

Demystification of the National Program for the Production and Use of Biodiesel

A review of the Brazilian vegetable oil industry

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Introduction

This brief analysis covers some of the relevant aspects related to biodiesel, the new fuel with an important role in Brazil's economic, social and environmental areas, that have been discussed in various forums for some time now.

A careful analysis of these aspects will provide the basis for judging whether the incentive program for the production and use of biodiesel is valid. In other words, it will answer the question: Is developing biodiesel a worthwhile program for Brazil?

We have selected some of these debates and present them in the form of questions and answers. In this way, ABIOVE, the Brazilian Vegetable Oils Industries Association, seeks to contribute its point of view to the discussion, always using transparent and reliable sources. Good reading!

What is biodiesel?

To start with, we need to understand exactly what biodiesel is. Law No. 11.097/2005, Article 6, item XXIV, defines biodiesel as *“a biofuel derived from renewable biomass for use in internal combustion motors with ignition by compression or, according to regulation, for generating another form of energy that can partially or totally replace fossil fuels”*.

National Petroleum Association, ANP Resolution No. 7, dated March 19, 2008, in its Article 2, Item I, put it in this way: *“biodiesel – B100 – fuel made up of alkyl esters of long-chain fatty acids derived from vegetable oils or animal fats, conforming to the specifications in the Technical Regulation that is an integral part of this Resolution”*.

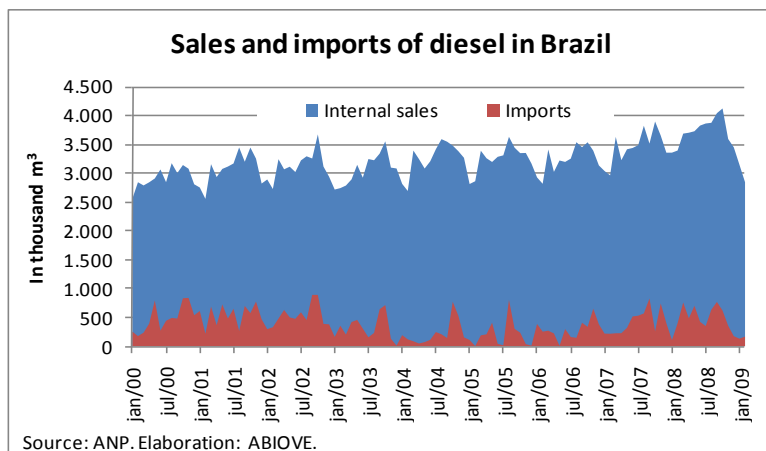
In summary, we can say that biodiesel is the fuel produced from vegetable oils or animal fats with a view to replacing, totally or partially, petroleum diesel.

Why replace petroleum diesel?

There are several reasons that justify a program to replace petroleum diesel. As relates to Brazil, we can start by qualifying the word “replace”. After all, is Brazil self-sufficient in diesel? The answer is no. Brazil is a net importer of diesel, importing on average 12% of our consumption needs since 2000. This dependency has economic and strategic costs because diesel fuels all of Brazil's road transport logistics.

Thus, we can see that Brazil is, in fact, replacing expensive imported diesel that is subject to political uncertainties in the world's main producer regions, so biodiesel reduces

our need to import diesel. Since 2005, the year the Brazilian program started, the country has saved over US\$ 1.5 billion on importations of mineral diesel.



Source: ANP. Elaboration: ABIOVE.

Biodiesel also improves the quality of the air. Because it is a derivative of vegetable oils or animal fats, its composition does not include sulphur, the element present in diesel that causes respiratory problems and the so-called “acid rain” in the large urban centers.

In the case of soybean biodiesel, these benefits were quantified by Garcia, J.R. (2007) in his dissertation for his Master’s degree. In the thesis, he performed a bibliographic research and observed that, compared to petroleum diesel, pure soybean biodiesel reduces emissions by:

- ✓ 67% of hydrocarbons (HC);
- ✓ 48% of carbon monoxide (CO);
- ✓ 78% of carbon dioxide (CO₂);
- ✓ 47% of particulate matter;
- ✓ 100% of sulphur oxides (SO_x).

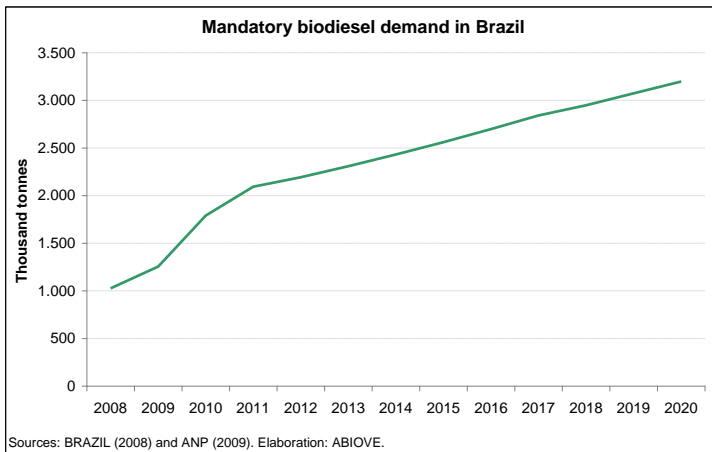
These results show that, in the current context of fighting the causes of climatic changes, biodiesel fits the clean-fuel category perfectly because it reduces the emissions of greenhouse gases and comes from renewable sources. With these benefits, biodiesel helps Brazil maintain the clean-source share in its energy matrix at high levels.

