Brazil (Cosan, Bonfim, LDC Bioenergia, and Guarani) now benefit from foreign capital. Commodity companies such as Cargill, Bunge and the Noble Group are important players in the whole chain, whilst largely European companies like BASF, Bayer and Syngenta benefit from the sales of herbicides and pesticides that sugarcane needs. Meanwhile, US and European biotech companies experiment with new genetically manipulated varieties of sugarcane.

The agrofuel sector has strong influence over Brazilian public policies and succeeds to guarantee public financing and policies geared towards aiding expansion of the sector. Prominent ex-politicians from Lula’s government, who have become important investors in agrofuels, ensure easy access for business to public policy makers.

The expansion of sugarcane in Brazil is unlikely to benefit rural communities or the environment. Such monoculture crops replace smaller, more productive, family farms. Demand for energy crops has created an explosion in the rural property market where foreign investment groups - lead by Soros and ex WorldBank president Wolfensohn - are buying up large areas for future sugarcane expansion and pricing local people out of the market. The real winners in Brazil will be the large land owners, national and international agribusiness and, increasingly, overseas investors.

### argentina

Argentina is currently the biggest biodiesel exporter in the region but is the world’s second largest producer of soybeans (producing 18% of the global total) and is promoting agrofuels, mainly from soybean oil, through a new law in 2006. This requires the blending in of ethanol and biodiesel, through the elimination of export taxes on biodiesel, and through research and promotional activities.

The growing of soybeans in Argentina has had a major impact on rural communities and the environment, as well as increasing greenhouse gas emissions. It has contributed significantly to deforestation (about 250,000 hectares of forest are being eradicated annually), the displacement of livestock farms and rural villages, and an increased concentration of land ownership. Nearly half of all soy production is in the hands of 2.2% of the producers. Conflicts between local communities and soy producers are increasing.

As the area of soy increases, the land that was being used for dairy production, grains and fruit and vegetable production has decreased. This has had a considerable impact on prices of fruit and vegetables. More than 90% of Argentinean soybeans are genetically modified leading to increased spraying of herbicides, contamination of surface waters and aquifers, and illness amongst people exposed to the cocktail of chemicals. Rural employment is dropping, as the production of soy requires far fewer workers than other types of agriculture.

Although the consumption of biodiesel production in Argentina is currently limited, investments are increasing with an eye on the biodiesel export market: current production is 1.6 million tons of biodiesel with plans for an additional four million tons in the coming three years. The government is also encouraging investments in ethanol production, with incentives for the sugar industry.

Most of the companies developing biodiesel operations are the big players in the soybean industry, such as the European companies Glencore, Nidera and Dreyfus. Domestic financial investors have also made alliances with European companies (e.g. Oilfox with Neckermann-Gate) with European companies, such as the German firm Lurgi, providing the technology. The main soybean oil-exporting companies remain Cargill and Bunge and these remain the main players in the biodiesel market. Monsanto and Syngenta are important providers of seeds and pesticides.



Soy field in the agricultural area of Londrina, in the state of Parana, Brazil.

The soy industry is extremely powerful and has successfully lobbied for subsidies and other favours from the government. In a recent conflict with the government over increased export taxes, the soy producers blocked roads and caused food shortages and price increases.

Any growth in soy production to meet the growing demand for biodiesel is likely to force even more small scale farmers and rural communities out of the countryside, increase the intensification of agriculture through the use of genetically modified seeds, and push the farming frontier into new areas, thereby threatening biodiversity. The winners in this trade are going to be big business and in particular European companies who will finance the developments, provide the technology and process and sell the end product.

### uruguay

Uruguay is seen as having the potential to be a major agrofuel producer and the sector is currently undergoing rapid development. Estimates suggest that up to 40% of the country could be used to grow crops for agrofuel, producing more than 40 million litres of biodiesel. Production is currently focused on ethanol from sugarcane, soybeans for biodiesel, and tree plantations which can be used to produce cellulose for ethanol.

A widespread conversion to mono-crop agriculture would affect Uruguay's capacity for food production, impact on conservation efforts, reduce soil quality and change patterns of land ownership. Small farmers and rural workers feel they are already being forced out as a result of the increasing foreign ownership of land and protests have already taken place.

In 2006 more than 3,300 hectares of sugarcane was being cultivated, largely dominated by Brazilian companies, with plans to increase to 10,000 hectares in 2010. Soybean cultivation in Uruguay has been expanding rapidly over recent years: from 12,000 hectares in 2000 up to 278,000 in 2005. How much of this is used for agrofuels is not known. European companies, such as Botnia (Finland), Ence (Spain) and Stora-Enso (Sweden/Finland), are already highly present in the forest plantation industry, where there is currently a million hectares of forest plantation monoculture, mainly owned by transnational corporations.

The government has policies in place to promote biofuel production, such as a tax exemption for alternative fuels, research programs, and targets (5%) for ethanol (in petrol) and biodiesel.

With investment pouring in, big business is looking to Uruguay as another source of agrofuel. French company Akuo Energy invested US\$ 300 million in alternative energy (including biofuels) and foreign oil companies such as BP and Petrobras are interested to invest as well.

Controversy and conflict already exist in Uruguay over land use. Unmanaged increases in energy crop production could exacerbate this situation creating competition between ethanol and sugar; timber and energy, and cattle feed and biodiesel. The agrofuel expansion further entrenches the current trend for large landowners and more foreign ownership in Uruguay, threatening biodiversity and degrading natural ecosystems.

### colombia

Peak oil, climate change and the recent upward global trend in fossil fuel prices have been the main motivations for the Columbian government to implement policies aimed at improving self-sufficiency in energy and securing and extending energy supply. Gasoline contains 10% ethanol while diesel fuel contains 5% biodiesel. Subsidies, risk insurances and tax exemptions are given to palm oil producers.

These measures have led to a substantial 160% increase in the cultivation of oil palms between 2002 and 2006. Plans for oil palm expansion in Colombia are ambitious with the main growers' federation predicting levels that would need an additional 743,000 hectares of cultivation by 2020. Colombia is currently the largest oil palm producer in the Americas and the fourth in the world. Although most of the oil has so far been for domestic use, exports are increasing rapidly with Europe as the main destination.

Much of this expansion, financed through international monetary funds such as the WorldBank, the Inter American Development Bank (IADB) and USAid, has been to the benefit of national companies, entrepreneurs and paramilitary groups under a regime of fear and violence and a culture of corruption. This rapid expansion is at the expense of the environmental and human rights of local communities who continue to be the victims of this business development.

Although the government stresses the opportunities for job creation connected to palm oil, the number of jobs is actually very low. Research shows that it has the second lowest number of jobs per hectare of the 30 main agricultural products. Entrepreneurs see reducing labour costs as a way of reducing production costs. This leads to the loss of employment stability, to outsourcing and to increasingly precarious and unstable contractual conditions. No trade unions are formed in most agro-industries which means that workers lack the organisational conditions to negotiate better labour and salary conditions.

## executive summary and conclusion

continued

The development of the intensive palm oil industry is leading to pressure to develop transport infrastructure such as roads and ports to speed up access to international markets. Numerous communities are fighting plans for networks of canals, deep water ports and new roads through forest terrain. Many of these developments are financed by the government and include new transport links opening up a transnational connection with Peru and Brazil through the Putumayo and Amazon rivers.

There is also significant evidence of the close relationship between business and government with people close to key politicians receiving thousand of hectares of uncultivated land. A leading palm oil entrepreneur was Colombia's representative at the FAO and minister for Agriculture. Oil palm expansion in areas such as the Colombian Pacific region are also associated with the incursion of paramilitary groups, who have carried out a number of massacres since the mid-1990s, "recovering" the collective lands granted to communities. This has resulted in the displacement of the local population and even the annihilation of community leaders.

The forced displacement of the local population from collectively-owned lands, particularly those owned by black and indigenous communities, reveals how people are being forced out to make way for oil palm plantations. Members of paramilitary groups have taken advantage of the displacement of the local communities to acquire lands, coercing communities to sell their plots.



Deforested area in the Amazon.

Left: Palm oil plantation.  
Right: Deforestation in Brazil.

### central america

The Central American countries of El Salvador, Costa Rica and Guatemala, while not currently big producers of agrofuels, have reacted to the current global energy crisis with a strong offensive to encourage production. Whilst this is predominantly aimed at domestic use, exports and the involvement of foreign companies are likely to play an important role. With the IADB being a strong supporter of this development, existing trade deals with the US (with an exemption of export taxes for ethanol from all three countries) and planned agreements with the EU will further promote agrofuel development. Brazil is already using Central American countries to avoid paying taxes for export to the US market.

The model of farming promoted, mainly through sugarcane and palm plantations, will have serious consequences for people and the environment, including increased food prices, the spread of mono-cropping and extensive social problems such as an increased use of child labour. El Salvador already has a reported 30,000 children taking part in the sugarcane harvest.

Crops such as sugarcane already threaten water supplies in Guatemala, where thousands of people no longer receive enough water for their own needs. El Salvador already has one of the lowest supplies of water per capita. In addition, plans to expand crops to meet the agrofuel demand lead to environmental contamination with agrochemicals. This threaten important rainforest areas and the indigenous people who depend on them and are now being displaced to allow large sugarcane companies to "purchase" their lands. Agrofuels are also replacing food crops resulting in shortages. All this is aided and abetted by national governments. In El Salvador, the government has even identified 480,000 blocks of currently "idle" land which could be devoted to agrofuels. In practice, however, these lands accommodate various ecosystems and form the basis for a wide range of social activities.

The pressures to grow more crops for agrofuels is also leading to initiatives to reform land ownership that will allow landowners to hold even more land thereby leading to a greater concentration of land in fewer hands for mono-cropping.

US and European businesses are already active in Central America and aided by existing or proposed free trade deals are likely to become even more present in the near future.



## conclusion

The Latin American case studies seen here show a clear pattern. With their eyes on new markets arising from the North's growing demand for agrofuels, governments are all too willing to open up their lands to the cultivation of crops such as sugarcane, soy, palm oil and even trees. All countries studied have increased or plan to increase their production of agrofuels at alarming rates. Governments establish policies that are extremely attractive to the agrofuel business, ranging from providing subsidies, tax exemptions, research budgets, land rights, permits and infrastructure to quotas for blending ethanol and biodiesel in transport fuels.

Rather than developing people-friendly sustainable farming to supply food for their own population, governments pursue the traditional cash-crop model using intensively-farmed monocultures. These are grown on existing agricultural lands, thereby pushing other agricultural activities into other parts of the country or onto new agricultural lands. This is leading to widespread deforestation and is threatening biodiversity in Argentina, Brazil, Colombia, Costa Rica, El Salvador, Guatemala and Uruguay. Pollution from pesticides and fertilizers and serious water shortages due to agrofuel production are problems that can be seen in all the case studies.

Working conditions on plantations are often very poor, akin to modern day slavery. In some cases child labour is reported. Claims that agrofuels will bring jobs are highly disputable, as this sector has a very low employment rate compared to other agricultural crops. Several studies also report that agrofuels are replacing food crops resulting in higher prices and shortages of food supplies for the local population.

As a consequence of expanding this type of agriculture rural communities are displaced and forced away from the countryside. Conflicts over land use are increasing rapidly in all countries. Agrofuel production is in the hands of a small number of large farmers and companies. The losers are the people who do not own land, the rural communities who don't buy into the cash-crop model and, all too often, the plantation workers. All this is within a context of a lack of transparency, little democracy, virtually no land use planning, weak governance and in some cases the use of violence and the involvement of paramilitary groups.

At the same time big producers, traders and investors are increasing their profits through expanding sales of commodities, agricultural inputs and financial gains from land speculation. Whilst so far mainly national companies and entrepreneurs are benefiting from these expansions, a number of European and international companies, such as Cargill, Bunge, Dreyfus, Beyer, BASF, Syngenta, Botnia and Monsanto, are already strongly involved. The rapid increase of production for export will bring in more foreign investors, multinational agri-businesses and international investors such as Soros and ex World Bank president Wolfensohn. Multilateral development banks, such as the IADB, are already financing the expansion.

A strong link between the agrofuel business and politics can also be witnessed, including former politicians setting up their own soy, palm and sugarcane companies. This not only results in extremely pro-agrofuel government policies, enabling and promoting the expansion, but we also see many cases of conflicts of interest (entrepreneurs in charge of developing public policies), corruption and government closing its eyes to the illegal activities of landowners and producers.

This report concludes that the development of agrofuels is unlikely to benefit ordinary people in Latin America. Rapid expansion will increase preexisting social, environmental and human rights problems enabling national, and increasingly international, agribusiness and investors to profit.



*Sugarcane plantation fields  
after the harvest, Brazil.*

## one sugarcane ethanol production in brazil

### sugarcane ethanol production in brazil

lucia ortiz, friends of the earth brazil

Brazil has a central role in the new geopolitics of agrofuel. In the last 30 years, it has developed the lowest production costs for fuel derived from sugarcane, and was the world's biggest ethanol producer until 2005, when it was overtaken by the United States. With the introduction of dual-fuel vehicles at the start of this decade, ethanol production has expanded. The government has also set targets for biodiesel use.

While Brazil's technological expertise in agrofuel production and influence grows, the country is also facing serious socio-environmental problems resulting from the expansion of monoculture agrofuels. With more expansions planned, questions about sustainability are being overlooked.

Brazil has become a strong advocate for agrofuel technologies, but it has made little progress in addressing these issues. A debate is needed - and has been called for by civil society - to look at the effectiveness of these policies in tackling climate change, social inclusion, rural development and their contribution to a more efficient and sustainable energy policy.

#### the national agroenergy plan

Brazil's National Agroenergy Plan (MAPA, 2005) sets a strategic development path for the agrofuel sector designed to make the country a world leader in energy crops. It prioritises ethanol from sugarcane, biodiesel from vegetable oils and animal fats, energy forests, biogas and waste and residue use. The so-called liquid agrofuels, ethanol and biodiesel, are given greatest priority in response to the levels of national and international demand.

#### sugarcane ethanol

Sugarcane has been produced in Brazil since the beginning of the 16th century and by the mid 17th century Brazil was the world's largest sugarcane producer, shipping most of the crop to Europe. It was grown primarily in the northeast of the country, on previously unfarmed land, including parts of the Atlantic Forest, which today covers just 7% of its original range. Poor farming methods left the soil degraded and contaminated the water supply.

Following the oil crisis in the 1970s, sugarcane plantations expanded in the southeast of the country, particularly in the state of São Paulo, which today accounts for more than 60% of the country's production. The National Alcohol Program (Proalcool), launched in 1975, promoted improved farming, milling and distilling techniques. By 1989, almost all cars

manufactured in Brazil ran on hydrated alcohol, with ethanol production peaking at 12.3 billion litres in 1986-87.

The crisis in government, rising sugar prices on the international market, and domestic shortages brought the ethanol boom to an end in the late 80s, leaving cars queuing for fuel all over Brazil. Tax breaks for alcohol-powered cars were removed, the industry was deregulated, ending regional ethanol production quotas and Brazil returned to fossil fuels.

The introduction of flex-fuel vehicles in 2003, running on petrol or hydrated alcohol, triggered policy measures to stimulate new growth in ethanol production. These included a 20-25% mix of ethanol with petrol, tax reductions on flex vehicles, and a fuel tax exemption for ethanol.

The government continues to promote "agro-climatic zoning", indicating the best areas for sugarcane cultivation around the country as well as providing partial guarantees on infrastructure development, mainly through investments by state-run Petrobras and some R\$ 2 billion of credit from the National Bank for Economic and Social Development (BNDES). Credit is also available via the Program to Strengthen Family Farming (PRONAF), which finances ethanol or biodiesel production from family farms.

#### biodiesel

The government launched a National Programme for Biodiesel Production and Use (PNPB) in 2004, including a legal requirement to include a minimum of 2% biodiesel in diesel oil from January 2008, increasing to 5% by 2013.

The PNPB also allows the use of raw animal material to encourage diverse supply. Biodiesel sourced from small farms can be certified as "Social Fuel" and is auctioned separately. Soybeans currently account for more than 80% of the raw material used, despite their low oil content. This is because the sector is well developed with soybeans easily available.

Biodiesel production is expected to replace diesel imports by 2013, but would need to adapt its quality standards to export.

This study focuses on the impact of the production of ethanol derived from sugarcane, which represents the bulk of Brazil's agrofuel industry. But Brazil's rapidly developing biodiesel industry is also a magnet for foreign investment, attracting a number of multinational companies.

### sugarcane as an energy source

Fuel from sugarcane accounted for 13.8% of the Brazil's energy supply in 2005,<sup>1</sup> with some 16.04 billion litres of ethanol. Of these, 13.29 litres were used for road transport, with most of this going to make up the 20-25% mix in petrol. Almost 2.5 billion litres were exported.

Internal demand for ethanol is growing. Demand for hydrated alcohol grew by 42% in 2004. Petrobras, the state oil company, predicts that 72% of all cars in Brazil will be flex by 2020. Ethanol accounted for 13% of commercial fuel in 2006.

There were 7.05 million hectares of sugarcane cultivation in 2006, accounting for more than 18% of the total yearly agricultural land use. On average, a hectare of sugarcane produces 85 tons which produces 82 litres of ethanol. Around half of the sugarcane grown is used for sugar production and half for ethanol. Of this, just over a half (54%) was used for hydrated alcohol for use in flex-fuel and ethanol-powered vehicles. The rest was mixed with petrol.

Production has increased markedly in the last 25 years (213% on 1980 production), with the area cultivated with sugarcane increasing by 170%. Productivity has also increased.

There are some 370 registered mills<sup>2</sup> in operation, with a further 60 planned, as shown in figure 1.

Demand for ethanol is estimated to require almost 200 million tons of sugarcane by 2013, representing a production increase of 50% (2005). But the current rate of mill expansion suggests an even greater increase in production. Most expansion is concentrated in the Miniero Triangle, west Paulista, southern Goias, and the southeast and east of Matto Grosso Do Sul - an area of Brazilian savanna (Cerrado biome), four fifths of which depends on water from the Paraná-Paraguay basin. Expansion is being considered in Maranhão, closer to the Amazon.

Domestic demand is growing as flex-fuel vehicles become more popular. This growth is estimated to require an extra 8 billion litres of alcohol by 2010 just for the domestic market.

FIGURE 1 SUGARCANE MILLS OF BRAZIL



Source: MAPA.

There is also growing international demand. Studies have shown that Brazil could make a significant contribution to replacing 10% of petrol globally,<sup>3</sup> and would need to increase ethanol production sevenfold, (almost 110 billion litres) to meet 50% of global demand.<sup>4</sup>

According to Brazil's National Energy Plan 2030 (EPE, 2007), sugarcane will provide 18% of Brazil's national energy supply by 2030, with cultivation covering almost 14 million hectares. This would bring Brazil's reliance on "renewable" energy sources up to 44.7%.



