


Territorial vulnerability of globalized agribusiness in Brazil: crisis in the sugar-energy sector and the local implications


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Territorial vulnerability of globalized agribusiness in Brazil: crisis in the sugar-energy sector and the local implications¹

Abstract

This article discusses the productive regional specialization and territorial vulnerability of the globalized agribusiness in Brazil based on a study of the current economic crisis in the sugarcane industry. Since 2008, in Brazil, more than 100 sugar-energy agro-industrial units (SAPs) have interrupted their processing activities due to several conjunctural and structural factors that have led to an increase in debt and loss for many business groups. Because the process of productive specialization has resulted from the spatial occupation pattern of the sugarcane industry and from the economic difficulty faced by this sector, several municipalities, mainly those presenting low demographic levels and low urban-industrial dynamism, have become vulnerable judicial recovery and bankruptcy amongst sugarcane agroindustry companies.

Keywords: Globalized agribusiness. Sugarcane industry. Territorial vulnerability.

Vulnerabilidade territorial do agronegócio globalizado no Brasil: crise do setor sucroenergético e implicações locais

Resumo

O artigo discute a especialização regional produtiva e a vulnerabilidade territorial do agronegócio globalizado no Brasil, a partir do estudo da recente crise econômica do setor sucroenergético. Desde 2008, mais de 100 unidades agroindustriais sucroenergéticas (UAS) suspenderam suas atividades de processamento no país, em função de diversos fatores conjunturais e estruturais que aumentaram o endividamento e os prejuízos de vários grupos empresariais. Em razão do processo

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de especialização produtiva provocada pelo padrão de ocupação da agroindústria sucroenergética e da dificuldade do setor, vários municípios, especialmente os de baixo patamar demográfico e reduzido dinamismo urbano-industrial, estão vulneráveis a recuperação judicial ou falência de UAS.

Palavras-chave: Agronegócio globalizado. Setor sucroenergético. Vulnerabilidade territorial.

Vulnerabilité territoriale de l'agro-industrie mondialisée au Brésil: crise du secteur sucro-énergétique et implications locales

Résumé

Cet article vise à discuter la spécialisation productive régionale et la vulnérabilité territoriale de l'agro-industrie mondialisée au Brésil, à partir de l'étude de la récente crise économique du secteur sucro-énergétique. Depuis 2008, plus de 100 unités agro-industrielles sucro-énergétiques (UAS) ont suspendu leurs activités de transformation dans le pays. En raison de divers facteurs conjoncturels et structurels qui ont augmenté l'endettement et les pertes de plusieurs groupes d'entreprises, en fonction du processus de spécialisation productive provoquée par le modèle d'occupation de l'agro-industrie sucrière et la difficulté du secteur, plusieurs municipalités, spécialement celles dont le niveau démographique est faible et le dynamisme urbain et industriel réduit, sont vulnérables aux cas de récupération judiciaire et de la faillite de UAS.

Mots-clés: Agro-industrie mondialisée. Secteur sucro-énergétique. Vulnerabilité territoriale.

Introduction

In Brazil, from the first decade of the twenty-first century, the sugar-energy sector has undergone a new growth cycle, with a boost to the external sugar and internal ethanol markets and the growth of bioelectricity. The emergence of flex-fuel vehicles on the automobile market and the expectations of converting ethanol into a commodity were the main incentives for resuming the expansion of this sector (Lemos et al., 2015). The gradual state deregulation and the productive restructuring that had taken place since 1990 were factors that led to the reorganization of capital within the sector and the propagation of new investments, via mergers and acquisitions (M&A) or associations (joint ventures), led by large national and transnational corporations. In addition, this recent expansion has been closely related to what Milton Santos (2010) termed *globalized scientific agriculture*, and several other authors (Castillo, 2011; Elias, 2011, 2013, 2017; Frederico, 2013; Stedile, 2013; Oliveira, 2016) have termed *globalized agribusiness*.

However, the sugar-energy expansion, which occurred mainly in the regions covered by the morphoclimatic and phytogeographic domains of the Cerrado biome (Savanna) in Central-Southern Brazil (Castillo, 2015), brought about the conformation of *regional and territorial productive specialization* (Silveira, 2010, 2011; Kemeny; Storper, 2015) in various areas of the country. The spatial pattern of the agro-industry and of the respective areas of sugarcane farming promoted a private, intensive occupation of huge portions of rural land, and the functionalization of the urban secondary and tertiary sectors of several municipalities to the demands of products and services of the sector. In addition to the socio-environmental implications of the production process, the recent crisis experienced by the sugar-energy sector, due to the high levels of debt suffered by the agents and the temporary or permanent closure of sugar-energy agro-industrial plants (SAPs), highlights the *territorial vulnerability* of several municipalities involved in the production and processing of sugarcane. Since 2010, many sugar-energy groups have faced major financial and operational difficulties due to a series of macroeconomic and structural factors, causing a wave of SAPs² applications for judicial recovery or bankruptcy, which has negatively affected several municipalities in the sugar-energy agribusiness productive regions (SAPR).

In view of this, the aim of this article is to discuss regional productive specialization and the territorial vulnerability of globalized agribusiness in Brazil, with the use of a study on the recent economic crisis in the sugar-energy sector. The methodology adopted in the work consisted of the following procedures: (i) bibliographical survey and review (books, articles, theses and dissertations) on globalized agribusiness in Brazil, the dynamics of regional and territorial productive specialization, the constitution of the agribusiness productive regions (APRs), the sugar-energy market and the factors that resulted in the current crisis within the sector, (ii) statistical-documentary survey in order to obtain secondary data and information regarding the economic situation of the sugar-energy sector, the operational and legal status of the SAPs and the participation of sugarcane in the total area of temporary and permanent

² Supported by Law no. 11.101 (Brasil, 2005), which regulates judicial and extrajudicial reorganization and bankruptcy of entrepreneurs and companies.

crops and in the territorial extension of the municipalities, and (iii) field work, so as to assess the main economic and socio-environmental implications of the closure of SAPs in municipalities in the Central South region of Brazil (specifically in the states of São Paulo, Goiás, Mato Grosso do Sul, Minas Gerais and Paraná).

In addition to this brief introduction and the final considerations, the article is divided into three sections. The first discusses the process of regional productive specialization in globalized agribusiness and how it has configured a framework of territorial vulnerability in the productive regions, quite a common dynamic in the case of the sugar-energy sector. The second section seeks to analyze the economic situation of the sugar-energy sector as of the second decade in the twenty-first century, a period that marked great financial and operational difficulties for various business groups, leading to an increase in the number of cases of judicial recovery and bankruptcy amongst the SAPs. The third and final section addresses the territorial vulnerability of the municipalities involved in sugar-energy production related to the high level of agricultural specialization and the temporary or permanent closure of SAPs.

Regional productive specialization and territorial vulnerability in globalized agribusiness

In the current historical period, large corporations and financial investors are better able to know and to intervene in each place, region or territory, due to the massive concentration and centralization of capital in several economic sectors, as well as the uniqueness of techniques and of the cognoscibility of the planet (Santos, 2010) which, together with neoliberal practices (Peck; Tickel, 2000; Harvey, 2005), characterize globalization.

Currently, the occurrence of what Santos and Silveira (2010) have called the selective and corporate use of territory, in which regions, territories and/or places are selected for effective use in the various spatial productive circuits and cooperation circles (Santos; Silveira, 2010; Castillo; Frederico, 2010b), providing geographic locational advantages (natural, geo-economic and political-normative-institutional) fundamental to the competitiveness of productive agents. Accordingly, these agents need to have privileged access to territorial resources and assets (Benko; Pecqueur, 2001) in a strategic partnership with the States to obtain the desired productivity, fluidity, and profitability.

