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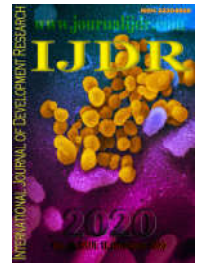
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## AN ENVIRONMENTAL ANALYSIS IN THE SUGAR-ALCOHOL PLANTS OF PARANÁ

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### ABSTRACT

The goal of this article is to identify the factors that make up the sugar production scenario in order to understand what are determinants for decision making and the composition of a Strategic Planning. For this purpose, the directors of 14 (fourteen) mills in Paraná associated to ALCOPAR - Association of Alcohol and Sugar Producers of the State of Paraná were consulted, with the return of 4 (four) mills. The factors were prioritized and correlated according to the viewpoint of the leaders. The prioritization matrix was adopted, a tool used in the S.O.W.T. analysis. analysis, which in turn points out the internal and external scenario of the sector. For this purpose, the correlations were calculated and the factors that have more or less drive, magnitude, accessibility and impact were pointed out. The analysis shows that the correlation is neutral and there is a need to reinforce the potentialities and minimize or extinguish the sector's weaknesses. The results will allow the power plants to make decisions for investments, improvement, monitoring or elimination of causes or factors pertinent to the sector.

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### INTRODUCTION

Technological advances and competitiveness in the market are growing and demands that the organizations inserted in it become more and more efficient and effective, which leads the sugar cane mill managers to formulate a strategic planning that culminates in their development in the scope of national production and exports. With the growing demand both internally and externally for sugarcane derivatives, the need to elaborate a strategic planning becomes an important point in product development. Even because the determinants of quantity and quality of production cannot be fully planned and oriented, because there are factors not controllable by companies, such as climate. The interest in producing sugarcane in the world has increased research, which aims to better understand the influence of the environment on its growth and development (SILVA, et. al., 2014). According to a research conducted by EMBRAPA (2009), Brazil is the world leader in the production of sugarcane and its derivatives. The segment employs more than 4 million people and, in 2008, accounted for 1.76% of the national agricultural GDP (Gross Domestic Product).

In recent years, as cited by Jordão and Moretto (2014), Brazil has been one of the world's largest producers of sugarcane. In light of this scenario, the growth of sugarcane activity has made it one of the main topics of discussion about social and environmental problems. Such problems derive from the various phases of the activity, especially those related to the practice of burning sugarcane before cutting, such as soil degradation, water pollution, pressure on other crops and areas of native forests, application of pesticides and fertilizers, in addition to the destruction of legal reserves and areas of permanent preservation (COELHO *et al.*, 2007; NOEL, 2007; GOLDEMBERG *et al.*, 2008; MARTINELLI and FILOSO, 2008; WWF, 2008). This study seeks to identify the factors that influence the production of sugar in the mills of Paraná using the prioritization matrix for the SWOT analysis in order to raise important points of the internal and external environment of these mills. In this way, the correlations were calculated, and the factors that have more or less motricity, magnitude, accessibility and impact were pointed out based on the data provided by the mills. Based on these data, a SWOT prioritization matrix was made, which allows ordering possible solutions, functions and tasks, based on already established criteria.

The matrix also allows an analysis of the situation seeking to understand the potentialities and deficiencies in that sector. Furthermore, this study allows companies to identify their deficits and strengths, where the results obtained will allow the plants to make decisions for investment, improvement, monitoring or elimination of causes or factors pertinent to the sector.

## THEORETICAL REFERENCE

### STRATEGIC PLANNING AND SWOT ANALYSIS

The development of the planning function in organizations inserts a set of previous measures that must be taken by the manager in order to obtain a future scenario different from the past. In this way, every planning activity must result from present decisions, taken from the examination of their impact in the future. Strategic planning is a comprehensive rational approach to strategy development in which it uses a systematic process with specific steps, such as internal assessments, goal setting, analysis, evaluation, and action planning to ensure the organization's long-term vitality and effectiveness (Pasha, Poister, and Edwards, 2020). This way the planning process becomes more important than its final result, because the final result is the sum of the whole process. The implantation of a planning must be developed by the company, because otherwise it may culminate in inadequate and useless plans for the organization. Strategy, in turn, can be seen as a set that encompasses decision making rules to guide the behavior of an organization. According to Ansoff (1993) "strategy is a potentially very powerful tool to deal with the changing conditions that surround the company (...)".

