

# **The access of family farmers to biodiesel markets: partnerships between big companies and social movements**

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## **1. Introduction<sup>1</sup>**

Over the last years Brazil has become a decisive international player in the process which is bringing about the end of “oil civilization” (Sachs, 2005). It occupies the technological frontier of bioenergy production, as a consequence of more than 30 years of research in the field combined with practical experience that has resulted in the construction of hundreds of alcohol production plants and an enormous number of cars running on this fuel (UNCTAD, 2006). 50 billion liters of ethanol are produced in the world, 17.4 billion in Brazil and 18.5 billion in the USA (Veiga Filho, 2007). The market is highly promising, which explains the exponential increase of foreign investment in the acquisition and construction of industrial units in Brazil. The area of land occupied by sugarcane has also increased dramatically in those regions where it already dominated the landscape (e.g. São Paulo), as well as in areas where it has substituted pasture and soybean production (e.g. in the mid-West and the Northeast). Between 2005 and 2007 the contribution of sugarcane to the income of Brazilian agriculture increased from 14% to 21% of the total.

The technological innovations on which is based this performance nonetheless did not diminish three central marks of the presence of sugarcane in Brazilian agricultural history: the large territorial areas used to cultivate the product, the resulting monotony of the agricultural landscape in the areas where it is found and the degrading working conditions that are the norm, especially during the harvest (Moraes Silva, 2005).

The importance of sugarcane, the force of the national, and increasingly, international interests linked to its expansion seem to confirm the prediction made recently by two Professors from the University of Minesotta in the prestigious magazine, *Foreign Affairs* (Runge and Senauer, 2007) that the history of the industrial demand for agricultural products in developing countries basically benefits the largest producers.

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Nonetheless, parallel to the expansion of the alcohol plants the Brazilian Government has formulated and started to implement a policy which supports the production of biodiesel. In contrast to the policy for the national supply of alcohol from sugarcane, the **National Program for the Production and Use of Biodiesel (PNPB)** is clearly aimed at integrating family farmers into the production of biofuels and as a result contributing to their ability to generate income. It aims to do it using forms of production that avoid monoculture and enable the use of areas that had previously been underutilized. It is true that, in the same way with sugarcane, there has been a rush of foreign investment in the production of biodiesel. It is also true that soybean – a product that is well established and frequently cultivated in large and monotonous areas of land – represents the main feedstock for the production of biodiesel.

A new market is being formed as a result of government intervention. Its main objective is to include family farmers in the oil chain and to encourage the use of previously rarely employed feedstock. In reality soybean has some limitations that prevent it being the basis for producing biodiesel: its low oil yield, competition with the food oil – making the supply for the production of fuels insecure- and dependency of its value on the prices of the soybean meal, whose market is completely independent from that which guides the prices of biodiesel. However, the weight of soybean in the vegetable oil production chain is so great that it makes it unlikely – without governmental intervention in the organization of the market – the increased production of other crops that would provide an alternative.

It is interesting that the governmental objective of linking the production of biodiesel and the income of family farmers was immediately supported by two groups whose relationship oscillate between conflict and indifference: the big companies which process feedstock for the production of biodiesel and the rural workers' trade union movement.

This declared link between the supply of feedstock for the production of biofuels and income generation for family farmers – under the sponsorship of the State, organized by private companies and with the contractual agreement of the trade unions – appears to be internationally unprecedented<sup>2</sup>. In Brazil itself it is the first time that a policy has been drawn up in which the State creates conditions whereby an important part of the supply of feedstock for a particular industry comes from productive units that, without this intervention, would be unlikely to play a significant role in the market. It is a form of State intervention very different from the policies relating to credit (PRONAF) or the cash income transfer to the poor, where the State allocates resources directly to a particular public. This initiative should not be confused with those that exist in developed countries which guarantee that the government will purchase part of the production of particular segments<sup>3</sup>. What is interesting about the Brazilian case is that the State intervenes in the organizational format and in the incentives upon which a certain market is constructed, but it does so without the use of public resources.

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<sup>2</sup> The work of UNCTAD (2006) shows that the offer of feedstock for biodiesel provides, all over the world, greater opportunities to family farmers than ethanol. However, in the countries whose policies are described in the study (South Africa, Thailand, India, the Philippines, China, Guatemala, the USA and the European Union) there are no institutionalized connections between bio-diesel and the strengthening of family farming as is the case in Brazil.

<sup>3</sup> This is the case with the US Small Business Administration of the Department of Commerce, which guarantees, especially for small businesses, a significant part of the powerful market created by governmental purchases (see <http://www.sba.gov/GC/>).

More than being a typical supply chain contractual integration case, what is at stake here is the formation of an unprecedented pattern of the operation of the market itself and its governance (Buskens *et al*, 2003). The companies not only **select** their suppliers based upon the work of the trade union movement, but rely on the trade union structure **to negotiate the contracts** and **to organize the supply**. There is a **price guarantee** and the firms offer **technical assistance** to the farmers. The “**social label**”, which enables the companies to participate in the auctions organized by the National Petrol Agency (ANP) based upon Resolution n° 3 of the National Council for Energy Policies, depends on this relationship between the companies and the trade union movement. This is what guarantees their participation in the national policy which forces an increasing percentage of vegetable oils to be added to the diesel produced from fossil fuels (<sup>4</sup>). In other words, companies’ access to market depends upon forms of market operation that include the trade union movement in their system of governance.

This article aims to describe the **social forces** behind the construction of this policy, and above all, the mechanisms and the system of **governance** (Buskens *et al*, 2003, Fligstein, 2001) of the emerging Brazilian bio-diesel market. Why private companies subject to contractual forms that make them dependent upon actors with whom, up to now, they have not had a permanent relationship and who are potential sources of considerable conflict? What are the chances that this policy will provide a sustainable source of income generation for groups that find themselves at the base of the social pyramid of farmers? Can it establish technological and organizational innovations capable of creating sustainability in the processes of income generation that it stimulates?

