



Food Industry

SUSTAINABILITY IN THE FOOD INDUSTRY

A VISION OF THE FUTURE FOR RIO+20

INDUSTRY MEETING FOR SUSTAINABILITY



CNI – NATIONAL CONFEDERATION OF INDUSTRY – BRAZIL

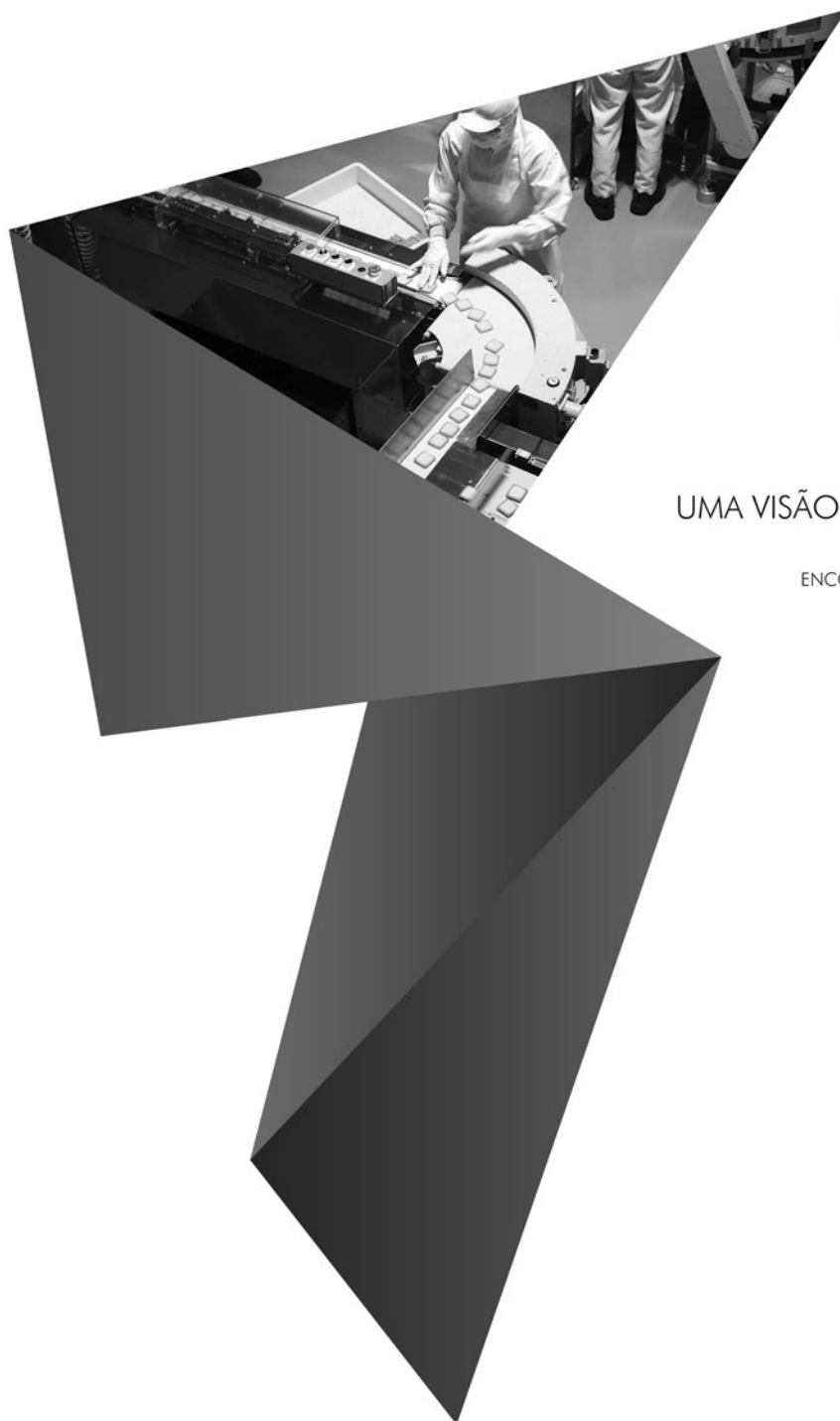
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Indústria Alimentícia

SUSTENTABILIDADE NA INDÚSTRIA DA ALIMENTAÇÃO

UMA VISÃO DE FUTURO PARA A RIO+20

ENCONTRO DA INDÚSTRIA PARA A SUSTENTABILIDADE

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CNI PRESENTATION

The diversity of the national industry and the significant availability of natural resources reveal excellent opportunities for the sustainable development of Brazil, combining economic growth, social inclusion and environmental conservation. The materialization of concerns related to sustainability in the strategic agenda of enterprises and governments is a reality. Apart from isolated cases of success, the consequences of this attitude are felt in entire sectors of the economy. Further advances are still needed, but the path has already been identified and going back is impossible.

After coordinating an unprecedented critical thinking process on sustainability with 16 industry associations, the National Industry Confederation (CNI) delivers to the Brazilian society a wide range of information on progress, challenges and opportunities yet to come. The results presented here may not portray the significance of the discussion process experienced by the industry in preparing these documents. Developments on the process will be beyond the Rio +20 Conference, and are definitely incorporated on the daily lives of companies.

The subject of sustainability is inserted differently in each of the industrial sectors. However, some elements are common to all. The continuous pursuit for efficiency in use of resources and the need to increase industrial competitiveness are on the agenda of all the sectors. Encouraging innovation and scientific and technological development is strategic on the transition to more sustainable patterns of production.

Strategies to intensify actions coordinated internally in the industrial sectors and with governments and civil society organizations are no less important. The dissemination of sustainable practices by means of the supply chain and incentives for companies to undertake the role of integrated management of the territories are powerful tools.

The sectorial volumes developed by industry associations are valuable contributions to addressing subjects such as sustainability and competitiveness of domestic industry. One of the most representative results of this process will certainly be the strengthening of structured programs of action with a focus on promoting sustainability in the

production. These initiatives will act as raw materials so that the industries involved and CNI are able to systematically publish documents presenting the national industry's developments towards the goals of sustainable production.

The documents presented here are intended to be a valuable contribution to enhance the debate on sustainability. Each of the sectorial associations is to be congratulated for their efforts.

Robson Braga de Andrade

President of the National Confederation of Industry – Brazil



SECTORIAL PRESENTATION

The food industry in Brazil and in the world has shown clear efforts to become more sustainable. Since the Rio-92 Conference, the industry has engaged in international discussions on sustainable development and has strived to design and adopt the best practices.

The projections of population growth and the increase in the food consumption pattern, especially in developing countries, increase even more the importance of social and environmental best practices in the production of food and water for everyone. That is why Brazil, as a large producer and global supplier of food, must have a central role in defining the direction of sustainable development.

If the increase in consumption should be the inducer of larger production of food and beverages, the industry – the Brazilian industry, in particular – becomes a mediator between the needs of consumers and farmers.

It is clear that the relationship between the food industry, and the sustainable development occurs more “out of the gates” of the food and beverage factories throughout the country. The interactions along the value chain, from farmers to consumers, are what make this industry a key part of the sustainability puzzle.

The food industry is the destination of 57% of the country’s agricultural production, and the farmers are the ones that interact most directly with the environment. The industry is convinced that its policies addressed to the suppliers, are crucial to reduce the environmental impacts of agricultural production and to expand its social dividends and food supply. At the same time, production of food and beverages reaches practically the whole population, every day. This presence in the daily life of people strengthens the role of the industry when targeting to supply quality food available to everyone.

It is clear that the new consumer and modern society demands are legitimate and must be responded with healthier, more accessible and more environmentally friendly products. Going forward, the industry believes that its practices impact the country as a whole; that is why it is transforming the choice of ingredients, packaging and marketing into sustainability and healthy eating habits promoters.

Obviously, we must recognize the intrinsic challenges concerning the pursuit of a sustainable industrial activity. However, it is evident that they are already being addressed, as well as those related to the food value chain.