Left: Areas designated for land reform have now become plantations due to higher land prices as a result of the ethanol boom. Right: Sugarcane plantations in Brazil.

1 EPE (2006).  
 2 In [www.agricultura.gov.br](http://www.agricultura.gov.br) document title: Relação das Unidades Produtoras cadastradas no departamento de cana-de-açúcar e agroenergia – Posição 24/01/2008 (Relation of registered Production units in the department of sugarcane and agroenergy- Position 24/01/08).  
 3 BDNES study.  
 4 Berman (2007).

# one sugarcane ethanol production in brazil

continued

## Brazilian ethanol exports

Brazilian exports of ethanol have increased by more than 50% each year, with an increase of more than 600% between 2001-2005. The United States was the biggest importer in 2007.<sup>5</sup>

**TABLE 1** BRAZILIAN ALCOHOL EXPORTS, BY COUNTRY (IN MILLIONS OF LITERS)

COUNTRY/YEAR	2005	2006	2007
India	410,757	10,074	-
Japan	315,392	225,403	364,003
United States	260,715	1,767,060	866,611
Netherlands	259,403	345,615	808,557
Sweden	245,891	204,614	116,466
Rep. South Korea	216,356	92,273	66,693
El Salvador	157,851	181,143	224,397
Jamaica	133,288	131,143	308,968
Costa Rica	126,693	91,265	170,367
Nigeria	118,441	42,680	122,879
Mexico	100,098	40,241	49,210
Trinidad and Tobago	71,579	36,116	158,869
<b>Total</b>	<b>2,592,293</b>	<b>3,426,857</b>	<b>3,532,667</b>

Source: MAPA.

Exports to Central American and Caribbean countries have increased as exporting companies take advantage of these countries free trade agreements with the United States, so avoiding the high import taxes for Brazilian ethanol.

In Europe, the Netherlands is one the largest importers of Brazilian ethanol, with increases of 133% from 2005-06 and 312% in 2007.



Left: Sugarcane plantation worker in Escada, Pernambuco, Brazil.  
Right: Sugarcane plantation in Brazil in Escada, Pernambuco, Brazil.

<sup>5</sup> Data from MAPA 2007, available at: [http://www.agricultura.gov.br/pls/portal/docs/PAGE/MAPA/ESTATISTICAS/COMERCIO\\_EXTERIOR\\_BRASILEIRO/EXP\\_ALCOOL\\_PAISES\\_2007.PDF](http://www.agricultura.gov.br/pls/portal/docs/PAGE/MAPA/ESTATISTICAS/COMERCIO_EXTERIOR_BRASILEIRO/EXP_ALCOOL_PAISES_2007.PDF).

## International investors in Brazil

Ethanol production developed initially with state support, but is now entirely in the private sector, with Brazilian companies dominating until 2000.

Research in 2007<sup>6</sup> showed that most investment (estimated at R\$ 17 billion) comes from Brazil, mainly from groups with some experience in the sector. Some first-time investors are attracted by alcohol "fever" and the chance of high returns. Around 5% comes from international investment groups, but their involvement is growing. Four of the ten biggest ethanol companies in Brazil (Cosan, Bonfim, LDC Bioenergia, and Guarani) now benefit from foreign capital.

For example:

- In 2006 US multinational Cargill bought a 63% stake in CEVASA, one of the biggest groups operating in São Paulo.
- In 2007, the Noble Group announced a US\$ 200 million investment in ethanol production in Brazil, starting with the US\$ 70 million purchase of the Petribu Paulista mill. Nobel wants to become one of the main exporters of ethanol in Brazil in the coming years and the group is already responsible for 10% of national exports.
- The "National" Sugar and Alcohol Company (CNAA) is the result of a partnership between Santa Elisa and Global Foods, an American holding company which also owns European companies. The company plans to invest R\$ 2 billion in constructing four mills with funding from the Inter American Development Bank (IADB).
- Louis Dreyfus controls the Luciânia (MG), Cresciumal and São Carlos (SP) mills, has a 6.3% stake in four mills in the Tavares de Melo Tereos (PE) group, 47.5% in Franco Brazilian Sugar (FBA) and 100% in Açúcar Guarani.
- The state run oil company Petrobras plans to start investing in ethanol to supply the Japanese market. The National Alcohol Programme is partially funded from government money.
- Sugarcane production in Brazil is gradually becoming more mechanized, increasing reliance on imported machinery. The US agricultural machinery manufacturer John Deere is building new factories in Brazil to make specialized machinery for harvesting sugarcane. Sales of this kind of machinery have increased 194% since 2004.<sup>7</sup>

Sugarcane cultivation relies on high levels of herbicide and pesticide use, boosting profits for the biocide industry.<sup>8</sup> The biggest companies active in Brazil are the Anglo-Swiss multinational Syngenta and German companies Bayer and BASF.

<sup>6</sup> Berman (2007).

<sup>7</sup> Gazeta Mercantil- 26/03/2007- Os fabricantes de colheitadeiras de cana-de-açúcar no Brasil vêm batendo sucessivamente seus recordes de vendas (Sugarcane harvest machinery makers keep breaking sales records).

<sup>8</sup> Valor Econômico 07/11/07 - Venda de defensivos surpreende, e Basf estima crescer 20% (Surprising sales for biocides, BASF expects 20% growth).

**TABLE 2** INVESTMENT IN BRAZIL'S SUGAR-ALCOHOL SECTOR

SECTORS	INVESTORS
National Investors	<p><b>Luiz Fernando Furlan</b> and <b>Roberto Rodrigues</b>, ex-ministers  <b>Gustavo Franco</b> and <b>Armínio Fraga</b>, ex-presidents, Central Bank  <b>Juan Quirós</b>, ex-president of APEX- Association for the Promotion Exports  <b>Henri Phillipe Reichstul</b>, ex-president of Petrobras and head of a US\$ 2 billion ethanol investment fund  <b>Jorge Paulo Lemann</b>, of AmBev, second richest man in Brazil  <b>Naji Nahas</b>, speculator, buying land in the state of Piauí  <b>Daniel Dantas</b>, Opportunity banker, with a project to export ethanol from 100 thousand hectares in southern Pará  <b>Emerson Fittipaldi</b>, partner of Copersucar  <b>Alexandre Grendene</b> and <b>Jonas Barcellos</b>, Brazilians, former owner of Brazilian Free Shops together in a R\$ 200 million project to produce ethanol in SP</p>
International investment funds and Consortiums	<p><b>George Soros</b>, partner in Adecoagro  <b>Vinod Khosla</b>, partner in Brazil Renewable Energy Company (Brenco)  <b>James Wolfensohn</b>, former head of the WorldBank, foreign partner in Brenco, which plans to invest US\$ 2 billion alcohol production in Brazil  <b>Kidd &amp; Company</b>: controlling share in the Coopernavi mill. Also part of Infinity Bio-Energy alongside others, such as the American financial management company <b>Merrill Lynch</b> and the international investment funds <b>Stark</b> and <b>Och-Zitt Management</b>  <b>Infinity Bio-Energy</b>: owns 4 mills in the country</p>
Sugar-alcohol and trading companies participating in international alcohol trade	<p><b>Louis Dreyfus</b> controls the Luciânia (MG), Cresciumal and São Carlos (SP) mills, and has a 6.3% stake in 4 of the mills in the Tavares de Melo Tereos (PE) group, 47.5% in the Franco Brazilian Sugar (FBA) and 100% in Açucar Guarani  <b>Cargill</b> bought control of Vale do Sapucaí Central Energy (Cevasa)  <b>Bunge</b> invested in buying the Vale do Rosário mill, third biggest alcohol and sugar manufacturer in the country  <b>Pacific Ethanol</b>: Partners include billionaire Bill Gates, and the German company NordZucker SudZucker, active in the European sugar sector, and <b>BHL</b>, an Indian company which owns mills in India, and which hired KPMG consulting firm to coordinate its Brazilian expansion</p>

**Source:** *Brazilian Press, adapted from Wilkinson and Herrera, 2007.*

Brazilian sugarcane is genetically manipulated to guarantee resistance to pests, with adapted species replaced in 10-15 year cycles. The sugar-alcohol sector wants to use genetically modified organisms to speed up this process. EMBRAPA (the Brazilian Agricultural Research Corporation) is working with international companies, including BASF and Monsanto, and has filed requests to carry out research on GM sugarcane with the National Biosafety Technical Commission (CTNBio).

#### the role of financial institutions and international agreements

Multilateral banks are playing an important role in agrofuel expansion across the Tropics. Inter American Development Bank (IADB) investments are forecast to reach US\$ 3 billion.

It is involved in four projects in Brazil, designed to contribute to the goal of tripling ethanol production by 2020,<sup>9</sup> including loans of US\$ 570 to increase capacity at a mill at Moema in São Paulo and around US\$ 2 billion in loans for new development sites in Minas Gerais and Mato Grosso do Sul.

Regionally, the IADB is funding the market analysis studies and developing pilot projects across the Caribbean and Central American regions. The countries involved form the reprocessing route taking Brazilian alcohol to the US,<sup>10</sup> taking advantage of free trade agreements.

The bank is also involved in developing feasibility studies for agrofuel development in other countries, including Haiti, Honduras, Nicaragua, Panama and the Dominican Republic as part of the Brazil-United States accord for technology transfer for ethanol production, from funding designated for collaborative efforts to tackle and adapt to climate change.

<sup>9</sup> See <http://www.iadb.org/NEWS/articledetail.cfm?Language=En&parid=2&artType=PR&artid=3779>.  
<sup>10</sup> See the projects known as: El Salvador ES-T1057 and TC0002071, Mexico ME-T1007, and Brazil BR-T1040 and BR-M1028 (source: IADB research portfolio from the Rede Brazil).

## one sugarcane ethanol production in brazil

continued

The World Bank's IFC (International Finance Corporation) has investments of almost US\$ 200 million in sugarcane ethanol in Brazil - considered by the bank as the viable source for the production of first generation biofuels. These are in "solid and well established large groups with the capacity to increase exports of alcohol and sugar, and with low financial risk."<sup>11</sup>

Brazilian National Development Bank, BNDES is expected to invest R\$ 100 billion by 2011, including finance for transport and storage logistics, banking services and commercial links. Some R\$ 20 billion are earmarked exclusively for new sugarcane mills and energy generation, up to half of which could be public money.

In 2006, BNDES doubled previous year investments in ethanol and sugar to R\$ 1.974 billion. In the first quarter of 2007, it provided a further R\$ 723 million to the sector with involvement in 70 ethanol and energy from sugarcane waste cogeneration projects.

### land use and ownership

Government statistics<sup>12</sup> show that 60% of the land for sugarcane is owned by the mills, and by extension, their international and national shareholders. The rest belongs to suppliers or tenant farmers.<sup>13</sup>

According to UNICA (the sugarcane industry union), some 60,000 independent small suppliers (less than 150 hectares) contribute 27% of total production. Most of these lease their land to mills. There are few family farms in the sugarcane industry.

The turnover in land ownership is high in Brazil, benefiting large land owners and putting pressure on small and medium sized rural property owners.<sup>14</sup> Monoculture crops, like sugarcane, have replaced increasingly unviable family farms.<sup>15</sup>

Demand for energy crops has created an explosion in the rural property market, revealing the government lack of control over foreign land ownership. It can do little to stop the foreign investment groups who, according to INCRA data, are buying up large areas of west Bahia, Mato Grosso do Sul, Mato Grosso, Tocantins, Maranhão, Pará, and São Paulo.

New restrictions on land purchases were introduced in 2007 aimed at preventing land purchases by foreign nationals acting through Brazilian companies.

Foreign companies want to see greater access to land. The Finnish company Stora Enso (which illegally acquired land on the border of southern Brazil and Uruguay) has lobbied for a Constitutional amendment to allow foreigners to acquire land within the previously forbidden 150km strip along Brazil's 8 million kilometre border, giving access to land in Rio Grande do Sul and Mato Grosso do Sul.

Land that would once have been considered unproductive is now being leased for sugarcane. This means that areas once allocated for land reform are being taken over by plantations.<sup>16</sup>

The leader of the Pana settlement in Nova Alvorado do Sul/MS told the researchers:

*"Right here there is a farm that was headed for land reform and which would be a new settlement, but then it was leased. It is a strategy by the mill owners, they lease the land of unproductive farms and it's like throwing a bucket of cold water on the land reform movement. It's frightening how they are occupying all the land in the region."*

According to a representative from the Rural Works Union in Rio Brilhante/MS

*"The conflict between sugarcane and the land reform movement here in Rio Brilhante is very complicated. We can't move forward with the land reform process. Since sugarcane arrived, the number of roadside camps has only grown."*

An indigenous leader, Guarani-Kaiowá in Dourados/MS said:

*"Our last border demarcation here in November, December of last year was reversed. I think it has to do with the arrival of sugarcane in the region. The way it's going, the conflict for land is only going to get worse."*

Statistics show that in Mato Grosso do Sul, land conflicts, or acts of resistance against the possession, use and ownership of land grew by 87.5% between 2003 and 2005, jumping from 16 to 30.<sup>17</sup> The number of occupations of rural properties doubled in the same period, with most taking place in districts where new plantations are planned.



<sup>11</sup> Notes from the meeting between the Friends of the Earth Brazil, the Bank Information Center and Friends of the Earth United States with agribusiness executives from the IFC, on September 18, 2007, in Washington, DC.

<sup>12</sup> MAPA (2007).

<sup>13</sup> Land leasing is practiced in Brazil, where the owner "rents" the land to be used for a certain period of time (16-20 years in the case of sugarcane). The tenant must cultivate and manage the land during this period.

<sup>14</sup> Brazil has one of the highest levels of concentration in land ownership in the world, with just 1.7% of distinct properties occupying 43.8% of the total area registered by INCRA.

<sup>15</sup> Guedes et al (2006).

<sup>16</sup> Cleaning up Uncertainties, Despoluindo Incertezas, Teixeira et al (2007).

<sup>17</sup> Pastoral Land Commission (CPT).

## agrofuel impacts

There are currently 7 million hectares of land cultivated with sugarcane in Brazil and the industry is growing. This monoculture production, half of which is concentrated in the state of São Paulo, like most export-driven monocultures, is causing serious environmental and social problems, including issues over land ownership and rural poverty, illegal deforestation and soil and water table contamination as a result of the intensive use of agrochemicals.<sup>18</sup>

The sugarcane industry causes particular problems as a result of:

- *the practice of burning before the harvest - used on 80% of plantations*
- *uncontrolled use and disposal of a toxic byproduct called vinhoto, which is used as a fertilizer, leading to soil and water contamination<sup>19</sup>*
- *demand for land which leads to the conversion of agricultural areas (including subsistence farms) and ecosystems for agrofuel cultivation;*
- *poor working conditions for sugarcane cutters, who make up more than half of the 1 million jobs generated by the sector - conditions akin to slave labour have been uncovered in a number of regions of Brazil, including on modern farms.*

The sector claims to be working to ensure better practice, including regulations for workers. It argues that expansion is mainly in degraded cattle grazing areas, long since abandoned. But research has shown that the increase in land prices as a result of the expected growth in the ethanol market have resulted in many activities migrating to more sensitive zones.<sup>20</sup>

Pesticide use is causing environmental and health problems, particularly in rural areas.

One small farmer told researchers:

*“When the people from the mill apply the poison to kill the plants that grow between the sugarcane, it spreads and kills all our grass, which already isn’t much. So when it’s time to milk, it’s no good. Then there are the beetles that come over from their plantation and attack our gardens and fruit trees. We never used to need any kind of poison, now if we don’t attack them hard, we won’t even get a single plant growing.”<sup>21</sup>*

## land use and biodiversity

Growing demand is pushing agrofuel farming onto previously uncultivated land and forcing some cattle ranching and farming to move into new areas. Biodiversity and habitats are under threat.<sup>22</sup>

One study of land use change resulting from sugarcane expansion found less land now used for other crops, grassland and fruit, although the amount of land dedicated to grazing and forestry remained unchanged.<sup>23</sup>

Sugarcane is now spreading to regions where it has never been grown before, threatening natural sites such as the Pantanal Wetland in Mato Grosso and Maranhão.

In 2005, the governor of Mato Grosso do Sul asked the Legislative Assembly to prohibit alcohol mills from being built on the Alto Paraguay Basin, but the state Secretary of Tourism and Production argued that the distilleries were the only way of developing the economies in the region. Social and environmental movements successfully campaigned against the mills, although environmentalist Francisco Anselmo de Barros sacrificed his life in the fight.<sup>24</sup>

In July 2006 the governor of Maranhão launched an agrofuel production program to promote ethanol production to generate 120,000 jobs. The programme, based on a study that showed that 45 million tons of sugarcane could potentially be harvested each season, producing 2 billion litres of ethanol. This could be exported via the port at Itaqui.<sup>25</sup>

Brazilian law requires rural properties set aside 20% of their land as a biodiversity reserve.<sup>26</sup> Some sugarcane growers claim that the reserves had already disappeared when they moved on to the land and that re-creating them would have no ecological value. Some producer associations have suggested plantations finance conservation efforts elsewhere instead.

In response to growing international concerns about biodiversity loss and the impact on carbon emissions, the federal government has put forward a plan for “economic-ecological zoning”. But as there are no legal or land-planning tools apart from the Forest Code, it is difficult to restrict or curtail land-use in this way.

<sup>18</sup> Ortiz (2006).

<sup>19</sup> In order to produce one liter of ethanol, 10 liters of water are needed, which is then discarded in the form of vinhoto after fermentation and distillation. That means that if 17 billion liters of ethanol are produced, 170 billion liters of vinhoto will be reused as fertilizer, treated or dumped.

<sup>20</sup> Teixeira et al (2007).

<sup>21</sup> Small farmer- Iturama/MG, 28/11/2006, Teixeira et al (2007).

<sup>22</sup> Rodrigues and Ortiz (2006).

<sup>23</sup> Quartaroli et al (2005).

<sup>24</sup> ECOA, 2005- By a vote of 17 to 4, the Assembly shelves the mill project; at: [http://www.riosvivos.org.br/canal.php?canal=289&mat\\_id=8300](http://www.riosvivos.org.br/canal.php?canal=289&mat_id=8300).

<sup>25</sup> Maranhão Government, 2006 - Governor launches Biofuel Program and says population will benefit; at: <http://www.ma.gov.br/investimentos/noticias.php?id=5570>.

<sup>26</sup> Rodrigues and Ortiz (2006).

