

## Chapter 2

# State Intervention in the Chain of Production of Ethanol from Sugarcane in Brazil: Its Forms and Effects on the Development of the Sector Between the 1930s and 1980s

To better understand the form and relevance of state intervention in the agribusiness of sugarcane production in Brazil, we sought to create a chronology of the major government policies adopted and of their effects on the industry. The sugarcane ethanol industry has seen alternating cycles of overproduction and oversupply.<sup>1</sup> Therefore, intervention in the industry has been based primarily on maintaining the balance between production and consumption using two basic instruments: crop plans and policies designed to regulate prices and credit.

State intervention in the sugar industry has been inextricably linked with the very emergence of the sector. However, our analysis of the intervention process begins with the creation of the *Instituto do Açúcar e do Alcool* (IAA, Sugar and Ethanol Institute) in 1933, when the government effectively began involving itself in production planning. Some phases of the intervention process are noteworthy. Between the 1930s and 1960s, there were broad, intense interventions (production levels were regulated, prices were tabulated, and marketing standards were dictated). Those interventions were implemented at the request of the producers themselves in order to resolve the severe overproduction crisis of 1930. The IAA was charged with the oversight of production planning. Sugar was a major export at the time, and the government, to some extent, controlled market risks, thereby guaranteeing the sale of the sugar produced.

The second phase began in the 1970s. The earlier measures (controls on production and pricing) remained in place, and the government set its sights on increasing exports, given the favorable conditions in foreign markets at that time. In addition, the Brazilian government imposed measures designed to stimulate both production and demand. There were programs aimed at improving productivity as well as modernizing both agricultural systems and the industrial park. This, along with incentives for the relocation and merger of facilities, was critical in enhancing external competitiveness. The government established the *Programa Nacional do Alcool* (Proálcool, National Ethanol Program), the primary objective of which was to stimulate the production of anhydrous ethanol. To that end, the Proálcool plan set

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<sup>1</sup> For example, in less than 10 years (between the harvests of 1989–1990 and 1998–1999), the sector suffered two serious and asymmetric crises: first a shortage of fuel ethanol, and then a surplus of ethanol and sugar.

forth well-defined rules for marketing and production, while protecting producers from market risks.

In the early 1980s, which marked the final phase of the implementation of the Proálcool plan, a new era of state intervention began. At that time, the country's macroeconomic indicators were unfavorable, leading to a policy of containment of public spending. Therefore, government resources for investment programs began to dwindle. Some sugar mills and ethanol distilleries that relied on government resources to complete their projects were unable to do so or were forced to delay implementation. In 1989, the export of sugar, which had previously been managed by the IAA, was privatized.

In the early 1990s, during the second implementation phase of the Proálcool plan (the phase in which the government promoted the use of automobiles powered by hydrous ethanol), the demand for ethanol outstripped production, leading to an ethanol shortage, which seriously jeopardized the future of the program. The mismatch between supply and demand, the onset of disputes between the government and the private sector, and the trade liberalization initiated by the administration of then-President Fernando Collor de Mello highlighted the need for a new model of state intervention in the sector.

The last period of state intervention, from the beginning to the end of the 1990s, was characterized by a drastic reduction in the extent of that intervention. It was recognized that the government could no longer continue along the same path because the institutional environment had changed so dramatically. When the government exited in the late 1990s (relinquishing control of prices and marketing), there was an oversupply of sugarcane, sugar, and ethanol, which had plunged the industry into an unprecedented crisis. The producers, who had previously been guaranteed a market by the government, began operating in free markets, beginning a period of overproduction and consequent price reductions (1998–1999). This had an impact on the production structure, as will be seen in the following sections.

## **The 1930s: The Beginning of State Intervention and the Creation of the IAA**

In the early 1930s, the sugarcane industry was particularly vulnerable because of the worldwide economic downturn caused by the Great Depression of 1929, and the increase in Brazil's agricultural and industrial capacity in the early 1920s. Under those conditions, as pointed out by Szmrecsányi (1979), government intervention in the sugar sector had been established at the request of the producers themselves in order to solve the problems of oversupply and to restructure the domestic markets.