Finally, but no less importantly, “biodiesel mixed with diesel oil tends to improve the characteristics of this petroleum derivative – increasing lubricity, important in a diesel oil with low sulphur content” (PENTEADO, 2005). This will favor the gradual implementation of this low-sulphur diesel, as announced by the Ministry of the Environment (BRAZIL, 2009).

What is the timetable for implementing the biodiesel mixture in Brazil?

Biodiesel blends in Brazil are regulated by Law No. 11.097/2005 and Resolution No. 2, dated April 27, 2009, of the CNPE, National Council for Energy Policy. The first

stipulates that, starting in 2008, 2% biodiesel be mixed with conventional diesel, increasing to 5% in 2013. The second determined an increase to 4% in July 2009, allowing up to 5% on a voluntary basis, depending on the operation's economic feasibility.¹



As can be seen, the percentage of biodiesel is increasing gradually so as to allow the market to adjust to the supply and demand.

In 2008, about one million tons of biodiesel were used, which should increase to 1.3 million tons in 2009, gradually growing to 3.1 million tons in 2020. This production

will require an equivalent volume of vegetable oils, and domestic production capacity will be fully able to meet this demand.

According to ABIOVE (2005) estimates, Brazil will harvest about 105 million tons of soybeans in 2020. Processed locally, the country will be able to count on 20 million tons of soy oil. And this doesn't include the development of other oilseeds, such as sunflower and rapeseed, which should see strong growth in the next years as a result of the demand for biodiesel oil.

These estimates do not include clearing native vegetation in new areas. ABIOVE (2005) projections calculate that only another eight million hectares will be needed for this increased production because agricultural productivity will improve as the country uses its more than 170 million hectares livestock pastures more efficiently. Given that Brazil's average animal density is one head per hectare, a 5% increase in productivity over twelve years, or just 0.4% annually, would be enough to free up new areas for soy production.

These indicators show that Brazil has an adequate volume of raw material available to meet the needs of the program over the long term, without impacting the other food and industrial uses for vegetable oils.

In the current context of increasing the efficiency of meat production and of concerns with climatic changes, it can be seen that the effort to increase soy production, food and biodiesel is wholly compatible with the country's natural resources and technologies.

¹ CNPE had already increased the obligatory percentage of biodiesel in mineral diesel from 2% to 3%, with the publication of Resolution No. 2, dated March 13, 2008.

Will biodiesel increase soy acreage in Brazil?

A lot is being said on this subject. To understand the basic economic implications behind any estimates made, it is important to understand the physical composition of soy. On average, this oilseed is made up of 78% protein meal and 19% oil, although these percentages vary from year to year, depending on the variety planted and the edaphoclimatic conditions. For example, a variety with high protein content tends to have a low oil content, and vice versa.

However, none of this is enough to change the percentages significantly. In the case of meal, the difference will be less than 3%, in oil it will be under 1%. It is therefore not economically feasible to plan an increase in soy acreage to supply a demand for soy oil for biodiesel.

It is a mistake to believe that the private sector will make decisions based on just 1/5 of a product, without a defined market for the other 4/5, related to meal. Increasing soy production in the same volume as the demand for oil would create excess soy meal for which there is no consumer. To sell this excess, the industry would be obliged to sell it at below-market prices, incurring losses.

For example, a demand of 1.3 million tons of biodiesel is expected in 2009. To supply this demand, new soy acreage would be necessary to produce a further 6.6 million tons of the oilseed, equivalent to 11.4% of the 2008/09 crop.

As a result, 5 million tons of meal would be produced, needing a destination. In the domestic market, this number represents 43% of current meal consumption, or 40% of current exports. With the current meat growth rate, mainly poultry and pork meats, this would result in depressed prices, marketing difficulties and economic loss.

But then what causes an increase in soy production?

As stated by Oil World (1999, pg. 23), a traditional company in the oilseeds, meals and oils sector, in its 2020 Projections Report "*Soybeans – traditionally regarded as an oilseed – are primarily a meal-seed with an oil content of 18-19% and a meal/pellet content of 79-80%*". In other words, soy production is oriented by the demand for vegetable protein.

As shown, it would not be possible to produce all the biodiesel in 2008 if the *sine qua non* condition is an increase in soy production. We are talking about this year for two reasons:

1. It was the first year of obligatory mixture in the National Program for the Production and Use of Biodiesel.

2. Prices rose strongly this year, mainly caused by financial market speculation. We will speak more of this later.

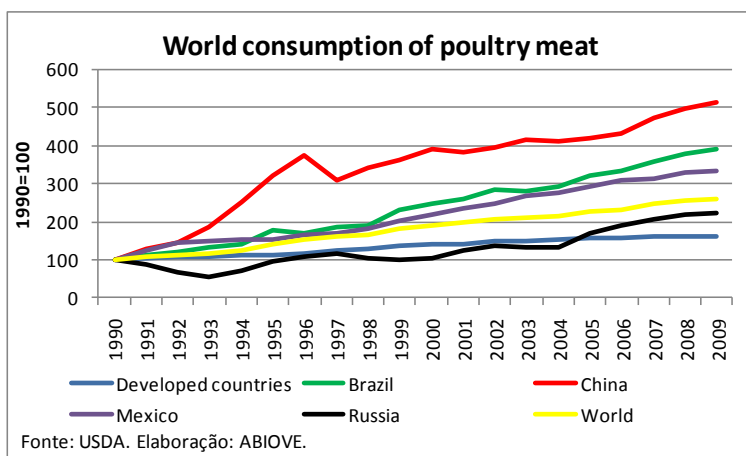
What leads to an increase in soy production is an increase in meat consumption, especially poultry and pork meats, that leads to a bigger demand for its main product: soy meal for the rapid and healthy growth of the animals. In this case, soy meal is an ingredient making up about 18% in the composition of feeds.

