

THE STAKEHOLDERS' THEORY AS A TOOL FOR STRATEGIC PLANNING IN AQUACULTURE: A CASE STUDY IN THE NORTH - AMAZON REGION (PARÁ) AND IN THE NORTHEAST REGION (CEARÁ) OF BRAZIL

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ABSTRACT

The states of Pará and Ceará are highlights in aquaculture in the North (Amazon) and Northeast regions of Brazil, respectively. These states are developing public policies to provide for the development of this activity, based on the Stakeholder Theory. The use of stakeholder analysis as a tool for strategic planning has become quite popular in the fields of administration and the development of public policies in the last two decades Xavier (2010). The objective of this work is to identify the socio-economic profile of stakeholders and aquaculture producers in Pará and Ceará; identify the main strengths, opportunities, weaknesses and threats and define priorities to be taken into account in the development of public policies that provide for the development of aquaculture in these two states. Technical workshops were held to survey information in loco; in the period from August 2019 to February 2020, in which the following techniques were used: application of a semi-structured questionnaire to identify the socio-economic profile of stakeholders and aquaculture farmers; elaboration of the SWOT matrix for the identification of the main strengths, opportunities, weaknesses and threats, and elaboration of the GUT Matrix for the definition of priorities. The results found allowed us to reach the objectives proposed in this study and are described in the specific section. The main limitations of the research were the absence of data related to the stakeholders of aquaculture, other than the aquaculture producers themselves, as well as the limited availability of information related to the issues of planning and strategic management for aquaculture. The main contribution of this study concerns the use of a management tool - the Stakeholder Theory - to generate information for the elaboration of sectoral public policies, and its originality can be attested to by the identification of the socio-economic profile of the aquaculture stakeholders since previous works have used only the aquaculture farmers.

Keywords: Stakeholder Theory; Aquaculture; Pará; Ceará.

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1. INTRODUCTION

The stakeholders' analysis is recognized as a trend that aims to combine the organization's objectives with the external environment and the demands of stakeholders that highlight the values, principles and processes that govern the mechanisms of project management. This is a recognition by managers, researchers and politicians about the importance of stakeholders, as well as the recognition of their potential to influence organizations (Brugha and Varvasovszky, 2000).

The concept of stakeholder can be expressed as an individual or group that can affect or is affected by the goals and activities of an organization (Freeman, 1984). Stakeholders can be people or any groups that have legitimate interests in the activities of a particular organization, while the latter also has an interest in relating to such groups or people (Donaldson and Preston, 1995). According to Pinto and Oliveira (2003), stakeholders are groups or individuals who affect the organization or are significantly affected by it, in achieving its objectives. For Mascena (2015), Soares et al. (2014), Vale (2014), PMI (2013) and Teixeira and Moraes (2013), there are several definitions for stakeholders, however, these definitions can be translated as "interested parties". These parties can be customers, suppliers, government, society groups, parliament, employees, etc. Teixeira Neto (2019), meanwhile, states that according to the common understanding, stakeholders are people or groups that depend on an organization to achieve its goals and objectives and on whom, in turn, the organization depends.

Machado (2019) states that studies on stakeholder management have been developed for organizations to recognize and analyze the characteristics of these groups and their connections to the strategy and longevity of the organization. According to Barney and Harrisson (2018), stakeholder theory can be used, is being used, and should be used to inform business decision making, and is an area full of opportunities for new research in a wide variety of disciplines. Banzato (2019) cites that stakeholders can be identified by the possession of the following attributes: the power to influence the organization, legitimacy of relationships within the organization, and urgency in making claims on the organization with power gaining authority from legitimacy and being exercised from urgency.

Alcaniz et al. (2019) state that the shareholders' approach seems to be predominant against the stakeholders' approach. However, Couto (2020) cites that due to the importance that stakeholders have in the participation of organizations, the stakeholder theory has increasingly gained prominence in the literature, giving more attention to the

interests of other groups of individuals and not just shareholders, as in the Shareholders theory. In turn, Stocker et al. (2019) add that stakeholder network analysis has shown promise for investigating the interconnections between multiple stakeholders and their influences on organizations.