Brazilian bio-diesel market organization cannot be explained exclusively by the specific assets it mobilizes or in terms of the need to reduce the transaction costs between its protagonists. Whilst these factors are clearly present, political-cultural (Fligstein, 2001) dimensions are decisive. Social participation in the feedstock supply structure has incorporated in the market functioning issues such as the social responsibility of companies, income generation for members of the population living below the poverty line, the integration between the production of food and energy, the diversification of feedstock for oil and the ecological integrity of the regions themselves into which the product is expanding. This is what justifies the approach of this article based in the instruments of new economic sociology to deal with these markets from a political-cultural standpoint: the intentional action of the protagonists of these markets (<sup>5</sup>) is able to avoid some of the central problems which could be foreseen in their operation: concentration of income which follow the increase in supply, and above all, the environmental problems that the increase in the production of bio-fuels may bring.

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<sup>4</sup> The technological path of the current bio-diesel policy follows that of petroleum. In the case of alcohol the motor was adapted for the fuel, in contrast to what is happening at the moment where the fuel is being adapted to the motor. For a critical perspective of this development see Professor Guilherme Dias’ exhibition in the Institute of Advanced Studies at USP: [http://www.iea.usp.br/iea/online/midioteca/biomassa/v061109b\\_700/Web/Script/index\\_IE.htm](http://www.iea.usp.br/iea/online/midioteca/biomassa/v061109b_700/Web/Script/index_IE.htm)

<sup>5</sup> It is in this way that Buskens et al (2003:3) characterize the governance of the markets as “...a result of purposive behavior of independent actors”.

## 2. Theoretical bases

This article is based upon two theoretical perspectives. On an agricultural and energy standpoint it explores the possibility of integrated systems for the production of energy and food in order to attenuate the skepticism with which an important part of the international literature about this topic views the increase in the world production of bio-fuels (item 2.1). However, the functioning of these systems – according to the second perspective – presupposes forms of market organization set up with social and environmental ends (item 2.2).

### 2.1. Conflicts and interactions between food and energy

#### 2.1.1. The skeptical views

The increase in the international production of bio-fuels has provoked an important and consistent combination of critiques that can be summed up in the following basic points:

a) **In the USA and Europe the principal crops which provide feedstock for bio-fuels have a low, sometimes negative, energy balance.** The quantity of energy required to produce the corn to make ethanol (including the industrial process itself) means that “only about 20% of each gallon is ‘new’ energy” (Tilman and Hill, 2007). Furthermore, if each of the 70 million acres used for planting corn in 2006 were used to make ethanol, the amount of energy produced would only replace 12% of the gas oil market in the USA. The amount of ‘new’ energy (non-fossil fuel) obtained would be very small, only 2.4% of the market. Tuning a car and ensuring that the tires were adequately inflated would economize more energy. The expansion of the production of corn in the USA could have a negative effect on soil and water resources. It could also encourage farmers to remove their land from conservation programs, such as the “Conservation Reserve Program” and the “Wetlands Reserve Program” (Babcock, 2007). Clearly the force of these impacts depends upon the products used to obtain bio-fuels and their system of cultivation. However, until now, in the USA and Europe crops with an extremely low energy performance predominate. It is worth remembering that the criticism of the energy inefficiency of agriculture based upon large farms of highly specialized crops was already being made in the 1970s in the pioneering works of David Pimentel (1980).

b) **These products make a small contribute towards the reduction of the greenhouse effect,** because of the use of fossil fuels in their production, as well as the deforestation which they cause. The expansion of sugarcane into the Brazilian mid-West could result in the relocation of livestock and soybean in the direction of the Amazon and thereby put increasing deforestation. The expansion of palm oil in Indonesia is essentially based upon deforested areas (Monbiot, 2007). The international effort for the certification and traceability of biofuels illustrates the importance of this problem. The broad-based participation, including Brazilian companies and organizations, in “the round-table discussions about sustainable biofuels”, organized by the Energy Center of the Federal Polytechnic School of Lausanne is an attempt to deal with the environmental problems caused by the expansion of biofuels (Frei et al, 2006).

c) **The increase of biofuels is a threat to world food security.** This point of view has been defended by the ex-president of the Société Française d’Économie Rurale, Jean-Marc Boussard (2006): the generalization and exclusivity in the use of biofuels “as a

source of energy could put unsustainable pressure on agricultural land”. Along the same lines, Michel Griffon (2006:160) in an important recent book asserts: “In terms of food as well as the production of energy, agriculture does not constitute a solution for the creation of global energy scenarios that include the massive use of biomass”. The increase in the price of corn is an expression of this phenomenon; its current stocks, as a result of the increased demand for ethanol, are at their lowest levels since the drought of 1995 in the USA (Range and Senauer, 2007). In Mexico this increase has already provoked significant social tension as a result of the importance of corn as a staple in the diet of the population. The IFPRI predicts strong pressure upon agricultural prices if the current patterns of land use and technology for the production of bioenergy persist (Rosegrant *et al*, 2006). More than 200 organizations from various parts of the world signed the **Biofuelwatch** manifesto calling for the European Union to abandon targets for the consumption of biofuels because of their estimated negative social and environmental consequences, advocating instead a drastic reduction in the use of energy and the use of truly renewable sources of energy ([www.biofuelwatch.org.uk](http://www.biofuelwatch.org.uk)).

d) **The production of biofuels accentuates - throughout the world - the concentration of income and the importance of the large-scale producers as well as the big processing firms:** “The major classes of biomass for biofuel production recognized to date are monoculture crops grown on fertile soils, such as corn, soybeans, oilseed rape, switchgrass, sugarcane, willow, and hybrid poplar” (Tilman *et al*, 2006). Corn and soybeans are products that are subject to the lobbying of large-scale planters and big processing companies; Archer Daniels Midland Company (ADM) is the largest producer of ethanol in the North-American market (Runge & Senauer, 2007). The risks of the negative impacts on the environment and on the supply of food are highlighted in a recent United Nations report, “Sustainable Bioenergy” (United Nations, 2007). Whilst the last IPCC report illustrates the important role played by biofuels in the reduction of global warming, the United Nations warns of the inverse effect, if the expansion of sugarcane and oilseed plantations threaten the forests and food production.