This has already been documented in several studies by institutions globally respected for their work in the oilseed sector. A publication by UNCTAD (1990, pg. 45) says: “(...) *Even when oil prices are high and meal prices relatively low (as was the case in 1984), meal provides more than 50% of the value of the crop. The overall demand for soya beans is therefore largely dependent on the demand for meal used as feedstuff, derived from the demand for livestock products (dairy and meat). The rising demand for meat in general and for white meat in the industrialized countries in particular has increased the demand for soya-bean meal, which is a basic ingredient in compound feeds*”.

Oil World (1999, pg. 23) says: “*Although there have been periods when the tightness in the oil market has been the driving force for a further increase in soybean cultivation, it was still mainly the rapidly expanding world protein demand that was behind the outstanding growth in soybean cultivation from 44 Mn ha worldwide in the five years ended in the 79/80 season to almost 67 Mn ha in the current 5-year period 95/96 until 1999/2000*”.

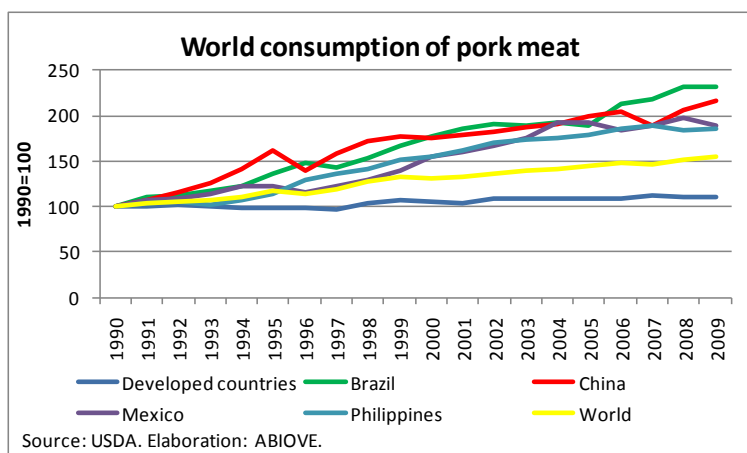
This need arises in a world where economic forces are changing rapidly with the persistent and accelerated growth of developing countries. It is this growth, together with urbanization and changes in eating habits, that is leading to an increase in the per capita consumption of animal proteins in markets representing a significant portion of the world’s population.

These very populous countries had very low levels of food consumption and, therefore, increases in income tend to be spent on food and other primary goods. Consequently, millions of people in countries such as China, India, Russia, the Asian Tigers and even Brazil started to consume more meat,



stimulating world grain demand for feed, as can be seen from an analysis of the historic poultry and pork meat consumption in these countries.

In China, for example, a country with over 1.3 billion inhabitants, poultry consumption has increased five times since 1990 and pork consumption doubled. Globally, the demand for poultry increased more than 150% and for pork more than 50%. For this reason, global meal production almost doubled in less than 20 years, according to Oil World data. Between 1990 and 2008, supply went from 134.51 million tons to 265.29 million tons. Soy meal accounts for a good part of this increase: going from a production of 70.3 million tons in 1990 to 163.0 million tons in 2008, a growth of 132%.



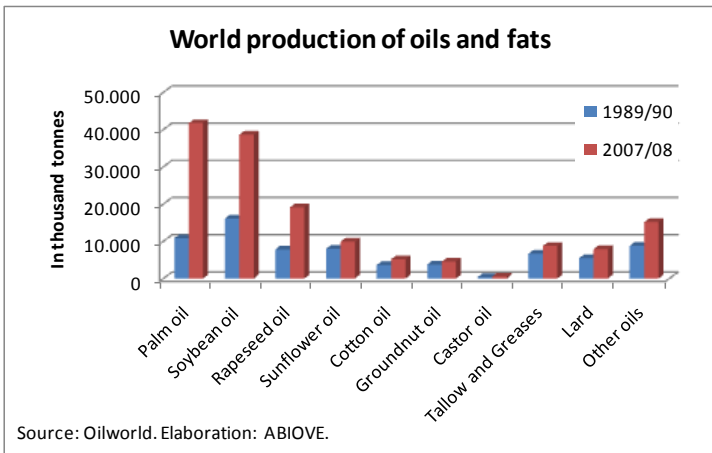
According to UNCTAD (2000, pg. 7), this accentuated growth is directly related to soy protein's chemical composition. Meal from this oilseed, as compared to other oilseeds, has a high content of protein, as well as calcium and the essential amino acids. One of these acids is lysine, whose presence

in soy meal (2.9%) is the highest among the meals. It is related to palatability and is a decisive factor for its selection among the various meals, especially for poultry and pork feeds. Another important factor that makes it an adequate product for animal feeds is the low fiber content, around 3%.

Oil World (1999, pg. 23) summarizes these tendencies: *“The recent strong rise in soybean meal production and usage has exceeded what was experienced in the seventies and eighties and was linked to the accelerating world demand for livestock products and increasing acceptance of soybean meal”*; and concludes: *“World demand for oil meals in general and for soybean meal in particular has benefitted in the nineties from the rising commercialization of livestock production and thus from a rising demand for specific compound feeds”*.