For many years the industry has believed that, with healthy, affordable and fairly paid food, produced within the law and respecting the environment, it is possible to strengthen the country and ensure the well-being of the population, in the present and in the future. And this is exactly what the content of this document portrays.

Edmundo Klotz

President

Brazilian Association of Food Industries (ABIA)



1 ECONOMIC CHARACTERIZATION OF THE SECTOR ACTIVITY

The food and beverage industries let out products that are shipped and that are equivalent to 9% of the Gross Domestic Product (GDP) of Brazil. Besides creating a growing number of jobs, they generate a trade surplus greater than that created by the rest of the economy.

The turnover of the 45.400 companies of this industry¹ totaled R\$ 388.7 billion in 2011², of which R\$ 321.1 billion came from food and \$ 67.6 billion from beverages. This performance puts the industry as the second largest in the gross value of production of the transformation industry, only behind the petrochemical³ industry.

US\$ 44.7 billion of the total sales went to foreign markets, an amount equivalent to R\$ 74.9 billion, or 19.3% of the total⁴. On the other hand, the imports of food are much less significant and concentrated on wheat, totaling US\$ 5.8 billion⁴.

This makes the food industry one of the most relevant industries for the generation of a positive trade balance, reaching in 2011, US\$ 38.9 billion, above the trade balance of the Brazilian economy as a whole, worth US\$ 29.8 billion⁴.

Although semi-processed food have a great weight in the overall results of the industry's exports, the segments that export processed food have reached leadership positions in the world trade. Sugar, orange juice, meat and meat products, and soybean meal are the four main exporting industries of processed food and in the case of the first three products, they are world leaders.

1 Ministry of Labor and Employment (MTE), *Annual List of Social Information of 2010 (RAIS)*.

2 The source of the data without citation in this document is ABIA.

3 Brazilian Institute of Geography and Statistics (IBGE) *2010 Annual Industry Survey (PIA)*.

4 Department of Foreign Trade, Ministry of Development, Industry and Foreign Trade (Secex/MDIC) Brazilian Trade Balance in 2011.

Faced with growing internal and external demands, the food and beverage manufacturers have undertaken several investments to raise production capacity and efficiency. In 2010, R\$ 17.2 billion in investments were publicly announced, which represented about 5% of the sales, even in a year of crisis. In 2011, despite the worsening of the international crisis, investments totaled R\$ 15.7 billion. It is important to highlight that the sales and investment growth have remained constant, even despite the economic downturn. In 2009, despite a 0.3% shrinkage in the Brazilian GDP, actual sales of the industry grew 3.46%.⁵

This growth reflected also in the increase of jobs. In 2011, the industry employed 1.62 million workers. Since 1992, the number of employees has grown 90.4%. The annual rate of growth was 3.3%, significantly above the processing industry average, of 2.6% per annum⁶.

COMPETITION AND TECHNOLOGY

Also from the standpoint of the products, the industry has shown a great development in the last two decades. The Brazilian population has migrated heavily from fresh to processed food. Today, 85% of the food consumed in the country undergoes some processing, compared with 70% in 1990 and only 56% in 1980.

In addition, the industry has also increasingly explored new niche products such as dietary and functional food and beverages. In 2010, the segment of health care and wellness products, (diet, light, functional, fortified, natural and healthy) sold R\$ 27.5 billion, or 8.2% of the total sales. Despite representing great opportunities, the growth in consumption of products with higher added value demands from enterprises a higher level of technology and management. The scenario is highly competitive and tends to concentrate.

⁵ Value calculated from the industry deflator, based on data from the Economic Research Institute Foundation (FIEP) and IBGE.

⁶ MTE, *General Register of Employed and Unemployed (Caged)*, from 1992 to 2011.

MAIN INDICATORS

Data on economic performance in the industry are highlighted in the Conjuncture Survey of ABIA, which encompasses about two-thirds of the market. These indicators are consolidated in the table set out below⁷.

TABELA 1. FOOD INDUSTRY MAIN INDICATORS						
Food Industry Main Indicators						
	Unit	1992	2010	2011	Var. % p.y.- 1992-2011	Source
Sales						
Beverage Sector (A)	R\$ bi *	17,7	60,1	67,6	6,9	ABIA
	US\$	4,0	30,9	40,4	12,2	
Food Sector (B)	R\$ bi *	171,0	305,9	321,1	3,2	ABIA
	US\$	38,9	157,1	191,7	8,3	
Food Industry (A+B)	R\$ bi *	188,8	366,0	388,7	3,7	ABIA
	US\$	42,8	187,9	232,1	8,8	
% of GDP	%	11,0	9,0	9,8		ABIA/IBGE
% Transformation Ind.	%	18,0	18,2	19,3		ABIA/IBGE
Foreign Trade						
Export		6,0	37,9	44,8	10,6	
Import	US\$	0,6	4,1	5,9	12,4	ABIA/Secex
Trade Balance		5,4	33,8	38,9	10,3	
Internal Market						
Food Retail		137,1	198,5	205,3	2,0	
Food Service	R\$ bi *	27,6	83,0	89,1	6,0	ABIA
Internal Market Total		164,7	281,5	294,5	2,9	
Employment						
Food Sector	Million	0,851	1,527	1,621	3,3	MTE
% Transformation Ind.	%	17,1	19,4	19,3		MTE
Companies						
Total Number	K	25,9	45,4			MTE
* 2011 prices						
US\$ = Annual average commercial dollar BACEN sale						

⁷ The data in the table include the following food industries: wheat chain, chocolate chain, cocoa and candy, cereal chain, coffee, sugar and salt, canned vegetables and juices, dairy, animal protein chain, dehydrated and frozen food; oils and fats, soft drinks, alcoholic beverages (except beers), mineral water, others (ice cream, snacks, spices).



2 SOCIOENVIRONMENTAL FEATURES

2.1 Use of resources

2.1.1 Energy

The power supply is essential for all processing industries. The search for energy efficiency and clean energy sources in this sector of the economy, therefore, results in obvious effects on the environment.

CLEAN ENERGY MATRIX

In the Brazilian case and in particular, in the national food industry, the power matrix is already much cleaner than that of other countries. In Brazil, almost half the energy comes from renewable sources,⁸ while in the world average, these sources are no more than 15%⁹. One cannot lose sight of this Brazilian difference when discussing the relation between energy and environment in the international arena.

The 2011 National Energy Balance (BEN), referring to 2010, has demonstrated that the food industry uses even more renewable energy than the Brazilian average. According to the BEN, the food and beverage industry draws 75.2% of the energy consumed from the sugar cane bagasse. Firewood accounts for 9.6% of the energy matrix of the industry and network electricity serves 9.3% of the consumption. Other sources, such as natural gas, fuel oil and diesel oil account for the remaining 5.9%.

⁸ Energy Research Company / Ministry of Mines and Energy, *National Energy Balance 2011*.

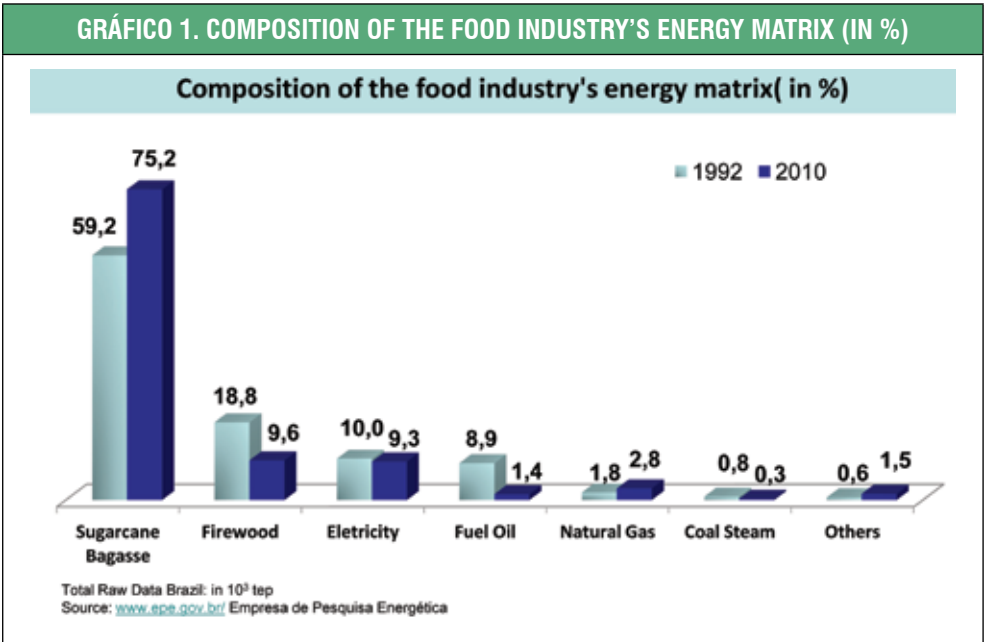
⁹ International Energy Agency, *World Energy Outlook 2011*.