### 2.1.2. The paths of integration

These arguments, presented here extremely briefly, are without a doubt based on empirical facts. More than this, they insist upon the importance of re-thinking the patterns of civilization which are based upon the intensive use of energy in contemporary societies. In the same vein an important report by Greenpeace and the European Renewable Energy Council (Greenpeace, 2007) underlines the urgency of measures aimed at reducing the consumption of energy as one of the most effective measures for contemporary society to adapt to the current situation. The cheapest and the least polluting energy is that which is not used.

However, the arguments set out above suffer from a basic flaw of reasoning, as illustrated in various recent articles by Prof. Ignacy Sachs: they do not take into account that the technological patterns upon which the supply of biofuels is based could be different from those that predominate today. Currently there are sufficiently solid scientific bases for the conception of integrated systems for the production of energy and food that could overcome the principal dilemmas of the conventional system which presents a impasse between energy and food. In 1983 Ignacy Sachs and Dana Silk launched the “Food and Energy Nexus Program”, under the auspices of the United Nations University with the objective of finding synergetic solutions to the agricultural production of energy and food. The program fostered various research projects

experimenting with integrated production systems in Brazil and India (Sachs & Silk, 1990). Its central ideas were the intensive use of biomass, the stimulation of biodiversity and the use of biotechnology capable of taking greater advantage of feedstock. The United Nations Program focused on this issue was stopped at the beginning of the 1990s, but it is vital to recognize its pioneering role and its influence on the directions that the Brazilian biodiesel program is taking today.

Amongst the most recent work, in the same vein as Sach's work in the 1980s, is the research of Tilman *et al* (2006), published in *Science*. The study shows that the main problems with the biofuel production pattern in North-American agriculture could be overcome by the use of degraded land – instead of the more fertile areas - and by taking advantage of the diversity and integration of the crops which don't rely on the intensive use of chemical products. The experimental crops upon which Tilman *et al* (2006) based their conclusions did not receive fertilizers; they were watered only when planted and relied upon a minimal amount of inputs for their development. All the forms of conversion of the plants grown in this system, baptized as “low-input high diversity” (LIHD) showed themselves to be significantly more efficient than the monocultures that currently dominate. One of the most positive indicators was that plant diversity increased the storage capacity of carbon in comparison to homogeneous crops.

Schrimpff's work (2007) shows that for the production of biofuels in Germany “rapeseed is almost exclusively grown (80% of the total) and in addition sunflower and flax... Nonetheless [in Germany] 15 other oilseeds could be grown. Across Europe this number reaches almost 50 species, and worldwide it is probably more than 2,000 species, that are under-used in function to the technological path which consists in concentrating the production in a handful of products. In the final analysis all seeds and the flesh of various fruits (e.g. avocado, palm) contain oils and vegetable fats”. Schrimpff recognizes that in the current pattern of production the conflict between food and energy is obvious. However, there are two elements that could significantly alter this scenario. Firstly the rotation system between oilseeds - whose fertilizing properties for the soil are widely recognized - and cereals could be improved. Secondly many oilseeds, and this is the case with rapeseed and also soybean, apart from oil, produce flour rich in protein that can be used to feed animals and humans.

Therefore the skepticism with respect to the future of biofuels is strongly countered “when, instead of the monotonous monocultures planted today, the agriculture of the future gives way to multiple poly-cultures (combined systems of cultivation)”. Based on this reasoning, Prof. Ignacy Sachs (2007) put forward the hypothesis that the integrated systems of energy and food production could use less land because the supply of food for animals would reduce soil needed for pasture. This is the case for a large Argentine company that implemented a system whereby the leftovers from corn used to produce ethanol were used to feed the livestock, whose dung in turn was used to produce bio-gas which generated electricity used in the ethanol plant and also for milk production<sup>(6)</sup>. There have been similar synergies between the production of ethanol and the raising of livestock in the State of Iowa, as presented by Babcock and Hart (2006).

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<sup>6</sup> According to an article published in El Clarín on 14/04/07, <http://www.clarin.com/suplementos/rural/2007/04/14/r-01399401.htm>, downloaded from the internet on 29/04/07.

To sum up, there are sufficiently solid scientific bases to assert that, from a technical perspective, the current environmental, energy and social pattern which provides the base for the majority of biofuel production around the world could be beneficially replaced by social and environmental forms capable of avoiding the problems briefly set out in the previous item. The second line of thought upon which this article is based parts from the premise that markets are structures subjected to social pressures and incorporate in their basic operating mechanisms the expectations of the actors not just in terms of quantity and price, but also in terms of their social and environmental attributes. The aim here is not to describe the social forces that raise concerns about the paths that are leading to the end of the petroleum-based civilization, but rather to examine the bases that provide an alternative path to that which dominates the Brazilian and international scene.