Stakeholder Theory considers that the organization should seek to meet their interests, acting as an agent (legitimacy principle), and should do so also to ensure the survival of the organization and the benefits arising from this relationship in the long term (Freeman, 1984). This approach leads us to believe in the legitimacy that the stakeholders have been assuming in this new conception of organizational relationships. The understanding of the latter makes it possible to understand the complexity of the relationships related to the organization (Ceará and Pará aquaculture) considered in this work, considering the rights, objectives, expectations and responsibilities concerning each actor that makes up such groups (Clarkson, 1995). The effective participation of these stakeholders endorsed the information that was gathered and that provided the basis for the preparation of these regional diagnoses, which, in turn, served as the basis for the preparation of the Aquaculture Development Plans for the states of Pará and Ceará.

The organization, by focusing on the stakeholders' potential, can recognize their emerging needs, elaborate and/or modify plans for the development of its activities. This way, according to the Stakeholder Theory, the Organization becomes the aquaculture in the two states worked on and these plans must attend to the interests of these groups of individuals that influence and are influenced by this activity.

FAO (2008) defines aquaculture as the cultivation of aquatic organisms in continental or coastal areas, which implies, on the one hand, intervention in the breeding process to improve production and, on the other hand, individual or corporate ownership of the cultivated stock. In Brazil, on the other hand, this activity is defined as the activity of cultivating organisms whose life cycle in natural conditions, takes place totally or partially in the water, implying ownership of the stock under cultivation, equated to the agricultural activity (Brazil, 2009).

According to IBGE (2019), Brazil produced 579,260 tons of farmed fish in 2018, of which, freshwater fish accounted for 519,270 tons, marine shrimp for 45,759 tons, and marine molluscs (oysters, mussels, and scallops) for 14,231 tons.

Aquaculture in the Northern (Amazonian) Region is essentially carried out by freshwater fish farming (basically Tambaquí - *Colossoma macropomum*) and Table 1 presents the aquaculture production data for all the states in this Region:

Table 1. Aquaculture production in the Northern (Amazon) Region by the state in 2018

State	Production (tons)
Rondônia	50.181
Pará	13.500
Tocantins	11.367
Roraima	10.818
Amazonas	8.162
Acre	3.826
Amapá	823
TOTAL	98.677

Source: (IBGE, 2019)

Aquaculture in the Northeast Region, on the other hand, is essentially carried out by the cultivation of freshwater fish (basically Tilapia - *Oreochromis niloticus*) and marine shrimp (*Litopennaeus vannamei*):

Table 2. Northeast Region Aquaculture Production by state in 2018

State	Fish production (tons)	Shrimp production (tons)	Total Production (tons)
Maranhão	27.329	346	27.675
Ceará	11.152	13.045	24.197
Pernambuco	20.586	2.203	22.789
Rio Grande do Norte	2.400	19.764	22.164
Bahia	13.575	1.724	15.299
Piauí	10.809	2.318	13.127
Alagoas	8.853	435	9.288
Paraíba	2.382	2.734	5.116
Sergipe	1.464	2.906	4.370
TOTAL	98.550	45.475	144.025

Source: IBGE (2019)

The state of Pará is one of the 7 (seven) states that make up the Northern (Amazon) Region of Brazil and according to IBGE (2019), Pará aquaculture production in 2018 was 13,630 tons. Of this total, fish production was 13,500 tons (99.04%), oyster production was 70 tons (0.51%) and farmed sea shrimp production was 60 tons (0.44%).

The state of Ceará, on the other hand, is one of the nine (9) states that make up the Northeast Region of Brazil and according to IBGE (2019), Ceará's aquaculture production

in 2018 was 24,197 tons. Of this total, the production of farmed marine shrimp was 13,500 tons (54.17%) and fish production was 11,000 tons (45.83%).

2. METHODOLOGY

Data collection is one of the research steps that aim to acquire information about the reality and that, once the research objectives are defined, the data collection instruments can be defined (Bastos, 2012). This author also states that there are several techniques and ways to collect data, of which the most used are: interviews, questionnaires, forms and observation.

In this work, semi-structured questionnaires were used, which were applied during the technical workshops held during the execution of this work and encompassed the 14 integration regions of the state of Pará and the 7 planning regions of the state of Ceará (which concentrate 90% of the aquaculture in the state).