Comparison with data from BEN for 1992 show a major advance in the industry toward renewable energy. In the year of Rio-92, the industry drew 59.2% of its energy from sugar cane bagasse and 18.8% from firewood. At the same time, the sum of direct non-renewable resources (fuel oil, natural gas and coal, excluding the utility services), fell from 11.5% to 4.5%, as shown in the chart on the next page.

Behind that clean-energy matrix, the food-industry counts on the fact that it generates by-products that can be used to generate electricity and steam, especially the sugarcane bagasse. There are also projects that use byproducts from the agroforestry activity, not focused on the production of food, such as wood chips and the sawmill from planted forests. The location of many food industries, near the agroforestry base, facilitates the integration of alternative biomass to the energy matrix of the industry.

Despite the progress already made, several investments have been made to continuously make these byproducts better and better, with more efficient equipment, transmission lines to sell the surplus power and the adoption of new technologies, such as generating electricity from animal waste digestors.

Adding also other initiatives, rather restricted to large industries, such as the construction of small dedicated hydropower plants, there are cases of companies with dozens of factories around the country that can reach up to 95% of direct renewable energy.



ENERGY EFFICIENCY

Besides adopting a clean energy matrix, the food industry has clearly sought to reduce its consumption of electricity and fuels. Although it may seem paradoxical, the entrepreneurs and executives of the industry, have learned to deal with the vagaries of the Brazilian energy supply and sought their own consumption solutions and savings before increasing the environmental pressure on the energy sources.

In particular, the 2001 blackout left indelible marks in the power management of companies in Brazil. The food industry has learned to live with restrictions of supply of electricity, which led some companies to reduce up to 85% of their electricity consumption in the last 10 years.

2.1.2 Water

In addition to the product when bottled, water is a key consumable in the food industry, both in the industrial processes and in the generation of raw materials – i.e., agricultural production. As the agricultural activity is the largest water consumer in the world, the food industry has been working on awareness programs for farmers and on watershed protection to ensure the supply of quality water.

From the industrial side, heavy investments have been made to reduce the consumption of water and to guarantee the quality of the water returned to the environment. It is important to remember that the environmental permit for the operation of the plants is very strict about the quality of water, so that the industries already meet these standards. These requirements and controls also helped to stimulate the reuse of water and the savings in the abstraction of these resources. Furthermore, to obtain a license for water abstraction from the environment involves additional demands by the controlling bodies.

All this led the industry to seek for the maximum efficiency possible, to the point of reusing even the water extracted from their own raw-materials. This is the case of the orange juice industry, which uses the water extracted from the fruit in the concentration process. Thus, the industries in this segment return to the environment as much as 1.5 liters for every liter of water withdrawn, and the entire volume goes through wastewater treatment plants.

In the case of the industries in urban areas that use the local distribution network, the high cost of water supply is, in its own, encouraging enough on the pursuit of efficiency in the consumption.

Many industries have adopted targets for reducing the water consumption per kilo or per liter of the manufactured product. The largest soft drink brand in the country announced in 2010, the goal of achieving their water neutrality by 2020 – that is, to return to nature all the water it withdraws. On the other hand, the largest brewer in the country wants to reduce the consumption of water per liter of beverage produced from 3.9 to 3.5

liters between 2009 and 2012. When compared to the data from 2004, when 4.37 liters of water were used per liter of beer, these seem to be goals that are quite achievable.

2.1.3 Biodiversity

Despite being a country rich in biodiversity, native species are not prevalent in the diet of the Brazilian population. There are rare cases of Brazilian native animals being consumed as food, and further, these exceptions tend to be geared to personal consumption and do not enter the industrial chain. In the fish of catching fisheries, the most common species on the table are sardines and tuna, which may originate from Brazilian waters. In both cases, the national brands have the certifications “Dolphin Safe,” which ensures the selective fishing of tuna fish without affecting the dolphins, and the “Friends of the Sea,” which follows the criteria of the United Nations organization for Food and Agriculture (FAO) for the preservation of the marine bio diversity.

In the case of the flora, there are a few examples of bio diversity used as consumables for the food industry. They are mainly fruit, such as guarana, pineapple, açai, pequi, cupuaçu, buriti and cocoa – although the latter is explored in fields outside the original biome, and not according to the extractive model. The formal industries that use these raw materials often develop environmental and social projects with the local communities, to ensure preservation of the bio diversity and the livelihood of the families.

This applies to the community of Maués (AM), a municipality about 250 km from Manaus, from whence most of the Brazilian guarana crop comes from. The food industry has already distributed over half a million free seedlings of the plant to stimulate the renewal and increase of the production area. Technical assistance for quality production is also provided. Strictly from the social standpoint, donations to the state government allowed the construction of 1300 houses in the rural zone of Maués.

The professional training for the sustainable extraction of raw materials, the encouragement to the organization and certification of local producers and the funding for investments in technology are also practices of the food and beverage industries that use the Brazilian bio diversity in their products.

INTERACTION WITH AGRICULTURE

The interaction of the food production chain with bio diversity, however, is much broader than the use of the native species as a productive resource. It must be recognized that the farmer is the citizen who interacts most with the environment, and that his actions can either protect or threaten bio diversity.

In this sense, the industry acts raising awareness, putting pressure and choosing its suppliers according to patterns of preservation of the bio diversity. This, however, is only one of the aspects of environmental responsibility that should be demanded from farmers, so that the subject will be more comprehensively detailed in the following section (2.1.4).

In the case of paper and cardboard packaging, for example, the demand for certification from the Forest Stewardship Council (FSC) that certifies that the forests that originate the product are sustainable and preserve the bio diversity is already growing.

2.1.4 Raw material

The food industry is the destination of 57% of the Brazilian agricultural production. In this sense, it is an industry vital to the socio-economic stability of the field, with the generation of income and the fixation of the population to the land. In the 2012 crop year, the gross value of production (GVP) of the main agricultural products of the country should reach R\$ 214 billion¹⁰. At the same time, the capillarity and the strength of the industry in the harvest of raw materials in the country allow us to support and push the farmers to adopt the best economic, social and environmental practices.

Among the numerous projects of the food and beverage industries to disseminate the best practices among their suppliers, we highlight the initiatives of broader scope and, above all, of compulsory enforcement, since they have a greater effect and in a shorter time.

From an environmental standpoint, the projects that draw attention most are those aimed at controlling the deforestation. The Soybean Moratorium, for example, prevents the purchase of soybean grown in deforested areas in the Amazon biome after 2006 by companies associated to the Brazilian Association of Vegetable Oil Industries (Abiove) and to the National Association of Grain Exporters (Anec). A term of behavior adjustment (TAC) signed between the main meat processors, and the Public Ministry of Pará is also reflected in the banning of cattle sales from illegally deforested areas in that state. These projects are detailed in section 2.2.5. Deforestation.