In June 1933, through Decree no. 22,789, the IAA was created. The main objectives of this new agency were to solve the problem of overproduction of the sugar

industry through annual planning and production control, and to adapt the industry to the needs of internal and external consumption. In addition, the IAA was charged with promoting the production of fuel ethanol in the country.

The primary responsibility of the IAA was the determination of limits for the production of ethanol and sugar by each facility. Those limits would be based on existing stocks of sugar in the country and on projections of the upcoming harvests.

In the 1930s, after the creation of the IAA, several measures were taken in an attempt to control the supply of sugar. Those measures included the following: a nationwide ban on the establishment of new sugar production facilities, without prior authorization; mandatory registration of all facilities producing sugar, ethanol, or spirits; incentives to promote the production of fuel ethanol; and subordination of all existing refineries to the IAA. The IAA was also given the power to order the installation and operation of sugar refineries to supply the domestic market. In addition, the main measure taken during this period was the establishment of the production limits for each producing state. The limits were set by taking the annual state average for the last 5 years, and adjusting it to account for existing stocks of sugar in the country as well as sugarcane crop forecasts.

According to Szmrecsányi (1979, p. 194), the initial calculation allocated 62.8% of the production to the northern and northeastern regions of the country, while the remaining 37.2% was allocated to the sugarcane-producing states in the southeast (Minas Gerais, São Paulo, and Rio de Janeiro). The lion's share of the production (37.6%) was granted to the northeastern state of Pernambuco retaining its hegemony, giving it a share greater than that of the three southeastern states combined. Furthermore, in order to minimize conflicts between mill owners and suppliers, the government came to intervene directly in transactions involving the purchase and sale of sugarcane through Law no. 178, which came to regulate such transactions.

In 1939, the government approved the production caps set by the IAA for each sugar mill and sugar refinery in the country. From these individual limits, the IAA began to formulate annual crop plans. It also set objective criteria for increasing production caps at each facility: If sugar production increased, the corresponding increase in the quantity of raw material (sugarcane) should be divided proportionally: 70% going to the sugarcane suppliers, farmers, and settlers and only 30% going to the sugar mills (which grew their own sugarcane). Disputes between mill owners and sugarcane suppliers have long been noted, as described by Ramos (1991, p. 112):

... the consolidation of lands and industrial centralization occurring at that time resulted in the proletarianization of sugarcane workers and sugar mill workers, a process the workers sought to resist. This resistance evolved into direct confrontation, agents of the workers pulling up the railroad tracks leading to the mills and vandalizing the mills' equipment. These disputes reached a state of social conflagration not only in Pernambuco but also in the state of Rio de Janeiro, where, for reasons specific to the region, small sugarcane suppliers had a strong presence. There, the process of land concentration led to a struggle for survival of those producers, who even threatened to set fire to the mills...

## **The 1940s: The Sugarcane Farming Statute; World War II; and the change in the Spatial Distribution of Sugar Production in the Country**

### ***The Sugarcane Farming Statute***

On November 21, 1941, Decree-Law no. 3,855 established the Sugarcane Farming Statute, which strictly regulated interactions between sugarcane suppliers and the producers of sugar and ethanol. In brief, the statute imposed limitations and constraints on the agricultural activities of sugar mills, setting supply limits for the sugarcane produced by the mills themselves and established criteria for fixing the price of sugarcane.

The two most important innovations introduced by the Sugarcane Farming Statute were the establishment of the sugarcane supplier as a legal entity and the establishment of limits for such suppliers. Sugarcane suppliers were defined as any farmers who, cultivating their own lands or those of others, had supplied cane to the same sugar mill, either directly or through an intermediary, for three or more consecutive harvests. The statute also stipulated that, although up to 60% of the sugarcane used by the sugar mills could be produced by the mills themselves, the remaining 40% had to be obtained from official sugarcane suppliers. Therefore, the sugarcane suppliers would be certain that their share of the production would be purchased at the price fixed by the IAA (“... calculated in relation to the prices of sugar and ethanol, according to the limit for processing raw sugarcane into refined sugar or ethanol and in view of the average industrial performance of the production facilities of the corresponding state, as well as in relation to the sucrose content and purity of the sugarcane delivered...”)<sup>2</sup>

The Sugarcane Farming Statute envisioned broader assistance provided to sugarcane suppliers, not only on the technical side but also in terms of health care and formal education, with the objective of organizing rural life, especially that of small landowners. However, as pointed out by Queda (1972), the feeling in the early 1970s was that, although the statute contained important social measures and that its goal was to share with sugarcane suppliers the benefits that the sugar policy had until then conferred upon the sugar mills alone,<sup>3</sup> it had failed in the sense that, of the sugarcane used by the mills, the proportion produced by the mills themselves had grown, to the detriment of the official sugarcane suppliers.

