



CORPORATE SUSTAINABILITY IN THE BRAZILIAN SUGAR ETHANOL SECTOR

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Introduction

This report is the result of a study carried out between December 2006 and August 2007 by the Brazilian Foundation for Sustainable Development (FBDS), in partnership with the Forum for Corporate Sustainability Management (CSM) of the International Institute for Management Development (IMD), and COPPEAD Institute of Administration of the Federal University of Rio de Janeiro (UFRJ). FBDS was responsible for applying the methodology, which was designed by CSM/IMD, while COPPEAD/UFRJ provided technical support for applying this methodology to the Brazilian sugar ethanol sector. This work was sponsored by National SESI.

The purpose of the study was to discover the main challenges for including sustainability in the business strategy in the Brazilian sugar ethanol sector. Eleven of the largest sugar and ethanol producing groups in Brazil¹ participated, plus the Brenco Group, which is a new player in the current move to consolidate and open the market, and four other major stakeholders from the sector. These stakeholders are: BNDES (The Brazilian Bank for Economic and Social Development); Center of Sugarcane Technology (CTC); Alagoas Sugar and Ethanol Syndicate (SINDAÇÚCAR-AL); and the São Paulo Union of the Sugarcane Agro-industry (UNICA). The methodology involved interviewing top executives from the aforementioned institutions and sending questionnaires to

Figure 1 – Research Sample



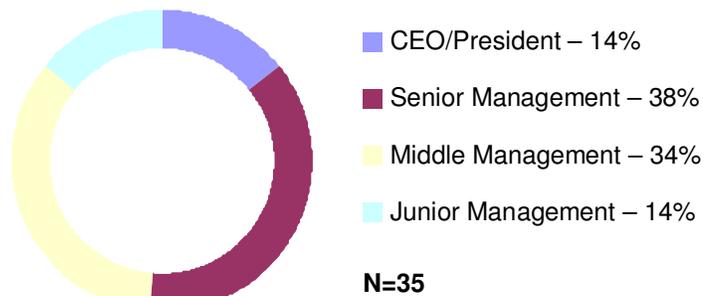
¹ São Martinho Group did not participate in the interviewing stages and completion of questionnaires.

middle management. Altogether, 35 executives were interviewed from various relevant areas and 45 questionnaires were completed. FBDS also examined documents and information disseminated to the general public by the target institutions in this study, as well as other sector reports. The complete methodology of the study is described in further detail in the section on “Research Methodology” on page 46.

This report is divided into four parts. In the first section, the concept of corporate sustainability is defined in order to determine the scope of this report. Next, a brief introduction will be given of the key characteristics of the Brazilian sugar-ethanol sector. Then we discuss the main sustainability

practices in the sector, and their presence in the institutions under study, using public information. Lastly, this report analyzes executives’ perceptions of major challenges to incorporate sustainability into their business strategies.

Figure 2 – Hierarchy Levels



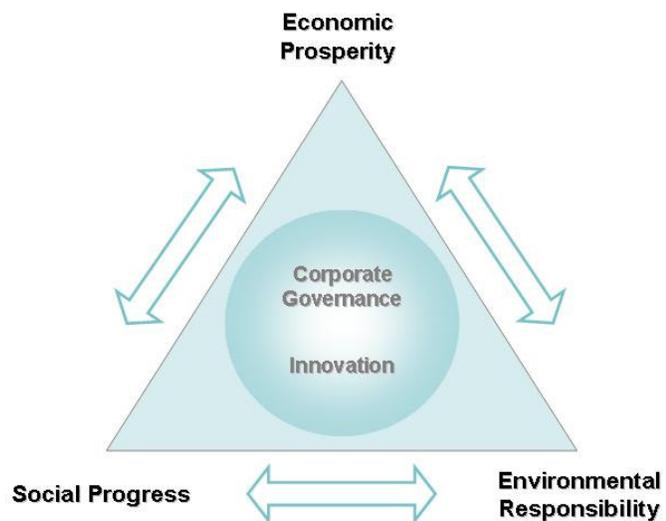
Corporate Sustainability: Definition of the Concept

Although the widely accepted definition of the concept of sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”², there is a major debate on the correct definition of the term corporate sustainability, because of its association with terms already known earlier in the business world as social responsibility, corporate social responsibility or corporate citizenship.

This study addresses corporate sustainability as the incorporation of social and environmental aspects in the definition of business strategy, business operation and stakeholder interactions. It is evident, therefore, that social and environmental activities that are not related to the business operation and strategy, such as philanthropic initiatives and donations (common in this sector), are not included in the scope of this paper. The emphasis here is on the word *incorporation*: the purpose of this study is to investigate how social and environmental aspects relating to everyday business are being addressed by the organizations.

Often associated with the term corporate sustainability, and of the utmost importance in understanding the subject, is the concept of the triple bottom line (TBL) proposed by John Elkington in 1998 in his book *Cannibals with Forks*. The TBL concept refers to economic prosperity, environmental quality and social progress, and to building metrics that help measure the performance of a company not only in the economic but also social and environmental spheres.

Figure 3 – The Triple Bottom Line



Corporate sustainability does not necessarily imply higher costs, more bureaucratic processes and lower financial returns. Sustainability lies in a business view in which socio-

² Brundtland Report, WCED, 1987

environmental performance goes hand in hand with economic performance – a change of paradigm that prioritizes permanence and perpetuation of the organization. In some situations, improvement in socio-environmental performance can generate short-term financial gains for the organizations – for example, the reductions in chemicals needed due to the utilization of the vignasse and other industrial residues in soil fertilization. In other situations, this improvement may not bring immediate benefits but does give the company long-term gains, which contribute precisely to the ongoing and permanent success of the organization. So, a situation in which socio-environmental improvements are primarily linked to economic losses violates one of the three supports of the TBL, and is not sustainable.

Two principles are extremely important in promoting corporate sustainability: corporate governance and innovation. A company can guarantee that the interests of the various stakeholders are preserved only when it is based on good corporate governance practices, and a sustainable company is exactly the one that recognizes and valorizes its internal interdependence not only with internal agents, such as its collaborators, but also with players outside the company, namely, suppliers and clients. On the other hand, innovation is the catalyst of the aforementioned change in paradigm, creating new products, redesigning existing processes and rethinking the business model of the organization.

The Brazilian Sugar Ethanol Sector

General Characteristics

The Brazilian sugar ethanol sector consists of companies that produce sugar or ethanol, or operate at some stage of their production chain. In Brazil, this sector is directly related to sugar cane plantations, since sugar cane is the principal input for the production process.

Many sugar mills work with sugar and ethanol, varying the proportion of sugar cane allocated to each production line in accordance with the variations and market trends. Sugar can be classified in different types – 1, 2A, 2B, 2G, etc. – according to the product’s color and degree of purity. Ethanol has two basic variants, each with a different proportion of water in the final product: anhydrous alcohol used as an additive to gasoline; and hydrated alcohol, which can be used as a fuel directly in ethanol or flex-fuel engines. Ethanol can be used for different purposes, for example, the pharmaceutical or chemical industry, but its application in the transportation sector is now the major driver of growth of the sugar ethanol business and this classification has been welcomed by the market.

Brazil is the world’s largest sugar producer and second largest ethanol producer. The country today produces around 35% of the world’s ethanol and is the largest sugar exporter.

Figure 4 – Data of sector and study sample

	Sector	Sample	(%) Sample / Sector
Processed sugarcane (ton):	457,980,000	114,578,856	25.0 %
Sugar production (ton):	30,629,827	9,204,904	30.1 %
Ethanol production (m ³):	17,909,822	4,390,623	24.5 %
<i>Anidro (m³):</i>	8,081,661	2,407,991	29.8 %
<i>Hydrated (m³):</i>	9,828,161	1,982,632	20.2 %

Source: Ministry of Agriculture, UNICA and SINDACUCAR-AL

The intensive use of sugar cane as basic feedstock for sugar and ethanol production, plus the climate conditions and other environmental factors, offer several competitive advantages to the productivity and quality of Brazilian products against foreign alternatives, which use other inputs such as corn or sugar beets.

Figure 5 – Comparison among sources for ethanol production

Region	Culture	Production Cost (USD/liter) ³	Energy Efficiency ⁴	Productivity (liters/hectare)
Brazil	Sugarcane	0.21	8.3	6,000
USA	Corn	0.27	1.4	3,100
Europe	Sugar beet	0.76	1.9	5,000

Source: Sugarcane Energy – UNICA (2005)

History

Sugarcane has been planted in Brazil since the country was discovered. The first seedlings were planted in 1532 and the sector’s history merges with the country’s own history: captaincies, large estates, sugar mills, and other crops (especially coffee) were key elements in the history of sugar plantations in Brazil. For example, the 1929 crisis, marked by the decline of the coffee sector in São Paulo state and the large influx of Italian immigrants, determined one of the characteristics that even today distinguish between the producers of this region and those in Northeast Brazil: the dominance of families of Italian descent who started a new life in Brazil.

The current structure of the sector began in 1975 when the National Ethanol Program (Proalcool) was launched. Its objective was to reduce the country’s energy dependence on heavy investments in production and subsidies for developing an ethanol consumer market. After the second oil crisis in 1979, and the development of national engineering, engines were now designed to run solely on ethanol.

National demand varied widely over the next twenty years, leaving companies in the sector uncertain about the market’s future: according to Anfavea data, in 1984, 94.4% of vehicles produced used ethanol-run engines, slipping to 1.05% in 2001. The Brazilian government was largely responsible for this wide variation in demand, but also provided support that helped companies and industrial plants avoid bankruptcy. This action occurred mainly through price subsidies, debt refinancing and regulations that increased the anhydrous alcohol portion of gasoline.

³ Value considering the December 2004 quotation: R\$ 2,80

⁴ Renewable energy produced / fossil input consumed

In those 30 years, Brazil was able to set up a robust industrial and logistics structure for domestic ethanol production and distribution. Since 1999, the sugar ethanol sector has broken away from government intervention in planning and management, and today is ruled by market forces, with no subsidies in the fuel price. The maturity of the sector is reflected in the turnover of key players who have created new risk mitigation mechanisms, such as futures contracts, and transformed ethanol into a negotiable commodity on the stock exchange.

Organization of the Sector

The sector’s value chain can be separated into three stages: the sugar cane plantation and sugar cultivation; sugar or ethanol production; and trading the finished product. Only a few companies can vertically integrate all three stages, but the vast majority use partnerships and long-term contracts, principally for sugar cane supply activities and trading, keeping their focus on sugar or ethanol production.

The physical restrictions imposed by the production process – the maximum distance between plantation and mill is 30 km – and the historic characteristics of the sector’s background reinforce the concentration of the first two stages around longstanding traditional family groups. Currently there are several large independent sugar cane producers as well as small sugar cane producers and farms owned by sugar mills.