## 2.2. The political-cultural approach to the markets

One of the central ideas of the new economic sociology is that markets do not basically consist in points of encounter – neutral and impersonal – between supply and demand, flowing from actors whose reciprocal relations are limited to those derived from the indications received from the system of prices: markets are social structures, that is, recurring and stable forms of interaction, subject to sanctions (Swedberg, 2005). What is important in this approach is that it enables markets to be viewed not as universal and abstract forms of interaction, but as the products of history whose existence depends on social networks (Granovetter, 1985) and whose real content can not be defined beforehand. The formats of these networks determine the opportunities that the individuals and the firms encounter in the markets. Granovetter (1995) shows that the contacts derived from connections between individuals that are relatively distant from each other are much more advantageous – for example, in terms of getting a job – than those that result from the so called “strong ties”. This theme is particularly important for this article, since the PNPB stimulated the formation of “weak ties” on the part of the protagonists involved in it: it encouraged social links between actors that do not belong to the same economic, political or cultural universe. This is expressed in the trade union organizations (who begin to establish partnerships with companies <sup>(7)</sup>), in the business practices (that begin to base several of their activities upon trade union actions) and in the Government itself (in the case of the Ministry of Agrarian Development which began to negotiate with companies instead of having relationships almost exclusively with social movements).

Beyond understanding the format of the networks, it is important to study the recurrent forms in which the markets structure themselves. Neil Fligstein constructed a sociological theory based on the idea that, in contrast to that postulated by neo-classical theory, the actors in markets do not aim fundamentally to maximize their interests. They rather try **to stabilize their relationships** so as to reduce the risks which their exposition to the price system subject them to <sup>8</sup>. This stability is based upon four basic factors, without which no market could function. The first is **property rights**: feedstock for biodiesel production has to be offered by the farmers to the companies, but under

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<sup>7</sup> For example, see the “Note on the conjunction of CONTAG and Brasil Biodiesel on the inclusion of family farming in the national biodiesel program” signed by the presidents of the two organizations on the 12<sup>th</sup> of May 2006.

<sup>8</sup> “The sociology of markets that I am developing replaces profit-maximizing actors with people who are trying to promote the survival of their firm” (Fligstein, 2001:17).

certain contractual conditions (price guarantee, technical assistance, social label), without which the right to participate in the supply chain is threatened. The second decisive aspect in the functioning of a market is in its **structure of governance**, that is to say the “general rules that define the relationships of competition and cooperation, and define the way in which firms are organized” (Fligstein, 2001:34)

The work of Buskens *et al* (2003<sup>a</sup>:2) is similar to that of Fligstein: they define governance as “...the measures that the actors involved in the exchange use or implement to mitigate the risks associated with economic exchange”. What is important in our case is the diversity of the actors that interfere directly in the establishment of these rules, as will be seen below.

The third element around which a market is established are the **rules of exchange**, which guarantee that the conditions under which the market functions apply to all, through, for example, monetary patterns or the submission to commercial agreements. Here too the proximity to the approach of Busken *et al* (2003b:108) is notable. They insist on the fact that the “buyer does not need only to find a product that meets his needs in terms of price and quality. He needs to encounter the seller who will offer guarantees and service that are beneficial to him and the buyer needs to believe that the seller will act as promised”. In our case what is important is the participation of the trade unions in the mobilization of the farmers, as well as the guarantee of the purchase of the product on the part of PETROBRAS.

The fourth element is especially important for this study and is called **conceptions of control** by Fligstein. These reflect the agreements within firms, as well as between firms around the validity of certain norms of operation and about the reach and the limits of practice of competition and cooperation. Fligstein cites the anthropologist Clifford Geertz to illustrate his idea, emphasizing that the conception of control in terms of the functioning of a market is a form of “local knowledge” and that, in this sense it should be approached from a historical and cultural perspective. This is in a similar vein to the explanation of Buskens *et al* (2003a:10) that the transactions and the attempts to reduce risk and to stabilize relationships on the part of the participants in the market can only be understood in terms of their embeddedness in a certain social context. The idea is also similar to that of Podolny and Hsu (2003:78) to whom different forms of government “depend on the networks and the elements of reputation induced through the links in the networks”.

These factors lead to the study of markets in terms of strength relationships between its participants. They inspire also the study of the participation of the State in market formation and regulation. Fligstein is inspired by Pierre Bourdieu (2005), describing economic life – and particularly markets – in terms of the notion of “fields”, that “contain collective actors that attempt to produce a system of domination, that supposes the production of a local culture which defines its social relations” (Fligstein, 2001:15). The rules with which a particular market regulates itself are not the spontaneous fruit of its evolution, but are the result of the active participation of the forces of organized society as well as the State itself. Furthermore, the characterization of markets in terms of “fields” makes them a permanent space of dispute – economic, political, and cultural – between what Fligstein calls the *incumbents* <sup>(9)</sup> and the *challengers*. Precisely because

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<sup>9</sup> Whilst the word incumbent refers to the occupier of a particular position, within the theory of arenas, it is closer to a position of domination.

it forms a particular field, a market is only stabilized when the terms upon which disputes between the participants are settled are accepted in a relatively homogeneous way.

Market stabilization around certain “conceptions of control” with respect to the use of resources is especially important in explaining the corporate environmental behavior as has been well illustrated by Andrew Hoffman (2001). The incorporation in the operating structure of the companies – in the form of directors in charge of powerful teams – of environmental issues is important in defining the current operation of not only government agencies, but also for the markets themselves. The work of the team directed by Olivier Godard, in France, shows also that companies do not act in a purely reactive way to governmental environmental legislation with respect to the environment, but try to anticipate the questioning that they may receive because of their business practices (Hommel, 2004).

The studies that emphasize the cognitive dimensions of the behavior of companies are important in our case because of the unprecedented social and political constellation upon which the supply of biodiesel is based.

### **3. The construction of a new market**

The PNPB was only set up recently which prevents a rigorous evaluation of its results. The objective here is to present its institutional format and its principal mechanisms of incentives so that it is possible to evaluate if it is actually a policy that innovates in the process of income generation and if it is capable of including farmers who do not participate in conventional markets and thus contribute to the greater diversification of agriculture. Around what elements are this market established (Buskens *et al*, 2003)? What are the property rights, the system of governance, the rules of exchange and the conceptions of control (Fligstein, 2001) of the emerging Brazilian biodiesel market? Is the presence of powerful Brazilian and international interests in its organization compatible with the governmental objective of making the production of biofuels an element in opening up the opportunities for the participation of the poorest in the market? Are the links between the various governmental agencies, companies and social movements an expression of corporatism (Thomas, 1993) or to the contrary, express the constructive role that the “strength of the weak ties” (Granovetter, 1995) is capable of playing in the functioning of social networks?