The fact that the sugarcane supply structure had been organized based on small farms, hindered the emergence of an important pressure group. According to Jungmann (1971), the sugarcane suppliers were unable to make the Sugarcane Farming Statute effective, probably because they were not a cohesive group: “In disputes

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<sup>2</sup> Loosely speaking, there are similarities between this process and the current model of remuneration for sugarcane (CONSECANA-SP, 1999).

<sup>3</sup> Government price guarantees had created the financial stability that allowed the expansion of credit available to the refineries.

between sugar mills and sugarcane suppliers, other suppliers of the same mill, despite having a stake in the process, rarely came to the aid of the latter, because they did not want to alienate the mill owners...”

## ***World War II***

The outbreak of World War II had an impact on the two main products of the sugarcane industry: sugar and ethanol. Because the market for ethanol is cyclical, the scarcity of petroleum products, mainly gasoline (nearly all of which was imported from abroad at the time), had a major effect on the production of anhydrous ethanol, which came to be considered strategic within the national economy.

Between 1937 and 1941, various incentives were initiated through laws and decrees aimed at increasing the production of anhydrous ethanol. In 1941, the proportion of anhydrous ethanol to gasoline was fixed at 20%.

In September 1942, Brazilian lawmakers passed Decree-Law no. 4,722, which declared the ethanol industry to be of national interest. The new law stated that, for a period of 4 years, starting with the harvest of 1943–1944, the government would guarantee “minimum prices for ethanol and for the raw materials used in its manufacture,” thereby benefiting producers whose production reached the levels set by the IAA.

World War II limited the number of foreign markets for Brazilian sugar. European countries that were allies of Germany, or whose territory had been invaded by the Nazis, halted imports from the Americas due to the high risk involved in shipping, which was subject to the actions of enemy submarines. England and the USA, for their part, chose to reduce consumption and to use alternative sources of supply.

In April 1945, it was stipulated that the issuance of new permits for the construction of sugar mills would be contingent upon the installation of refineries for the production of anhydrous ethanol. However, that did not succeed in increasing the production of anhydrous ethanol because there was a shortage of benzene, which was used as a drying agent. The importation of benzene had been interrupted by the war, and this was complicated by the fact that the supply of sugar from the northeast to the south-central part of the country had been disrupted because of the risk of shipping (submarine attacks having prevented the exchange of all goods between the north and south).

To meet the demand for sugar in the south-central region, the government decided to expand sugar production in areas that had previously been importing their sugar from the northeast. Therefore, beginning with the 1942–1943 harvests, there was a major reversal of the crop plan policy, which then came to be geared toward increasing the production of sugar. In November 1942, the federal government authorized the relaxation of the regime of production caps and allowed the construction of new sugar mills. The various measures taken at that time led not only to increased domestic production of sugar, but also to a shift in production from the northeast to the south-central region. The difficulties in transporting goods from the

city of Recife to the ports of Rio de Janeiro and Santos, combined with the gap between production and consumption in the south-central region, eventually demanded the end of rationing, favoring the expansion of sugar production in that region.