# one sugarcane ethanol production in brazil

continued

## air pollution

The sugarcane harvest in Brazil has traditionally been done by hand, with the fields burnt before harvest to clear away leaves. Despite increasing mechanization, burning is still widespread, causing severe health and environmental impacts, especially in the south east.<sup>27</sup>

Burning releases ethane into the atmosphere, along with other hydrocarbons, toxic compounds and particles. Ethane contributes to the formation of low-level ozone, the main component of smog, which causes respiratory problems for humans and other animals. The toxic compounds are also damaging to health.

Acidic residues from burning find their way into water supplies and increase soil acidity. Increased acidity damages forests, kills fish, corrodes metal and other construction materials.

Data from Piracicaba in the heart of the sugarcane territory shows that pollution from burning leads to an increase in child and adolescent hospital stays as a result of respiratory illness.<sup>28</sup>

## working conditions

The sugarcane industry relies on manual labour for a range of tasks including planting, combating ant infestations and harvesting. The harvest is the most labour intensive, accounting for more than 60% of the labour force.<sup>29</sup> Workers are paid according to productivity, which is added to a monthly wage depending on cane cutting performance.

In the Riberão Preto region workers on average harvest 12 tons of sugarcane a day, twice as much as in the 80s. Over the same period, the cutters' minimum wage has almost halved.<sup>30</sup> Today a cutter earns on average R\$ 620 a month, about 1.5 times the minimum wage. Other rural jobs are even less well paid, but cutting work lasts for at most 8 months of the year.

The hard work involved and the constant pressure to increase productivity can be fatal. During the 2004/05 and 2005/06 harvests, 14 workers died from overwork while cutting cane.<sup>31</sup> In October 2007, a worker was accidentally burned to death as he tried to control a burning field.

To minimise health problems, sugarcane companies try to recruit healthy workers, reducing health care costs, and leading workers to seek medical assistance only as a last resort.<sup>32</sup>

The number of women working as cutters has fallen. The Andradina Rural Workers Union, (SerAndradina), reports that some plantations are asking women to show proof of infertility before they are employed, to avoid the cost of "unwanted" pregnancies.

In recent years regulation of working conditions in the sector has increased. The government has signed up to a number of International Labor Organisation (ILO) standards which prohibit the most dangerous kinds of child labor. Levels of child labor have fallen in the last decade.

But cases of slave labor are still being uncovered. In 2006, a Ministry of Labor investigation found 430 cutters working in dangerous conditions in Bauru, São Paulo. Just a few days earlier, inspectors freed 249 workers from slavery-type conditions in Campos de Julho, Mato Grosso. In 2007 the Ministry registered almost 3,000 people, including indigenous workers, living and working under slavery-like conditions.<sup>33</sup>

## modernisation and unemployment

The more progressive companies, especially those hoping to move into the international market, are improving working conditions. They try to minimise strike action, health problems and legal action because of the impact on production levels and on the company's image abroad.

But new technology, especially mechanised harvesting, does not always mean an end to poor working conditions, or the use of burning, which is thought to increase yields.<sup>34</sup>

Workers who previously worked in dangerous conditions now worry about growing unemployment. As more machinery is introduced, less workers are needed. A modern harvesting machine can replace up to 100 workers.<sup>35</sup> As technology spreads, more than 60% of jobs in the sector could disappear.<sup>36</sup>

The threat of unemployment creates a climate of insecurity in which workers are more willing to accept longer workdays, faulty or a total lack of safety equipment, poor quality or insufficient food, unsafe transport and unhealthy, even dangerous, working conditions.<sup>37</sup>

The loss of manual jobs affects the least educated workers most. Even in São Paulo, the most developed of the Brazilian states, 71% of cutters do not finish elementary school, and 39% have less than one year of schooling. Alternative jobs for these workers are hard to find. The effects of mechanization can be wide-reaching, affecting communities and social structures.<sup>38</sup>

27 Ometto et al (2005).

28 Arbex (2004).

29 Gonçalves (2005).

30 Alves (2006).

31 The Migrants Pastoral.

32 Scopinho (2000).

33 Repórter Brasil, 31/01/2008 - Grandes libertações de trabalhadores em canaviais dominam

2007 (Large-scale liberation of sugarcane workers dominates 2007).

34 Scopinho (1999); Alves (2006).

35 Ustulin & Severo (2001).

36 Guilhoto et al (2002).

37 FETAEMG (2002).

38 Veiga Filho et al (1994).

### processing, transport and trade

The state-owned oil producer Petrobras is the main actor in the export market, with investments in plant expansions, pipelines, storage facilities and ships.

The industry currently relies primarily on road transport, with diesel trucks used to take the harvested cane to the mills, transport the alcohol to storage centres, and in most cases deliver the product to refineries. From there it is exported via a network of pipelines and trucks.

Petrobras subsidiary, Transpetro could invest some R\$ 4 billion in logistics projects including two new pipelines and an expansion project and new port on the Tietê-Paraná waterway. The Santos Alcohol Export Terminal, built specifically for alcohol exports, is expected to double its capacity within the next two years.<sup>39</sup>

Dutch company Vopak, which already holds stakes in three terminals,<sup>40</sup> is planning to invest US\$ 60 million in logistics infrastructure in Brazil, building ethanol storage centres at strategic export locations including the Ilha D'Água Terminal in Rio de Janeiro and Suape in Pernambuco. Suape is considered strategic because of its proximity to the US and Europe.

There is also Dutch interest in developing an ethanol export terminal in Santos to supply the planned ethanol distribution hub for Europe, based in Rotterdam. Companies including Argo and Caldic are involved in the project. Caldic has invested €30 million in an ethanol terminal in Rotterdam and sees ethanol as Brazil's most important cargo for Europe.<sup>41</sup>

### corporate influence on government policies

ÚNICA, (the sugarcane industry union) is the most organized and powerful lobby for sugarcane sector, representing more than 100 producers, via two union groups. ÚNICA lobbied to change a state law that would have ended cane field burnings by 2006, winning a postponement until 2031. It has also created a positive competitive image for the sector internationally, and promoted corporate responsibility programmes among its members.<sup>42</sup>

But the central role of agrofuels in federal government policy also guarantees public financing and policies geared towards aiding expansion, including promotional campaigns overseas.

This has created economic opportunities for ex-politicians from Lula da Silva's government, who have become important investors. The former Agriculture Minister Roberto Rodrigues, who drafted the National Agroenergy Plan, resigned to set up his own company<sup>43</sup> and concentrate his efforts on the creation of the Inter American Ethanol Commission together with Jeb Bush, brother to the US president, and Jaime Moreno, the Colombian president of the IADB.

Luiz Fernando Furlan, Lula's former Planning Minister, Gustavo Franco and Armínio Fraga, former presidents of the Central Bank, Juan Quirós, former president of the Association for the Promotion of Exports- Apex, and Henri Phillipe Reichstul, former president of Petrobras, are among the newest big investors in ethanol who previously occupied high level positions relevant to agroenergy policy in Brazil.

There is little evidence of international companies directly influencing Brazilian policy, but proposed European biofuel targets and the expected increase in demand has been key.

### resistance

The new wave of sugarcane expansion has been opposed by social movements and environmental organizations who have held protests and sought to challenge the government's proposals in public debates, questioning the export of energy resources and calling for a limit to the spread of monocultures.

The agro-export model is seen as a way of promoting short-term economic growth at the expense of long-term sustainable, people-centred development, and the existing diverse, decentralized, sustainable way of life for rural populations.

Market mechanisms and certification schemes that support agrofuel exports, especially "green" seals and "sustainability certificates" as promoted by the EU, are seen as ways of legitimizing the damage. And while Brazil promises environmental guarantees for exports, nothing is done to implement those measures at home, and no certification scheme exists for the domestic market.

Social and environmental movements, though highly sceptical, have demanded greater decentralization for the production and commercialization of agrofuels, involving family farmers in supplying local and regional markets, while also advocating sustainable energy policies geared towards promoting energy sovereignty, including decentralized models of alcohol micro-distilleries and mini vegetable oil mills in a network that gives them energy autonomy associated to the production of food in family farms.<sup>44</sup>

<sup>39</sup> COSAN (2007).

<sup>40</sup> Valor Econômico, 25/04/2007 - Logística para álcool atrai holandeses (Alcohol logistics attracts Dutch).

<sup>41</sup> A Tribuna/Santos, SP, 02/05/2007 - Holandeses querem terminal em Santos (Dutch want a terminal in Santos).

<sup>42</sup> Rodrigues & Ortiz (2006).

<sup>43</sup> Dinheiro Rural, Edição nº 25, 28/11/2006 - A iniciativa privada de Roberto Rodrigues: Depois de três anos e meio a frente da pasta da Agricultura, ex-ministro está prestes a lançar um fundo milionário para financiar projetos de álcool e biodiesel. (The private initiative of Roberto Rodrigues: after three and a half years as head of Agriculture, the former minister is ready to launch a multi-million fund to finance alcohol and biodiesel projects).

<sup>44</sup> Ortiz (2008).

## two biodiesel in argentina

### biodiesel in argentina

roque pedace, friends of the earth argentina

Argentina is not currently a major producer of agrofuels, but is the world's second largest producer of soybeans and is keen to develop biodiesel from soybean oil and other sources, especially for domestic use.

The soybean sector and government are currently in conflict over increased export taxes. Soybean producers have this year been on strike, blocking roads and causing food shortages and major disruption. Supplies have been halted and prices have gone up at a time when high commodity prices are already causing problems in the global food market.

The government has criticised soybean production as a result of the dispute, describing soybean production as a "powerful threat to biodiversity" and highlighting the increases in deforestation and the social impacts of rural communities that are being displaced.<sup>45</sup>

#### soy production in argentina

Argentina introduced a biofuels law in 2006 to encourage the take-up of biofuels in the domestic market. The law requires all petrol and diesel to contain a proportion of ethanol or biodiesel by 2010, generating a yearly demand of 690,000 to 800,000 tons of biodiesel.

With half of Argentina's farmland dedicated to growing soybeans, this is the most likely raw material for agrofuel, especially as other sources of oil such as rapeseed and palm oil can fetch higher prices in other markets. Argentina's sugarcane industry is also being encouraged to produce ethanol.

Argentina is the world's second largest producer of soybean oil, producing 18.3% of the global total. But much of this oil is currently exported. In fact Argentina is the world's leading exporter, with 6.25 million tons a year exported to more than 50 countries. India is the biggest customer from Argentinean soybean oil.

The main by-product from the grinding process, soy pellets, are mainly used for animal feed. The greatest demand comes from countries in the European Union (Italy, Spain, The Netherlands, Denmark) following changes to animal feed regulations after the outbreak of mad-cow disease.

Originally grown in the pampas regions, Argentinean soybean production has increased steadily since the 70s in response to the opportunity to sell to the European market.

It has now spread beyond the pampas regions, contributing to deforestation, the displacement of livestock farms and rural villages and an increased concentration of land ownership. More than 90% of Argentinean soybeans are genetically modified.

Biodiesel production in Argentina is currently limited, with a small number of processing plants controlled by the soybean producers, and aimed at the export market .

TABLE 3

LARGE-SCALE PLANTS ALREADY  
INSTALLED AND OPERATING AS OF  
1 JANUARY 2008

COMPANY	PRODUCTIONS (TONS PER YEAR)
Ecofuel SA	200,000
Renova	200,000
<b>Total</b>	<b>400,000</b>

#### government policies and expansion plans

The government's biofuel law, introduced in 2006, established targets for domestic agrofuel use and created tax exemptions and other incentives to encourage consumption. Further incentives are provided at a provincial level, such as tax exemptions on agrofuel investments.

Though the explicit purpose of both the law and the public policies is to supply the domestic market, the elimination of export taxes on biodiesel, (while maintaining taxes on exports of soybean and other vegetable oil exports) works as a differential subsidy and encourages biodiesel investments.

Government policies also support research and development into potential new agrofuel crops such as jatropha, castor-oil and other oleaginous plants and into improving industrial processes for obtaining biodiesel. But the resources to implement these policies are limited, and private sector investment is minimal.

The government hopes to encourage more diversified domestic production by 2010, including a more balanced regional spread. But rapeseed oil is in demand for food production, while castor-oil and palm oil are highly valued for use in cosmetics.

<sup>45</sup> <http://www.ambiente.gov.ar/?aplicacion=noticias&idarticulo=5320&idseccion=12>.

Much of the agrofuel industry is currently concentrated around grain ports, like Rosario- and again the government intends more regional diversification. Plants under construction or already built by the end of 2008 will have a production capacity of 1.6 million tons of biodiesel per year. But most of these will be based in the oil industry centre of Greater Rosario.

The government is also encouraging investments in ethanol production, with incentives for the sugar industry. But biodiesel has more potential as an export product. Argentina does not have the capacity to compete with Brazilian ethanol in the global market.

Argentina does not have a national policy for sustainable uses of biomass.

**company involvement**

Most of the companies developing biodiesel operations are the big players in the soybean industry. Some new foreign companies with experience in installing plants and trading biodiesel abroad are also moving into the market.

European companies like Glencore, Nidera and Dreyfus are already well-known players in the soybean business. Other companies are now going into partnerships with local firms, allowing them to benefit from the experience that has already been developed in Europe.

Some domestic investors have made alliances with European companies (eg Oilfox with Neckermann-Gate).

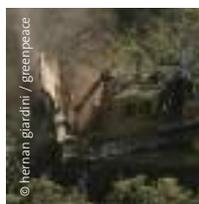
The petroleum companies REPSOL and Petrobras have minor investments in biodiesel production for export. Petroleum companies in Argentina need to import oil in order to cover the diesel shortfall, which is why there is an interest in developing biodiesel.

The main soybean oil-exporting companies in 2003 were Cargill and Bunge Argentina and these remain the main players in the biodiesel market (see Table 4).

**TABLE 4** MAIN SOYBEAN OIL EXPORTING COMPANIES - 2003

COMPANIES	TONS	%
CARGILL	927,979	21.4
BUNGE ARGENTINA	887,200	20.5
AGD	613,809	14.2
DREYFUS	570,642	13.2
VICENTIN	474,115	10.9
PECOM	234,165	5.4
NIDERA	130,235	3
MOLINOS RIO DE LA PLATE	109,551	2.5
<b>Sub-total</b>	<b>3,947,696</b>	<b>91</b>
<b>Total</b>	<b>4,337,464</b>	<b>100</b>

Source: SAGPyA.



Forests being cleared by bulldozers before being burnt in Salta, Argentina.



Forests cleared and burnt in Salta, Argentina.

## two biodiesel in argentina

continued

**TABLE 5** COMPANIES BUILDING NEW PLANTS FOR BIODIESEL AND CAPACITY - NEXT THREE YEARS

COMPANY	2007
Asociación Coop. Argentinas	250,000
Louis Dreyfus	230,000
Louis Dreyfus	300,000
Unitec Bio (Grupo Eurnekian)	200,000
Raiser (Ar) y Green Fuel (es)	200,000
Patagonia Bioenergia	200,000
Explora	100,000
Molinos Rio de la Plata	100,000
Oil Fox	240,000
Terminal Puerto Rosario	240,000
International Chemical Industry	200,000
Repsol YPF	100,000
Prerex	100,000
Cargill	100,000
Cargill	200,000
Oil M&S SA	200,000
Nidera	100,000
Glencore	100,000
Cil Global Corporation	100,000
FT Holding	250,000
Alquimia Inc	200,000
Greenlife International	100,000
Agricultores Fed. Argentinos	100,000
Prarex International LTD	100,000
<b>Total</b>	<b>4,010,000</b>

**Source:** Villalonga, 2007 in GP Cono Sur, from publications and research.

To produce 4 million tons of biodiesel in Argentina (Table 5) from soybeans would need more than 9 million hectares of the crop, that is, 60% of the area already planted with soybeans.

According to AABH (Argentinean Association of Biofuels and Hydrogen), 20 other projects representing over US\$ 500 million of additional investments are planned, involving international companies (eg Dutch company Biokraftstoffe Vom Süden) as well as Repsol YPF, Cargill, Oil Fox and the Federation of Argentinean Farmers. American companies Pure Biodiesel,

Imperial Renewables and World Energy are all said to be considering developing facilities in Argentina.

The technology used for the large-scale plants is mainly provided by the German firm Lurgi, and they are designed to comply with European standards.

Until now, petroleum companies have played a secondary role. Repsol-YPF has launched a mix of diesel and biodiesel in the market, called Repsol Bio, containing 1% soybean fatty acid methyl ester. Significant investments have been made in the company's research centre and there has been an intense advertising campaign. The company is currently building a large-scale plant and is requesting subsidies for biodiesel. Petrobras, heavily involved in the Brazil's agrofuel market, is not as involved in Argentina.

One of the largest European operations in Argentina is the Dreyfus plant General Lagos, in southern Santa Fé.

The Spanish Green Fuel Corporation is involved in a US\$ 190 million joint development with Noble Argentina (part of a global group, with headquarters in Hong Kong), Raiser (also Argentinean) and the state-owned gas and petroleum company Enarsa, to build a soybean crushing and biodiesel production centre at Timbués, on the Paraná River. The plant will have the capacity to process over three million tons of soybeans a year (7% of the Argentinean soybean production in the 2006/07 season).

Partnership operations with local companies makes it easier to access credit from the IADB (Inter-American Development Bank), while investment in related infrastructure, such as roads and ports, also gives access to credit from international and domestic public banks.

Soybean production relies on seeds and pesticides developed by foreign companies. More than 90% of Argentinean soybeans are genetically modified, with the GM seeds licensed to Argentinean seed producers (current legislation prevents a monopoly of patent holders). Transnational biotech companies such as Monsanto and Syngenta play an important role in shaping the industry.

Farming methods depend mainly on locally developed machinery for sowing the seeds, but tractors and harvesting machinery tends to be imported from foreign suppliers, primarily in the US, Brazil and Europe.

More significant yet, the Argentinean government has had to face a tax rebellion by soybean producers against measures that imply limitations to their profits. The situation has resulted in roadblocks and the largest ever shortage of food supplies in Argentina's recent history. The government has responded by officially denouncing, for the first time, the soybeanization process of agriculture in Argentina.<sup>46</sup>

<sup>46</sup> <http://www.ambiente.gov.ar/?aplicacion=noticias&idarticulo=5320&idseccion=12>.

## land ownership

The changes undergone by Argentinean agriculture in the last two decades have resulted in land ownership being increasingly concentrated in the hands of a small number of owners, while small-scale producers are forced from their land. According to the latest National Agricultural Census, the number of rural establishments in Argentina fell 24% between 1988 and 2002 to 318,000. During the same period, the area used for soybean production grew by 126%.

This expansion has been at the expense of land that was being used for dairy production, grains and fruit and vegetable production. Vegetable and legume farming decreased by over 25% in terms of area, and livestock forage areas were reduced by more than half. This has had a considerable impact on prices of the fruit and vegetable supply.