#### **3.1. Basic characteristics of the PNPB**

The PNPB has been set up in an environment that opens up opportunities different from that adopted by the ethanol program in the 1970’s and whose damageable social and environmental consequences are well known. In contrast to sugarcane, the participation of family farmers in the production of feedstock for biodiesel is significant. Even when dealing with soybean in Rio Grande do Sul, half of the supply comes from units of family production. Furthermore, the family farmer’s organizations gained extraordinary influence in the conception and execution of Brazilian public policies. The National Program for the Strengthening of Family Farming (PRONAF) meant that almost two million farmers received credit, half of the potential public. In no other segment of small urban or metropolitan enterprises there is a comparable ability to influence public

policies and access to governmental resources (<sup>10</sup>). The Ministry of Agrarian Development - created in a situation of urgency to deal with land conflicts - today is responsible for the management of this policy which allocates, in the form of credit to family farmers, around R\$ 12 billion (more than US\$ 6 billion), reaching a significant number of those who are at the bottom of the social pyramid of farmers.

When, in 2003, discussions were started, within the Government, with respect to the need to stimulate the production of biodiesel, the Presidency of the Republic orientated the technical analysis explicitly so as to avoid what the Government considered the social and environmental distortions that were the result of the Pro-ethanol policy, and to guarantee to the family farmers – especially those in the Northeast – part of the supply of the feedstock for the product (<sup>11</sup>). This orientation has the chance to establish itself not just because of the interests of the family farming organizations, but also because of the promising perspectives offered to industries already active in the production of soybean as well as those who plan to enter specifically into the production of biodiesel independently from the supply of oil and flour for food (<sup>12</sup>). Until today the majority of the feedstock for biodiesel production comes from soybean. However there are important incentives that could avoid repeating the pro-ethanol monoculture pattern in the case of PNPB.

The touchstone for the business interest in the PNPB is the increasing percentage (starting at 2% in 2008 and growing to 5% in 2013) that non fossil origin feedstock should have in the composition of diesel. For this target to be met the National Council for Energy Policies will supervise the mixture and quality of the fuel. It is here that the social content of the recent measures enters into the equation: for the companies to be able to participate in the auctions where PETROBRAS buys in advance biodiesel production – thereby establishing the market for the companies – they need to present a social label. This is conceded by the Ministry of Agrarian Development (MDA), based upon a detailed examination of the contract that the companies formulate with the farmers, with the signature of the rural workers trade union of the municipality where the production will be carried out (<sup>13</sup>).

Depending on the region where the company is situated the obligatory percentage of the production that originates from family farming varies. In the Northeast (and particularly in the semi-arid areas) to obtain the social label, and thus be accredited to participate in

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<sup>10</sup> Of the 10 million units that make up the small scale urban and metropolitan “nanoenterprises”, only 300,000 manage to receive formal credit. Of the 4.2 million family farms, more than 2 million have access to credit (Abramovay *et al*, 2003)

<sup>11</sup> The Program has an executive commission that is directed by the Presidential Staff Office and which consists of 14 ministers, apart from the National Petrol Agency (ANP), Petrobras and the National Bank of Social and Economic Development. In other words it is not a program that belongs exclusively to a ‘social’ ministry (like Agrarian Development, MDA) and whose force is limited, but rather an initiative that involves the Presidency of the Republic. The civil servants have to constantly report directly to President Lula who takes a special interest in the development of the PNPB.

<sup>12</sup> Amongst the companies authorized by the ANP to produce biodiesel, almost a third were set up specifically to produce the fuel. The others are companies that already existed and were active in a variety of segments such as the production of ethanol, vegetable oils, the chemical industry, industrial technology and tires.

<sup>13</sup> The relationship between these different actors (companies, social movements, unions, PETROBRAS, the Ministry for Agricultural Development) has not been formally established yet and there is no guarantee that this arrangement that assures a market for the family farmers will be effective in the long run. This does not impede it from representing a significant institutional advance with strong chances of being consolidated.

the auctions that guarantee a demand for their product by PETROBRAS, it is necessary that a company obtains 50% of its feedstock from family farmers. The industries established in the South and South-east need to prove that 30% of the raw materials used come from family farming. In the North and mid-West the figure is 10%.

Meeting these targets does not only guarantee that the product will be bought by PETROBRAS, thereby offering a degree of stability for investment in industrial installations, but also exempts the companies from an important group of taxes. The policy of fiscal incentives not only aims to stimulate the contractual relationship between the companies and the family farmers. It also stimulates the use of feedstock that had previously been little used in the production of biodiesel, such as castor-oil plant (*Ricinus communis*) and palm. These plants are known not only for their energy efficiency but also for their compatibility with productive systems characteristic of family farming.

The guarantee that these percentages were actually met and that, thereby the company effectively earns the social seal comes from the individual contracts with the producers, signed by the president of the Workers Union in the municipality in question and the verification of the receipts for the purchase of the raw material. The verification of the contract is carried out through an annual audit. The validity of the operation depends on each producer having obtained a formal declaration from the trade union that he belongs to the category of 'family farmer'.