In turn, the manner in which private agents access and use territorial assets and resources defines their conditions to act and achieve a greater or lesser level of competitiveness, i.e., to produce and circulate more efficiently and remain in the national and international markets. The spaces, in turn, have different capacities to offer these conditions, according to the technical and organizational circumstances that guarantee a certain *spatial productivity* (Santos, 2012). Thus, the practice of competitiveness is also inherent to the geographical space, since “the effectiveness of the actions is closely related to their location” (Santos, 2010, p. 79)³. This is because, as Porter (2003) argues, the productivity and growth of firms are highly dependent on certain local and/or regional conditions and processes that bestow greater competitive advantages and operational efficiency.

³ This and all non-English citations hereafter have been translated by the authors.

Thus, geographic competitiveness is within the context that Santos and Silveira (2010) termed the “war of places”, designating the competition between locations for the same activity or company by offering a series of material and immaterial assets and resources that may give them greater spatial productivity or competitiveness⁴, whereby corporations have a great power to negotiate and impose on these places the most advantageous conditions for their own installation and operation. On the scale of the productive regions, this context has been called *regional competitiveness* (Budd; Hirmis, 2004; Kitson; Martin; Tyler, 2004; Boschma, 2004; Bristow, 2010a; Huggins; Thompson, 2017), as stated by Bristow (2010a, p. 121):

The pre-eminent conception of regional competitiveness as equivalent to ‘attractiveness’, or the capacity of the region to compete with other places for mobile capital, leads to a strategic emphasis on the ability of the region to attract and retain innovative firms, skilled labour, mobile investment and central and supranational government subsidies and funds, and an overriding focus on the pursuit and measurement of their success in doing so relative to other places or ‘rivals’.

Thus, the gathering and concentration of natural, technical and normative functional factors in a determined economic activity (agriculture, industrial or services) in certain portions of the territory may give rise to the formation of a *competitive region* (Castillo, 2008, 2011). This concept is directly linked to the idea of organizational cohesion or solidarity in a region due to external vectors (Santos, 2012), and “is a geographical compartment characterized by the productive specialization (rural and urban) compliant to external parameters (generally international) of quality and costs” (Castillo, 2011, p. 337).

One of the necessary conditions to achieve high levels of geographic competitiveness, at least with regard to the different sectors of agriculture, is based on *regional productive specialization* (Scott; Storper, 2003; Silveira, 2010, 2011; Kemeny; Storper, 2015). This process is linked to the deepening of international and territorial division of labor and is based on the selective appropriation of natural, geo-economic and political-normative-institutional resources of a certain geographical area by a given activity or economic sector, with the aim of generating an efficient functionality in the production and circulation (often competitively) of certain types of product and/or service.

For Benko (1996), regional specialization has become increasingly common in the current period of economic and financial globalization, as the current international division of labor is constituted by a “mosaic of specialized productive regions”. Santos (2000, p. 81) highlights that “each and every piece of the earth’s surface becomes functional to the needs, uses and appetites of States and companies at this stage of history”, and “places become specialized, depending on their natural potentialities, their technical reality and their social advantages. This responds to the demand for greater security and profitability for capital obliged to an ever-increasing competitiveness” (Santos, 2012, p. 146).

4 It should be noted that spatial productivity (Santos, 2012) is the capacity of a place to offer a certain level of profitability to a productive agent. Competitiveness, on the other hand, involves more complex and selective geographical attributes, i.e., found in but a few places. Hence, not all places with high spatial productivity are necessarily competitive.

When trying to adapt to the global and competitive production of commodities, several portions of the Brazilian territory, for example, have been affected by high regional specialization focused on hegemonic agricultural production (grains, sugarcane, forestry/ eucalyptus, cotton, coffee, cattle farming), activities that are especially operated by large transnational firms in the agro-industrial and *trading* segments (Castillo; Frederico, 2010a; Elias, 2011, 2013, 2017; Frederico, 2013; Stedile, 2013; Castillo et al., 2016; Oliveira, 2016; Niederle; Wesz Junior, 2018). The implantation of extensive monocultures and uniform land uses is a recurring characteristic of specialization in these regions by corporate agribusiness. In addition, several urban centers in these areas become extremely functional for this activity, sometimes becoming the so-called “agribusiness cities” (Elias, 2011, 2013). The inflexibility of the use of municipal territories, due to this bias, leads to an increased dependence on the urban-regional economy (and its secondary and tertiary activities) practically towards a single productive sector.

This production model has, however, generated diverse socio-environmental implications, a drastic reduction in productive diversity in the countryside (and also in small towns) and a strong alienation and dependence of places on the recurrently unstable markets of agricultural commodities, revealing a context of *territorial vulnerability* (Arroyo, 2006; Castillo; Frederico, 2010a; Camellini; Castillo, 2012; Frederico, 2013; Faccin; Castillo, 2017). This vulnerability is closely associated with the neoliberal context of *accumulation by dispossession* (Harvey, 2005) and we may understand it, even preliminarily, as the propensity of places towards disorder or damage (economic, social, environmental) resulting from crises (sectoral or macroeconomic) or socio-environmental implications of some economic activity.⁵

Some intensive branches of the agriculture, for example, have caused territorial vulnerability, with negative and often threatening effects from the standpoint of autonomy in local and regional development (Elias, 2013; Castillo et al., 2016). The case of the sugar-energy sector is emblematic since, in addition to the various socio-environmental implications (Szmrecsanyi; Gonçalves, 2009; Barreto; Thomaz Junior, 2012; Camellini; Castillo, 2012; Pitta et al., 2014; Bernardes; Castillo, 2019), the logic of spatialization linked to some intrinsic characteristics of the sector⁶ (Castillo, 2013, 2015) has induced strong regional productive specialization around the SAPs, causing enormous economic dependence in many municipalities and establishing territorial vulnerability, which is especially exacerbated in the current moment of the sector’s difficulty.

The crisis of the sugar-energy sector in Brazil

Between 2000 and 2010, Brazil witnessed a strong geographical expansion of the sugar-energy sector, with the installation of dozens of greenfield SAPs and their respective sugarcane cultivation areas, especially in regions within the Cerrado (Savanna) biome in the

5 Common cases of territorial vulnerability may be noted in Brazilian municipalities close to mining companies where there is a high risk of tailing dams collapsing.

6 Restrictions on the storage of raw material (perishable in up to 48 hours or high logistical cost) and the vegetative economic cycle (mean viable agricultural yield, on average, up to the fifth harvest, requiring balance between reform areas, newly planted sugarcane, first harvest and cane for other harvests) are conditions that require the formation of an extensive and continuous sugarcane monoculture in areas that are close, physically and relatively, to the SAP.

Central Southern (Castillo, 2015). Overall, during this period, the number of SAPs in operation increased from 306 to 440 (Santos et al., 2016). The planted area and the quantity produced increased by 118% (4.8 million to 10.1 million) and by 120% (326 million to 746 million), respectively, in the period from 2000 to 2018.