Some small and medium-scale soybean producers exist, selling to elevators (who in turn sell to vegetable oil manufacturers) but most production is large scale with contracted labour. More recently “sowing pools”, set up by agricultural investment funds, have leased land for soybean planting. A government report in 2008 showed that 46% of the soybean production was controlled by just 2.2% of producers. The profits have also attracted foreign buyers, including Adecoagro, a company owned by financier George Soros.

## impacts

The expansion of soybean production has not just been at the expense of other farm products, but also has considerable environmental impacts, contributing to increased rates of deforestation in the country. Soybean farming contributes to Argentina’s greenhouse gas emissions and the monocrop farming methods, including the use of GM seeds and related herbicides, degrades the soils and damages the local environment.

Changes in farming patterns are also affecting rural employment. The number of dairy farms in Argentina for example halved between 1988 and 2003. According to the Argentinean Agricultural Federation, 200 hectares of milk production employs five families throughout the year. The same quantity of soybean production requires one person for 10 days a year.

Soybean profits have increased demand for agricultural land, resulting in forest areas being felled to make way for grazing and farms. Table 6 below shows deforestation rates for the central and northern provinces. Similar rates of deforestation are also found in Espinal.

TABLE 6

AREA OF INDIGENOUS FOREST AND DEFORESTATION RATE

PROVINCIA	AREA OF INDIGENOUS FOREST (HA)			AREA OF FOREST CLEARED (HA)		YEARLY DEFORESTATION RATE (%)	
	1998	2002	2006	1998-2002	2002-2006	1998-2006	2002-2006
Chaco	5,107,780	4,939,466	4,811,975	117,974	127,491	-0.57%	-0.65%
Córdoba	1,108,769	979,095	885,165	122,798	93,930	-2.93%	-2.52%
Formoso	3,073,011	3,052,119	3,021,823	19,977	30,296	-0.16%	-0.25%
Salta	7,235,736	6,931,705	6,516,771	194,389	414,934	-0.69%	-1.54%
Santa Fe	554,799	530,354	519,027	20,737	11,327	-0.95%	-0.54%
Santiago del Estero	6,608,826	6,193,836	5,678,608	306,055	515,228	-1.18%	-2.17%
<b>Total</b>	<b>23,688,921</b>	<b>22,626,575</b>	<b>21,433,369</b>	<b>781,930</b>	<b>1,108,669</b>	<b>-1.01%</b>	<b>-1.35%</b>

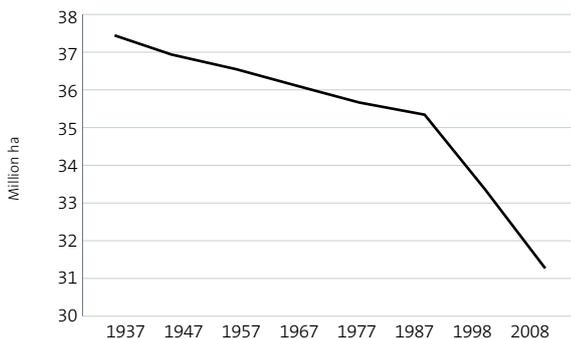
Source: UMSEF-SAYDS.

## two biodiesel in argentina

continued

FIGURE 2

### AREA OF INDIGENOUS FOREST (MHA)



**Source:** UMSEF-SAYDS. *Clearing and degradation of indigenous forests.* Secretaría de Ambiente y Desarrollo Sustentable. Dirección de Bosques. Unidad del Sistema de Evaluación Forestal. (Environment and Sustainable Development Office. Forestry Division. Unit of the Forest Assessment System).

Figures quoted by the government suggest that about 250,000 hectares of forest are being eradicated annually throughout the country, with 70% of this clearance occurring in the Dry Chaco<sup>47</sup>. The Chaco region has been the site of increased “pampeanization” - the term used to describe the use of the soybean farming methods first introduced in the Pampas region.

In the Chaco-Yungas ecozone, large areas of the sub-humid forests have been replaced with agriculture. More than 80% of the forests in the Dry Chaco area have been lost to agriculture.

As agriculture advances, rural communities find themselves forced from their homes, often with little regard for their human rights. Numerous investigations have exposed abuses of authority, corruption and the disregard of the rights of rural dwellers. Many were subsistence farmers, often living on land that is “owned” by the province, and then sold.

The “Selva de Montiel” In northern Entre Ríos, is an important area of indigenous woodland. But from 1993-2003 the area authorized for forest clearance was 60,000 to 75,000 hectares yearly, one of the highest figures worldwide.

### case 1: dismantling of native indigenous rights for soybeans planting

When a public hearing was held into proposals to clear 3,000 hectares of woodland to allow the expansion of El Álamo farm in Rivadavia, many of the local indigenous communities did not even know it was happening. The El Traslado Wichí indigenous community lives just a kilometre from the edge of the proposed development, with two other Wichí communities living a few kilometres further away. But as a statement from the Llaka Honhat Association of Native Indigenous Communities explained:

*“...due to a lack of public communication, and because it was held in a locality far away from where the woodland clearance is planned, few people took part in the hearing, and those directly affected by this initiative, the members of El Traslado Wichí community, were not there”.*

The only participants were the Quebracho Colorado company, represented by a lawyer, and the Fundación Asociana (Asociana Foundation) who raised objections through their spokesman Andrés Leake. The niyat (leader) of the Honhat Le` Les wichiguaraní community from Embarcación, Octorina Zamora, inquired as to why the hearing was held in Embarcación, but nobody could explain. The leader demanded the hearing be declared null and that a new one be held in the location that is targeted for felling.

*“This is a way of wiping us out; it was the Winchester in the past, today it’s soybean” she stated.*

*“Their historical homeland is partially in that farm,” an engineer working with Asociana explained. “They would run out of building materials for their homes, not being able to hunt, nor to collect fruits or fibers for their fabrics”.*

Asociana helped the community present an appeal in 2006 on the grounds of unconstitutionality so that the State regularized their rights over their own lands.<sup>48</sup>

A new National Forestry Law, introduced in 2007, brought a halt to the clearances, although some states are struggling to enforce the restrictions and partially degraded forest land can still be legally converted to agriculture.

<sup>47</sup> [http://www.ambiente.gov.ar/archivos/web/File/032808\\_avance\\_soja.pdf](http://www.ambiente.gov.ar/archivos/web/File/032808_avance_soja.pdf).  
<sup>48</sup> [http://www.nuevodiariodesalta.com.ar/diario/archivo/noticias\\_v.asp?5986](http://www.nuevodiariodesalta.com.ar/diario/archivo/noticias_v.asp?5986)  
<http://www.clarin.com/diario/2007/07/03/sociedad/s-03206.htm>.

### impacts resulting from the intensification of agriculture

The intensification of soybean production in Argentina has resulted in a serious reduction in soil nutrient content. Crop rotation and the use of cover crops are recommended good practice for soybean farming - including by the soybean producers associations such as AAPRESID. Such practices would help the soil to recover, but they are seldom followed.

Pollutants from the soybean inputs, including glyphosate which is used extensively on GM soybean production, mostly end up contaminating surface waters and aquifers. Glyphosate has been shown to damage human health and the environment. The use of glyphosate decreases the nitrogen fixing capacity of the soybean, increases susceptibility to diseases and reduces the development of the fungi needed for soil nutrient extraction.

The absence of undergrowth during the flowering period makes it difficult for useful insects to survive, increasing the threat of plagues of more harmful pests.

Soybean farming has also been shown to increase N<sub>2</sub>O emissions, contributing to an increase in Argentina's greenhouse gas emissions. This is partially a result of the nitrogen in synthetic fertilizers, but mainly a consequence of the soybean's nitrogen fixing properties, which means nitrogen is released when the agricultural waste is buried after the harvest.<sup>49</sup>

#### case 2: colonia loma senés, formosa

In February 2003, at least 23 small-scale producers and their families from Colonia Loma Senés, in Pirané, Formosa, were the victims of repeated sprayings from "mosquito" planes on the neighbouring soybean fields. The planes were spraying glyphosate and 2,4-D.

The chemicals destroyed most of their crops, leaving the plants burnt. Their livestock was affected, and some chickens died. Some of the people suffered vomiting, nausea, nose bleeds, breathing difficulties and problems with their eyes. The damage left the communities without enough food to feed themselves, let alone sell at market. When authorities checked water supplies, they found they were contaminated with pesticides.

Confronted with this scenario, and finding no help from the authorities, they decided to resort to legal action, asking for an injunction to stop the soybean sprayings. The judge granted a six-month ban, which in August was extended for a further three months. But in September the farm started spraying again.

This case was not the only one in the province. In Belgrano, farmers from the MOCAFOR ("Movimiento Campesino de Formosa") managed to prevent aerial sprayings on fields next to their farms. In Colorado dead fish and birds were reported as a consequence of sprayings on soybean crops.<sup>50</sup>

### indirect impacts

The soybean industry and indeed the agrofuel industry, have indirect impacts on the environment through the impacts of associated infrastructure and the need for transport.

New waterways, roads, railways and ports have been built to make it easier to move soybean oil around the country, often as part of national and regional development plans, affecting ecosystems and also increasing access to new territories for extraction activities.

The opening of the Paraná-Paraguay waterway has already led to an increase in barge traffic resulting in more erosion of the banks of the Paraná River up to Santa Fé. Work to deepen the Paraguay River up to Corumbá (Brazil) is underway, which will result in a major changes to the marshland ecosystem in Pantanal.

### future developments

More than 90% of the soybean grown in Argentina is already genetically modified with Roundup Ready varieties. Monsanto is working with BASF to produce a new generation of GM seeds in the next three years, which include soybeans with a higher oil content which will improve their suitability for biodiesel production. Nidera Semillas, Syngenta and Pioneer-Dupont are also working on varieties to increase the oil content.

Although only two genetic modifications are marketed (Roundup Ready and glufosinate-tolerant seeds), there are applications to approve the properties of more than 20 varieties, including changes to the oil content and increased capacity for assimilating nitrogen.



© pat.shrout / dreamstime

Soy bean pods.

<sup>49</sup> <http://unfccc.int/resource/docs/natc/argnc2s.pdf>.

<sup>50</sup> Informe Grupo de Estudios Rurales (Rural Studies Group Report), UBA, and Asociación de Feriantes de Pirané (Market Vendors Association of Pirané), Formosa, see <http://www.biodiversidadla.org/article/articleview/3575/1/8/>.

## two biodiesel in argentina

continued

### company influence on government policy

Both local and foreign companies in the soybean production chain have successfully lobbied the government, particularly through the Chamber on Biofuels, to obtain considerable subsidies and other advantages to encourage agrofuel production and increase the soybean trade.

The Biofuels Chamber has a low public profile but works behind the scenes. It has received one million Euros from the European Union for carrying out an analysis of the current situation, looking at the use of technology, and future potential for agrofuels in Argentina, Uruguay and Paraguay.<sup>51</sup>

The Biofuels and Hydrogen Association, does not include industry representatives but acts as a management and public relations pressure group, with a strong influence on the media.

The power of the soybean sector is apparent from the recent dispute over taxes - which has resulted in food shortages and price increases.

Biodiesel companies want to maintain the tax policy as it is, with guaranteed subsidies. With the new obligation to supply the domestic market, they want to ensure they receive the same advantages that they currently obtain from exports. They would also like to see prices set by the market, not by the state, as currently planned.

Seed production companies are also powerful - urging the government to reject the Cartagena Protocol - regulating GM crops. They are also lobbying to curtail the rights of farmers to keep their seeds, to speed up the release of GM seeds into the market, and to allow them to create monopolies.

There have been cases of corruption found at all levels in both chambers of Parliament - and some business figures are active in government, including standing as senators.



Forests cleared and burnt in Salta, Argentina.

© herman gerdini / greenpeace, argentina

<sup>51</sup> <http://www.biodiesel.com.ar/?p=498>.

## three agrofuels and corporations in uruguay

### agrofuels and corporations in uruguay

carlos santos and lorena rodriguez, REDES - friends of the earth uruguay

Uruguay is seen as having the potential to be a major agrofuel producer and the sector is currently being developed. Some estimates suggest that up to 40% of the country could be used to grow crops for agrofuel,<sup>52</sup> producing more than 40 million litres of biodiesel.

Production is currently focused on ethanol from sugarcane, but state company ALUR SA (Alcoholes del Uruguay) also plans to use sorghum and sugar beet. There is interest from the private sector in soybeans, and wood could be used for cellulose and biomass.

Agrofuels are seen as a way of boosting the economy, attracting investment, with some estimates suggesting they could generate more than US\$ 17 million in exports, boosting GDP and reducing unemployment.<sup>53</sup> But a widespread conversion to monocrop agriculture would also affect Uruguay's capacity for food production, impact on conservation efforts, reduce soil quality and change patterns of land ownership.

This report looks at the current situation in Uruguay and maps corporate initiatives, their origin and potential.

#### agrofuels in the MERCOSUR region

In 2006 the MERCOSUR member countries (Argentina, Brazil, Paraguay, Uruguay and Venezuela) signed a memorandum of understanding to encourage and promote biofuel production and consumption.

The following year, at the first American Congress of Biofuels, a US\$ 500 million investment in biofuel production was announced by Argentine businessman Julio Gutierrez on behalf of the Campo en Acción foundation. The investment was to be spent on buying arable land and installing biodiesel plants in Argentina, Uruguay and Paraguay.

A working group was set up to look at biofuel regulation, to promote joint research and to foster technological cooperation and the exchange of information between the public and private sectors across member states. The group also agreed to promote capacity building for sustainable biofuel production, including environmental impact assessments on land use. The participating countries were required to introduce domestic laws promoting biofuels as safe, renewable and environmentally sustainable energy sources, which provide environmental and development benefits and provide alternative energy sources for rural communities.

#### the domestic framework in uruguay

Uruguay introduced measures to stimulate agrofuel production in 2002 when the production of alternative, renewable fuels made from national animal or vegetal raw materials was declared an activity of national interest by law.

The law also provided a total exemption from tax on alternative fuels manufactured from vegetable or animal matter, and established feasibility studies into production and distribution systems for biofuels.

Responsibility for the promotion, regulation and production of agrofuels in Uruguay<sup>54</sup> is held by a number of government departments and agencies. In 2005 an Inter-ministerial Commission was established to oversee public policies relating to biofuels.

The National Administration of Fuel, Alcohol and Portland Cement (ANCAP) is responsible for the biofuel market - which is currently a monopoly. It set up ALUR SA, the state-owned company developing agrofuels, operating in the north of Uruguay.

The Committee for the Standardization of Biodiesel defined a national standard to guarantee the quality of biodiesel for fuel engines.<sup>55</sup>

The government's Technological Development Program (PDT) is supporting research into the use of non-traditional raw materials for agrofuel, including sweet sorghum, tartagal, thistle and lingo-cellulosic waste. Research has also been carried out into improving yields by using new varieties.

Uruguay's energy strategy (2006) prioritizes alternative energy sources, especially biofuels, as well as wind and biomass energy generation<sup>56</sup> and its energy policy (2007) sets out targets for biofuel use and a reduction in the use of oil. This includes a minimum 5% mix of carburant alcohol (ethanol) in petrol production by December 2014, and of a minimum of 5% biodiesel in diesel fuel by January 2012.

<sup>52</sup> United Nations agencies: ECLAC (Economic Commission for Latin America and the Caribbean), FAO (Food and Agriculture Organization).

<sup>53</sup> El País newspaper (Dec 27th, 2007).

<sup>54</sup> Based on "En clave uruguaya. Agroenergía", Inter-American Institute for Cooperation in Agriculture (I.I.C.A.) (March 2007) link: <http://www.iica.org.uy>.

<sup>55</sup> See "Normas UNIT", at <http://www.unit.org.uy>.

<sup>56</sup> DNETN-MIEM (2006)

## three agrofuels and corporations in uruguay

continued

### agrofuel crops in uruguay

Three crops currently grown in Uruguay are suited to agrofuel production - sugarcane which is used for ethanol; soybeans for biodiesel, and tree plantations which can be used to produce cellulose for ethanol. There is research into using sugar beet, sorghum and rice.

**sugarcane** is grown in Artigas, a department in the north of the country, where there are some 198 growers,<sup>57</sup> cultivating a total of 3,343 hectares in 2006 with an autumn and spring harvest producing 144 tons, a fall on the previous year.<sup>58</sup>

The growers supplying ALUR SA in Artigas are geographically in an enclave of foreign-owned land, with 24 Brazilian-owned farms in the area in 2006.

NATIONALITY OF GROWERS	NUMBER OF FARMS		CULTIVATED AREA	
	NUMBER	%	HECTARES	%
Uruguayan	541	94.4	156,605	86.2
Argentinean	3	0.5	146	0.1
Brazilian	24	4.2	23,217	12.8
Others	4	0.7	1,683	0.9
Not applicable	1	0.2	34	0.0
<b>Total</b>	<b>573</b>	<b>100.0</b>	<b>181,685</b>	<b>100.0</b>

Source: Moraes, Díaz, Lappado & Peirano (2006).

This increasing foreign dominance has created problems, including an influx of unregistered immigrant workers, and problems with smuggling. Some have even questioned the implications for Uruguay's sovereignty in the region.<sup>59</sup>

Small farmers and rural workers in the area feel they are being forced out as a result of the increasing foreign ownership of land and restrictions which mean they must settle in lands they can lease to ALUR SA. These problems contributed to a protest in January 2006 when small rural farmers and sugarcane workers occupied two plots of land in Colonia España demanding land reform and better working conditions.

ALUR SA plans to increase sugarcane production with a target for 10,000 hectares in 2008.

**soybeans** Uruguay's main soybean plantations are on the west coast (in Soriano, Rio Negro, Paysandú and Colonia). In this region, cheap land prices, a sympathetic tax regime and easy access have led to a number of Argentine soybean farmers buying and leasing land.<sup>60</sup> Unlike Argentina, Uruguay does not tax soy exports.

In Uruguay, soybean cultivation has been expanding rapidly and provides a valuable export crop, generating more than US\$ 90 million dollars in 2004. In 2005 Uruguay produced 460,000 tons of soybean, according to the Ministry of Cattle, Agriculture and Fisheries.<sup>61</sup> How much of this is used for agrofuels is not known.

TABLE 8

SOYBEANS: CULTIVATED AREA AND YIELD

	2000/01	2001/02	2003/04	2004/05
Cultivated area (ha)	12,000	29,000	247,000	278,000
Production (ton)	27,600	67,000	377,000	478,000
Yield (kg/ha)	2,300	2,305	1,526	1,720

Sources: Achkar, Dominguez & Pesce (2006).

