



BRAZIL OF BIOFUELS

SUGARCANE

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Impacts of Crops on Land,
Environment and Society

 **Repórter Brasil**

Biofuel Watch Center
ONG Reporter Brasil
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The year of 2009 was marked by strong activity in Brazil's sugar-alcohol industry. After a deep crisis in the previous year, when companies suffered with credit restriction, several of them saw their balance sheets recovery in a scenario of permanent increase in the domestic demand for ethanol. Encouraged by a promising market, capitalized foreign groups purchased major Brazilian companies and already account for milling over 20% of the sugarcane produced in the country. In spite of the changes, environmental and social liabilities still taint the industry. Important initiatives in 2009, such as sugarcane zoning and the labour commitment signed by companies, still depend of a series of proceedings to be enforced. The scenario demands that civil society organizations such as NGOs, labour unions, and social movements keep watching so that ethanol's potential benefits to the country are not restricted to a few. Follow our work at [**www.biofuelbrazil.org**](http://www.biofuelbrazil.org)

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**Brazil of Biofuels - Impacts of Crops
on Land, Environment
and Society - Sugarcane 2009**

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GENERAL PRESENTATION

With 'Brazil of Biofuels - Impacts of Crops on Land, Environment and Society - Sugarcane 2009', the Biofuel Watch Center (BWC) of NGO Repórter Brasil closes its second year of activities, started in January 2008. Along this time, the BWC research team, supported by the work conducted by the other departments in the organization, researched, examined, and published stories related to the growth of biofuels in Brazil - chiefly ethanol and biodiesel.

Several agricultural activities were investigated - related to crops such as soybean, cotton, babassu, sugarcane, rapeseed, oil palm, sunflower, castor bean, and jatropha, and the cattle industry that provides animal fat for biodiesel - as well as the expansion vectors and social-environmental, labour, and economic impacts created after their spreading. At the same time, all that content served as the basis for the political articulation conducted by Repórter Brasil with government sectors, parliament members, civil society and business organizations in order to improve socioenvironmental conditions for production in the area.

Even though it recognizes the need for dialogue with the widest possible range of society segments and strongly works for it, the BWC deepened its impact studies and denounced irregular and illegal practices found. Our analyses and journalistic texts covered names of major Brazilian and foreign business groups that, despite their financial power, did not develop business that were less ruinous to the environment and fairer to workers and communities involved.

After two years of activity, it is our pleasure to say that we have conducted monitoring activities in all Brazilian states including border areas with Paraguay and Bolivia, and were physically present in most of them. We listened to local social movements and non-government organizations, we interviewed authorities and business-people, we collected field data - all in order to offer the public the best information possible, which could serve as an instrument of social change.

Even the most renowned experts disagree about the importance of biofuels in a post-oil era, but the general evaluation is that products like ethanol and biodie-

sel will play a major role in it. Likewise, state and private sources predict that Brazil will be a prime field for the expansion of bioenergy raw materials, as pointed out by the industry's growth in the last two years and, according to forecasts, for at least the next twenty.

The role of organized civil society, NGOs, labour unions and social movements is to warn for that prospect not to become real at all costs. The preservation of forests, wild animals, soil, water and air, as well as biodiversity as a whole, should be a priority in soybean farms, cattle areas, and ethanol processing companies. The international movement against global warming is there to support our beliefs.

From workers' point of view, there are plenty of complaints. Together with the most modern agricultural techniques that place Brazil as one of the world's productivity champions, some workers remain deprived of their basic rights - including freedom. Those are citizens slaved to clean soil in order to plant the grass that will feed cattle or to cut the sugarcane that will be processed into ethanol. All that needs to be changed.

In its strategic planning for the next two years, the Biofuel Watch Center has already defined its targets. It will keep working to strengthen the debate on sustainability with organized civil society - and in this new stage, including Paraguay and Bolivia; it will keep producing annual reports on the socioenvironmental impacts of the main farming activities related to energy production; it will increase content production and provide more public access to the information generated; and it will keep the pressure on governments and businesses that contribute to the expansion of biofuels.

In this new stage, we will again count on support from our main fund providers, including Cordaid, The Doen Foundation, and Solidaridad. We take the opportunity to thank them publicly for their trust and encouragement. Our work would not be possible without the hundreds of NGOs, local social movements, activists that unselfishly multiply their efforts to denounce impacts and concert actions on behalf of their communities and their environment. Our sincere gratitude to all of them.





INTRODUCTION

The year of 2009 was marked by strong activity in Brazil's sugar-alcohol industry. After a deep crisis in the previous year, when companies suffer with credit restriction, several of them saw their balance sheets recovered in a scenario of permanent increase in the domestic demand for ethanol. However, the crisis favoured a different sort of consolidation: capitalized foreign groups purchased major Brazilian companies and already account for the milling of over 20% of the sugarcane produced in the country.

From the point of view of public policies for the industry, two moments stood out in 2009. In June, the federal government, labour unions, and businesses launched the National Commitment to Improve Labour Conditions in Sugarcane; in September, president Luiz Inácio Lula da Silva signed sugarcane's Agroecologic Zoning, AEZ (Zonamento Agroecológico da Cana-de-açúcar), which proposed restrictions to its expansion and the establishment of new processing companies in the Amazon, in the Pantanal region and in the Alto Paraguay river basin. In spite of their positive features, the two efforts, which will be examined in detail along this study, remained on paper: the 'Commitment' is awaiting definition about how companies will be monitored, and the AEZ needs to be voted by Congress in order to be legally binding, as proposed by the government.

According to the National Supply Company (Companhia Nacional de Abastecimento, CONAB), Brazil's sugarcane production reached 612.2 million tons in 2009, a 7.1% increase over the previous period. The state of São Paulo concentrated 57.8% of the production and harvested 354.3 million tons - 2.5% over 2008. Three states stood out for their increase in the amount of sugarcane harvested. In Goiás, production increased 50.1% and reached 44.4 million tons; in Mato Grosso do Sul, there was a 38.8% growth, with 28.8 tons produced; and in Minas Gerais that increase was 20.1%, with 49.7 million tons harvested.

Differently from previous years, in 2009 companies focused on sugar production. Prices increased 80% over 2008, driven by the reduction of harvest in several countries, especially India, which went from being an exporter to an importer. Brazil's sugar output reached 34.6 million tons - a 9.5% increase over 2008. About 65% of that amount will be exported.

In the opposite direction, alcohol production decreased and reached 25.8 billion litres - a 3% decrease over 2008, but enough to supply the domestic market of

21 billion litres. According to a CONAB's estimate, Brazilian ethanol exports fell to 1.5 billion litres in 2009, compared to 4.9 billion in the previous year. Even so, the offer/demand margin was narrow and there was pressure on ethanol prices at the end of the year, to the point of drivers choosing to use gasoline in their cars in states like São Paulo.

That scenario is also a result of the excess of rainfall in Brazil's Mid-South - preventing a faster harvest and reducing sugarcane's sucrose level. Estimates are that 20 million tons could not be harvested because of rain. Ethanol prices accumulated a 68.5% increase in the second half of 2009, according to the CEPEA/ES-ALQ indicator. In order to mitigate the impact of price increases in 2008, the federal government decided to reduce from 25% to 20% the percentage of anhydrous ethanol added to gasoline for 90 days starting February 1st.

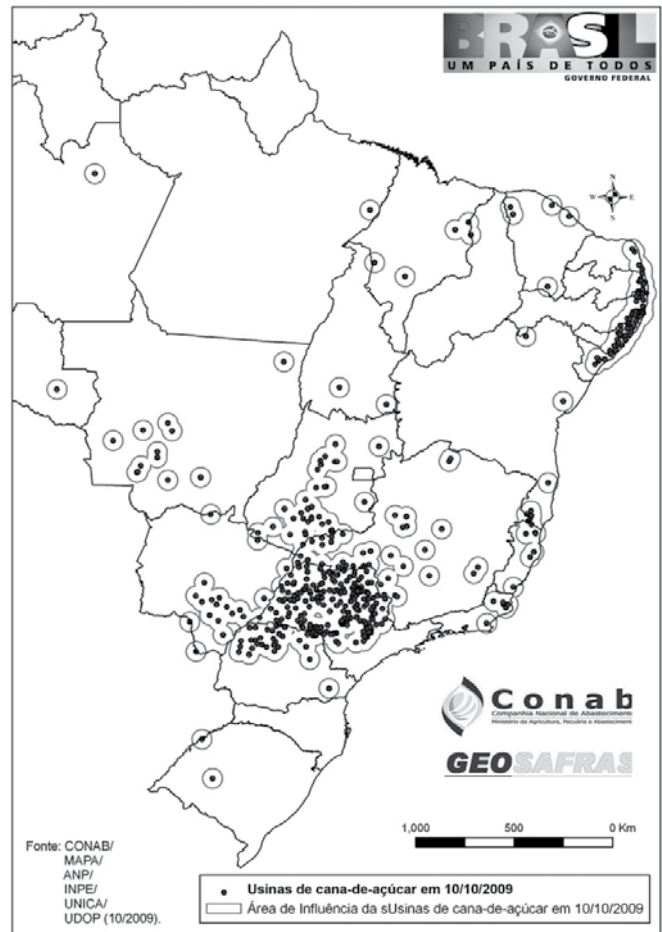
From a demand point of view, the environment for the industry is positive. Sales of flexpower vehicles - those that run on gasoline and/or ethanol - were 92.3% of the total units sold in the country in 2009. Besides, Brazil's car industry seems to be immune to the world crisis that hit the segment: 2.6 million new vehicles were sold during 2009 - a 13.9% increase over the previous year according to data provided by National Association of Automobile Manufacturers (Associação Nacional dos Fabricantes de Veículos Automotores, ANFAVEA). In 2010, the trend is for new records to be broken.

Another pro-demand factor is the reduction of ethanol import tariffs in China from 30% to 5%. Decision made by the Chinese government, which meets the country's commitments to the World Trade Organization (WTO), may favour Brazilian exports. Some Chinese provinces already add ethanol to gasoline at the same proportion of Brazil, but the country still lacks infrastructure and logistics to increase that procedure, so that no increase in ethanol imports is expected soon.

Also in the US, the debate on the increase of the maximum mixture level from 10% to 15% gained ground in 2009. The measure is advocated by farmers and their representatives in Washington as a way to reduce emissions of greenhouse effect gases. Car and oil industries, however, pressure on the opposite way. Their main argument is that US vehicles are not technically prepared to operate with 15% of ethanol in their tanks and could lose performance and durability.

Aware of the potential demand, the Federal Government's Brazilian Social and Economic Development Bank (Banco Nacional de Desenvolvimento Econômico e Social, BNDES) intends to grant the in-

dustry in 2010 the same 6 billion reais given in 2009. Those are projects related to ethanol and sugar production, establishment of plants for co-generation of energy from sugarcane bagasse and increase in sugarcane plantations. The bank's portfolio includes companies such as COSAN, ETH, controlled by the Odebrecht group, Iaco Agrícola, belonging to the groups Grendene, Irmãos Schmidt, and to businessman André Esteves, and Usina São Fernando, from the Bumlai and Bertin Groups, now part of JBS-Friboi.



Besides BNDES, the federal government operates in the sugar-alcohol industry through Petrobras Biofuels - a subsidiary of Brazil's state-owned oil company. The company's plan is to purchase stocks and become a partner in enterprises already established in the ethanol industry. In 2009, Petrobras defined the acquisition of 40% of Total, a processing company located in Bambuí, with a 150-million-real investment. Besides, it closed a deal with Chinese state-owned company Petrochina to study joint projects focused on exports. In the medium run, Petrobras plans to account for at least 15% of Brazil's ethanol market. Aware of that, during 2009 Repórter Brasil discussed with the company's social responsibility department in order to drive it into demanding from its clients a series of sustainability criteria.

In the private sector, business was even more intense. French company Louis Dreyfus bought Santelisa Vale and created LDC-SEV, of which it holds 60%. With 13 processing plants in five Brazilian states, it is already the country's second largest group, capable of producing 40 million tons of sugarcane a year. Another major transaction in 2009 was the purchase of Moema Participações by Bunge, involving majority control of six plants capable of milling over 15 million tons a year. With that move, Bunge becomes third place in Brazil for sugarcane processing.

COSAN remains as Brazil's largest sugar-alcohol group. In 2009, the company bought Nova América, thus increasing its processing capacity to 56 million tons of sugarcane a year in 23 processing plants. According to observers, the industry's consolidation process shall favour improvements in companies' management, including in the area of sustainability. However, social and environmental problems faced by the industry still taint Brazilian ethanol. COSAN itself, for instance, was included by the Ministry of Labour and Employment in the dirty list of slave labour in late 2009 - which it left temporary after being granted a preliminary court order.

Along this report, data, analyses and stories will be presented on impacts caused by the expansion of the sugar-alcohol industry in Brazil. The problems involve overexploitation of workers, disrespect for communities, traditional populations, and indigenous peoples, and environmental degradation. Without solving those liabilities, ethanol will not live up to its fame of green fuel that can play a major role in a still hypothetical post-oil era.

CASE | Brazil exports ethanol production model to poor countries

In order for sugarcane ethanol become a commodity, more countries should produce it. Brazilian businessmen and the federal government know that and, as a strategy to allow exporting the product to Europe and the US, they encourage expansion of the sugarcane industry in Africa and Latin America. 'To form an international market, more offering countries are needed. Only that way we will develop a future market, with stock market negotiations', sustained Alexandre Strapasson, head of the Sugarcane and Agroenergy Department of Brazil's Ministry of Agriculture, Livestock and Supply (Ministério da Agricultura, Pecuária e Abastecimento, MAPA).

The executive-director of Brazil's Sugarcane Industry Association (União da Indústria da Cana-de-Açúcar, UNICA), Eduardo Leão de Sousa, agreed with that view. 'From the viewpoint of energy safety, it is important to have other countries producing in order to show consumers that the offer is stable', sustained Sousa. 'Otherwise, it's an egg and chicken situation we are living now: there is no consumer market con-

solidated, so several countries hesitate to start producing. On the other hand, few countries produce it, so the consumer market cannot be consolidated', the executive-director explained.

The targets of Brazil's foreign policy for expansion of monoculture are the countries of the once called third world. By and large, they have more land and cheap labour available as well as agroclimatic conditions that are more favourable to sugarcane plantations development. Besides, for Caribbean and African countries it is easy to sell to the US and Europe, respectively. Caribbean countries also accumulate the tax advantage: their alcohol does not pay taxes to Uncle Sam, thanks to a favoured trade agreement signed in 1983 and renewed in 2000, known as the Caribbean Basin Initiative - CBI.

► Foreign policy

In Brazil, the Division for New and Renewable Energies of Brazil's Ministry of Foreign Relations (Ministério das Relações Exteriores, MRE) coordinates the Pro-Renova Programme, under which over 60 memoranda have been signed towards bilateral technical cooperation in the area of sugarcane production. 'Those memoranda are divided into two groups: developed countries that demand biofuels and turn to Brazil to know more about our ethanol experience and developing countries with agricultural vocation, where sugarcane can be a development vector', said MAPA's agroenergy coordinator.

According to him, the most successful memorandum was signed with the United States in 2007, to conduct joint studies on sustainability of sugarcane ethanol. One of the work's focuses is the attempt to create a common methodology to quantify greenhouse gas emissions. The head of MRE's Division for New and Renewable Energies, councillor Cláudia Vieira Santos, detailed the scope of the initiative: Brazilian and American researchers have conducted studies on the feasibility of producing ethanol from sugarcane in El Salvador, Haiti, Dominican Republic, and Saint Kitts and Nevis, and now work together in Guatemala, Jamaica, Guinea-Bissau and Senegal.



Brazil's president Lula and Ghana's John Kufuor dedicate EMBRAPA's new office in Africa

Source: Valter Campanato/Ab

Far from just meeting existing demands, Brazil has adopted a proactive stance in its foreign policy regarding ethanol. In last October and November, for instance, a technical team including members of MAPA, MRE and the Brazilian Agricultural Research Corporation (EMBRAPA) visited Botswana, South Africa, Angola, Zambia, Tanzania, Zimbabwe, and Mozambique to give a course on sugarcane's Agroecologic

Zoning (AEZ). According to Santos, the action was aimed at 'supporting the qualification of African countries interested in implementing or already implementing national programs in the area of bioenergy'.

► Brazilian private enterprise

According to MAPA's Agroenergy director Alexandre Strapasson, direct investments by Brazilian sugarcane businesses abroad are shy. 'It is a challenge to convince them to invest in Africa and Latin America, and more so since they face competition by European countries, which are also interested in producing in those territories', justified the manager.

Brazilian business groups that already count on the expansion of sugarcane into foreign territory include Guarani and Odebrecht. The former, which has six processing plants in São Paulo, started investing in Mozambique in 2007, when it bought a sugarcane plant built in 1998. Through a renewable contract for concession of public land valid for 50 years, Afri-

can sugarcane plantations belonging to the Guarani Group now occupy 91 thousand hectares, with totally manual planting and harvesting. In the last harvest, that unit produced 66 thousand tons of sugar. According to the company's press office, so far there is no ethanol production, but the 'Mozambican government, which has shares of the group, showed high interest in the industry of renewable fuels through projects presented to the IMF [International Monetary Fund] and the World Bank'.

The Odebrecht Group, in turn, shall start its production of ethanol and sugar in Angola by the end of 2010. The Brazilian construction corporation has a 40%-share in the Angolan Bioenergy Company, whose other partners are state-owned oil company Sonangol and Angolan conglomerate Damer.

For now, the Brazilian company that has profited the most from the foreign policy of encouraging the expansion of the sugar-alcohol industry is Dedini, the world top maker of equipments for that industry. 'Our exports increased 660% in the last 5 years', celebrated the company's export director Antônio Pereira. According to him, about 10% of Dedini's revenues come from foreign markets and it has costumers spread over 26 countries, especially in the Caribbean and Africa, as well as Venezuela, United States, Uruguay, Colombia, Argentina, Bolivia and Mexico.

► Warning signals

The Brazilian campaign to spread the model for large scale production of sugarcane ethanol does not mean only the opportunity to generate income in developing countries, as



The efforts made by the Brazilian government to increase the number of ethanol producing countries do not stop there. As seen above, Mohammed came to the mountain. But, in this case, the mountain also came to Mohammed: MAPA, working in a partnership with the São Carlos Federal University (UFSCar), held in Ribeirão Preto (SP, Brazil), from November 16-20, 2010, the 'First Ethanol Week: Sharing Brazil's Experience'. The audience were managers and businesspeople from about 20 English-speaking African countries (such as Botswana, South Africa, Nigeria and Kenya), Latin America (such as Jamaica and Guiana), Asia (Vietnam and Thailand) and Oceania (Fiji Island). In 2008, the 'Ethanol Week' was held in Araras, SP, and included representatives of 31 Spanish and Portuguese-speaking countries: Argentina, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, El Salvador, Haiti, Dominican Republic, Cuba, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, Angola, Cape Verde, Guinea-Bissau, Mozambique, São Tomé and Príncipe, Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo.

Source: Divulgação MAPA

Alexandre Strapasson, MAPA's Bioenergy department's head: more countries offering ethanol are needed



the government advertises - or, more pragmatically speaking, the attempt to consolidate the 'green fuel' as a commodity. It bears, above all, the risk of resulting in degrading exploitation of natural resources and workers in the Caribbean and Africa.

In Guatemala - a sugar-exporting country - the Institute of Agrarian and Rural Studies (Instituto de Estudios Agrarios y Rurales, IDEAR, has been conducting studies for almost three years on Brazil's incursions into Guatemalan territory. Researcher Alberto Alonso Fradejas said that the sugar-processing plant Guadalupe Chawil Utz'aj invaded areas where food crops were traditionally planted. One of its shareholders is the sugar-alcohol group Pantaleón, which is part of a joint-venture with Colombian mill Manuelita and Brazil's Unialco. Together, the three partners built a sugar-alcohol processing plant in Brazil (Vale do Paraná, in Suzanópolis, SP) and are investing in the construction of an alcohol dehydrating plant in Guatemala, aimed at the US market.

In Mozambique, ProCana pledges to spend 500 million US dollars and create 2 thousand direct jobs, using Brazilian technology to produce sugar and ethanol. An article published in March, 2009 by US journalist Adam Welz on the website 'Mother Jones' (which specializes in socio-environmental matters) details the project's risks. About 30 thousand hectares of native savannas will be turned into sugarcane plantations in Massingir, the country's driest region, causing loss of biodiversity and excessive water consumption (approximately 409 billion litres a year for irrigation). And 38 thousand people living around the Limpopo National Park will have to leave their land.

Mozambique's Constitution establishes that all land in the country belongs to the state, which can grant permission to companies for using them for up to 50 years. That concession, however, is tied to the absence of traditional communities in the territory. It seems that in that country - as happens in Brazil - good laws do not guarantee good practices.



CHAPTER 1 LABOUR-RELATED IMPACTS

Despite business consolidation, the arrival of foreign companies, and the effort by segments of the federal government to make companies comply, Brazil's sugar-alcohol industry was still marked in 2009 by serious violations to workers' rights and aggressions to local communities involved. As though the cases publicized by inspection groups along the year were not enough, the strongest blow to the image of the industry would come on December 31st, the last day of 2009: COSAN, the world's largest sugar-alcohol company, had its name included into the 'dirty list' of slave labour published by the Ministry of Labour and Employment (Ministério do Trabalho e Emprego, henceforth MTE).

The inspection resulting in COSAN's inclusion in the 'dirty list' took place in June 2007, at the Junqueira processing plant in Igarapava, São Paulo, when 42 workers were freed. COSAN also owns other 22 production units, four refineries, and two port terminals. Over two years passed between the operation and the companies' inclusion in the list, because of time needed for the administrative proceeding within the Ministry. COSAN employs over 40 thousand people in harvest periods and has an estimated 56 million tons of sugarcane to be processed in 2009. Right after MTE's announcement, state agencies such as BNDES and private companies like Wal-Mart announced the cancellation of their business with COSAN.

This behaviour by businesses met recommendations of the National Pact for the Eradication of Slave Labour, whose management is shared by Repórter Brasil. It is true that all that activity did not last much. On January 8, 2010, COSAN's lawyers were granted a preliminary court order by Brasília's Regional Labour Court in order to withdraw the name of the company from the list. Among arguments, they sustained that the 42 workers caught in a situation analogue to slavery had been hired by an outsourced company and their situation was not known to COSAN's representatives. After that, BNDES and Wal-Mart resumed their business with the company.

The final decision is yet to be made by Brazilian justice, so that it is not known whether or not COSAN will return to the 'dirty list'. But damage has already been done. Not only the reputation of the world's largest sugar-alcohol company has been tarnished, but also that of the whole industry. During 2009, the Brazilian government and businesses strengthened their efforts to change the image of sugarcane plantations and processing com-



panies. The main related event was the 'National Commitment to Improve Labour Conditions in the Sugarcane Industry', launched in June.

The 'Commitment' was signed by 331 Brazilian companies, virtually 80% of the industry. That was the concrete result of the 'Dialogue Table to Improve Labour Conditions in Sugarcane', installed in July 2008 after president Lula's request. The Secretary General of the Presidential Administration was in charge of organization and labour union leaders were called to the debate. The terms of the 'Commitment' were approved by the São Paulo State Federation of Rural Waged Workers (Federação dos Empregados Rurais Assalariados do Estado de São Paulo, FERAESP), National Confederation of Agriculture Workers (Confederação Nacional dos Trabalhadores na Agricultura, CONTAG), Sugarcane Industry Association (União da Indústria da Cana-de-Açúcar, UNICA) and the Sugar-Energy National Forum (Fórum Nacional Sucroenergético).

The document establishes that signatory companies will carry out exemplary business practices regarding workers. It was decided that labour intermediation would be forbidden for sugarcane and ethanol production - an attempt to eliminate the so-called 'cat', a middleman that recruits workers for temporary work in rural areas. The agreement also includes strengthening collective bargaining, proper lodging facilities, intermediation by the Public Employment system to hire migrant workers, and respect for labour health and safety by providing Individual Protection Equipments (IPE) and safe transportation, among other items. However, written words and bare reality are distinct things.

There are at least three serious problems regarding the Commitment's management: 1) the filter was too wide, that is, even companies that regularly violate workers' rights were accepted as signatories; 2) companies that violated workers' rights even after they signed the document remain as signatories; 3) although included in the document, there is still no monitoring system to confirm whether or not companies are following the Commitment's terms. Since they are not subject to punishment, a company that respects workers' rights and one that regularly breaks them are treated equally. And the latter can keep using the fact that it signed the document as a marketing piece with its customers and the general public, even if it did not really improve its labour standards. One of the most evident mistakes in managing the Commitment is the inclusion among the signatories of Usina Santa Cruz, belonging to the José Pessoa Group, located in Campos dos Goytacazes, state of Rio de Janeiro.

The company was caught in the act three times with workers under a situation analogue to slavery in 2009, according to a compilation by the Land Pastoral

Commission (Comissão Pastoral da Terra, CPT) based on data from the Ministry of Labour and Employment and labour prosecutors. On May 15, inspection groups freed 150 workers in that situation in the company; on



Cutter collects sugarcane he cut in the area of Guariba, SP

Photo: Pastoral do Migrante Guariba-SP

June 6, other 324 were liberated, five of whom were children or adolescents; on November 11, a new inspection at the Lagoa de Cima farm, leased by the company, found 122 slave labourers. Let us not forget: the José Pessoa Group is multi-relapsing. The conglomerate, which has sugar and alcohol production units in Japoatã, Sergipe; Icem, São Paulo; and Brasilândia and Sidrolândia, Mato Grosso do Sul, as well as Campos dos Goytacazes, was excluded from the National Pact for the Eradication of Slave Labour in 2008. The Pact's Monitoring Committee, of which Repórter Brasil is a member, made that decision after units belonging to the company were caught in the act with slave labourers in November 2007 (in Brasilândia) and June 2008 (Icém). In spite of all those crimes, José Pessoa Group's Usina Santa Cruz can sell itself to society as a signatory of the 'Commitment'.