From the social standpoint, there are covenants of the sugar cane industry against forced labor and of the tomatoes' processing industry for the eradication of child labor in the fields. These topics are listed in section 2.3. – Social aspects.

One cannot forget also to emphasize, despite the lack of official data or even of wide scope data, the efforts of the industry to raise productivity and reduce the losses of raw materials. The food chain has invested in the transportation logistics, warehousing and technology to achieve these goals, which, besides improving the business performance, also reflect on the use of the resources of the planet. In the State of São Paulo, for example, the sugar industry has sought association with the railway operators to recover railroad sections, build terminals and buy cars and locomotives to improve the logistics of sugar. The Ministry of Agriculture estimates that between 10% and 15% of the agricultural production is lost before it even reaches the market¹¹.

¹⁰ Office of Strategic Management of the Ministry of Agriculture, Livestock and Supply (AGE/ MAPA).

¹¹ <http://souagro.com.br/infraestrutura-logistica-deficiente-custa-carro-para-a-populacao>, on 12/22/2012.

2.2 Environmental Aspects

2.2.1 Climate

Food production is one of the essential human activities most vulnerable to climate variations. Changes in temperature, rainfall and the composition of the atmosphere directly affect productivity of crops and pastures. The indirect effects can be even more harmful, with the emergence of new pests, diseases and weeds, due to changes in the environment. For all these reasons, it is natural that the industry takes action to minimize the causes and effects of climate changes that threaten the production of raw materials in various parts of the world.

The main tools that the food industry has at its disposal to minimize the greenhouse effect consists in reducing the emission of gases that cause the phenomenon. Among them are domestic emissions from industrial processes, from the transport logistics and from the process of raw material productions – including those relating to the deforestation.

2.2.2 Emissions

Until November 2011, 43% of carbon credit projects in Brazil recorded by the United Nations (UN) came from the food industry, or used as a source of energy, the consumables originating from that chain¹². These projects are mainly linked to the generation of energy from burning waste such as sugarcane bagasses, rice husks and animal waste.

Out of the 198 projects registered by Brazil, 85 are connected to the food chain. By 2020, these projects will have removed from the atmosphere or prevented the issuance of 34.8 million tons of carbon dioxide, equivalent to planting and maintaining 2,654 km square kilometers of native savannah vegetation for 20 years. This area amounts to more than half of the metropolitan region of Rio de Janeiro, with its 19 municipalities¹³. There are over 47 projects related to the food chain in validation process with the UN.

In addition to projects that use raw materials from that chain, the projects initiated by the food industry, using other clean energy sources or even other methods of generating carbon credits, should be considered. Some food industries use byproducts such as wood chips and dust from sawmills to generate electricity and steam, reducing the consumption of fossil energy sources, as described in section 2.1.1. – Energy.

The model of transportation logistics in Brazil, based on the road modal, hampers the reduction of emissions in the distribution process. However, the adoption of other modals by the food industry is reducing the dependance on trucks for the transportation of the production and hence the emission of greenhouse gases. Among these investments, we highlight the rail and waterway transports – the latter concentrated in the Tiete-Parana waterway.

¹² Survey of the United Nations (UN), *CDM Pipeline*, December 2011.

¹³ Based on estimates of Embrapa Environment, in <http://www.cnpn.embrapa.br/5ciic/4ciic/Artigos/RE10403.pdf>, on 02/16/2012.

2.2.3 Pollution

The food industry is not a major generator of air pollutants. This condition is intrinsic to the activity itself, since the product of this industry is intended for human consumption, not involving components that are harmful to health in the manufacturing processes.

The same could be said about soil pollution, but it is necessary to emphasize the concern about the correct use of pesticides. These consumables, essential to agricultural production on a large scale, may pose a risk to health and the environment. That is why the food and drink industries that purchase the production from farmers, invest in programs for the analysis of residues and for the awareness on the correct use of pesticides. It should be emphasized that the climatic conditions of Brazil, a mostly tropical country, are ideal for the reproduction and spread of pests such as insects and fungi, which make pesticides even more necessary than in temperate regions such as Europe, the U.S. and Argentina.

In the case of water pollution, as was stated in section 2.1.2., strict guidelines for the treatment of effluents are in place. The industry of meat and meat products faces a special challenge to deal with waste in their processes, but has also being successful. Water is used in abundance in the process of boning, trimming and cutting of animals, including ensuring the quality and hygiene of the final product. Loaded with organic material, the water used in these units often goes to ponds which, when built in the right way, prevent environmental contamination.

2.2.4 Waste generation

The waste management throughout the life cycle of a product is changing level in Brazil with the approval of the National Policy on Solid Waste. In the food chain, all agents are getting involved to assume their responsibilities in the reverse logistics and the proper disposal of waste.

In this sense, agreement between the different productive chains related to post-consumer packaging and the Ministry of Environment are about to be executed, through which the private sector will implement, in the first step, reverse logistics projects in the 12 cities hosting the World Cup, extending to the metropolitan areas, as detailed in section 3.2.2. – National Policy on Solid Waste. The project will provide full support for the effective implementation of selective collection in the World Cup host cities, from the consumer education – who needs to change behavior and begin to separate the household waste – to the investment needed for the structuring of cooperative of waste pickers, so they also work in the collection of waste in partnership with the urban cleaning services.

With the implementation of the first stage of the project, scheduled to start in 2012, it is expected an annual diversion from landfills of more than 2 million tons of recyclable material and to increase by 34% recycling in this country, considering that the cities of the World Cup together represent about 22% of the total municipal waste generated in Brazil.

Even before the approval of the National Policy on Solid Waste, however, the industry was applying technologies and policies to recycle waste from the production processes and end packaging used in their products. The challenge that was already being addressed, consists primarily in ensuring the economic feasibility of the packaging logistics system of final products (post consumption) and add and retain the economic value of the material resulting from screening, intended for recycling and/or reuse.

The efforts in this direction go through direct initiatives with consumers and partnerships with recycling cooperatives, public power, packaging manufacturers and retailers. It is increasingly common to find points of collection of empty packages in retail chains, often in partnership with the industry.

There is also a success story in the collection of used cooking oil for the production of biodiesel. Even after being used for food purposes, the oil can be used for the production of biofuel. In 2010, the program collected 260 tons of vegetable oil, a volume that is still small, but that is equivalent to avoiding the consumption of about 250,000 liters of diesel fuel.

Within the industry, a common way to reduce the generation of waste is to use it in the industrial processing to generate energy. Thus, biomass of the sugar-cane bagasses, poultry and swine manure, rice husks, are transformed into electricity and steam. These forms of energy supply the industries themselves, and often also generate additional income. This applies to companies that sell surplus energy or sell carbon credits generated by replacing fossil fuels with biomass. With these and other strategies, there are already real examples of companies that have shown to be possible to reach close to 100% in the recycling of industrial waste.

Most of the companies sponsoring the Business Commitment for Recycling (Cempre) belong to the food industry. Sixteen of the 40 associated companies are food and beverage industries, which play a key role in the success of the entity. Founded in 1992, Cempre works on the awareness education and organization of the society for recycling. In Brazil, about 800 000 families live from collecting and sorting recyclable waste, according to Cempre. This also raises all the initiatives in favor of recycling to the condition of important social factor.

PACKAGING TECHNOLOGY

In this sense, technological development that is being applied to packaging is of utmost importance. The beverage industries, especially, have been concerned with plastic packaging with a higher return for the collectors. The use of colorless pet, for example, raises the price of the collected product by approximately 30%.

Another advance supported, and in the process of implementation by the food industry is the use of plastic from renewable sources in packaging. With a large production of ethanol, Brazil is leading the world in the beginning of the migration from petrochemicals to the alcohol chemistry, opening great possibilities for biodegradable packaging. The plastic from sugar-cane is being applied in the packaging of food and beverage in Brazil. Besides being more easily degradable, this plastic emits approximately 25% less carbon dioxide in its production process.