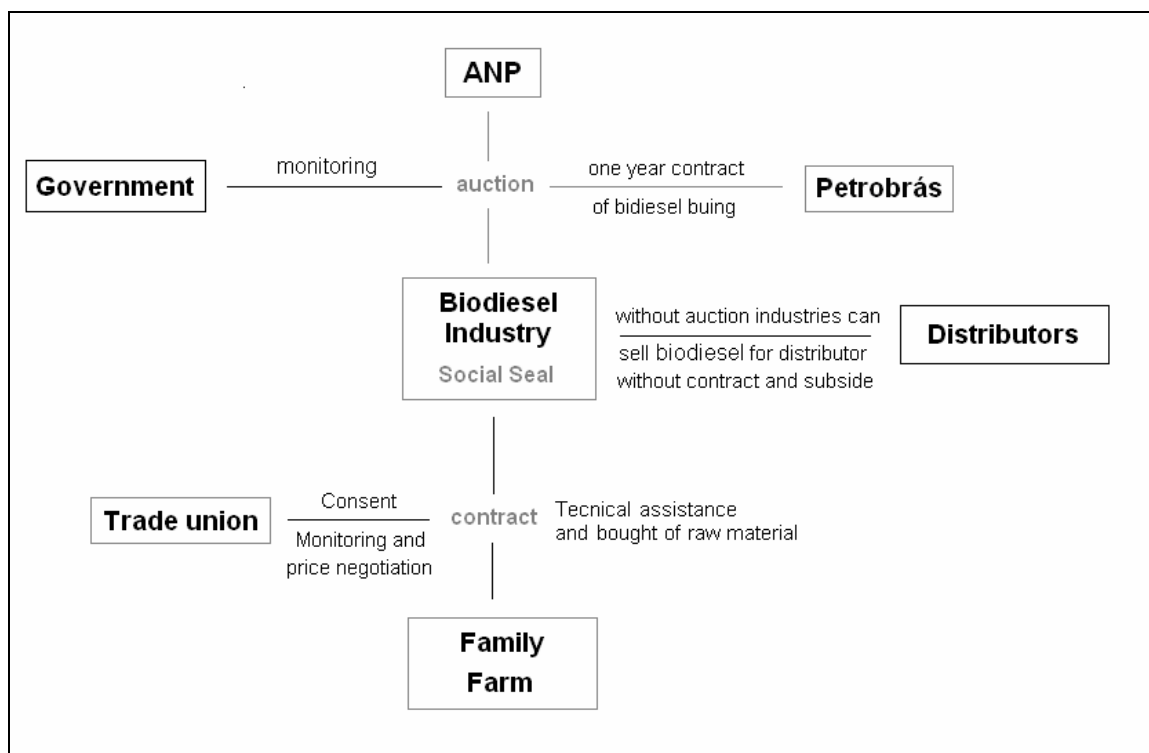
The contracts agreed between the companies and each farmer contains the following basic clauses:

- The **period** over which the relationship is established. In the Northern region there are companies which have committed to purchasing the product over various years, in function of the natural cycle of the plants: in the case of palm in the Amazon there are 25 year contracts. For castor-oil plant the contracts are two yearly.
- The **value to be paid** for the product. When this value cannot be stipulated in the contract there is some kind of clause which in general guarantees the producer a higher price than that usually paid by the market. For example, in the case of soybean in Rio Grande do Sul the trade union movement made it a condition for the validation of the 2007 contracts that an additional payment of R\$1.00 per sack of 60 kilos be made, as well as an improvement in the price paid for castor-oil plant in relation to the conventional markets.
- The companies offer **technical assistance** to the producers. This item may not be important in the cases where well known products are being cultivated, but it is fundamental when the aim is to introduce new crops. Apart from the technical assistance the company provides, in various cases, seeds and inputs to the farmers. Today Brasil Ecodiesel, for example, has 210 offices in 436 Brazilian municipalities. The specialists visit each producer four times during the whole process from preparing the soil to harvesting. The company is now investing in the training of 'rural community agents', members of the local society who will be responsible for mediating between the specialists and the farmers for questions that relate not only to agricultural production, but also to issues such as health and other basic services.

- The **delivery conditions** (humidity, place for the collection of the crop, transport) also are part of the contract, with the consent of the trade union.

The biodiesel market is formed from a unique conjunction of forces (see figure 1). It is not the same type of relationship that the companies that deal with small animals maintain with the farmers in the South of Brazil (Sadia, Perdigão, amongst others): in this case the contracts are public, socially monitored, regulated by the government and subject to negotiations that are not limited to the companies and farmers. The trade unions are not simply organizations that defend the interests of the farmers, but participate actively in the formulation and the execution of the contracts.

**Figure 1. Agents involved in the National Program for the Production of Biodiesel (PNPB)**



Buskens *et al* (2003a:3) study four phases that characterize **exchange relations**: the “search and selection of partners, negotiation and contracting; contract execution and performance; and (possibly) conflict regulation”.

Whilst the contracts are standardized, they are nonetheless signed by each individual – or with cooperative organizations. The technical assistance in the beginning is also individualized. Apart from the company and the producer, the manager of the local trade union also signs the contract. Clearly there are considerable expenses and transactional costs incurred by the companies. However they have some important advantages, apart from the exemption from taxes and the purchase guarantee from PETROBRAS and that the four phases analyzed by Buskens *et al* (2003) characterizes well. The company reduces its costs in the search for partners. The trade union leaders help to organize meetings in which the company sets out its objectives and invites farmers to join their production system. The contracts do not need to be negotiated or explained individually, once they are understood and accepted as a consequence of trade

union diffusion work. The execution of the contracts is also accompanied by the trade union movement. However there is no data to evaluate their capacity to control with respect to the real monitoring of what takes place in the field, especially in terms of the technical assistance.

Today there already are 68.5 thousand signed contracts, of which 13 thousand are from the South of Brazil. The forecast is that by the end of 2008 there will be 225 thousand signed contracts throughout the country, of which 85 thousand in the Northeast, 18 thousand in the South-east, 27 thousand in the South. In these contracts castor-oil plants is the principal crop (61% of the total), followed by soybean (29%), DENDE (4%) and sunflower (3%). The average area of the planted area is between 2 and 5 hectares. Table 1 presents the principal crop already planted in each region.