And that is not the only case. According to CPT, on February 4, 245 slave labourers were freed at Usina Cruangi, in the state of Pernambuco, including 16 children and adolescents. Also in Pernambuco, Usina Salgado was caught in the act with 50 slave labourers on November 15. And in Confresa, Mato Grosso, 55 slave labourers were freed on November 15 at Destilaria Araguaia (former Gameleira), of the Eduardo Queiróz Monteiro Group. All of those companies, despite extremely serious violations, are signatories of the 'Commitment', which has also not barred companies caught using slave labour in previous years, included in the 'dirty list'. That is the case of Agrisul Agrícola Ltda. (which has a unit known as Debrasa, belonging to the relapsing José Pessoa group), in Brasilândia, MS, Centro Oeste Iguatemi Ltda. distillery (Dcoil), owned by Dr. Nelson Donadel, who specializes on labour medicine, and Energética do Cerrado Açúcar e Alcool Ltda., in Itarumã, GO. The agreement's provisions are certainly positive for workers, which is acknowledged by sugarcane cutters' unions. The problem is the lack of a

monitoring and punishment system for violators - as that existing, for instance, in the National Pact for the Eradication of Slave Labour.

Launched in 2005, it is signed by over 200 companies committed to cut from their lists of providers those caught using slave labour. Major fuel companies, such as Petrobras and Ipiranga, take part in the Pact and use the 'dirty list' of employers as their main reference. In case companies do not follow what they signed, they risk being excluded, as happened to the José Pessoa Group. That possibility is established in the terms of the 'Commitment', but has not been applied yet. The document's clause 4 establishes the creation of a 'National Commission for Dialogue and Evaluation' aimed at 'proposing and defining systems for adjustments in membership and permanence of companies to this National Commitment'. According to Pedro Luciano, one of the coordinators of the Sugar-Energy National Forum as well as the 'Commitment', a monitoring system is still under discussion. But there is one target: establishing it in the second half of 2010, in order to evaluate the behaviour of companies regarding labour during the next harvest.

More expeditiousness is really necessary. In 2009, once again the sugarcane industry was leader in number of slave labourers freed by inspection groups. A total of 1,911 workers in 16 cases denounced, 45% of the total of 4,234 people freed during the whole year. In second came the set 'other crops', with 773 people freed (18%) in 31 denunciations, and cattle came in third with 682 (16%) in 122 cases. In number of areas with slave labour, however, cattle is still first place, which shows that the practice is more disseminated in this industry. Data come from the Land Pastoral Commission and are still subject to revision. It is crucial that the sugar-alcohol industry is pressured to improve the management of its workers - about a million all over the country. A current comment in the industry is that mechanization of sugarcane harvesting, which has already reached 50% of the planted area in states like São Paulo, 'will solve past labour-related liabilities'. But that is far from becoming a reality. The main reason is that the area planted with sugarcane increases at a pace as high as that of mechanization.

Therefore, many workers 'expelled' from a given area by machines migrate to others where cutting is still manual. Between 2001 and 2007, for instance, the number of workers involved in sugarcane cutting in São Paulo went from 76 thousand to 97 thousand - a 27% increase according to data from the Ministry of Labour and Employment for positions with regular working papers. During the same period, harvest mechanization also increased.

In São Paulo, Brazil's largest sugarcane-producing state, no case of slave labour was recorded in 2009. But that did not mean that the state's plantations and processing plants are free from labour problems. Roberto Martins de Figueiredo, who coordinates São Paulo's State Rural Group - a 25-strong team of labour auditors who specialize in rural inspections - explains that notifications' causes have changed in recent harvests. Nowadays, cutters without proper working documents are rarely found in the state, but there are many notifications for excess of working hours and violations to workers' health and safety conditions, as in cases where toilet facilities are improper, transportation to working fronts is made in unsafe buses and workers do not receive proper individual protection equipments (IPEs) and quality tools.

In 2009, the group inspected 26 companies in the area of Bauru, 13 around Ribeirão Preto, and 7 at São José do Rio Preto's region. The labour situations of 32,939 people were examined. Auditors inspected mainly if companies' abide by the Consolidation of Labour Laws (Consolidação das Leis do Trabalho, CLT) and Regulating Norm 31. A total of 72 violation notifications were issued regarding violations to legislation and 166 to safety.



Roberto Martins de Figueiredo, coordinator of the rural group in São Paulo

| CASOS DE TRABALHO ESCRAVO - 2009 | | | | | | |
|----------------------------------|-------------------|-------------|--------------------------|-------------|--------------------------|-------------|
| Por Atividade 2008 | Casos Denunciados | % | Trabalhadores Envolvidos | % | Trabalhadores Libertados | % |
| DESMATAMENTO | 4 | 2% | 160 | 3% | 160 | 4% |
| PECUÁRIA | 122 | 51% | 1.686 | 28% | 682 | 16% |
| REFLORESTAMENTO | 12 | 5% | 170 | 3% | 105 | 2% |
| EXTRATIVISMO | 10 | 4% | 626 | 10% | 105 | 2% |
| CANA | 16 | 7% | 1.911 | 31% | 1.911 | 45% |
| OUTRAS LAVOURAS | 31 | 13% | 798 | 13% | 773 | 18% |
| CARVÃO | 26 | 11% | 464 | 8% | 254 | 6% |
| OUTRO & n.i | 17 | 7% | 314 | 5% | 244 | 6% |
| TOTAL | 238 | 100% | 6.129 | 100% | 4.234 | 100% |

Fonte: Comissão Pastoral da Terra

Among the most serious cases of irregularities found, according to the rural group, are Destilaria Cafeal-cool (lack of time off after six consecutive hours of work; excess of working hours; extending working hours without a license), in Cafelândia; Usina da Barra (lack of records on workers' entrance and exit hours; work on Sundays without a license; irregularities in IPEs; and dirty bathrooms), belonging to the COSAN group, in Dois Córregos; Usina Diamante (six workers without regular papers; no control on working hours; no time off on Sundays and holidays; cutting seven sugarcane streets instead of five; dirty bathrooms; irregular Labour Health Certificate, lack of a plan to assist accident victims; irregular lodging facilities; outsourced transport companies with no toilet or eating facilities), also belonging to the CO-

SAN group in Jaú; and Guariroba (irregular lodging facilities, work on Sundays, dirty bathrooms; irregular IPEs, lack of risk assessment or safety actions), now belonging to Bunge, in Pontes Gestal.

As can be seen, even among the most powerful sugar-alcohol Brazilian and foreign business groups, labour management is still highly flawed. Without definitely correcting those problems, Brazil's ethanol will not be able to bear the sustainable image before communities involved with its production. It is about time government and businesses really looked into that, clean up their liabilities, and give workers the value they deserve.

TRABALHO ESCRAVO NA CANA EM 2009

| MUNICÍPIO | UF | FAZENDA DENUNCIADA | PROPRIETÁRIO | DATA DA FISCALIZAÇÃO | TRABALHADORES ALCANÇADOS | CRIANÇAS E ADOLESCENTES | TRABALHADORES LIBERTADOS | VALOR PAGO (R\$) |
|-----------------------|----|---|--|----------------------|--------------------------|-------------------------|--------------------------|------------------|
| São Mateus | ES | Usina Cridasa | Grupo "Infinity Bio Energy" | 19/5/2009 | 1.551 | | 288 | - |
| Joviânia | GO | Bandeirantes | Selson Alves Neto | 20/7/2009 | 26 | | 15 | 29.074,58 |
| Inhumas | GO | Ipê Agro-Milho Industrial Ltda. | Ipê Agro-Milho Industrial Ltda. | 20/7/2009 | 115 | | 115 | - |
| Limoeira do Oeste | MG | Bela Vista | Antonio Cabrera | 15/4/2009 | 385 | | 99 | 389.979,79 |
| Paracatu | MG | Destilaria Vale do Paracatu - Agroenergia Ltda. | Destilaria Vale do Paracatu - Agroenergia Ltda. | 10/7/2009 | 241 | | 170 | 375.880,78 |
| Cláudio | MG | Santo Antônio e Santa Izabel | Destilaria Alpha Ltda | 15/10/2009 | 85 | | 80 | 162.767,56 |
| Confresa | MT | Destilaria Araguaia | Zihuatanejo do Brasil Açúcar e Alcool S.A Grupo EQM (Eduardo Queiroz Monteiro) | 15/10/2009 | 192 | | 55 | - |
| Aliança | PE | Usina Cruangi S/A | Usina Cruangi S/A | 4/2/2009 | 252 | 16 | 245 | 319.303,80 |
| Escada | PE | Usina Estreliana no Engenho Liberdade | Paulo Roberto Monte Barreto arrendador | 10/3/2009 | 70 | 1 | 39 | 24.575,93 |
| Moreno | PE | Engenho Contra Açude | Fernando Vieira de Miranda | 16/6/2009 | 101 | | 40 | 61.644,60 |
| Escada | PE | Usina Salgado S.A | A identificar | 15/10/2009 | 50 | | 50 | 31.258,48 |
| Campos dos Goytacazes | RJ | Usina Santa Cruz | AGRISUL Agrícola Ltda. Grupo José Pessoa CBAA | 6/6/2009 | 324 | 5 | 324 | - |
| Campos dos Goytacazes | RJ | Usina Paineiras S.A | Usina Paineiras S.A | 16/7/2009 | 81 | | 81 | 229.248,65 |
| Campos dos Goytacazes | RJ | Guandu / Cupim | Coagro | 28/10/2009 | 996 | | 38 | 58.793,03 |
| Campos dos Goytacazes | RJ | Usina Santa Cruz | AGRISUL Agrícola Ltda. Grupo José Pessoa CBAA | 15/5/2009 | 150 | | 150 | - |
| Campos dos Goytacazes | RJ | Lagoa de cima - Faz. arrendada por Sta Cruz | AGRISUL Agrícola Ltda. Grupo José Pessoa CBAA | 11/11/2009 | 153 | | 122 | - |

Fonte: Comissão Pastoral da Terra, com base em dados do Ministério do Trabalho e Emprego e do Ministério Público do trabalho

CASE | Destilaria Araguaia once again caught in the act when using slave labour

In July, 2009 the Araguaia Distillery (former Gameleira) signed the National Commitment to Improve Labour Conditions in Sugarcane, the voluntary agreement widely advertised by President Lula in Brazil and abroad. In October, less than four months later, a mobile inspection group freed 55 people subjected to slavery at that ethanol processing plant.

That was the fourth slave labour case in the last eight years: in 2001, 76 people were rescued; in 2003, 272 were freed; and in 2005, the number of workers subjected to slavery at the company increased to 1,003. Gameleira entered the dirty list of slave labour released by the Ministry of Labour and Employment (MTE) in November 2003 and was excluded from it in May 2008. During that period, it even had its name withdrawn from the official list of slave-using employers by preliminary court decisions later reversed by justice itself.

In 2006, Gameleira changed its name to Destilaria Araguaia in an attempt to disconnect the company's image from the labour-related scandals. Its controller Eduardo Queiroz Monteiro (EQM) Group is connected to several media: Folha de Pernambuco newspaper, Folha de Pernambuco radio station, Folha Digital de Pernambuco, and Agência Nordeste. Its political power can also be measured by the fact that Eduardo Queiroz Monteiro is the brother of Congressman Armando Monteiro Neto (PTB/PE), president of Brazil's National Industry Confederation (Confederação Nacional da Indústria, CNI). The sugar-alcohol conglomerate also controls three other processing companies in Pernambuco (Usina Cucaú Açúcar e Álcool), Tocantins (Destilaria de Álcool Tocantins) and Maranhão (Destilaria de Álcool Tuntum), as well as an agribusiness company (Tupaciguara Agricultura e Pecuária).

Destilaria Araguaia, in turn, is located in Confresa, in north-eastern Mato Grosso. The town is close to the Amazon biome, an area where sugarcane plantation expansion is banned according to the bill regulating that crop's agroecologic zoning (AEZ) under proceedings in Congress. 'the AEZ is not a problem for us, since it does not concern enterprises already established. The proposal for Mato Grosso's ecological socioeconomic zoning [ZEE] worries us, because it outlaws farming less than 15 km from indigenous lands', says the EQM Group's operational support director Domingos Azevedo Neto.

Mato Grosso's ZEE is under debate at the state parliament. The concern of Araguaia's manager is justified because its facilities are near the Urubu Branco indigenous land, which belongs to the Tapirapé people. In 2007, the company was notified by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) for illegal burnings. The 15-million-real fine has not been paid yet because the company appealed the charge.



Domingos Azevedo Neto: no fear of sugarcane AEZ

In the latest inspection by the Mobile Group coordinated by the MTE, Araguaia received over 40 violation notifications and four interdictions for lack of a device to open its cold chamber from inside, lack of a pressure control device in industrial pans, improper insulation of the electricity generator and irregularities in the supply truck. The 55 slave workers freed at the time used to be subjected to exhaustive working hours, with no weekly time off guaranteed by law, and under the risk of accidents. Larvae were found in the water container used by workers. One of the dorms was described by inspectors as 'dirty, full of poisonous insects and with its structure deteriorated'. To make things worse, Time of Service Fund (Fundo de Garantia por Tempo de Serviço, FGTS) was not regularly paid and pesticides used in plantations were stored with no proper care.

'Workers say they are under slave labour circumstances just to receive unemployment insurance', Domingos challenged. 'If conditions here were that bad, why would sugarcane cutters have been coming from and going to Maranhão for 15 years?', he argued.



Industrial pans lacked proper pressure control devices

Formerly, Gameleira had been owned by the EQM Group since 1987. During harvest time, from May to October, it has up to one thousand employees. Sugarcane workers are brought from other states, especially Maranhão. 'On average, 600 migrants are lodged here. We send for them without seeing their resumé, so that we get all sorts of things. Sometimes the police come into the farm seeking a fugitive', accused Domingos, who, not by chance, is a cousin of Eduardo Queiroz Monteiro.

The businessman's argument, besides being full of prejudice, loses even more credibility given the fact that there is a combine harvester stopped at Gameleira's patio. The 6 thousand hectares of sugarcane plantations that the Group has in Confresa are plain and therefore totally apt for mechanization. In spite of that, only in 2006 and 2007 the crop's planting and harvesting was partially mechanized - not more than 40% of the planted area. 'In 2005, when we had to let workers go right in the middle of the



Hélio Schul shows medical report indicating impacts of physical effort



Idle harvester at the company's yard shows its poverty exploitation policy

harvest period [the rescue operation by the Mobile Group took place in June], we rented a few machines. In the following year, we bought four harvesters for a million reais each', boasted Domingos. However, he sustained that agricultural machines are not used because there is no local specialized labour to operate them. That is: to cut sugarcane, it is possible to bring hundreds of workers from other places; to operate four harvesters, it is not.

Not only migrants suffer with the EQM Group's policy of exploiting poverty. Confresa residents have few alternatives for work in a region dominated by extensive cattle raising and, more recently, mechanized soybean plantations that arrived with the pavement of the BR-158 federal road. They are Araquaiá's permanent staff, whose wages have not been paid since August. 'My name is at SERASA [debtor's registry], I have to run away from the bank manager. I've been at that thing for three years and seven months now. I call it a thing because Gameleira does not deserve to be called a company', revealed Hélio Schul, who works in transporting and unloading sugarcane. A report from last July, signed by traumatologist Hernan Fernandes Lizarazu, says that the tractor driver has sequelae in his left and right clavicles, worsened by constant physical effort.

Edinaldo Pereira dos Santos Works for Araquaiá as a boiler operator since July 2007. He came from Maranhão on his own, in search



Edinaldo Pereira dos Santos: no money for rent

of a job. 'Our situation is very difficult. I have no money to pay rent and I have moved several times this year (2009),' the young man regretted.

► Guaranteed market?

Labour prosecutors (Ministério Público do Trabalho, MPT) filed a public lawsuit for Destilaria Araquaiá to have its assets sequestered until all duties to its employees are paid, and for it to be prevented to hire new employees until then. In the hearing that took place in São Félix do Araquaiá on December 2, 2009, Justice authorized the EQM Group to sell 1.5 thousand cattle heads it has in Confresa. The value of the operation (about 1.35 million reais) shall be deposited in court and used to pay due wages and contract termination fees of 200 workers by December 18.

The decision was celebrated by the president of Confresa's Rural Workers Union Aparecida Barbosa da Silva: 'We were afraid that the payment could be made in instalments. The result of the hearing was very good', the union leader rejoiced.

Besides the public lawsuit, prosecutors offered Araquaiá Distillery a Conduct Adjustment Commitment, (TAC) by which the company commits itself to adjust to rules for safety and health at work. Measures necessary for it to resume operation include installation devices to open cold chambers from inside and fire and explosion protection systems in areas considered risky.

Araquaiá processes 300-500 tons of sugarcane a year, producing about 25 million litres of ethanol. In the last harvest, that figure was well below average: 18 million litres, from 280 thousand tons of raw material. 'This year (2009) we won't mill anything because of the crisis that made us paid salaries late and the interdiction by inspectors', Domingos said. However, he sustained that the sugarcane grown in 2009 will not be lost: 'We will be back in April next year. We are working on it', guaranteed the manager.



Araquaiá Distillery hurries to get rid of MTE's interdiction. On the picture, workers build insulation for electricity generators

During the time it was included in the dirty list of slave labour, the then Gameleira was not able to sell its production to large distributors, which were committed to the National Pact for the Eradication of Slave Labour. When it left the official list of slave-using businesses, however, the now called Destilaria Araguaia immediately resumed its provision to Petrobras. 'The Araguaia region is an alcohol-importer, so Petrobras buys it from us, since transportation costs are lower. Whatever we produce, market is guaranteed', Domingos said.

A Petrobras' statement said it 'repudiates slave labour and includes a clause in all its contracts in which its providers commit themselves to not using labour under conditions analogue to slavery'. The company has been a signatory of the National Pact for the Eradication of Slave Labour since its launching in 2005. 'Nowadays, the name of Destilaria Araguaia, former Gameleira, is not [of slave labour] list, and that is why it is still a provider of Petrobras Distributor - BR', justified the text.

The list is updated twice a year. Inclusion only takes place after an administrative process at MTE, based on data presented by the inspection team.

In 2009, there was neither harvesting nor milling at Araguaia Distillery



CASE | "Eitos e Talhões"

Amongst a seamless vastness of sugarcane intersected by vinasse channels, tiny sugarcane cutters emerge with the blue of their uniform from the chest up and the black of smut from their chest down. Today they will produce more, because it is cloudy, even though sugarcane leaning under its own weight, wind, and heat from burnings reduce productivity.

We are on the land of a processing plant that appears in this work, in text and image, under the condition that the names of the company or its employees are not published. Those are complicated things about journalism.

In the company in question, seven groups work (filling seven rural buses with about 40 workers each, leaving from surrounding towns), of which two come from Ibitinga. I am watching number 53. Its routine is as follows:

- The bus driver collects the first workers at the stop at 5:15 a.m., in Ibitinga, and arrives at the company by 6:30. In some of the companies in that region, before their shift starts, sugarcane cutters undergo 15 minutes of exercises preparing for work, but it is not the case of this one. Work starts at 7.
- At 9, the group supervisor honks for a long time to indicate that it is time for the first mandatory 10-minute break. All cutters have to drop their machetes under the risk of being formally admonished - the break is mandated by the Ministry of Labour. Most remain where they are, seated. Others get up to drink water. A similar break takes place at 1 p.m.
- From 10-11 a.m., half the group has lunch, including those who had to 'open the sugarcane', that is, started cutting in order to open way for others working besides them. The other half eats from 11-12. They stop working at 3 p.m., to clean the sweat from their faces and take the smut off their clothes, and get on the bus to leave at 3:20 p.m.

The company's general inspector - a thin and tall young man - points out that everyone is wearing the complete set of individual protection equipment (IPE): iron-tipped boots, jeans pants, leather leg protection with steel structures up to their knees, long sleeve shirts, arm protection, Arab-style head protection, safety glasses, and gloves. A real Middle Age armour, under which they spill an average of eight litres of sweat every day. In order to contain such a massive loss of water and avoid cramps, which are a constant problem, some companies, like this one, give out a hydrating supplement, which according to some people also provides energy, but is not standardized or rigorously controlled.

Besides the full armour, each cutter received a machete with a square tip and a 50-cm blade, sheath, and a spoon the size of a pan for their meals.

Sugarcane geography has its own vocabulary: the plantation is divided in talhões - a certain area with no defined measure. Each talhão is divided into eitos - the ground for the work of the 'blacks'. Yes, in sugarcane cutting, slavery-time vocabulary has survived.

The group inspector, one more piece in the long and strict work hierarchy whose base is the facãozeiro, or machete man, is in charge of distributing one eito to each cutter. In the region, the most common eito is that made up of five streets, which are rows of sugarcane 1 metre apart from each other. Each worker cuts a 6-metre wide rectangle with as much length as he can in the day.

Some banners show how much each workers has produced each day, and variation can be seen: some got less than 90 metres, many cut 100-180, and a few reached or passed the 200-metre mark. A banner stands out saying a single cutter has cut off 300 metres or over 20 tons of sugarcane on that day. He earned 70 reais.

- Damn it, that guy earns more than I do! - says a surprised employee who is in charge of receipts.

Sugarcane must be cut right by the ground, since sucrose is concentrated near the roots. It is also necessary to cut the top tip, where there usually is some straw remaining from burning.

The inspector explains that workers must always throw the sugarcane perpendicular to the third street, as tidily as they can. Otherwise, the machine that lifts the piles of sugarcane has to go on zigzagging to collect it, he explains. There are two ways to organize it: in piles - blocks about 2 metres apart from each other - or in rows, where it will be disposed as a continuum. The choice will depend on the type of sugarcane.

With a cordless phone, the general inspector tells the group inspector to ask a cutter to be more careful with the distribution of sugarcane in piles. That cutter was closer to the general inspector than to the group one, but the hierarchy ritual has to be followed.

The division of eitos does not prevent cutters from helping each other when it is necessary. Sometimes a single weaker peon is left to finish his eito while others have already crossed their arms. In that case, they usually make a group effort to help the colleague to finish his daily share. It is also frequent that an exhausted worker leaves part of his eito to another one who is less tired and later they share the pay.

The general inspector shows a little paper with the values agreed upon by the labour union and the company in the last collective agreement. Regardless of production, each cutter will receive 18.87 reais a day. The 18-month sugarcane is worth 3.3077 a ton; the remaining cuts, 3.1806. Food tickets, 120 reais. Bent sugarcane pays 10% over the established price; if it is rolled up, it will pay 25% more.

In a town like Ibitinga, cutters from several companies live together in a common environment: many are related or have migrated from the same area, and usually live in the same neighbourhoods. They also go to the same bars, where they talk about football, other people's lives, and work - including pay raises negotiated between the union and the company in that year.

Leila, a member of the union of rural workers from Ibitinga, uses that image to explain why local companies sign agreements by the

same rates. If cutters from one of them feel damaged compared to their colleagues... there will surely be a strike.

By and large, in the annual campaigns, labour unions start asking for a 10%-raise and end up closing a deal for about 7%. All that needs to happen is one company to close a deal and the cascade will start: unions usually do not get a higher value in the bargaining with the others.

In 2009, the pay raise in Santa Fé was 5.43%. Fabiane, an employee with the union of rural workers of Nova Europa - the main negotiator with that company - was surprised by the figure: the lowest value negotiated since 2002, when she started working at the union. But, since other companies in the area had already closed deals for similar values, it was taking or leaving.

When companies get in trouble, workers are the first to be threatened: small raises are one of the indications, besides many dismissals.

A report made by the NGO Repórter Brasil's Biofuel Watch Center offers an explanation for the squeeze in the industry: while the financial crisis triggered in the second half of 2008 reduced the amount of credit available in the market, companies started taking up debts driven by their desire to expand in order to follow the increasing demand for alcohol, generated mainly by the success of flexpower vehicles (which run on both alcohol and gasoline)

Fabiane believes that in 2008 and 2009 strikes in the industry were stronger than in previous years, both because of the crisis and because workers are more aware of their rights.

Still holding a Bible after Sunday service at the Baptist church, shy-looking Valmir, one of the 17 born in Ibitinga in a group including also 23 workers from the state of Bahia working at Zanin since 1989, speaks enthusiastically about last year's strike. They stopped working for 17 days, unhappy about what the company offered to readjust their wag-

Exhausting labour in sugarcane in Ibitinga



es. The whole company stopped, which means 1,500 men. He underscores: the whole company. Only from Ibitinga, that included the four buses (only two remains in 2009), and other from Nova Europa, Dobrado, Tabatinga, Matão.

Santa Fé's cutters did not go on strike, but in 2009 they stopped for one day because they did not accept the price paid for their work. They say there had not been strikes like that in the company for twelve years.

In spite of more intense mobilizations in the state, a general strike in São Paulo is unlikely. The last time it happened was in 1986, when, in Leme, a female worker was killed by the police during a demonstration. Two years before that, there was the historical strike in Guariba, where sugarcane workers resisted the establishment of seven streets per eito and denounced, with nationwide repercussion, the horrible work conditions at the traditional sugarcane region of Ribeirão Preto, the infamous Brazilian California.