2.2.5 Deforestation

Deforestation is responsible for 61% of the Brazilian emissions of greenhouse gases, according to the National Policy on Climate Change. Farming is often cited as the main cause of deforestation, although this causal relationship has not been proven in most of the cases. Anyway, the fact is that farming and ranching that usually occupy the areas opened after the extraction of wood demand that the food industry exercise caution when purchasing raw materials and to discourage deforestation.

The power of pressure from the industry on farmers is one of the central tools for the adoption of correct agricultural practices in Brazil and worldwide. Aware of this force, and also aware of consumers and feed retailers demand for a more sustainable food, the industry has developed some awareness projects and restriction to suppliers associated with deforestation.

AFFIRMATIVE ACTIONS

One of the biggest is the so called Soy Moratorium. Through an environmental pact, non-governmental organizations monitor the commitment of companies that are members of the Brazilian Association of Vegetable Oil Industries (Abiove) and of the National Association of Grain Exporters (ANEC) not to buy soybeans from deforested areas in the Amazon biome after July 2006. In October 2011, the associations and partners, Ministry of Environment, Bank of Brazil, Conservation International, The Environmental Research Institute of the Amazon (IPAM), The Nature Conservancy (TNC) and the World Wildlife Fund (WWF-Brazil) renewed the Soy Moratorium for another year, until January 31, 2013.

Through satellite tracking, associated with a work of encouragement of the producers in the Amazon region for joining the Rural Environmental Registry (CAR), the Soy Moratorium has shown strong results. In the monitoring of the last complete harvesting season (2010/2011), the initiative has identified 11,698 hectares of soybeans planted in areas deforested after July 2006, which represents only 0.39% of the area deforested in Mato Grosso, Para and Rondonia – main Amazon states in which the planting of soybeans is feasible.

In addition to directly discourage deforestation, the action of large companies in the industry creates a domino effect on the entire chain. By blocking the suppliers of newly deforested areas, they devalue that production and hinder their trade.

There is also an agreement between meat packers, ranchers and the state government of Pará to prevent the marketing of cattle originating from areas of recent deforestation, under monitoring of the Public Prosecutor. Ranchers must adhere to the CAR, and the practical effect is identical to that of the Soy Moratorium: whoever fails to comply is excluded from the list of accepted and approved suppliers.

In addition to the industry's own, individual or joint initiatives, the food sector relies on lists and existing public policies to control deforestation. Thus, most companies that directly buy agricultural and livestock products, have adopted as an official policy, the

blocking of producers included in lists of disapproval and from embargoed areas of the Brazilian Institute of Environment and Natural Resources (IBAMA). Thousands of vendors were blocked because of that – 1,873 only in 2009 and 2010. Special attention is also given to the origination of raw materials in the municipalities included in the list of the deforestation of the Ministry of the Environment, which indicates the regions in which the opening of forest areas is still critical.

AWARENESS

No less important is the awareness project and social support of industries with the rural producers. In the region of Santarém (PA), the industry develops the Sustainable Soy Project, in partnership with the The Nature Conservancy NGO. With a donation of US\$ 3 million, the NGO will encourage the responsible production of soybeans and cocoa, a fruit originated from the Amazon, in already deforested areas.

2.3 Social aspects

2.3.1 Qualification of labor

Besides qualifying their own labor, the food industries have invested in upgrading and completion of studies of their employees' family members. In partnership with educational institutions and municipal departments of education, they have also supported the training of young and adult workers, family members and local communities. These investments translate into improvement of the economy around the industrial units and in the increased supply of skilled labor, an asset known to be scarce.

Structured internship and trainee programs are also increasingly common in this industry. These strategies are ways to attract new talent, since the lack of skilled labor is cited as a challenge in almost all areas of the economy. Professionals such as engineers of different specialties are disputed based on increasingly generous wages and benefits.

2.3.2 Employment

Between 1992 and 2011, the food industry generated 769,700 new formal jobs¹⁴. This represents a growth of over 90% within two decades, with an annual average of 3.3% growth per year. Just for comparison, the increase in employment in the manufacturing industry as a whole, during the period, was 2.6% per year.

¹⁴ MTE, Caged.

In 2011, the food and beverage industry employed 1.621 million workers, with the creation of 93,400 net jobs over 2010. It is the largest employing industry within the processing industry of this country¹⁵.

The employment performance in the food industry in recent years shows that this sector is an important anchor of stability in times of economic downturn. In 2009, when Brazil's GDP dropped 0.3%, the processing industry generated only 50,300 net jobs over 2008. The industry accounted for more than half of that surplus, with the creation of 25,400 jobs¹⁶.

2.3.3 Safety

After an increase in the first half of the 2000s, the proportionate number of occupational accidents in the food industry has been falling since 2006, compared with the other economic activities. In 2000, the industry registered 6.4% of the occupational accidents in the country¹⁷. This rate rose to 9.6% in 2006, when the trend curve reversed. In 2010, the food industry accounted for 8.5% of all occupational accidents. It is important to highlight that the changes in the calculation methodology of the Ministry of Social Security have interfered adversely in the results of the industry over the past 20 years, hampering a comparison on the same basis.

In any case, there was an inversion in the curve of occupational accidents, associated with a wide range of actions, such as the search for the occupational health and safety certification of OHSAS 18001. In 2010, 48 food and beverage industries received the certification, according to a survey in the Brazilian Protection Yearbook 2011. Altogether, 740 Brazilian companies received the certification that year.

2.3.4 Health

All the major industries that purchase agricultural products are signatories of the National Pact for the Eradication of Forced Labor, an initiative created in 2005 by the International Labour Organisation (ILO), the Ethos Institute and the NGO Reporter Brazil. All participants of the pact pledged not to buy products from producers entered in the so called "dirty list" of forced labor, updated every six months by the Ministry of Labor and Employment. Either directly or through associations, 28 food industries are in the Covenant, including the members of the Brazilian Association of Meat Exporters (Abiec) that brings together the leading beef processors, and the Brazilian Association of Vegetable Oil Industries (Abiove), which brings together the biggest industries that purchase grain in the country.

¹⁵ MTE, Caged.

¹⁶ MTE, Caged.

¹⁷ Ministry of Social Security (MPS), *Statistical Yearbook of Occupational Accidents, 2000–2010*.

In addition to the workers in its supply chain, the food industry has also a great responsibility on the health of the entire population. To provide food and drinks in satisfactory quantity and quality, several controls and certifications have been sought. Moreover, the industry has strived to create healthier products and to change the formulation of the existing items, in order to reduce the current levels of sodium, sugar and fat. ABIA maintains agreements with the Ministry of Health for the progressive reduction of the levels of these substances in food that is being met despite the challenges.

Despite the difficulties in replacing sodium in the formulation of food, many foods are having their levels of the substance reduced, as agreed with the Ministry of Health. Various categories of food already have sodium reduction targets agreed with the Ministry, ranging from 2.5% to 9.5% per year until the year 2020. Only in the first three categories included in the agreement, (instant pasta, rolls and loafs of bread), the agreement will represent a reduction of 1,600 tonnes of sodium in the products in 2014.

A similar agreement has already had a great effect in reducing the levels of trans fat in several food categories. Just in 2009, there was a reduction of 230,000 tons of the substance in the food sold in this country. Compliance with these voluntary targets is guaranteed by another agreement, in which the National Agency of Sanitary Surveillance (ANVISA), is also a participant. Through it, the agency is responsible for monitoring the presence of substances listed in the covenants of reduction in the products sold to the market.



3 ECONOMIC, SOCIAL AND ENVIRONMENTAL REGULATIONS AFFECTING THE INDUSTRY

3.1 International agreements and regulatory issues

3.1.1 Millennium Development Goals

In 2005, the member states of the United Nations (UN) have pledged to achieve eight Millennium Development Goals (MDGs) by 2015:

1. Eradicate extreme poverty and hunger.
2. Achieve primary and basic education.
3. Promote gender equality and empower women.
4. Reduce infant mortality.
5. Improve maternal health.
6. Combat AIDS, malaria and other diseases.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

Each MDG has its own targets and indicators, and the food industry is more directly connected with the goals 1 and 7.