**tree plantations** The use of trees for ethanol is controversial. In 2007, the then minister of Industry, Energy and Mining, Jorge Lepra, announced that the future for ethanol was from cellulose. By 2012, he claimed, cellulosic ethanol would be widely available at a competitive price. "Ligno-cellulosic ethanol" is a by-product of paper production and is seen as an attractive source of ethanol because it does not compete directly with food for land. But critics point out that demand for land for tree plantations also creates problems.<sup>62</sup>

Indeed, the National Director of Forest Management, Andrés Berterreche has warned that: "it may not be good for the country (...) to fall in the hegemonic process of wood production for energy. That may be good for a company but not for the country".<sup>63</sup>

There are currently a million hectares of forest plantation monoculture in Uruguay, mainly owned by transnational corporations, including US and European giants in the paper industry. These include Botnia (Finland), ENCE (Spain), Stora-Enso (Sweden-Finland) and Weyerhaeuser (USA).<sup>64</sup>

Research has shown that plantations are already reducing Uruguay's capacity to grow food and affecting water supplies, while exacerbating the concentration of land in foreign ownership.<sup>65</sup>

<sup>57</sup> See section 4.a below.

<sup>58</sup> DIEA-MGAP (2007).

<sup>59</sup> Moraes, Díaz, Lappado and Peirano (2006).

<sup>60</sup> Especially at the beginning of the soy expansion in the mid 90s.

In 2006 some restrictions were imposed on corporations, mainly on PLC.

<sup>61</sup> Achkar, Dominguez & Pesce (2006).

<sup>62</sup> El País (08/11/2007).

### agrofuel companies in uruguay

ALUR SA (Alcoholes del Uruguay SA) was set up as a state-owned company in 2005 by the new left-of-centre government. Ninety per cent of the shares in the company are held by ANCAP (the National Administration of Fuels, Alcohol and Portland Cement) and the remaining 10% is held by the National Corporation for Development.

It produces sugar and ethanol from sugarcane, and aims to produce 18 million litres of ethanol, 55,000 tons of sugar and 8 megawatts of electric power in 2008.<sup>66</sup> This would be enough ethanol to replace six per cent of Uruguay's crude oil imports, turning a deficit of US\$ 2 million into US\$ 8.5 million credit.<sup>67</sup>

### private investment

A number of private sector initiatives, including European Latin American companies, are looking at developing agrofuel production in Uruguay.

- *The French company Akuo Energy is investing US\$ 300 million in agrofuels, biomass, wind and hydro power, through Uruguayan subsidiary Energías Renovables del Sur.*<sup>68</sup>
- *PDVSA, the Venezuelan state-owned oil company wants to buy part of ALUR SA's ethanol production, providing joint investment.*<sup>69</sup>
- *Argentine-Uruguayan company Buquebús is investing US\$ 5 million to supply two new ships for an biodiesel plant in Maldonado.*<sup>70</sup>
- *Petrobras, the Brazilian oil corporation (part-owned by Shell) has announced its interest in producing biodiesel in Uruguay.*
- *Houston-based Gulf Ethanol Corporation is interested in sorghum for ethanol.*<sup>71</sup>
- *Uruguayan vegetable oil company COUSA (Compañía Oleaginosa Uruguaya SA) is considering a joint project with ANCAP to install a biodiesel plant using soy.*<sup>72</sup>
- *COPAGRAN (National Agrarian Cooperative), supported by private investors, plans to build a soy biodiesel plant in Colonia, importing machinery from Argentina.*<sup>73</sup>
- *A government project to generate electricity and steam from wood by-products (cogeneration) potentially using funding from the Kyoto Protocol's Clean Development Fund (CDM) has involved Urufor SA and Bioener SA in the consultation phase.*<sup>74</sup>

63 AM Libre, 2008 - the complete quote is: "The thing is that there are other products such as pellet production or even cellulosic ethanol production which is something that is currently being discussed, and in that case the issue is that we should think about it as with cellulose production, that is to say, that . it is always right to produce it as long as it is produced within an integrated forestry complex, not alone and by itself, because we may fall in the hegemonic process of wood production for energy only. That may be good for a company, but not for the country. Similarly, we believe that in terms of biofuels, it is good to have sovereignty, to be more independent in terms of our national energy matrix, but not necessarily as a good business to export cellulosic ethanol".

64 CBB-REDES – FoE Uruguay (2006).

65 Santos, Viera & Elosegui (2006).

- *Uruguayan company ECOSOL expects to produce nearly 4,000 litres of biodiesel from soy at its new plant in 2008.*<sup>75</sup>
- *Pandelco, a subsidiary of Spanish-Uruguayan construction company Teyma is involved in the forestry sector and supplies biomass to various industries.*<sup>76</sup>
- *Argentine-owned Biocombustibles del Plata (BP) and the Uruguayan Cooperativa Agraria de Dolores (Cadol) have signed an agreement under which Cadol leases BP facilities on the San Salvador river for a biodiesel plant which will be supplied by Cadol partners (local growers of sunflower and soybeans). The plant will have a processing capacity of 4,000 tons of grain a year producing 1.6 million litres of biodiesel with production starting in 2008.*<sup>77</sup>

Private companies are also involved in research into producing biodiesel and ethanol from sorghum and sunflowers in a US\$ 40 million project which could involve the cities of Montevideo, Canelones and San José, creating a "metropolitan" scale project producing biodiesel and ethanol from 100,000 hectares of land in the south of the country.<sup>78</sup>

### Influence of corporations on government policies

With so much investment at stake, developers can hold considerable influence over a government which is relying on them to deliver this new industry.

The French company Akuo Energy, has made it clear that it believes it is "important" that the government gives a clear sign to investors that their investment will be paid off in 20 years. CEO, Eric Scott said the government should aim to create a "coherent group of tariffs, plus tax incentives that guarantee the investment."

Alain Castro, the president of Energías Renovables del Sur, has urged the Uruguayan government to speed up legislation to encourage other sources of renewable power.

He said, "We have a commitment to invest in Uruguay because of the advantages it presents, it also depends on how fast other governments move. If it only takes three months for another government to issue legislation that promotes the installation of alternative energy projects, that will be more appealing than Uruguay, if it takes two years".

66 Achkar, Domínguez (2007).

67 As above.

68 El País newspaper (11/23/2007).

69 Achkar & Domínguez (2007).

70 As above.

71 El País (07/17/2007), Crónicas (07/20/2007)

72 Achkar & Domínguez (2007).

73 La Diaria (01/15/2008).

74 Carbosur (12/17/2007).

75 El Espectador (06/27/2007) El Observador (10/26/2007).

76 El País (04/23/2007).

77 La República (10/30/2007).

78 El País (11/06/2007).

## three agrofuels and corporations in uruguay

continued

### land use: food or energy?

Controversy and conflict already exist in Uruguay over land use. Unmanaged increases in energy crop production could exacerbate this situation, creating competition between ethanol and sugar; timber and energy; cattle feed and biodiesel.

The agrofuel expansion further entrenches the current trend for large landowners and more foreign ownership in Uruguay, threatening biodiversity and degrading natural ecosystems.

Researchers have said: "In an optimistic scenario, if all the arable land available is used for cultivation, maintaining the current focus on food production as the main goal of the Uruguayan rural space, the country could replace up to 25% of consumption of oil-derived fuels with ethanol and up to 36% of gasoil with biodiesel."<sup>79</sup>

But they also warn that: "the hypothesis of Uruguay as agrofuel exporting country is not real, at least not with the current production patterns."

### case 3: akuo energy

The French company Akuo Energy – leader in generating "renewable" energy in France – is to invest US\$ 300 million in alternative energy projects in Uruguay, attracted by the country's stability, economic situation and renewable resources. The investment is part of a US\$ 1.8 billion worldwide investment program.

To do this, it has created a subsidiary company in Uruguay, Energías Renovables del Sur (Southern Renewable Energy), to develop agrofuel, wind, hydro and biomass projects. Work starts in 2009 with at least two projects, and an investment of US\$ 150 million.

Source: *El País*, 23/11/2007.



*Eucalyptus plantation in Uruguay.*

<sup>79</sup> Achkar and Dominguez (2007).

### case 4: cellulose and agroenergy: teyma-abengoa

Pandelco is a subsidiary of Spanish-Uruguayan construction company Teyma (Teyma-Abengoa S.A.). The company has provided forest sector services and supplied biomass to industry since 1996, operating as two separate business units.

The forest service unit provides wood harvesting, extraction, loading and transportation. The biomass unit focuses on providing biomass for industry.

*"As a result of the company's insertion in the forestry activity, and due to the fact that the processes related to it generate surplus products - wood with less value without a specific use - we thought it would be good to provide a service aimed at commercializing those surplus products to industrial clients as energy sources"* said Santiago Severi, manager of Pandelco's Biomass Commercialization. He added that the company deals with 80,000 tons of wood a year of which 60% comes from forestry services and 40% for biomass.

Pandelco only operates in the local market, primarily on the west coast. While its initial contracts were to produce wood for export, today it focuses mainly on services to the forestry corporations linked with the future manufacturing of cellulose. It plans to also develop its biomass business because of the expansion potential.

Source: *El País*, 23/04/07.

### case 5: carbosur: agrofuels and climate change as parallel business

Carbosur is a Uruguayan company providing "specialized services on climate change". It has strategic alliances with the European company Factor CO<sub>2</sub> and Carbon Ideas. It aims to "meet the needs of companies, administrations and other agents in this field through a wide supply of services". Factor CO<sub>2</sub> was created in 2004 by the law firm MAS Abogados, the environmental consultant group CIMAS Innovación y Medio Ambiente and expert-consultant Kepa Solaun.

It has advised over 200 public and private clients and specialises in European emissions trading scheme, buying carbon assets, emissions reduction projects (CDM and Joint Implementation) and the development of public policies to mitigate and adapt to climate change.

In order to carry out its consulting and intermediation work in the carbon markets, Factor CO<sub>2</sub> has a wide network of collaborating companies, such as Carbosur. In Uruguay it advises Bioener S.A. in the project submitted to the Clean Development Mechanism under the Kyoto Protocol.

Source: Carbosur ([www.carbosur.com.uy](http://www.carbosur.com.uy)) ; Factor CO<sub>2</sub> ([www.factorco2.com](http://www.factorco2.com))

## four african oil palm production in colombia

### african oil palm production in colombia

irene vélez torres, CENSAT - friends of the earth colombia

Peak oil, climate change and the recent upward global trend in fossil fuel prices have been the main arguments for the Colombian government in establishing policies aimed at improving self-sufficiency in energy and securing and extending energy supply. The National Development Plan includes promoting new oil prospecting and exploitation contracts, increasing the number of departments where gasoline contains 10% ethanol and increasing the number of departments where diesel fuel contains 5% biodiesel.

At the same time, the Ministry of Agriculture and Rural Development is encouraging agrofuel production as a way of protecting Colombian oil reserves and reducing dependency on fossil fuels, benefiting the environment and promoting agricultural development through the creation of jobs and crop diversification. The reduction in fuel imports is estimated as saving US\$ 500 million a year.<sup>80</sup>

As these show, Colombia is clearly heading towards an increase in oil palm cultivation. In fact between 2002 and 2006 there was an average annual increase of 11.47%.<sup>81</sup> This oil palm boom is linked to a strategic shift, also in geopolitical terms, by multinational corporations, in association with national entrepreneurs striving to benefit from the shifting economy. This rapid expansion is at the expense of the environmental and human rights of local communities, who continue to be the victims of business development.

#### brief background on oil palm in colombia

The African oil palm or *Elaeis guineensis* (originally from Africa) was first introduced in Colombia in 1932 and first grown commercially in 1945, when the United Fruit Company – a North American banana grower, famous for its role in the 1928 “Banana massacre”, established the Patuca African oil palm plantation in Magdalena.

Production was encouraged under the 1966–1970 Economic and Social Development Plan, because of the high yield and availability of suitable land. As demand for vegetable oil grew, Columbia invested in developing some 40,000 hectares of oil palm to replace imports. In 1967, the newly created National Federation of Oil Palm Growers (Fedepalma) published its strategy mainly aimed at import substitution and currency savings. This strategy recognized that oil palm was unsuitable for smallholders, stating that a plantation should be at least 2,500 hectares to be profitable. To maximize production, it said a minimum of 5,000 hectares was needed. The average size of plantation in 2005 was more than 5,000 hectares.

The expansion of oil palm was initially assisted by the use of tariff barriers on imports, with loans and tax incentives for growers and producers between 1984 and 1990. Improved regional economic integration and a more open market stimulated exports, under the terms of the World Trade Organization (WTO) and regional trade agreements.

In 1995, oil palm crops covered 130,000 hectares. An analysis of the sector in 1996 recommended plans and programs to further develop oil palm institutions and cultivation.

TABLE 9

INCREASE OF AFRICAN OIL PALM CROPS BY REGION (HECTARES)

REGION	1958-60	1986	2005
North (Urabá, Magdalena, North César, North Bolívar)	1,370	16,300	89,883
Center (Central Magdalena, César and Bolívar)	2,500	36,900	64,630
West (Tumaco)	1,800*	10,470	32,416
East (Orinoquia)	1,190	7,600	88,409
<b>Totals</b>	<b>6,860</b>	<b>53,200</b>	<b>275,318</b>

\* Including the department of Valle del Cauca.  
**Source:** Mejía (2007).

TABLE 10

HECTARES PLANTED WITH AFRICAN OIL PALM IN COLOMBIA

2002	2003	2004	2005	2006	PROJECTION 2010
185,165	206,938	243,037	268,037*	301,810**	443,037

\*This figure varies in non-official sources; this is the case of Mario Mejía (2007), who estimates that the cultivated area in 2005 was 275,318 hectares.  
 \*\*This figure differs from an official statement by the President's Office where it is stated that the Department of National Planning estimates the area cultivated with African oil palm in 2006 was 303,000 hectares.<sup>82</sup>  
**Source:** Developed for the purposes of this document, based on information released by the Ministry of Agriculture and Rural Development, the President's Office and Fedepalma.

<sup>80</sup> Pérez-Rincón (2008).

<sup>81</sup> Information contained in a statement by the President's Office dated July 10, 2007, indicates that the African oil palm cultivation area in Colombia grew by 123% during 1996–2006, increasing from 134,000 hectares to 303,000 hectares.

<sup>82</sup> Communication by the President's Office dated July 10, 2007. <http://web.presidencia.gov.co/>.

## four african oil palm production in colombia

continued

Official figures for oil palm crops may be an underestimate. This is because a large part of oil palm cultivation is done illegally and, in a significant number of cases, with corrupt local and national authorities turning a blind eye.

The growth in international oil palm transactions, combined with the threat of a global energy crisis and the control of the market by a few countries, has led the government and national companies to focus on large scale African oil palm cultivation. Colombia is currently the largest oil palm producer in America and fourth in the world, although it is a long way behind Malaysia and Indonesia, the major producers at the global level.

TABLE 11

PALM OIL EXPORTS AT THE GLOBAL LEVEL (IN THOUSAND TONS).

COUNTRY	2004	2005	2006*
Malaysia	12,582	13,439	14,404
Indonesia	8,996	10,436	12,540
Papua New Guinea	339	295	363
Colombia	249	248	238

\*Preliminary data.

Source: Developed for the purposes of this document, based on data by Fedepalma.

TABLE 12

COMPARATIVE DATA ON PRODUCTION AND EXPORTS  
FIRST HALF OF 2006 – FIRST HALF OF 2007  
(IN THOUSAND TONS)

FIRST HALF	PALM OIL PRODUCTION	PALM OIL EXPORTS	PALM KERNEL PRODUCTION	PALM KERNEL OIL EXPORTS
2006	203.7	137.3	85.3	18
2007*	216.5	157*	91.5	14.7

\*Preliminary data.

\*\*This figure differs from the last report by the Ministry of Agriculture, where palm oil exports between January and July, 2007, are estimated at 147,900 tons.<sup>83</sup>

Source: Developed for the purposes of this document, based on data by Fedepalma.

Exports of palm oil and palm kernel oil grew by 15.1% in 2007. Palm oil accounts for the largest part of this percentage.

Despite the increase in exports, oil expert Senator Hugo Serrano claims that on price, the only agrofuel that is economically viable for Colombia is ethanol, and ethanol obtained from sugarcane in particular. A barrel of Colombian biodiesel costs USD130 at current prices while diesel fuel is USD75.

The government makes much of the opportunities for job creation connected to agrofuels, particularly in rural areas and for people displaced by violence and rehabilitated from armed groups outside the law.

The government is using social programmes, like Plan Colombia's Investments for Peace Fund, to provide training for young people in rural areas in oil palm cultivation.

The Rural Areas in Action programme is aimed at reducing the number of illegal plantations by financing Alternative Development Projects in agriculturally, aquiculturally and environmentally productive areas. It is also being used to support the expansion of oil palm.

These programmes are financed through loans and cooperation funds, including loans from the Inter-American Development Bank (IADB), the World Bank and the Andean Development Corporation (CAF). The United States is a significant donor.

There are also questions about the number of jobs mono-crop farming creates. Statistics from the Ministry of Agriculture and Rural Development show that the number of workers per hectare is quite low in the agro-industry sector. For example, 2006 figures for more than 30 main agricultural products, including monocultures such as rice, panela cane, corn and cotton, show oil palm as having the second lowest number of jobs per hectare, with an employment rate of 0.16 people per hectare. The employment rate for sugar is even lower.

Entrepreneurs see reducing labour costs as a way of reducing production costs. This leads to the loss of employment stability, to outsourcing and to increasingly precarious and unstable contractual conditions. No trade unions are formed in most agro-industries, which means that workers lack the organizational conditions for negotiating better labour and salary conditions.<sup>84</sup>

<sup>83</sup> In: Ministry of Agriculture and Rural Development (2008). Estadísticas sector agropecuario (Agricultural sector statistics) Bogotá.

<sup>84</sup> Vélez, Hildebrando and Vélez, Irene (2008).

### institutions, laws and loans to promote oil palm

An increasingly complex bureaucratic system has developed, with the support of the government, to regulate and support the oil palm sector. This institutional support is crucial as it creates the opportunity for dialogue and negotiation with the government. Growers, producers and marketers obtain a status of legitimacy at the national and international level through membership.

The main institutions supporting oil palm cultivation in Colombia are:

- **Fedepalma:** the National Federation of Oil Palm Growers was founded in 1962 to act as a union of oil palm growers and represent the sector's interests. Fedepalma is the only union in this sector, representing 175 oil palm growers, who accounted for 59.6% of the net cultivated area in 2000.
- **Cenipalma:** this institution aims to find solutions to issues relating to oil palm cultivation through technologies that respond to the specific conditions in Colombia, contributing to an improved competitiveness in the production of palm oil and its byproducts.
- **C.I. Acepalma S.A.:** this palm oil marketing institution was established in 1991 to promote direct marketing. It is responsible for supporting joint marketing efforts for oil palm products, and develops palm growers' knowledge and skills in exports.
- **Oil Palm Promotion Fund:** this fund collects and manages tax-related funds derived from the Oil Palm Promotion Payment, and is used to support programs of general interest for the oil palm agro-industry in the fields of research and marketing.