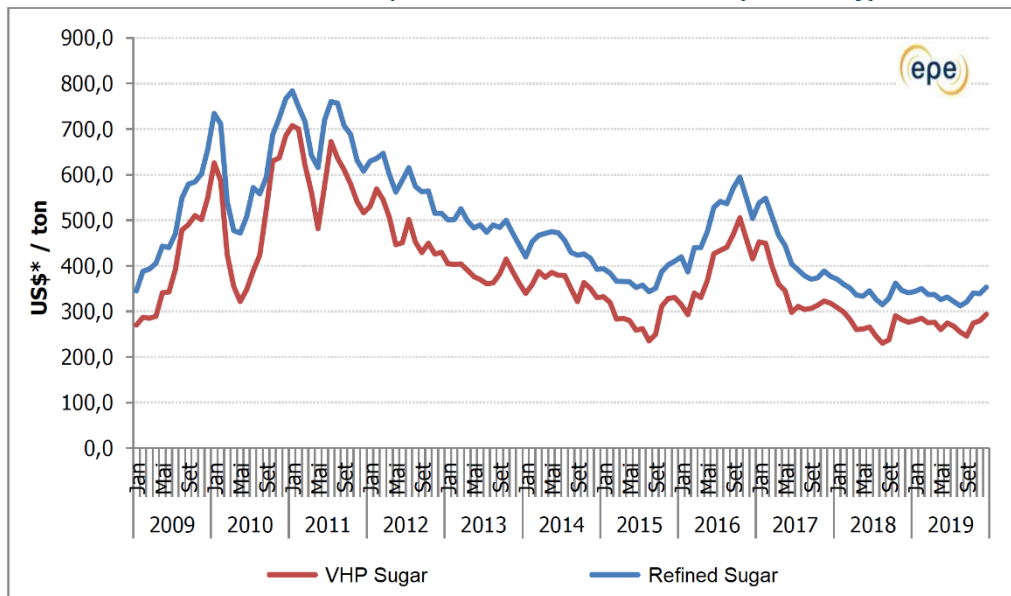
However, as of 2011 the sugar-energy sector began to register signs of great difficulties, without however having observed a significant decrease in the planted area of sugarcane, which remained stable between 2013 and 2018 (IBGE, 2020). The international economic and financial crisis of 2007-2008 (Harvey, 2011; Chesnais, 2013) was one of the main macroeconomic events that brought about the beginning of a wave of financial losses in the sector. According to Mendonça, Pitta and Xavier (2012) and Pitta et al. (2014), one of the consequences of the crisis was the increase in debt and bankruptcy of many SAPs. Since many sugar-energy groups had taken on cheap loans in US dollar, and had speculated with foreign exchange derivatives to finance their expansion process - through a future promise of production and profit linked to a commodities boom (2003-2008) -, the sudden valorization of the dollar against to the Brazilian Real in the years following 2008 and a drop in the international price of sugar caused a sharp increase in the amount of debt. With negative cash balances and credit restrictions on the market, many companies stopped investing, for example, in the renewal of sugarcane fields, in culture treatments and fertilization, in the systematic combat of pests and diseases, in exchanging outdated equipment and machinery, etc., thereby considerably reducing agricultural and industrial productivity, business profitability and, therefore, levels of competitiveness. Pitta et al. (2014, p. 15) attribute the risks of bankruptcy for sugarcane companies to the difficulty of accessing new financing.

In addition to this episode, in later years, other factors were decisive for the crisis in the sector to become worse (Bressan Filho, 2010; Mendonça; Pitta; Xavier, 2012; Milanez et al., 2012; Pitta et al., 2014; Neves; Trombin, 2014; Moraes; Bacchi, 2014; Santos, G. et al., 2016; Oliva, 2017), namely:

- I. a decrease in the international price of commodities (including sugar) between 2012 and 2015;
- II. the policy of the Brazilian government to freeze fuel prices practiced between 2011 and 2015 (unfavorable tax regime);
- III. a reduction of credit in the market (funding and investments), especially by the National Bank for Economic and Social Development (BNDES);
- IV. a sharp rise in production costs, especially agricultural mechanization and chemification;
- V. a decrease in agricultural productivity linked to the mechanization of harvesting (non-adapted varieties), the aging of the sugarcane fields (lack of renewal) and bad weather (excessive or insufficient rainfall, prolonged drought, frosts);
- VI. an increase in the debts of sugarcane mill owners.

The gradual fall in the international price of sugar between 2012 and 2015 and between 2017 and 2019 (Figure 1), which was due to the last subperiod of overproduction in India and Thailand and the high global surplus in stock (Teixeira, 2018), was one of the main factors for a drastic reduction in the remuneration of the sugarcane mills over recent years. The price per ton of very high polarization (VHP) sugar, for example, dropped from \$ 640.00 in 2011 to \$ 250.00 in 2015.

Figure 1 – World: international prices for VHP and crystal sugar, 2009-2019



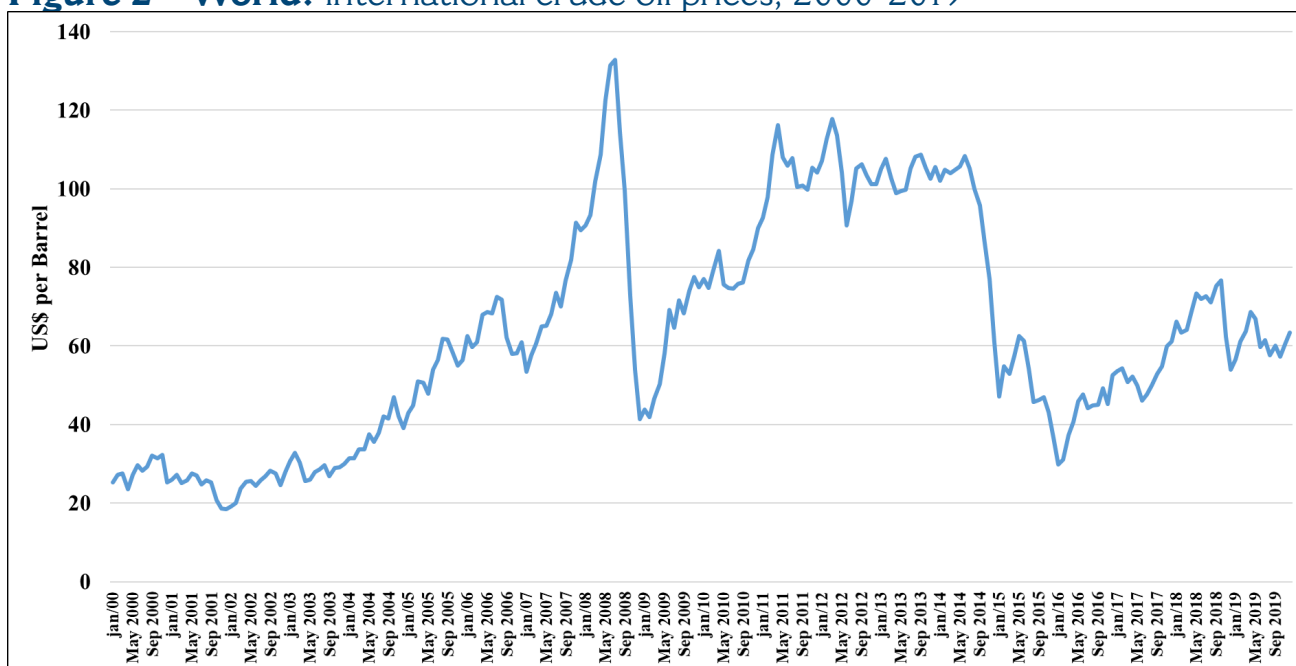
Source: EPE (2020, p. 19).

Concomitant to this, between 2011 and 2015, there was a federal government policy of freezing fuel prices, as already mentioned, to contain the inflationary wave that was occurring in Brazil at the time. Amongst the measures adopted, the government reduced the rate of the Contribution on Intervention in the Economic Domain (CIDE) to zero on imports and sales of oil and its derivatives, on natural gas and its derivatives and on ethanol fuel (Brasil, 2012)⁷. This policy of price intervention, therefore, prevented the SAPs from readjusting the price of ethanol to stay in line with the increase in production costs and international oil prices after the international crisis (Figure 2), thereby generating huge losses. The stagnation of hydrous ethanol prices between 2012 and 2015 may clearly be observed in the graph in Figure 3, in which a recovery is only observed in the second half of 2015, when Petrobras⁸ began to equate the prices of gasoline and diesel with the international price of oil, thereby generating positive fluctuations that benefited ethanol.

⁷ For further details on the impact of the measure on the sugar-energy sector, see Simões (2012) and Batista (2013b).