The application of this questionnaire allowed the elaboration of the socio-economic profile of the stakeholders in aquaculture and aquaculture producers in the states of Pará and Ceará; identify the main strengths, opportunities, weaknesses, and threats of this activity; as well as define the priorities to be worked on in the form of public policies that provide for the development of aquaculture in the states studied.

The data analysis aimed at establishing an understanding of the data collected, answering the questions formulated and presenting the socioeconomic profiles of the stakeholders and aquaculture producers in the states studied.

Pará

The state of Pará is divided into twelve (12) Integration Regions (www.seplag.pa.gov.br), in which the regional diagnoses were conducted: Guamá, Rio Caeté, Rio Capim, Guajará, Marajó, Baixo Amazonas, Tapajós, Xingu, Carajás, Araguaia, Tocantins and Tucuú Lake. These diagnoses were prepared after the holding of 09 (nine) technical workshops in the period from August to December 2019, in the following host cities: Castanhal, Paragominas, Belém, Altamira, Santarém, Marabá, Xinguara, Abaetetuba and Tucuú. These host cities for the technical workshops contemplated the twelve (12) integration regions of Pará. During these 9 (nine) workshops 336 stakeholders participated (Table 3):

Table 3. Characterization of the Technical Workshops in Pará State

Host city	Integration Regions	Date	No of participants
Castanhal	Guamá e Rio Caeté	08/10/2019	69
Paragominas	Rio Capim	09/10/2019	53
Belém	Guajará e Marajó	10/10/2019	25
Santarém	Baixo Amazonas e Tapajós	21/10/2019	18
Altamira	Xingu	23/10/2019	24
Marabá	Carajás	05/11/2019	44
Xinguara	Araguaia	07/11/2019	41
Abaetetuba	Tocantins	10/12/2019	24
Tucuruí	Lago de Tucuruí	12/12/2019	38
TOTAL	TOTAL	-	336

Source: Research data

Ceará

The state of Ceará is divided into 14 Planning Regions (www.ipece.ce.gov.br) and 90% of Ceará's aquaculture production is concentrated in 7 (seven) of these regions: Vale do Jaguaribe, Centro-Sul, Litoral Leste, Litoral Norte, Grande Fortaleza, Maciço de Baturité and Litoral Oeste/ Vale do Curu. In this way, the regional diagnoses of this research were carried out in these 7 (seven) planning regions. These diagnoses were prepared after 06 (six) technical workshops were held in the period from September 2019 to February 2020, in the following host cities: Jaguaribara, Iguatu, Aracati, Jaguaruana, Orós, and Acaraú. These host cities of the technical workshops contemplate 04 (four) of the 07 (seven) planning regions in which aquaculture has greater importance in the state of Ceará (Vale do Jaguaribe, Centro-Sul, Litoral Leste e Litoral Norte). The planning regions of Greater Fortaleza, the Baturité Massif and the West Coast/Curu Valley did not fit into the methodology proposed for the technical workshops, due to their aquaculture production being very restricted to 4 (four) companies/producers and not to a diverse number of stakeholders and/or aquaculture producers. During these 6 (six) workshops, 122 stakeholders participated (Table 4):

Table 4. Characterization of the technical workshops in Ceará state

Host city	Planning Region	Date of completion	No of participants
Jaguaribara	Vale do Jaguaribe	12/09/ 2019	32
Iguatu	Centro-Sul	02/10/ 2019	16
Aracati	Litoral Leste	22/01/ 2020	25
Jaguaruana	Litoral Leste	22/01/ 2020	14
Acaraú	Litoral Norte	05/02/ 2020	20
Orós	Centro-Sul	12/02/ 2020	25
TOTAL	4	-	122

Source: Research data

Primary data

In each workshop, information was collected that allowed for the elaboration of a socioeconomic profile and the classification of the participating stakeholders according to the Brazil Economic Classification Criterion.

The primary data used to elaborate this socioeconomic profile were obtained through a semi-structured questionnaire, applied during the technical workshops. The non-probabilistic convenience sampling method was used, as recommended by Guimarães (2008), which has the advantage of making the sample selection and data collection relatively simple.

The questionnaire was composed of open and closed questions, with socioeconomic information (gender, sex, age, marital status, residence, number of certain items in the home, education, etc.) and technical information (area and species farmed, estimated production, aquaculture model used, origin of the seeds, type of feed, source of financial resources, environmental licensing, technical assistance, etc.).