Why is soy oil important in the world supply of oils and fats?

Soy oil currently holds the No. 2 position in the world supply of oils and fats, according to Oil World. In 1990, production of this oil was about 16.1 million tons, followed by palm oil with 10.8 million tons. Other vegetable oils with significant global production were rapeseed and sunflower, both with about 8 million tons, and cottonseed and peanut, with approximately 4 million tons each.



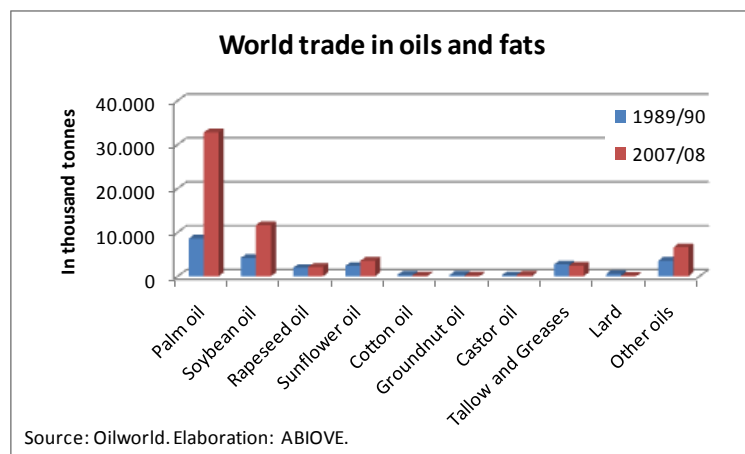
Although they are interchangeable, each of these oilseeds has specificities that make it more or less adequate for its final use. Many have their production tied to a growth in demand for the other products of that oilseed, as is the case of cottonseed, whose main demand is for the lint that goes to the textile and clothing industries.

Another example is the supply of animal fats. It would not be correct to estimate beef suet, chicken fat and pork lard based on the demand for biodiesel as these products are derived from the production and demand for meats.

Bearing in mind the restrictions of oil supply in each market, the growing world demand for oil in the food sector stimulated the production of oilseeds with a higher oil content than soy, long before the demand from the biodiesel industry. In other words, the global demand for vegetable oils incentivated growth in the production of varieties whose yield in oil per hectare was more advantageous.

The biggest change in demand patterns occurred in palm oil, whose growth was so accelerated that it replaced soy as the world's largest supply of vegetable oils. Another important case was rapeseed oil that increased production to 19.1 million tons, an increase of 145% in less than two decades.

The international trade of these products also shows the strong relation between vegetable oil production and demand. When not impeded by trade protection barriers, the comparative advantages among countries serve to incentivate the production of different oils in different parts of the world.



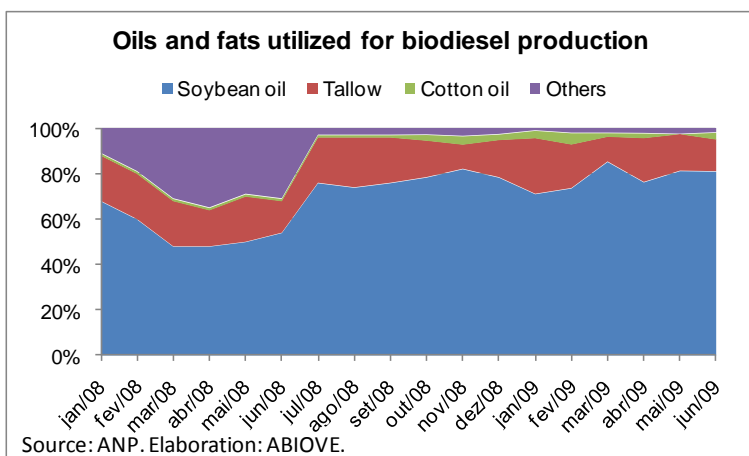
The great advantage of trade is that, in addition to promoting economic and social development, there is better use of the edaphoclimatic conditions in each country, thus ameliorating climatic variations and their impact on production and prices.

Again, palm oil is an example of these changes. International trade of this product grew from 8.6 million tons in 1989/90 to 32.8 million tons in 2007/08, an increase of more than 286%. Soy oil trade also grew, though at a lower rate, from 4.2 million tons to 11.6 million tons in the same period, an increase of 177%.

These numbers for soy are limited, physically and economically, by the intrinsic dependence of soy oil production on the performance of the meat market, as has been explained. Trade of the other oils and fats was and is marginal in relation to production because domestic consumption absorbs the local production. This is the case for oils from cottonseed, peanut and castor seed, for example.

What is soy oil’s role in the production of biodiesel in Brazil? Is the Brazilian Program dependent on soy?

Soy oil is currently the main component of biodiesel production in Brazil. According to ANP (National Petroleum Agency) data, this raw material is responsible for between 70% and 80% of the biofuel’s production. Other raw material with significant share are beef suet (15-20%) and cottonseed oil (3-5%). Other fatty materials participate residually.



This reflects the internal supply of oils and fats as soy oil and beef suet have the necessary scale and availability to lever the national program. Without them, it would not be possible to develop, on the short term, this important program to replace the energy that comes from petroleum.

However, this does not mean that Brazil is “dependent” on soy, a term often used in a derogatory manner. Being able to use soy is a strategic advantage for Brazil as it confers the capacity to produce feed for the poultry, pork and other meat sectors and, concomitantly, meet the need for vegetable oils.