Thus, strategic planning is defined by Oliveira (2004) as "the administrative process that provides support to establish the best direction to be followed by the company", being the responsibility of the highest levels of the company and corresponds to the most appropriate means for the organization to achieve its objectives within the mission, respecting its current internal and external situation. SWOT analysis is a tool used for strategic planning and strategic management in organizations. This can be used effectively to build the organizational strategy and competitive strategy. According to the System Approach, organizations are all that are in interaction with their environments and consist of several subsystems. In this sense, an organization exists in two environments, one being internal and the other external. It is necessary to analyze these environments for strategic management practices (GÜREL; TAT, 2017, our translation). Furthermore, according to Gürel and Tat (2017), SWOT analysis is, therefore, a significant tool for situation analysis that helps managers to identify the organizational and environmental factors in which they operate (our translation). DANTAS (2008) explains that SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. It is basically a scenario analysis and is divided into an internal environment (Strengths and Weaknesses) and an external environment (Opportunities and Threats). The internal environment can be controlled by managers, since it is the result of the strategies defined by the organization. The external environment is totally out of the control of the organization, but it must be known and monitored by the organization in order to take advantage of opportunities and avoid threats. This form of analysis allows the manager to systematize the available information and to obtain clear

information for a balanced decision making and to identify their situation in the market. Due to market competitiveness, organizations have been seeking ways to improve their performance focused on controlling material, financial and human resources, and management information, through the adoption of information systems, which contribute to the evolution of business, aiming at the quality and safety of the information used, in order to provide improvements in analysis requirements and process redefinition, generating possibilities for organizations to develop new strategic management scenarios (PINOCHET, 2016). Strategic management consists of the analysis, decisions and actions that an organization takes to create and sustain competitive advantages. The strategic management process is a sequential set of analyses and choices that can increase the probability of an organization choosing a "good strategy", that is, one that generates competitive advantages (GÜREL; TAT, 2017, our translation).

**THE SUGAR CANE:** The history of Brazil is so closely linked to the cultivation of sugarcane that it is impossible to dissociate it, under the penalty of incurring a falsehood (PINA, 1972). Sugarcane played a fundamental role in the formation of the Brazilian economy, being the first economic activity developed, marking the process of formation and consolidation of the country since the colonial period. Today, Brazil is the largest producer of sugarcane with 720 million tons and 40% of the cultivation worldwide. Sugar is one of the commodities with the greatest evidence in the Brazilian agricultural sector, with a dynamic of international commercialization remarkable not only by the volatility of prices, but also by the exposure and interdependence of regional markets. Sugarcane production, estimated for the 2020/21 harvest, is 642.1 million tons, which indicates a slight retraction of 0.1% in sugarcane production in relation to the previous harvest, which was over 642.7 million (MAPA, 2020).

Since 1999 the state has moved away and the sector starts to operate in a free market, inducing it to seek competitive strategies to maintain itself in the new scenario (MORAES, 2007). The mills have adopted different strategies diversifying the types of sugar produced, in addition to implementing new forms of organization and management of production VIAN (2003). The sugar-alcohol sector has undergone major changes, mainly due to the introduction of foreign investments which, according to data from the Brazilian Sugarcane Industry Association - UNICA (2012), currently approximately 25% of domestic production is controlled by foreign capital. According to Lunas (2014), Brazil occupies a prominent position in terms of sugarcane production and productivity at the international level, with export growth and dynamism in the sugar-alcohol sector contributing to the strengthening of the domestic ethanol market, which has enabled a greater contribution to the national GDP. Brazil currently has 411 sugar-alcohol plants in operation, all of which have cogeneration units (NOVACANA, 2020a). And according to Michels and Arakaki (2012), only the sugar-energy sector represented 2% of the Brazilian GDP in 2012. According to Unica (2011) data, from 2005 on sugarcane production costs grew around 40%, going from R\$ 42 per ton to R\$ 60. A number of factors explain this advance. Some of them are present in the extensive list of the so-called Brazil cost, such as the appreciation of the Real and the high tax burden, which reduces the competitiveness of national companies (NOVACANA, 2020b).