Figure 6 – Family control on producing groups

Family	Controlled Mills	Tons of processed sugar cane	% national production
Ometto	19	43,653,672	11.4%
Biagi	14	31,041,588	8.1%
Lyra	10	14,553,192	3.8%
Wanderley	4	7,113,895	1.9%
TOTAL	47	96,362,347	25.2%

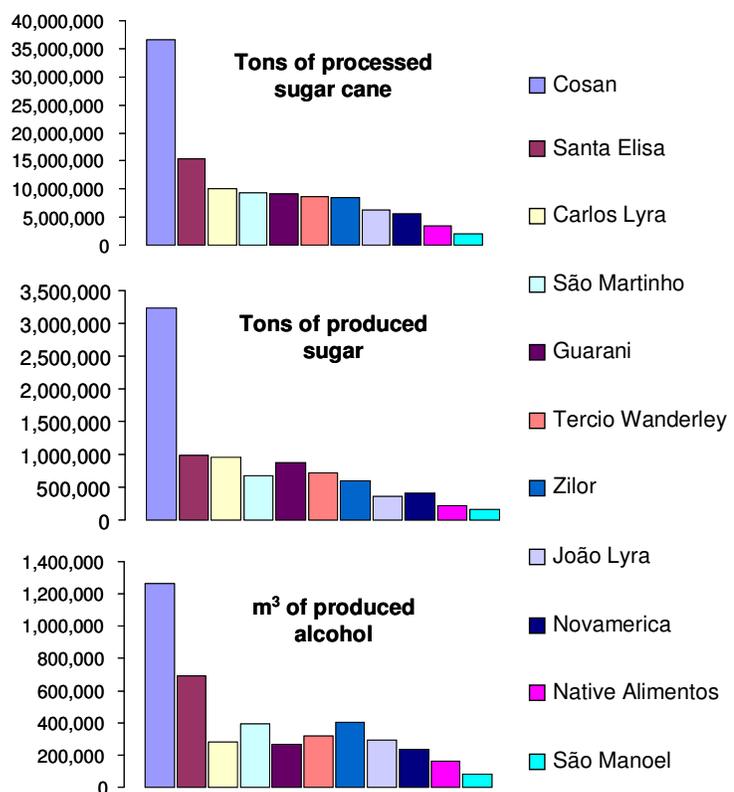
Sources: Ministry of Agriculture, company reports and websites of Unica and listed sugar mills.

The sugar ethanol sector is very diffused among these large groups and small independent producers. Figure 7 – Comparisons among participants in the study– shows the relevance of the participants in the sample in this scenario. The two ends of the typical production chain of the sector – the sugar cane cultivation activities and trading of the end products (sugar and ethanol)

– are controlled by cooperatives that guarantee scale gains for their members. This is the case, for example, of Copersucar, which operates in sugar trading and has 85 members, 31 of which are sugar and ethanol producing units, under its umbrella. This structure the sector highly competitive, mainly in the international market: 39.9% of its total R\$ 5.643 billion in sugar sales was from exports.⁵

In the competitive domestic market, smaller sugar mills need government support to compete, given their lack of economies of scale. They typically ask for facilitated loans, assistance with the creations of physical infrastructure, and the renegotiation of past debts. The demand for this type of support is higher in North-Northeast Brazil, where the production level is lower and where it is more difficult to distribute products. According to the Ministry of Agriculture, the region processed 53.6 million tons of sugar cane in the 2006/2007 harvest, corresponding to 12.54% of the national production. The difference in tax rates between Brazilian states can also be a factor of imbalance in the competition between sugar mills. Today, the VAT tax (ICMS) in Minas Gerais State, for example, is 25% versus 12% in São Paulo State, which is now the largest national producer. In the 2006/07 harvest, São Paulo State was responsible for more than 60% of Brazil's production.

Figure 7 – Comparisons among participants in the study (2006/07 Harvest)



Source: UNICA and SINDAÇUCAR-AL

Despite the move to consolidate the market – to be discussed below – the wide disparity in size and growth rate between the players hinders consolidated analyses and raises some

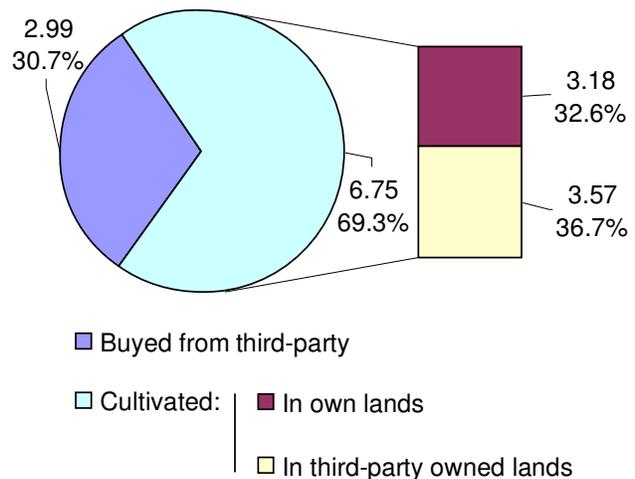
⁵ Exame Yearbook 2007/2008 (June 2007)

questions about the competing forces and their bargaining power. These questions can be partially answered by the fact that the land is concentrated in the hands of few producers, typically the sugar mill owners. If, on one hand, large groups cultivate crops on ever larger farms to become more efficient and obtain bigger margins, small land owners can gain bargaining power when they perceive that their lands can significantly constrain the growth of local sugar mills. The need for proximity between the harvest (Farm) and the processing point (Mill) makes this a local discussion, involving the players geographically close to each other.

The use of third-party owned lands is very common in this sector, and this can be observed in almost every producing group. The São Martinho group, for example, announced in its initial share issue prospectus that, of the 9.75 million tons of sugar cane processed in the 2005/2006 harvest, only 3.18 million tons came from its own land, covering a total area of 88,600 hectares.

The role of the local Sugarcane, Sugar and Ethanol Producers Council (CONSECANA) should be mentioned when explaining the exchange relations of various players in the sector. Commercial conditions of transactions among sugar cane producers and processing units are standardized by public brochures, drafted and monitored by regional producer councils, CONSECANA, in each region. This is one of the main initiatives in the sector towards greater transparency in commercial trade. The value of commercial transactions is based on the quantity of Total Sugar Recovered (TSR), which represents the quantity of sugars contained in the sugar cane, varying with plant quality, presuming also an average loss of 11% in the industrial process. CONSECANA in each region is also responsible for trade relations between companies in the productive chain, producing and publishing studies on technical aspects and quality of the sugar cane produced, for example.

Figure 8 – São Martinho Group
Processed sugar cane – 2005/2006 harvest (million tons)



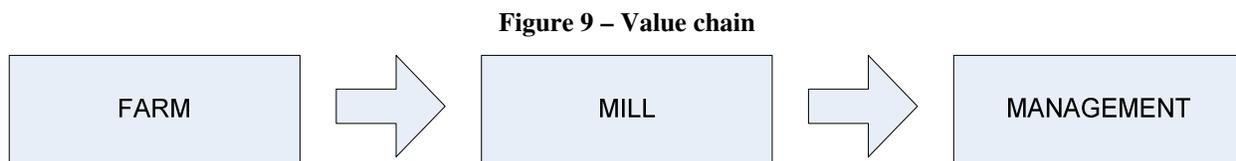
Source: Final Prospectus for Primary and Secondary Public Distribution of Common Share Issue by São Martinho

This standardization does not occur when ethanol is sold to the consumer market. Despite pressures from the sector and recent projects of the Futures and Commodities Exchange (BM&F), Brazil has not yet succeeded in establishing a solid market for negotiating ethanol futures contracts or in the transformation of this product into a commodity, which could increase the huge potential growth of the ethanol market. In an article published by the newspaper *Valor Econômico* in August 2007, specialists in the sector point to some barriers raised against this scenario, such as (i) the high price per liter, encouraged by the strong demand in the home market; (ii) tariff barriers raised by some countries, such as the USA, against importing Brazilian ethanol (US\$ 0.54 per gallon); and (iii) regulations, which require its direct sale to service stations strictly through fuel distributors, preventing open negotiation of futures contracts in the national market due to the great bargaining power of the distributors.

International competitiveness of Brazilian ethanol could also be influenced by a greater opening of the market. Some analysts believe that such an opening would improve flow mechanisms for Brazilian production, resulting in greater revenues. A greater opening of the market could also strongly increase competition, however, and this could reduce investment in social and environmental projects. The latter rationale presumes that this is the natural behavior of the commodities markets, generally guided only by low costs. The other line of reasoning looks favorably on further exposure to international markets, considering that these publics are more demanding in relation to the sustainability of the production process, and may even demand that the sector adopt seals of socio-environmental responsibility for products consumed.

Sustainability Practices in the Sugar Ethanol Sector

The main questions relating to socio-environmental sustainability of the sugar ethanol sector are discussed in this section, as well as the most significant actions of companies in this field. As a result of the operational nature of the activities, the items are organized in three large groups, associated with the stages in the typical value chain of the industry, as shown in the diagram below: Farm, Mill and Management.



For the sake of appraisal, we will consider Farm activities as those occurring before the arrival of sugar cane at the industrial plant, responsible for its processing. Therefore, the stages associated with the Farm are as follows: preparing the land, planting, cultivating, harvesting, cutting and transporting the sugar cane.

The Mill activities begin when the sugar cane arrives in the processing plant and is crushed. After this, all activities involved in the sugar or ethanol production will be considered belonging to the Mill.

Finally, the Management area involves management and strategy issues and relates to the efficiency and competitiveness of the company in the sector and the constant search for new financing agents and partners. Trading activities will be analyzed only from the point of view of competitiveness and the relationship with company strategy, in conjunction with the questions considered at the Management level.

Farm

Soil Conservation and Use

In the relationship established between the sugar cane producer and the plantation, environmental preservation and rational soil use are essential. Lack of attention to those items may lead to the deterioration of major natural assets, such as native forests and characteristic

ecosystems, which is a reason for strong pressure by the various stakeholders and is subject to state regulations.

Given the fast deterioration of sugar contained in the sugar cane after cutting, a maximum distance of 30 km is considered the limit between the place of the harvest and processing plant; this configuration encourages the concentration of vast plantations around the plant. Single sugar cane cropping may increase soil degradation mainly due to greater exposure of soil to erosion (wind and rain) and to harvesting: between 3% and 5% of the sugar cane harvest is soil pulled out with the plant.⁶ Some of the main direct and indirect consequences of environmental degradation are the exhaustion of the soil properties, fewer water resources and a decline in biodiversity.

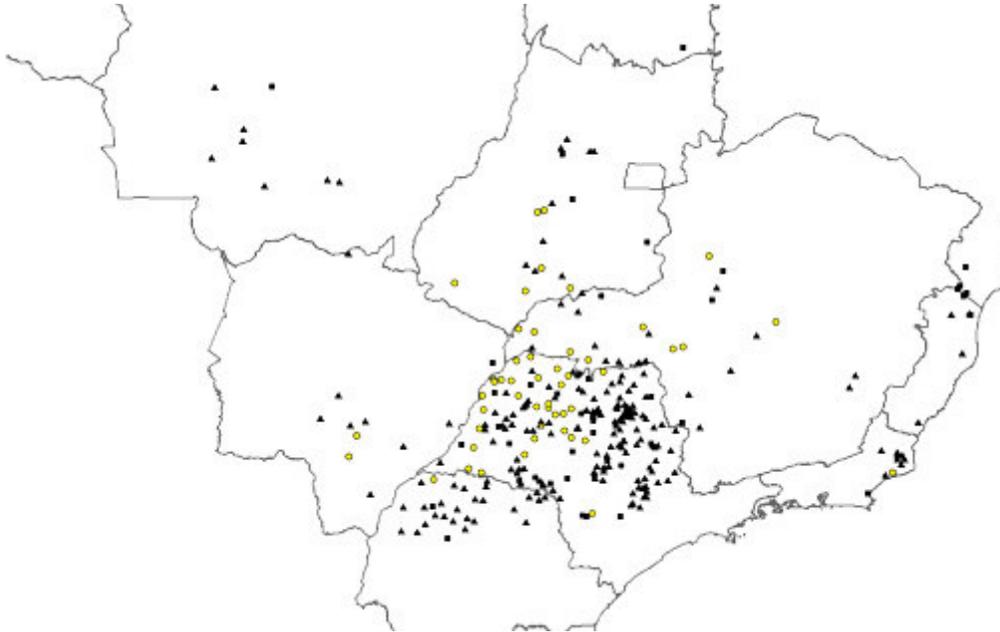
The principal measures in relation to these aspects would be to maintain natural reserves and to adopt planting practices that reduce the effect of erosion (such as interspersing the sugar cane with higher trees to protect against wind damage). Brazilian law requires natural reserves to be maintained in 20% of the area of any private property (Laws 4771/65 and 7803/89). These regulations are criticized by specialists in the sector, because (i) they do not distinguish the treatment in previously degraded areas with areas of preserved natural woodland; (ii) they fail to mention the need to create biodiversity corridors between the reserves; and (iii) they do not explicitly require maintenance/recovery of gallery forests around the rivers and springs.