In 1986, strike unrest reflected in Santa Fé. Abelo, who now owns a bar in Ibitinga, remembers running after his workmates holding his machete, to make them stop. A little embarrassed to tell the story, he says that he no longer remembers the demands, only that they were wage-related. Because of strike, the company sent away a couple of people from Bahia, including himself. He went to Zanin and returned to Santa Fé after five years.

At the time, denunciations emerged all over the country of companies cheating on employees. One of the demands was that employers stopped setting sugarcane prices in metres - a proposition later abandoned by employees and companies. As mentioned above, the price is set in tons. The conversion of that price is arduous, with complex calculations - especially for people with little education such as sugarcane cutters.

Back to the company, to try to understand how that conversion works. When the inspector distributes groups over the talhão in the early morning, he also gives a provisional value to be paid for the sugarcane metre. When I visited the company, it was 0.24 reais. Before noon, a sample is weighted and workers learn the actual price - guarantees the inspector. He also admits he always guesses the provisional price as low as possible, so that he has to correct it up, otherwise he will certainly get in trouble with cutters.

Sampling starts at 10 a.m. For each section collected by the carrier, the inspector uses a 2-metre wide compass of the same type used to count each cutter's production by the end of the shift. One of the workers elected by the group checks the counting of metres needed to fill the truck. If it is different from the inspector's, then the compass is used again. The sample truck, called 'the champion', is loaded with three eitos from distinct parts of the talhão in an attempt to represent the average sugarcane in the place.

A worker from a different group jokes with the measurer:

- That's going to be about 30 or so, right?...
- Almost. 24.
- Damn it, do you want my wife to starve?



Workers and sugarcane plantations: a common scene in the state of São Paulo

The champion is loaded with a total of 156 metres and then goes to the company's scale.

While the 1986 strikes were not able to end the price-per-ton calculation, at least there was a late achievement: the possibility of a cutter representing the group, or union members, to watch the weighting of the truck. In the case of this company, at least on this day an employee follows the measuring. To compensate what he loses by not cutting, his daily wage is a little higher than his colleagues', about 20 reais. But most companies, although they allow the control, do not make that distinct payment so that no one is willing to follow the weighting operation.

With the truck over the scale, the computer says 27 tons. The sugarcane is unloaded and the vehicle is weighted again in another scale. A technician explains that, even though the weight of the truck is registered, it always has to be weighted again, because fuel alone can make a big difference on the value paid to workers.

The truck only weighted 10.6 tons, meaning that the total of sugarcane was 16.4 tons. The weight is divided: 105 kg per metre. The base-price set for that product is 3.18 reais per ton - 0.33 reais per metre.

- Damn, what a big mistake I made! Cutters will be all happy - says the inspector.

He writes down calculations on a piece of paper, hands it to the group's representative and lets him go.



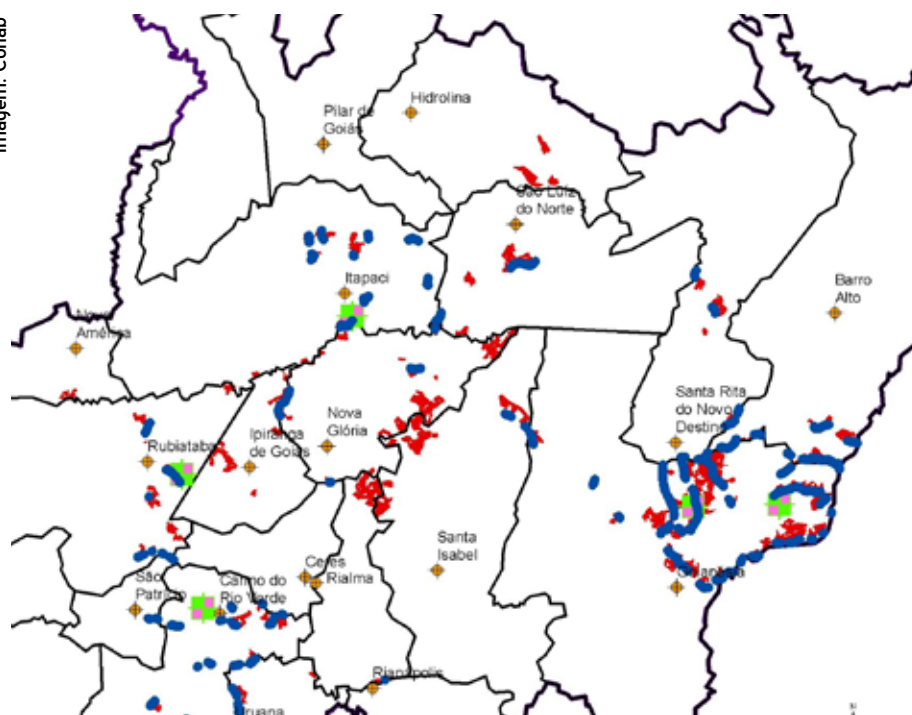
CHAPTER 2 ENVIRONMENTAL IMPACTS

In 2007 and 2008, the states of Mato Grosso (MT) and Mato Grosso do Sul (MS) were top of the list regarding deforesting as a result of sugarcane plantations. In 2007, the crop replaced 1,119 hectares of forests in MS and 1,892 in MT. In 2008, Mato Grosso do Sul was not included in the index of deforesting resulting from sugarcane, but in Mato Grosso, the area cut increased to 2,385 hectares. Data come from the National Institute for Space Research (Instituto Nacional de Pesquisas Espaciais, INPE), and were obtained through satellite images. According to the document 'Sugarcane ethanol - Contributions to climate change mitigation and the environment', produced in 2009 by Wageningen University (Holland) with support from CANASAT/INPE, between 2002 and 2006, about 125 thousand hectares of sugarcane expanded over land with a distinct previous use. That meant new areas for agricultural production - part of which were the place for deforesting as those seen in Mato Grosso e and Mato Grosso do Sul.

In the division of roles among employers' organisations, the Brazilian Federation of Agriculture and Cattle (Confederação da Agricultura e Pecuária do Brasil, CNA) has taken charge especially of changes in Brazil's environmental legislation - more permissive ones, of course. While CNA is an open advocate of those changes, the Sugarcane Industry Association (UNICA) has worked with discretion in debates and confrontations about those matters in Congress. In the backstage of Parliament in Brasília, however, the action of the sugar-alcohol industry is notorious for changes in the current rules of the game. On the one hand, because a large part of current sugarcane enterprises do not meet the environmental legislation regarding the establishment of areas of legal reservation and permanent preservation areas (APPs); on the other hand, because the industry advocates that future enterprises will suffer damages if the current legislations is maintained.

In Goiás, a National Supply Company (CONAB) survey showed the risk of expanding sugarcane over APPs and fountainheads (see map). Initially, CONAB paid attention to that issue only for the Ceres microregion (in Goiás's north-western area), but during 2010 it shall widen studies for the whole state, and in the future, to the whole country. According to CANASAT data, the Ceres microregion had an expressive increase in its sugarcane area between the year of 2005 and 2007, the first period studied.

Imagem: Conab



During the same time range, sugarcane areas extended towards water courses. In that micro-region, higher occupation was seen for sugarcane plantations in permanent preservation areas near processing plants, especially in the town of Goianésia - which has two of them, Goianésia and Jalles Machado - followed by Barro Alto, Itapaci, and Nova Glória.

According to the study, Goianésia has about 238 hectares of permanent preservation areas near water bodies occupied by plantations. In the town of Barro Alto, in turn, 63 hectares of those APPs are affected by sugarcane. In Itapaci, 46 hectares of APPs are occupied by plantations. And in Nova Glória, there are 27 hectares. That is, almost 400 hectares of permanent preservation areas are threatened by sugarcane plantations - only in one microregion of one Brazilian state.

Johan Moritz Marciano, an environmental and fiscal analyst with the Brazilian Institute of Environment and Renewable Natural Resources (Instituto Brasileiro dos Recursos Naturais e Renováveis, IBAMA) in Rio Verde, Goiás, explains that the pressure on APPs is repeated in the region covered by the agency. 'Today's major problem in our region is the evasion of permanent preservation areas', he says, adding that in some cases, the problem happens in areas leased from other owners, but company's own areas often cannot include APPs and legal reservation areas they should.

During 2009, problems related to APPs in the Rio Verde area (south-western Goiás) have generated several fines for the sugar-alcohol industry, total-

ling about 5 million reais. Each fine corresponds to 5-50 thousand reais per hectare, varying according to the size of the company, the area involved, enterprises' educational training, etc. According to him, in the case of processing companies, fines per hectare were around 30-40 thousand reais, giving an idea of the number of hectares where problems were found.

In order to prevent the problem from having its present dimensions - or larger ones, since the region is a frontier for major sugarcane expansion - the local IBAMA branch intends to get a more precise mapping on planted areas from each company, delimitating APPs and legal reservation areas. Such mapping will show whether or not those areas are occupied by sugarcane, etc. 'Our intention is to identify existing environmental liabilities and then reduce them', he adds. 'It is not only a punitive measure, but also orientation'. According to IBAMA workers, prosecutors might contribute to the effort of reducing liabilities by establishing conduct adjustment agreements (termos de ajustamento de conduta, TACs).

Other measures, such as requesting cancellation of loans, can also be adopted for the proposal to have the expected effects. The Rio Verde IBAMA branch is in charge of 30 towns. Travellers in the area see numerous signs for new enterprises as well as plantations and processing plants that are already working full blown. The 2009 crisis, however, stopped part of the investments and beginning of operations. And changes in the environmental legislation, which become stricter when it comes to authorizing and licensing sugarcane cutting with burning, improved the situation regarding burnings.

In spite of sugarcane expansion, Rio Verde presents strong farming activities in other areas, such as several grain as well as poultry and pork production, with thousands of animals slaughtered in the large factories existing in town.

Alleging budget problems, the municipal government proposed to extinguish its environmental department, but gave it up after mobilization by local society. According to Tony Parreira Braz, president of the Rio Verde Environment Foundation (Fundação Rio-verdense do Meio Ambiente, FURMA), the funds available for the department are below demand if the

scale of enterprises existing in Rio Verde is considered. 'It doesn't even have fuel to make inspection. It is inoperative', he criticizes.

He says that people are afraid to oppose local economic leaders (which are the same political leaders) and the municipal government. And they are right. 'Those people end up persecuted and suffer retaliation', he explains. His own story confirms his concerns: 'I'm a tax inspector. I went against company's interest and I was fired. Braz explains that he was accused of being 'rude to taxpayers who owed millions to the city'. After 11 years working non-stop for the city, his dismissal cost him four years of legal battles to get his position back, where he says he still suffer retaliation.

FURMA's president thinks that sugarcane monoculture can create new problems for the town, whether they are environment or labour-related, but he sustains he is not against this or that industry. 'Of course I'm in favour - I'm in favour of following the law and that town councillors have the courage to inspect companies and oppose vested interests', says Braz, who no longer has a fixed phone line since he was threatened several times because of his dismissal and his action at FURMA.

In case reports coming from Goiás' countryside sound too specific to the reader, here is the story of Daniel Aguiar, a researcher with INPE's Agriculture and Forest Remote Sensing Lab (Laboratório de Sensoriamento Remoto em Agricultura e Floresta, LAF) about the situation of permanent preservation areas in São Paulo. Aguiar is a member of a group of researchers who have been developing important studies on the sugar-alcohol industry, both in terms of cutting sugarcane by burning and the existence of deforesting or threats to food crops by the sugarcane industry. The studies, conducted as a dialogue with UNICA itself and the São Paulo state government, are becoming one of the main references in the country when the subject is sugarcane and might help to establish better practices for the private and public sectors.

In 2010, the LAF shall give especial attention to APPs, mapping all areas in the state of São Paulo and publishing monthly report on the matter. The first results obtained, however, allow Aguiar to say that 'there are several areas of conflict' between sugarcane plantation and permanent preservation areas. Such conflict in the largest producer state - and which is supposed to have the best production practices - sounds contradictory for those who read the article 'Sugarcane - the new paradigm for clean and renewable energy', by UNICA's president Mar-

cos Sawaya Jank, available at the association's website. 'Our third challenge is to turn UNICA into an example to be followed in the socioenvironmental area in Brazil and abroad. Our environmental agenda is large: eliminating sugarcane burning; environment licences and authorizations, preserving APPs; carbon balance; emissions of greenhouse effect gases, rational use of water, pesticides, and new transgenic varieties, edaphoclimatic zoning, certification and environmental seals', says the article, whose content reminds of Jank's speech at the opening of Sugar Week 2007.

However, an article published by UNICA's president in December 2009 in the newspaper 'O Estado de S. Paulo' seems to point out a real turn in the association's discourse regarding environmental issues. UNICA's president says that there are many examples in Brazil of irrational disputes between agriculture and the environment' and that the major one is the interpretation in recent times of the concept of 'legal reservation' provided for in the Forest Code'.

In his analysis of the provision to reserve 80% of the area for native vegetation in the Amazon forest, 35% in Cerrado areas within the Legal Amazon, and 20% in most of Brazil's territory, Jank sustains that 'in states with a long story of occupation of their territory (Brazil's south, southeast and northeast) there is no longer native vegetation enough to meet the 20% of legal reservation'. He says that such situation forces producers to abandon part of their planted areas to recompose native vegetation 'islets' within each property'.

Jank's understanding is that 'that demand is unparalleled in any country in the planet, even because it makes no environmental, economic, or legal sense. Its irrationality is a result of the fact that those 'islets' will never form an integrated ecosystem and will tremendously reduce agricultural properties' economic efficiency'.

Jank's estimate presented in the text is that the current interpretation given to the concept of legal reservation might compromise 3.7 million hectares of fertile land in São Paulo's territory and lead to revenue losses of 5.6 billion reais a year. He argues that 'depending on how that subject is treated, the largest destruction of value in the history of Brazil's agriculture will be at stake, incomparably higher than the damage caused by the persistent tariff and non-tariff barriers we have been facing abroad', and it is 'sad to see an anachronistic legislation with such a capacity to transfer income, money, and jobs to others countries. And those countries will certainly love that surprising modality of self-mutilation were are imposing'.

The article follows a line close to CNA president's discourse, where a nationalist bent is used to advocate private and vested interests. In a December 15 article, the title expressed the opinion of CNA president Kátia Abreu about the matter. Its website underscores that 'only Brazil gives up production for preservation' and that 'differently from wrong information that some NGOs insist on spreading, CNA's president explained that Brazil is doing very well to defend the environment and food production'.

In mid-January 2010, CNA resumed its advocacy of changes in the Forest Code, highlighting in its website's homepage that 'the [federal] government is back to the forest code', and published an article with the points that should be changed in the environmental legislation according to 'ruralists' view.

A Special Congress Commission has been created to examine the tens of bills regarding changes in the forest code. With reasonably flexible deadlines, the commission cannot approve legislation and only provides opinions on the proposals' merit. In case it reaches a conclusion - whether it is consensual or consolidates antagonistic views - proposals will then proceed to be voted by the House of Representatives and the Senate. Since this is an election year, it should be more difficult to conclude the commission's works before the end of this legislature, but the line adopted by employers' associations shows that there is an disposition to overcome such obstacle.

► Aiming at the Cerrado biome

Even if there is no change in Brazil's current environmental legislation, the Cerrado region shall lose large extensions of its biodiversity to sugarcane plantations in the coming years. According to data provided by Professor Nilson Clementino Ferreira, from the Goiás Federal University's Institute of Socio-Environmental Studies (Instituto de Estudos Sócio-Ambientais, IESA), by 2035 Cerrado might have lost about 600 thousand hectares to sugarcane in new deforested areas. As for its areas already dedicated to other aims (agriculture, pasture, and reforesting), over 10 million hectares might be converted into sugarcane plantations (see table). As a whole, the sugarcane area present in Cerrado would jump from 3.13 million hectares (2007 figures) to 14.56 million in 2035 - a 365% increase.

Ferreira says that figures underscore the need for measures to revert the current trend to destroy the Cerrado - approximately half of the biome (about 1 million km²) has been occupied and deforest-

| EXPANSÃO DA CULTURA DA CANA NA REGIÃO DO CERRADO - 2007>2035 | | | |
|--|------------------------------|------------------------------|----------|
| Uso do Solo (2002) | Cana 2007 (km ²) | Cana 2035 (km ²) | Expansão |
| Agricultura | 22.863 | 74.077 | 224% |
| Cerrado | 1.044 | 7.145 | 584% |
| Pastagem | 7.223 | 63.049 | 773% |
| Reflorestamento | 194 | 1.304 | 572% |
| Total | 31.324 | 145.575 | 365% |
| Fonte: Lapiq-UFG - Professor Nilson Clementino Ferreira | | | |

ed. 'There has to be urgent recovery of native vegetation in at least 30% of the area, if we consider the current legislation', he advocates, adding that 'if we take into account the ecological aspects, then an area larger than 30% should be preserved, in order to increase Cerrado's conservation units, which are very few'.

According to the professor's view, 'sugarcane plantations might seriously compromise important ecological processes'. Besides, Ferreira questions precisely how much water will be used to irrigate new sugarcane areas. He is concerned about the effect that large plantations might have on migration of Cerrado species and ultimately, about sugarcane's indirect effect on the Biome. 'Areas with remaining vegetation in the future can be occupied by pastures and crops that have been previously converted into sugarcane', he thinks.

The document 'Sugarcane ethanol - Contributions to climate change mitigation and the environment', of Holland's Wageningen University, underlines the professor's concerns. The study sees that 'the rapid further expansion of sugarcane areas forecasted for Brazil is expected to continue at the expense of current crop land and extensively managed pastoral land in the Cerrado region. This expansion may directly or indirectly affect parts of the Cerrado area with native vegetation and unprotected forest where biophysical, infrastructural and socio-economic conditions are favourable for sugarcane cultivation. Most threatened are those lands adjacent to current production areas. Environmental consequences of sugarcane expansion might range from quite acceptable (conversion of crop land and managed pastures) to very negative where sugarcane expands directly or indirectly in unprotected areas, which still have native vegetation with high bio-diversity or into native forest areas'.

► Other biomes

Expectation regarding Cerrado has its parallels, to a higher or a lower degree, in Brazil's other biomes. An exclusive survey conducted by the BWC based on data provided by SOS Mata Atlântica Foundation identified towns that most deforested the bi-

ome among the 250 with the largest sugarcane plantation area. The survey sought to examine town-by-town data from SOS Mata Atlântica in search of the amount

Marcelo Goulart, a state prosecutor from São Paulo, is concluding a report about the functioning of processing companies in the state's - and Brazil's - main producer region. Goulart has already told the BWC, however, 'that problems caused by sugarcane plantations in the Ribeirão Preto area are very serious, involving APPs, legal reservation, and burnings'.

Therefore, the aforementioned INPE, IBAMA and CONAB surveys on sugarcane pressure on APPs and legal reservation areas are very welcome. Such material might generate better practices in the future and correct current ones. SOS Mata Atlântica itself is considering establishing a closer dialogue with the sugar-alcohol industry in order to map remaining Atlantic Forest

areas - for instance, structuring potential ecological corridors between areas they identified.

In the Caatinga biome, in turn, in Barra, Bahia, the mere possibility of the establishment of an alcohol processing company destroyed part of local vegetation and changed the lives of tens of small farmers: in the area where the South Korean group announced it could establish its enterprise, land-related conflicts sharpened.

In that region, near the Boqueirão highlands, old (and large) farms live side by side (and not always peacefully) with several small far communities. The communities work by the system known as 'fundo de pasto'. In that model, families use the land collectively, for animal pastures and crops such as corn, beans, manioc, rice, pumpkin, watermelon, etc. In the Boqueirão area, residents of those communities say that the oldest groups date back from the 19th century, while other communities were formed from the 1930s on.

Now, with the news about the possible arrival of the Celltrion group, heirs of the Boqueirão farm work to prepare the property for a possible sale to the South Koreans. Therefore, there is talk about the transfer of up to 70 thousand hectares to the group - including the area occupied by the communities, estimated by the Land Pastoral Commission (CPT) in Barra at about 60% of that total. The communities resist the idea of leaving the area where they live and challenge the origin of documents that allegedly prove the area of the Boqueirão farm and its respective ownership.

| DESMATAMENTO DE MATA ATLÂNTICA NOS PRINCIPAIS MUNICÍPIOS PLANTADORES DE CANA (2005-2008) | | | |
|--|---------------------|--------------------|------------------------|
| Município | Área desmatada (ha) | Área plantada (ha) | Mata remanescente (ha) |
| Olímpia (SP) | 79.0 | 36.367 (27*) | 5.833 (11%**) |
| Itaquiraí (MS) | 73.0 | 16.906 (121) | 9.967 (5%) |
| Passos (MG) | 51.0 | 13.100 (184) | 4.095 (12%) |
| Arealva (SP) | 42.0 | 20.000 (93) | 715 (4%) |
| Itumbiara (GO) | 35.0 | 14.830 (158) | 2.984 (3%) |
| Rio Brilhante (MS) | 34.0 | 63.958 (3) | 12.891 (7%) |
| Iturama (MG) | 22.0 | 21.500 (79) | 3.588 (5%) |
| Itapira (SP) | 20.0 | 13.703 (180) | 2.533 (9%) |
| Mococa (SP) | 18.0 | 16.500 (127) | 2.727 (13%) |
| Nova Andradina (MS) | 15.0 | 12.285 (202) | 7.048 (7%) |
| * Posição no ranking nacional dos 250 maiores plantadores de cana no Brasil | | | |
| ** Percentual de Mata Atlântica remanescente em relação à original | | | |
| Fonte: Fundação SOS Mata Atlântica e IBGE | | | |

of hectares deforested in each one, which planted from 10-114 thousand hectares (Morro Agudo, has the largest planted area in 2008 according to IBGE).

In 51 of them - 37 in São Paulo - the biome was deforested between 2005 and 2008, totalling 699 hectares of Atlantic Forest deforested in the period. Olímpia, SP, with 79 hectares; Itaquiraí, MS, with 73 hectares; Passos, MG, 51 hectares; Arealva, SP, 42; Itumbiara, GO, 35; and Rio Brilhante, MS, with 34 hectares were top deforesters, followed by Iturama, MG, 22; Itapira, SP, 20; Mococa, SP, 18; Nova Andradina, MS, 15; Canápolis, MG, Ituiutaba, MG, Maracá, SP, Capivari, SP, and Fernandópolis, SP, 14; Pederneiras, SP, 13; Rancharia, SP, Santa Bárbara D'Oeste, SP and Iguatama, MG, 12; and Barretos, SP, Araras, SP, Quirinópolis, GO, Iacanga, SP, and Martinópolis, SP, with 10 hectares deforested.

Also in São Paulo, there are cases of cities that have deforested along their occupation process virtually all the Atlantic Forest existing within their limits, but keep insisting in cutting parts of the biome. It is the case, for instance, of Limeira, which has only 122 hectares (2%) of its original Atlantic Forest cover and has deforested 3 hectares. Santa Bárbara do Oeste, with only 1% of original forest, cut 12 hectares during the period observed, almost 10% of the 159 hectares remaining in late 2008.

Evidently, it is not possible to point out a direct relationship between deforesting in sugarcane champion towns and the industry itself. But the situation certainly deserves a closer look from organizations and authorities, which, in some cases, might indicate problems to be solved in the industry.



Photo: Luiz Henrique Parahyba (Fetaeg)

Helder Rocha da Conceição, a member of CPT in Barra, says that the community does not question that about 30 thousand of the 70 thousand hectares involved might really be part of the farm, 'even though no one knows for sure if the family has legitimate ownership over that land'. According to Conceição, land grabbing is historically a very common practice in the region. He sees the current situation as similar to some past episodes. For instance, the land conflict in Bahia that became known as 'the Manioc scandal' and the replacement of cotton, coffee, anil, and tobacco production with sugarcane in the British colonies of the Antilles in the 17th century. In the case in point, the backdrop is the state government incentives to biofuel production through programme Bahiablo.

According to Conceição, because of the current conflict, people from the community 'are being called to the police station, where they are intimidated. The farm owners' lawyers file pointless complaints, speak of threats to employees, occupation, things like that, and people are intimidated to go to the police station because of those baseless charges'.

On the other hand, community members are receiving supposed tittles on their land, but with recommendation to register them only within a few years. 'But the title is valid only with the registration!', Conceição challenges, also questioning the possibility that families keep using land collectively amidst a huge sugarcane plantation - two ideas, it seems, really irreconcilable.

Local land has good quality and 'people plant almost everything with no fertilizers. The name of those communities is related to that, they are called "baixões" [lowlands], highly fertile land,' Conceição explains. Local fauna and flora are also very rich. 'Very often we find at the Boqueirão animals like teiú (a lizard), armadillo, some local types of jaguar, leopard, puma'. In order to delimitate the land to be sold, Caatinga areas were suppressed by the opening of channels (photo). 'Only by that work we can have an idea of the magnitude of the land they intend to claim: it's kilometres and kilometres'. The vegetation, put down with tractors by employees of the alleged owners, is near the Grande, one of the main tributary of the São Francisco River.

Data from the Ministry of the Environment say that the biome Pampa would have already lost virtually half of its original vegetation. Marcelo Dutra da Silva, a visiting professor at Pelotas Federal University, studies the biome and thinks that 'the

change in southern landscapes is remarkable, in some cases, amazing'. Silva says that 'here we live in a great ecosystem. We are losing time and investing in the wrong economic model'.

Silva explains that Pampa in the state of Rio Grande do Sul is a space for high diversity, covering environments with distinct characteristics and types of vegetal cover - fields, forests, field-forest mosaics, wet fields, and marshes. Some of those regions have been through more change than others and some systems are under major threats. That is the case of natural fields that have been historically occupied by cattle.