Being an agricultural commodity, port and freight costs strongly interfere with final costs. According to BURNQUIST (2002) protectionism in the international sugar market has been very restrictive, to the point of characterizing it as one of the most disadvantaged in the agribusiness market. Production flexibility is a determining characteristic. This is because the sugar mills with distillery attached, can direct both to the manufacture of sugar and alcohol, using the profitability of the products as a decisive factor in the process of final production (ALVES, 2004). Besides the diversity of commercial products that are manufactured from sugarcane juice and the solid and liquid residues from milling, such as cachaça, rapadura and cogeneration of electric energy generated by burning the bagasse. And with a strategic geographic position that enables the production of sugarcane and its derivatives in a wide geographic space (CONAB, 2020). This is conducive to a climatic diversity enabling large-scale production. With a sufficient supply to meet the demand for sugar and alcohol, even with the increase in the fleet of bi-fuel cars and exports (DIEESE, 2020).

In the matter of production competitiveness in the domestic market there are basically two subsystems, one in the Center/South and another in the North/Northeast, the first being more competitive and dynamic (WAACK, 1998). According to the CONAB (2020) survey, the Center-South region was responsible for 90.2% of the total sugar produced, and the North/Northeast for the rest, 9.8%. São Paulo, Minas Gerais, Paraná, Goiás and Alagoas remain the largest national sugar producers. Another important aspect of Brazil's sugarcane industry is the regional distribution of sugarcane production, with the center-south region accounting for approximately 84% of the country's total production. Analysis from 2012 to 2013 and 2013 to 2014, this proportion increased to an average of 91%. On the other hand, there has been a relative stagnation of sugarcane production in the North and Northeast regions (Moraes, Bacchie and Caldarelli, 2020, our translation).

Today, almost all Brazilian states produce sugar cane, but the largest producing state is still São Paulo, with about 53.7% of national production (CONAB 2020). The agricultural production of sugarcane has a solid base, with a good capacity to respond to pests, diseases and climatic variations GOES (2008) stresses that this has been possible, with the continuous supply of resistant varieties. According to CONAB (2020), climate conditions have oscillated during the production cycle, but are considered favorable in most producing regions, in addition to investments in technification and management improvements also help to achieve greater production potential. There are more than 500 commercial varieties of sugarcane in Brazil, with 15 occupying 80% of the cultivated area in the Center-South, the country's main producing region, responsible for more than 90% of the national harvest - the rest is in the Northeast. Of these 15 main varieties, seven were developed by the Technology Centre Canavieira (TCC), which accounts for about 30% of the planted area in the country (CTC, 2020). In 2018 the MINISTRY OF AGRICULTURE PECUARIA AND ABASTECIMENTO made projections for sugar consumption for the next one in Brazil, it is expected to grow at an annual rate of 1.8%. This is equivalent to going from a consumption of 10.6 million tons in 2017/18 to 12.7 million at the end of the projection. The volume exported in 2027/28 corresponds to an increase of 25.8% over 2017/18

exports and an annual rate of 2.8%. The indicators and the favorable environment show a positive effect on the sector.