**Table 1. Castor-oil plant is the principal crop of family farming for the production of biodiesel**

Region	Planted area				
	soybean	palm	castor-oil plant	peanut	sunflower
South	94%		4%		1%
North		100%			
Northeast		5%	88%		2%
Central-West	39%		46%		15%
Southeast				100%	
<b>Total</b>	<b>29%</b>	<b>4%</b>	<b>61%</b>	<b>0%</b>	<b>3%</b>

Source: MDA/Selo Combustível Social, 2007.

### 3.2. The interests of the social actors

The formation of the biodiesel market, with a dimension of social responsibility, is the result of a coalition of interests of three actors: companies and social movements under the coordination of the Federal Government. Actors that previously were only in positions of conflict found themselves responsible for the formation of a productive arrangement. This unexpected configuration was made possible by the substantial changes in the “conception of control” (Fligstein, 2001) which guides the action of the three principal agents responsible for the formation of the biodiesel market: companies began to adopt social responsibility as the nucleus of their business; social movements twisted from contestation to partnership with companies; and the government played the role of catalyst between previously antagonistic agents instead of the traditional corporatist practice (Thomas, 1993).

In the 21<sup>st</sup> century corporate social responsibility is no longer an isolated attitude of a few more advanced companies. According to a survey by the IPEA (2004), almost 70% of private Brazilian companies carry out some sort of social action. However, philanthropy is the principal view that the companies have in terms of their relationship

with society. The food distribution and several programs of social assistance are what the great majority of companies offer to their communities.

The approach of the biodiesel social seal by the companies is much closer to that which Porter and Kramer (2006) call the “strategic social dimensions of the competitive context”. In this case social responsibility is conceived of as strategic and aims to increase competitiveness through changes in the social context to explore new business opportunities and increase the productive efficiency. Biodiesel companies try to explore diversification of feedstock suppliers a social and economic objective at once.

Apart from the reduction of the taxes for the companies that buy feedstock from family farmers, the production costs of the family farms are competitive, when compared with big farms. Less use of machinery and chemical inputs, diversification of income's sources and principally, the subsidized credit provided by PRONAF, make the family farming production system competitive. Whilst the large buyers of soybean in the mid-West region prefinance their suppliers with interest at market rates, the family farmers produce the raw material for biodiesel with subsidized interest rates. The incorporation of producers with less capital in the biodiesel market has precisely this objective of a wider supply of raw materials at a low cost.

In addition to this the Brazilian companies enter in the foreign market with a social label which could open up greater opportunities of access and less risk of contestation. For example, the access of soybean to the European market has been increasingly linked to the adherence of companies to certifications and policies of environmental and social responsibility. Whilst restricted to the social aspect, the Fuel Social Seal is the only system of certification of biofuels in the international market.

However what more surprise in the formation of this market is the big engagement of social movements. From different ways and oriented by different market conceptions, the biodiesel market becomes one of the prime social movements guidelines.

Brazilian rural trade union movements emerged in the 1960s. In spite of their confrontational character, the organizations of the so called “official structure” are until today dependent on the State. Trade unions finances are based mainly on obligatory contributions made by all agricultural and collected by the State. The large reach of PRONAF explains significantly the prestige of trade unions. Over its first three decades of existence the movement was based upon agrarian reform claim and the conquest of rural workers' rights, such as worker's and social security rights. With the modernization of agriculture, the intense exclusion of the poorest farmers, the formation of large-scale agroindustries and cooperatives, a new line of struggle has been created, since the 80's directed towards the direct conflicts with the private sector.

Some of the most important actions of the rural trade union movement took place in the southern region in the 80s and 90s with the mobilization of the tobacco farmers against Souza Cruz, the pig and poultry farmers against Sadia and Perdigão, the dairy farmers against Parmalat and the excluded family farmers against the big cooperatives, to cite just a few examples. Nonetheless even in the actions against the private sector, the focus of the trade union activities was always oriented to the State, especially to Federal Government.

What changes have taken place that caused a sizeable part of the rural trade union movement to work directly in partnership with the large companies that produce biodiesel? The Ministry of Agrarian Development coordinates presently one of the largest financial programs directed to a specific economic segment in the country. From 1999 to 2006, almost R\$ 32.7 billion (about US\$ 16 billion) were invested in credit to family farmers through PRONAF. In the first ten years of PRONAF, the program represented the principal source of political legitimation for the rural trade union movement.

Annually the rural trade unions present demands seeking an increase in the resources for and a reduction in the interest rates of PRONAF. Improvements in the policy have been made and many are still to be implemented. However, the capacity of rural organizations to promote substantive changes in the public policies and with this, justify their role to their social bases is reaching a limit. The conquest is routinized and the role of trade unions in its existence no longer a basis for its political reputation.

The creation of the Fuel Social Label represents a new source of justification for the rural trade unions. With this power in hands they have unprecedented opportunities to act formally in the mediation between the producers and industry, and in this way to influence the new market organization and to act directly in the negotiation of prices paid by the industries to family farmers.

The possibility of offering new opportunities to access the market to family farmers, especially a market with great potential, and the new and unprecedented possibilities of politically strengthening of the rural trade unions are the two hypotheses that explain the trade unions engagement, especially those affiliated to CONTAG, to the program.

Other segments of the social movements, however, have strong contestation against the Fuel Social Label. FETRAF (Federation of Rural Trade Unions), MST (Landless Movement) and MPA (Small Farmer Movement) reject the model which stimulates the integration between family farmers and large private companies. Recently in Curitiba, FETRAF and Sindipetro (trade union of Petrobras workers) launched a manifesto against the seal. These organizations pressure government to finance cooperative industrial units that could be managed directly by popular groups.