Another example is the huge amounts of fields that have been turning into eucalyptus plantations. On the other hand, Silva points out that 'Pampa is not lost yet and its natural areas have a high potential for conservation, but we have to be smart'. He sees backward use and occupation of space regarding environmental zoning. 'We should have agricultural or environmental zoning that allowed us to assess the potential of resources, how they could be used, etc. We have to recognize space as a whole, which are its current uses and which could be', he advocates.

Silva sustains that the effect of sugarcane plantations on Pampa are still highly location-specific, 'but it is a sort of plantation that demands, in practice, converting the natural environment into large planted areas'. He adds that in the north of Rio Grande do Sul, around São Luiz Gonzaga, there are projects to acknowledge the production potential of sugarcane in southern Brazil and the behaviour of main varieties. 'Some people estimate that sugarcane might one day replace soybean and other grains, but I have a different view. I believe in diversifying crops. A strong economy is a diversified economy'.

In the researcher's opinion, the possibility to establish vast extensions of sugarcane plantations in the region, under the model now used for other crops, 'is just a threat that has been gaining ground, while others have been established for longer, such as soybean, rice, and also cattle, as well as eucalyptus planted on Pampa's fields, thus changing their status of open areas'.

As for possible - direct or indirect - connections between Pampa degradation and climate problems faced by southern Brazil (such as draughts, strong rainfall, and even tornadoes), Silva understands that 'we are suffering a lot more from global than local effects'. On the other hand, he says that if we face higher increases in temperature and rainfall, severely conducted activities causing more drastic changes might make the consequences even more serious.

In his studies, Silva seeks to identify soils' environmental weakness based on an analysis that related distinct thematic compositions. 'Weakness analysis attempts to identify actual or potential losses, where the most common form is by erosive force, and rainfall has everything to do with that'. He explains that the variables used include the level of erosive rainfall 'that might result in catastrophic effects if other variables do not compensate that important physical force'.

In recent years, a gradual increase in rainfall has been seen in the area. 'Therefore, if predictions are confirmed, my environmental weakness results for Pampa's environments will show major possibilities of loss or more sensitive environments (environmental weakness)'. In other words, the analytical model adopted might allow - as long as proper information is available - 'modelling future and extreme situations, allowing us to assess, in advance, occasional changes in soil and/or use conditions under situations of weakness in the environment'. At the same time, such modelling might help to employ conservationist practices and proper management for land occupation, both in the rural environment and within urban perimeters of big cities.

According to him, 'we have to plan more, to plan better. There are already enough models, technology, and knowledge for us to model future situations. We have to invest in human resources that are able to conduct such models, invest in research, and bring together what has been studied about it'.

In his understanding, investment in the area is still low. 'We have to invest more in that in order to carry out such enterprises'. Therefore, the recipe would be: proper management, research and development, respect for the legislation, and lots of planning, so as to overcome difficulties and solve the problems.

► Burnings

Regarding burnings, recent measures adopted by federal and state governments as well as the industry have been speeding up the replacement of manual by mechanized cutting, reducing its frequency, and seeking, if not to eliminate it, at least to reduce it at a faster pace. In São Paulo, for instance, between 2006 and 2009, the percentage of cutting without burning jumped from 30% to 54%, according to data from LAF-INPE. In Mato Grosso do Sul, in turn, state prosecutor Paulo Zeni filed a public civil lawsuit at the Dourados Federal Justice to demand that licences for burning sugarcane straw are preceded by an EIA/RIMA (Environment Impact Assessment and Report). The preliminary order has not been judged yet.

On the other hand, in some areas there has been clandestine cutting of sugarcane by burning. That is, processing companies, even without a license to burn, resort to that practice, counting on authorities' lack of capability to control how cutting is conducted. Sugarcane cutters in Goiás, for instance, have denounced that companies that have a license for mechanized cutting, with no burning, are ignoring that restriction in parts of their areas. Therefore, first they burn and then they use the machines to cut - breaking environmental and labour rules - as well as those related to public health, of course.

José Luís de Carvalho Sales, in charge of environmental education at the Environmental Protection Division of the Municipal Economic Development Department in Araçatuba, north-western São

In Goiás, burnings happen even in areas with no license for them



Paulo, explains that the city faces several problems caused by sugarcane burning, such as increases in temperature and the amount of CO₂ (release during burning) and smut that invades the city.

Carvalho Sales says that, in Araçatuba, problems resulting from burnings 'hit mainly the outskirts of the city, causing major disruptions such as air pollution and dirty houses, besides breathing problems for the population'. A biologist who specializes in environment education, he is also concerned with animals that started living in the large plantations, where burnings and harvesting end up causing 'a significant loss of the little fauna that remains'.

'Sugarcane monoculture since past centuries has caused several social, economic, and environmental impacts', he recalls, reminding that 'in the state of São Paulo, coffee has also generated high environmental impacts such as deforesting and the extinction of part of the native fauna, as well as extensive cattle industry'. He says that nowadays, 'with the boom in sugarcane plantations, as a result of the bio-fuel development project, both environmental laws and market demands force businesses to organize towards mitigating impacts'.

According to him, the current municipal administration has been concerned with sustainable development. Therefore, they have established a close dialogue with members of the Union of Bioenergy Producers (União dos Produtores de Bioenergia, UDOP), 'in order to underscore that the development of the city is essential, but according to sustainable criteria when planning public policies'. In order to answer that question, Sales points out the need to 'carry out a zoning programme in town, allowing other crops such as cotton, tomato, and peanuts to be established for the city no to be dependent only on the sugarcane monoculture'.

► Pesticides and smuggling

From 2004 to 2008, spending on pesticides in Brazil saw a substantial growth, from 4.45 to 7.13 billion dollars. The amount went from 463.6 to 673.9 thousand tons. Data provided by the National Association of the Industry of Agricultural Defence Products (Sindicato Nacional da Indústria de Produtos para Defesa Agrícola, SINDAG), the ranking of pesticide use follows agricultural production: Mato Grosso, São Paulo, and Paraná have respectively used 136.4 thousand tons, 108.4 thousand tons and 107.8 thousand tons. A little behind come Rio Grande do Sul, Goiás, Minas Gerais, Mato Grosso do Sul, and Bahia.

Between 2004 and 2008, pesticide consumption by sugarcane went from 29.93 thousand tons to 50.34 thousand tons. With that increase, sugarcane is ahead of cotton in the total amount of pesticides consumed, only behind corn (about 50% less) and soybean (absolute, accounting alone for almost half of the country's total consumption).

In Dourados, MS, the western branch of EM-BRAPA Agropecuária started in 2009 a research project aimed mainly at studying the environmental behaviour of two pesticides that are often used in sugarcane in the state. According to researcher Rômulo Penna Scorza Junior, studies focus on lixiviation, degradation, and sorption of those substances by local soil. He explains that lixiviation refers to the movement of pesticides with water infiltrating soil, thus determining how deep it goes and assessing the potential for underground water contamination. Other items examined are related to assessing soil persistence (degradation) and its ability to retain (sorption) those pesticides, thus preventing them from being lixiviated.

With the results expected from the study, the researcher's team hopes to be able to 'help assessing the crop's sustainability in the state or even proposing new managing techniques in order to reduce its environmental impact'. The project is funded by EM-BRAPA (IDB/Agrofuturo), CNPQ, and FUNDECT-MS and has already begun collection of soil samples to examine pesticide residues at different depths. The degradation and sorption study stages of the project shall start soon.

In 2007, smuggling of pesticides into Brazil resulted in an operation that led to the dismantling of four criminal organizations, 70 arrest warrants, and the apprehension of 13 tons of illegal products. Federal police officer in Corumbá, MS, Mario Paulo Machado Nomoto, in charge of 'Operation Ceres', explains that it lasted eight months and pointed out soybean, sugarcane, and cotton plantations as the mains destinations of illegally sold chemicals. According to him, most pesticides banned in Brazil or those not banned but arriving through smuggling are made in China and enter the country through Guairá, PR, and Mundo Novo, MS, coming from Paraguay, and through Santana do Livramento, RS, coming from Uruguay. Nomoto explains that products from Paraguay arrived in large scale, and the neighbouring country is the main entry door, before the goods are traded again in Brazil, while material purchased through Rio Grande do Sul is sold in the retail market.

Pesticides arriving that way do not have the 'triple registration' and there are no guarantees of their effectiveness and safety. Illegal product pur-

chasers test the active principle existing in the product, which often comes in lower levels than the original. 'Producers trust those products without trusting', says the police officer. He says that the main Brazilian state benefiting the most from illegal pesticides is Mato Grosso and that this became 'clear with the apprehensions'. Mentioning the areas of Primavera do Leste, Rondonópolis and Sorriso, he explains that in Mato Grosso, cotton is the main crop involved. In the two other champion states, in turn, soybean is the main crop in Mato Grosso do Sul and sugarcane in São Paulo.

In one of the dialogues intercepted during the operation, an attempted negotiation of Syngenta's Envoke - a pesticide for sugarcane - was recorded. The deal ended up not happening, but it shows why some producers and 'tradespeople' venture with smuggled products. Sold for 3 thousand dollars a kilogram in Brazil, Envoke used to arrive through the border at 800 dollars. 'The profit in this trade is the same as in drug traffic, but punishments are softer', says Nomoto, explaining that some drug dealers have even changed business because of that.

The operation, he says, certainly had an inhibitory and educational effect, but other gangs were formed after operation Ceres in order to occupy the space opened by the arrests of those in charge of the scheme. SINDAG's Fernando Henrique Marini says that his organization estimates that illegal products account for about 10% of Brazil's market, according to the last study commissioned by his organization to an international consultancy firm. According to Marini, the products, which are made in China and sold to Paraguay and Uruguay, are legal in Brazil's neighbours, but when they are sold to Brazilian farmers, they become illegal for lack of license registration in the country. Marini explains that the agencies in charge of that are the ministries of Agriculture, Environment (via IBAMA), and Health (via ANVISA). When illegal products are traded, two essential documents are not provided: purchase receipt and the agronomical prescription issued by a competent professional (an agronomist, for instance).

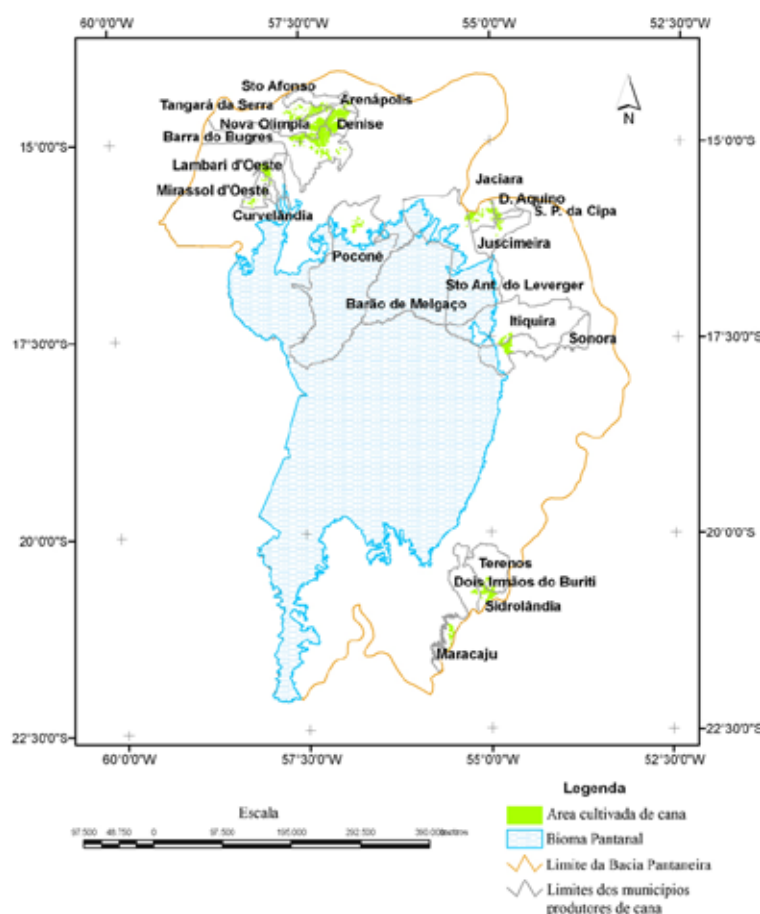
Besides, package labels come in Spanish (Portuguese labels are mandatory in Brazil) and empty packages of illegal products cannot be returned at regular collection centres (according to CONAMA guidelines) and they are thrown out improperly, in the environment (by roadsides, near lakes, rivers, pastures, or are buried and burned).

► Risks to Pantanal?

In the current scenario, an important question to be asked is whether the combination of increase in pesticide use and smuggled products could cause some sort of risk to Pantanal's biome? Researcher Rômulo Penna Scorza Junior says that they 'are still conducting experimental studies to answer those questions'. Anyway, he adds that EMBRAPA in Dourados has already made studies to assess potential contamination and will rank the most frequently used pesticides in Mato Grosso do Sul and which ones will be more likely to contaminate water resources. 'Now, we will have some research projects to really collect water samples and analyse pesticide residues'. Those analyses are only possible after the 2009 restructuring of the pesticide residue analysis lab.

The article "*Space-time dynamics and environmental characterization of sugarcane plantation in the Pantanal basin*", written by researchers from the INPE's Remote Sensing Division¹, raises important issues about the risks caused to Pantanal by sugarcane expansion.

The study underscores that, in recent years, 'sugarcane had high expansion rates at the Pantanal Basin', where most of the water that feeds life in Pantanal comes from. According to researchers, 'there should be a warning, especially regarding the crop's



expansion into areas of environmental risk, such as those near Pantanal (0-10 km) and in soils less apt for its production, for instance, sandy soils that are more prone to erodibility e lixiviation'.

According to the study, the area with higher expansion in sugarcane plantations is that located between 25 and 50 km from the Pantanal's border, which saw grew 27% a year between the 2005/06 and 2007/08 harvests - a figure twice as high as the annual increase seen in the ranges of 0-10 km (12.6%), 10-25 km (12.4%), and 50-100 km (12.3%). The 100-200 km, in turn, presented an annual decrease of 4.3%.

The article considers protection mechanisms for Pantanal, such as Mato Grosso do Sul State Law 1581/1982 (which bans new processing companies in the Pantanal Basin - PB, but allows existing ones to proceed) of 'questionable effectiveness'. In researchers' views, 'a proper scenario for protection would be provided by works studying sugarcane's real impacts, as well as other anthropic uses, to PB's ecosystems aiming at the ecological zoning of that landscape'.

The article concludes by saying that 'data presented show the continuous expansion of sugarcane, meaning that existing processing companies are no longer enough to absorb and generate the production demands for sugarcane in the PB. Therefore, State Law 1581, intended to protect Pantanal from sugarcane's potential impacts, has to be revised based on studies that assess the real impact of planting sugarcane in that biome'. That is a very important aspect to be taken into account, even when the Sugarcane Ecological Zoning proceeds in Congress (see page 35).

Given irregularities in the functioning of part of the companies existing in Mato Grosso do Sul, state prosecutors conducted negotiations with some of them. According to Dourados' prosecutor Paulo Zeni, negotiations were initially established in the legal districts of Sidrolândia, Naviraí, Dourados, and Batayporã. So far, only in Batayporã a Conduct Adjustment Agreement has been signed. 'In Sidrolândia an agreement was not possible and in the other cases negotiations are still going on. But it should be underscored that there are other districts where prosecutors are investigating and could result in future negotiations'. Zeni adds that during that period, directs negotiations were also conducted with state authorities, 'in order to contribute to improve the action of the state agency in charge of granting licenses'.

In the specific case of Sidrolândia, it has not been possible to establish a TAC with Companhia Brasileira de Açúcar e Alcool (CBAA), which belongs to the José Pessoa Group. For that reason, prosecu-

tor Fernando Zaupa filed a civil public lawsuit. Zeni explains that Sidrolândia's trial court judge granted a preliminary order, 'determining the immediate cessation of the company's activities in permanent preservation areas and legal reservations, as well as the presentation of relevant regular licenses, including EIA/RIMA, to the environmental agency'. The preliminary court order, however, was challenged at the Justice Court, which partly granted the company's appeal, giving it other 90 days to present the EIA/RIMA.

A preliminary survey conducted by the BWC on data provided by IBAMA's Coordination for Inspection Regulation (Coordenadoria de Normatização de Fiscalização, CONOF) shows that other regions of Brazil have the problems seen in Mato Grosso do Sul.

Data regarding irregularities committed by sugarcane and sugar-alcohol companies in the country in recent years include both the largest groups in the industry and some others with a history of violations, as well as those included in the so-called 'dirty list' of slave labour.

One of the most common problems is the habit of burning sugarcane - and the vegetation around it - without following relevant regulations. Another common violation both in small companies and in some larger groups refers to the lack of information required by IBAMA about environmental issues. Therefore, everything happens: from not presenting annual reports on the companies' activities to the Federal Technical Registry - sometimes for several years in a row - to functioning without the mandatory registration in the category of chemical industry producing ethanol, methanol, and the like.

The list presents more serious cases. For instance, companies notified for irregular disposal of pesticides, improper storage of products poisonous to human health, and irregularities in companies' licences - sometimes their inexistence.

As can be seen, there have been important advancement in the industry's practices, but problems also remain, with major challenges to be effectively faced - if the 'green fuel' proposal is to be for real, here and in the foreign market (and forums).

CASE | Scientists disagree about the real contribution of ethanol to the struggle against climate change

Brazil's policy of adding anhydrous alcohol into gasoline and the growth in the sales of 'flexpower' cars in the country shall prevent emission of 92 million to 203 million tons of carbon dioxide into the atmosphere until 2035. That is one of the conclusions of the report 'The economy of climate changes in Brazil', released in November 2009. The study was jointly conducted by 11 Brazilian research institutions: São Paulo University (USP), Campinas University (UNICAMP), Minas Gerais Federal University (UFMG), Rio de Janeiro Federal University (UFRJ), the National Institute for Space Research (INPE), the Brazilian Agricultural Research Corporation (EMBRAPA), a the Economic Research Institute Foundation (Fundação Instituto de Pesquisas Econômicas, FIEPE), the Institute for applied Economic Research (Instituto de Pesquisas Econômicas Aplicadas, IPEA), the Oswaldo Cruz Foundation (FIOCRUZ), the Brazilian Foundation for Sustainable Development (Fundação Brasileira para o Desenvolvimento Sustentável, FBDS), and the Amazon Institute for Environmental Research (Instituto de Pesquisa Ambiental da Amazônia, IPAM).

Known as Stern Report Brazil², the study projected economic impacts of climate changes in Brazil until 2050, working with two scenarios developed by the Intergovernmental Panel on Climate Change (Painel Intergovernamental de Mudanças Climáticas, IPCC)³. In both of them, the main commodities produced in the country shall undergo a decrease in areas apt for planting (see Table below). The exception is sugarcane: while areas proper for production have decreased between 30% and 34%, for instance, those with potential to be turned into sugarcane plantations would see an increase between 139 and 147%.

The relationship between climate changes and biofuels does not stop there. The expectations regarding increase in ethanol output and exports are directly linked to the fact that replacing fuel fossils with ethanol can be seen as a strategy to fight the so-called global warming. That is why EMBRAPA issued in April 2009 a technical bulletin called 'Mitigating greenhouse effect gases by using sugarcane ethanol produced in Brazil'. Researchers calculat-

ed CO₂ emission equivalent to a Chevrolet S10 single cabin pick-up truck, during a 100-km trip, using four types of fuel: diesel oil, pure gasoline, mixed gasoline, and sugarcane ethanol. Besides the emissions of the vehicle itself, the calculation considered the balance of Greenhouse Effect Gases (GEGs) emissions in the whole production cycles of each fuel: extraction, refining, and transportation in the case of diesel and gasoline; planting, industrial processing, and transportation, for ethanol.

The table below shows results of that comparison. They confirm that the use of sugarcane ethanol (whether added into gasoline or pure) really reduces the amount of GEGs released into the atmosphere.

► Methodology controversies

In spite being almost consensual among researchers that sugarcane ethanol helps mitigating climate change, there is much controversy about the real size of that contribution. Difficulties to agree on a result were evident in the workshop 'Socioeconomic, Environmental, and Land-Use Impacts', organized last May by the FAPESP Bioenergy Research Programme (BIOEN). At the time, three studies about the balance of greenhouse effect gases were discussed. They focused on only one aspect of the ethanol production chain: occupation of land by sugarcane plantations. In the study conducted by the University of Illinois on plantations located in several countries (including Brazil), the balance was negative, that is, sugarcane plantation worsened global warming. The study made by

| IMPACT OF CLIMATE CHANGES OVER AGRICULTURE IN BRAZIL | |
|--|-------------------------------------|
| Agriculture | % variation of low-risk area (2050) |
| Rice | - 12% in both scenarios |
| Cotton | - 14% in both scenarios |
| Coffee | - 17% or - 18% (A2 or B2) |
| Beans | - 10% in both scenarios |
| Soybean | - 34% or - 30% (A2 or B2) |
| Corn | - 15% in both scenarios |
| Sugarcane | + 139% or + 147% (A2 or B2) |
| Source: Economia das Mudanças do Clima no Brasil | |

the Centre for Nuclear Energy in Agriculture of São Paulo University (CENA/USP) showed an opposite result: soil with sugarcane sequestered CO₂ from the atmosphere. Researchers with EMBRAPA Agrobiology reached the same conclusion as the latter, only that they pondered that the accumulation of carbon in soils will depend on their level of degradation.

'Here uncertainty and variability around the figures we work with were visible', says the coordinator of BIOEN's Impact Division Heitor Cantarella. 'We have to standardize methodologies. Our intention is to create a working group to discuss that harmonization', underscored the programme's coordinator Gláucia Souza.

That uncertainty might help to explain why in the last meeting of the Roundtable for Sustainable Biofuels (RSB), in November in Switzerland, a proposal emerged to exclude the demand for biofuels to have a minimum percentage for reduction of GEGs over fossil fuels. Its main advocates were members of producers' chambers, especially soybean producers from Argentina and US corn producers. Given the threat by members of the environmen-



Jackson Schneider, ANFAVEA's president: ranking favours ethanol

| COMPARAÇÃO DAS EMISSÕES DE GEES COM USO DE COMBUSTÍVEIS FÓSSEIS E ETANOL | | | | | |
|--|---------------|---------------------------------|-----------------|-------------------------------------|---------------------|
| Modelo | Motor | Combustível | Rendimento Km/l | GEEs emitidos Kg CO ² eq | Emissão Evitada (%) |
| S10 cabine simples | 2.8 turbo | Diesel | 14 | 30 | — |
| S10 cabine simples | 2.4 flexpower | Gasolina pura | 10 | 35 | 0 |
| S10 cabine simples | 2.4 flexpower | Gasolina misturada (23% etanol) | 10 | 28.62 | 18 |
| S10 cabine simples | 2.4 flexpower | Etanol (cana de açúcar) | 7 | 7 | 80 |

Fonte: Circular técnica 27 da Embrapa

Photo: Roosevelt Pinheiro/Abr

tal chamber to leave the process, a compromise was reached: for now, the RSB has no principles or criteria defined for mitigating climate change, but it was agreed that it will adopt a Swiss methodology as standard for field tests, with three scenarios for relative decrease in emissions: 10%, 40%, and 70%.

Another example that illustrates the dispute between methodologies refers to the classification of vehicles made in Brazil in 2008 according to their level of pollutant emission. In September, the Ministry of the Environment (Ministério do Meio Ambiente, MMA) publicized a ranking showing that cars running on alcohol can pollute as much as those using gasoline. The so-called Green Note by the Programme for the Control of Air Pollution by Automobiles, however, considers only carbon monoxide, carbohydrates and nitrogen oxide emissions. Brazil's National Association of Automobile Manufacturers (Associação Nacional dos Fabricantes de Veículos Automotores, ANFAVEA) reacted and released its own ranking, includes CO₂ emissions, thus favouring ethanol-driven vehicles.

► The US standard

In May, US President Barak Obama announced the Renewable Fuel Standard (RFS), which creates devices to increase biofuel consumption in the US. The American demand for biodiesel and ethanol should reach 136 billion litres until 2022, but, in order to enter that market, the so-called green fuels will have to meet some standards, including minimum GEG emission reductions. In the American official ranking, sugarcane ethanol emerges as environmentally more efficient: it would reduce greenhouse effect gases by 44% compared to gasoline, while ethanol would reduce them by only 16%.

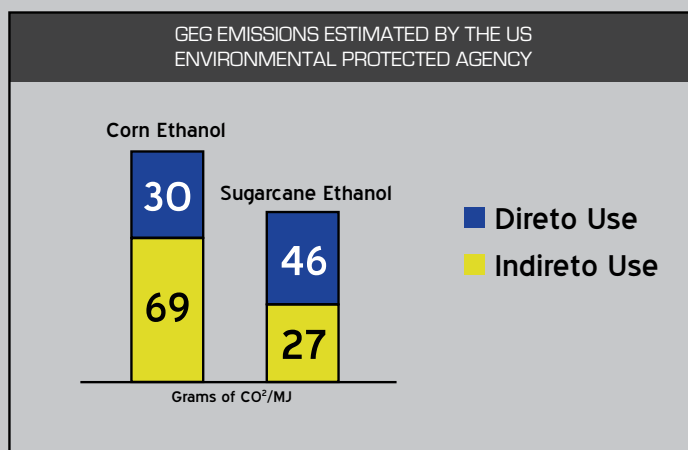
Notwithstanding, Brazilian researchers and businesses were not happy about the results, because the calculation made by the US Environmental Protection Agency (EPA) includes the so-called indirect use of land: estimates about deforesting resulting from migration of farming driven to sugarcane and corn plantations. Indirect emission accounts for 46 of the 73 g of CO₂ per megajoule established for sugarcane ethanol. In corn ethanol, of a total 99g of CO₂/MJ, only 30 would come from deforesting (see chart below).