Approximately 35% of Brazilian territory is now dedicated to pastureland, compared with 7% dedicated to agriculture.⁷ In this scenario, sugar cane, which occupies 0.6% of the total area of Brazil, can be an agent for environmental rehabilitation, since it can occupy degraded pastureland and start a cycle to renew soil properties. Between 1992 and 2003, for example, 94% of cultivated areas in the Midwest region were located around already existing production plants, minimizing the destruction of natural biomes, such as the *cerrado* savanna. The figure below shows the map of the expansion of the sector, identifying the plants under construction (in yellow), demonstrating the intense concentration of the activity in the Mid-South region, especially in São Paulo State.

⁶ WWF Action for Sustainable Sugar (2005)

⁷ The Energy from Sugarcane – UNICA (2005); chap. 6

Figure 10 – Map showing the extent of the sugar and alcohol plants



Source: Ethanol Project – NIPE and UNICAMP

Use of Irrigation, Pesticides and Fertilizers in Cultivation

Minimal water is used in the irrigation activities for sugar cane in Brazil. Irrigation is only used as a complement to rain in some areas. While irrigation activities in the São Paulo region are practically nonexistent, they do play a significant role in the plantations in Northeast Brazil, and are used at three different levels:

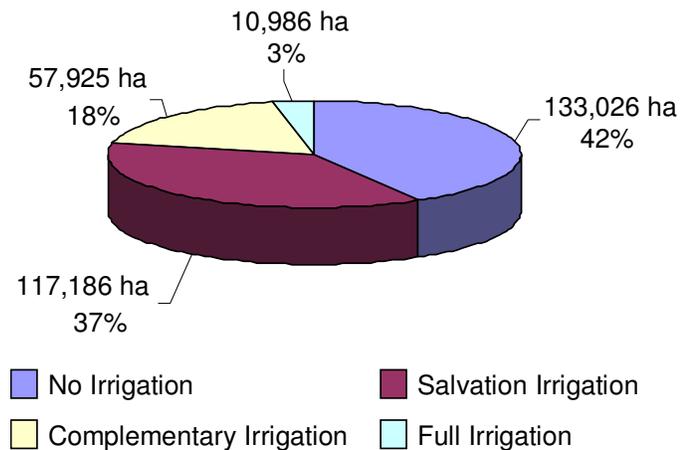
- Salvation irrigation: application of 1 to 2 water layers per cycle;
- Complementary irrigation: application of 3 to 6 water layers per cycle;
- Full irrigation: application of 7 or more water layers per cycle.

A common concern about water is its contamination by waste, nutrients or pesticides, which could affect the quality of this resource used by communities living near the plantations. Water contamination is not found in the state of São Paulo, where this activity is rated by the Brazilian agricultural research center EMBRAPA at level 1: without impact on water quality.

In general, sugar cane plantations use few pesticides, insecticides and fungicides. The only potentially harmful substances are herbicides that still exceed the quantities applied to the corn or coffee plantations. A small volume of fertilizers are also used, but this is mitigated by the high degree recycling of nutrients such as potassium through the use of sugar cane liquor and filter cake⁸ in this function. Nevertheless, some companies, especially those in Northeast Brazil, are studying more modern irrigation techniques such as drip irrigation to potentially further reduce water and fertilizer consumption and increase productivity per planted hectare.

A study⁹ conducted by Utrecht University in Holland in partnership with Unicamp, Brazil highlights the fact that current Brazilian laws do not comply with various international standards. This is due partly to the absence of performance indicators linked to environmental degradation, even though these laws are seemingly coherent with the Brazilian reality. At the same time as the study acknowledges low water contamination rates and use of pesticides and fertilizers, it also points to a series of projects with potential to improve even further the position of the Brazilian sugar cane cultivation as the major use of biological pest control and as an extension of studies of more resistant varieties of sugar cane.

**Figure 11 – Status of irrigated sugar cane areas
State of Alagoas (2005/06 harvest)**



Source: Statistical Report on 2005/2006 Harvest, Sindaçúcar-AL

Cane Burning and Harvest Mechanization

Sugarcane consists primarily of the stalk that contains sugar (which is the producer's feedstock), and straw, discarded during the process. Considering the risk of accidents due to

⁸ Sugarcane liquor and filter cake are two of organic sub-products from the production process that need to be correctly managed. Without proper management, they could cause serious damage to the local environment.

⁹ Sustainability of Brazilian bio-ethanol (Smeets *et al*, 2006)

the sharp edges of the cane leaves and presence of potentially aggressive animals¹⁰ in the sugar cane plantation, four basic alternatives have been considered for safe harvesting. These include combinations of the following items: crude or burnt sugar cane (which eliminates straw and animals); harvest gathered by hand or mechanically. The most traditional process is to gather burned sugar cane by hand. Although this process reduces the risk of accidents in manual harvesting, burning increases soil erosion and air pollution, reduces the quality of the raw material and generates waste. In addition, although there are no conclusive studies relating to health problems, it potentially presents greater risks of accidents if the fire reaches the power grid, roads or forests.

Although traditionally accepted, these practices are being increasingly questioned. The work in the sugar ethanol sector is considered one of the most harmful to human beings of any other agriculture. A WWF¹¹ 2005 report states that life expectancy of rural sugar cane workers is one of the lowest in farming activities in the world, and there are situations in which monthly pay is not enough to buy food to replace the calories burned during the harvest labor.

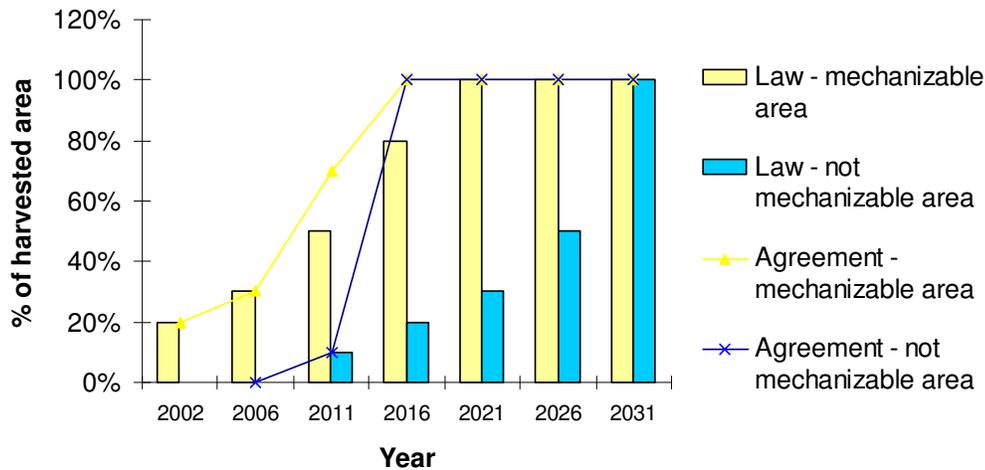
If sugar cane is harvested in its crude form, rather than burned beforehand, leaves can be discarded in the field, improving renewal of organic matter in the soil, preventing excessive evaporation and reducing erosion. São Paulo State formalized projects to gradually reduce burnings by enforcing Law no.11241, dated September 19, 2002, which considers technological advances, employment status and risk areas, and proposes total elimination of burning during the sugar cane harvest by 2031, in accordance with goals for the sector. In addition to this law, which determines the deadline for producers, the São Paulo government recently¹² signed an agreement in which it proposes to award a special seal to sugar mills that comply with these goals, adopting the plan presented in the graph below.

¹⁰ Principally snakes, lizards, rodents and various kinds of insect.

¹¹ WWF Action for Sustainable Sugar (2005)

¹² June 4, 2007.

Figure 12 – Goals for the elimination of cane burning in São Paulo



Source: Laws on burnings, Law no. 11,241 dated September 19, 2002
 Official announcement of agreement, Ethanol Summit, June 2007

These goals are monitored by the Secretariat of Agriculture and Supply, public agencies, local government councils and sector sugar cane councils, with the help of EMBRAPA satellite monitoring equipment. This information is not yet available to the general public and is only accessible to the private network of EMBRAPA.

According to a related report by UNIETHOS,¹³ increasingly mechanized harvesting improves productivity and drastically reduces the seriousness and quantity of occupational accidents; it also reduces demand for labor: a harvester machine substitutes for, on average, 100 employees. Accordingly, the mechanical upgrade, although desirable from the viewpoint of labor conditions in the sector, creates a social impasse, characteristic of the development from a labor-intensive to capital-intensive activity. The challenge, therefore, is to train workers in new activities and provide support to those who do not find alternate employment.

Work Conditions

Farm work involves extremely seasonal operations and is a major source of temporary jobs, especially at harvest time. In a presentation at the Ethanol Summit 2007 in São Paulo, the CEO

¹³ Case Study: The Sugar-Alcohol Industry in the State of São Paulo – UNIETHOS (2005)

of the energy research company EPE, Mr. Mauricio Tolmasquim, pointed out that the sector employs around 1.3 million people directly and in 2010 should create 1.8 million jobs, approximately 80% on farms.

Although the average remuneration in the sector is on a par with overall averages in the agriculture industry (as presented in the following table), the jobs created typically are of poor quality, very often based on informal relations and with few benefits for workers. These production centers, geographically far from urban centers, usually in places difficult to monitor, are very often accused of unfair labor conditions, including child labor and irregular inducement. According to estimates in a report by UNICA,¹⁴ informal employment comprises about 55% in the São Paulo region; child labor, about 2.4%, and functional illiteracy 23.9%. To benefit the sector, there is no doubt that priority should be given to this topic, especially in the clear external position of sugar mills and groups on the subject of practices and progress.

The average remuneration gauged by UNICA and shown in the following table is above the national average in the Mid-South region, especially in São Paulo:

Figure 13 – Average worker income

Average monthly income in Brazil		Average income in sugar cane agriculture		Average income in sugar industry	
Brazil	R\$ 692.00	Brazil	R\$ 446.00	Brazil	R\$ 821.00
Agriculture	R\$ 390.00	N – NE region	R\$ 283.00	N – NE region	R\$ 707.00
Industry	R\$ 671.00	C – S region	R\$ 678.00	C – S region	R\$ 865.00
Services	R\$ 706.00	<i>São Paulo estate</i>	<i>R\$ 797.00</i>	<i>São Paulo estate</i>	<i>R\$ 881.00</i>

Source: Sugarcane Energy – UNICA (2005); chap. 12

The instability of the labor supply reflects directly on poor communities, whose members very often move from place to place in search of job opportunities. The practice of using intermediaries in labor relations between producers and farm employees tends to aggravate this situation. In fact, most of the problems of low quality jobs and forced labor are found in this link in the chain. Producers do not yet seem to have a clear view of the responsibility they have for activities in their value chain, and in some cases they ignore the problems arising from such

¹⁴ The Energy from Sugarcane – UNICA (2005); chap. 12

suppliers. This attitude tends to decline as the sector is more exposed to the scrutiny of civil society.