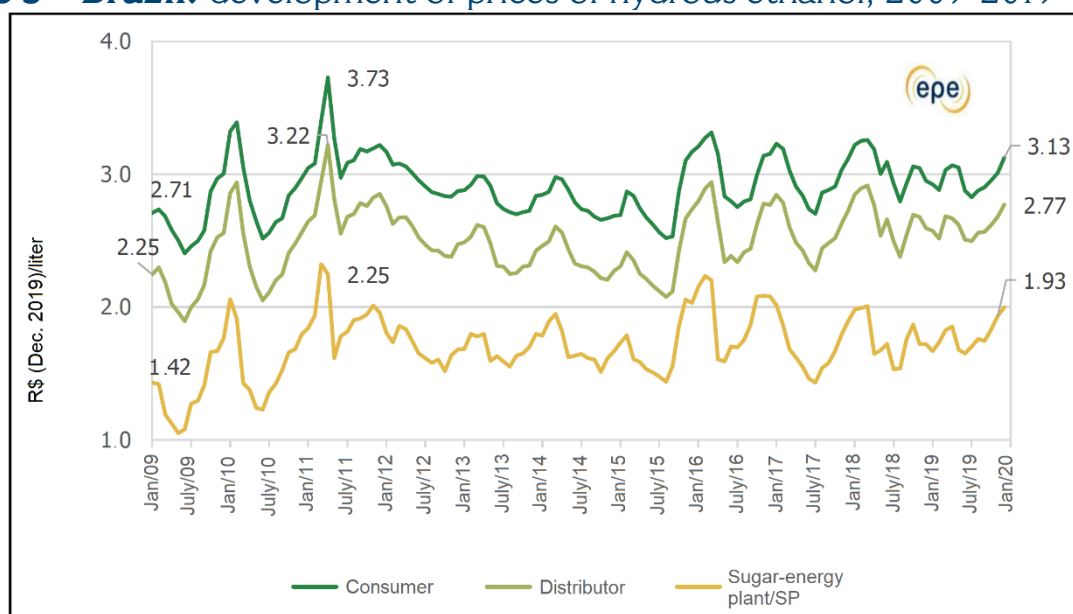
⁸ A state-owned Brazilian multinational corporation in the petroleum industry.

Figure 2 – World: international crude oil prices, 2000-2019



Source: Índex Mundi ([2019]).

Figure 3 – Brazil: development of prices of hydrous ethanol, 2009-2019



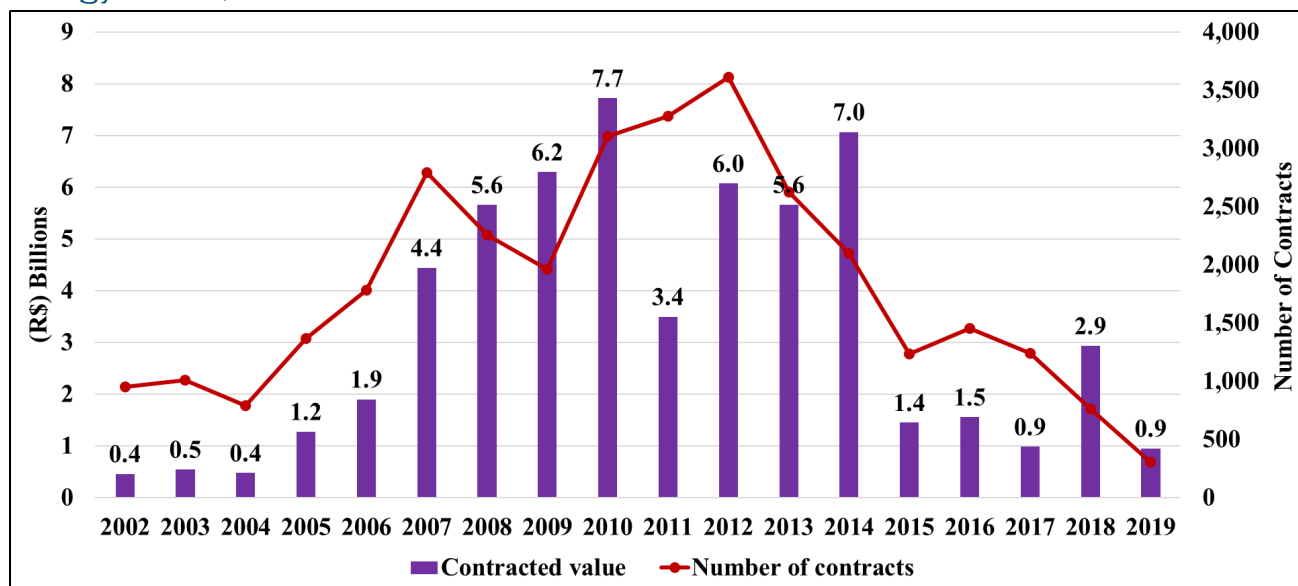
Source: EPE (2020, p. 26).

Despite the recovery in sugar and ethanol prices between 2016 and 2017 (Salomão, 2016), the drastic reduction in resources made available by the BNDES, the main source of financing for the sugar-energy sector, become a major problem for sugarcane mill owners, as it affected the entire investment schedule and forced them to seek other more expensive sources of credit. According to Novacana ([2020])⁹, BNDES resources intended for the sector gradually decreased from R\$7.0 billion to R\$0.9 billion between 2014 and 2019 (Figure 4).

⁹ A major news and statistical data portal for the Brazilian sugar-energy sector.

Public financing, aimed specifically at cultivating sugarcane, fell from R\$ 2.1 billion to R\$ 0.7 billion between 2013 and 2019 (EPE, 2020). Pitta et al. (2014) clarified that credit is central to a sector that fundamentally depends on the “debt rollover” to continue producing, since a large part of the loans and other financial expenses are allocated to the commodities futures market, i.e., the future promise of payment with the production of sugar and ethanol.

Figure 4 – Brazil: credit values and number of BNDES contracts for the sugar-energy sector, 2002-2019



Source: Novacana (2020).

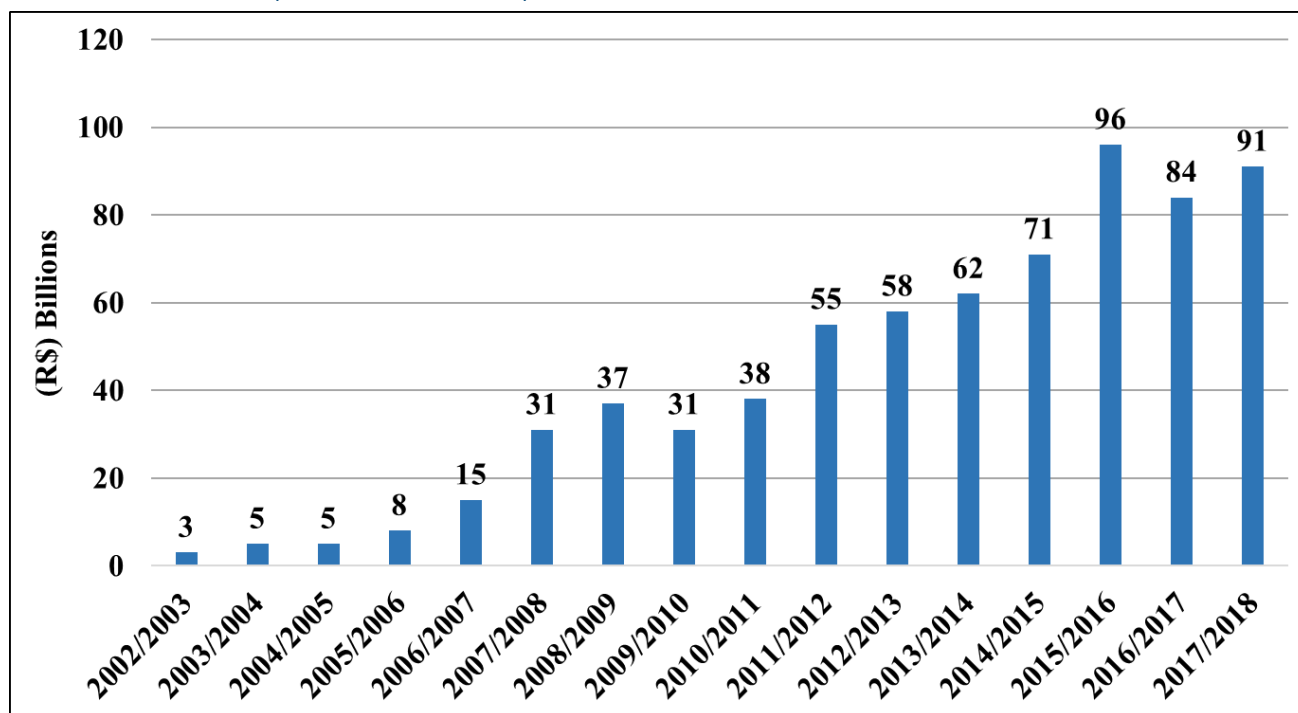
The increase in production costs, both for cultivating sugarcane and for manufacturing sugar and ethanol, is also an additional complicating factor. According to a survey conducted by the Continuing Education Program in Economics and Business Management (PECEGE), the average total cost of sugarcane production increased by 177% between the harvests of 2008/2009 and 2017/2018, in addition to 163% for manufacturing sugar and 157% for manufacturing ethanol (Ramos, 2019b). The necessary use of new agricultural (mainly mechanization of cane cutting, carrying and transportation - CCT) and industrial techniques has greatly increased the operational costs of SAPs over recent years, requiring a large contribution of financial resources and large-scale production (to dilute costs) for the economic support of sugar-energy activity. Losses in agricultural production associated with bad weather, such as either excessive or insufficient rainfall during certain periods of the year, prolonged drought (especially after planting or the re-sprouting of harvested cane),¹⁰ and frosts have also more frequently affected the profitability of the SAPs (Batista, 2013a; Toledo, 2018; Chuvas irregulares..., 2019).