Oil palm plantation.

- **Price Stabilization Fund:** in order to reduce fluctuations and counter the volatility of palm oil prices at the national and international levels, the Andean Price Band System (SAFP) and the Price Stabilization Fund (FEP) were created in Colombia. The fund for stabilization of palm kernel oil, palm oil and fractioned oils prices has operated since 1998. It is managed by Fedepalma under a contract with the government.

Colombia's oil palm industry has also seen the extensive policies and strategies aimed at achieving productivity and profitability goals established by investors and owners. These include the extensive development of legal instruments and regulations, fiscal guarantees, subsidies and risk insurances provided by the State so that entrepreneurs can obtain their expected profits.

The State also offers support for training workers and funds scientific and technological development that will benefit the private sector. Although it is argued that the establishment of this broad bureaucratic legal system is a matter of energy security, it mainly responds to income and profit-generating considerations.<sup>85</sup>

Regulations include:

- **Law 693 (2001):** states that fuels used in cities with more than 500,000 inhabitants must contain oxygenated components. Also provides general regulations on the use of ethanol and some incentives for the production, marketing and consumption.
- **Law 788 (2002):** Tax reform introducing VAT exemptions, a Global Tax and an Additional Tax on the alcohol component in oxygenated fuels.
- **Resolution 0447 (2003):** regulates the environmental quality criteria applied to liquid and solid fuels used in furnaces, boilers and internal combustion engines, as well as quality requirements for anhydride ethanol (water content must not exceed 0.4%).
- **Resolution 180687 (2003):** technical regulation for fuel alcohol production, stockpiling, distribution and mixing points. It also sets the 10% level for ethanol use in the mix with basic gasoline shall be 10%.
- **Law 939 (2004):** measures to stimulate production and marketing of agrofuels derived from vegetable or animal substances for use in diesel engines.
- **Resolution 1289 (2005):** quality criteria for agrofuels used in diesel engines, introduction of 5% biodiesel mix in diesel fuel as of January 2008.
- **Decree 1970 (2005):** exempts crops that require a longer period to give a yield from tax on net taxable income for a period of 10 years.

<sup>85</sup> Vélez, Hildebrando and Vélez, Irene (2008).

## four african oil palm production in colombia

continued

Economic incentives are also provided, including credit and financial instruments:<sup>86</sup>

- **Tax Reimbursement Certificate (CERT):** supports exports through the reimbursement of indirect taxes, duties and contributions paid by the exporter, but likely to be replaced to comply with WTO rules.
- **Rural Capitalization Incentives (ICR):** supports the adaptation and modernization of agricultural activities, and covers sowing costs and support during the unproductive period in oil palm cultivation. In 2005, 78% of FINAGRO's credit for oil palm sowing went to medium size and large producers.<sup>87</sup>
- **Tax incentives:** various tax incentives encourage oil palm cultivation, including offsetting investments in new plantations and investments in research; tax discounts for job creation and tax and credit incentives in border areas.
- **National Agricultural Credit System (SNCA):** provides and maintains finance for agricultural activities. FINAGRO finances the sector's production and marketing activities.
- **Agricultural Development Credit:** available to stimulate production and increase agricultural employment. It is regulated by FINAGRO.
- **Instruments for investment in the rural sector:** Several instruments including the Forestry Incentive Certificate (CIF) and the Agricultural Guarantee Fund (FAG) have been set up to increase investment in the rural sector and modernize and integrate production activities.

FINAGRO provided 207 loans for oil palm cultivation amounting to 58,754 million pesos in 2007,<sup>88</sup> with funding support from the Investments for Peace Fund, the Productive Alliances Program, the Rural Capitalization Incentive (ICR) and various tax incentives.

### african oil palm projections

Forecasts for oil palm expansion in Colombia are ambitious. Fedepalma hopes to reach a production of 3.5 million tons of palm oil by 2020, based on current growth rates of 8%. This would mean some 743,000 hectares of cultivation by 2020.

<sup>86</sup> Auza (2007).

<sup>87</sup> According to Auza (2007), the Alexander Von Humboldt Institute for Biological Resources Research – a state institution – carried out a research study in 2000 called Incentivos económicos perversos para la conservación de la biodiversidad: caso de la palma africana [Economic incentives harmful to the conservation of biodiversity: the case of the African oil palm]. Through macroeconomic analysis, this research showed that, in certain cases, the ICR can be harmful to the conservation of biodiversity. A biodiversity indicator was calculated which allowed comparison of the current biodiversity level against a hypothetical level if potential areas were covered by oil palm crops. The conclusions showed that in Tumaco, if the vegetation was indiscriminately replaced by oil palms, biodiversity loss would range from 21.8% to 35.15%.

<sup>88</sup> official information released by the President's Office (February 1, 2008).

<sup>89</sup> Vélez, Hildebrando and Vélez, Irene (2008).

<sup>90</sup> Communication from the President's office.

TABLE 13

POTENTIAL AREA FOR AFRICAN OIL PALM CULTIVATION, 2005

REGION	CULTIVATED AREA IN 2005 (HECTARES)	POTENTIAL AREA (HECTARES)	CULTIVATED AREA / POTENTIAL AREA (%)
North	89,883	579,493	16
Center	64,630	693,103	9
West	32,416	66,865	48
East	88,409	1,933,821	5
Others (Catatumbo)	---	258,562	0
<b>Totals</b>	<b>275,318</b>	<b>3,531,844</b>	<b>8</b>

Source: Developed for this document, based on Mejía (2007) and Auza (2007).

The government and private sector want to see oil palm spread to the grasslands of the eastern plains, in a form of "self-colonisation" which will ultimately lead to an unfair transfer of energy and materials from the countries in the South to the countries in the North, and from the peripheral regions to the central metropolitan regions.<sup>89</sup>

Fedepalma is seeking to also boost palm oil exports, with ambitions to increase these from a 24% share of national production in 2001 to a 78% share in 2020. Government departments are keen to promote more competitive production of palm oil.

Palm oil is also being promoted for domestic use, with the introduction of 5% biodiesel in diesel fuel from 2008. Five biodiesel plants are currently being built.<sup>90</sup>

TABLE 14

AGROFUEL REFINERIES UNDER CONSTRUCTION, JANUARY 2007

LOCATION	CAPACITY (TONS PER YEAR)
Codazzi	50,000
Santa Marta	100,000
Barrancabermeja *	100,000
Fundación – Santa Marta	100,000
Castilla La Nueva	35,000
Sabana de Torres – Villavicencio	100,000
San Carlos de Guarranca	100,000
Tumaco	60,000
<b>Total</b>	<b>645,000</b>

\*ECOPETROL plant, operating since 2008.

Source: Ecopetrol.

If this business continues to develop at the expected rate, in 2008 the total annual processing capacity of all the plants under construction combined would reach 645,000 tons of palm oil.

### infrastructure for oil palm

One of the government's main concerns is developing the transport infrastructure needed for commercial development. This is also key to attracting private investment. The strategy has focused on the Pacific region, from where trade can spread to the rest of the world. But while this new infrastructure may benefit business and importing countries such as the United States, the impact on local people is less positive.

As part of the broader Initiative for the Integration of Regional Infrastructure in South America (IIRSA), Colombia plans to develop the Archimedes project. This major infrastructure proposal will link the Atlantic and Pacific Oceans via a network of canals and waterways, with new ports and new roads built through the forest terrain.

In 2006 the government approved funding for a road connecting the sea port of Tribugá and the city of Pereira, crossing the Chocó region. This crucial funding was the sign needed by private developers wanting to attract investment for the port development at Tribugá.

Local communities have expressed their opposition to the Tribugá port and road development, which will cause serious environmental and social impacts, through the Community Council, the main authority for liaising with the government and private players via the Prior Consultation process.

The main arguments put forward by the Nuquí-Los Riscuales community focus on the various cases of corruption at other infrastructure works in the region, from which the people have not benefited in any way. The communities have highlighted the lack of an informed environmental study and mitigation and ecosystem protection plan. They also warn that the development may encourage oil palm companies to move into the area, pushing people off their land, as has happened elsewhere.<sup>91</sup>

The construction of a deep water port at Málaga Bay was successfully opposed by local communities, with some national support, due to the impact it would have on marine life. The Bay is an important breeding ground for humpback whales and there were concerns about the effect of underwater acoustic pollution from ships using the port. In the end, the Ministry declared the project environmentally unfeasible and Málaga Bay was declared an area of national interest in 2005.

Local communities opposed to the port at Tribugá, are learning lessons from other community battles, and exploring possible ways forward.

A number of other projects are being financed by the government, including 375 billion pesos for road projects across the country, improving transport links and opening up a transnational connection with Peru and Brazil through the Putumayo and Amazon rivers.

### international support, commercial networks and entrepreneurs

A large share of the palm oil produced in Colombia is used in the domestic market. Most exports are sold to the European market (see Table 15), and 80% of exported palm products are unprocessed raw materials, which are refined in Europe before being re-sold.

TABLE 15

BREAKDOWN OF PALM AND PALM KERNEL OIL EXPORTS. FIRST SEMESTER, 2007\*

COUNTRY	COUNTRIES PALM OIL IS EXPORTED TO (158,000 TONS)	COUNTRIES PALM KERNEL OIL IS EXPORTED TO (14,700 TONS)
Spain	26%	33%
United Kingdom	26%	---
Germany	12%	3%
Brazil	9%	---
Holland	9%	---
Dominican Republic	4%	---
Venezuela	2%	5%
Mexico	---	44%
Ecuador	---	3%
Peru	---	3%
Others	12%	9%

\*Preliminary data.

Source: Developed for the purposes of this document, based on data by Fedepalma.

National companies dominate palm and palm kernel oil exports, with the Famar S.A. group and the Daabon group, owned by the Dávila family, the main players. These groups operate internationally, through companies such as Tequendama (Daabon) and El Roble (Famar S.A.).

Comercializadora Internacional El Roble has received credit benefits and the help of FINAGRO, the Investments for Peace Fund and USAID. Comercializadora Internacional Tequendama, which operates in the south of the department of Bolívar, has recently expanded thanks to funding from USAID.<sup>92</sup>

<sup>91</sup> Bermúdez (2008).  
<sup>92</sup> Mingorance (2006).

## four african oil palm production in colombia

continued

International financial institutions are also supporting the palm oil expansion. The World Bank, as part of its strategy to encourage developing countries away from fossil fuels, has increased loans to the energy sector by 40% between 2006–2008. The Inter-American Development Bank (IADB) promotes agrofuels through its Sustainable Energy and Climate Change Initiative, with policies to support the expansion of oil palm and sugarcane.

These institutions are the main source of government funding to support palm oil expansion. Loans from these international institutions have to be repaid by the State.

One of the government's strategies to encourage palm oil development is Strategic Alliances. In the first half of 2007 18,500 hectares were planted under the Strategic Alliance system. The two leading figures in these alliances are the entrepreneurs Carlos Roberto Murgas and Indupalma. In 2007, Murgas owned some 14,400 hectares of alliance plantations, obtaining loans of more than 22.5 billion pesos through the Rural Capitalization Incentive (ICR). Indupalma has some 4,100 hectares, with loans for more than 23 billion pesos.

Murgas worked for the governments of César Gaviria and Andrés Pastrana, managing the Agricultural Fund, before becoming the president of Fedepalma and Columbia's representative at the Food and Agriculture Organisation (FAO) and the Minister of Agriculture under Pastrana. He later became a key person in Álvaro Uribe's presidential campaign. He is part of a small group that now leads agricultural activities in the country. His business group owns the Codazzi palm oil refinery.

Murgas is not the only entrepreneur of this kind to benefit from the close relationship between business and government. Research by the media uncovered that more than 16,330 hectares of uncultivated land had been given by Incode to 13 people close to Senator Habib Merheg from Risaralda. These individuals included people from his Parliamentary Work Unit, his secretary, his lawyer and directors of Cable Unión de Occidente, a company he had been related to. Senator Merheg also bought a farm in the same area in 2005. This property, which extends over 2,400 hectares will be used for oil palm crops.



Forests being cleared for oil palm plantations.

### local agrofuel impacts

The Chocó region in the humid equatorial strip of Columbia lies at the epicenter of a territorial dispute between palm growers and local communities. The region has great riches, with gold, platinum and silver mines, attracting investors, as well as environmental and cultural diversity, and access to both the Pacific and Atlantic coasts. Oil palm expansion in the Colombian Pacific region has been associated with the incursion of paramilitary groups, who have carried out a number of massacres since the mid-1990s.

The aim of these paramilitary actions has been to “recover” the collective lands granted to black communities after the 1991 constitutional reform, and has resulted in the displacement of the local population and the annihilation of community leaders.<sup>93</sup>

The territorial disputes in this area of the country are closely related to the implementation of the collective land titling program,<sup>94</sup> which has allowed the communities to secure a total of 3.5 billion hectares of collective lands, where they have introduced regulations preventing external ownership in some areas and so restricting corporate interests in the region.

In the case of individual and family properties, Community Councils have the final decision as to whether the property can be taken over, but in some cases, their power is limited, creating problems for the communities.

Another key factor is the expansion of coca crops in the region, leading to glyphosate spraying as part of the government's anti-narcotic strategy. Coca brought more illegal armed groups into the area, leading to battles between the guerillas and the paramilitaries. This has affected the territories owned by the Afro-descendant communities, resulting in massive forced displacements and a “re-colonisation” of the lands by palm oil and cattle-raising entrepreneurs.

The cases presented below are part of this strategy of oil palm expansion in the Colombian Pacific region, showing how lands collectively owned by black and indigenous communities are the targets of the palm oil production.

<sup>93</sup> Vélez, Hildebrando and Vélez, Irene (2008).

<sup>94</sup> Mingorance (2004) and several reports by Justicia y Paz (2008).

## tumaco

Tumaco in the south of Columbia is surrounded by 34,862 hectares of oil palm plantation, according to official data,<sup>95</sup> an increase from 1,800 hectares in 1999.<sup>96</sup> This figure, however, is challenged by members of the Afro-descendant communities in the area. They claim that there is a high percentage of illicit oil palm plantations on both private and collectively-owned lands. Some estimates suggest as many as 80,000 hectares have been planted with oil palm.<sup>97</sup>

Palm growers appear to be illegally buying collectively-owned lands, while also setting up companies to form Strategic Alliances.<sup>98</sup> In the areas surrounding the Mira River near the border with Ecuador, several cases of corruption have been reported. Community Councils together with the local Tumaco office of the Colombian Institute for Agrarian Reform (INCODER) have illegally sold land to *paisa*<sup>99</sup> buyers. According to statements given by witnesses, some Community Council members have been threatened so that they do not report the corrupt sales. The local communities are demanding the intervention of external organisations. They also want local, national and international communities to know these land deals are illegal, regardless of the authorization of the Community Councils, because this was given under duress.<sup>100</sup>

There is also pressure from the central government to expand oil palm cultivation in this region. The current President of the Republic, Álvaro Uribe Vélez, sees oil palm expansion in this area as a strategic megaproject, sending out a clear message to the local communities:

*"... I would beg you to... [speaking to the Minister of Agriculture and Rural Development] lock the businessmen of Tumaco up in a room with our Afro-Colombian compatriots and not let them out of the office until they've reached an agreement. It has to be this way, it can't be done without perseverance... Lock them up there and propose the following to them: that they reach an agreement amongst themselves on the use of these lands and the government will contribute venture capital resources. Fix a date and tell them: sirs, we are holding a conclave and we won't leave until we reach an agreement... Because we must acknowledge both the good and the bad, in Meta and in Casanare, and recently in Guaviare, oil palm plantations are undergoing an extraordinary expansion; but this isn't happening in Tumaco. And Tumaco, with its highway, if we go a little north, that area in Guapi, El Charco, with its excellent conditions and not a single palm tree, but full of coca plantations that we have to eradicate ..."*

**(President Uribe Vélez, XXXIV Fedepalma Congress, June 7, 2006 (Villavicencio), quoted by Oosterkamp, 2007)**

This government approach, combined with a regime of fear and violence and a culture of corruption is benefiting the palm oil companies at the expense of the rights of the Afro-Columbian local communities, including their sovereignty and self-determination rights.

## curvaradó and jiguamiandó

The negative aspects of illegal oil palm plantations in Curvaradó and Jiguamiandó were featured in Columbia's second largest newspaper *El Espectador*, in January 2008, revealing a national public scandal with clear evidence of human rights abuses committed by palm-growing companies in association with paramilitary groups. The report known as "Palm-Grower Dossier" [Dossier de los palmeros] describes the situation:

*"Knowing that the black communities of the Chocó region are the sole owners of the lands adjacent to the river basins surrounding the municipalities of Carmen del Darién and Belén de Bajirá, over the last 10 years and with the support of the government, these lands have become the seat of an agro-industrial megaproject aimed at growing oil palm trees. The Public Prosecutor's Office is now beginning to act against private corporations which have appropriated these "community lands" and against civil servants who have enabled or promoted these dispossession actions."*

Research in 2004 found that there was no official records of palm oil crops being grown in the Chocó region.<sup>101</sup> Yet communities living in Curvaradó and Jiguamiandó river basin areas have reported the expansion of illegal oil palm plantations in the collectively-owned lands of the black communities in the area.

Black communities were granted the waste lands they had historically occupied in 2000. Following complaints from communities, the Colombian Rural Development Institute (INCODER) released a report in 2005 confirming that 93% of the areas with oil palm crops belonging to the companies Urapalma S.A., Palma de Curvaradó, Palmas S.A. and Palmadó were illegally planted in collectively-owned lands belonging to black communities in the river basin area of the Curvaradó and Jiguamiandó rivers.

The report also confirmed that almost all the traditional settlements had disappeared and that the territory was being repopulated by people from outside the area. It was also revealed that Urapalma S.A. and other palm-growing companies funded their plantations with public money from Banco Agrario and with assistance provided by USAID.<sup>102</sup>

<sup>98</sup> According to business definitions (Franco), "strategic alliances are formal relationships between two or more organizations for the purpose of creating associations that enhance corporate competitiveness and strengthening. In the case of the Colombian Government, the alliances that have been promoted consist of the creation of associations between private companies and local communities towards the implementation of a productive and/or commercial project.

<sup>99</sup> It should be noted that this term is used to refer both to people who come from the Antioquia region and to non-black people from inland areas.

<sup>100</sup> López (2007).

<sup>101</sup> Mingorance (2004).

<sup>102</sup> Vélez, Hildebrando and Vélez, Irene (2008).

<sup>95</sup> Fedepalma and Tumaco City Hall.

<sup>96</sup> López (2007).

<sup>97</sup> Bermúdez (2008).