An increasingly mechanized harvest tends to improve working conditions, reducing the seasonal nature of employment and permitting better career planning and training. On the other hand, it also reduces the quantity of jobs and requires more skilled manpower, excluding those that do not have access to professional enhancement programs. Today there are fewer farming jobs and more industrial jobs, and this requires a different worker’s profile, with broader academic qualifications. The report on social activities of UNICA¹⁵ disseminates a large number of educational projects organized by its members, complementing the State action on this matter:

Figure 14 – Educational projects sponsored by companies from the state of São Paulo

	Projects	People directly involved
Formal and Informal Education	55	35,060
Professional training	32	14,232
Scholarships	36	7,200
School supplies	24	20,990

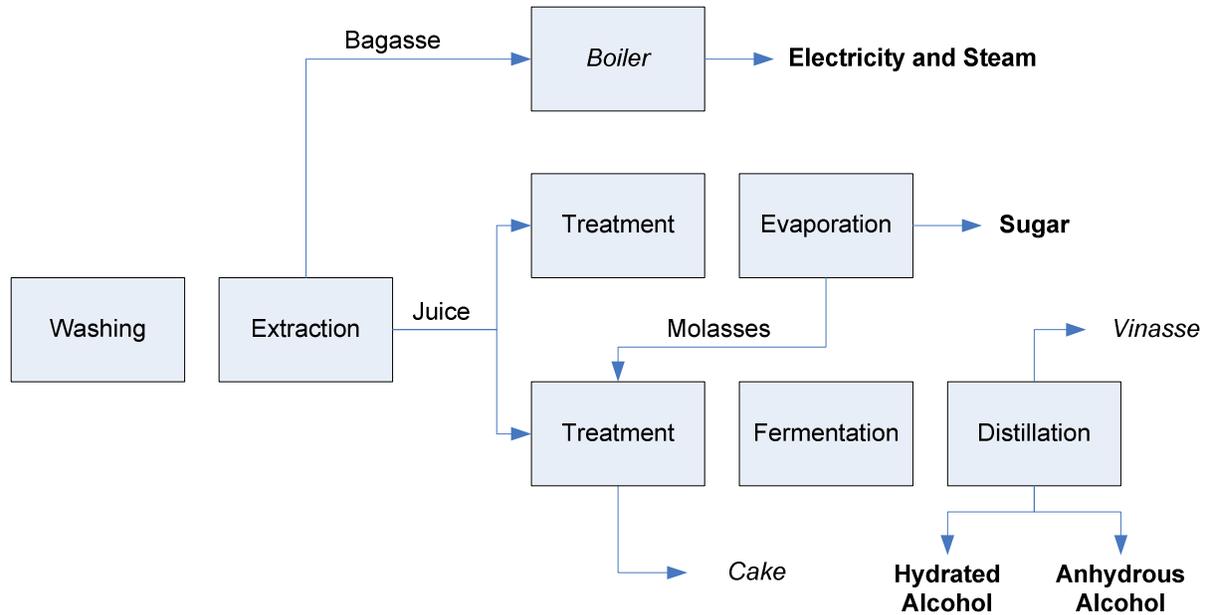
Source: Sugar and Ethanol: Social Responsibility in a history of sustainable development (UNICA, 2004)

Mill

The sugar cane transformation process begins with the crushing stage, in which juice is extracted from the bagasse (biomass). This juice will go through several physical-chemical stages before one of the two end products is obtained: sugar or ethanol.

¹⁵ Sugar and Alcohol: Social Responsibility in a history of sustainable development (UNICA, 2004)

Figure 15 - The process of alcohol production



Source: adapted from Sustainability of Brazilian bio-ethanol – Copernicus Institute and Unicamp (Smeets et al., 2006)

Water Resources Management

The processes of transforming sugar cane into sugar or ethanol result in the creation of sub-products: (i) liquor and sugar cane waste water; (ii) sugar cane wash water; and (iii) other water used in physical processes (e.g. cooling, condensation). Today most mills operate in a closed water system, reutilizing water in various stages of the production process, according to higher or lower concentration of sugars and nutrients, and its temperature and pressure.

Although ethanol production requires a significant amount of water – 21 m³ per ton of sugar cane – in Brazil, this production is highly efficient.¹⁶ When the sugarcane enters the mill to be crushed, 70% of the stalk weight is comprised of water. Only a small external supply of water is used in addition to this large volume of water in the cane. Between 1990 and 1997 the re-usage rate of water was about 5 m³ per ton of sugar cane. In 2004 a value of 1.83 m³ per ton of sugar cane was achieved by the best mills in São Paulo.

¹⁶ The Energy from Sugarcane – UNICA (2005); chap. 5

Periodic washing down of sugar mills in the production line involves removing material accumulated in their filters – called filter cake - abundant in organic substances, which can be useful to balance soil properties. This waste must be correctly managed, since its direct disposal into the environment can, for example, reduce oxygen levels in nearby rivers, causing imbalances in local ecosystems.

Another sub-product from the process that requires special care is sugar cane liquor. An average of thirteen liters of liquor per liter of ethanol is produced. This substance is very rich in chemical elements such as nitrogen, phosphorus, potassium and sulfates, required to restore arable soils. This characteristic enables it to be reused in fieldwork during the fertilization-irrigation process, provided that it is used in suitable quantities. Its incorrect disposal in open areas can cause disagreeable odors and this effluent has a slightly acid pH – from 4.0 to 4.5.

There are already relevant regulations to control the reuse of these sub-products. Namely, the Technical Standard P 4,231 of the São Paulo State Secretariat for the Environment regulates all relevant aspects of its application in fertilizing the soil, including banning the use of sub-products in high risk areas, determining permitted rates of use, and standardizing technologies that can be used.

Energy Cogeneration

All Brazilian industrial centers in the sugar and ethanol sector have a potential to be self-sufficient in terms of energy use. Burning the sugar cane bagasse generates more energy than is required for the plant's operation, thereby creating alternatives to sell the surplus; this process is known as cogeneration.

According to data published by UNICA,¹⁷ the energy generated from the use of bagasse as fuel is now equal to the sum of all natural gas and fuel oil used in the country: 17.5 Mtep.¹⁸ Associating this practice with the high level of national ethanol production (180,000 barrels/day registered in 2005, equal to 50% of all gasoline used in the country), the importance of the sugar and ethanol industry's share in the Brazilian energy matrix is understandable.

¹⁷ The Energy from Sugarcane – UNICA (2005); chap. 1

¹⁸ Mtep = Million tons equivalent of petroleum

Like burnings during harvest time, the energy obtained from burning sugar cane bagasse causes increased air pollution, and may affect neighboring communities if no filters are fitted to gas outlets of the generators. On the other hand, this is a renewable energy, which contributes positively to the balance of carbon emissions from the Brazilian energy matrix, providing potential financial revenue through Clean Development Mechanism (CDM) projects. Moreover, regardless of what happens in the ethanol and sugar negotiations, electricity can be sold directly to interested parties, allowing for the negotiation of higher contribution margins when selling this product.

Management

Product competitiveness

Economic results of the sugar and ethanol companies depend on the international performance of some commodities, mainly sugar, which can be produced from other raw materials, corn and sugar beet, and petroleum, a direct substitute for ethanol. Depending on the prices of these elements, the producers can alternate the proportions of their portfolio of products in search for higher margins.

Considering that the average ethanol consumption per kilometer in flex-fuel automobiles is slightly higher than that of gasoline, ethanol is considered the best option, since its retail price per liter is 70% or less than that of gasoline. The following table shows an analysis of the impact of fluctuations in the value of the barrel of petroleum on the price of gasoline, at two exchange rates. This illustrates the limit values at which ethanol can continue to be competitive at gas pumps.

Figure 16 – Analysis of price fluctuations between ethanol and gasoline

Maximum retail ethanol price vs. petroleum price							
Dollar rate	Price of petroleum (US\$/barrel)	30	40	50	60	70	80
R\$ 2.15	Price of gasoline at service stations (R\$/m3)	1.778	1.962	2.146	2.330	2.515	2.699
	Maximum price of ethanol at service stations (R\$/m3)	1.245	1.374	1.503	1.631	1.760	1.889
R\$ 1.90	Price of gasoline at service stations (R\$/m3)	1.571	1.734	1.896	2.059	2.223	2.385
	Maximum price of ethanol at service stations (R\$/m3)	1.100	1.214	1.328	1.441	1.556	1.670

Source: Adapted from UBS/Pactual Investment Research – December 2006 – 2005/06 harvest

Brazilian ethanol produced from sugar cane has the world’s highest contribution margin. According to studies by UNICA in 2005, production costs can reach US\$ 0.20/liter¹⁹ in the most efficient plants, so that ethanol would have a price competitive with gasoline, if petroleum were negotiated above the US\$ 30/barrel mark. It is estimated that, for an exchange rate of R\$ 1.90/US\$, this limit value rises to approximately US\$ 44/barrel.

These low production costs are directly associated with innovations in the Brazilian sugar cane industry in recent decades. Namely, the development of new varieties of sugar cane, led by the work of CTC, has led to productivity gains and reduced risk in the plantation. According to a study by UNICA (2005), more than 500 varieties of cane are used today in Brazil. This diversity helps to control the spread of pests and diseases in the plantation, in addition to providing specific productivity gains for each type of soil and climate. Brazil is currently a leader in agricultural technologies related to sugar cane cultivation. To maintain this leadership as a sustainable competitive advantage, continuing investment in research and development is essential.

The sugar ethanol industrial activity based on sugar cane also permits development of alternative business, typically based on reusing and optimizing the use of resources. Some examples are: (i) energy cogeneration from the burning of sugar cane bagasse; (ii) the production of yeast from processing the sugar cane bagasse; and (iii) the production and commercialization of different crops using crop rotation (typically peanuts, soybeans and beans).

¹⁹ *Valo Econômico* calculated the December 2004 rate: R\$ 2,80.

Crop rotation itself does not provide the company with substantial revenue. Nonetheless, some groups have directed the other products cultivated during crop rotation to social projects supported by the company, resulting in intangible gains within local communities. The sale of energy and yeast has increased the options for the plant's portfolio, reinforcing its bargaining power in the market. As well as balancing between ethanol and sugar production, the company can change the proportion of bagasse for electric power generation or yeast production depending on market opportunities.

Management Consolidation and Culture

The major global interest in ethanol, boosted by civil society's pressing for solutions against global warming, has attracted international companies to the Brazilian market and courted the arrival of new players, such as multinationals and private equity funds. According to the consulting firm Datagro, which specializes in the sugar ethanol sector, today Brazil has 357 plants in operation and 43 under construction. Approximately 21 of those in operation belong to foreign capital groups, which are responsible for at least another 12 designs for new plants.

Figure 17 – Disclosed projects from groups controlled by international players

Company	Details	Plants in operation	Projects in development
Adeco Agro	Own plants. Investments of R\$ 1.6 billion by 2015.	1	2
Brenco	Investment fund with expected financing of up to US\$ 2 billion	0	4
Cargill	Food multinational, with 63% of the Cevasa plant.	1	
Clean Energy Brazil (CEB)	Ethanol investment company. Owns 49% of the Usaciga plant and investments of R\$ 500 million in two other projects (greenfield ²⁰). Plans to add five new plants, creating a center focusing on ethanol, with processing of 30 million tons of sugar cane.	1	2
Dow Chemical	Partnership with Crystalsev to create an integrated ethanol-chemical complex: plant and polyethylene factory. Estimated capacity of eight million tons of sugar cane.		1
Global Foods	Partnership with Santa Elisa in Companhia Nacional de Açúcar e Álcool (CNAA), with expected investment of US\$ 2 billion	0	4
Tereos Group	Own plants. Control of Açúcar Guarani and holdings in Franco Brasileira de Açúcar (FBA).	4	2
Infinity Bio-Energy	Investment fund. Acquired Usinavi, Alcana, Cridasa and Disa plants. Already invested US\$ 300 million. Forecast of another US\$ 500 million.	4	5
Louis Dreyfus	Owns private plants. Planned investment of US\$ 800 million	7	1
TrueEnergy	Company in the American group Upstreamcap, with announced investment of US\$ 300 million.	0	3

Sources: *Exame Agronegócios Yearbook (2007/2008)* and *Valor Econômico*

At the same time, the sector's boom might lead to a drop in the value of ethanol, at least during the next two years. This trend has discouraged the entry of opportunists, and has left all players to face a long period of reduced profitability, disproportionately harming smaller or unprepared producers.