However, the working conditions, remuneration and quality of life of workers are very precarious compared to the other categories of employees in the country. The cutting of sugarcane is one of the most arduous rural jobs, performed in the open air, under scorching sun and with the presence of soot and dust. The payment is made by production, the cutters are pushed to increase the pace of work, exceeding physiological limits, reaching an average productivity of 12 tons of cane cut daily, three times higher than in the 1950s (Gomez, 2020). Gomez (2020) still makes an analysis of the perspective of increased mechanization in this sector and stresses that the same difficulties remain, however, because where the machine does not cut, for various reasons, such as on steep slopes, stony land, because it is first cut cane or for replanting, it is up to the worker to do so, being demanded an increasing volume of production.

## METHODOLOGY

However, the working conditions, remuneration and quality of life of workers are very precarious compared to the other categories of employees in the country. The cutting of sugarcane is one of the most arduous rural jobs, performed in the open air, under scorching sun and with the presence of soot and dust. The payment is made by production, the cutters are pushed to increase the pace of work, exceeding physiological limits, reaching an average productivity of 12 tons of cane cut daily, three times higher than in the 1950s (Gomez, 2020). Gomez (2020) still makes an analysis of the perspective of increased mechanization in this sector and stresses that the same difficulties remain, however, because where the machine does not cut, for various reasons, such as on steep slopes, stony land, because it is first cut cane or for replanting, it is up to the worker to do so, being demanded an increasing volume of production.

## RESULTS AND DISCUSSION

In an interview with plant directors and the results of the survey conducted by Neves and Conejo (2007), the issues that guide the opportunities, threats, strengths and weaknesses of the scenario affecting companies were listed as key outputs for the analysis of the problem, according to Box 1. We asked all plants to fill in the matrix by crossing the information of the quadrants (horizontal and vertical) and analyzing the factors in terms of correlations between them, being "0" for weak correlations, "1" for average correlation and "2" for strong correlation. We obtained response from only 4 (four) plants whose results are presented in Figure 1.

For the application of the correlation, the following guidelines were given: For Q1 one must understand the intensity that the weak point "x" makes us more vulnerable to the impacts of the threat "y". For Q2, it is sought to verify with what intensity the force "x" contributes to the use of the opportunity "y". In Q3, the intensity of force "x" contributes to reducing the impacts of threat "y" and in Q4, the intensity of weakness "x" makes it difficult to take advantage of opportunity "y". The results were analyzed observing the correlations of the four quadrants, that is: quadrant 1 (Q1) refers to the weaknesses and threats and, therefore, there are the main deficiencies related to the problem, which must be eliminated in order to achieve success.

**Box 1. Scenario factors affecting sugarcane mills**

<b>OPPORTUNITIES</b>		<b>THREATS</b>	
A.	Growth of sugar consumption in the world	A.	Non-existence of legislation for standardization aimed at export (in the world market)
B.	Prohibition of burning generating more energy in the plants	B.	Sugar substitute products (sweeteners)
C.	Professionalization of the sector (corporate governance practices, going public with the plants)	C.	External Trade Restrictions
D.	Cane needs crop rotation, generating an increase in food production in the areas of renovation	D.	Prohibition of burning will make some areas unfeasible (greater or lesser impact on different plants)
E.	Availability of land for expansion of the sector in Brazil	E.	Lack of regulatory stocks
F.	Harvest mechanization	F.	Lack of manufacturing capacity for expansion (machinery and equipment) of the sector
G.	Cane genetic modification	G.	Climatic variation bringing reduction of available area
H.	Use of satellites and precision agriculture	H.	Cost of inputs (mainly fertilizers)
I.	Research in fertilizers (varieties that use less fertilizers)	I.	Image of the use of sugarcane in the harvest
J.	Intensive use of biofertilizers (vinasse)	J.	Technological gains in sugarcane competitors (beet, corn and others)
<b>STRONG POINTS</b>		<b>WEAK POINTS</b>	
A.	Lowcost in sugar production	A.	Unstable horizontal supplier
B.	Higher productivity than competitors (corn and beet)	B.	Little investment in research (focus was given to biodiesel)
C.	mature and large industry	C.	Manual harvesting and the human aspect
D.	Capacity to expand new areas	D.	Practice of burning
E.	Cane Varieties	E.	Labor legislation
F.	"Free" Advertising	F.	Low capacity to anticipate problems and coordinate the reaction
G.	Internal logistics,	G.	Logistics for export
H.	Professionalization	H.	Insufficient staffing in the face of growth
I.	Consecana (contracts)	I.	Shortage of technical training centers
J.	Diversity of entrepreneurial profiles leading to a rich environment (idea generation and discussion)	J.	Supplier representation in the quantitative aspect

Source: The Authors.