The socioeconomic part of the questionnaire was based on the Criterio de Classificação Econômica Brasil (CCEB), or Brazil Criterion, which, according to Appolinário (2009), aims to segment the Brazilian population into strata divided according to their purchasing power, the so-called economic classes.

Criterion Brasil is a classification system that has been developed since the early 1970s and has been revised and consolidated since then. The CCEB classification is carried out through a scoring system that takes into consideration two major factors: the level of education and the presence of certain items in the residence of the research subject.

According to the accumulated score, the interviewed individuals were classified into economic classes (Table 5).

Table 5. CCEB's Economic Classes Score

Classes	Points
A1	45-100
B1	38-44
B2	29-37
C1	23-28
C2	17-22
D – E	0-16

Source: ABEP (2019)

In addition to the social classes, the questionnaires provided the collection of various information from the stakeholders and aquaculture producers present in the workshops, and thus it was possible to elaborate the respective socioeconomic profiles and conduct a comparative analysis between these profiles in the two states studied.

To identify the strengths, opportunities, weaknesses, and threats, the SWOT Matrix was used. The SWOT matrix is the acronym for strengths, weaknesses, opportunities, and threats, which is a tool that allows the evaluation and competitive strategic management (LOBATO, et al, 2003).

The opportunities and threats present in the external environment were related to the strengths and weaknesses mapped in the internal environment of the activity (in this case, aquaculture in the states of Pará and Ceará).

For the definition of priorities, the GUT Matrix was used. This matrix is the representation of potential problems or risks, through quantifications that seek to establish priorities to address them, to minimize impacts (Cierco et al., 2003). In each technical workshop, the main problems were identified and the priorities to be worked on were defined. The problems were listed and analyzed under the aspects of severity (G), urgency (U), and tendency (T), using a whole number between 1 and 5 for each of the dimensions, where 5 corresponds to the highest intensity and 1 to the lowest, multiplying the values obtained for G, U, and T to obtain a value for each problem analyzed. The factors that obtained the highest scores were listed as priorities.

Secondary Data

The secondary data were collected through a bibliographical survey of past works and information available in official and/or producer representation agencies and entities (FAO, IBGE, among others).

3. RESULTS AND DISCUSSIONS

The results were presented in three segments and by state: identification of the socioeconomic profile, SWOT analysis, and definition of priorities.

Identification of the socioeconomic profile

Initially, the socioeconomic profiles of the stakeholders in the two states were identified and are presented in table 6:

Table 6. Socioeconomic profile of the stakeholders in Ceará and Pará:

Variable	Ceará	Pará
Social Class	24% of Class B2	32% of Class B2
Gender	82% are Men	78% are Men
Marital Status	65% are married	66% are married
Age Range	32% are in the 41-50 age range	32% are between 31-40 years old
Has its residence	84%	85%
Up to 5 people living in your home	97%	88%
If you have running water	98%	90%
Has a paved street	66%	60%
Level of Formal Education	26% have completed high school or college education	44% have completed college education
Main Activity	51% (Piscicultura)	59% (other activities)
Average Income	26% (Carcinicultura)	27% have more than 5 minimum wages
Time in Business	37% receive from 1 to 2 minimum wages	38% have more than 10 years in the activity

Source: Research data

Regarding the framing in social classes, the highest occurrence among the stakeholders present at the workshops in the two states studied was of class B2; in Ceará, this participation was 24% and in Pará, it was 32%. In turn, according to ABEP (2019), 10.5% of the inhabitants of the Northeast region fall into social class B2 and 11.7% of the inhabitants of the North region fall into this same class.

It was found that 82% of aquaculture stakeholders in Ceará were male, while in Pará, 78% were of the same gender, the same found by Matias (2012); Nakauth et al., (2015), Araújo (2015), Torres (2017) and Sousa et al., (2019). As for marital status, the majority found in the two states surveyed is married, a fact corroborated by Oliveira and Florentino (2018) in Amapá, and Victorio (2019).

In the state of Ceará, the predominant age range of the actors was 41-50 years, close to that found by Souza and Pessoa (2014) in Minas Gerais (41-60 years). In Pará, the majority of the aquaculture farmers studied are between 31-40 years old.