This is only possible after more than 30 years of research in Brazil by the public and private sectors, which have put Brazilian production at the global technological frontier, together with the U.S. and Argentina.

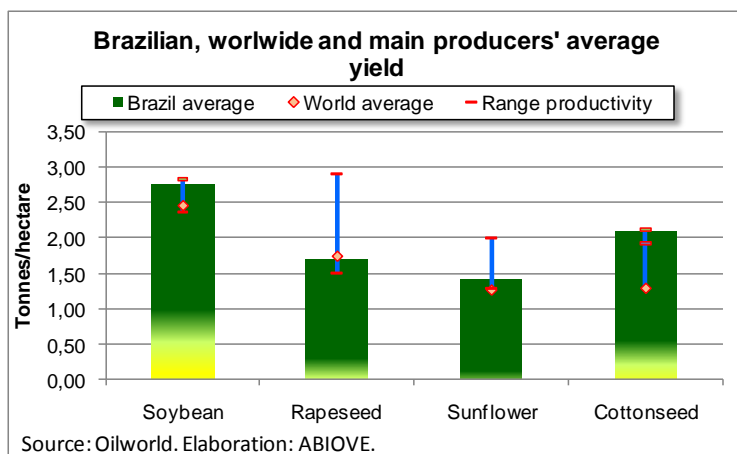
Currently, soy oil accounts for 73.3% of Brazil's available oils and fats, followed by beef suet, chicken fat and pork lard which jointly account for 11.6%. The remaining oils, such as palm and cottonseed oils, have a lower share in domestic supply.

The current predominance of soy oil in Brazil can, however, create new opportunities for Brazilian agribusiness. Oilseeds such as sunflower and rapeseed have an enormous potential for development.

These plants, which have a much higher oil content than soy, still have little agricultural productivity in Brazil, as compared to other large producers. They are therefore viable and adequate alternatives for oil production.

**Availability of vegetable oils and animal fats in Brazil
2007/08 – in thousands of tons**

Product	Production	Imports	Supply	Share %
Soy oil	6,258	90	6,348	73.3%
Tallow and greases	598	6	604	7.0%
Pork lard	394	0	394	4.6%
Palm oil	215	143	358	4.1%
Cottonseed oil	278	0	278	3.2%
Sunflower oil	50	20	70	0.8%
Rapeseed oil	59	9	68	0.8%
Castor oil	56	8	64	0.7%
Other vegetable oils	366	106	472	5.5%
Total	8,274	382	8,656	100.0%



In comparative terms, soy oil content is, on average, 19%, and cottonseed about 15%, while the oil content of rapeseed runs at 40% and sunflower is 41%. It would therefore be much more profitable to invest in these crops in Brazil because, while the country's soy and cotton production is state of the art

compared to the best producers, in rapeseed and sunflower production Brazilian agriculture is still respectively 42% and 29% behind.

For these reasons, the National Program for the Production and Use of Biodiesel should provide incentives for the diversification of oilseeds, generating jobs and income, and reducing the emission of international currencies.

Other global incentive programs for the production of renewable energy also rely on one or other raw material source. In the U.S., soy oil has this role, while in Indonesia palm oil guarantees local production of biodiesel. In Europe, the use of vegetable oils and animal

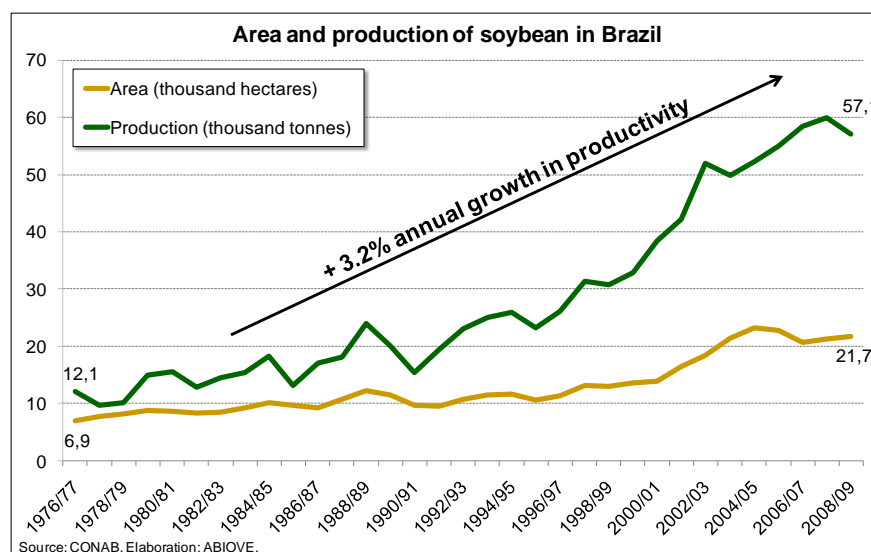
fats is more diversified because that continent is very dependent on importations, but even so rapeseed has a predominant role over the others.

How will the oil supply increase in Brazil?

As explained, there is an enormous opportunity to invest in oilseeds that have an oil content higher than soy, such as rapeseed and sunflower. This investment will be both in increased acreage and in increased yields.

Soy is emblematic of the changes brought about by investing in research and technology. Over the last 33 years, average productivity for Brazilian soybeans grew at a rate of 3.2% per year, almost quadrupling production since 1976/77 while the planted area just doubled.