Recent mergers and acquisitions in the sector also point to a consolidation of the market in a few companies, which has encouraged various national groups to attract investors and

²⁰ Greenfield projects are those that involve designing and building the mill and all necessary infrastructure. They start from the acquisition of a portion of land.

strengthen their capital base. This scenario is stimulating change also in management standards and corporate governance practices of these companies. These organizations, most of which are family owned, need to develop new management practices, principally with regard to transparency and accountability, essential requisites to meet the expectations of new stakeholders: investors, funding agencies and civil society.

The sector is also characterized by the strong centralization of shareholding control among family members and a large number of closed capital companies, despite the market's growing interest in investment in the area. By July 2007, only three companies had adopted this strategy: the Cosan Group,²¹ which is the current market leader and went public in November 2005; the São Martinho Group,²² which had its first issue of shares for the market in February 2007; and Companhia Açúcar Guarani S.A.,²³ controlled by Tereos Group,²⁴ of France, which had its IPO in July 2007. These three groups are part of the most advanced level of corporate governance of the São Paulo stock exchange (Bovespa), the Novo Mercado, in which members agree to accountability and good practices of corporate governance. In addition, the Novamerica Group recently issued debentures²⁵ to a total value of R\$ 300 million, reinforcing the move to greater exposure of traditional groups in the sector to the capital market, both in equity and funding.

²¹ Available at <http://www.cosan.com.br/ri>

²² Available at <http://www.saomartinho.ind.br/ri>

²³ Available at <http://www.acucarguarani.com.br>

²⁴ Tereos Group, structured as a cooperative, consists of 14,000 French farmers (www.tereos.com)

²⁵ Available at <http://institucional.novamerica.com.br/institucional/investidores/index.jsp>

Figure 18 – Summary of the rules for the companies in the Novo Mercado listing



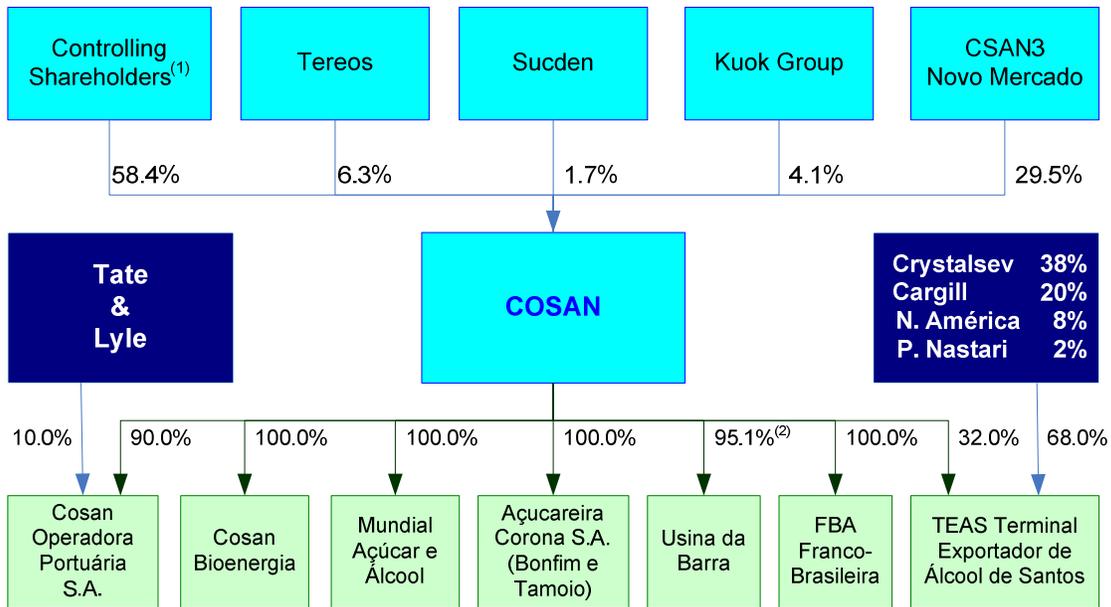
Novo Mercado proposes a series of governance practices that aim to enhance communication of the company with investors, and establish rules to protect the minority shareholder. The measures can be summarized as follows:

- Address all shareholders equally, mainly during changes in management control or capital closure.
- Maintain a constantly renewed widespread board of directors, with participation of independent directors.
- Expand information provided, including, for example, cash flow statements and details about the securities issued by the company and held by member of the control or management body, in accordance with the IFRS or US GAAP international standards.
- Disclosing an annual calendar of investor relations activities, including public meetings with analysts, assemblies.
- Detailed dissemination of documents involving related parties, such as terms of contracts with the company and negotiations of the company securities by the controlling shareholders.
- Maintaining at least 25% of the company’s capital stock in circulation, always in favor of spreading the capital in public share distributions.
- Joining the Market Arbitration Chamber to settle corporate disputes.

Source: Adapted from www.bovespa.com.br

Despite this move towards greater transparency and the development of their management teams, adapting to the market requirements, companies in this sector must also improve the use of communication channels and professionalize their succession processes. For example, reports on the IPOs of COSAN and São Martinho Groups indicate as a relevant risk factor the extreme dependence on their executives and controlling shareholders, who are individuals, not companies. COSAN, specifically, is fully controlled by one individual, Rubens Ometto. Ometto and other members of his family are main suppliers of sugar cane to COSAN. COSAN, therefore, depends greatly on these individuals, and the company risks conflicts of interest due to these operations with related parties.

Figure 19 – Cosan Group corporate structure at the time of its IPO



(1) Includes Aguassanta Participações S.S., Usina Costa Pinto S.A. Açúcar e Álcool, Nova Celisa S.A. and Belga Empreendimentos e Participações Ltda. All of them are directly or indirectly controlled by Rubens O. S. Mello

(2) Direct or indirect participation

Source: Final Prospectus of Primary and Secondary Public Distribution of a Common Stock Issue of COSAN (2005)

Family members are involved in various links in the productive chain of the organizations. Many plants buy part of the processed sugar cane from third parties, under long-term supply contracts. In some cases, the plantations involved are the personal property of majority shareholders of the plants; this can cause conflicts of interest with the other company shareholders or, at least, is a risk factor in the eyes of the stock market.

Conclusion on Sustainability Practices in the Sector

After examining available literature and information disclosed by the companies themselves, it was possible to identify a series of challenges when companies in the sugar ethanol sector include corporate sustainability in their agenda. These challenges, which are related to the dimensions of the triple bottom line concept – social, environmental and economic-financial –

were analyzed in accordance with the production chain of the sector and, thereby, distributed among the Farm, Mill and Management.

At the Farm, we found an important link between the company and natural capital – such as the soil and water resources – and the social – its workers and sugar cane suppliers. Most of the key issues regard the need to adopt suitable techniques for cultivating sugar cane and handling from inputs to plantation. Although these problems can be solved with existing technologies and could easily be monitored on small farms, sugar cane production demands large scale farming, which significantly increases its potential impact on the environment and communities.

However, two dilemmas mark this stage in the production chain, and have demanded further attention from company executives. First, the legal decision to reduce/eliminate burnings requires heavy investments in equipment and technology on a deadline. At the same time, this decision creates a social challenge, given the drastic reduction in the demand for manpower during harvest time, typically laborers with few skills and restricted social inclusion. Secondly, there is the problem of working conditions in the field, which can no longer be solved by only considering the physical and geographic boundaries of the sugar Farm. It is increasingly necessary to engage definitively sugar cane supplies and manpower, even temporary, in a commitment to quality working conditions. Therefore, in addition to technical and farming aspects, the teams linked to the Farm increasingly require a management view of social relations with collaborators and partners.

We have found that that society is clearly concerned about issues related to the consumption, use and treatment of water at the Mill. As with the Farm, producers have found many techniques that can mitigate negative impacts. Nonetheless, producers do not effectively communicate their best practices and so they continue to be scrutinized by special interest groups.

Another issue that stands out at the mill, represents a clear opportunity and not simply a challenge: energy cogeneration. The potentially positive impact of this practice on the business is very interesting and on a par with good sustainability practices. With energy cogeneration, companies diversify their portfolio of products, become energy independent and also can contribute to the national energy matrix with carbon neutral energy.

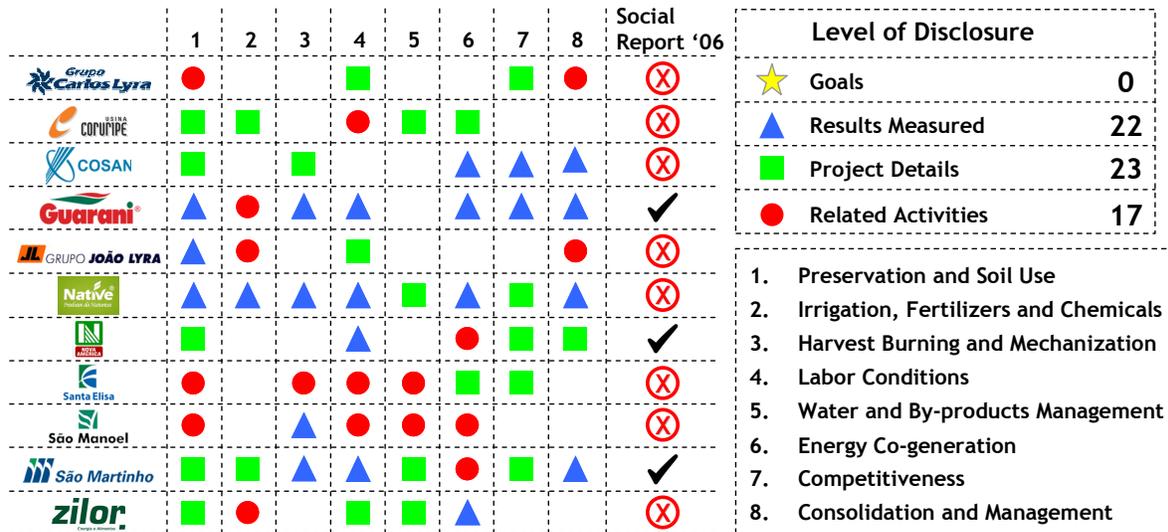
Management challenges are less frequently confronted by companies and most of these challenges are associated with changes in the management culture of the sector – typically family, traditional and conservative. Seeking to increase their competitiveness in face of price volatility and the emergence of substitute products, companies typically strive to differentiate their portfolio of products²⁶ or seek further operational efficiency by means of innovative and upgraded technologies in the production process. This has required a more cooperative and less competitive attitude among market players, since the integrated role of the sector, for example, in the research and development and trading activities may be a competitive edge in relation to foreign alternatives. Added to this is the recent move to consolidate the market and the entry of newcomers, such as investment funds and the major multinational trading companies. The main challenge to existing players is the need to include a new management mentality, based on practices of good corporate governance, further disclosure and accountability to society.

As a result of the new configuration of the sector, such practices are essential to good performance in the mid and long term. Intensifying the market forces, more volatile capital and the increasingly strong exposure to the world public opinion are clearly trends in the sugar ethanol sector. This scenario will require a strong cultural change, namely toward further transparency, so that the companies can continue to be sustainable in the new competitive paradigm.

Evidence of the sector's currently poor commitment to accountability and disclosure can be found in the following graph, based on public information, where company communication practices are summarized. This confirms the difficulties of mapping the sustainability practices in the sector and the strategic positioning of the companies against future challenges.

²⁶ For example: sugar, alcohol, energy, yeast and biotechnology.