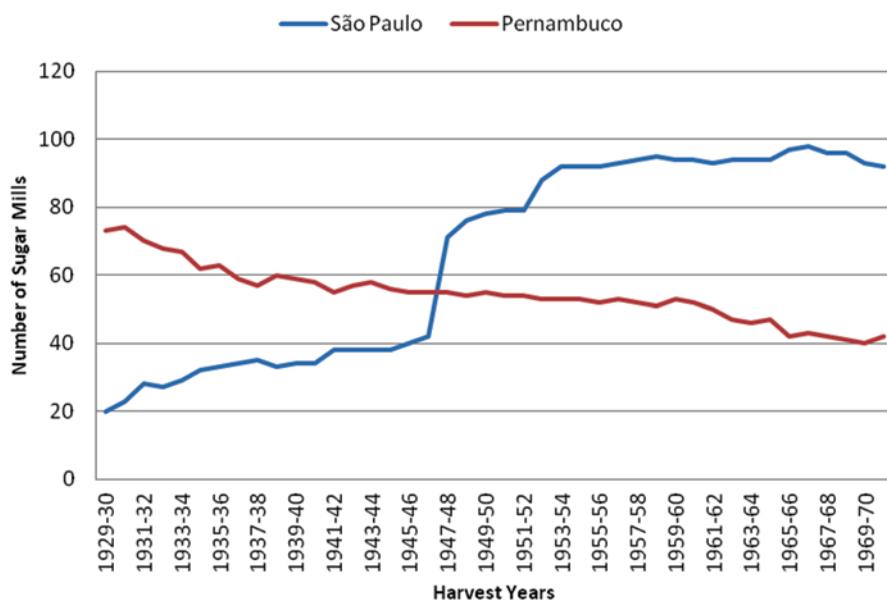
### ***The Change in the Spatial Distribution of Sugar Production***

When World War II ended, the tendency to expand sugar production in Brazil did not, and sugar mill owners in the state of São Paulo petitioned the IAA to raise their caps. In September 1946, the federal government, through Decree-Law no. 9,827, ordered a re-evaluation of the sugar production caps for each state. This decree subordinated increase in the state production caps to the consumption needs of each region rather than to those of the nation as a whole, i.e., production shares began to be distributed according to the gap between production and consumption in each state, which led to an increase in the number of sugar mills in the state of São Paulo, where consumption surpassed production at the time.

Ramos (1991) pointed out that the wholesale review of sugar production caps based on regional consumption was a result of intense lobbying by the sugar mills in the state of São Paulo (pressure that nearly led to extinction of the IAA) in response to the IAA's attempts to control their expansion. After the "liberation" of production in São Paulo, the problem faced by the IAA in the following years was exactly that: how to contain the growth of those mills. The same author also stated that, although the Sugarcane Farming Statute stipulated that all registered sugar mills must maintain "absolute separation between agricultural and industrial activities," Decree-Law no. 9,827 introduced a certain flexibility that would allow production to expand in the state of São Paulo. The decree stipulated that only 50% of the sugarcane used by the mills in order to increase production up to the new limits could come from their own crops. Nevertheless, if the IAA judged the production capacity of the existing sugarcane suppliers to be insufficient, the mills would be allowed to use their own crops to increase their output. Therefore, the existing sugar mills could increase their production by processing their own sugarcane. For mills under construction, there was no impediment to landowners becoming sugar producers. Consequently, landowners would become mill owners, the "absolute" separation between agricultural and industrial activities stipulated in the Sugarcane Farming Statute succumbing to reality.

According to Queda (1972), "[...] The quantitative and qualitative leap in this industrial sector [sugar mills in the state of São Paulo] occurred during the harvest of 1947–1948. Prior to then, the number of sugar mills in São Paulo had been growing steadily but slowly: there were 20 during the harvest of 1929–1930; during the harvest of 1940–1941, there were 34; and the number grew to 42 during the harvest of 1946–1947. However, by the harvest of 1947–1948, the total number of sugar mills in the state had grown to 71..." Fig. 2.1 (drawn from Queda, 1972) shows the evolution of the number of sugar mills in the states of São Paulo and Pernambuco.