In respect to hunger, the goal is to halve the proportion of hungry people in the world population between 1990 and 2015. Along with appropriate income distribution policies, the food industry has contributed to achieve the target in the quest for lower cost products, more accessible to low-income populations.

In Brazil, specifically, the increase in income and the historical reduction in the expenditure with food have been reflected in the great success in reducing starvation and in the growth of the economy. This because food, which affected 33.9% ¹⁸of the population income in 1974, consumed 19.8% of the household income in 2008, ¹⁹allowed increases in the expenditure on housing, transport, health and education.

As for the MDGs relating to the environmental sustainability, the theme relates to the food industry in a number of indicators chosen by the consultants of the UN: the proportion of forested areas, use of energy, per-capita emissions of carbon dioxide, among others. While the MDGs are the responsibility of the member states of the UN, the private sector has moved toward the fulfillment of these goals, even when they are not the intended final actions. The environmental goals of the UN Millennium Project are an example of that, since the food industry has taken several actions that lead to the fulfillment of most indicators of the MDG 7. The efforts to reduce deforestation (section 2.2.5 of this document), the emissions of carbon dioxide (section 2.2.2) and the energy efficiency (section 2.1.1) are examples of that.

3.1.2 Kyoto Protocol

Specifically regarding the reduction in the emission of greenhouse gases, there is a UN protocol with even more direct impact on the corporations, the Kyoto Protocol. Open for signatures in 1998, the Protocol set targets for reducing greenhouse gas emissions for the developed countries and the concept of the clean development mechanism (CDM) for developing countries, whose data on carbon credit projects in the food sector have been exposed in section 2.2.2.

¹⁸ IBGE, National Survey of Family Expenditure 1974/1975.

¹⁹ IBGE, Household Budget Survey 2008/2009.

3.2 National legal instruments

The set of laws and regulatory instruments that involve food production in Brazil is very extensive, so that one needs to focus on the major provisions that directly affect the industry, not the entire production chain.

3.2.1 National Policy on Climate Change

Since the approval of the National Policy on Climate Change, Brazil has set the first goals for reducing the emissions of greenhouse gases. The country is expected to reduce between 36.1% and 38.9% its emissions on the projections for 2020. Most of this reduction will come from controlling deforestation and agriculture, which already have established action plans to achieve their goals.

To date, only the deforestation in the Amazônia Legal and the Cerrado, the energy sector, agriculture and metallurgy sectors have individual plans defining how they will reduce their emissions. For the other sectors, the government had set the dateline of 15 December 2011 to publish the plans, but the deadline was extended by decree to April 16, 2012. Among the sectors that are awaiting for their plans, is the processing industry.

But the plans for deforestation and low carbon agriculture already have effects on the food industry. The plan for agriculture provides, among its goals, that the treatment of animal waste is expected to reach 4.4 billion liters per year. This type of investment is, without doubt also the result of the action and incentive of the industry, as it had been occurring since before the new law. This is because the access of farmers to credit and technology is often mediated by the industry, especially for poultry and pig farms under the integration system. In this model, which dominates the production of poultry and swine, the farmers are exclusive suppliers of an industry that provides all consumables, and the assistance needed for the production.

Furthermore, the control of deforestation is now also depending on the industries to raise awareness and to put pressure on their suppliers, and this is not expected to change. In this framework, the food industry should be seen as an important agent for the success of the National Policy on Climate Change.

3.2.2 National Policy on Solid Waste

Law No. 12305, 2010, which instituted the National Policy on Solid Waste (PNRS) is an innovative legislation that establishes the shared responsibility for the life cycle of products, among the manufacturers, importers, distributors, traders and the government, forcing all the participants to act. The governments should establish programs for the proper management of waste and to eradicate waste dumps; the consumers are responsible for the correct sorting of waste for collection and delivery, or in some cases, to return the product after its use, and the business sector is required to structure and implement the reverse logistics systems of packaging – and in some cases, of their products – after their use.

Although the food and beverages are not on the initial list of products with mandatory reverse logistics, (such as tires, lubricants, light bulbs, electronics, batteries and pesticides), the food industry is moving together with representatives of other links in the chain of post-consumption packaging, including the retail, to strengthen the system of reverse logistics of such packaging. This is a great challenge, but that was already being faced since before the law was passed. Besides the complex operation to implement a reverse logistics system for post-consumption packaging, they have been working for years in order to reduce the use of the packaging and make them recyclable. This is one of the goals of PNRS itself, and had already been adopted in the industry.

Signaling the collective effort to achieve the objectives laid down by law, many sectors have come together, including the food industry, to implement a reverse logistics project for post-consumption packaging. The bill provides that the investments begin in the 12 host cities of the World Cup 2014, extending to the metropolitan areas, so they become models for the rest of the country. Projects like this will turn many initiatives that were individual initiatives the companies or the supply chains, collective tasks. It is clear that the best way to apply the PNRS is through the union of the parties responsible for optimizing the resources and to facilitate the implementation in the largest number of cities and in the shortest possible time.

3.2.3 National Policy on Water Resources

Since 1997, the use of water in Brazil is governed by Law No. 9433, 1997, which instituted the National Policy of Water Resources (PNRH). This policy defines the rules for the use of water in the country, significantly interfering in the operations of the food and beverage industries. According to the PNRH, companies must apply for a grant from the state environmental agencies to abstract water for their operations. The applications are reviewed according to the uses and current and future impacts on each watershed.

Because each watershed has its own committee, with different priorities and guidelines, the grant is now a nebulous and lengthy process. In practice, this bureaucratic procedure ends up turning into another element of uncertainty for the entrepreneur, who cannot accurately estimate when and if he will be able to put a new plant into operation.

The PNRH has also instituted a charge for the use of water, which is reverted to the protection and recovery of the watershed in which the enterprise is located. The collection of these funds and their application, with proper supervision, is still a relatively recent process that the companies find difficult to follow. One would have to make the process of granting and application of resources more transparent in order to provide security for the investment and a better understanding of the relevance of these instruments.



4 BUSINESS PRACTICES FOR SUSTAINABLE DEVELOPMENT (1992–2011)

4.1 Innovation and management technological changes

Many sustainable practices and technologies were developed and implemented since 1992 in the food industry. As in all the other sectors of the economy, indicators that did not even exist in the Eco-92 are today normally adopted to measure and manage the sustainability.

Among the innovations created or made popular since then, we highlight:

- the construction of high efficiency and low environmental impact small hydroelectric power plants owned or encouraged for the generation of energy for own consumption;
- digesters of animal manure and abattoir effluent, which also remove organic matter that could affect the environment, and are also being used to generate energy from the burning of such waste;
- integrated programs of satellite monitoring, with the employment and acquisition of images at lower prices and information management software integrated with the purchase of raw material systems;
- traceability systems of agricultural production, which allow tracing down all the way to the retail the origin and practices adopted;
- new technologies, strategies of approach and business models related to the economic feasibility of the recycling industry;
- fortification of food and beverages to control the micronutrient deficiencies of the population, which involves advanced laboratory work to identify these deficiencies and the development of the best ways to supply them to the food of consumers;

- adoption of formal environmental and social policies and codes of ethics and conduct by companies with the necessary continued communication to all employees;
- development of healthier food products, through complex changes in formulation possible through innovations in the product and ingredient development areas;
- more efficient packaging and packaging machinery, that use less consumables and are recyclable, generating less waste and saving natural resources;
- popularization of cartons, which increase the shelf life of perishable products and thus enable their storage and distribution to isolated regions and of little agricultural potential;
- contracts and business models in the acquisition of raw materials which include social and environmental criteria in the selection and pricing of products, plus all the technological and management apparatus necessary for the correct verification of these criteria;
- calculation methodologies and control of gas emissions;
- prioritization of vehicles with lower fuel consumption and lower emissions of pollutants for corporate fleets;
- adoption of high pressure boilers for the combustion of sugar-cane bagasses, capable of generating surplus power for sale to the electrical system;
- more efficient wastewater treatment plants, such as those using ultrafiltration technology.