Therefore, the situation of years with low sugar and ethanol prices, scarce public resources for financing and a surge in agro-industrial production costs ultimately increased the general

¹⁰ During the harvesting period, the low volume of rainfall is essential for the maturing and accumulation of total recoverable sugar (referred to as ATR) in the plant, while satisfactory rainfall regimes favor the crop during periods of planting/replanting or re-sprouting of the cane stalks after cutting.

level of debt within the sector. According to an estimate by the BTG Pactual bank, the sector's total debt increased from R\$ 3 billion to R\$ 91 billion between the harvests of 2002/2003 and 2017/2018, particularly gaining notoriety from 2011 (Figure 5). During the 2019/2020 harvest, it was estimated that the sector had already reached a debt close to R\$ 100 billion (Porto, 2019).

Figure 5 – Brazil: development of the sugar-energy sector debt between harvests of 2002/2003 and 2017/2018



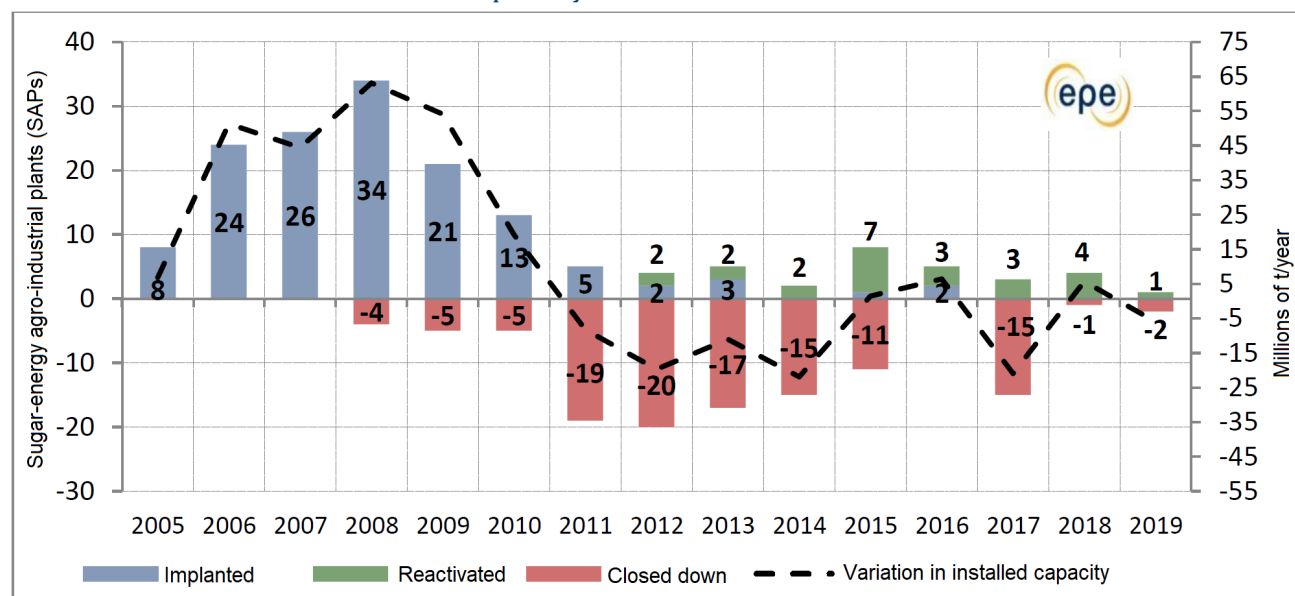
Source: Coury (2018).

In addition to these conjunctural factors, other factors, of a structural nature, are also important, and directly affect the economic performance of the sector. Amongst them, the reduction should be mentioned in agricultural productivity motivated by problems such as soil trampling and losses in the ATR due to mechanized harvesting¹¹, as well as an increase in the presence of pests and diseases (especially with the burning of cane straw coming to an end). Managerial reasons have also negatively influenced the sector, such as the uncontrolled level of debt amongst the SAPs, failures in crop planning and industrial administration, lack of investments or failure to do so in a timely manner (especially with regard to renewing sugarcane plantations, acquisition of machinery and equipment and adopting modern production techniques), improper crop management (using unsuitable sugarcane varieties for production environments or mechanization, insufficient application of agrochemicals, use of rudimentary soil preparation techniques, irregular combat of pests and diseases), deficient logistical systems, judicial convictions due to the environmental and labor irregularities (non-compliance with standards), amongst others (Neves; Trombin, 2014).

¹¹ In the mechanized regime, the cane is chopped into several pieces to facilitate its transportation (unlike manual cutting, in which it was taken in its entirety to the SAP), which accelerates the degradation of the raw material and reduces the ATR.

Therefore, this set of unfavorable factors led to the closure of dozens of SAPs and, consequently, to the recent stagnation in the growth of sugar-energy production in Brazil. According to EPE (2019), the number of newly installed SAPs has dropped significantly, and since 2008, 114 industrial plants have closed temporarily or permanently in Brazil (Figure 6). As a result, according to data from the Sugarcane Industry Union (UNICA, 2020), sugarcane production fell by 4% between the harvests of 2015/2016 and 2019/2020 (from 666 million to 642 million), sugar production decreased by 31% (from 38.7 million to 29.6 million tons) and ethanol production increased by 30% (from 27.2 billion to 35.5 billion liters) between the harvests of 2016/2017 and 2019/2020¹² (Figure 7). Another fact that demonstrates a decrease in investments in the sector over recent years is the manufacture and sale of sugarcane harvesters. According to the National Association of Motor Vehicle Manufacturers (ANFAVEA, 2020), between 2013 and 2019, sales reduced by 118% and, consequently, by 75% in the country's sugarcane production.