Various authors, including Szmrecsányi (1979), Queda (1972), and Gnaccarini (1972), have stated that the most important aspect was the profound and irreversible



**Fig. 2.1** Sugar mills in the states of São Paulo and Pernambuco: 1929–1970

shift in the spatial distribution of sugar production in the country. Data presented by Szmrecsányi (1979) underscore that statement: the increase granted to the states in the south-central region in 1946 increased its share from 39.9 (the maximum allowed until the harvest of 1944–1945) to 46.8%. Specifically, the share allocated to the state of São Paulo rose from 17.6 to 22.2%, whereas that allocated to the state of Pernambuco dropped from 37.7 to 28.9%. Regarding the transfer of production from the northeast to the south-central region, the author noted that the divergences between the two regions, in terms of the socioeconomic conditions, might have had a greater influence than did Decree-Law no. 9,827. Pina (1972, p. 41) stated that the decree benefited producers in the south “... due to the particular conditions (in the south), which included greater financial strength, an advantageous market position, a modern industrial park with efficient facilities, and favorable agricultural conditions. Therefore, conditions in the south were almost completely the inverse of those in the northeast, which also had other unfavorable economic indicators, starting with low purchasing power within the regional market.” These factors made the average costs of sugar production higher in the northeast. That, in addition to the shipping costs, favored the expansion of production in São Paulo, the growth of which eventually surpassed that of consumption in the state. According to Szmrecsányi (1979), between the harvest of 1946–1947 and that of 1951–1952, production in the state of São Paulo increased by 84%, surpassing that of Pernambuco, which until then had been the largest producer in the country. However, the author points out that the growth of the sector as a whole, although induced by government incentives, was not wholly artificial, because there was an effective increase in domestic

consumption, resulting from population growth, urbanization, and industrialization, which increased the demand for sugar from factories producing beverages, food, etc.

One of the consequences of Decree-Law no. 9,827 was overproduction of sugar, which was partly absorbed by the export of sugar at compensatory prices (because sugar producers in Europe and the far East had not yet recovered from the effects of the war). However, foreign demand was insufficient to reduce Brazilian stockpiles to an acceptable level.

When overseas sugar producers began to recover from the war, the international market price of sugar began to fall, making exports uncompetitive, and protectionist measures were taken in order to maintain the levels of those exports.

In January 1948, the IAA established the Sugar Price Compensation Fund, by which it subsidized exports (compensating for the differences between domestic and foreign prices) using funds raised by a surcharge to be levied on each bag of sugar manufactured in the country. Those funds would also be used in financing the production of ethanol, in order to draw down the stockpiles of sugarcane.

Also in 1948, with an eye toward solving the problems of excess raw materials and the balance of payments deficit (largely caused by the importation of automotive gasoline), the federal government again began to encourage the production of fuel ethanol. According to Szmrecsányi (1979), this time the objectives were fully achieved as early as the harvest season of 1948–1949.

## **The 1950s: The Consolidation of Production in the South-Central Region**

The 1950s were marked by the expansion of production, encouraged by the IAA, to meet growing consumption needs. The remarkable expansion of the Brazilian domestic market during this period, due to extensive urbanization and industrialization, increased the demand for sugar, resulting in a corresponding expansion of the sugarcane industry.

Ramos (1991) stated that the fundamental problem of the Institute during the 1950s was to contain southern expansion, or viewed another way to promote production in the state of Pernambuco. The author noted that the IAA could no longer impose the rationing that it had achieved in the late 1930s and the first half of the 1940s. Strong pressure was being exerted by the mill owners of São Paulo against this containment, and many legal documents were filed in order to revise or repeal the resolutions relating to the production caps that the Institute had imposed on the states.

The hegemony of the south-central region, and especially that of the state of São Paulo was officially recognized when, in December 1957, the IAA increased the overall production limit for the country, dividing it in proportion to the increased production achieved by each sugar mill for the harvests processed between the 1951–1952 and 1956–1957 seasons.



Between the harvest of 1952–1953 and that of 1954–1955, Brazil again began to have a sugar surplus, causing the IAA to increase sugar exports significantly, although international prices were at record lows. In 1954 and 1955, the situation worsened due to rising global stocks caused by the overproduction of sugar worldwide. This situation was offset by the crop failures of 1956–1957, and by the increased consumption resulting from the new wave of industrialization and urbanization stimulated by the administration of then-President Juscelino Kubitschek.

In the 1958–1959 harvest season, sugar production was 20% greater than in the preceding year. The surplus was earmarked for exportation. Although the international market price of sugar remained quite low, the federal government was still grappling with the balance of payments deficit. According to Szmrecsányi (1979) the exchange revenues generated by sugar in 1957 represented 5% of the total value of all Brazilian exports. In 1958, sugar exports were surpassed only by those of coffee and cocoa, which were the two main export products.