'The model used to estimate the indirect use of land does not reflect reality, because it was based on old data that do not consider energy generation by sugarcane bagasse, plantations mechanization or increase in productivity', protested the president of the Sugarcane Industry Association (UNICA) Marcos Jank. As a research-



er with Campinas University's Interdisciplinary Centre for Strategic Planning (Núcleo Interdisciplinar de Planejamento Energético, NEPI/UNICAMP), Isaías de Carvalho Macedo agrees: 'I've been taking part in conference calls with American scientists in an attempt to adjust the model to our reality. Until 2002, São Paulo's sugarcane plantations increased because of sugar production and the recent expansion happened on pastures and plantations already open. So, it is not fair to transfer to our ethanol a debt it does not have', argued the researcher.

The indexes set by the US government might be reviewed, since the EPA opened a public consultation for organizations and institutes from all over the world to react to the figures released in May. In Brazil, for instance, the Institute for Studies on International Trade and negotiations (Instituto de Estudos do Comércio e Negocia-



ções Internacionais, ICONE), a non-government organization created in 2006 by agribusiness associations, sent a calculation based on its own methodology, developed in a partnership with Iowa University's Center for Agricultural and Rural Development and the Food and Agricultural Policy Research Institute (CARD/FAPRI). That methodology was named Brazilian Land Use Change - BLUM, since it would better fit the country's reality.

According to ICONE'S data, the relative reduction in GEGs with the use of ethanol increases to 64% (see table below). The US government has not yet spoken about suggestions and data provided in the public consultation.

| PERCENTAGE OF GEG EMISSION REDUCTION FOR SUGARCANE ETHANOL OVER GASOLINE | |
|---|--------|
| Source | Result |
| EPA's original analysis | -44% |
| Results generated by the Blum model | -64% |

CHAPTER 3 SUGARCANE AGROECOLOGIC ZONING

Increasing production of sugarcane ethanol and conquering the international market are two connected targets of Brazil's sugar-alcohol industry, which has received almost unconditional support from the federal government. To reach them, the government and the sugar-alcohol industry consider it necessary to signal to potential foreign buyers that Brazil's ethanol actually contributes to mitigate climate changes. In other words: expansion of sugarcane plantations will not destroy primary vegetation, especially the Amazon forest by releasing greenhouse effect gases into the atmosphere. It is in that context that president Lula launched on September 17, 2009 the Sugarcane Agroecologic Zoning (AEZ).

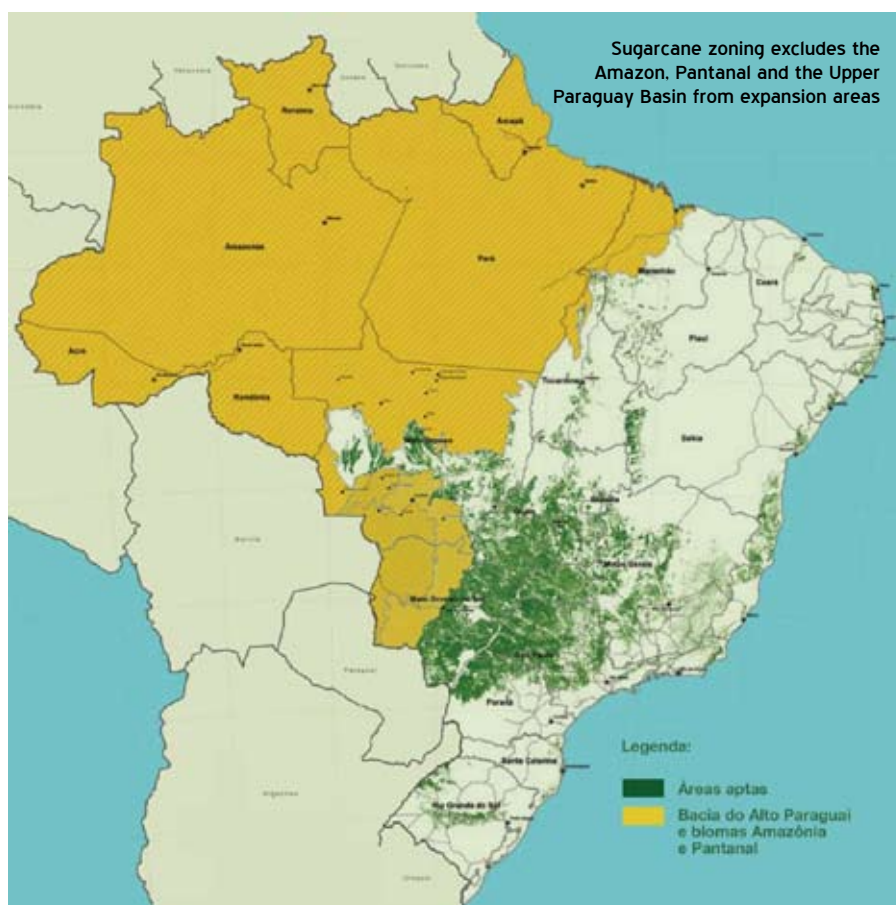
Photo: Wilson Dias/Agência Brasil

President Lula at the launching
of Sugarcane's AEZ in Brasília



The AEZ was officially published in the Presidential Decree 6.961/2009 and also became a bill in Congress (6.077/2009). Its launching was expected for a year, since the technical study coordinated by the Agroenergy Division of Brazilian Agricultural Research Corporation (EMBRAPA) was finished. In the internal dispute between environmental advocates (the Ministry of the Environment) and the ruralist segment (the Ministry of Agriculture) within the government, the former group was the winner: the federal proposition bans the expansion of sugarcane plantations and the establishment of new ethanol or sugar companies in the Amazon, in Pantanal are and the Upper Paraguay Basin. It also establishes that primary vegetation areas cannot be deforested to plant sugarcane and the crop cannot be extended to land with

declivity equal to or higher than 12% (where mechanization is not possible). Finally, it creates a certificate to be given to new enterprises in the industry by the Ministry of Agriculture, Livestock and Supply, guaranteeing that there will be no risks to food security.



Those are important advances, which should be considered as achievements, since they establish conditions for concession of rural and agribusiness credit. Following zoning guidelines, the National Monetary Council published on November 26 two resolutions (3813 and 3814) forbidding state and private banks to fund new sugarcane plantations and processing companies in the Amazon, Pantanal, Upper Paraguay Basin, indigenous lands, areas with declivity higher than 12% or those with native vegetation and reforestation. The measure was in force from the day of its publication, but it does not include plantations and companies established before October 28, 2009.

► Dispute in Congress and in the state of Mato Grosso do Sul

However, in order for AEZ rules to be enforced in a broader way, beyond banking operations, they have to become laws. In other words, Bill 6077/2009 has to be approved by federal representatives and senators. And according to the first reactions by the ruralist parliamentary group and Mato Grosso do Sul governor André Pucini (PMDB), its proceedings will be slow and troubled.

The president on leave of Mato Grosso Agriculture and Cattle Association (Federação da Agricultura e Pecuária de Mato Grosso, FAMATO), federal deputy Homero Pereira (PR), said he will lobby to change the original Bill. A similar stance was adopted by governor Pucini, who harshly criticised the AEZ and made violent remarks against environmental minister Carlos Minc. According to data from the State Department for Agrarian Development, Production, Industry, Trade and Tourism (Secretaria Estadual do Desenvolvimento Agrário, da Produção, da Indústria, do Comércio e do Turismo, SEPROTUR), Mato Grosso do Sul had 21 sugar and alcohol companies in September, 2009. The state government's expectation is that the amount tripled in a few years, since 21 others already have environmental licenses for construction and other there 48 other request under examination.

That helps to explain why on last December 15, almost three months after the federal proposition for sugarcane zoning had been sent to Congress, the Mato Grosso do Sul state parliament approved a law creating the Programme for Territorial Management of the state. As a result

of the first stage of debate about economic ecological zoning for Mato Grosso do Sul (ZEE-MS), the programme actually allows the establishment of sugar-alcohol companies in some areas within Pantanal and especially in the Upper Paraguay Basin. For ZEE-MT coordinator Sérgio Yonamine, the measure does not clash with sugarcane AEZ: 'Those who wish to expand sugarcane in those areas can do it as long as they have no bank loan', the manager provoked. 'What matters is that the law is a subsidy to



review the Sugarcane Bill in Congress', added Yonamime. The director of NGO Ecoa Alcides Faria disagrees: 'What they proposed is a monster. The proposition for [ecological economic] zoning [in Mato Grosso do Sul] has no technical basis; it creates zones that nobody knows what they are and opens the Pantanal for sugarcane plantations and processing companies. And anything you do there has an impact on the whole pantanal basin', the environmentalist criticised in a text published on the NGO's website.

Until now, the sugarcane AEZ Bill has not advanced much in the House of Representatives and seems far from reaching the Federal Senate. It was appended to another bill already related to sugarcane and ethanol production: Bill 3680/2008, presented by Deputy Pedro Eugênio (PT/PE), which turns farms with illegal sugarcane plantations into candidates for expropriation for agrarian reform. Officially, Bills 6077/2009 and 3680/2008 are undergoing common proceedings under a priority regime. But the permanent commission that shall examine the two bills has not even been established yet, even though the request for their establishment has been sent to the House's Coordination of Permanent Commissions on October 2.

Photo: Ivaldo Cavalcante/Agência Câmara

Congressman Pedro Eugênio (PT/PE): land reform in illegal sugarcane plantations



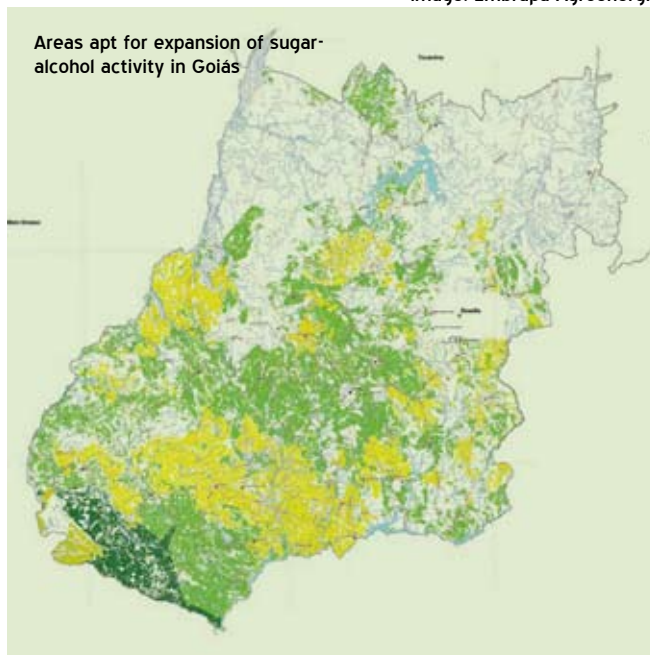
► More agricultural than ecological?

The risks around Sugarcane AEZ are not restricted to the difficulty to pass the Bill. By banning the crop's expansion in the Amazon, Pantanal and the Upper Paraguay Basin, the Federal Government's proposal shall increase the sugar-alcohol industry's pressure on the other biomes, especially Cerrado. "No-go" sort of propositions might leave the false impression that everything is possible elsewhere', warned Cristiane Azevedo, project manager of Minas Gerais-based environmental NGO Quatro Cantos do Mundo.

Goiás is one of the states where sugar and ethanol production should see the highest growth. The state has currently 401.8 thousand hectares of plantations, but sugarcane AEZ establishes that areas apt for new plantations total 12.6 million hectares (or 37% of the whole

territory, according to map below). The State Department for Environment and Water Resources (Secretaria Estadual do Meio Ambiente e dos Recursos Hídricos, SEMARH) says that Goiás already has 32 companies operating, 33 under implantation, and 15 others waiting for environmental licensing.

Image: Embrapa Agroenergia



According to Nilson Clementino Ferreira, professor of the Post-Graduation Programme in Geography of Goiás Federal University, the federal government should focus on recovering vegetation already destroyed by agribusinesses, especially in Cerrado, which has few conservation units. 'It is a lie to say that preserving the vegetation remaining in Cerrado, extremely fragmented and degraded, is an ecological initiative of AEZ. Planting sugarcane in the areas pointed out as apt might seriously compromise important ecological processes, since large plantations work as obstacles to the migration of endemic animal species that only exist in that region', the researcher regrets.

Ferreira also warned against the likely consumption of water in excess to irrigate plantations - a concern also stressed by the study 'The economics of climate changes in Brazil', released on last November by 11 Brazilian research institutions⁴ and coordinated by Jacques Marcovitch, a professor with the Economy, Business and Accounting School at São Paulo University (FEA/USP). Among other projections, the study modelled the impact of climate changes on Brazilian agriculture. The conclusion was an unfavourable scenario for the main commodities produced in the country, except for sugarcane, whose land apt for plantation shall increase 139-147% by 2050. 'Areas in southern Brazil, now with plantation restricted to sugarcane, might become regions with high production potential within 10-20 years. Places in the Midwest, now with low potential, shall remain as low risk areas, but will be increasingly

dependent on complementary irrigation during the driest season', explained the report 'Global Warming and the new geography of agricultural production in Brazil', which is part of the broader study.

Jacques Marcovitch: area proper for sugarcane shall increase up to 147% by 2050



Another critical point in sugarcane's AEZ is that it did not consider the Map of Priority Areas for Biodiversity Conservation. EMBRAPA Environment general chief Celso Vainer Manzatto justifies that the government has 'chosen not to use' the official list of strategic official regions of Brazilian fauna and flora because 'its scale is macro'. Besides, the AEZ is not an integrated agricultural policy, since it deals only with sugarcane, not considering the reciprocal influence of the dynamics of cattle or other crops. In other words: the government predicts that sugarcane plantations, which now occupy 7.8 million hectares, will double their area by 2017.

► The fait accompli logic

Even for the Amazon, Pantanal and the Upper Paraguay Basin, the sugarcane AEZ is no guarantee against the negative impacts of sugarcane and ethanol production. The bill sent to congress underscores that the new rules do not apply to 'installation and operations of industrial units that have an environmental license granted until December 17, 2009'. And the resolutions by the National Monetary Council, as seen above, leave out of bank loan restrictions plantations and companies established until October 28, 2009.

That means that Jayoro, which operates in the Amazon with no legal title on its land, will not be threatened by the AEZ. And that Biocapital will be able to get credit to produce ethanol in Roraima's natural fields, even

with the serious problems found in its environmental impact study.

In the Amazon, besides Biocapital in Roraima, there are at least four other projects for new processing plants for ethanol and/or sugar under way: Álcool Verde, in Capixaba (Acre), Curtipam, in Cerejeiras, and Santa Carmem, in Porto Velho (both in Rondônia), which already have their license for installation; and Bioenergia,

in Juara, Mato Grosso, about which the State Environment Department provided no details, because 'it is a delicate matter under discussion'. In the states of Amazonas, Pará and Amapá there is no request for new companies. In Maranhão, in turn, it was not possible to obtain a list of protocols regarding the Amazon biome because the State Environment Department says that processes 'were on paper, in folders classified by year' and 'it would take over a month' to gather the requested information.

CASE | Coca-Cola uses sugar from a company with no environmental license in the Amazon

The Brazilian state of Amazonas has only one operating ethanol and sugar-processing plant - Agropecuária Jayoro, in the town of Presidente Figueiredo - which will remain as the only one in the state if the bill for Sugarcane Agroecologic Zoning (AEZ) is approved according to proposal of the federal government banning new units in the Amazon biome. In spite of its relatively small production (on average 18 thousand tons a year), Jayoro's sugar indirectly reaches the whole country, besides Colombia, Venezuela and Paraguay. That is because the caramel in the mysterious formula of Coca-Cola concentrate distributed to all factories where the beverage is produced and bottled in Brazil and in the three neighbouring countries is made in Manaus.

Considered as a model plant by environment director of Coca-Cola Brazil José Mauro de Moraes, Jayoro is operating without having its environmental licence renewed for the year for its 4 thousand hectares of sugarcane plantations and its 400 hectares of guaraná trees by the Amazonas Environmental Protection Institute (Instituto de Proteção Ambiental do Amazonas, IPAAM). Despite that, it could renew environmental licenses of industrial units for sugar and ethanol production and guaraná processing.

The environmental license for the plantations was not renewed because of land irregularities that affect the establishment of the legal reservation, according to Eduardo Costa, an environmental analyst with IPAAM. The area occupied by Agropecuária Jayoro has 59 thousand hectares, of which 13% are deforested (4.4 thousand hectares with sugarcane and guaraná plantations; 600 hectares with roads and constructions and 2,670 hectares with degraded pasture). At first sight, it would be a good example of following the environ-

mental legislation, which allows up to 20% of deforesting in properties located in the Amazon. But formally, those 59 thousand hectares are the sum of areas in 17 estates, most of which are public land irregularly occupied or areas whose ownership has been granted by the National Institute for Colonization and Agrarian Reform (INCRA) less than ten years ago (when squatters who received the title can neither sell nor lease the land). 'In order to jointly consider the establishment of the legal reservation taking into account the total area of 59 thousand hectares, farming needs to solve the land problem', Costa explained.

'The land issue is an old problem in the Amazon region. Jayoro has a plan to work it out. We see that as nonconformity that can be solved', said the environment director of Coca-Cola Brazil. 'When we received our operational license, IPAAM did not question the regularity of the land documents we presented. If they had warned us in advance about the need for adjustments, that would be solved by now', argued Jayoro superintendent Waltair Prata. He added that the company has sent to IPAAM the land titles of the six estates registered in behalf of the company and, regarding the others, there will be an individualized environmental licensing process to be asked by the squatters themselves when they get their final titles from INCRA.

According to the head of INCRA's advanced unit in Presidente Figueiredo, Alfredo Nonato, land regularization in those areas might take place still in 2009, under Programme Terra Legal, created in order to simplify and streamline the process of granting titles of public land (which now takes about five years). The target of the programme launched by president Lula in last June is to regularize, within up to three years, 296.8 thousand possessions of up to 15 'fiscal modules' occupied before December 1, 2004 in the Amazon, of which about 58.5 thousand are located in the state of Amazonas.



Jayoro, whose deforesting took place in the 70s, is the only ethanol and sugar processing plant in Amazonas

On why the state government only now demands that Jayoro regularizes the enterprise's land, IPAAM director-general Aldenira Queiroz justified that 'public administration might review its acts any time'. She explained that only two years ago the agency started to have precise georeference data on target areas for environmental monitoring and from then on inspectors realized that 'the company incorporated more land than it owned'. In 2007 and 2008, the environmental license for Jayoro's plantations was renewed after it signed a Conduct Adjustment Commitment (TAC) with IPAAM.



'Besides the land issue, another clause not met by the company is the creation of a conservation unit. That's why this year's (2009) license has been cancelled', Queiroz said. Jayoro's superintendent argued that, four months ago, he presented to the Amazonas State Centre of Conservation Units the request for the creation of a Private Reservation for Sustainable Development. The project includes two areas under study, both within the company's premises: one with 334 hectares and the other with 304 hectares.

Federal prosecutors learned about the lack of valid environmental license for Jayoro's plantations in July, but, since the prosecutor in charge of the matter is on maternity leave, no charge or any attempt to sign a TAC with the company were made. Jayoro became a target to prosecutors last year, when they started an Administrative Procedure to investigate charges that the pesticide it used would be contaminating creeks and damaging family farmers around it. In 2008, IPAAM informed prosecutors that the company was meeting all legal standards. Early 2009, however, when they notified the agency demanding that it sent reports on the analyses of waterways used by the farmers, they were told (in May) that the license renewal was under analysis. Two months later, IPAAM sent an evaluation report informing that the license had not been renewed.

► Old project, new investors

Deforesting at Agropecuária Jayoro took place over 30 years ago, in the early 70s. The company emerged in the context of the federal programme Pró-Álcool, supported by the Amazon Development Superintendence (Superintendência de Desenvolvimento da Amazônia, SUDAM), but soon started declining. In 1995, when the enterprise was resumed with new investors (including Coca-Cola), there were only 30 hectares of sugarcane plantations, used to produce cachaça (sugarcane brandy).

'Now 70% of our sugarcane goes to sugar and the rest is used to make ethanol, with an average of 8 million litres a year, which is the maximum capacity of our distillery', said Jayoro superintendent. That fuel is sold to small distributors (such as ATEM'S and Distribuidora Nacional de Petróleo - DNP), which operate in the local market. 'For them, we are a guarantee of regularity in provision

when the boat (which brings ethanol from Mid-south Brazil) is late', says Prata.

Sugar production, in turn, besides serving Recofarma (a company belonging to the Coca-Cola group, which makes its concentrate in Manaus), is sold to small packagers in the capital. 'We serve only about 10% of the local demand for sugar. The region's largest providers are companies from Mato Grosso, such as Imarati and Jaciara', explained the superintendent.

Guaraná production also goes to Recofarma, to produce concentrate for the soda Kuat. 'So far we have sold guaraná syrup but we are starting to process its powder, which makes it easier to export it to Atlanta [Coca-Cola headquarters]. That also allows us to reach new markets, such as the cosmetics industry', he said.

► Goods practices

José Mauro Moraes, environmental director for Coca-Cola Brazil, pointed out that the company 'regularly audits' its providers, evaluating their environmental and labour practices. 'If any aspect is conflicting, an adjustment plan will be needed', the executive said. When asked if those periodical audits have shown problems at Agropecuária Jayoro, he argued that 'corrections' are normal in the industrial process. 'Irregularities always take place anywhere, and there are always reasons for correction plans. If you come right now to the Coca-Cola headquarters in Rio de Janeiro, you will find problems', Moraes provoked.

Jayoro's superintendent confirms that Coca-Cola - even more than government agencies - is the institution that puts the highest pressure on his company to adopt good environmental and labour practices. 'With their encouragement, we are under a process of ISO 14000 certification', Prata said. ISO 14000 is a series of norms developed by the International Organization for Standardization establishing guidelines on environmental management in companies.

The so-called clean technologies already adopted by Jayoro include channelling and pulverizing vinasse (the highly polluting liquid resulting from ethanol production) in sugarcane plantations,



serving as a supplementary fertilizer. There is also the use of sugarcane bagasse to generate electricity. 'In this harvest, we started using a new 5-megawatt turbo generator, which consumes less bagasse and produces more energy than the previous one. Our milling ended on September 29, but we were able to provide the company with locally-produced electricity until October 24, as well as storing some bagasse for the next harvest', celebrated the superintendent.

► Labour relations

Jayoro's permanent staff includes 650 employees, but that number reaches 980 during harvest. When the project was resumed in 1995, 70% of sugarcane cutters used to be brought from Maranhão in charter flights. Nowadays, the percentage of migrants decreased to 10% and part of the harvesting (40%) is mechanized.

'When I was hired by Jayoro, in 1999, the average daily sugarcane productivity of each cutter was 4.8 tons. It now increased to 6.7 tons', Waltair Prata says proudly. 'In order to increase it, we hired the most productive cutters, who used to have fewer accidents, to teach the others. During two harvests, they were paid to walk around plantations, giving tips to their colleagues', boast-

cuted the manager. Another strategy adopted by the company was the annual raffling of air tickets to north-eastern Brazil, for a person and a companion, among the team with the most accident-free days. All employees take part in the competition, including those in the industrial area.

'The worst problem I faced was to get those farmers, who are used to plant only manioc, to hunt in the morning in order to harvest in the evening, and train them', sustained Jayoro director Eduardo Camillo, who lives in São Paulo. 'When I arrived in Presidente Figueiredo, I order the destruction of the shacks where

cutters were lodged and the construction of dormitories. As soon as I entered the enterprise, my order was to have no bóias-frias (cold eaters) there', underscored the businessman.

Labour inspectors Rômulo Machado e Silva and Klênio Fábio Gomes Lima, from the Safety and Health area, were at Jayoro in 2009. 'The company is always in our inspection agenda. Their general conditions are good, workers use IPEs [Individual Protection Equipment], there are bathrooms in the plantations', Silva commented. Lima, who inspected the company for the third year in a row, agreed with his colleague's positive opinion. He underscored that Jayoro has adjusted to notifications made by auditors and mentioned the examples of seatbelts installed in the bus that transports workers, remodelling of the machete used to manually cut sugarcane (in order to avoid accidents) and construction of a proper place for meals at the work fronts.

The chief inspector of the State Labour and Employment Superintendence (Superintendência Regional do Trabalho e Emprego, SRTE) in the state of Amazonas, Francisco Edson Rebouças, however, reminds us that manual sugarcane cutting is exhausting under any climate, but even worse in the region's combination of heat and moisture. 'A worker cannot be happy cutting sugarcane under the 40°C sun of Amazonas', he summarised.

In September, another SRTE inspection team visited Jayoro and registered five violations at the company: employees were doing more than the legal two hours of overtime a day; overtime was paid or compensated, but not recorded as a whole in their card; the period for that payment or compensation sometimes would exceed the legal one-year limit; the time of workers' travel to the company was not counted as working hours; salaries were late.

Labour inspector Rômulo Machado e Silva: conditions at Jayoro are fair



Construction of a proper eating facility was recommended by the State Labour and Employment Superintendence

CASE | The struggle to cancel the environmental license of an ethanol processing company in Roraima

Two months before the federal government launched the proposal for Agroecologic Zoning (AEZ) for Sugarcane, which forbids expanding the crop and ethanol production in the regions of Amazon, Pantanal e the Upper Paraguay Basin, Biocapital received on July 15 a provisional license to establish its processing plant in the town of Bonfim, Roraima. The authorization was granted by the State Environment, Science, and Technology Foundation (Fundação Estadual de Meio Ambiente, Ciência e Tecnologia, FEMACT), even though a public civil lawsuit was filed on October 2008 by federal prosecutors and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), asking for competence for licensing to be transferred to the federal government and the issue of a new Environment Impact Assessment and Report (EIA-RIMA) for the enterprise.