**Figure 1. S.W.O.T. Analysis Matrix**

		Q 2 – INVESTING												Q 4 - MONITORING													
		X	OPPORTUNITIES												THREATS												X
		SCORE MAGNITUDES	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J	STRENGTHS AND WEAKNESSES				
		SCORE MAGNITUDES	X	10,0	9,0	9,0	8,5	8,0	8,0	7,5	7,0	6,0	6,0	9,0	9,0	8,5	8,0	8,0	7,5	7,0	7,0	6,5	X				
STRONG POINTS	A	10,0	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	370				
	B	10,0	2	0	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	360				
	C	9,5	2	1	2	1	1	1	1	1	1	2	1	2	2	2	1	1	1	1	2	2	266				
	D	9,5	2	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	1	1	2	2	304				
	E	9,0	1	2	1	2	2	1	2	1	2	2	0	0	0	1	0	0	2	2	2	2	225				
	F	9,0	1	0	2	0	0	0	0	1	0	1	1	0	0	2	0	1	0	0	0	0	2	99			
	G	8,5	2	2	1	1	1	2	0	2	0	1	0	1	0	1	0	2	2	1	1	0	170				
	H	8,5	2	1	2	2	1	2	1	2	1	2	2	2	2	2	2	1	1	1	1	1	2	264			
	I	8,0	1	0	2	0	0	1	0	1	0	2	2	2	2	2	2	2	2	2	0	2	1	192			
	J	8,0	1	2	2	1	2	1	1	1	1	0	2	2	2	2	2	1	2	2	0	1	2	224			
SUBTOTAL (I)		X	16	10	17	13	13	14	12	14	12	16	14	12	15	12	13	13	13	11	15	17	X				
WEAK POINTS	A	9,5	2	2	1	2	2	1	2	1	2	2	1	1	1	1	2	2	2	2	2	2	314				
	B	9,0	2	2	2	2	1	0	2	0	2	0	2	1	2	1	2	1	1	2	2	0	243				
	C	9,0	2	2	2	1	2	2	1	2	1	2	2	0	0	0	0	0	0	1	0	0	180				
	D	8,0	1	2	1	2	2	1	2	1	2	1	2	0	1	0	2	0	0	1	1	2	192				
	E	8,5	2	0	2	1	2	2	0	2	0	2	0	2	1	2	1	1	1	1	0	0	2	196			
	F	8,0	1	0	2	0	0	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	248			
	G	8,0	2	0	1	0	1	0	0	0	0	1	0	2	1	2	0	2	2	0	0	0	112				
	H	7,0	1	0	2	1	2	2	0	2	0	2	2	1	2	1	1	1	1	0	0	2	161				
	I	7,0	2	0	2	2	1	2	2	2	2	2	0	2	2	2	2	2	1	1	2	2	231				
	J	6,5	1	2	1	2	2	2	2	2	2	2	0	1	1	2	1	2	2	2	2	2	2	215			
SUBTOTAL (II)		X	16	10	16	13	15	14	12	14	12	12	14	12	14	12	14	12	12	12	11	14	X				
ACCESSIBILITY OR IMPACT		X	0	0	1	0	-2	0	0	0	0	4	0	0	1	0	-1	1	1	-1	4	3	X				
			Q 3 – IMPROVE												Q 1 - ELIMINATE												

Quadrant 2 (Q2) deals with the correlation between the strengths and opportunities offered by the labor market/policies and the advancement of internal strategies adopted by the mills. Quadrant 3 (Q3) presents the correlations between weaknesses and opportunities that the business faces.