## four african oil palm production in colombia

continued

A resolution issued by the Office of the People's Advocate (Resolution 39, June 2005), urged government bodies including the Ministry of the Interior and Justice, the Ministry of the Environment, Housing and Land Development, the Ministry of Agriculture and Rural Development, INCODER, the Attorney General's Office as well as credit and banking institutions, to adopt measures to deal with the situation in this area. The Community Councils involved filed a criminal report before the Public Prosecutor's Office in 2005. In spite of requests from the Office of the People's Advocate, an investigation was not initiated until February 2007 and 23 palm-growers were investigated.

The forced displacement of people from the collectively-owned lands in Curvaradó and Jiguamiandó reveal how people are being forced out to make way for oil palm plantations. And as the El Espectador revealed, members of paramilitary groups have taken advantage of the displacement of the local communities to acquire lands, coercing communities to sell their plots.

As a result of pressure from the national and international community, the human and environmental rights violations against black communities in this area have been made public and a network of corruption in the oil palm system has been uncovered. Yet the government institution Codechocó, which is in charge of issuing and monitoring environmental licenses in the Chocó department, has not imposed penalties on the growers. INCODER and the Ministry of the Environment similarly took no action. All three institutions appear to be "turning a blind eye", just as they ignored the complaints by communities and the Office of the People's Advocate.

The investigation also revealed that several INCODER employees endorsed the issue of false resolutions to companies so that they would be able to operate their plantations. Criminal actions have been filed against these employees.

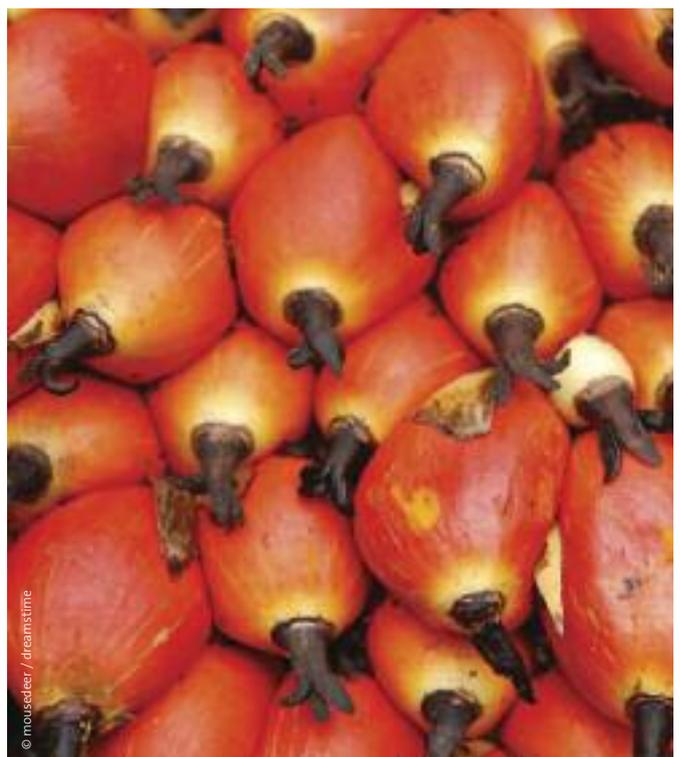
A former commander of the National Army's XVII Brigade is also being investigated as a result of several statements by members of the communities who accused him of giving armed support to palm-growing companies.

The system also appears to be complicit in delaying judicial action as a result of this investigation, with three years allowed to pass since the communities reported the case to the Public Prosecutor's Office, and almost 10 years since the companies illegally took the land.

Oil palm plantation.



Close up of palm oil seeds.



## five agrofuels in central america:

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### agrofuels in central america

Silvia Quiroa, CESTA - Friends of the Earth El Salvador | Isaac Rojas, COECOCEIBA - Friends of the Earth Costa Rica | Mario Godínez, CEIBA - Friends of the Earth Guatemala

The Central American countries of El Salvador, Costa Rica and Guatemala, while not currently big producers of agrofuels, have reacted to the current global energy crisis with an unprecedented offensive to encourage production.

Northern countries - whose domestic ethanol production is unable to match their demand - as well as international financial institutions, large food companies and oil corporations all have their eyes set on the Central American isthmus. The United States (US) and the European Union (EU) clearly see in Central America a chance to meet their targets for reducing their petroleum dependency, through the use of agrofuels.

The Inter-American Development Bank (IADB) is a strong promoter of agrofuels in the Central American region and plans to invest US\$ 300 million in technical assistance and a Clean Energy Program for Central America, working closely with the private sector. The IADB is also involved in promoting ethanol in the region via the Inter-American Ethanol Commission, formed by a group of private sector stakeholders, and co-chaired by the President of the IADB, former governor of Florida Jeb Bush, and Roberto Rodrigues, President of the Agribusiness High Council of the Federation of Industries of the State of Sao Paulo, Brazil.

As part of a regional plan, Guatemala, Costa Rica and Honduras, will grow agrofuel crops, with industrial processing concentrated in El Salvador. Exports will be facilitated by the Free Trade Agreement between Central America, the Dominican Republic and the United States (CAFTA-DR) as well as, in all likelihood, the new free trade agreement with the European Union, currently being negotiated.

The CAFTA-DR gives preferential treatment for Central American countries, establishing zero-tariffs for ethanol exports to the US.

The Central American countries seem set on finding ways to meet the global demands for energy regardless of the consequences. Using fuels from crops instead of oil will have serious consequences for people and the environment, including increased food prices, the spread of mono-cropping and extensive social problems, including an increased use of child labour.

This move is not unopposed. The social and environment movements, who worked together to oppose the imposition of the Central American Free Trade Agreement (CAFTA), have said they intend to continue resisting and fighting for the just and healthy social and environmental conditions they want in the region, and for energy sovereignty.

### agrofuels in costa rica

The use of alcohol as a car fuel has been the subject of interest and research in Costa Rica since the early 1980s. But the government has now opted for a more aggressive approach, announcing its intention to introduce a 10% ethanol in petrol requirement as a first step, linked to credits through mechanisms such as the Kyoto Protocol's Clean Development Mechanism.

Agrofuel development in Costa Rica, while reflecting the need to find more energy resources, may also be connected to the business interests that a number of important figures in the current government have in the sugarcane industry. Agrofuel development is presented, without any real debate or consideration of the serious impacts experienced elsewhere, under the guise of environmental protection, improved living conditions for the traditionally impoverished communities of the south and north of the country, greater investment and its corollary, increased employment.

Costa Rica does not yet, suffer from the serious impacts experienced by agrofuel producing countries in Asia and Latin America. There are 51,000 hectares of sugarcane in Costa Rica and 47,000 hectares of oil palm. But given the government's expansion plans, Costa Rica can expect such problems within a few years. Car ownership is growing in Costa Rica, meaning that increasingly large areas of land will be needed if the 10% ethanol in petrol target is to be met.

Despite these potential problems, there has been no suggestion from the government that the country considers a new framework for its national energy model.

## five agrofuels in central america:

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### costa rica's current situation

There are some 7,000 sugarcane growers in Costa Rica, producing 6.8 million sacks of sugar (50kg/sack) from 16 mills. Of these, four million sacks are used for domestic consumption. The surplus is exported to markets in Russia, Morocco, China, the United States, and the Caribbean.<sup>103</sup> According to Congressman Marvin Rojas Rodríguez, 90% of the farmers that supply sugarcane to the mills own less than seven hectares of land on average.<sup>104</sup>

The sugar mills are located in the Pacific region (Costa Rica, El General, Porvenir, La Argentina, Providencia, San Ramón, and Victoria); Guanacaste (Ingenio Taboga, CATSA, Azucarera el Viejo, and Azucarera el Palmar); San Carlos (Cutris, Quebrada Azul, and Santa Fé), and Turrialba (Atirro and Juan Viñas). Some are cooperatively-owned; others, such as the Ingenio Taboga, are linked to the current President of the Republic, and some are corporations, making it difficult to know who their owners are. The Chamber of Sugar Producers is the body which represents the manufacturers.

Some of the mills also generate electricity from the sugarcane waste, known as bagasse. Electricity from the Ingenio Taboga mill is sold to the Costa Rican Institute of Electricity (ICE).<sup>105</sup>

According to the National Chamber of Oil Palm Producers (Canapalma), there are some 47,000 hectares of oil palm in the country<sup>106</sup> and official figures state that there are 1792 producers, the largest being the Palma Tica company (3,049 hectares<sup>107</sup>) which has been criticised for violating environmental regulations.<sup>108</sup> Government proposals to facilitate investments are likely to lead to further expansion.

The existing growth in the sector has resulted in a more organized and complex production chain, improving competitiveness. Oil palm is harvested, extracted, refined and fractioned in Costa Rica, producing raw material for soaps, perfumes, plastics, paints, candles, and biodiesel. An estimated 70 by-products are obtained from palm oil.<sup>109</sup> At present, production is channeled entirely to the oil market. Three mills are owned by Palma Tica, while Coopeagropal own a mill at Roble.

<sup>103</sup> Information obtained from <http://www.laica.co.cr/qs.asp>.

<sup>104</sup> Rojas Rodríguez, Marvin; Report to the International Affairs and Foreign Commerce Committee of the Legislative Assembly, Costa Rica (November 23, 2006).

<sup>105</sup> The FECON Energy Group and trade union organizations, such as the Frente de Trabajadores y Trabajadoras of the ICE, have filed reports and conducted investigations on this case.

<sup>106</sup> La Nación (May 4, 2006, Juan Fernando Lara).

<sup>107</sup> Ministry of Agriculture, Palm Administration, Estado del sector de la palma aceitera en Costa Rica (2005).

<sup>108</sup> See article by Juan Figuerola at <http://www.wrm.org.uy/plantaciones/material/palma5.html/>

<sup>109</sup> See [www.canapalma.com](http://www.canapalma.com).

<sup>110</sup> La Nación, Juan Fernando Lara (May 1st, 2006).

<sup>111</sup> La Nación (May 4, 2006, Juan Fernando Lara).

### the role played by the government: promoting agrofuels

Ethanol production in Costa Rica was introduced during Rodrigo Carazo Odio's government (1978-1982) and there have been government policies since 2004 to encourage and develop biodiesel use.

In December 2006 the government set up the National Biofuels Committee (bringing together the Ministries of the Environment and Agriculture, the Office for Joint Implementation, RECOPE, ICE, ARESEP, professional schools and the palm oil and sugar sectors). This Committee is responsible for proposing an action plan for agrofuel use, proposing basic legal reforms and a public information campaign.

The industry has long called for such changes in the system. In a newspaper interview in May 2006, the executive director of the Sugarcane Industrial and Agricultural League (Laica) Edgar Herrera complained that: "until now, the lack of a clear policy and a legal framework has halted any new investments in this field... A distillery requires an investment of US\$ 8 to US\$ 10 million, and nobody will risk that sum if they don't have any guarantees that the production will be placed in the domestic market".<sup>110</sup> Producers have also called for an incentives plan for ethanol production to spur investment in the sector. The potential has been identified for up to 50,000 hectares of sugarcane crops and industry is keen to attract investment to expand.

The private sector has clearly lobbied for changes to the legal framework. But at the time of writing new legislation is only in draft - and there has been little public debate about this issue.

The government justifies the promotion of agrofuel use by pointing to the need to combat climate change, reduce oil dependency and increase development by building up energy sources based on local raw materials, such as sugarcane, palm, cassava and sorghum.

Agrofuels, according to government claims, will reduce greenhouse gas emission by up to 50,000 tons within three years, ensuring a better quality of life and greater health. The government has also said that Costa Rica will be carbon neutral by 2021, aiming to cut carbon dioxide emissions by 630,000 tons by 2010 through the use of agrofuels, and with the support of the Clean Development Mechanism. Such announcements run counter to the government's declared commitments to promote the petroleum industry in Costa Rica.

According to the Ministry of the Environment and the Council of Production, agrofuel will lead to new industry, bringing development to the countries poorer regions.<sup>111</sup> The executive director of CANAPALMA has said there will be great economic benefits for the north and south of the country.

In 2006, RECOPE launched a pilot program to sell petrol containing 5% ethanol obtained from sugarcane. If the results prove positive, the infrastructure needed to incorporate up to 10% ethanol in petrol will be rolled out across the country by 2009, requiring an estimated investment of US\$ 5.7 million.

In January 2007<sup>112</sup> RECOPE presented proposals to add 1-2% biodiesel to diesel for distribution starting in June, which will require 45,000 liters of biodiesel a day, or 16.5 million liters a year. According to media reports, this will come from Brazilian alcohol, refined in Nicaragua. Current regulations mean Costa Rican sugarcane cannot be used.<sup>113</sup>

### future plans

An ethanol diesel mix has already been introduced in Guanacaste and in the Central Pacific region using Costa Rican raw materials, leading to reports in the media of 12 drivers facing problems with their car engines.

The RECOPE, the MINAE and the School of Agronomic Engineers have conducted research on the production of agrofuels based on cassava and sunflower.

In September 2006<sup>114</sup> some busses in the capital city began using biodiesel manufactured by Energías Biodegradables de Costa Rica, starting with a 30% biodiesel and 70% diesel mix.<sup>115</sup>

Costa Rica's first agrofuel plan is expected by 2010<sup>116</sup> when the country would be using petrol containing 10% ethanol and diesel with 20% biodiesel, requiring an US\$ 484 millions investment in crops and in the industry, equal to 34% of the national petroleum bill for 2007.

This will require an estimated 10,000 extra hectares of sugarcane, which would be located in the north of the country (Los Chiles, Upala, and Guatuso), and 3,000 more hectares of oil palm, which would be located in the Atlantic region. Another 3,500 hectares would be planted with biofuel crops in the South Pacific region (Parrita, Quepos, and Coto Brus), with targets for a further 4,000 hectares of cassava in the north for ethanol. Investment in processing would also be needed.

The proposals are reported to be in the final consultation stage before being presented to the Council of government. But environmental groups have not been consulted.

According to official statements, the National Biofuels Program will greatly benefit some of Costa Rica's poorest communities with investment targeted at encouraging growing crops for fuel and developing industrial plant in these regions. Estimates suggest that US\$ 2,000 is needed to support one hectare of oil palm, while extraction requires an investment of US\$ 8 million to process thirty tons per hour. Another US\$ 13 million is

needed to convert the oil into biodiesel, and US\$ 8 million is needed for transport and other costs. One thousand producers would benefit directly from all of this investment in the country's Caribbean region.

But claims that this expansion will provide improved living conditions are disputed. Indeed evidence from the country's existing banana and oil palm plantations reveal a different reality. Critics say that these communities need a true development alternative that would enable them to improve their living conditions, not agro-industry. Support to grow beans and other basic grains, which are key staples of the national diet, as well as support for local markets would be far more sustainable.

### the role of the international institutions

The government has said that the Central American Bank for Economic Integration (CABEI) and the national banks, including the Banco de Costa Rica and the Banco Nacional, could provide finance for the development of agrofuels, providing credit for small and medium-sized companies.<sup>117</sup>

In Costa Rica and El Salvador, the IADB is funding feasibility studies and technical assistance, which includes drafting regulations, market development and public education, to help the governments of these two countries meet their 10% targets. It also funds technical meetings of the Mesoamerican Biofuels Group, a forum formed by countries of Central America and the Caribbean.

Petrobras and ECLAC have also funded research and training activities for the government.<sup>118</sup>

### CAFTA-DR

The Central America Dominican Republic Free Trade Agreement (CAFTA-DR) already contains provisions which benefit the major sugar exporting companies, at the expense of key sectors of small and medium-sized farmers producing for the domestic market.

Large companies will probably continue to use their lobbying power to avoid regulation, such as the current requirement to purchase sugarcane production from independent producers. Mills currently face sanctions if they don't comply, ensuring that small producers can sell their produce. Free trade supporters argue that regulation should be used to increase production levels, not guarantee markets in this way.

<sup>112</sup> La Nación, January 13, Presentará propuesta al Minae en febrero, Juan Fernando Lara.

<sup>113</sup> La Nación (October 9, 2006, Marvin Barquero).

<sup>114</sup> La Prensa Libre (September 1st, 2006, Silvia Coto).

<sup>115</sup> Ibid.

<sup>116</sup> La Nación, Plan inicial para el 2010, Marvin Barquero.

<sup>117</sup> La Nación (May 4, 2006, Juan Fernando Lara).

<sup>118</sup> Quirós Garita, Ruth; Estudio del caso de biocombustibles en Costa Rica, gasolina con etanol, in VII Foro Regional, incentivos a las energías renovables y biocombustibles en Centroamérica, undated.

## five agrofuels in central america:

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### companies in costa rica

Companies exporting products to the US under the terms of the CAFTA-DR are keen to see expansion - and will also benefit if Costa Rica ratifies a free trade agreement with the EU.

Energías Biodegradables de Costa Rica is a national company<sup>119</sup> supplying biodiesel for busses in the metropolitan area, supported by the Costa Rican Association for Development Organizations (ACORDE), which grants credits and provides advice for small and medium-sized companies. Following increases in the price of castor oil, it announced plans to cultivate 3,000 hectares of castor beans in southern Costa Rica for its own use.<sup>120</sup> The project will provide employment for at least 600 families. The company's plant in Ochomogo produces 250,000 liters of biodiesel a month, but it has a capacity for three million.

Central Biodiesel supplies equipment for biodiesel production exporting to 24 countries around the world along with jatropha,<sup>121</sup> which has been described as the petroleum of Costa Rica.<sup>122</sup>

### conclusions

The prospects for agrofuels under the current government are clear: there will be an expansion of crops, under the pretense of protecting the environment, combating climate change and improving the living conditions of targeted communities. But the reality will be an agribusiness model that damages the environment and further impoverishes those communities it fails to displace.

This allows Costa Rica to continue to rely on the current energy model without considering how energy-saving policies might be implemented. There has been no debate on transport. Agrofuels will do nothing to improve the current situation and could lead to more negative impacts. National laws that protected the most vulnerable sectors of society and the environment have already been seriously eroded or even abolished. Free trade agreements with the United States, and potentially with the European Union - both regions favouring agrofuel expansion - mean that Costa Rica will be further encouraged to develop its agrofuel industry.

### agrofuels in guatemala

In Guatemala, the government has also viewed the global energy crisis as an opportunity for business. Supported by the regional powers, Brazil and Columbia, Guatemala is installing ethanol transfer and transformation plants to export ethanol to the United States.

Guatemala has traditionally exported sugarcane, and produced 17 million gallons of ethanol in 2005, mainly for export to the US. As well as producing ethanol from domestically grown sugarcane, Guatemala processes alcohol from Brazil and Columbia, again for export to the US, competing with El Salvador to become the region's largest ethanol processing plant.