4.2 Information disclosure and transparency

In the last decade, the Brazilian food industry started to publish annual sustainability reports. The Web helps in the democratization of this information, which include not only the activities carried out by companies, but also their social and environmental goals – including those that have not been met, with appropriate accountability and transparency.

Currently, the corporate world experiences the definition of standards and methodologies for reporting the sustainability practices. The Brazilian food industry is participating in this process. An example is the GHG Protocol, a global private protocol for calculating emissions of greenhouse gases. Of the 77 companies that inventoried their emissions in 2010 in Brazil, 11 are food and beverage industries – or 14.3% of the total. These inventories are publicly available on the Internet, guiding partner companies and consumers in their selections.

Even more comprehensive, the Global Reporting Initiative (GRI) is a standardized disclosure model of information about sustainability that facilitates the comparison of data between the companies. The original audience of the GRI is the financial market, which can, from the data collected, define social and environmental criteria on investments,

for example. But the questionnaires completed by the adhering companies are also available to anyone on the Internet. In Brazil, seven food industries filled out the comprehensive report in 2010. In all, 137 Brazilian companies have joined the GRI that year.

All the food industries eligible for the Carbon Efficient Index (ICO2) of BM&F Bovespa chose to adhere to the requirements of that index. Developed by the Stock Exchange, in partnership with Banco Nacional de Desenvolvimento Economico e Social (BNDES), the ICO2 lists the companies of the index of the 50 most liquid stocks (IBrX-50) who agreed to adopt standards of transparency regarding their emissions of greenhouse gases. The five food and beverage industries listed in the IBrX-50 adhered to the ICO2.

The Differentiated Corporate Governance Index (IGC) of the BM&F Bovespa also lists most of the food industries with stock publicly traded. There are 13 companies of the sector in the IGC, which lists corporations with different policies with respect to minority shareholders and transparency.

Finally, the general socioeconomic data of the industry are public on the website of the Economic Department of ABIA. The billing history, employment, foreign trade, the profile of the companies and sales per channel can be freely accessed. The publications of ABIA, with scenarios, trends and actions in several areas are also available, including those on sustainability.

4.3 Certification and self-regulation

CERTIFICATION

Most of the actions listed in this document are audited and certified by independent organizations, including the sustainability reports of the large companies of the industry. In many cases, these actions include partnering with an independent third party, such as non-governmental organizations related to environmental and social areas. These organizations act as guarantors and supervisors of the actions, which is fundamental for the success and credibility of those actions.

Increasingly, industries are being certified within international standards, such as the Global Reporting Initiative and the GHG Protocol – as explained in section 4.2.– Information disclosure and transparency. Certifications in compliance with the International Standardization Organization (ISO) are also extremely common. Those that stand out most in quantity are ISO: 9001, Quality; ISO: 14001, environmental, and OHSAS: 18001, occupational safety.

The retail chains have also applied their own certifications or required standard certifications from their suppliers, leading the industry to adopt them. This practice is becoming increasingly common in the domestic market, after already being usual in exports to European and American customers.

Standards of good agricultural practices, such as EurepGAP (European retail) and US-GAP (U.S. retail), are customary for the exporting industries' use and end up spreading their concepts to producers who do not follow these standards. This is because the certification in these standards often value the products.

SELF-REGULATION

The industries have also created a series of commitments related to sustainability, and have also adhered to agreements with the same purpose with public and civil organizations. An example is the project of the tomato processing industry of Goiás on the eradication of child labor in the harvest, called "Infância Protegida" (Protected Childhood). In addition to contributing financially to the Fund for Children and Adolescents, the industry requires from its suppliers pre established standards for labor conditions. Furthermore, they stand as voluntary forms of regulation of the food industry, the National Pact for the Eradication of Forced Labor, mentioned in section 2.3.4. – Health and the Cattle and Soybean Moratoriums, are described in section 2.2.5. – Deforestation.

In the field of food itself, ABIA maintains voluntary agreements with the Ministry of Health to reduce the levels of sodium and trans fat in everyday food. The fulfillment of these agreements has already cut more than 230 000 tonnes of trans fat from the food of Brazilians every year since 2009, when the first pact was signed.

In the case of sodium, the agreement was expanded in December 2011 so that 1050 tons of sodium will be removed from the diet of Brazilians in 2012, reaching 1,634 tons of reduction in 2014. This only in the first three product categories included in the agreement: instant pasta, rolls and loafs of bread. Several other products are also receiving targets to reduce the maximum content of sodium, such as French bread, cakes, snacks, cookies and mayonnaise.

The concern about the quality of food and beverages consumed by the population also includes the way they are presented so that the food industry is a strong supporter of the National Council of Advertising Self-Regulation (Conar). Recognized worldwide as a reference on self-regulation, Conar has relied on the industry since it was established in 1978 and since then, has never had a decision not complied with by the media. Out of the 155 companies that are today members of Conar, 21 are food industries.



5 CHALLENGES AND OPPORTUNITIES IN THE PATH OF SUSTAINABILITY

5.1 International trends in sustainability

5.1.1 Increased demand for food

The sustainability in food cannot be addressed only within the environmental and social aspects of their production process, but also from the viewpoint of its essentiality for human life. In this sense, the crucial trend to which the food industry should be aware of, is the growth of the world population, concentrated in the poorest countries.

Despite getting slower, the population growth is still big. We were 5.5 billion people in 1992, and we have reached over 7 billion in 2012, ²⁰with about 800 million in starvation²¹. Moreover, the trend is of a much higher growth in emerging or low development countries that now have a rate of 1.5% per year²². In the developed world, where the hunger and poverty dimensions are much less worrisome, the population growth is 0.5% per year.

In addition to having ever more potential consumers – 80 million new residents a year – the population income is increasing and with it, the people's patterns of food consumption. Between 2000 and 2016, the world Gross Domestic Product (GDP) should grow 95.3%, while the growth in emerging countries is expected to be 229.5%²³.

20 United Nations Population Fund (UNFPA), 2011.

21 Food and Agriculture Organization of the United Nations (FAO/UN), 2010.

22 UNFPA, 2011.

23 International Monetary Fund (IMF), *World Economic Outlook*, September/2011.

With regard to the purchasing power parity, the year 2012 should mark a dead heat, with chances of the emerging countries overcoming for the first time the developed world in purchasing power. With more income, the population tends to take longer to abandon the consumption of certain food when prices rise, which leads the prices to go up still further before they become more restrictive to the demand²⁴.

The increased income is reflected not only in larger volumes of food being demanded, but also in a stronger growth in the purchase of products with higher added value such as processed food and beverages and animal proteins. This whole process of change that began in the emerging countries between 1992 and 2012, should continue over the next 20 years.

5.1.2 Consumer awareness and traceability

The increase in the consumption patterns also leads to the emergence of new demands and new concepts, increasingly present in the media and in the government regulations. The responsible consumption puts pressure on all the production chains against the abuse of labor, child labor, deforestation, the squandering of natural resources, the damage to the environment and the issue of greenhouse gas emissions, among other condemned practices.

The consumer is increasingly involved with these issues and to answer them in the case of food, means not only adopting the right practices and desired by consumers. The companies must be able to demonstrate their policies over a long chain, which makes the traceability from farm to table an inexorable trend.

The Brazilian industry already operates with traceability systems in products like organic food and beverages and beef exported to the European Union, for example, but it is certain that new lower-cost systems should appear in the next few years to be used by a much wider range of products.

5.1.3 Agriculture – A new approach

Reflecting all this change, agriculture must rethink its production system. The consumption of natural resources, especially water, will not be sustainable if the current trend of increasing demand is maintained. The human being needs three liters of water per day for drinking, but the production of his minimum daily food consumes about 300 liters²⁵. For each kilogram of wheat produced, 400 to 1 thousand liters of water are spent; for each kilo of beef water consumption goes from 1 to 2000 liters²⁶.