Another alternative is increasing domestic oilseeds processing. Brazil has an installed processing capacity of 51.3 million tons of oilseeds, though on average 32% of this capacity is idle. This means that production of



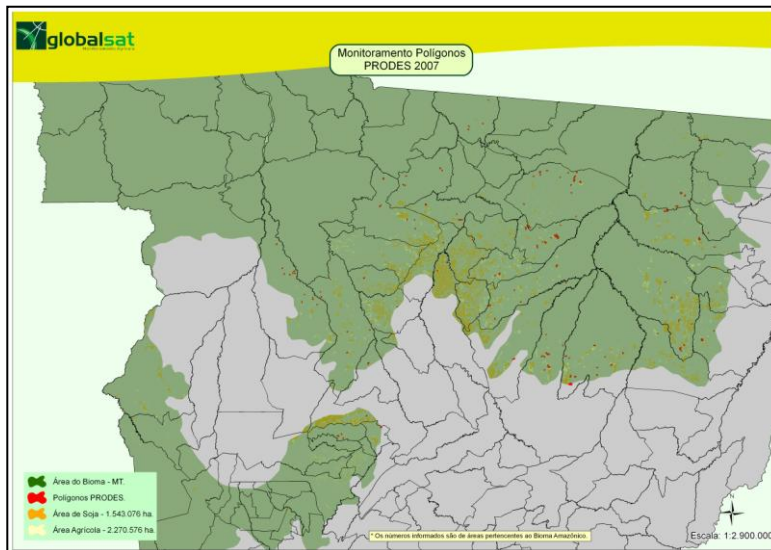
vegetable oils and meals could increase by about 16.5 million tons.

For this increase to become a reality, the country needs to solve its tax and logistics problems that impede at least part of the 24.5 million tons of soybeans being processed domestically. If 9.4 million tons of this exported quantity were destined for this market, it would generate about 1.8 tons of soy oil, enough to add 4.5% biodiesel to petroleum-based diesel.

Will this increase in soy oil lead to deforestation in the Amazon?

As we saw, a relationship between soy oil prices and the oilseed's planted area cannot be established as this is a simplistic and mistaken correlation that does not consider the peculiarities of the soy complex.

Paulo Adário, Greenpeace Amazon Campaign Director, recognizes: “Biodiesel demand for soy oil is not seen as a significant driver of Amazon deforestation” (Biodiesel Magazine, 2009).



Even knowing there is no relationship between these two variables, and even less of a relationship between soy and deforestation in the Amazon, a more detailed analysis of the correlation between soy and the Amazon would demystify this false relationship.

The satellite images shows that there are 1.5 million hectares of soybeans in the Mato Grosso state portion of the Amazon Biome. Adding the soybean acreage of the other states increases this number to 1.7 million hectares, which corresponds to just four-thousandths, or 0.4%, of the total area of the Amazon Biome.

On top of this evidence, a socio-environmental transparency and accountability initiative was launched by ABIOVE and ANEC members on July 24, 2006. On this date, the associations and their respective corporate members signed a commitment not to acquire soybeans from new deforestations in the Biome as from that date.

To perform the work, the GTS (Soy Work Group) was created, formed by representatives of the business sector and the NGOs International Conservation, Greenpeace, IPAM, The Nature Conservancy and WWF-Brazil. The GTS defined the following subgroups:

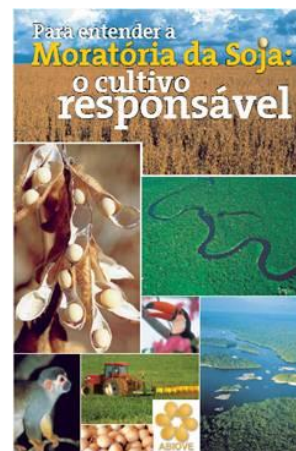
- **Education, Information and Forest Code**, with the responsibility for developing ways of disseminating the adoption of socio-environmental care to be applied locally.
- **Institutional Relations**, to improve sustainable development policies, stimulate improvements in legislation and creation of a development plan for the Amazon Biome, and get governance tools, such as maps, rural property register and inspections.
- **Mapping & Monitoring**, to monitor and document land use and occupation of deforested areas in the Amazon Biome after the Soy Moratorium, with the

specific objective of evaluating whether or not there were soybeans in these areas.

The first two subgroups have already produced several important actions, among which was the preparation of a primer aimed at the farmer on how the Moratorium worked and information on environmental legislation.

Another highlight was the commitment undertaken by the Federal Government in 2008 to develop the Economic-Ecologic Zoning (ZEE) and the registration and regularization of land within the Amazon Biome, among other actions.

In April 2009, the Mapping & Monitoring Subgroup ended its second year of inspecting areas in the Amazon Biome deforested after July 2006.



Using the official data bases of INPE, IBGE, IBAMA and FUNAI, the Subgroup analyzed a total of 157,896.37 hectares in 630 deforested polygons in 46 municipalities with significant soy production in the Amazon Biome.

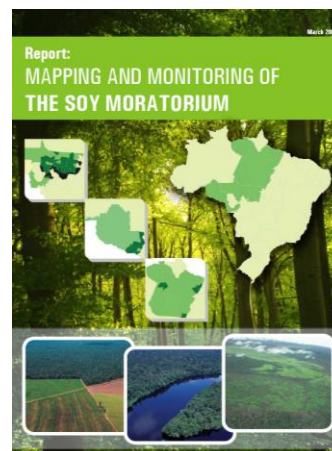
The analysis of land use and occupation involved over 230 flying hours and 6,000 photos of these areas, in addition to almost 1,300 satellite images analyzed by a specialist technical team and field visits.