Figure 20 – Companies’ disclosure practices



Source: FBDS Analysis

The symbols used in the graph above are related to different levels of disclosure practices by the companies, according to a scale used for this comparison. Blank spaces mean that no information was found on the topic. The other four signs are explained in the following table:

Figure 21 – Criteria for the comparison of disclosure practices in companies

Level	Description	Examples
● Related Activities	First level of disclosure. The company makes some superficial mention of the topic.	“We make important investments in the preservation and recovery of native forests.”
■ Project Details	Second level of disclosure. The company describes, with some detail, some of its projects or initiatives.	“The Program Better Days takes place in our producing units. It aims the continuous improvement of labor conditions through simple initiatives, like (...)”
▲ Results Measured	Third level of disclosure. The company publishes some quantitative data about the accomplishments of its initiatives.	“At the beginning of the Green Cane Project, our mill had 5% of native area. Today, after 15 years, we’ve reached 14%.”
★ Goals	Highest level of disclosure, with a public commitment of the company, auditable accomplishments and goals.	No examples were found among the companies analyzed.

Executives' View on the Sustainability Challenges in the Sugar Ethanol Sector

Analyses of interviews and questionnaires answered by executives and management body of producer groups and stakeholders involved in the study are discussed here. These results are organized in five sections, as stated in the IMD methodology: (i) motivation to include sustainability in business; (ii) capability to implement the concept in the companies; (iii) alignment of the various areas in the organization; (iv) use of related tools; and (v) national and sector-specific characteristics that influence sustainability.

Motivation

During interviews with the executives of the groups involved, it was clear that, although the term “corporate sustainability” is very frequently used in the sector, the concept has different interpretations. The direct and indirect impacts of the sugar ethanol activity on socio-environmental aspects encourage the development of social responsibility, focusing on working with the neighboring communities, and the effort to meet environmental requirements. Nevertheless, such considerations do not actually determine a position fully aligned with the concept of corporate sustainability that should be based on a unified vision of social and environmental dimensions. In this context, significant differences were observed, both in understanding and in the adopting of the concept of sustainability by the several companies studied.

Misinterpretation is also found in regard to concepts such as social welfare, social responsibility and corporate sustainability. The close relationship between the mills and local communities exposes the culture of social welfare as a common practice and even strongly present in this market. Even in groups where the management team has become professionalized, the identification of opportunities to create value, based on practices for sustainability is still not commonly found.

With respect to the implementation of the concept, few groups identify and seize business opportunities related to corporate sustainability, becoming more competitive and obtaining better results in the social, environmental and economic dimensions. The great majority assume

a reactive position to the pressures of stakeholders, adopting only the practices necessary to comply with prevailing laws and treating social and environmental initiatives as cost generators.

The faulty understanding of the concept restricts the company's initiatives and the sector's sustainable development. This can be seen in the answers about the company's motivations to include sustainability in the company strategy.

It is worth highlighting that many executives associated their motivation to publish "mission, vision, values" statements with "societal pressure". These comments can be associated, respectively, with the cultural tradition of the organizations (generally relating to social welfare practices) and the reactive attitude of the companies when confronting socio-environmental questions. In fact, it is found that, although most sugar mills have a background in social and environmental activities, these initiatives generally have no structure and no relationship with business performance. Hence the importance of the existence of the sector agencies such as UNICA, which works to help the overall sector to diagnose and organize their projects, stimulating the measurement and dissemination of performance indicators in the social and environmental areas. The most remarkable example in this sense was the initiative, organized by UNICA, for company's self-diagnosis by applying the ETHOS indicators of social responsibility. The project took place in 2006 with the voluntary participation of 28 companies in São Paulo.

A third element, stressed by many interviewees, but only by some of the producing groups, was the market opportunity that some good practices for sustainability could provide. This demonstrates that some companies have a more proactive and market-oriented view of the subject. In these groups, there is clear consistency among executives on the issues and challenges faced. This stronger alignment reinforces the strategic role of the concept of sustainability within the organization.

It is concluded that, in general, the concept of corporate sustainability still needs appropriate clarification, and it is often mistaken for the concept of social responsibility. This fact prevents its full inclusion in the strategy of the companies and encourages the adoption of socio-environmental practices very often unrelated to the business and therefore with limited value creation for the company.

Implementation capability

When discussing the capacity to implement sustainability in the companies, executives addressed practices that, according to their perception, encourage or hinder the further adoption of the concept. Here, the goal is to be able to understand how the organization is structured, the use of socio-environmental variables in the company's processes, and the main characteristics of the corporate culture that can affect positively or negatively the achievement of sustainable management.

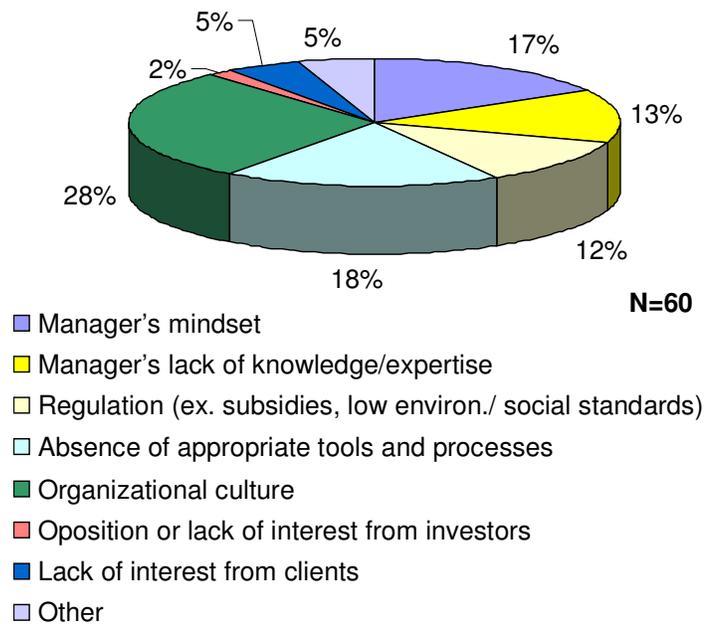
Regarding the influence of organizational structures on the advance of the sustainability agenda, it should be mentioned first that executives perceive it as positive to the adoption of sustainable management practices in the company. Typically, such structures have only few hierarchical levels and involve teams dedicated to socio-environmental questions. The use of foundations and the outsourcing of socio-environmental activities through associations and syndicates are generally regarded by the executives in the sector as positive elements for the development of corporate sustainability. Nonetheless, this perception clashes with the fact that isolation of the socio-environmental questions in a unit outside the strategic core of the organization demonstrates, *a priori*, that little relevance is attributed to these questions. In most cases under study, the structures that deal with social and environmental issues are in different areas. The environmental area seeks to monitor indicators associated to the use of natural resources and to the company's legal compliance (biological reserve, water consumption, energy, waste management, etc.). At the same time, the social area is mostly focused on community assistance, without a considering the company's accountability in the value chain as a whole. Some of the interviewees consider this a transitional system, where one of the functions of the team dedicated to socio-environmental activities is the dissemination of the concept by the company areas. According to them, this could be a natural path to institutionalized sustainability as the topic gains maturity in the organization, although in this study no company was found that had successfully made this transition.

On the subject of the management processes, it should be mentioned that it was not possible to clearly identify their full integration with socio-environmental issues. These issues are considered in some activities, but generally as conditions imposed on the operation by laws, societal pressures or required certification. Environmental and social variables, such as the levels of reused water resources or of employees legally registered, are independently

monitored and in general are not associated to corporate goals. As a result of this and of the answers to the questionnaires, we concluded that there is no clear movement towards the search of opportunities based on including socio-environmental criteria in the management processes.

The third element of analysis related to the capability of implementation is the organizational culture, which was widely indicated as a barrier by the respondents of the questionnaires. Fifty-five percent of the 45 executives who answered the questionnaires mentioned the existence of barriers to projects that promote sustainability. Organizational culture and management mentality, which are directly related to the executives' attitude, were the most frequently mentioned items, together representing 45% of the answers.

Figure 22 – Key barriers for projects of sustainability



Organizational culture, marked by traditionalism and an inward view, is shown to be an obstacle to the progress of corporate sustainability in two basic aspects: (i) little attention is given to the questions of sustainability in the value chain and (ii) companies have weak communication and disclosure practices.

Although there is awareness of the consequences that problems in the value chain may bring to their business, executives in the sector generally tend to minimize this issue, in a reactive manner and, at the most, show only a start in acting together with other links in the value chain. Some groups adopt practices such as formal training and operational support for their suppliers; others use contractual clauses that demand good labor practices in third-party but the companies that do this are clearly exceptions in the market.

The other aspect of organizational culture – external communication – was also a frequent topic of discussion in the interviews. The executives acknowledge their deficiencies, mainly with regard to full disclosure and accountability of their activities. When mentioned, this item was always stressed as one of the company’s weaknesses. This finding is aligned with the previous analysis of the sector, based on public information: accountability practices are far below what is expected from large business groups

(see Figure 20 – Companies’ disclosure practices). The importance given to the deficiencies in communication is also reinforced by the questionnaires: when asked about the initiatives that could improve their relations with stakeholders, executives most commonly mentioned that greater disclosure was potentially the most efficient means. There is limited

and generally reactive dialogue with society. For example, only one of the groups interviewed mentioned the practice of holding public hearings with the participation of local communities when inaugurating a new production plant.

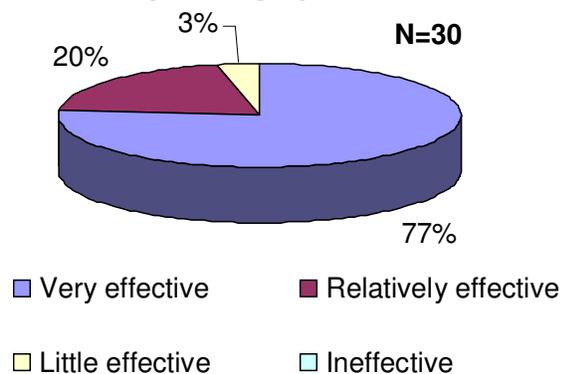
It can, therefore, be said that organizational structures, processes and culture are still obstacles to the progress of corporate sustainability in this sector, and hard work will have to be done to overcome the identified barriers.

Alignment among corporate areas

The level of alignment among the areas of the organization is important for understanding the company’s progress toward a management based on the concept of sustainability. In the interviews, it was clear that a good level of alignment was found among the perceptions of the executives, mainly in those groups that most widely incorporate the concept.

The issues and challenges mentioned by different interviewees were aligned among executives from the same company. The five most frequently mentioned challenges relate directly to corporate cultural change and internal communication practices (1 and 5), external

Figure 23 – How efficient major disclosure can be to improve relations of your company with the stakeholders



communication practices and accountability (4) and preparing for growth in the stimulating environment (2 and 3), which reinforces the points in the preceding sections.

Analysis of the questionnaires goes beyond the findings to show the alignment of the executives' perceptions and focus on organizational characteristics. The areas that executives indicated to have the highest potential for promoting sustainability were, first, the corporate area, because it plays the role of strategic direction and the definition of guidelines in the organization, and second the production area, probably because industrial processes directly impact the environmental and economic-financial spheres. This information stresses the importance of these areas and suggests that the improvements in these areas will be in greater demand.