It refers to the issues that must be addressed and improved. Finally, quadrant 4 (Q4) checks the relationships between the sector's strengths and the possible threats posed by the external environment. In this quadrant the items must be constantly monitored, since it deals with the "obstacles" that affect the problem. The results are presented in Figure 2.

**Box 2. Magnitude, Accessibility, Motricity and Impact of Factors**

OPPORTUNITIES	MAGN	ACCESS	STRONG POINTS	MOTR	MAGN
Growth in world sugar consumption	10	0	Low cost in sugar production	370	10
Ban on burning generating more energy in the plants	9	0	Higher productivity than competitors (corn and beet)	360	10
Professionalization of the sector (corporate governance practices, going public with the plants)	9	1	Mature and large industry	266	9,5
Cane needs crop rotation, generating an increase in food production in the areas of renovation	8,5	0	Capacity to expand new areas	304	9,5
Availability of land for expansion of the sector in Brazil	8	-2	Cane Varieties	225	9
Mechanization of the harvest	8	0	"Free" Advertising	99	9
Can genetic modification	7,5	0	"Free" Advertising	170	8,5
Use of satellites and precision agriculture	7	0	Professionalization	263,5	8,5
Research in fertilizers (varieties that use less fertilizers)	6	0	Consecana (contracts)	192	8
Intensive use of biofertilizers (vinasse)	6	4	Diversity of entrepreneurial profiles leading to a rich environment (idea generation and discussion)	224	8
THREATS	MAGN	IMP.	WEAK POINTS	MOTR	MAGN
Technological gains in sugarcane competitors (beet, corn and others)	9	0	Unstable horizontal supplier	313,5	9,5
Non-existence of legislation for standardization aimed at export (in the world market)	9	0	Little investment in research (focus was given to biodiesel)	243	9
Sugar substitute products (sweeteners)	8,5	1	Manual harvesting and the human aspect	180	9
External trade restrictions	8	0	Burning Practice	192	8
Prohibition of burning will make some areas unfeasible (greater or lesser impact on different plants)	8	-1	Labor legislation	195,5	8,5
Lack of regulatory stocks	7,5	1	Low capacity to anticipate problems and coordinate the reaction	248	8
Lack of manufacturing capacity for expansion (machinery and equipment) of the sector	7	1	Logistics for export	112	8
Climate change bringing reduction of available area	7	-1	Insufficient personnel for growth	161	7
Cost of inputs (mainly fertilizers)	7	4	Shortage of technical training centers	231	7
Image of the use of sugarcane in the harvest	6,5	3	Supplier representation in the quantitative aspect	214,5	6,5

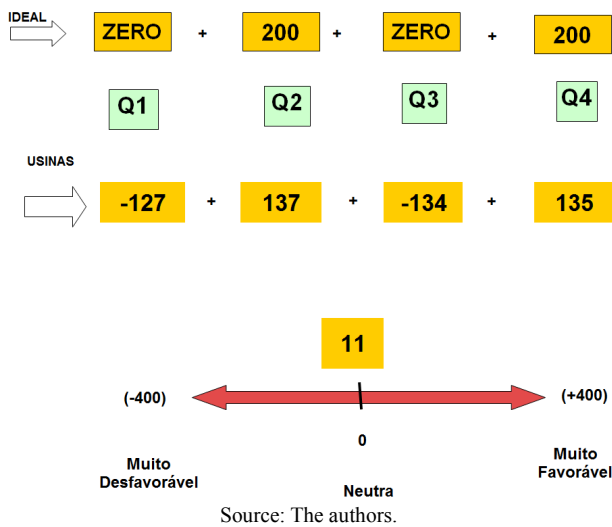


Figure 2. Situational Analysis Matrix - Correlation between factors

The ideal score for quadrants 1 and 3 should be zero (0), because if the problems can be eliminated or improved, the probability of success is higher. However, it is observed that the result is far from zero demonstrating that there is much to improve and that the weak points, which are controlled variables should have all possible attention. Quadrants 2 and 4 for referring to issues related to opportunities and strengths can achieve the maximum score of 200. As the result, the closer the problem is to this number the better. According to the results, it is necessary both to invest in the sector and monitor existing threats and weaknesses.