Despite accounting for foreign exchange inflows into the country, exports of sugar were not competitive, and the IAA, due to the large quantity exported, could no longer subsidize them. Therefore, the government began to provide the resources to subsidize sugar exports. The social costs of that re-allocation of resources were overlooked because of the concerns regarding the balance of payments deficit.

## Pricing Policies

The pricing policies put in place by the IAA are also considered one of the factors responsible for the displacement of sugar production from the northeast to the state of São Paulo. According to Gomes (1979), those pricing policies became effective as of 1943, having theretofore resembled minimum price policies, whereby the government set the lower limits of sugar prices and favored fiscal mechanisms to prevent prices from falling below those values. According to the author, in 1943, the government set prices with the condition of “FOB northeast” (“free on board,” or “put on the ship,” in the ports of producing states in the northeast), whereas, for the other states (with the exception of Rio de Janeiro, which was also an exporting state), consumer prices were determined by adding in the costs of transporting the product from the northeast to the producing states.

The IAA pricing policy benefited the sugar producers in the south-central region, because the sugar from the northeast (at the time responsible for most of the sugar consumed in the country) came to southern consumers at a higher price, since it incorporated the costs of production and transport. This triggered protests from producers in the northeast, because it led to the growth of their competitors to the south and ran counter to the main objective of the intervention, which had always been to protect the sugar industry of the northeast. Therefore, in 1951, that pricing policy was amended to establish a single settlement price for all sugar producers in the country (based on the price set for sugar produced in the northeast) and another price designated the “billing price.” Under this system, producers in the south-

central region were charged a fee, which was redirected to the producers in the northeast. Those fees, collected by the Bank of Brazil, represented the differences between the two prices and were used in order to create a retrofit fund, administered by the IAA. According to Szmrecsányi (1979, p. 242) the retrofit fund would be used, among other things, for the following: "... to compensate for shipping costs, in order to equalize consumer prices across the various metropolitan centers (areas of high consumption), regardless of the origin of the sugar being sold; to finance the production of sugar and ethanol, as well as the expansion of the industrial park related to that production; and the costing of modern materials used in sugar production..." This resulted in a backlash of sugar producers in the state of São Paulo expressing their dissatisfaction with this policy of "adding-on" to the price. Pressure exerted by those producers led to the enactment of Law no. 4,870, which repealed the policy in December of 1965. As of 1967 (when the new law went into effect), the price of sugar came to be established on the basis of the average industrial costs in each producing region. Therefore, prices were higher for sugar produced in the northeast, where production costs were higher than they were in the south.

Because the new pricing policy resulted in the fixed price of sugar being higher in the northeastern region, it was necessary to enact strict legislation that would prevent the transfer of sugar between the regions (because of the lowest production costs—and consequently lower prices—in the state of São Paulo and other producing states in the south). That allowed sugar to be sold at a competitive price in northeastern markets, even if the cost of transport between the regions was taken into consideration. This pricing policy remained in force until the price control regime ended, in February 1999.

### **The 1960s: The Encouragement of Exports and the Crisis Caused by Overproduction in the 1965–1966 Harvest season**

In the 1960s, various situational factors altered the prospects of the sugar industry in Brazil, which in turn influenced government intervention that has always come in reaction to economic and social processes. The perception of the IAA (despite the dramatic short-term fluctuations in supply and international market prices) was that the exportable surplus of sugar from the northeast would not be sufficient to meet the growing domestic and foreign demands for the product. Therefore, the Institute again adopted an expansionist policy, aiming to increase exports and expand the industrial park as well as to increase the sugarcane crop.

One of those situational factors was the occurrence of the Cuban Revolution. The establishment of the socialist regime in 1959 resulted in Cuba losing its access to the USA market, which was the most lucrative and therefore, the preferred market. This opened the doors for Brazilian exports of sugar (previously restricted to the less lucrative free world market), which allowed Brazil to reduce its stockpiles of sugar produced in the northeast, a process that was still dependent on the consumer market in the south-central region as well as on external markets.

Production of Ethanol from Sugarcane in Brazil

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