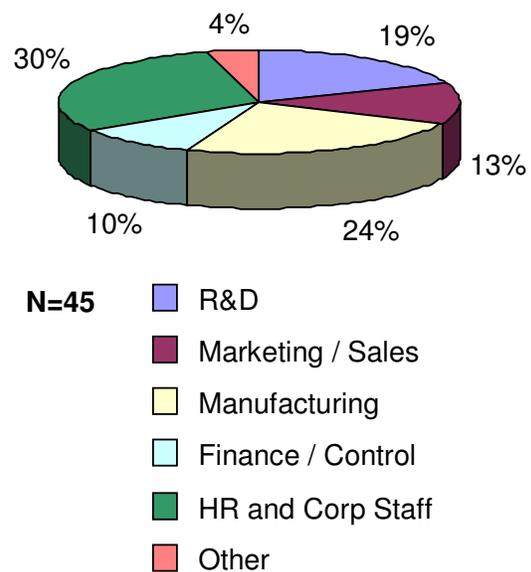
Respondents were asked to indicate the areas that present the greatest barriers to sustainability issues. Some of the respondents mentioned the operational area, which seems to confirm the importance of this unit in implementing sustainability. A high number of answers were also attributed to the option "other areas", where many of the respondents highlighted the CEO or top management of the company (see Figure 26 – Areas with higher barriers to sustainability initiatives), representing 20% of all

Figure 24 – Sustainability in the view of the executives



Análise FBDS

Figure 25 – Areas with high potential for the promotion of sustainability



answers. This finding is aligned with issues related to organizational culture, presented earlier, and which were the main aspect stressed by respondents when asked about the barriers to sustainability projects in the companies (see Figure 22 – Key barriers for projects of sustainability).

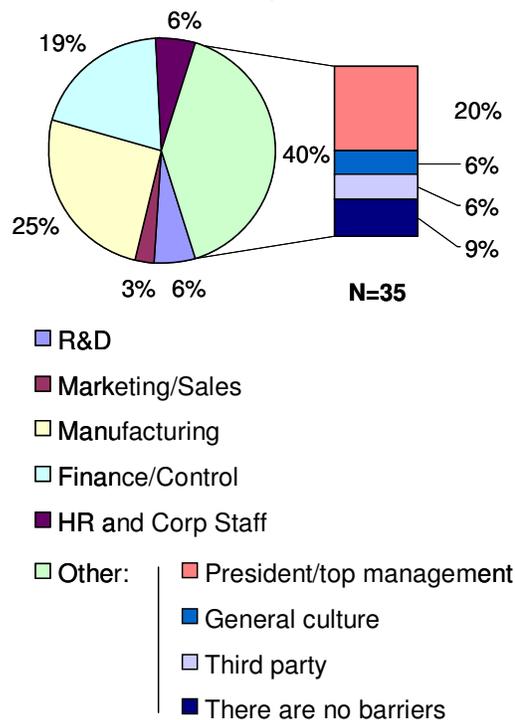
The identification of leadership as a barrier to sustainability may be associated with another aspect very intensively discussed in the interviews and stressed in the above sections: communication. Analysis of the sector leads to the conclusion that this is one of the main practices to be developed in the companies that seek a better position in civil society and to compete in international markets.

The combination of this information reinforces the important role of leaders to promote sustainability in the sector. Any process of cultural change that involves strategic thinking and a long-term outlook – as the inclusion of corporate sustainability requires – demands the strong engagement of the company’s top management. Without this condition, progress of the sector in that direction would be restricted and doomed to failure or to a radical change by reacting to external forces, such as consumers, investors or competitors.

Use of management tools

The use of proper management tools shows the commitment of the organizations in incorporating sustainability, since it encourages institutionalization of the company’s values and practices in their daily activities. In the sugar ethanol sector, executives mentioned that the main tools they have adopted were forming of committees and seeking certifications. This information was confirmed in the questionnaires.

Figure 26 – Areas with higher barriers to sustainability initiatives

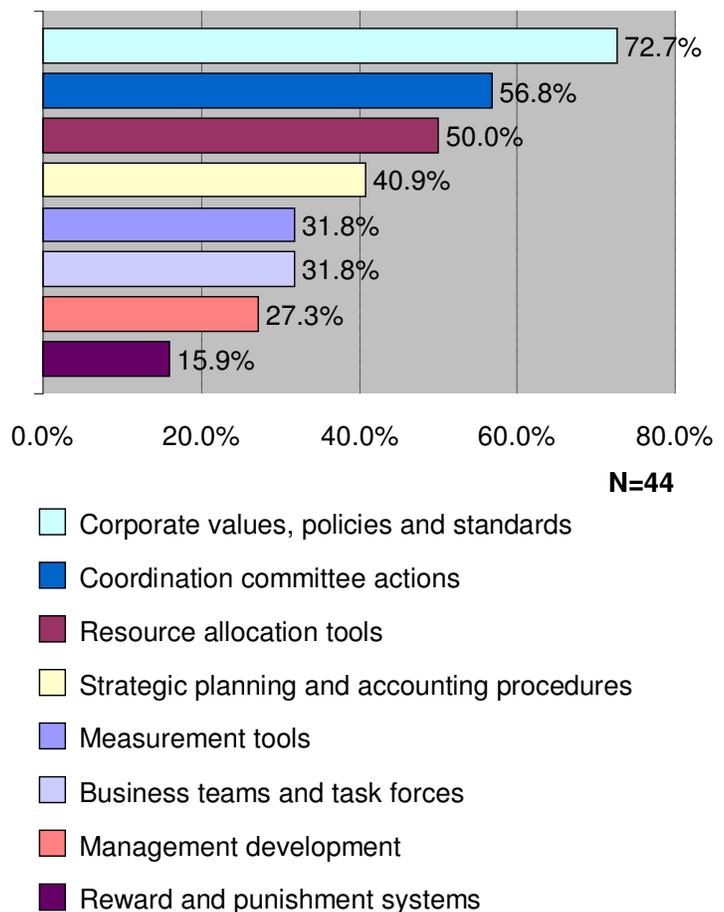


In fact, the use of temporary or lasting committees, generally multidisciplinary, is very common in the sector. Many of these committees are dedicated to specific socio-environmental issues. These issues are determined by law, by consumer demands or by the strategic focus of the organization. Since committee members can bring back the acquired knowledge to their areas, very often including new practices in their activities, this tool has a positive informal effect on the company’s internal communication, at least at the senior management level.

Tools such as executive development reward and punishment systems are rarely adopted. This raises the question, identified in the earlier sections, about barriers created by the CEO and top management to sustainability initiatives. Such tools could mitigate these problems among managers and corporate leaders.

It is also found that, despite the fact that only three tools were indicated in more than 50% of cases, more effort is being made to adopt management tools, including socio-environmental issues. For example, one of the tools considered to be very significant in sustainable management – a system of variable remuneration using socio-environmental metrics mixed with financial results – has already been adopted by one of the companies in the study, while some others have demonstrated intentions to do the same.

Figura 27 – Most commonly used tools



Socio-environmental or quality certifications, widely adopted in the market and frequently mentioned in the interviews, are an effective form of communication with external publics, even though these certifications are not enough for company-stakeholder relations. Many executives

discussed what would be most important for the sustainable development: to do the “right thing” or disclose what is being done even if current practices are not ideal. Some groups that already have certifications highlighted the speed with which they were obtained, as a result of good socio-environmental practices already adopted previously. Others, who claim that they are acting in accordance with the criteria of several certifications, complain about the high financial and human investments necessary to obtain and renew these certificates.

From a business standpoint, it is important to note that corporate sustainability does not address intentions but results. It rewards practices that have lasting value for companies. In this way, disclosure of results and accountability to external publics are tools that add value to the company from the moment when the rules and standards adopted by the company are clear to the stakeholders, reducing unnecessary pressure and making it easier to distinguish risks and opportunities. In other words, companies must be accountable and disclose information; this is a sustainability practice, as much as preserving ecosystems and guaranteeing fair working conditions. In a sector with increasing and widespread worldwide exposure, obtaining certificates and developing accountability activities tend to add high value to the business, and may be established as necessary conditions for companies to stay competitive.

In addition to market certifications, it is worth mentioning the effort of some sugar mills, under the guidance and coordination of UNICA, to adopt the ETHOS Indicators as a self-diagnostic tool to improve future sustainability performance. This initiative brings a new vision to the companies in the sector and stimulates the diffusion of standards among the organizations and their practices.

National and sector peculiarities

The history of Brazil and of sugar cane activities are two determining factors of sustainability issues in the Brazilian sugar-alcohol sector. Current major characteristics of the Brazilian sugar ethanol activity for the sustainability agenda are as follows: (i) the intensive use of natural and social resources; (ii) Brazil’s competitive advantage due to its climate conditions and experience in the sector; and (iii) the move to consolidate, expand and welcome new players to the market.

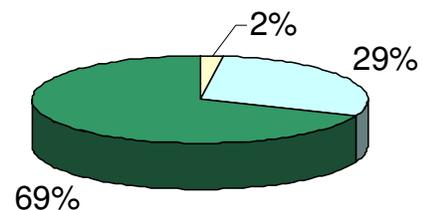
The intensive use of resources is an attribute inherent to the activity and is part this centuries-old culture in Brazil. The geographic proximity of farm, mills and communities led to the establishment of a relationship of mutual dependence among them. Consequently, the

sector acquired vast experience in initiatives that compensate for poor performance rather than initiatives that are sustainable. Currently, these initiatives are reinforced by legal requirements, with regulations and targets established for issues that have become controversial, such as burnings, work conditions and employment throughout the value chain. Regulation is a great concern for executives in this sector, and their opinions on its effect in the progress of sustainability vary. For some, the growing legislation is interpreted as a barrier, when laws are enforced indiscriminately and unrealistically, instead of adapting to the local and historic characteristics; for other, regulation is addressed as an opportunity to demand significant advances in practices and to address the interests of civil society and the consumer market.

Another important characteristic – the sector’s competitive advantage in relation to international alternatives – emerged from the emphasis given to the activities of common centers such as UNICA and CTC, which generate benefits for a wide range of companies and help establish competitive standards, comparison bases and development targets. Executives perceive the importance of these bodies which stimulate progress in maintaining good practices and encourage the innovation and development of better standards for the sector as a whole.

Lastly, increasing consolidation in the sector, a growing trend of the worldwide ethanol market, is stressed in interviews with the executives. The interviewees unanimously agreed that this structural change tends to benefit the development of the sustainability concept, by the fact that involvement with sustainability issues is demanded by external consumers and the capital market. It is expected by the executives in the sector that both consumers and investors attribute value and reward the companies and products that visibly incorporate sustainability practices. Today, the opinion of the executives is that these products may gain in priority among consumers in the domestic market, but not margin: “the customer buys first, but does not pay more”.

Figure 28 – How capital markets will react to socio-environmental actions



- N=45**
- Very positively
 - A little positively
 - No change
 - A little negatively
 - Very negatively

The threat perceived by executives in this movement toward consolidation is related to the intensity of growth through mergers and acquisitions. The sector, extremely stigmatized, suffers pressure from the media and society that tends to address it indiscriminately as the archenemy because of its socio-environmental scandals. True or not, cases of abuse are frequently addressed as standard in the sector, affecting guilty and innocent alike. Thus, executives are extremely concerned with the entry of irresponsible opportunists, and fear that the unstructured growth of opportunists' ventures may denigrate the image of more responsible players, transforming the prevailing opinion in society in a self-fulfilling prophecy.

Conclusions and Future Agenda for Sustainability in the Sector

By interviewing and sending questionnaires to executives in the Brazilian sugar ethanol sector, it was possible to undertake a comprehensive analysis on the understanding and the level of application of the concept of corporate sustainability among the companies involved. It is found that, although the term is widely used, the concept is not yet uniformly interpreted by the various groups in the market, and there are misunderstandings, for example, about the definitions of social responsibility and corporate sustainability. The differences are even greater when the degree of adoption of the concept in these companies is evaluated.

The portrait of the sector, based on the collected data, first reveals different motivating factors for the adoption of good practices. Aspects relating to the organizational culture, reflected in the set of mission/vision/values refer to the traditionalism of the companies and seem to reinforce the actions of social welfare and socio-environmental responsibility. The pressure of society and other stakeholders, from different groups such as the media and NGOs, seems to be a stronger motivator in the groups with more reactive attitudes that are less dynamic when adopting sustainability. At the same time, motivation to find market opportunities is stressed in groups that have a clearer understanding of the concept and that demonstrate further progress in including it in the business strategy.