²⁴ FAO/UN and the Organization for Economic Cooperation and Development (OECD). *Agricultural Outlook 2011*.

²⁵ FAO/ONU, Aquastat system, 2010.

²⁶ FAO/ONU, Aquastat system, 2010.

Given its large consumption of resources, beef tends to lose priority against animal proteins that have lower costs and environmental impacts, particularly poultry and pigs. No wonder that the beef presents the lowest rate of growth in global consumption, even if the demand continues strong. In the extensive cattle-raising system, such as the Brazilian system, the trend is that pastures lose space to agriculture, but without reducing the production capacity. The increasing efficiency will compensate for the reduction of the pasture area.

The availability of arable land is going downward, forcing agriculture to pursue two paths: increase productivity and adapt to areas currently unsuitable for planting. This incurs in new technologies, which can generate a natural rejection of consumers to changes in food beyond their control. This is a challenge that the food industry is already facing with genetically modified organisms (GMOs), which can become more recurring in the future.

5.2 Challenges of sustainable development

5.2.1 Global warming

Regardless of the discussions on what is the degree of responsibility of man on global warming, there is a consensus that the planet's temperature rise is occurring and will have effects on life. The fight against climate changes and the adaptation to them are two movements essential for the maintenance and growth of food production.

A study by researchers of the Brazilian Agricultural Research Corporation (Embrapa) and the State University of Campinas (Unicamp) in 2008 estimated that the Brazilian harvest of grains can lose up to R\$ 7.4 billion already in 2020 due to the effects of global warming. In 2070, that number will have risen to R\$ 14 billion a year.

It is important to remember that, not only the development of plants is affected by the increase in temperature. Also the dynamics of insects, weeds, fungi and diseases changes significantly due to the changes of climate. Thus, the pests that were previously unimportant may become extremely harmful to crops, increasing the challenges of the food production chain. The food industry needs to be aware of this process, directing its suppliers to a low-carbon agriculture and mediating the relationship between the new technologies applied to agriculture and the consumers.

5.2.2 Social and environmental barriers

The increasing demands from consumers and regulators about the production of food is a trend that should remain consolidated, but that can hide a serious threat to the Brazilian industry. The demand for sustainable and healthy products is beneficial, but can be used as a device for creating non-tariff barriers to the international trade of food items.

As one of the largest food exporter in the world, Brazil is vulnerable to this type of barrier. To some experts, there is a trend of migration of technical barriers to the world food trade, that were once tax barriers, have become sanitary and are now migrating to a social and environmental basis.

An example is the policy of the European Community (EC) for the import of biofuels and their raw materials. Under the laudable goal of ensuring that the replacement of oil is made on a sustainable basis, the EC has adopted restrictive criteria and indicators questioned by several countries of the international community. European experts and politicians have expressed their intention to extend the policy of bio fuels to food, which could cause harmful effects to the Brazilian exports.

Moreover, the deepening of the global financial crisis has led some countries to increase protectionist measures that impact on the access to food. Be they of non-tariff or tariff nature, these measures are a concern when they reduce the competitiveness of the food of poorer countries and increase the cost of food worldwide.

Given this risk, the organizations representing the food industry in the Mercosur countries and Chile signed in December 2011, an agreement to reaffirm their support to free trade. Through the document, the entities demand from the national governments, the free movement of food and beverages among the countries of the region and propose that the authorities consult the representative bodies of the industry before adopting protectionist measures that often may have little or no positive results.

5.2.3 Taxation

The challenge of bringing food to the growing world population also stumbles on the price issue. It is not enough to have sufficient food if it is not accessible to those in need. The trend of high agricultural prices should remain, given the uncertainty of investors in the corporative scenario and the growth in demand from the emerging countries.

This situation highlights a nonsense lived in Brazil, which is the high taxation of food. The tax burden on the distribution chain of industrialized food is 35% (2010), which raises the food prices and affects exactly the most in need. A study submitted to the Congress by ABIA in 2007 showed that countries like the UK, Portugal and Mexico fully exempt the food chains. Among the developed countries surveyed, the highest taxation was found in Canada, where the food pays on average 8% tax.

In addition to making food more affordable, the tax exemption also tends to be reflected in a greater formalization of the sector. The great competitive advantage of informality lies in the non-payment of the tax due. Without this advantage, a greater number of industries tends to integrate the formal market to access customers who require the full legality from their suppliers and often, the sustainability standards. In other words, the exemption of the food chain should, in the last degree, make the chain greener.

Nevertheless, two provisional measures (MPs) published in 2011 went in the opposite direction to the exemption. The first one, the MP 545/2011, amended the rules for taxation of PIS/Cofins on green coffee. The alleged purpose was to simplify the billing system, but the practical result was an increase of taxation, since the tax credits generated from the export will no longer be compensated in the domestic market, which will cause the product to become more expensive for Brazilian consumers.

Another MP, the 552/2011, eliminated the presumed credit of PIS/Cofins that exempted the cereals, dairy and soybean product chains. The immediate impact of that decision is an increase in taxation, inhibiting the ability of investment and the creation of employment in the sector. In addition, consumers will also be affected, with increases between 1% and 4% in the final prices of cereal products and dairy products.

5.3 Opportunities for sustainable development

5.3.1 Strong demand and added value

If the proper food for a growing population and favorable income trends is essential for sustainable development, so it brings an obvious opportunity for the food industry. The production of global agribusiness is expected to grow 20% from 2010 to 2020 and in Brazil, this growth should be 40% to meet the global demand for food²⁷.

An increasingly larger share of this production will include the industry, on account of the changes in consumption habits. The urbanization and the growth of per capita income of the developing countries point to the increasing consumption of processed foods. The next step in this ladder of added value, is represented by the differentiated products, such as the dietary and functional items, which generate great opportunities for industries.

²⁷ FAO/ONU and OCDE, *Agricultural Outlook 2010*.

5.3.2 Differentials in Brazil

Despite all the challenges, the Brazilian industry has a great opportunity to benefit from the migration of the global economy to a sustainable basis. With abundant natural resources and the already cleared arable land available, Brazil has a great potential to increase its food production without incurring in damage to the environment.

The country has about 140 million hectares of pasture with some level of degradation, which can be recovered or give way to farming. This area would allow agriculture to double its current acreage (90 million hectares) without cutting a single tree. This should be a great advantage of Brazilian food in a global trade increasingly guided by environmental criteria.

Furthermore, Brazil and the food industry, in particular, may have advantages in a low-carbon economy. The energy matrix of Brazil is much cleaner than the world average, which makes the “starting point” of Brazilian companies to be ahead of their international competitors in terms of carbon emissions. In Brazil, almost half of the total energy comes from renewable sources, while the world average of these sources does not reach 15%. The food industry, in particular, has an even cleaner matrix than the country as a whole, in which more than 90% of the energy is renewable. If the emissions are priced fairly in the world trade, Brazilian products can benefit therefrom

However, in order to enable these favorable perspectives to materialize, the global debate on sustainable development needs to be influenced, to prevent the creation of barriers and to consider in a fair way the Brazilian differentials. In this sense, the importance of Brazil in the food production and in the preservation of nature must be reflected in a leading role in international debates. This is the only way to prevent the issue from becoming a threat and ceases to be an opportunity.

It is crucial that Brazilian diplomacy works closely with the private sector at this unique time, which greatest symbol is the very Rio+20, so the comparative and competitive advantages we already have in an inclusive and green economy are valued. We cannot be subdued in these debates, when the developed world itself, in the figure of the Organization for Economic Cooperation and Development (OECD), sees Brazil as the greatest potential to meet the global demand for food. And that considering the continued reduction of deforestation and a clean-energy matrix. Likewise, the government should work with the industry in the formulation of public policies that direct food production to an even greater sustainable basis.

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