The creation of the Fuel Social Label marks a clear change in the logic of government's actions. The approximation between the companies and the trade union organizations was mediated by the MDA which did not just formally establish through the norms of the label that the companies approached the trade unions so as to close deals with the farmers, but also encouraged the creation of councils to plan the production where both sides are represented. The Ministry itself has been going through important changes. Previously its field of relationships was limited to the area of public bodies and organizations in the sector. Through establishing closer links with large private companies in the energy sector, the department of the Ministry that coordinates the policy became more preoccupied with the management, with the markets and with the economic rationality of the policies for which it is responsible.

The Federal Government has adopted two mechanisms to bring together companies and social movements. The first is the formal mechanism described above, through which the companies need the consent of the trade union organizations for the contracts between the companies and the family farmers. The second mechanism aims to

establish long lasting relationships between the social agents through the formation of local coordinations for the production of biodiesel. The formation of these local coordinations has the objective of monitor the contracts and targets negotiated by the companies and the trade union representative for the farmers are met. They aim to coordinate the various operations needed to carry out business, encouraging cooperative relationships between the agents involved in the biodiesel production chain. The coordinations are structured with the creation of Management Working Groups, with the participation of the biodiesel companies, as well as the representatives of the trade union organizations, financial agents, technical assistance companies, research institutions, and cooperatives and in some cases universities, municipalities and other public or private organizations.

The methodology for the creation of the coordinations is also different from the traditional forms of organization of public policies forae. Whilst in the traditional forae the actors move themselves around strategies to meet specific and unrelated demands, in the biodiesel coordinations, the organization and its actions are orientated by the targets set in the ANP auctions and in the contracts between the companies and producers. The first step in the creation of the coordinations was the carrying out of an analysis of the production chains of biodiesel, with the aim of identifying conditions for the production of the feedstock, and the actions that were being implemented by the organizations and local institutions. Once the critical points had been identified in each region, plans of action are drawn up involving credit policies, technical assistance, training and technological innovation so that the production targets could be met. Furthermore, the organizations gathered in the Working Groups monitor the execution of the contracts and verify if the companies or producers broke them or not.

### **3.3. Some limits**

There are three factors that could compromise the innovative elements of the policy.

- a) There is no evidence that integrated systems of energy and food production are being adopted in a significant way. It is true that in the State of Paraná a milk cooperative system (Sisclaf) in partnership with a credit cooperative (Cresol) is encouraging the integration of milk production with biodiesel, by making use of the leftovers of the sunflower seed (after the oil has been extracted) as animal feed. In the same way, in Abelardo Luz (Santa Catarina), the agrarian reform settlements have integrated systems for the production of sunflowers and fish. The Ecovida Network (present in the South of Brazil) promotes the use leftovers of castor-oil plant as compost for organic farms. However, currently these examples are not the dominant norm of the technical assistance and of the agricultural practice in the production of biodiesel.
- b) In the same way as happened in the beginning of PRONAF (Abramovay & Veiga, 1999), there is a risk that only the more prosperous family farmers will manage to take advantage of the opportunities to participate in the markets opened up by biodiesel. In the mid-West, the majority of the supply comes from farmers with land of between 50 to 100 hectares. Currently there is no empirical data to evaluate this question.
- c) The social label has no environmental guidelines: the introduction of agricultural practices aimed at the integrated production of energy and food could be part of

a wider movement for the environmental certification of biodiesel, which could have interesting market repercussions for all the actors involved in the process.

#### **4. Results and conclusions**

Research carried out in various countries suggests that the inclusion of small scale and low income agricultural producers in dynamic markets depends upon very specific institutional arrangements. The role of public subsidies and their capacity to target specific groups is important, especially when the producers are not well organized and have limited influence on the supply chain (Berdegué, Peppelenbos e Biénabe, 2006)

The arrangements stimulated by the PNPB contribute for creating new patterns for the inclusion of low income farmers in dynamic markets. Such conditions are met by three basic political components: a new organizational model, new technical productive standards (by the use of new products) and strategic models of social responsibility on the part of the companies.

The principal organizational innovation is the strength of social links between trade unions, companies and Ministry. On the part of the companies, there has been the creation of an unprecedented contractual link with the farmers, under open and explicit trade union and government supervision. Here lies an important issue for discussion amongst the social movements: some segments (Fetraf and part of the MST) do not want to rely on the companies to participate in the PNPB and aim to implement cooperative units managed by the workers themselves.

Union organizations are increasing their power in price negotiation, in contract monitoring and by their participation in shaping the market. This power is not addressed against the companies. Unions are decisive in encouraging family farmers to take part in the market, in the mobilization of the network of suppliers, in the organization of the technical assistance and in the monitoring of the contracts. They contribute substantially to reduce transaction costs of the companies.

In spite of the expectations that biodiesel production would be based on a soybean monoculture, the Program is stimulating the introduction of new products in family farming production. It is important to highlight the participation of EMBRAPA, and also of the companies themselves, in agricultural research which have led to a mapping of the possibilities of new crops in several regions of Brazil. The areas planted with crops for bioenergy, within family farms, are sufficiently small so as not to threaten their characteristic diversity. However, there is a need for agricultural research specifically to this end which, above all, establishes the formulation and execution of integrated systems for the production of energy and food. Furthermore, the companies have incentives to invest in degraded areas and also those with a low level of agricultural use. Consequently, in contrast to what occurred with the expansion of alcohol production, there is no indication that the PNPB threatens, even indirectly, forest areas.

The government policy promoted the formation of “weak ties” between the social actors that were on opposite sides of the social arena. This was made possible through the conjunction of stimuli that saw the convergence of the views and interests of the companies and the union organizations in a common strategy for the formation of the biodiesel market

It is also important that companies benefit from the social inclusion aimed by the policy in their mark. In this case, social responsibility relates directly to their economic interests and to the business strategies of the companies, as well as the political interests of the union organizations that participate in the PNPB. These organizations are strengthened not by their generic opposition to agro-business, but by their ability to mobilize their social and political capital to increase the participation of their members in the market and to construct, together with the companies, the conditions to consolidate the economic viability of this relation.

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