Figure 6 – Brazil: number of SAPs implanted, closed down and reactivated and the variation in the installed capacity, 2005-2019



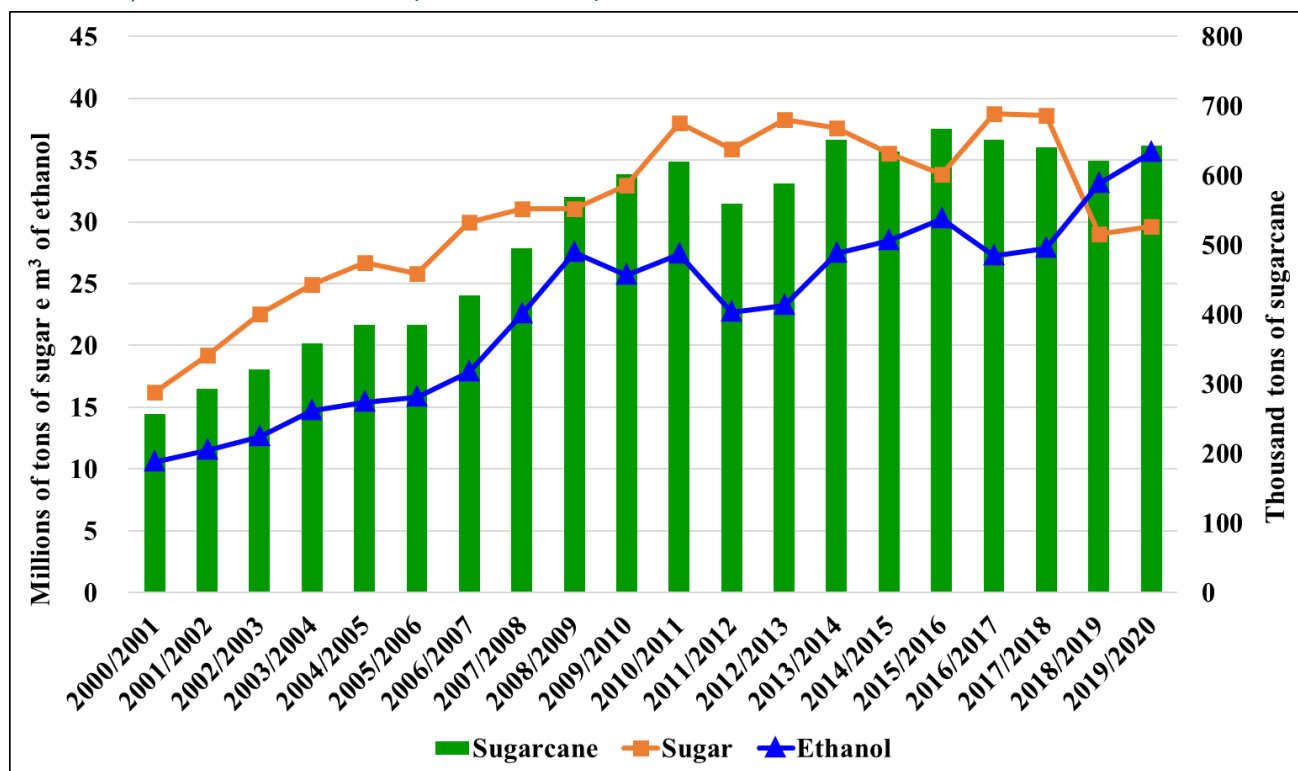
Source: EPE (2020, p. 30).

Despite the slow recovery of the sector over the past four years, with some of the SAPs being reactivated, the situation remains dramatic across much of the sector. By September 2020, around 79 SAPs had closed down (13% of the total crushing capacity and 23% of installed SAPs) (Ramos, 2019a; Em 2019..., 2019) and another 65 operated under judicial recovery (Table 1), involving large business groups (Chart 1).

In addition to the financial and business losses, the crisis in the sugar-energy sector has caused enormous repercussions all over the Brazilian territory, negatively affecting several municipalities involved in the production and processing of sugarcane.

¹² This was very much due to the lower prices practiced on the international market and the recovery of ethanol prices on the domestic market between 2017 and 2019, thereby leading the SAPs to prefer a production mix that tended towards more ethanol.

Figure 7 – Brazil: development of the production of sugar cane, sugar and ethanol, harvests of 2000/2001-2019/2020



Source: UNICA ([2020]).
Produced by the authors.

Table 1 – Brazil: number of SAPs by legal and operational status, September 2020

Legal status	Operational status			
	Operating	Stopped	total	%
Normal	269	19	288	69.7
Judicial recovery	65	31	96	23.2
Bankrupt	0	29	29	7.0
Total	334	79	413	100.0
%	80.9	19.1	100.0	–

Source: Personal information,¹³ Novacana ([2020]).
Produced by the authors.

Chart 1 – Brazil: large national and transnational sugar-energy groups bankrupt or in judicial recovery, September 2020

Majority capital	Judicial recovery	Bankrupt
Nacional	Atvos, Santa Terezinha, Farias, Aralco, Clealco, EQM, Moreno, Toledo, Olival Tenório, UNA, Itaiquara, Usina Goianésia, Usina São Fernando	CBAA, João Lyra, Sabaralcool
Transnacional	Abengoa Bioenergy, Renuka	Infinity Bioenergy, Comanche

Source: Personal information,¹⁴ Novacana ([2020]).
Produced by the authors.

¹³ Data provided by RPA Consultoria upon request in 2020.

¹⁴ Data provided by RPA Consultoria upon request in 2020.

The closure of SAPs and territorial vulnerability of the municipalities involved in sugar-energy production

The wave of judicial recoveries and bankruptcies of SAPs and the resulting social, economic, and environmental damage to the municipalities call into question the consequences of the excessive regional and territorial specialization caused by the sugar-energy sector in Brazil. It would appear that the great dependence of several of these municipalities on the activities of the sector - caused by the occupation of a large part of the land for planting sugarcane (considerably reducing the productive diversity in the rural space) and by the presence of SAPs, which stimulates the emergence of secondary and tertiary activities whose functioning is mainly linked to the sector - has several socio-environmental implications and is a risk to local socioeconomic support in the cases of an eventual cessation of the agro-industrial activity (Camelini; Castillo, 2012).

The crises caused by the closure of the SAPs, for example, have had several damaging effects on the population and on local governments, such as a rise in unemployment, a decrease in the income of the population, a reduction in agricultural production, company closures (industry and services), a collapse of local commerce and a fall in tax revenue for the city halls. The SAPs operating in judicial recovery have also caused a number of problems, as they have reduced their pace of production, causing sudden layoffs and, in most cases, are in debt with their employees (salaries, vacations, FGTS and INSS¹⁵ in arrears), suppliers (land tenants, raw materials, parts and maintenance services), logistics operators (storage and transportation of sugar and ethanol) and the State (municipal, state and federal taxes).

The situation is most notably serious in smaller municipalities with low demographic levels and less urban-industrial dynamism, and which, therefore, are highly economically dependent on the sugar-energy sector. This activity is ultimately responsible for the occupation of most of the cultivated land in the municipality and for the largest part of the sector in absorbing local labor and in generating income from urban activities, such as commerce, service providers and supplying agricultural inputs (agrochemicals, machinery, safety equipment). Table 3 presents some examples of the municipalities with a low demographic level in which SAPs were recently deactivated, and whose sugarcane activity had a significant participation in the cultivated area, in the value of agricultural production and in jobs in 2010 (before the SAPs closed down).