It was observed that in both states there is a large percentage of stakeholders who have their residence (84% in Ceará and 85% in Pará), corroborating what has been report-

ed for distinct regions of Brazil by Passarinho (2011), Oliveira (2017), Oliveira and Florentino (2018), and Sousa et al. (2019).

In the state of Ceará, the majority of stakeholders have completed high school or college education (26% each); while in Pará the majority (44%) have completed college education. This good level of education in both states is probably because most of the stakeholders live in cities that have easy access to formal education.

The average income of the stakeholders in Ceará was 1 to 2 minimum wages (37%); coming in line with Brabo et al., (2017). In the state of Pará, the average income was above 5 minimum wages (27%). This high average income in Pará is due to the effective participation of liberal professionals and civil servants in the workshops, unlike Ceará, which had greater participation of aquaculturists (fish farmers and shellfish farmers).

Subsequently, the socioeconomic profiles of the aquaculture farmers in the two states were identified and are presented in table 7:

Table 7. Profile of aquaculture producers in Ceará and Pará:

Variable	Ceará	Pará
Operates with its resources	67%	93%
Does not have an environmental license	65%	59%
Production area	96% produce up to 5 hectares (micro-producers)	91% produce up to 5 hectares (micro-producers)
Production	57% produce between	94% produce between
Main species cultivated	1 and 50 tons	1 and 50 tons
Origin of the young forms	Tilapia and Shrimp	Tambaqui
Cultivation model	100% within the state	87% within the state
Purpose of culture	Tilapia (net-tanks)	Tambaqui (nurseries)
Type of feed	Shrimp (ponds)	Oysters (tables and pillows)
Monitoring of the culture water	91% for commerce	66% for feed and trade
Has Technical Assistance	91% use commercial feed	77% use commercial feed

Source: Research data

As for the characterization of aquaculture farmers in the states surveyed, we have that in Ceará 67% used their resources for production, while in Pará, 93% used their resources. These results show us the difficulty of obtaining financing for aquaculture, which can be corroborated by Costa et al. (2015) and Sousa et al. (2019). However, in Pará, this difficulty was much more pronounced than in Ceará.

Regarding environmental regularization, 65% of Ceará aquaculture farmers do not have environmental licensing; while in Pará, 59% do not have this instrument. This is placed as one of the biggest barriers to the development of aquaculture in Brazil (Brito et al., 2017, Silva et al., 2017 and Valle et al., 2017).

The vast majority of aquaculture farmers present at the workshops produce up to 5 hectares, and in Ceará, this percentage was 96% and in Pará, 91%. Regarding the total amount produced per year, 57% of the Ceará farmers reported producing up to 50 tons per year; while 94% of the Pará farmers reported producing this amount. These two characteristics characterize the majority of aquaculture producers in both states as micro-producers.

The main organisms grown in Ceará were: Nile tilapia - *Oreochromis niloticus*, grown in net-tanks, the same found by Furlaneto et al. (2006); Oliveira et al. (2007); Sabbag et al. (2007), and Leonardo et al. (2018), and sea shrimp - *Litopenaeus vannamei*, grown in ponds. In Pará, on the other hand, the main species cultivated was tambaqui - *Colossoma macropomum*, the same found by Brabo et al. (2017), Zacardi et al. (2017) and IBGE (2018).

Most producers in both states use commercial feed (91% in Ceará and 77% in Pará), a fact reported by other authors (Oliveira et al., 2014, Sousa et al., 2019). This input is one of the major impediments to the development of aquaculture in Pará, due to the high price, which can represent 70% of the total cost (Sousa et al., 2015).

In the state of Ceará, 85% of the aquaculture farmers reported monitoring the water quality of the crops and 72% said they had technical assistance. In Pará, 64% reported monitoring water quality and 53% reported having technical assistance. These facts, in theory, should favour the development of the activity; however, in practice, this is not reflected in the results; since the low productivity, especially in Pará, perhaps due to a lack of better interpretation and decision-making by producers or those who make these analyses.