The EIA-RIMA approved by FEMACT has serious problems. One of them is saying that there are no 'indigenous tribes' near the company, hiding the fact that within the area under its direct influence at least nine indigenous lands are partially located: São Marcos, Jabuti, Canaúanim, Manoá-Pium, Tabalascada, Malacacheta, Moskow, Serra da Moça, and Raposa Serra do Sol. In its 'Indigenous peoples' section, the RIMA used clearly anti-indigenous language, in the common style of 'too much land for too few Indians', presenting a table that informed that Roraima has 20 thousand Indians, which would mean 8.7% of the state's population, who hold 46% of the land, and intended to enlarge it to 73%.

According to the Roraima Indigenous Council (CIR), the state has at least twice the indigenous population pointed out by Biocapital: 40 thousand individuals belonging to nine peoples: Macuxi, Wapichana, Ingarikó, Taurepang, Patamona, Wai wai, Wamiri Atroari, Yanomami, and Yekuana. 'The Raposa Serra do Sol Indigenous Land, which provoked the rage of large landowners, has 1.74 million hectares for 19,025 people, with a 4% annual population growth, well above the state and national averages. That means a population density of 1.1 inhabitants per km² - which might seem low for south-eastern standards, but is nearly three times the density of the other areas in Roraima', reacted Júlio Barbosa, a member of CIR.

The study presented by Biocapital does not mention the fact that the pollution it will cause might discourage or even prevent visits to one of Roraima's important historical heritage sites. Fort São Joaquim is 10 km away from the area where Biocapital intends to establish its facilities, precisely on the way of the main wind that will carry smoke from the processing plant's chimneys.

Besides, the EIA-RIMA underestimates the potential impacts on Roraima's natural fields. The region has rich biodiversity, according to biologist Ciro Campos, from the National Institute for Amazon Research (Instituto Nacional de Pesquisa da Amazônia, INPA). He heads the Lavrado Environmental Group, a movement that has led the opposition to the ethanol plant. 'The EIA-RIMA presented by Biocapital considers only the company's implantation and operation, without assessing the environmental impacts of sugarcane plantations, such as the use of inputs and pesticides, suppression of native vegetation or increase in river sedimentation', Campos criticised. 'The bill on sugarcane AEZ sent to Congress opens breaches for companies already licensed to go to banned biomes. The thing is we don't see that as the case of Biocapital', the biologist fired.

► Strategic location

If sugarcane AEZ rules are approved by federal deputies and senators, Biocapital will be able to carry out its project to become the largest processing company in the Amazon region, serving with little competition the states of Roraima, Amazonas, Amapá, and Pará. The brochure offering the company's stocks at the São Paulo Stock Market (BOVESPA), launched in 2007, already said that the country's northern region is 'an underexploited market, which offers attractive business opportunities', where most of the ethanol traded comes from the southeast and Midwest at high prices. The town of Bonfim is strategically located 50 km from the Roraima's capital Boa Vista, which, in turn, has easy access through the BR-174 road to Amazonas's capital Manaus. Besides, still according to the document itself, the town borders on English Guiana and is near Venezuela, 'allowing occasionally exporting ethanol to Europe with low logistic costs'. It was not by chance that on the latest September 14 President Lula was in Bonfim to dedicate the bridge that connects Brazil to Guiana, crossing 230 metres of the Tacutu River.

CIR Indians challenge Biocapital's studies



Photo: Roosewel Pinheiro/Agência Brasil

Lula dedicated in Bonfim a bridge linking Brazil and French Guiana



Foto: Ricardo Stuckert/PR

The processing plant in Bonfim will be the first investment by Biocapital in the ethanol market. The company has a large biodiesel plant in Charqueada, São Paulo, which used only bovine fat as raw material and has its production chain stained by labour and environmental crimes. In Roraima, Biocapital intends to reach, by 2015, the milling capacity of six million tons of sugarcane per harvest, which will demand a planted area of 74,565 hectares.

'Planting sugarcane in places where rainfall is too high, such as the Amazon, is not productive, since it grows too much and does not provide the sucrose needed to make sugar or alcohol', sustained Biocapital executive-director Roberto Engels. 'But Roraima has about four million hectares of Cerrado, which nowadays is degraded and idle field and could be used to develop the region', advocated the businessman.

According to FEMACT's environmental analyst Maria de Lourdes Gomes, after obtaining the provisional license, Biocapital has two years to request a license for its installation. However, there will be no public debate: that is, if the company keeps to the original proposal already evaluated in the process to grant the provisional license, the installation license is easily obtained.

► Land and water

According to federal prosecutors, besides not conducting mandatory consultations to the National Indian Foundation (Fundação Nacional do Índio, FUNAI) and the Brazilian National Historical and Artistic Heritage Institute (Instituto do Patrimônio Histórico e Artístico Nacional, IPHAN), Biocapital does not have a license from the National Department for Mineral Production (Departamento Nacional de Produção Mineral, DNPM) to use underground water for industrial purposes. The EIA-RIMA made by the company establishes consumption of at least 1.5 m³ of water per sugarcane ton milled only in the industrial process (an ambitious target, five times below other plants operating at the same scale). If the promise is kept, its consumption would reach 10 million m³/year, besides the 100 million m³/year at plantations. 'For comparison purposes, it has to be said that the town of Boa Vista consumes on average 90 thousand m³/day, or about 32 million m³/year. That is, only during harvest months, that enterprise alone will spend three times the volume of water that the whole population of Boa Vista uses in a year', warned biologist Ciro Campos.

'Water for the enterprise will be collected through underground wells under proper licences, which will not influence the water capacity of the region's superficial rivers', answered Biocapital's general manager in an interview by e-mail. 'That is, there will be no impact on the Tacutu River and the company's whole circuit will be closed, and the effluents will be properly treated, resulting in no risk of contamination. That is, we can say that there will be no impacts on the town of Boa Vista, regardless of the amount used', Engels added.

Another problem denounced by federal prosecutors Ludmila Bortoleto Monteiro and Osmar Pereira de Matos, authors of the public civil lawsuit, is that Biocapital 'invaded public land', since the EIA-RIMA informs that the Arapari farm, where the plant will be built, has been 'purchased by the entrepreneurs' and has 1,642 hectares. But an administrative process set in motion by the National Institute for Colonization and Agrarian Reform (INCRA) at the request of the company itself, sustains that the farm has actually only 800 hect-

ares. That is, Biocapital would have unduly occupied 842 hectares of Union's land.

According to Engels, the suspicion that Biocapital took over public land is 'baseless'. 'The Arapari farm is an 800-hectare property with its final ownership title. The area estimated for the ethanol plant has 182 hectares - much less than the total area stated in the estate's registration', argued the company's general manager. However, he did not explain why the EIA-RIMA of the enterprise says that the farm has 1,642 hectares.

► Public civil lawsuit

IBAMA and federal prosecutors sustain that the federal government should be the one to grant a license to Bonfim's ethanol processing plant, since it affects indigenous lands and an area where studies are under way to establish a conservation unit, besides involving potential damage to an international river (the Tucutu, linking Brazil and British Guiana). 'Another situation showing FEMACT's incompetence to grant these licenses is the inexistence of a working State Environmental Council, which is mandatory under Article 20 of Resolution 237 by CONAMA [the National Environment Council, or Conselho Nacional do Meio Ambiente]', sustains the text of the public civil lawsuit. According to Campos, when the licensing process was open at FEMAC (November 2007), Roraima's State Environment Council had not met for two years.

The validity of the three public hearings held by FEMACT to discuss the EIA-RIMA (in the towns of Bonfim, Cantá, and Boa Vista) is also challenged by prosecutors. At first, they had been scheduled for October 13, 14, and 15 last year, having been cancelled later. The new dates (October 20, 21, and 22) were announced only on the day before, violating a state law that establishes at least 90 days between they are publicly called and their actual hearings take place.

Federal Justice has not yet made a final decision on the ground of action of the public civil lawsuit filed by prosecutors, which will be made by chief justice Fagundes de Deus, from the federal Regional Court at the 1st Region in Brasília. The preliminary order, however, was denied by Roraima's federal judge justice Helder Girão Barreto. The Attorney General's Office, through IBAMA, filed a bill of review in order to have the decision overturned.

FOOD SECURITY

In recent years, sugarcane monitoring by government agencies and universities confirmed the advancement of the sugar-alcohol industry over areas previously occupied by other farming activities. However, debate is still going on over whether crop replacement has brought (or can bring) damages to food production and consequently threaten the country's food security.

According to the Ministry of Agriculture, despite the increase in the sugarcane area, as a whole, grain productivity and/or harvests have remained stable and sometimes grown in recent years, which dismisses, so far, any impact on food production. Nevertheless, according to harvest surveys by the National Supply Company (CONAB) conducted in late 2009, the numbers might not sum up like that.

In analyses conducted in September-November 2009, for instance, CONAB points out that, compared to 2008, the sugarcane area increased 9.5% (from 7.07 million hectares in 2008 to 7.7 million in 2009). Wheat production, in turn, might fall 14.3% between the 2008/09 and 2009/10 harvests, while rice will fall 4.3%; corn, 0.1%; and beans will have a maximum increase of 2.7%. Only soybean should have a good performance, perhaps with an output 11.4% higher in this harvest.

► Sugarcane advancement on farming (agriculture and cattle) areas

In the last four years, according to CONAB, the sugarcane area increased 4 million hectares. The agency's director for Agricultural Policy and Information Silvio Porto says that the current area corresponds to 20% of what is used by grain crops in the country, but we should pay attention to the fact that sugarcane is concentrated mainly in the states of São Paulo, Goiás, Mato Grosso do Sul, at the region known as Triângulo Mineiro and north-western Paraná. That is, he underscores, it is important to bear in mind that this increase took place mainly in five states, precisely those among the country's major grain producers.

The view held by the government and the sugar-alcohol industry that sugarcane expansion will happen mainly on degraded pastures can be a future trend, but according to CANASAT, the monitoring system of the National Institute for Space Research (INPE), in the

states of Minas Gerais, Goiânia, Paraná, Mato Grosso do Sul, and Mato Grosso, food crops were those that lost the largest area to sugarcane in recent years (Mato Grosso also stands out for deforesting in order to plant sugarcane. São Paulo, which lost part of its citriculture area to sugarcane, is evaluated separately).

► Zoning and food production

| 2008 - ÁREA DE AGRICULTURA, PECUÁRIA E FLORESTAS SUBSTITUÍDA POR CANA (EM HA) | | | | | |
|---|----------------|----------------|---------------|---------------|---------------|
| Atividade | MG | GO | PR | MS | MT |
| Agricultura | 91.959 | 108.072 | 55.159 | 38.908 | 17.761 |
| Pecuária | 48.284 | 34.514 | 42.336 | 48.465 | 10.555 |
| Florestas | 876 | 0 | 0 | 0 | 2.385 |
| Total | 141.190 | 143.255 | 97.719 | 87.434 | 30.735 |

Fonte: Canasat/Inpe

| 2007 - ÁREA DE AGRICULTURA, PECUÁRIA E FLORESTAS SUBSTITUÍDA POR CANA (EM HA) | | | | | |
|---|----------------|---------------|----------------|---------------|---------------|
| Atividade | MG | GO | PR | MS | MT |
| Agricultura | 93.883 | 59.442 | 71.883 | 26.823 | 15.134 |
| Pecuária | 25.656 | 25.703 | 35.039 | 18.395 | 8.440 |
| Florestas | 739 | 0 | 0 | 1.119 | 1.892 |
| Total | 120.306 | 85.559 | 107.350 | 46.446 | 25.524 |

Fonte: Canasat/Inpe

| EXPANSÃO DA CANA SOBRE AGRICULTURA, PECUÁRIA E CITRICULTURA EM SÃO PAULO [EM HA] | | | | |
|--|-------------|----------|--------------|---------|
| Ano | Agricultura | Pecuária | Citricultura | Total |
| 2008 | 268.633 | 371.262 | 19.919 | 661.969 |
| 2007 | 304.625 | 321.119 | 8.997 | 636.814 |

Fonte: Canasat/Inpe

Sugarcane expansion over areas already occupied by other farming activities is one of the aspects dealt with by the bill on Sugarcane Agroecologic Zoning (AEZ). That is, seen as a potential threat to the country's food security, crop replacement led the federal government to suggest criteria for controlling it. The AEZ presentation brochure, however, has contradictions already in its opening, when it sustains that Brazil has 64.7 million hectares 'apt for plantation or expansion under distinct agricultural uses' (the area used for agriculture and cattle) and then says that the area is precisely that considered proper for sugarcane plantation - with appropriateness divided into high, medium and low. Nowadays, out of the total 64.7 million hectares where sugarcane could in theory expand, 19.2 million that are occupied by farming activities are highly apt for sugarcane, 41.2 million hectares with agriculture or cattle have medium aptitude, and 4.2 million hectares under these conditions have low aptitude. According to Cid Caldas, general coordinator for sugar and alcohol at the Ministry of Agriculture, Livestock and Supply (Ministério da Agricultura, Pecuária e Abastecimento, MAPA), his ministry will be in charge of authorising the replacement of other farming activi-

ties with sugarcane, taking into account a nationwide estimate on the impact of that reduction on Brazil's food security. That is, soybean advancement over corn areas, for instance, will not consider local or state reality, but rather grain production in the whole country. In a prospective exercise - since the AEZ is above all a technical guideline for sugarcane - two aspects can be considered relevant in this scenario: the total impact of reduction in food production and the displacement of that production to sugarcane exclusion zones - Amazônia, Upper Paraguary Basin, and Pantanal.

According to the AEZ, 34 million hectares now occupied by pasture and cattle - an area often degraded or underused due to the activity's low efficiency - can open space for sugarcane. That change, according to the government, could encourage investments in the increase of cattle productivity (cattle heads per hectare), but, considering the historical trend of the relationship between agricultural expansion and cattle, which has created increasing cattle occupation in the Amazon, for instance, there are no guarantees that such scenario will not deteriorate. Nowadays, the cattle industry occupies about 75 million hectares in the biome. The same could happen with crops such as soybean (which already takes about 1.6 million hectares in the Amazon) and rice, which have also spread over sugarcane exclusion zones.

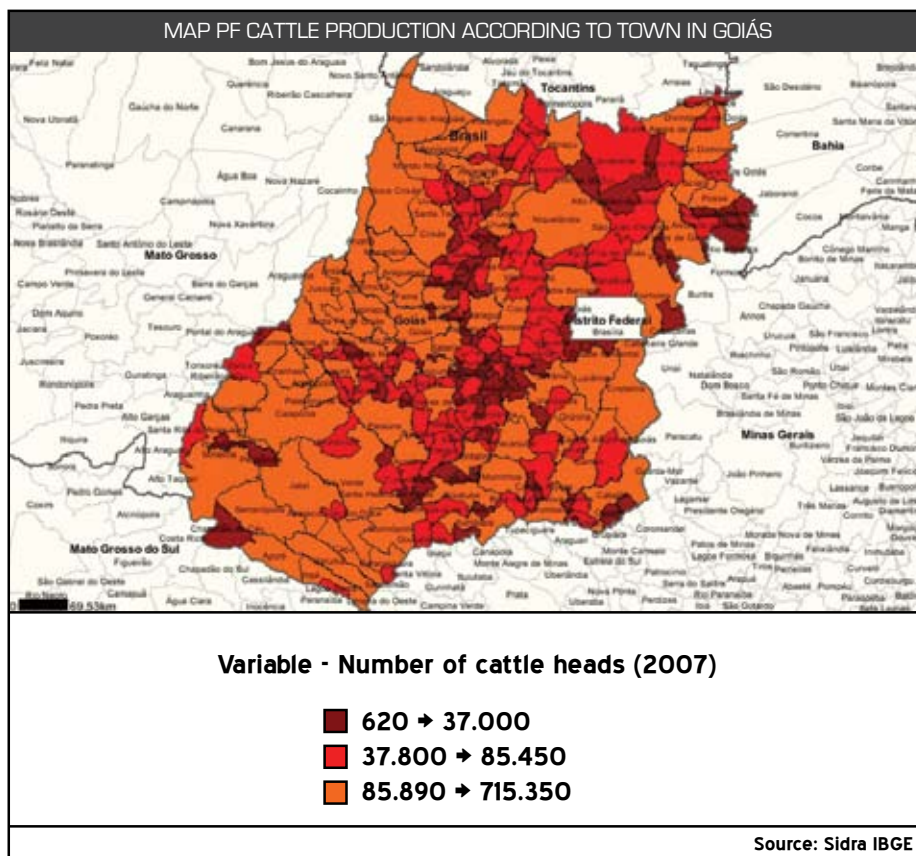
► Possible impacts on cattle and agriculture areas

According to the AEZ, states with higher aptitude for sugarcane expansion are Goiás, Mato Grosso do Sul, São Paulo, Minas Gerais, and Paraná, as well as the part of Mato Grosso that is not included in the Legal Amazon. Regarding cattle, the scenario in those states, according to surveys by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística, IBGE) in 2007, shows 20.4 cattle heads in Goiás, 25.6 million in Mato Grosso, 20 million in Mato Grosso do Sul, 22.5 million in Minas Gerais, 13 million in São Paulo, and 10 million in Paraná.

In spite of AEZ projections that sugarcane shall preferably occupy degraded, low-production pastures, there are no nation or state-wide data or surveys measuring the amount of areas in that situation. On the other hand, comparing AEZ maps on data and the zoning maps for cattle industry

made by the Automatic Retrieval System (Sistema IBGE de Recuperação Automática, SIDRA) points out that pasture areas apt for sugarcane plantation cover towns with high cattle productivity. Taking the state of Goiás as an example - which has 32 sugarcane companies in operation and 48 projects under way, 15 of which at their initial stage (preliminary analysis), 17 with preliminary licenses, and 16 with installation licenses - at the strip indicated by zoning as pasture area apt for sugarcane in the southern and south-eastern regions of the state (from Limeira do Oeste and Quirinópolis to Doverlândia, Caiapônia, and Piranhas), 2007 data from SIDRA point out the predominance of towns with high concentration of cattle (85-715 thousand heads). From the central region (Goiânia) to the northwest (Nova Crixás), concentration oscillates from medium (38-75 thousand heads) to high.

As for food crop areas, a comparison between zoning maps and data from SIDRA on agricultural production shows that, where there are pasture areas, several towns have high production of food crops (1-50 thousand hectares). Taking once again the state of Goiás as an example, where the zoning map shows pasture areas in the southeast, north, centre and northeast regions, there are mainly towns with 1-50 thousand hectares of rice, according to SIDRA. Those with 1-50 thousand hectares of beans also occupy most of the region pointed out by zoning as agricultural in the towns of Jussara and Santa Fé de Goiás, Rio Verde, Santa Helena, Jataí, Chapadão do Céu, Santa Rita do Araguaia, and Niquelândia. Towns with 1-50 thousand hectares of corn make up virtually



all area indicated by the zoning as viable for sugarcane. Serranópolis, Itaruma, Quirinópolis, and Gouvelândia, as well as Caiapônia and the region known as Entorno de Goiás, said to be pastures, are in fact heavy corn producers. The towns with the same productivity for soybean, in turn, occupy virtually all the agricultural area pointed out as apt for sugarcane.

According to CONAB's basic food manager Wellington Teixeira, since sugarcane plantation is directly related to the presence of processing companies - milling must happen within 36 hours from cutting - it is a fact that the surroundings of a processing plant, regardless of its previous activity, will be converted into sugarcane plantations.

Since soybean production in latest harvests has kept an increasing rhythm, as well as sugarcane's, the displacement of the crop is already under way, occupying family agriculture areas and creating impacts on more sensitive biomes. On the other hand, adopting a nationwide calculation to measure possible impacts of sugarcane on a food crop might considerably increase prices of crops that lose their areas, since transportation from distant places is one of the main costs included in final prices, says Teixeira. According to him, in case it is confirmed that AEZ will highly productive farming areas to sugarcane, its aim will have been totally distorted.

CROSSING IBGE AND AEZ DATA BY STATES

► The cattle industry

Mato Grosso | According to IBGE, in 2007 the state had 25.6 million cattle heads. In the pasture area pointed out as apt for sugarcane - a area going from the south-eastern (Upper Taquari) to the north-eastern (São Félix do Araguaia) regions of the state, towards the central area through Água Boa, Paranatinga and Nova Mutum - there is a balance between high (203-840 thousand cattle heads), medium (79-203 thousand) and low-productivity towns (13-78 thousand).

Mato Grosso do Sul | According to IBGE, in 2007 the state had about 20 million cattle heads. In the region pointed out by zoning as pasture apt for sugarcane, which occupies virtually all the strip between the state's south and northeast (from Iguatemi to Chapadão do Sul), towns with high productivity in their cattle industry prevail (275 thousand-1.8 million heads). Those with medium productivity (160-270 thousand) come in second.

Minas Gerais | According to IBGE, in 2007 the state had about 22.5 million cattle heads. In the pasture area shown by zoning as apt for sugarcane production, which covers

the whole western area of the state (from Carneirinho to Patrocínio), there are mostly towns with high bovine productivity (21-353 thousand heads). The same takes place in the north-western area (from João Pinheiro to Cabeceira Grande) and in the strip that crosses the state latitudinally (from Machado to Montes Claros).

São Paulo | In 2007, the state had about 13 million cattle heads. In the pasture area pointed by zoning as apt for producing sugarcane in the west of the state (within the triangle formed by Ilha Solteira, Teodoro Sampaio, and Paraguaçu Paulista), high-productivity towns prevail (21.5-135 thousand heads). The central region (an area covering the towns of Tupã, Promissão, Iacanga, and Botucatu), includes low (32-8 thousand heads), medium (8-21 thousand heads) and high productivity towns.

Paraná | Paraná has about 10 million cattle heads. In the pasture area indicated by zoning as apt for sugarcane production between the west and the north of the state (between Altônia, Cianorte and Santo Inácio), high bovine productivity prevails (26-172.6 thousand heads).

► Agriculture

Comparing zoning maps and data from SIDRA on agricultural output, it is possible to see that, where pasture areas are located, several towns have high productivity of food crops (1-50 thousand hectares). However, most important in that comparison is the indication that possible expansion of sugarcane over areas considered apt should cover those with high productivity of food.

Goiás | Where zoning maps point pasture areas in the towns of Dourados, Caiapônia, Rio Verde, Minerba, Aparecida do Rio Doce, and Santa Helena, in the south-east of the state; Porangatu, in the north; Goiás and Goiânia, in the centre, and Catalão, in the northeast, towns with 1-50 thousand hectares of rice prevail, according to SIDRA. Those with 1-50 thousand hectares of beans also cover most of the region pointed out by zoning as being occupied by agriculture, in the towns of Jussara and Santa Fé de Goiás, Rio Verde, Santa Helena, Jataí, Chapadão do Céu, Santa Rita do Araguaia and Niquelândia. Towns with 50 thousand hectares of corn make up virtually all the area shown as viable for sugarcane. Serranópolis, Itaruma, Quirinópolis, and Gouvelândia, as well as Caiapônia and the Entorno de Goiás region, pointed out as pastures, are strong corn producers. Towns with the same productivity of soybean occupy virtually all the agricultural area pointed out as apt for sugarcane.

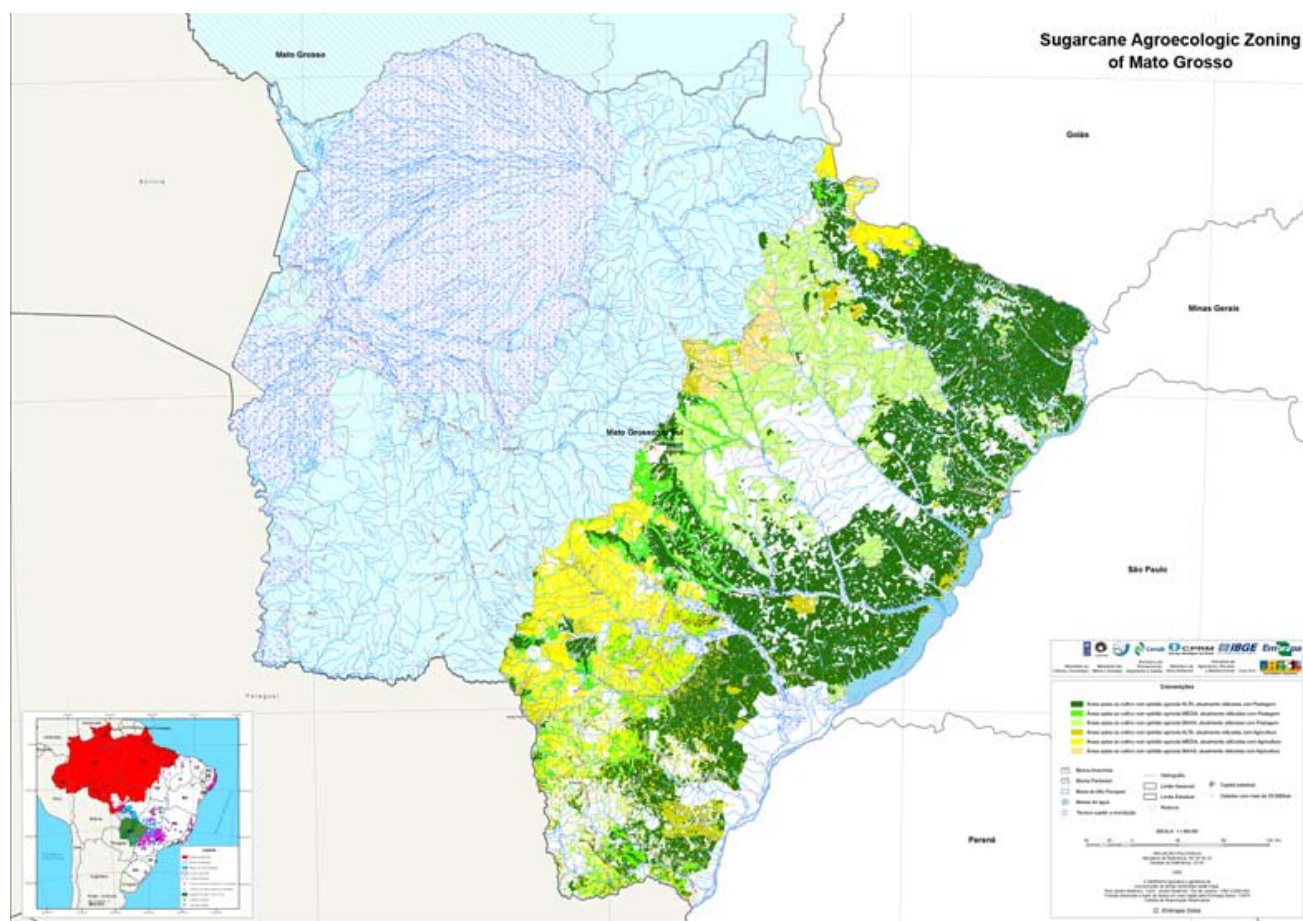
Mato Grosso | The whole agricultural area in the Midwest of the state said to be apt for sugarcane includes towns with 1-50 thousand hectares of rice. The same applies to regions pointed out as pasture areas in the southeast, such

as Primavera do Leste, Água Boa, and Canarana. The same Midwestern region - Campo Novo dos Parecis, Diamantino, and Sapezal - has high productivity for beans, as well as areas apt for sugarcane in the central region, like soybean champions Lucas do Rio Verde and Sorriso. Towns with more than 50 thousand hectares of corn make up virtually all the agricultural area in the state.