15 FGTS - Severance Indemnity Fund for employees and INSS – the Brazilian Social Security Scheme

Table 3 – Central South Region: indicators of territorial productive specialization (2010) in some of the municipalities where SAPs had stopped (2019)

Municipal	Data on municipalities and SAPs					Participation of the sector in 2010 (%)				
	Estimated population 2020 ⁽¹⁾	Group ⁽²⁾	Crushing capacity (t/harvest) ⁽²⁾	Legal status ⁽²⁾	Municipal area ⁽¹⁾	Agricultural area ⁽³⁾	Value of agricultural production ⁽³⁾	Jobs ^{(4)*}		
Canápolis/MG	12,201	João Lyra	1,760,000	B	11.4	80.9	55.0	57.1		
Capinópolis/MG	16,234	João Lyra	1,656,000	B	9.8	16.6	31.9	33.2		
Ibiá/MG	25,358	Araguari	558,000	JR	2.0	17.7	14.0	11.3		
Nanuque/MG	40,665	Infinity Bio-energy	1,400,000	JR	15.3	95.0	93.3	10.6		
Brasilândia/MS	11,853	CBAA	1,100,000	B	4.9	94.4	89.5	31.8		
Sidrolândia/MS	59,245	CBAA	1,200,000	B	1.6	9.7	21.8	7.7		
Cambará/PR	25,466	Casquel	–	JR	44.9	45.8	68.7	4.6		
Engenheiro Beltrão/PR	13,981	Sabaralcoo	1,150,000	B	14.2	12.9	22.2	41.8		
Nova América da Colina/PR	3,434	Destilaria Dasa	989,280	JR	11.6	15.0	18.1	86.1		
Perobal/PR	6,190	Sabaralcoo	950,000	B	6.7	20.3	20.0	60.3		
Brejo Alegre/SP	2,889	Renuka	4,500,000	JR	44.2	59.3	81.3	87.9		
Canitar/SP	5,292	Comanche	1,300,000	B	68.2	85.3	89.8	70.0		
Espírito Santo do Turvo/SP	4,878	Usina JJ	–	B	27.9	94.4	91.9	67.4		
Flórida Paulista/SP	14,790	Floralco	2,500,000	JR	40.3	90.4	92.7	64.2		
Ibirarema/SP	7,841	Usina Pau D'Alho	2,200,000	JR	43.8	42.6	57.8	74.6		
Icém/SP	8,304	CBAA	500,000	B	38.7	66.9	77.6	30.7		
Marabá Paulista/SP	5,948	Usina Decasa	1,400,000	B	15.6	91.8	95.8	69.0		
Pirangi/SP	11,471	Bertolo	1,500,000	JR	50.6	73.3	46.7	20.4		
Presidente Alves/SP	4,080	Negrelli	1,300,000	JR	6.8	66.4	52.5	5.3		
Regente Feijó/SP	20,394	Santa Fany	–	JR	5.9	69.9	73.0	0.0		
Santo Anastácio/SP	20,866	Camag-Alvorada	–	JR	8.4	59.2	75.5	27.4		
Santo A. do Aracanguá/SP	8,481	Aralco	2,400,000	JR	25.4	82.1	81.0	42.7		
Santa Rosa de Viterbo/SP	26,753	Usina Ibirá	1,300,000	B	35.7	86.1	80.4	31.7		

Abbreviations: B – Bankrupt; JR – Judicial Recovery.

Observation: *Participation of the sugar-energy sector (agricultural and industrial).

Source: ⁽¹⁾ IBGE Cities (IBGE, 2020); ⁽²⁾ NOVACANA ([2020]); ⁽³⁾ Municipal Agricultural Production (IBGE, 2020); ⁽⁴⁾ Annual List of Social Information (RAIS, 2020).

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SANTOS H. F.; CASTILLO R.

Sertãozinho/SP, a more dynamic and densely populated municipality, is another clear example. Unquestionably, a national center for the manufacture of machinery and equipment for the sugar-energy agroindustry (a branch that until 2014 represented 70% of the Municipal GDP) (Crises do setor ..., 2014; Ereno, 2016), in addition to being a sugar-energy producer (five SAPs installed), the municipality suffered a mass closure of companies with the sector crisis (two were SAPs), resulting in the loss of more than 8 thousand jobs and a reduction of almost 60% in the municipal tax collection between 2013 and 2017 (verbal information)¹⁶. In view of this situation, in contrast to the specialized development pole model, the municipal government created the Sertãozinho Diversification Program, which aims to attract new companies from other industrial sectors in order to boost a resumption of economic growth (Ações do Programa... 2017).

These are just a few examples of a group of municipalities that have recently faced serious socioeconomic problems due to the sugar and energy crisis (Crise em usina..., 2018; Tomazela, 2019). Map 1 demonstrates that in Brazil, in 2020, there were many cases of SAPs operating in judicial recovery or in bankruptcy, revealing a large number of municipalities that are or that may be affected economically. Territorial vulnerability may also be observed by analyzing the degree of agricultural productive territorial specialization within these municipalities. It was discovered that, of the 906 municipalities involved in sugarcane production¹⁷, 68% have more than 50% of the total area of temporary and permanent crops occupied by sugarcane and 14% have more than 50% of this crop occupying the total area of the territory, 85 municipalities in the same situation with a population of less than 30 thousand. Of the 339 Brazilian municipalities with SAPs installed, in their turn, 61% (206 municipalities) have a similar demographic level, considered low by the country's standard.

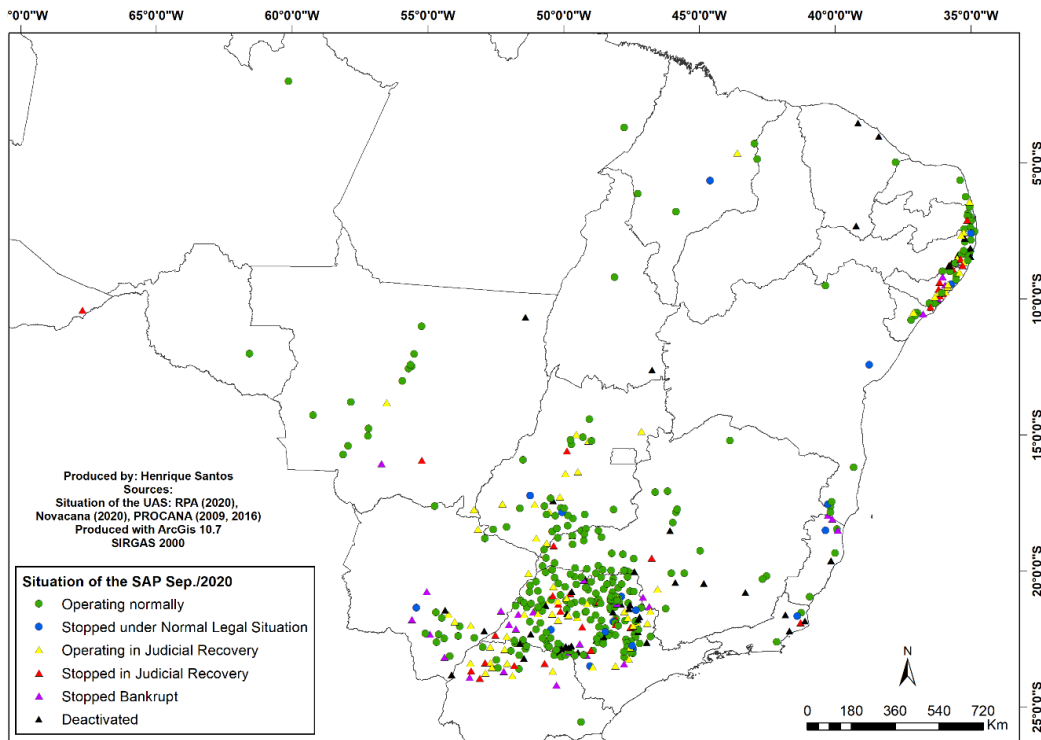
Map 2, therefore, demonstrates, from calculating the participation of the sugarcane cultivated area (UNICA, [2020]) in the total extension of each municipality, the areas of greatest agricultural productive specialization of the sector in the Central South region of the country. It may be noted that the municipalities with the highest rate of sugarcane occupation (61% to 82% of its total area) are to be found mainly in the northwest of the state of São Paulo. However, other areas with a strong presence of SAPs (north Paraná, the Minas Gerais Triangle and northwest Minas, south and southwest of Goiás and south of Mato Grosso do Sul) also present relevant rates (from 21% to 60%).¹⁸

16 Information obtained in an interview with representatives of the Municipal Secretariat for Economic Development in Sertãozinho during the 26th International Sugarcane Technology Fair (Fenasucro & Agrocana), which took place in Sertãozinho in August 2018.