The conclusions from this material show that soybeans have an insignificant presence in newly deforested areas in the Biome, as the analysis detected that the oilseed was planted in just 0.88% of the total monitored, representing an area of 1,384.95 hectares.

From this observation, ABIOVE and ANEC members reaffirmed their commitment not to acquire soybeans from these areas and to exclude producers that used new financing to plant soybeans.

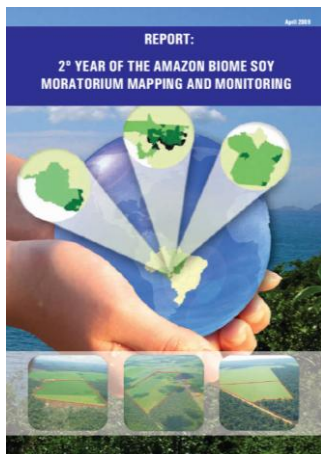
The positive results of the Soy Moratorium's second Mapping & Monitoring analysis reinforced the environmental transparency and accountability of the industries and trading companies and resulted in the following statements:

“The Soy Moratorium has been strategically important in fighting deforestation. The industry has reiterated its



commitment not to acquire this production and we hope the government will also support this initiative, making operational the governance mechanisms needed to strengthen this initiative.”

Paulo Adário, Greenpeace



“I recognize the positive effort and credit the significant reduction in deforestation to pacts such as the Soy Moratorium. (...) In addition to approving the Provisional Measure to regularize land use and payments for environmental services, the government will direct an excess R\$5 million from the PPG7 to accelerate rural environmental registration.”

Carlos Minc, Minister of the Environment

“It is important to note that a significant part of the agribusiness sector leads a process such as this one, seeking a positive agenda and generating favorable results. The sector has done its part, instead of finding guilty parties for the problem of deforestation.”

Carlos Alberto de Mattos Scaramuzza, WWF-Brazil

Will the Biodiesel Program hurt food production? What about homestead farming?

Contrary to hurting food production and homestead farming, the biodiesel program favors production of essential meals to produce meats, especially poultry and pork.

So, if one ton of soy biodiesel requires the production of that amount of vegetable oil, it also makes available another four tons of soy meal for feed production. In the case of poultry production, from the average feed composition used by producers, these four tons will be added to corn and other ingredients and will result in 12 tons of meat.

This does not mean that biodiesel, by itself, leads to increased soy production but it could make viable the local processing of soy currently exported as grain.

Over the long term, there are several consequences of increasing the production of oilseeds with a higher oil content, such as rapeseed and sunflower. In quantitative terms, meal production will be lower than would be the case were soy oil used. In the case of sunflower, one ton of oil would be produced together with 1.1 ton of meal. For rapeseed, this amount is 1.5 tons.

However, in qualitative terms, these meals will be used in feed compositions that differ from soy because their properties have different effects on meat production, being more or less adequate to different livestock and growth stages.

Another benefit that will come from a diversification of oilseeds will be better land use, since they would be planted as winter crops, such as rapeseed, and in rotation with other crops, such as sunflower (CIRAD, 2008).

Farmers will also benefit from this process because, having more profitable choices, they can diversify their production and increase their income, bringing the farmers greater stability and helping him remain in the field. The advantages extend to improvements in soil quality and pest reduction as a result of crop diversification.

It should be born in mind that changes leading to agricultural diversification require time for research to bring results. It is for this reason that the new rules of the Social Fuel Seal (BRAZIL, 2009) favor not only purchasing raw material from homestead farming but also what the industries spend on technical assistance and inputs.

Currently, over 92% of installed capacity has the Seal and works with homestead agriculture, a requirement for participation in 80% of ANP (National Petroleum Agency) auctions. This initiative should help rural development by increasing income and creating jobs.

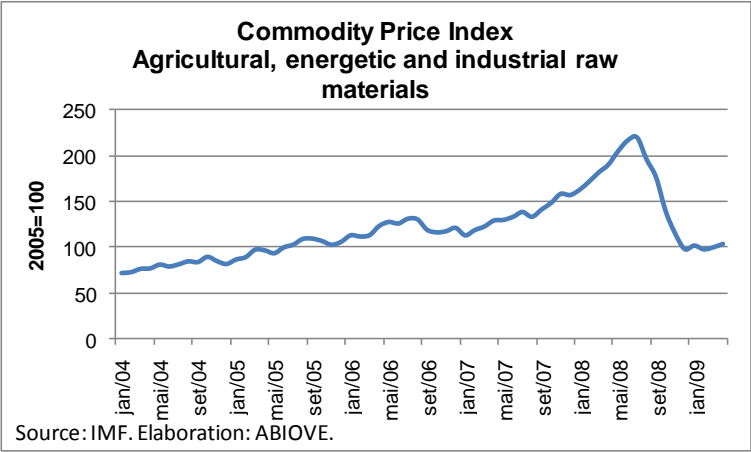
It is important to highlight that the amounts spent with oilseeds other than soy are accounted for tax reduction purposes with 50% more than that spent with this oilseed. These incentives contribute to accelerate still further the diversification process for biodiesel's raw material.

Will biodiesel cause an increase in food prices?

This is yet another myth to be destroyed. Between 2007 and 2008, international commodity prices, not just agricultural commodities, rose strongly and reached historical records.