The observed capacity to fully integrate the concept of corporate sustainability in the company, relating to organizational structures, processes and corporate culture also varies among companies. First, it is found that simple, less hierarchical organizational structures, which seem to favor further inclusion of sustainability, have a negative impact inasmuch as they isolate the socio-environmental questions from the company's strategic nucleus. Secondly, the

inclusion of socio-environmental variables in the company's management processes still occurs in individual cases, with no clear relationships to corporate results, which are generally measured only from the financial viewpoint. Lastly, the prevailing organizational culture encourages poor communication and disclosure practices, both in-company and externally, considerably impairing companies' relationships with various stakeholders and recognition by society of the advances in the sector in adopting good practices.

Inside the organizations, some questions relating to the alignment of areas can be identified. Namely, top management seems to be one of the areas that show the greatest barriers to actions of sustainability. This information, in line with issues relating to organizational culture, raised a discussion about the infrequent adoption of two important tools: executive training and variable remuneration with the incorporation of socio-environmental aspects. The wider adoption of these tools could encourage further involvement from the top hierarchy levels in the companies. On the contrary, the tool most commonly used in relation to corporate sustainability is a set of corporate and political values and standards.

Other tools frequently used in the sector are the formation of coordinating committees and the application for certificates. These practices are aligned with this moment of drastic change in the sector, marked by the consolidation of groups, internationalization of activities and more involvement in the capital market. Such tools offer greater systematization in problem-solving and further acceptance by new markets, respectively, contributing positively to the start of a strategy of sustainable growth.

In this scenario, it is possible to discuss the future agenda of the sector: the adoption of best practices and further sustainability of the business. It can be said that the best social and environmental practices have already been identified by the overall sector, even though not widely adopted, as yet. In other words, the solutions for most questions relating to these areas is already available, and it is only up to the organizations to decide strategically the best time to incorporate them, as a result of their motivating or restrictive efforts. Consequently, the issues on the future agenda tend to include challenges closest to management practices and strategic positioning.

The first issue relates to organizational culture, which aims for greater inclusion of the concept of sustainability at the core of the corporate strategy, as a mean to spread it among all

company areas. Once sustainability is fully understood and adopted as a truly institutionalized value, the companies will be able to fully enjoy the related market opportunities.

Secondly, communication, both internal and external, and accountability emerge as important issues in the sector. Improvement in the company's communication skills and accountability practices aims to mitigate the biased view of the market and civil society toward the sector, not only stressing the positive aspects and good practices already achieved or in progress, but also helping establish a more secure support platform for the sector in its expansion and international competition. Further accountability and establishment of two-way communication channels with society may encourage closer relations with the sector, breaking away from stereotypes and promoting a virtuous cycle of sustainable development.

Lastly, the prospect of an increase in joint, nationwide actions in the sector is included in the future agenda, beyond the activities performed by the regionalized bodies such as CTC, UNICA or SINDAÇÚCAR. Among executives there is a still emerging awareness that competitive advantages obtained in terms of costs, productivity and differentiation may only be sustained in the long term through constant advances and investments in environmental, social and technological research and development. The sector's coexistence with these elements, all closely linked to the sugar ethanol business, is a *sine qua non* condition to companies' long term competitiveness.

In short, the study concludes that there is a business case for corporate sustainability, not in the sector as a whole, but specifically for each company. In other words, there can be value creation based on the best socio-environmental practices and corporate governance. For some organizations, these opportunities are already quite clear and the results become more directly tangible each day. For the majority, however, the poor interpretation of the concept hinders the identification of opportunities, and companies fail to capture the associated value. Therefore, we conclude that the development of the business case for sustainability can be fully achieved in the Brazilian sugar ethanol sector. Nonetheless, this depends directly on the proactive performance of companies and is not a characteristic inherent to the sector.

Appendices

Research Methodology

The methodology of this study was conceived in 2002 by the Forum for Corporate Sustainability Management (CSM) of the International Institute for Management Development (IMD), and has been applied by the FBDS team in many Brazilian sectors. The methodology is described in four parts: sample of the study, source and data collection, data handling and methodological limitations.

Study Sample

The sample of the study includes eleven of the main national producing groups in this sector. According to the rankings of UNICA and SINDAÇÚCAR-AL for the years 2006/2007, they represent more than 25% of the national producing capacity. Access to executives has been a significant obstacle to the development of the research. The support of some sector-related institutions, such as UNICA and SINDAÇÚCAR-AL, was very important to overcome that barrier.

The main criteria used were production capacity and accessibility; this led us to the following set of production groups: Carlos Lyra Group, Cosan Group, Açúcar Guarani, João Lyra Group, Native Alimentos, Nova América, B5 Group (Santa Elisa Mill), São Manoel Mill, São Martinho Mill²⁷, Tércio Wanderley Group (Coruripe Mill), Zilor Group. We added to this set one start-up group, which is characteristic of the future reconfiguration of the sector: the Brenco Group, with its structure of capital based on international investors.

In addition to these 12 groups related to the producing activities, four other institutions of great relevance for the sector's development took part in the study: the Center of Sugarcane Technology (CTC), the Sugarcane Industry Union (UNICA), the Union of Sugar Industry in Alagoas State (SINDAÇÚCAR-AL) and the National Bank for Economic and Social Development (BNDES).

²⁷ The São Martinho Group did not take part in the interviews and questionnaires.

Sources and Data Collection

This study was conducted in two phases. The first was based on public company data. With the objective of identifying the main sustainability issues in the sector, this stage involved the analysis of many different sources of information, such as academic papers, research, companies' websites, newspapers, governmental information, and financial analysis of the companies, among others.

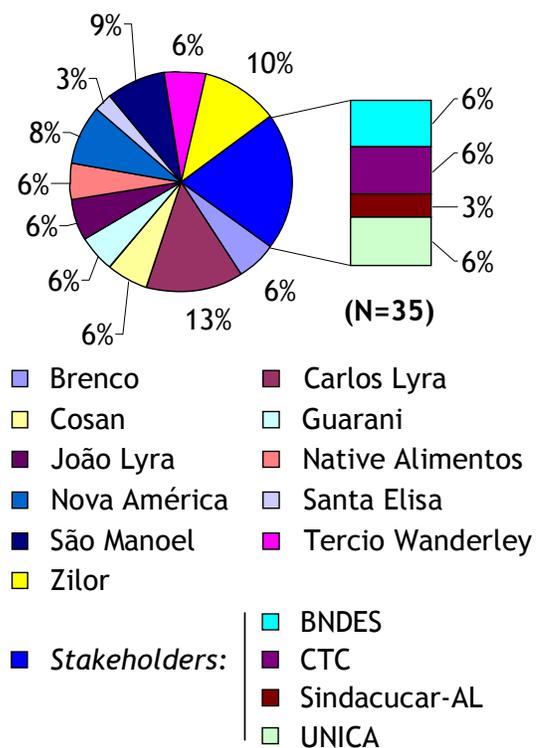
The second phase involved two stages for the gathering of primary data, as proposed by the methodology: (i) interviews with the main executives of the companies; and (ii) questionnaires sent to all interviewees and their teams.

The interviews had the average duration of 45 minutes. They were performed by telephone or in person with executives from different organizational areas at the selected companies, who were indicated by the companies themselves. Figure 29 shows the composition of the 35 interviews.

The interviews were designed to address the following topics:

- Motivation: knowing the concept, susceptibility to external pressures (NGOs, clients, regulatory agencies, capital markets), internal strengths and weakness and information system;
- Capacity to implement: leadership, cultural and organizational harmony, areas of lesser/greater resistance, and a preponderance of financial aspects in decisions;
- Alignment of the different areas of the organization: outlook, impact and effort of the various areas of the organization to achieving sustainability and identifying any points of resistance;
- Use of management tools: including sustainability in tools that drive the strategies and performance assessments of the company;

Figure 29 – Interviews performed



- Identifying peculiarities in the business sector: influence of national and sector characteristics in the sustainability design.

The questionnaires were sent to all interviewees and each interviewee was asked to pass it on to three to five people in his or her team. Figure 30 shows the composition of the 45 questionnaires received.

There are two types of completed questionnaires: sustainability officers' questionnaires and general managers' questionnaires. The sustainability officers' questionnaires were sent to those employees in operational areas directly related to sustainability, such as socio-environmental responsibility, social responsibility or sustainable development. The general manager questionnaire was sent to all other employees.

All the information obtained from primary sources (interviews and questionnaires) was checked with information officially published by the companies, mainly through their websites, presented below:

Figure 30 – Answered questionnaires

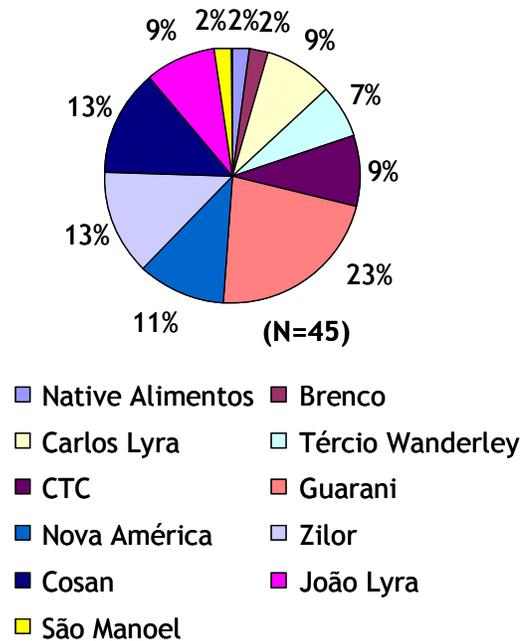


Figure 31 – Company websites

Company	Website
B5 (Santa Elisa)	http://www.santaelisa.com.br
Carlos Lyra	http://www.carloslyra.com.br
Cosan	http://www.cosan.com.br
Guarani	http://www.guarani.com.br
João Lyra	http://www.grupojoaolyra.com.br
Native Alimentos	http://www.nativealimentos.com.br

Company	Website
Nova América	http://www.novamerica.com.br
São Manoel	http://www.saomanoel.com.br
São Martinho	http://www.saomartinho.ind.br
Tércio Wanderley	http://www.usinacoruripe.com.br
Zilor	http://www.zilor.com.br

Data handling

The interviews were recorded on a digital recorder, with the previous agreement of the interviewee, and then transcribed to facilitate the process of drafting the final report. The

interviews were analyzed on a strictly qualitative basis, examining the statements of the executives in order to understand their perspectives on the main challenges for sustainability in their sector. This analysis was presented in the section of the report entitled “Executives’ View on the Sustainability Challenges in the Sugar Ethanol Sector”.

The questionnaires, on the other hand, received descriptive statistical treatment, to verify the inclusion of a certain perception in the set of answers received. All results of this analysis are included in the proper published file.

The reports and websites were also analyzed on a qualitative basis due to great variance in disclosure practices among companies.

Limitations of the Methodology

The research methodology has a series of restrictions to be considered when interpreting the results.

First, it is important to point out that, as in any qualitative study, this work is subject to bias in the interviewees’ responses. These biases can be related to individual and corporate values, as understood by the executives, at the specific time when the interview was being performed. Since they are merely perceptions, the answers of the interviewees, therefore, could have been influenced by several variables.

Secondly, the composition of the questionnaires received and the interviews are also limited. The small number of questionnaires answered was not sufficient to allow more advanced quantitative analysis, such as the verification of data correlation. This hinders any kind of analysis that seeks to generalize the answers for the sector as a whole. Therefore, the final analysis and conclusions should be considered as insights over the identified issues, and not as rules for the sector.

With reference to the analysis of the reports and websites, the disclosure or non-disclosure of a certain practices does not necessarily mean that it exists or does not exist; it may perfectly exist and not be publicly disclosed. The lack of disclosure of indicators, as mentioned above, prevents more detailed analyses.

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