17 Municipalities that fall under the following conditions: (1) with SAPs installed in their territory and an expressive area of sugarcane, (2) with installed SAPs and a small area of sugarcane, and (3) with no SAPs installed and with an expressive area of sugarcane (over 1,000 ha).

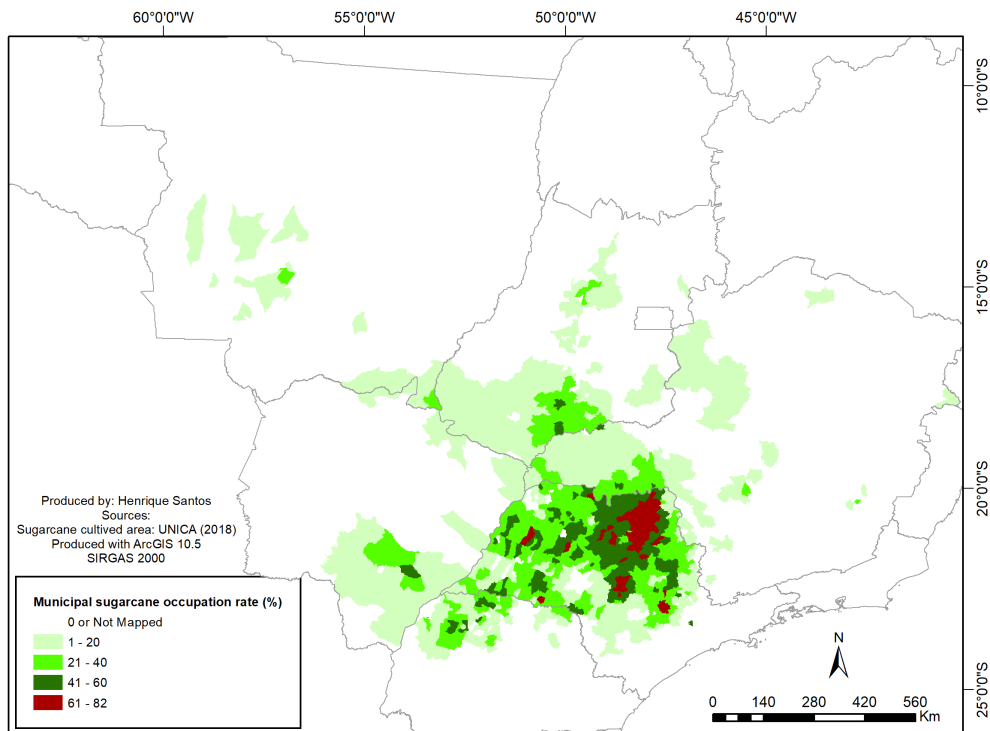
18 It should be stressed that the territorial extension of the municipalities directly influences the rate. This explains the lower figures in larger municipalities in the Midwest region, for example, even though they have a large area cultivated with sugar cane, as is the case of Rio Brillhante (MS), a municipality with the largest cultivated area of country cane.

Map 1 – Brazil: locations of the SAPs, by operational and legal situation, September 2020



Source: Personal information,¹⁹ NOVACANA (2020), PROCANA (2008, 2016).
Cartography: Henrique Santos.

Map 2 – Central South Region: the municipal occupation rate of sugarcane, 2017/2018 harvest



Source: UNICA (2020).
Cartography: Henrique Santos.

¹⁹ Data provided by RPA Consultoria upon request in 2020.

Thus, it may be considered that the areas most vulnerable to socioeconomic disorders caused by the sugar-energy crisis are those with the highest degree of regional and territorial productive specialization, consisting of a group of municipalities with a low productive capacity in terms of industry and services linked to other economic branches other than the production and processing of sugarcane. This reflects a lower *regional/territorial resilience*²⁰ (Hudson, 2009; Bristow, 2010b; Martin; Sunley, 2015; Boschma, 2015) which, in general terms, is understood as the ability of a region or territory to anticipate, prepare, respond, adapt and recover from eventual crises, disturbances or distortions (economic, financial, political, social, environmental, etc.) (Silva; Exterckoter, 2016).

In the case of sugar-energy municipalities, resilience could be characterized by the degree of productive diversity and/or the greater or lesser capacity of a municipality, especially through the local public authorities, to promote productive conversion in the short term and, thus, a rapid recovery in the event of any cessation of activities directly linked to the sector. However, this very much depends on certain geographical characteristics and forms of territorial use that indicate the existence, amongst other things, of great agricultural aptitude, good logistical conditions, greater regional/territorial productive diversification and an efficient organization of the different local agents (market, Government, industry associations, educational and research institutions, civil society organizations, etc.) to adapt to the sudden changes and instabilities of the economy.

Final considerations

Regional productive specialization is a fundamental condition to achieve relative geographical competitiveness in global terms, helping the regions and their respective municipal territories and productive agents to insert and sustainably maintain themselves in the various international markets. In the case of regions predominantly linked to globalized agribusiness, the efficiency of production and circulation of commodities depends, on the one hand, on large-scale production and at low operating costs (agricultural, agro-industrial and logistical) and, on the other, on the appropriation and corporate-strategic use of territorial assets and resources that guarantee, at any social, economic or environmental cost, the profitability and fluidity desired by investors.

The study of the sugar-energy sector in Brazil may reveal the fragility of places in view of the production model based on technical and organizational parameters arising from hegemonic agents of the globalized neoliberal economy. The realization of the local monopoly of control over land, water resources, workers, governments and their resources, as well as the various socio-environmental and economic implications that result from this, calls into question the feasibility of developing places based on the expansion of the sugar-energy sector and, therefore, in the political economy of agribusiness (Delgado, 2012). The geography of the sugar-energy agroindustry based on excessive regional and territorial productive specialization and the recent

²⁰ The notion of territorial and regional resilience has recently been used by several researchers to assess how different regions and territories respond to events of economic crisis such as that of 2007-2008. Despite being traditionally adopted in the field of natural sciences (physics, ecology, biology) and psychology (behavior of subjects), the notion of resilience has been widely used in studies on regional development.

fragility of the sector regarding the financialized, unstable market for commodities, especially sugar and oil, have generated uncertainties and vulnerabilities that call into question the autonomy of municipalities as to the destination of its development.

In summary, it may be understood that the crisis in the sugar-energy sector is reinforced and reproduced by three aspects: (i) the speculative and volatile logic of the commodities market, (ii) an increase in production costs with the mandatory agricultural mechanization and the modernization of processes to maintain the level of competitiveness required by the market, and (iii) the great dependence of agents on credit and constant debt in order to sustain this competitiveness. These factors have increased the economic disparity between the sugar-energy groups, which has resulted in the elimination of less efficient agents (especially low capitalized SAPs, with a low processing capacity and located in places of lower spatial productivity, such as the Northeast) and in the intensification of the oligopoly of the sugar, ethanol and bioelectricity market, deepening the centralization of capital and the geographical selectivity of the sector.

In turn, the financial difficulties and the lack of commitment of the sugarcane mill owners with the places have destabilized the employment, income, trade and tax collection of the local councils of several municipalities across the country, especially those with lower demographic levels and reduced urban industrial dynamism. The propensity of several groups to temporarily or permanently suspend production, either due to the impossibility of complying with the judicial recovery plans, or to an economic optimization strategy that aims to reduce operating costs in areas that operate in a cluster, represents a situation of complete insecurity and vulnerability in many of the municipalities involved in sugar-energy production.

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