Mato Grosso do Sul | Most of the agricultural area apt for sugarcane in the state - the region of Ponta Porã, Dourados, and Rio Brillhante - includes towns with 1-50 thousand inhabitants. The same happens with the region of Chapadão do Céu (identified in zoning as pasture areas). Sidrolândia, in the centre, Ponta Porã, Aral Moreira and Vicentina, in the southwest, and Naviraí and Querência do Norte, in the north of the state, also considered good for sugarcane, are major beans producers. The whole southern/south-western area, partially classified by the zoning map as pasture, includes towns with high corn produc-

tivity. The same occurs in the northeast - Águas Claras, Cassilândia, Chapadão do Sul, Costa Rica, and Chapadão do Céu (pointed out as pasture areas in zoning). A very similar picture describes the soybean crop, which covers a vast strip from north to south of the state, between the towns of Pedro Gomes and Mundo Novo.

Minas Gerais | The region between Sítio d'Abadia, Arinos, Unaí, and João Pinheiro, in the northeast of the state, pointed out by zoning as predominantly pasture, with some agriculture, concentrates the main rice-producing towns. The area between Sítio d'Abadia, Buritizeiro and Ibiá, also considered mostly pasture, includes part of the largest beans producers. Virtually all the towns listed as apt for sugarcane have high corn production (1-50 thousand hectares), and towns with the same output of soybean cover the whole west and northeast of the state, predominantly identified by zoning as pasture areas.

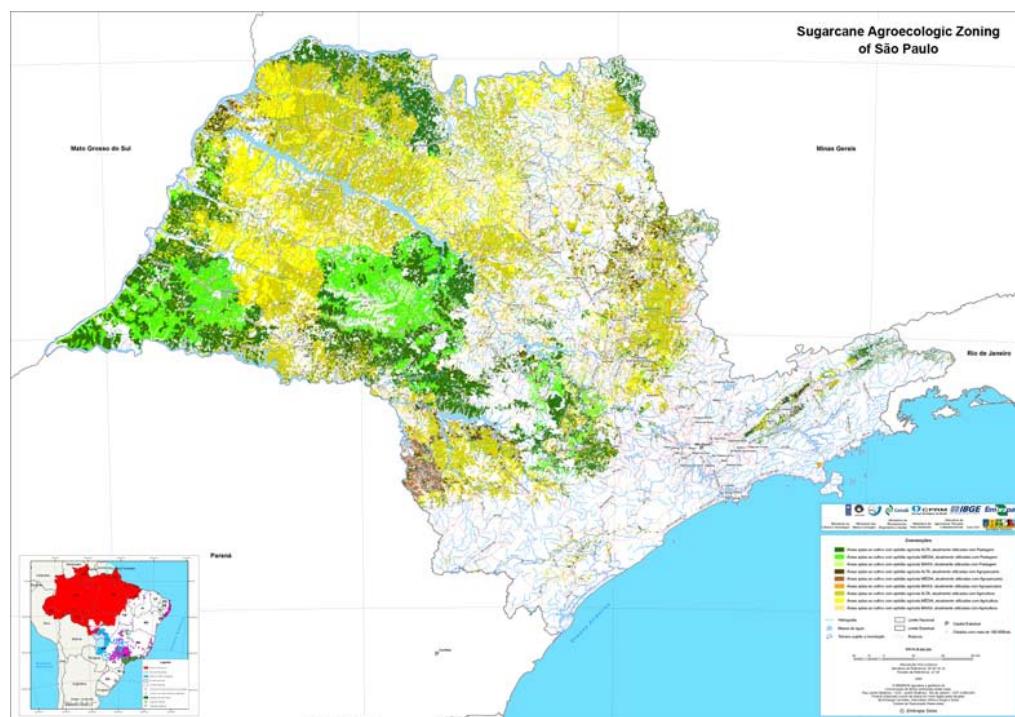
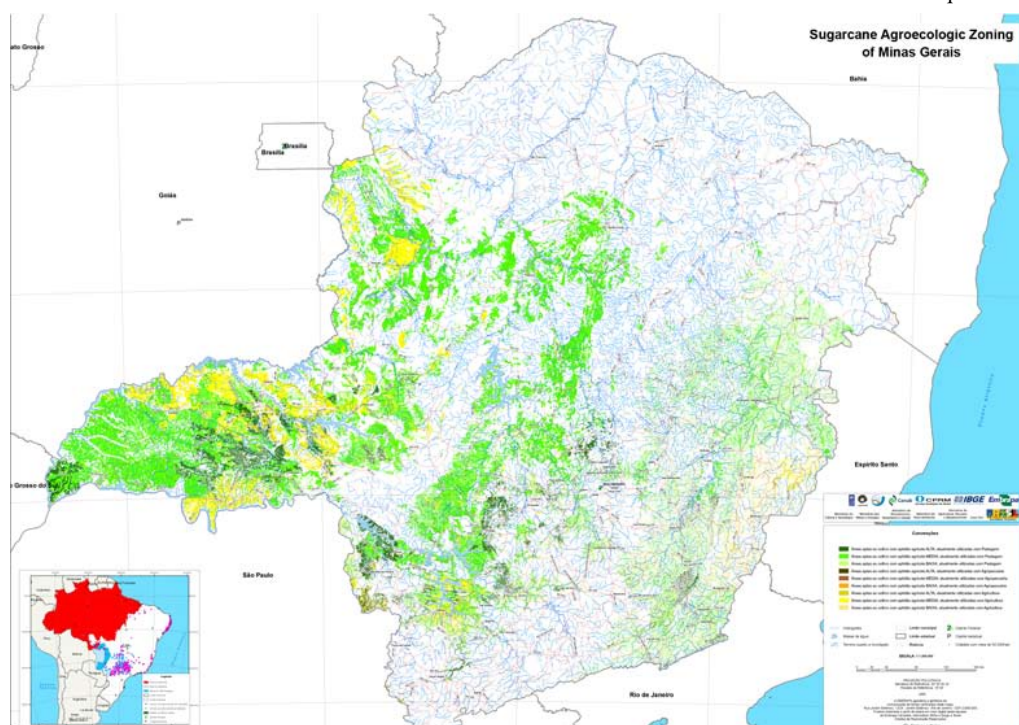


São Paulo | Rice areas in the northeast of the state are highly insignificant and should not suffer impact of sugarcane production. The same does not apply, however, to the main towns producing potatoes and beans – the region of Paranapanema, Capão Bonito, and Itapetininga, in the southwest, apt for sugarcane expansion. The main culture threatened by sugarcane, however, is corn, which covers

1-50 thousand hectares in virtually all towns considered good for planting sugarcane. Finally, soybean also occupies most of those towns in São Paulo's west and southwest.

Paraná | The few towns with rice plantations in the northeast of the state – Querência do Norte and Santa Mônica – and Londrina are considered apt for sugarcane. The same takes place with the largest producers

of manioc in the southwest, west, and northwest. Beans, in turn, which covers mostly the central area, the east and the northwest, should not be affected. Regarding corn and soybean, which cover virtually the same areas, the large producers in the strip that goes from the west, north, and northwest can be affected.





INDIRECT IMPACTS

It is still difficult to know whether sugarcane expansion in the southeast and midwest has pushed farming activities - particularly soybean and cattle - to other areas such as sugarcane-exclusion areas established by the Agroecologic Zoning (Amazônia, Pantanal, and Upper Paraguay Basin). The fact is that the northern region saw a 7.9% increase in soybean area in the 2009/2010 harvest over 2008/2009, according to CONAB's latest grain survey from January 2010 (in the northeast the increase was 8.9%, in the Midwest, 5%, in the southeast, 8.2% and 6.4% in the south).

According to IBGE's SIDRA, bovine cattle has also seen a significant increase in the northern region between 2007 and 2008, going from 37.8 million cattle heads to about 39.1 million. In the same period, the cattle industry in the Midwest saw a lower increase, from 68.08 million heads to 68.9 million; and in the southeast, there was a reduction from 38.5 million heads, in 2007, to 37.8 million in 2008.

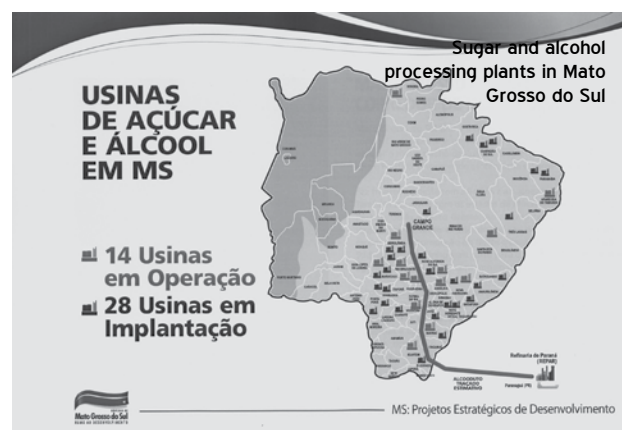
As has been said, sugarcane zoning is one of the tools within the government's strategy to stamp a 'green seal' on Brazilian ethanol before the world market, thus hindering deforestation, subtraction of native vegetation, and other impacts on sensitive areas and biomes. Cutting native Forest in Mato Grosso to plant sugarcane has indeed diminished between 2007 and 2008 - a trend that should be strengthened in the next period. However, it remains to be known whether the environmental impacts will not be 'outsourced', as farming activities displaced by sugarcane migrate to exception zones, or even turn into subtraction of the vegetal cover of areas to be later converted into sugarcane plantations.



CHAPTER 4 IMPACTS ON INDIGENOUS POPULATIONS

As mentioned in the chapter on Sugarcane Agro-ecologic Zoning, Mato Grosso do Sul, in spite of having its territory (Pantanal and Upper Paraguay Basin) considered as a sugarcane exclusion zone, has been making heavy investments in the expansion of the sugar-alcohol industry, especially in the state's 'south cone'. In the state government 'Strategic Development Project' published last year, Mato Grosso do Sul was considered the 'best place to produce ethanol in Brazil', with land available at competitive prices, easy mechanization, proximity to consumer centres and state government institutional support (since 1999, the government offers incentives on sales taxes (Imposto sobre Circulação de Mercadorias e Serviços, ICMS) to operations related to sugar and alcohol. Since 2006, when project MS Empreendedor (Enterprising Mato Grosso do Sul) was approved, incentives can reach 67% of sales taxes during up to 15 years).

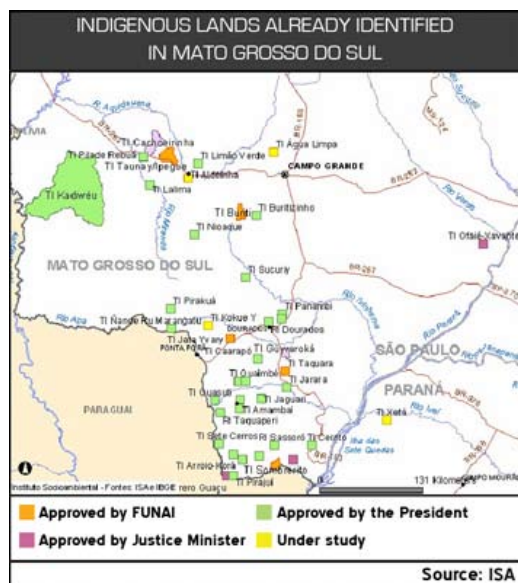
According to mapping made by the State Department for Agrarian Development, Production, Industry, Trade and Tourism (Secretaria Estadual do Desenvolvimento Agrário, da Produção, da Indústria, do Comércio e do Turismo, SEPROTUR)), the state has currently 14 processing companies in operation and 28 others under construction, and there are still 48 request for new units under evaluation.



Despite support by the state government, however, depending on results of anthropological studies for detection of indigenous areas resumed by the National Indian Foundation (Fundação Nacional do Índio, FUNAI) in late 2009, the advancement of sugarcane in Mato Grosso might be about to face some obstacles.

Among the 42 Indigenous Lands (ILs) already recognized in the state, a large part is concentrated within the sugarcane expansion area in the so-called South

Cone (between Dourados and the Paraguayan border), and according to federal prosecutors⁵, 16 processing plants are located in towns with Indigenous lands already identified and delimited by FUNAI.



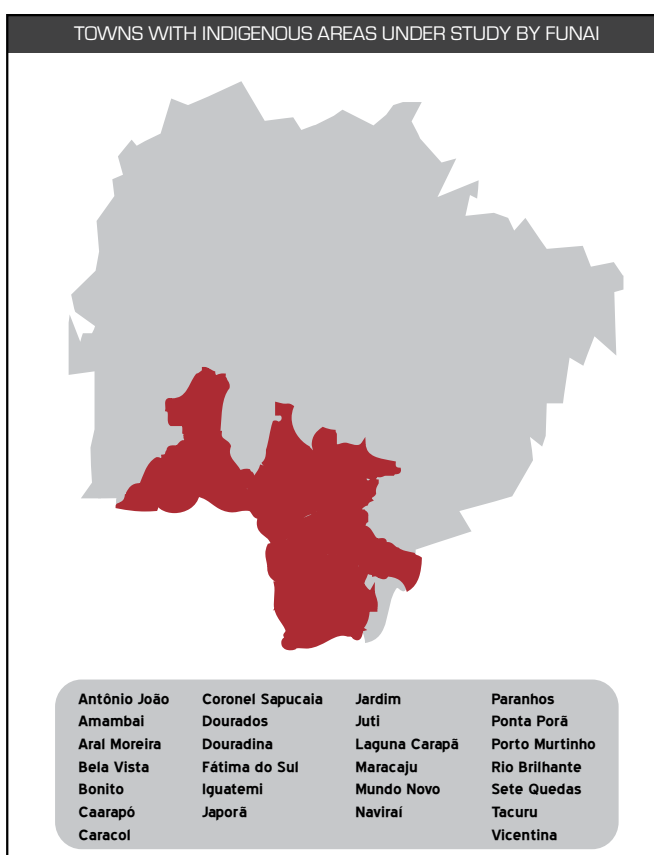
Since problems such as land conflicts and child malnutrition within the Guarani-Kaiowá worsened in recent years, mainly as a result of slowness of IL demarcation processes in the state, federal prosecutors and FUNAI have signed, in November 2007, a Conduct Adjustment Agreement (TAC) to resume anthropological studies on areas traditionally claimed by the Indians, but in September 2008, works stopped after strong lobby by the agribusiness industry and the state government itself.

In the second half of 2009, FUNAI announced that the work would be resumed, generating a strong reaction from governor André Puccinelli (PMDB). In an official letter to Justice Minister Tarso Genro on November 6, 2009, Puccinelli argues that the destination of that land cannot be seen as a solution for problems faced by the indigenous population. Above all, those people would need welfare, education and health policies, 'providing them with occupation and dignity, correctly and efficiently exploring the land that they already have'.

'This explanation intends to re-establish the truth and call the Justice Ministry of to close ranks with the Government towards serving society in Mato Grosso do Sul (composed by Indians and non-Indians) with equality, providing Indians with what they effectively need and guaranteeing non-Indians respect for the perfect juridical act and the right to property (...). In that context, given FUNAI's repeated breaking of agreements, I hereby request that you determine that the Foundation stops works currently conducted by its technical group, and all demarcation processes, even keeping the current Regulations in force, until a new round of negotiations is

established and works can be resumed according to the recent Supreme Court decision'.

Puccinelli also said that the state government will refuse to follow FUNAI's work since it does not want to be a 'mere assistant in a demarcation process that legitimizes actions [he considers as] contrary to interests of the (indigenous and non-indigenous) population represented by this government'. Notwithstanding the governor's positions, in December 2009 FUNAI working groups turned to the state to resume anthropological studies, which will include six basins (Dourados, Amambai, Iguatemi, Apa, Brilhante, and Ivinhema rivers), totalling 3.5 million hectares in 26 towns in southern Mato Grosso do Sul. Studies should be finished by mid-2010.



According to Marcos Homero Ferreira Lima, an expert anthropology analyst working with the federal attorney's office in Mato Grosso, even with the likely postponement of deadlines for demarcation of indigenous lands, the existence of communities that are near each other, with strong cultural, family, and economic links, which should be considered macrocommunities, can create future problems for producers whose areas overlap with indigenous lands. In any case, as pointed out previously, public funding for the sugar-alcohol industry was restricted by the National Monetary Council after the sugarcane zoning decree. Based on the AEZ, such fund provision for sugarcane is banned in Panta-

nal, at the Upper Paraguay Basin, and in the Amazon, as well as indigenous areas. In case the AEZ bill passes in Congress unchanged, the establishment of sugarcane exclusion zones will not only be a reference for public credit policy, but will be legally binding.

THE LAND ISSUE: INCREASING CONFLICTS

Land disputes involving Indians and farmers in Mato Grosso do Sul is one of the main causes for land conflicts with violence and victims in the state.

Confinement of indigenous populations in small areas for lack of demarcation of territories has encouraged violence at several levels, according to anthropologists and health experts. The top state for cases of violence against Indians in 2008, according to the Missionary Indian Council (Conselho Indigenista Missionário, CIMI), Mato Grosso do Sul saw 42 of the 60 murders of Indians in that year, driven by external attacks and internal conflicts. According to the document, as a result of confinement of populations in small areas, 'violence among Indians themselves is the most important indicator to assess the degree of tension and deep disturbance within Indian villages, also driving many families to roadsides or urban centres'.

In the previous year, according to the newspaper Campo Grande News, a survey by the National Health Foundation (FUNASA) showed that 'murders at Indians reservations in Mato Grosso do Sul increased 150% in 2007 over 2006. From January to October 2007, 35 Indians were killed in land conflicts or drug or alcohol-related episodes. In the whole year of 2006, there were 14 murders'.

According to the technical supervisor of FUNASA's Indian Health District, Zelik Trajber, 'Indians are confined in tiny areas and that is the root of the problems, added of the proximity with towns, where alcoholism and drugs come from'.

Besides Indian murders, violence suffered because of actions to take back traditional territories has been intensifying. On September 18, 2009, a Guarani-Kaiowá in Dourados, MS, was attacked by armed employees of the security firm Gaspem. Belongings and the shanties of people in the camp were burned and 62-year-old Indian Eugênio Gonçalves was shot. Documents presented by federal prosecutors and FUNAI indicate the involvement of employees and security guards of the Serrana farm, near which the camp was located. The property was leased for sugarcane plantations by Usina São Fernando, which belongs to Bumlai Group's Agropecuária JB and the Bertin Group, now incorporated to

JBS-Friboi, one of Latin America's largest meatpacking companies. According to CIMI, other cases of violence in 2009 - not necessarily involving sugarcane areas - were recorded in at least five occasions:

- About 20 Guarani-Kaiowá from the Sassoró and Porto Lindo villages were hurt on December 8, in a shock with private security guards of farmers from the Iguatemi area. Five Indians had serious wounds and were admitted at the hospital in Tacuru. An 73-year-old woman had her arm broken.
- A group of farmers and their private guards threatened with several shots and dogs the 250-some Guarani-Kaiowá who took back part of their traditional land (Kurussu Ambá), near the town of Coronel Sapucaia on November 25. The area occupied is located 5 km from the Madama Farm, where, during an eviction operation in January 2007, private security guards murdered 70-year-old prayer Julite Lopes and have still not been punished. For four years now, the Kurussu Ambá community have lived by the MS-289 state road, which connects Amambaí to Coronel Sapucaia. During this time, besides Julite, Ortiz Lopes was murdered in July 2007 and Osvaldo Lopes in May 2009.
- On November 19, a group of farmers followed by private armed security guards evicted without a court order a 300-strong Terena Indigenous community that had recovered part of the Buriti land in Sidrolândia. A battalion of some 50 policemen took part in the operation. The occupied farm Quêrência São José is located within Buriti land, identified in 2001 as traditional indigenous land.
- On October 29, the they after returning to their land currently occupied by the São Luiz farm in Paranhos, a group of Indians was taken by surprise by a truck full of gunmen, who 'arrived shooting'. According to report by Indian chief Irineu Verá, 'all those who were out there were hit with arms, rubber bullets and punches'. Teachers Olindo and Genivaldo Verá were murderer during the episode.
- On the evening of September 14, unidentified people burned down about 35 Guarani-Kaiowá Indian's houses at the Laranjeira Nãnderu village, near Rio Brillhante. The Indians were not at the village because since September 11 they had been forced to leave by a court order and are camped by the BR-163 federal

road. The 130-some Guarani-Kaiowá from the Laranjeira Nanderu community watched the fire destroy their houses and the rest of their belongings. During the night, the arsonists continued scaring the Indians, with cars watching burned things and turning on the headlights against shanties by the road⁶.

According to survey by federal prosecutors, there are administrative processes and/or lawsuits on 13 more serious conflicts involving Indians from non-demarcated areas and landowners, occurred between 2000 and 2009 (even though part of the areas in question has no relation to sugarcane activities, conflicts mentioned took place in sugarcane expansion areas).

| CONFLITOS - PROCESSOS ADMINISTRATIVOS E/OU JUDICIÁRIOS | | |
|--|--------------------|---|
| Município | Terra indígena | Nome da fazenda |
| Ponta Porã | Kokue'y | Fazenda Mosquiteiro |
| Paranhos | Ypo'i. | Fazenda São Luiz - soja |
| Rio Brilhante | Laranjeira-Nanderu | Fazenda Doinho - soja |
| Rio Brilhante | Laranjeira-Nanderu | Fazenda Santo Antonio da Nova Esperança - soja e gado |
| Ponta Porã | Kokue'y | --- |
| Ponta Porã | Kokue'y | --- |
| Amambai | Kurussu Ambá | Fazenda Madama |
| Dourados | Passo Pirajú | Fazenda Campo Belo - cana |
| Dourados | Pacurity | Fazenda Cruz de Malta - soja |
| Dourados | Apyka'y | Fazenda Serrana - cana |
| Itaporã | Karumbé | Fazenda Santa Terezinha |
| Itaporã | Karumbé | Fazenda Dom Pierino - cana |
| Maracaju | Karumbé | Fazenda Dom Fabrizio |
| Dourados | Karumbé | Fazenda Figueira - cana |
| Dourados | Karumbé | Fazenda Dal Lago - cana |

Fonte: MPF/MS

families live in 58 hectares, but which has 11,400 hectares, occupied by farms, recognized by FUNAI), and at the area of the Serrana farm, in Dourados, a former old settlement of Guarani Indians who are now camped by the BR 463 federal road (between Dourados and Ponta Porã), and the Campo Belo farm, in the region known as Porto Cambira, where 40 out of about one thousand hectares are occupied by Guarani from Paso Piraju.

Usina São Fernando, Dourados | Among the four processing companies mentioned, only São Fernando has signalled that it might recognize indigenous areas under legal dispute and accept the prohibition to plant sugarcane in them. Therefore, the company shall sign with the federal attorney's office an unprecedented TAC (Conduct Adjustment Agreement), by which it

commits itself to cancelling a leasing contract with the El Shadai Farm, located inside the Jatayvary Indigenous Land. According to the company's lawyer Clelio Chiesa, the cancellation took place notwithstanding the damage resulting from the loss of sugarcane planted to supply the company for the next five years. As for the plantation in the Serrana farm, in turn, which was the place for conflict between guards hired by the company and Indians who have been claiming the devolution of part of the area, São Fernando committed itself not to renew the leasing contract after its end. In April 2009, however, according to a statement by Indians who work in the company's plantations, it order the destruction of plantations in a Guarani camp established at Serrana after the group was

evicted, in spite of the agreement that families would have time to harvest.