New areas for sugarcane expansion have been designated without any consideration for the people who live there. Municipally owned lands in the east of the country have been granted under concessions to Taiwanese and US companies for planting agrofuel crops such as cassava. State-owned agricultural research institutions, such as the Institute of Agricultural Sciences and Technology, are carrying out research into the benefits of other agrofuel crops such as jatropha.

As things stand, Guatemala is poised to play the role it has always played: that of subordination to the great powers, responding to their demands for a replacement for petroleum at the expense of the country's poorest people and most vulnerable regions.

### sugarcane in guatemala

Sugarcane was introduced in Guatemala by Spanish plantation owners during the colonial era and became one of the country's traditional export crops, alongside banana, coffee and cotton. Non-industrially grown sugarcane can be found in Guatemala, but only in small areas, where artisan processing techniques are used to produce brown sugar loafs or unrefined brown sugar (panela or rapadura) used in remote communities.

Industrial sugar, produced in the "refineries," has waged a tough battle to take over not only the domestic market as the leading product, but also the regional and the global markets. Guatemalan sugar producers currently own most of the sugarcane production and refineries in Central America and the Dominican Republic, giving them a strategic position in the global sugar marketing chain. In the US, they have positioned themselves as powerful "holdings," which gives them various advantages unavailable to other producers in the country.

In the negotiations for the CAFTA-DR, sugar was one of the sectors most fiercely defended by negotiators, who obtained an expansion of the export quota for sugar for the next 15 years.

<sup>119</sup> See <http://www.energiasbiodegradables.com>.

<sup>120</sup> La Nación, Empresa sembrará higuera para biodiesel, Juan Fernando Lara (January 13, 2007).

<sup>121</sup> See <http://centralbiodieselhttp.com/sp/index.php>.

<sup>122</sup> Luis Diego Quirós, Teletica.com (November 21, 2006).

### environmental damage

Traditionally, sugar is cultivated in large plantations under a mono-cropping scheme, which affects water levels. At least eight rivers flowing into the Pacific Ocean have been drained as they reach the coastal areas. Important river basins, including the Madre Vieja River in the area's marshlands, lose volume as water is diverted for use in sugarcane plantations. The authorities appear powerless to stop this in the face of agribusiness.

The local authorities in Santa Lucía Cotzumagualpa attempted to prevent sugarcane plantations diverting rivers in the area, but faced a backlash from the powerful sugarcane sector, who are so powerful that they were able to influence the elections, preventing the election of independent candidates.

The industry affects the living conditions (and the environment) for thousands of Guatemalans. Communities downstream of the sugarcane irrigation schemes no longer receive enough water for their own need. According to the relevant environmental and agriculture authorities, there are no regulations containing provisions to penalize such practices. The authorization for the diversion of river flows in Guatemala merely states the volume that is to be diverted, which is determined based on the initial volume at source without taking into account downstream and upstream users.

### potential implications of sugarcane expansion

The areas that have been earmarked for potential sugarcane expansion are in the country's northern rainforest areas, sometimes known as the "Northern Transversal Strip". Indigenous peoples who have inhabited these lands for centuries are now being displaced, to allow large sugarcane companies to "purchase" their lands.

These companies are currently carrying out research to find new varieties of sugarcane that can tolerate the humidity levels of the rainforest and the new soil conditions in the region.

The Northern Transversal Strip is currently being fought over by a range of competing corporate and other interests. Pharmaceutical companies want to preserve protected areas for bio-prospecting purposes, transnational mining corporations have an interest in opencast gold mining operations and petroleum companies and agribusiness companies all want a stake. At the same time, the military seized lands illegally in this area during the internal armed conflict, drug traffickers have an interest and cattle owners from the Pacific Coast have moved their entire herd to this area.

The indigenous population, which had been as high as 500,000 inhabitants, is facing a new wave of displacements, after having been forced to move from place to place during the internal armed conflict, often losing their land ownership titles. This is now resulting in numerous conflicts arising from the irregularity of land ownership.

### conclusions

Guatemala sees the current energy crisis as an opportunity for business, responding to regional and global demands to tackle climate change and find new sources of energy. This will exacerbate existing problems for the environment, for the poorest and for Guatemala's indigenous populations.

The promotion of the erroneously termed "Clean Development Mechanisms" and the carbon market are generating solutions that are more harmful than the problems they are designed to solve.

This model transfers the cost of the energy crisis to the poorest societies, forcing them to change their way of life and transfers the problems created by agrofuel solutions to the regions of the global south.



## five agrofuels in central america:

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### agrofuels in el salvador

In April 2007, El Salvador launched a new energy policy, intended to diversify its energy system by expanding hydroelectric and geothermal power projects, promoting a hydrocarbon prospecting and production law, and diversifying hydrocarbons.<sup>123</sup> This includes promoting the use of agrofuels.

Agrofuel production is not new to El Salvador. At least four sugar refineries<sup>124</sup> have had the infrastructure and equipment for processing sugarcane to produce ethanol for the last 30 years. But a lack of political and private sector support has stalled these projects.

El Salvador is now seeking to project itself as one of the region's pioneers in promoting agrofuels and has looked to the governments of the United States and Brazil to support this development. Both have agreed to provide technical assistance and develop pilot projects to look at the potential for agrofuel production in the region. Colombia has also given support, providing seeds, fertilizers and know-how. Sugarcane for ethanol, the castor bean plant (*Ricinus Communis L*) and jatropha for biodiesel are being considered.

There are a number of laws under discussion in El Salvador's Legislative Assembly, including an Ethanol Bill, a Bill to Stimulate Investments in Renewable Energy, the Amendment of the Land Leasing Act, and the Amendment of the Biofuel Production and Consumption Act which will help further this policy.

### current projects

A Ministry of Agriculture and Livestock (MAG) castor bean pilot project in 7 of the country's 14 departments aims to plant 3,500 hectares across at least 1,000 farms, with 700 hectares planted so far. MAG's strategy is to stimulate the take up by supplying seeds and the other inputs and providing technical assistance to farmers. Studies are being carried out on five varieties of castor bean<sup>125</sup> imported from Brazil and one indigenous variety.

In the country's eastern region there are 210 hectares planted with jatropha.

In 2006/2007, 60,900 hectares of sugarcane were planted in El Salvador (approximately 3% of the surface area of El Salvador), yielding 530 thousand metric tons of sugar, with 44% of that production exported to different parts of the world, 46% sold in the domestic market, and 10% exported to the United States under a preferential scheme (see Figure 3), and 210 thousand metric tons molasses.

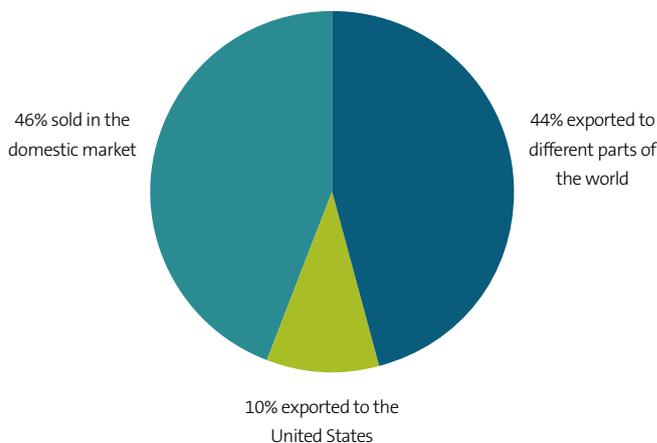
<sup>123</sup> La política nacional energética de El Salvador (April 2007).

<sup>124</sup> These refineries are: La Cabaña, Chaparrastique, Chanmico, and the old El Carmen facilities.

<sup>125</sup> The varieties of castor bean under study are: 1. Nordestina, 2. Paraguazo, 3. Guarani, 4. Mirante, 5. IAC-80.

FIGURE 3

PERCENTAGES AND DESTINATIONS OF SUGAR PRODUCTION - 2006/2007 PERIOD



**Source:** Prepared for this report, based on information by the Association of Sugar Producers of El Salvador.

There are eight sugarcane mills in El Salvador (Central Izalco, El Ángel, Chaparrastique, La Cabaña, Jiboa, San Francisco, Chanmico, and La Magdalena) with a combined capacity of approximately 45,750 tons/day. How much of this is used for ethanol is difficult to know as until now ethanol has been produced from molasses. But a new ethanol law means there are plans to expand sugarcane production, with the President of the Association of Sugar Producers of El Salvador, Armando Arias suggesting they could plant up to 120,000 hectares.

The Ministry of Agriculture and Livestock say that 480,000 blocks of land are currently "idle" and these could be devoted to agrofuels. In practice, however, these lands accommodate various ecosystems and form the basis for a wide range of social activities.

Since late 2005, the government of El Salvador has been looking at implementing a nationwide ethanol program. New legislation has been drafted to support a programme providing guarantees to investors and El Salvador's role as a pilot country in the US/Brazil ethanol promotion initiative has been established with support from the IADB.

The ethanol bill is currently being discussed by the Legislative Assembly and seeks to impose a requirement to include 10% ethanol in petrol. According to projections, ethanol will be produced for domestic consumption and for export to countries such as the United States, under the free trade agreement and through the Caribbean Basin Initiative (ICC), a trade programme that gives members preference for ethanol exports with zero tariffs.

## land ownership

Most of the land where agrofuel crops are currently grown is owned by small independent and cooperative farmers. The crops are planted by approximately 7,000 farmers, of which some 5,000 are members of one of 140 cooperatives, and the remaining 2,000 or so are independent farmers.

Some 1,500 members of the National Association of Farmers (277 farmers in the country's eastern region, 1,230 in the central region) all with between 4 and 7 hectares of land, have taken up jatropha and castor bean cultivation, in the place of grains, fruit and garden vegetables. Long-term forecasts estimate that some 30,000 units of jatropha will be planted, involving 10,400 farmers.

## impacts

The likely impacts of El Salvador's agrofuel experiment include:

- *Destruction of the country's already diminished forests and biodiversity, resulting in less water for human consumption. In comparison to other countries of Central America, El Salvador has the lowest supply of water, with only 3,126 m<sup>3</sup> per capita per year.*
- *An increase in the number of high-risk jobs and an increase in child labour. Some 30,000 children currently take part in the sugar harvest in El Salvador each year. An increase in crop growth is likely to increase the amount of child labor. It is not unusual to find children as young as 8 years of age cutting cane under appalling conditions.<sup>126</sup>*
- *A shortage of basic grains for domestic consumption. Food production would become even less important and the country will become more and more dependant on food imports. It is the most vulnerable sectors of society who will feel the impacts of this the most.*
- *Changes to land ownership are also likely. Under the current basic law from the agrarian reform individual landowners cannot hold more than 247 hectares of land. But with the growing interest in agrofuels, there is an initiative underway to amend that law to allow more extensive land holdings. This will lead to greater concentration of land in fewer hands for mono-cropping.*

## foreign investment

El Salvador, like the other Central American countries, pays zero tariffs on ethanol exports to the United States under the terms of the CAFTA-DR. And like the other central American countries, it attracts "cooperation for development" as part of an "Association Agreement" with the EU. This specifically mentions biofuels: *"The EU's development policy will be aimed at helping developing countries obtain the benefits provided by biofuels, and at the same time, give an adequate response to the above concerns."<sup>127</sup>*

Under this scheme, Finland has financed the installation of an biodiesel plant in El Salvador in 2007; Austria provides assistance through the Austrian Technical Cooperation Trust Fund; and Spain provided assistance for the reinstallation of an ethanol plant in La Cabaña refinery mill.

Brazil is interested in opportunities to avoid paying the 24.7% tariff applied to its ethanol exports to the US by using El Salvador for processing. American Renewable Fuel Suppliers ARFS and Southridge Enterprises, Inc follow this practice. Brazil is also seeking to consolidate itself as the dominant ethanol production hub in the south by promoting bilateral agreements and providing support in the form of technology, seeds and technical assistance.<sup>128</sup>

The supposed diversification of the energy system so as not to depend exclusively on petroleum, the environmental benefits, reactivation of agriculture, and generation of employment in rural areas are just arguments used to mask the real reasons behind agrofuel promotion.

To meet its targets, by 2015 the United States needs to cover 10% of its current demand for gasoline with ethanol (15,000 million gallons a year), so reducing its dependency on petroleum imports from the Middle East (countries that it terms "politically unstable"). This has made it focus once more its attention on its neglected "backyard."

A 2005 study warned of the complexity and difficulty of reproducing the Brazilian agrofuel production model in the short or medium term, and recommends that the World Bank and the countries of Central and Latin America refrain from investing in agrofuels.<sup>129</sup> But more specific studies are being conducted in El Salvador, Haiti, and the Dominican Republic which could give a green light to ethanol production. A Memorandum of Understanding between the US and Brazil has called for a Blueprint study, which is supported by the IADB.

<sup>127</sup> "Negative externalities" of a social and environmental nature.

<sup>128</sup> Biodiversidad, sustento y cultura Magazine, Issue Nº 54 (October 2007).

<sup>129</sup> Potential of Biofuels for Transportation in Developing Countries, Masami Kojima and Todd Jonson (2005).

<sup>126</sup> Human Rights Watch is conducting a campaign to raise awareness of and to censure child labor in El Salvador's sugarcane plantations.

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### impacts of biodiesel

Biodiesel has not been studied as much as ethanol, but there are pilot projects experimenting with “high-yield” seeds.

The most significant impacts on the medium and long term include:

- *Increased genetic erosion, as no native seeds will be used.*
- *Environmental contamination from the use of agrochemicals, as the aim is to improve the levels of productivity per cultivated hectare, which entails intensifying the use of fertilizers and soil-impacting machinery.*
- *Displacement of lands now used for food crops. This is evident in the government’s intention to promote agrofuel crops, planting them in what it calls 450 thousand blocks of “idle lands”.*

### processing, marketing and transportation

The processing, marketing, and transportation of agrofuels are issues on which there is still very little information. Two companies, Southridge Enterprises Inc. and ARFS (see Table 16), are involved in sending hydrated ethanol to be dehydrated in the plant in El Salvador before being exported to the United States, making use of El Salvador’s zero-tariff trade agreements.

Biodiesel marketing and transportation channels are being developed, but the latest information suggests that there is currently no market for the castor beans and jatropha harvests.

TABLE 16

COMPANIES WITH ETHANOL OPERATIONS IN EL SALVADOR

COMPANIES	DESCRIPTION AND CAPACITY
Southridge Enterprises, Inc, Dallas, Texas; supplies ethanol to the southeastern US	The government has allowed this company to lease a 25,000-block-extension, with option to buy. It has a capacity of 5 million gallons ethanol per year.
American Renewable Fuel Suppliers (ARFS)	Located in Acajutla; its investors are the Crystalserv group <sup>130</sup> (Brazil), Cargill (United States) and the Compañía Azucarera Salvadoreña (CASSA). The plant has the capacity to dehydrate 60 million gallons of ethanol a year.
La Cabaña refinery, located in the municipality of Aguijares, San Salvador	To install the plant’s equipment, the company received technical assistance from a Spanish company. Ethanol is produced from sugarcane molasses <sup>131</sup> with a projected production of 120,000 liters of ethanol a day. USD 800,000 were invested.

Source: Prepared for this report with material from national press reports.

TABLE 17

BIODIESEL PRODUCTION PLANTS

COMPANY	CAPACITY	INVESTORS
Castor oil industrial company, located in San Miguel.	400 liters of biodiesel extracted daily from castor bean plant.	Alliance for Energy and the Environment in Central America, with Finnish funds.
BIOENERGIA S.A., located in Sonsonate.	Has a daily production capacity of 10,000 gallons of biodiesel; currently uses palm oil imported from Guatemala and Honduras, but plans to use physic nut from El Salvador.	Mixed public and private investment. The public investment is represented by the Salvadorian Investment Corporation (CORSAIN).
Biosalva Industrias de Biodiesel de El Salvador, located in La Libertad.	5,000 gallons of biodiesel a day, processed with physic nut seed.	The owners are 1,250 farmers, who are receiving technical assistance from Colombia. This is an initiative of the National Association of Agriculture Workers and Producers.

Source: Prepared for this report with material from national press reports.

TABLE 18

SPANISH COMPANIES PLANNING TO INVEST IN AGROFUELS

COMPANY	PROJECTIONS
Biocarburantes Manchegos	Plans to build a plant to produce biodiesel from jatropha. Conducting feasibility studies.
Spanish business group Holding Del Dago-ICINSA	Plans to invest in 100,000 hectares of jatropha, offering farmers technology, seeds, commercialization and financing

Source: Prepared for this report with material from national press reports.

<sup>130</sup> In the heart of the Cristalasev conglomerate are the Biagi family of Brazil, and the Junqueira family, the sugar barons. Both families are the majority shareholders of the second largest sugar and ethanol group of Brazil.

<sup>131</sup> Some indicative numbers: 70 to 85 liters are obtained for use as direct juice, dropping to 12 liters when using unspent molasses (without maximizing sugar production), or just 6 liters of spent molasses.

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IADB – Banco Interamericano de Desenvolvimento (Inter American Development Bank)

BNDES – Banco Nacional para o Desenvolvimento Econômico e Sociais (National Bank for Economic and Social Development)

CPT – Comissão Pastoral da Terra (Pastoral Land Commission)

CUT – Central Única dos Trabalhadores (National Workers Union)

CTNBIO - Comissão Técnica Nacional de Biossegurança (National Biosafety Technical Commission)

EMBRAPA - Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation)

EPE – Empresa de Pesquisa Energética (Energy Research Company)

EPI – Equipamento de Proteção Individual (Personal Safety Equipment)

FAT – Fundo de Amparo ao Trabalhador (Worker's Protection Fund)

FERAESP – Federação dos Empregados Rurais Assalariados do Estado de São Paulo (Federation of Rural Employees of the State of São Paulo)

FETAEMG - Federação dos Trabalhadores na Agricultura do Estado de Minas Gerais (Federation of Agricultural Workers of the State of Minas Gerais)

IEA - Instituto de Economia Agrícola (Institute of Agricultural Economics)

IPI – Imposto sobre Produtos Industrializados (Tax on Industrialized Products)

MAPA – Ministério da Agricultura e do Abastecimento (Ministry of Agriculture Livestock and Supply)

MDA – Ministério do Desenvolvimento Agrário (Ministry of Agrarian Development)

OIT – Organização Mundial do Trabalho (International Labor Organization)

ONGs – Organizações Não Governamentais (Non-Governmental Organizations)

PRO-ALCOOL – Programa nacional do Alcool Combustível (National Alcohol Program)

SIFAESP - Sindicatos da Indústria da Fabricação de Alcool no Estado de São Paulo (São Paulo State Union of the Alcohol Manufacturing Industry)

SIAESP – Sindicato da Indústria do Açúcar no Estado de São Paulo (São Paulo State Sugar Industry Union)

ÚNICA – União da Agroindústria Canavieira de São Paulo (Sugarcane Industry Union)

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