Pará - SWOT Analysis

In Pará State, we have identified the main strengths as natural resources, the availability of inputs, support institutions, large lakes (high support capacities - Tucuruí and Belo Monte) and political will. As major opportunities, we have the availability of raw material for alternative feed, the educational and research institutions, new technologies, the modernization of crops and the Aquaculture Development Plan of the state of Pará. The weaknesses were explained by the precarious environmental and land regulation, the precarious and insufficient technical assistance, the low competitiveness and the sanitary inspection. The threats were represented by diseases, the environmental legislation, the sanitary aspects, the discontinuity of actions by the public power and the uncontrollable externalities.

STRENGTHS	WEAKNESSES
Natural resources	Environmental and land regularization
Availability of inputs	Technical assistance
Supporting Institutions	Competitiveness
Great Lakes (Tucuruí and Belo Monte)	Political disputes
Political will	Sanitary inspection
OPPORTUNITIES	THREATS
Raw material for alternative feed	Diseases
Education and research institutions	Environmental legislation
New technologies	Sanitary aspects
Cultivation modernization	Discontinuity of actions
Aquaculture Development Plan	Non-controllable externalities

Pará - Definition of Priorities

- Environmental and land regularization
- Technical assistance
- Data and information generation
- Crop modernization
- Technological innovations
- Sanitary aspects
- Management of public waters for aquaculture purposes

Ceará - SWOT Analysis

In the state of Ceará, we have the main strengths identified as the natural resources, the availability of inputs, the high consumption of fish (tilapia), the tradition in the aquaculture activity and the political will. The biggest opportunities are the large local market for tilapia and the international market for shrimp, the educational and research institutions, the new technologies, the modernization of the cultures, and the Aquaculture Development Plan of the state of Ceará. The weaknesses are explained by the difficulty of environmental and land regulation, the precarious and insufficient technical assistance, the low competitiveness, the water limitation, and the sanitary inspection. The threats, on the other hand, are represented by diseases, environmental legislation, sanitary aspects, discontinuity of actions on the part of public authorities, and uncontrollable externalities.

STRENGTHS	WEAKNESSES
Natural resources	Environmental and land regularization
Availability of inputs	Technical Assistance
High consumption	Low competitiveness
Tradition	Water limitation
Political will	Deficient sanitary inspection
OPPORTUNITIES	THREATS
Local and international market	Diseases
Education and research institutions	Environmental legislation
New technologies	Sanitary aspects
Cultivation modernization	Discontinuity of actions
Aquaculture Development Plan	Non-controllable externalities

Ceará - Definition of Priorities

- Environmental and land regularization
- Technical assistance
- Generation of data and information
- Crop modernization
- Technological innovations
- Sanitary aspects
- Management of public waters for aquaculture purposes

4. CONCLUSIONS

The higher occurrence of stakeholders framed in social class B2 can be justified by the presence of businessmen, liberal professionals and civil servants present in the workshops in Pará. In Ceará, this percentage can be explained by the presence of actors linked to carciniculture, a more profitable activity from the socioeconomic point of view than other aquaculture activities.

The aquaculture stakeholders in the two states were predominantly male, married, and aged between 31 and 50 years old; they own their own homes, with up to 5 residents, with running water and on paved streets.

The education of the stakeholders present in the workshops was high in both states studied, with complete high school or college education, which leads us to conclude that there is a good critical mass working in the aquaculture business, which can explain, in part, the recent development of the activity in the country.

The average income in Ceará was between 1 and 2 minimum wages and in Pará above 5 minimum wages. This difference can be explained by the large participation of fish farmers in Ceará (lower income) and liberal professionals and public employees in Pará (higher income).

There is little access to financing for aquaculture in both states. This is motivated by several factors, such as the difficulty of environmental and land regularization, the lack of information for producers located in distant regions, the indebtedness and the bureaucracy for those who have the information. Although not preventing production, this factor compromises the development of the activity.

Aquaculture in both states studied is still basically done by micro-producers, has low productivity and little competitiveness, which requires sectoral public policies that enable the development of this activity on a more sustainable basis.

Regarding the strengths, opportunities, weaknesses, and threats, concerning the general aspects, we can conclude that the information generated is remarkably similar, which shows a similarity between the aquaculture of the two states. However, when the local aspects are considered, significant differences were observed mainly in water availability (favourable to Pará) and the competitiveness of aquaculture (favourable to Ceará).

The priorities defined in both states were the same, highlighting the enormous similarities of the problems affecting Brazilian aquaculture.

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