SUGARCANE IN INDIGENOUS AREAS

Planting sugarcane in private-owned or leased areas that overlap with indigenous territories under recognition process has turn processing companies from Mato Grosso do Sul into targets to prosecutors acting in favour of the rights of those populations. Nowadays, according to the Biofuel Watch Center, at least four companies would be getting their sugarcane supplies from territories recognized or claimed and under process of anthropological study by FUNAI. In Dourados, Ponta Porã, and Caarapó, the companies Dourados Açúcar e Álcool, Nova América, Monte Verde, and São Fernando would be related to plantations at the Jatayvary Indigenous Land (in Ponta Porã, an area where 64 families live within 180 hectares, but which has 8,800 hectares recognized as an indigenous area by FUNAI and occupied by farms) and at the Guyraroca IL (in Caarapó, where 128

Photo: Marcos Homero Ferreira Lima (MPF-MS)

Indian Eugênio Gonçalves, 62, wounded in attack by São Fernando's security personnel



Usina Nova América, Caarapó | The Caarapó unit of the Nova América Group, a São Paulo-based company that owns the União sugar brand and associated itself to the COSAN Group in 2009 (at the end of the year COSAN was included by the Ministry of Labour and Employment in the 'dirty list' of slave labour, which it left in early January after a preliminary court order), is leased from the Santa Claudina farm, owned by state parliamentarian and agribusinessman José Teixeira (DEM), and which overlaps with Guyraroca Indigenous land (the area has been inspected by FUNAI and had its identification and delimitation summary published on the official gazette). The Guyrarocá group have claimed the area where the Teixeira farm has been established since 1990. In 1999, it was the target of violent police repression, killing a child while the mother tried to escape. In July 2005, Justice allowed the current 128 families to remain in an area of 58 hectares belonging to the Ypuitã farm, of Saulo Oliveira, which also overlaps with the area. Today, Nova América's sugarcane plantations surround the families in the Guyrarocá village. According to their leader Ambrósio Vilhalva, even with the absence of sugarcane burnings near the houses, villagers had health problems because of the smoke brought by the wind from nearby areas. Another problem, Vilhalva points out, is the constant poison fumigations that have already reached the creek separating the village from the plantation, where people get their water. According to a technical note issued by the Federal Attorney's Office, the action of landowners in the Guyrarocá territory has also caused quick environmental degradation, especially destruction of gallery forest in streams and rivers. Depredation would contribute for mines and water courses to be sand-filled and dry out.

Usina Dourados Açúcar e Alcool, Dourados | Owned by businessmen Celso Dal Lago⁷, the company is pointed out by Indians in Paso Piraju as the receiver of the sugarcane produced at the Campo Belo Farm, owned by Lago's brother-in-law Esmalte Chaves⁷. Campo Belo occupies the 1,000-some hectares claimed by the Indians, who are now confined within 40 hectares inside the property. According to a technical note issued by anthropologist Marcos Homero Ferreira Lima, who works for the Federal Attorney's Office in Dourados, the Indians await for FUNAI's working group to make the recognition of the territory they claim as indigenous land, which has been the place of several violent conflicts during the last six years. According to the document, they lived by the road linking Dourados a Caarapó when they first took back the Campo Belo farm in early 2004, being evicted soon afterwards. In October the same year, a new lawsuit on the farm results in the permission for occupation of 40 hectares, where the group remains to this date. According to the technical note, from then on 'attacks by the owner's son against the Indians were strengthened. In one of them, he hit a passing Indian woman with his vehicle; another, he tried to enter the area by breaking down the entrance gate with his pick-up truck; another time, he invaded the occupied area and unleashed fireworks against the Indians from his truck'. The constant attacks led to tragedy in 2006, when, according to the Indians, a non-identified vehicle carrying policemen in civilian clothes entered the village and created conflict, which ended with two policemen dead and nine Indians in jail.

Water for human consumption is contaminated with pesticides



Usina Monte Verde, Ponta Porã | With 60% of its shares held by multinational company Bunge (the other 40% belong to businessman Flávio Sergio Wallauer), Monte Verde leases at least three farms overlapping with the Jatayvary Indigenous land (Santa Luzia, Guarida, and Três Marias farms). FUNAI published the IL's (8,800 hectares) recognition summary on the official gazette in 2004, but the process of demarcation was stayed right after the act, being resumed in 2009. Differently from São Fernando, Monte Verde has not shown any opening towards discussing the leasing in indigenous lands, say federal prosecutors.



Monte Verde processing plant sign at the Jatayvary Indigenous Land

LABOUR: A COMPLEX RELATIONSHIP BETWEEN COMPANIES AND INDIANS

In spite of conflicts involving land disputed between farmers and Indians in Mato Grosso do Sul, the sugar-alcohol industry developed a close labour relationship with Guarani-Kaiowá communities. It is hard to measure the number of Indians who work annually in planting, management and cutting sugarcane in the state, but FUNAI and labour prosecutors estimate that up to eight thousand Indians are involved in the activity.

According to anthropologist Antonio Brand, with growing mechanization in the state's agriculture, sugarcane plantations ended up being the last niche for indigenous labour. Therefore, the industry has attracted an increasing number of young people from the villages and there are frequent cases of falsification of documents to get jobs at processing companies. Likewise, Brand says that sugarcane has led numerous families to abandon their villages. 'Indigenous lands of Caarapó, Dourados, and Amambaí, which total about 9 thousand hectares, are home to some 28 thousand people, that is,

about 70% of Mato Grosso do Sul's indigenous population. There is no chance that those people work in subsistence activities in that space, even because land is highly degraded, there are no resources for planting, and seeds won't grow', explains the anthropologist. According to him, in such a situation, young people do not expect land, but rather a job.

Despite major rejection to the presence of Indians and strong racism in Mato Grosso do Sul's farming industry, Brand thinks that indigenous labour is still highly valued in sugarcane, since Indians are considered 'more agile'. According to Indian leaders in the Dourados area, labour in sugarcane

plantations is now divided into Indians and migrants from north-eastern Brazil, with low use of local (non-indigenous) labour. About 14 buses arrive every day at daybreak to the Te'yikue indigenous village in Caarapó to take Indians to sugarcane plantations at the São Fernando and Nova América processing plants. Men are organized by internal middlemen, called *cabeçantes*, who supervise the works in the field and receive, besides a minimum wage, 7.5% on their colleagues' production. According to Zenildo Isnardo, a *cabeçante* at Te'yikue,

companies call those middlemen by phone and ask for a certain number of workers. Depending on the company, the middleman takes on the role of field inspector, following workers (that is the case of São Fernando). When the task is assumed by the company's own employers, such as in Nova América, there are often confusions and altercations, says Zenildo.



Zenildo Isnardo, a *cabeçante* at the Te'yikue IL

At Te'yikue, workers leave for sugarcane plantations between 2:30 a.m. and 5 a.m. and return usually around 4:30 p.m. (there are times when men return after 7 p.m., or work overnight, according to women in the village). The system was adopted after numerous problems were denounced, when Indians used to be kept in workplaces for 70 days or more. According to Indian professor Renata Ricardo, the absence of men for long periods causes major family disruption, since Guarani women have their status and role strongly defined by marriage. 'Without men at home, child rearing is disrupted, many women are rejected by their husband's families, cases of child prostitution, violence and child abuse increase as well as home desertion and other problems', she explains.

On the other hand, men who used to spend (or still spend) long periods at companies' dormitories have brought a series of diseases to the villages, such as syphilis and tuberculosis. In 2009, according to public health expert Estela Scandola, coordinator of NGO Ibiss, the health unit in Amambaí recorded 25 cases of pregnant women infected by syphilis. 'Infection rates are much higher, since only those pregnant women who searched for prenatal services were tested. If we take women - pregnant or not - who did not go to the health unit, and men, we will have an extremely complex scenario that is not treated by public health', Scandola says.

In Amambaí, the Naviraí processing company, belonging to the Infinity Bio Energy group, also maintains dormitories that, according to the National Health Foundation (FUNASA), have been one of the core vectors for contamination with tuberculosis among Indians working in sugarcane - nine cases were recorded in 2008 and in seven in 2009.

Labour-related problems, in turn, still remain in the area despite increasing regularization (working papers and legal employment contracts) of the activity in most companies, Te'yikue's Indians say. According to middleman Zenildo, the 150 workers hired by Brasilândia-based Debrasa have not been paid for over seven months. The same happens with Indians hired for 70 days by Santa Olinda, in Sidrolândia. Both companies belong to Companhia Brasileira de Açúcar e Alcool (CBAA), which filed for judicial recuperation in 2009. In 2007, Debrasa saw a megaoperation to liberate slave labourers - 810 Indians were rescued by the Ministry of Employment and Labour's mobile group. In 2009, Santa Olinda underwent a wave of strikes for lack of payment to workers.

Questioned about the differences between the several processing companies in the region, Zenildo is clear: 'We have no option, when there are jobs, we have to take them, no matter what company it is'. According

to him, the best employer in the surroundings is still São Fernando, which 'respects working hours and the way Indians work. At Nova América, in turn, we suffer a lot, inspectors won't let us rest, drink our tererê (cold mate), and they kick and beat workers'.

Even so, says Zenildo, the construction of Nova América, announced in 2006 and starting operation in 2009, attracted to Te'yikue a large number of new residents, increasing problems of confinement of the families and starting numerous internal conflicts. 'In 2005, we had about 3 thousand people at the village. Today there are about 4.5 thousand. Many single men came and started to create problems with women in the community, until we had to establish that only whole families could come', says Zenildo, which was a captain (chief) of the village until 2008.

Now, the major concern at Te'yikue is the fast advancement of mechanization at sugarcane plantations, which has already had an impact on labour demand at the village. 'With the end of jobs in sugarcane, the situation here will be unbearable. Almost nobody plants, for lack of space and time and for lack of credit, since, without the land property documents (indigenous lands are collective and belong to the Union), we cannot get money at the bank', Zenildo explains.

A distinct situation takes place at the Guyrarocá village in Dourados, led by Ambrósio Vilhalva. He headed actions in the struggle for land during the 90s - featured by Chilean film director Marco Bechis' 'Birdwatchers' and starred by Ambrósio himself - and now guarantees the maintenance of agriculture as the village's only source of subsistence.

Ambrósio Vilhalva guarantees agriculture at the Guyrarocá IL



In the 58 hectares occupied by the village and surrounded by sugarcane at the Nova América processing company, Guyrarocá's families plant rice, corn, manioc, pumpkin, cucumber, and a wide variety of vegetables, and the surplus is sold to a buyer from Cristalina. A former Debrasa employee in the late 80s, Ambrósio strongly criticizes other villages's option for work in sugarcane plantations. 'That is slave work. The company comes, talks to the captain and he sells everything to work in sugarcane. He exploits his colleagues and ends up losing everything, his wife, his children, and his family. And no one else wants anything with the struggle for land; working in sugarcane stops land demarcation. People at Te'yikue used to have beautiful small plantations in the 80s, but now we see them working for Nova América on weekends. They often spend their nights applying poison to sugarcane, so no one sees it'.

According to Ambrósio, the community in Guyrarocá was visited by Nova América manager and by middleman Zenildo, from Te'yikue, both trying to recruit workers. 'The company came twice, and they wanted to pay me 15% of the production of the workers I got them. You can live on your relatives, or do what we do: live out of what you plant. Do you think I would make businessmen rich and we wouldn't get a penny at the village?', he challenges.

IMPACTS OF THE SUGAR-ALCOHOL INDUSTRY ON AGRICULTURE

After a sharp malnutrition crisis in Mato Grosso do Sul's Guarani-Kaiowá children in 2005, which took international dimensions because of over 20 deaths, the state's Indians started to systematically receive food packages from FUNAI and the state government as a way to mitigate the hunger problem.

Despite acknowledging the measure as an emergency solution for the serious malnutrition problem, several Indian leaders have expressed their disagreements about the methods adopted when building assistance policies, arguing that there was no deep debate on the nature of food provision and structural policies to end the dependence on those food packages. According to Indian professor Otoniel Ricardo, who was elected a town councillor in Caarapó in recent elections, culturally, the Gua-

rani have always worked with agriculture as a form of subsistence - a practice that is being lost with closer labour relations with companies and the resulting decrease in the organization to struggle for land. 'I conducted a survey in villages and 100% of families sustained they would like to work in farming, if there were land and public policies or incentive.

Small plantations are one of the core family aggregation factors, keeping families together. I believe that the inevitable reduction in jobs in sugarcane as a result of increasing mechanization in the industry, although traumatic, will lead communities back to searching for solutions within their own areas', he thinks. Regarding the production profile of the Dourados, the Indians said that sugarcane has been quickly replacing crops like soybean and corn.

'Sugarcane is eating it all up. The El Shadai farm had soybean and corn; now it has sugarcane. Campanário, Paquetes, and Ponta Porá were soybean and cattle; now, it's sugarcane', says Zenildo Isnardo, from the Te'yikue village.

In the town of Rio Brilhante, in turn, where multinational company Louis Dreyfus Commodities (LDC Bioenergy) has the Passa Tempo and Rio Brilhante processing plants, sugarcane has had several impacts on areas of settlers and family farmers. According to small farmers from the Taquara settlement, surrounded by Passa Tempo's sugarcane, families have suffered mainly from herbicide fumigation in plantations, which reach their crops, and by sugarcane burning.

Artur Josemar da Silva cultivates corn, rice, beans, fruits, and vegetables, besides some milk cattle and a small eucalyptus plantation for firewood and lumber. His lot borders with the sugarcane plantations, which is about ten metres away from his corral. He says that fu-



INTERNATIONAL INVESTMENTS

Increasing interest by international capital in Brazil's sugar-alcohol industry is especially visible in Mato grosso do Sul. According to Thaine Regina Bakes, Master in Geography by the Human Sciences School of the Grande Dourados Federal University, of the 25 enterprisers with a share in 38 companies in the state, 20 have foreign individual/group shareholders. That is, 60% of the international capital invested in the state by the sugar-alcohol industry until 2008 has a direct or indirect participation of foreign capital⁸.

Following investments in processing plants, there is also an increase in mobilization for land deals. In February 2009, British auction house Sotheby's International Realty opened an office in Mato Grosso do Sul with an eye on land for grain and sugarcane production. According to a report by Terra internet portal, the company aims at 'two main types of investors: those that seek maintenance-free assets, leasing land at industrial scale, or food or energy companies seeking land to enlarge their plantations or pastures'.

That mobilization worries federal prosecutors, who have already sent questionings to the company about provision of information to potential buyers regarding land disputes between Indians and farmers in the state. According to prosecutors, real estate speculation involving foreign companies might affect land prices and create future problems to demarcate Indigenous land. Despite certain expectation that international pressure for socioenvironmental parameters and criteria for Brazil's ethanol comes to influence the practices of companies with foreign capital, several enterprises are still involved in labour or land-related problems:

- *Clean energy Brazil (Inglaterra)* | 33% of Unialco, owners of Alcoolverde, Dourados Açúcar, e Álcool, and Canavale processing plants in Aparecida do Taboado, Dourados, and Ponta Porã: Dourados Açúcar e Álcool, as said before, is involved in sugar production in the Guyrarocá indigenous area in Dourados.

migrations have already damaged most of the plantation and almost killed the eucalyptuses. 'Many families lost their vegetables, and mango and papaya trees no longer bear fruits. Eucalyptus was completely burned', he says. Pasture for his cattle was also damaged, and draining the lowland right below his property (an environmental crime) caused a major reduction in the water volume in his property.

Even though it adopted mechanization for its sugarcane plantation, Passa Tempo did not abolish the practice of burnings. According to settlers from Taquara, many of whom work as tractor operators for the company, it argues that green straw damages machines, which would justify the fire.

Settler Manoel José says that burning the sugarcane that is less than 20 metres from his house has already caught his family by surprise and almost caused a disaster. 'It was early morning when that big fire started. There was so much smoke inside the house that I had to flee with my son, otherwise we'd have suffocated to death', says the farmer. Like Artur, Manoel José also had his vegetables and his small eucalyptus plantations damaged by application of pesticides.

Mechanization in Dreyfus' area does not end sugarcane burning



- *Louis Dreyfus Commodities, LDC (França)* | Esmeralda, Brilhante II, Passa Tempo and Maracaju processing plants in Sidrolândia, Rio Brilhante, and Maracaju: besides impacts on settler's plantations in Rio Brilhante, as said before, LDC is accused by the local industrial workers' union of having immediately fired 70% of Passa Tempo and Maracaju after its purchase. Nowadays, according to the labour union, the company uses almost only outsourced labour, and most workers are brought from north-eastern Brazil by another company.

- *Infinity (EUA)* | Naviraí and Usinav II processing plants, in Naviraí and Iguatemi: they keep Indian workers in dormitories and there are several reports of tuberculosis.

- *Brenco (EUA)* | Brenco processing plant in the town of Costa Rica: in February 2008, the federal government's mobile inspection group caught 133 workers lodged in degrading conditions at Brenco's enterprises in the towns of Campo Alegre de Goiás e Mineiros, state of Goiás, 17 of which were considered slave labourers.

- *Bunge (EUA)* | Monte Verde processing plants in Ponta Porã: it leases a farm that overlapps with the Jatayvary area.

For Brazil's government and the sugar-alcohol industry, keen to conquer foreign markets and 'commodify' the country's ethanol, human, Indian and labour rights violations, as well as environmental impacts, will continue as a complicating factor to achieve credibility, mainly with the demanding European buyers. With increasing mechanization of sugarcane production processes and the resulting reduction in the demand for labour, indigenous land demarcation is more and more the only survival chance for an extremely weakened population whose constitutional rights have been systematically ignored by farming occupation of their ancient lands.

Therefore, co-liability by all actors in ethanol's production chain - sugarcane producers, processing plants, fund providers, distributors, and consumers - for problems, conflicts, and violations will be increasingly common, especially in international policymaking forums. According to the last UN report on conditions for mitigating global warming, efforts to reduce CO₂ included major investments in hydroelectric plants and biofuels. Many indigenous populations adopt a defensive stance towards those projects for fear that they might lead to expropriation of their land, eviction, and loss of their biodiversity. (...) At the UNFCCC Conference of the Parties in 2005, an International Alliance for Indigenous and Tribal Peoples of the Tropical Forests took a critical stance towards the fact that modalities and procedures regarding the fact that Clean Develop Mechanisms do not respect or guarantee the rights of Indigenous populations to land, territory, and self-determination.

Finally, the UN report also concludes that 'indigenous populations also denounce recrudescence of human rights violations, evictions, and conflicts resulting from expropriation of their ancient territories and forests for reforestation or bioenergy crops (soybean, sugarcane, oil palm, etc.). Those projects affect the whole ecosystem, straining water resources, changing landscapes on which indigenous peoples depend, and endangering their food security'.



CHAPTER 5 FINAL REMARKS AND RECOMMENDATIONS

Bioenergy's social and environmental sustainability is a crucial requirement for biofuels to be able to play a positive role in the process of readjustment of energy matrices worldwide.

Sustainability is understood as a framework of practices and measures that, on the one hand, do not create while fight against negative social, environmental, economic, labour, and cultural impacts, proposing and encouraging, on the other hand, positive impacts that benefit the environment, workers, the local and regional economy, and society as a whole. The basic (mandatory) reference for proper productive practices is the law in force (environment, labour, land-related and the Federal Constitution itself, regarding the rights of traditional and Indigenous communities or property's social role, for instance).

Therefore, besides being unsustainable, illegalities are perpetrated by properties that:

- Deforest illegally;
- Break the rules on Permanent Preservation Areas (APPs) and Legal Reservations;
- Use banned pesticides in their plantations;
- Contaminate water, soil, and air resources;
- Produce in grabbed land;
- Invade or occupy land belonging to Indigenous, quilombola (slave descendants), and traditional communities;
- Hire or use labour not according to labour laws;
- Use slave labour;
- Use child labour (except for subsistence activities and those not related to the biofuel production chain, as long as they inflict no damage to the distinct aspects of the child or adolescent's rearing);
- Perpetrate tax evasion (not paying INSS, FGTS, ICMS, among other taxes and social contributions).

Besides legal rules, however, other bases aimed at environmental preservation and enforcing fundamental rights and social well-being shall be observed or encouraged by actors present in the biofuel production chain. They include:

- Avoiding production in areas with recent deforesting in all biomes;
- Avoiding overexploitation of water resources that might become scarce and insufficient for other activities and communities;

- Avoiding activities that might interfere with the well-being of traditional and indigenous communities, such as using pesticides near rivers that feed them, purchasing or appropriating their lands, using the precarious labour provided by those populations.
- Recognizing the rights of those traditional and Indigenous populations on their territories, even under demarcation process; recognizing the Union's final propriety and possession over land expropriated for agrarian reform aims;
- Recognizing the right of workers to organize themselves in unions; not punishing social and unions leaders with dismissal;
- Establishing partnership contracts with family farmers that do not lead to their financial dependence on banks or their partners, do not threat their food security and sovereignty, do not constitute monocultures, and pay producers accordingly;
- Encouraging family farmer organization to make them advance in the biofuel production chain;
- Encouraging agrarian reform, mainly in regions of high mechanization and low labour cost;
- Encouraging biofuel production to meet local and regional demands;
- Encouraging participation by social organizations in making biofuel, environmental policies, as well as agro-ecologic zonings.

In the biofuel market, it is recommendable that companies and actors involved in any of the links of the productive chain - sugarcane producers, processing companies, ethanol distributors, and consumers - adopt social and environmental criteria in their commercial relations. Therefore, enforcing the demand for social and environmental guarantees to the origin of products and to the management of production chains should be a definitive criterion in trade relations.

It is thus recommended that processing companies, distributors and consumers, as well as funding agents, abide for the following premises:

- Not purchasing products, not funding, and not taking up societal relationships with sources that are frequently in the Ministry of Labour and Employment's list of slave labour users (the so-called 'dirty list').
- Not purchasing products, not funding, and not taking up societal relationships with sources that have been caught in the act using slave or child labour;
- Not establishing contracts with sources that owe their employees' INSS and FGTS;
- Demanding that trade partners that are not included in the family farmer category present the Certificate of Rural Estate Registration (Certificado de Cadastro de Imóvel Rural, CCIR), proof of domain (updated to less than 180 days or according to expiration dates defined by the Real Estate Registry) or proof of ownership origin, in order to avoid relationships with producers using grabbed land;
- Demanding from trade partners not classified as family farmer their estates' environmental licences in order to check if regulations are being followed;
- Demanding that trade partners not classified as family farmer present proof of conservation of Permanent Preservation Areas (APPs) and establishment of the Legal Reservation, in order to check if regulations are being followed;
- Not purchasing or funding products from sources that own areas judicially denounced by IBAMA;
- Not funding or taking up societal relationships with physical or legal persons that are occupying indigenous or quilombola land under recognition process.
- Not funding or taking up societal relationship with physical or legal persons that are occupying areas under legal dispute;
- Demanding that trade partners present clearance certificate regarding debts to INSS, FGTS, and ICMS;
- Guaranteeing the possibility of immediately ending societal relationship and other contracts in cases of illegal practices regarding environmental, labour, and land-related laws.

The public sector (public financial agents and the federal government), in turn, in the bioenergy context, should adopt and support a series of policies aimed at the country's energy security and sovereignty and which, at the same time, encourage regional development, social justice, and environmental sustainability. Among these measures, we recommend:

- Investment in research studies and projects aimed at developing production Technologies for biofuels that meet the demands of small communities, whether or not they are isolated;
- Investment in job and income creation in slave labourers' original areas and localities, with special attention to the economic placement of those rescued by the federal government;
- Support to the approval of measures to fight slave and degrading labour, such as Constitutional Amendment Proposal 438 (the so-called PEC of slave labour);
- Support to establishing nationwide and international measures and legislation that fight climate changes, such as repression to deforesting, the end of burnings in the sugar-alcohol industry, among others;
- Support to developing measures and legislation that guarantee survival for workers excluded from sugarcane activities by increasing mechanization, such as agrarian reform.

1 André Lima, Daniel Alves de Aguiar, Bernardo Friedrich Theodor Rudorff, Yosio Edemir Shimabukuro e Marcos Adami.

2 Regarding study released in 2006 by economist Nicholas Stern, concluding that the necessary investments to mitigate the effects of climate change would consume 1% of the world gross product every year. The same report pondered that, if nothing is done to fight the climate crisis, the damage could reach 20% of the world's gross product.

3 IPCC is an intergovernmental agency open to member countries in the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO), awarded in 2009 with the Peace Nobel Prize. It provides scientific, technical and socioeconomic information relevant to understand climate changes.

4 The study 'Economia das Mudanças do Clima no Brasil' is signed by: São Paulo University (USP), Campinas University (UNICAMP), Minas Gerais Federal University (UFMG), Rio de Janeiro Federal University (UFRJ), Instituto Nacional de Pesquisas Espaciais (INPE), Empresa Brasileira de Pesquisas Agropecuárias (EMBRAPA), Fundação Instituto for Economic Research (FIPE), Institute for applied Economic Research (IPEA), The Oswaldo Cruz Foundation (FIOCRUZ), the Brazilian Foundation for Sustainable Development (FBDS) and Amazon Institute for Environmental Research (IPAM).

5 Technical note "*A expansão do setor sucroalcooleiro no Cone Sul do Mato Grosso do Sul - impactos nos índios guarani*", **Marcos Homero Ferreira Lima**, Analista Pericial em Antropologia do MPF/MS

6 Information provided by the Missionary Indian Council (CIMI)

7 Information on Dal Lago and Chaves are included in the article "*Índios invadem fazenda no MS*", by Folha Online of 10/02/2004 - <http://www1.folha.uol.com.br/folha/brasil/ult96u58010.shtml>

8 Master's dissertation "*O capital agroindustrial canavieiro no Mato Grosso do Sul e a internacionalização da produção*", by **Thaine Regina Bakes**, Grande Dourados Federal University, 2009