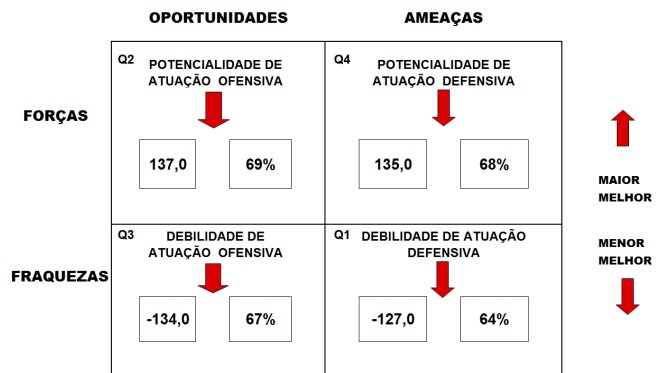


Figure 3 - Matrix to analyze the potentialities and weaknesses of the sector

The overall result, although not positive, is promising because it is neutral and may mean that actions are being taken to mitigate weaknesses. The matrix also makes it possible to make an analysis of the situation seeking to understand the potentialities and deficiencies according to Figure 3. In this matrix it can be observed in quadrant Q2 that the strong points of the actions emanating from the sector allow 69% of the opportunities that external actions offer. In quadrant Q4, the strengths reduce the effects of threats by 68%. In quadrant Q3, the weak points inhibit the exploitation of opportunities by 67% and in quadrant Q1, the weak points enhance in 64% the effects of threats. The differences express the fragility of the sector's internal factors in relation to the factors that provide sustainability to the sector.

The Magnitude of the Notes, the Accessibility, motricity and impact that the factors pointed out cause, in the view of the interviewees, are presented in Table 2. The magnitude, accessibility, motricity and impact of each item allow investigating the factors that should occur investments, improvement, monitoring or that should be eliminated. It is important to point out that Magnitude is present in the four determinants because it represents the size or magnitude that the variable or event has in relation to the factors. In relation to the opportunities, the plants feel safe in relation to their accessibility in relation to the use of precision satellites, negative accessibility in relation to the professionalization of the sector (corporate governance practices, opening of the plants' capital) and negative accessibility to those of more factors. As for threats, the sector believes that the greatest impact is related to the costs of inputs and image of sugarcane harvesting, and feels less threatened in relation to the prohibition of burning. In relation to the strengths, in terms of magnitude and motricity to stimulate/improve the sector is the low cost and high productivity in sugar production and higher productivity. These are weak points that affect the sector in relation to motricity, the instability of the supplier (horizontal), the little investment in research for the sugar product and the human aspect in relation to manual harvesting.

## FINAL CONSIDERATIONS

The objective of this article was to identify the factors that influence the production of sugar in the mills of Paraná using the prioritization matrix for SWOT analysis. We did not dare to analyze the segment, just apply the methodology and provide the result as important data to size a strategic planning. We understand that when the factors are evident it is up to the managers to plan and analyze the adoption of strategies that provide the company with greater advantage in producing or not a product, whether on a larger or smaller scale, as well as allocate the product to markets that provide greater value. It was observed that in terms of correlation of the factors that benefit or affect the decision making for the best performance of the plants in Paraná, they are neutral, i.e., they are capable of improvement with the adoption of strategies that enhance the market opportunities and strengths of the company, as well as eliminate weaknesses and minimize threats. These decisions must be congruent and need strategic planning that culminates in their development in the scope of national production and exports. This study is expected to be relevant for the participating plants as well as for researchers and companies in the sector. However, the factors pointed out should not be extrapolated or generalized to the whole universe due to the limitations of the scope being regional.

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