Petroleum, for example, had an average price level of US\$30-40 in 2004 and 2005 and was quoted at over US\$130 in mid-2008. Generally speaking, commodity prices more than doubled in 2008, compared to 2005 levels.

However, the worsening of political tensions in the main petroleum producing countries and the increase in concerns surrounding



climatic changes made biodiesel an important element in the simultaneous fight against these two problems.

In these two years, the global biofuel programs gained strength and growth took off, and this fact was immediately associated with the increase in international commodity prices, even that of petroleum.

That led to saying that products which replace even very small amounts of fossil fuels and use insignificant quantities of natural resources and raw materials caused devastating effects in global economy. In the case of biodiesel, the use of arable lands did not reach 4% in 2007 (USDA, 2008) and the use of vegetable oils and animal fats did not reach 7% of global supply.

Soon after July 2008, these prices fell drastically until January 2009, and held at the 2005 levels since then. These facts emptied the debate as it was obvious that the extremely volatile nature of the prices was not justified by supply and demand, but on the speculative movements of the financial markets. With the economic and financial crisis in developed countries, these movements strongly reduced their influence over prices.

Nevertheless, it is worthwhile making a careful analysis of two studies that show the economic relationship between commodity prices and financial markets. The first was made by the USDA, called *Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices* (USDA, 2008); and the second was made by the Fundação Getúlio Vargas, called *Determining Factors for Food Prices* (FGV, 2008).

Conclusions

This study's objective is to dispel some of the myths related to biodiesel, from ABIOVE's, the Brazilian Vegetable Oil Industries Association, point of view. ABIOVE's concern in preparing this study was to analyze the program in an integrated manner, from an economic, social and environmental standpoint. In this way, it seeks to contribute to the formation of opinion on a matter of great importance for Brazil, avoiding purely ideological or heavily subjective considerations.

In ABIOVE's opinion, the National Program for the Production and Use of Biodiesel is successfully meeting its goals in the three pillars of sustainability, some of which are being anticipated with society's perception that the country can raise the compulsory mixture before the date defined in Law No. 11.097/2005. Obstacles to its growth are being gradually solved in open and participative forums.

Biodiesel shouldn't be expected to be the solution for all existing problems in the areas where it exists. Environmental problems, such as the quality of air in large cities and the emission of greenhouse gases by the transport segment, are very complex and their

solution involves other important actions, such as investments in public transport, increase in engine efficiency and reduction in the sulphur levels of conventional diesel, to cite just a few.

What needs to be remembered is that biodiesel makes positive contributions to an ever cleaner and renewable energy matrix, generates jobs in the country and reduces the emission of international currencies. These elements justify its continuity and deeper study.

Bibliography

ABIOVE. **Perspectivas para a soja 2020**. Mumbai: Congresso IASC, 2005. Available on http://abiove.com.br/palestras/abiove_pal_iasc05_br.pdf. Accessed on August 6, 2009.

BIODIESEL MAGAZINE. **Greenpeace: biodiesel not seen as significant driver in Amazon deforestation**. Available on http://www.biodieselmagazine.com/article.jsp?article_id=3437. Accessed on May 4, 2009.

BRAZIL. Ministry of Agrarian Development. Normative Instruction No. 1, dated February 19, 2009. **Diário Oficial**, Brasília, February 25, 2009. Section 1, pg. 71-73.

_____. Ministry of the Environment. **Termo de Ajustamento de Conduta (TAC)**. Available on http://www.mma.gov.br/estruturas/ascom_boletins/_arquivos/83_30102008063642.pdf. Accessed on May 4, 2009.

_____, Ministry of Mines and Energy, Energy Research Company, **Plano Decenal de Expansão de Energia 2008/2017**. Rio de Janeiro, 2008. Available on: <http://www.epe.gov.br/PDEE/Forms/EPEEstudo.aspx>. Accessed on August 24, 2009.

CIRAD. **Guide technique pour une utilisation énergétique des huiles végétales**. Patrick Rousset, Coordinator. Brasília: 2008. 288 pg.

FGV. **Fatores Determinantes dos Preços dos Alimentos**. São Paulo: Nov. 2008. 47 pg.

GARCIA, J.R. **O programa nacional de produção e uso de biodiesel brasileiro e a agricultura familiar na região nordeste**. 2007. 165 pg. Dissertation (Masters in Economic Development: Area of Concentration Agricultural and Agrarian Economy) - Universidade Estadual de Campinas, Institute of Economy, Campinas, 2007.

PENTEADO, M.C.P.S. **Identificação de gargalos e estabelecimento de um plano de ação para o sucesso do Programa Brasileiro de Biodiesel**. 2005. 159 pg. Monograph (Professional Masters in Automotive Engineering). Universidade de São Paulo, Polytechnic School, São Paulo, 2005.

OIL WORLD, **Supply, Demand and Prices from 1976 through 2020**. Hamburg, Germany, 1999.

UNCTAD, **Oilcakes and meals – Market challenges for developing countries**. International Trade Centre UNCTAD/GATT. Geneva, 2000. 82 pg.

UNCTAD, **Vegetable Oils and Oil Seeds: A Trader's Guide**. Volume II – Principal Oils and Seeds in World Trade. International Trade Centre UNCTAD/GATT. Geneva, 1990. 363 pg.

USDA. **Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices**. May 2008. 30 pg. Available on www.ers.usda.gov/Publications/WRS0801/. Accessed on May 14, 2009.