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# THE IMPORTANCE OF THE LARGEST PUBLIC SUPPLY CENTER IN THE FRUITS AND VEGETABLES CHAIN IN THE BRAZILIAN PRODUCTION SYSTEM: AN ANALYSIS USING THE BUSINESS MODEL CANVAS

# ZNACZENIE NAJWIĘKSZEGO CENTRUM DOSTAW PUBLICZNYCH W ŁAŃCUCHU OWOCE I WARZYWA W BRAZYLIJSKIM SYSTEMIE PRODUKCYJNYM: ANALIZA Z WYKORZYSTANIEM SZABLONU MODELU BIZNESOWEGO

**Abstract:** Brazil is the third largest fruit producer in the world, with about 45 million tons per year. An important piece in this production chain is the Supply Centers, as a large part of the sale of vegetables, fruits and flowers in Brazil has been carried out through the Supply Centers. The purpose of this article is to present the importance of the fruit and vegetable production chain in Brazil and to analyze the value proposition of the largest supply center through the Canvas Business Model. This work can be classified as exploratory research of a qualitative nature. Exploratory research aims to provide greater familiarity with the problem, with a view to making it more explicit. The case study methodology is adopted because it is appropriate for such exploratory research. Based on the results and analysis it was verified that CEAGESP SP is the largest distribution center in Brazil, its main function is to facilitate the commercialization, distribution and storage of horticultural products, guaranteeing in a sustainable way the adequate and necessary infrastructure so that merchants to carry out their activities with guaranteed security.

**Keywords:** Brazil, Canvas, fruits, supply centers, vegetables

**Streszczenie:** Brazylia jest trzecim co do wielkości producentem owoców na świecie, z około 45 milionami ton rocznie. Ważnym elementem tego łańcucha produkcyjnego są Centra Dostaw, ponieważ duża część sprzedaży warzyw, owoców i kwiatów w Brazylii odbywa się za pośrednictwem Centrów Dostaw. Celem artykułu jest przedstawienie znaczenia łańcucha produkcji owoców i warzyw w Brazylii oraz analiza propozycji wartości największego centrum dostaw poprzez szablon modelu biznesowego. Pracę tę można zaliczyć do badań eksploracyjnych o charakterze jakościowym. Badania eksploracyjne mają na celu większe zapoznanie się z problemem w celu jego uwypuklenia. Przyjęto metodologię studium przypadku, ponieważ jest ona odpowiednia dla takich badań eksploracyjnych. Na podstawie wyników i analizy potwierdzono, że CEAGESP SP jest największym centrum dystrybucyjnym w Brazylii, jego główną funkcją jest ułatwianie komercjalizacji, dystrybucji i przechowywania produktów ogrodniczych, gwarantując w sposób zrównoważony odpowiednią i niezbędną infrastrukturę, aby handlowcy mogli prowadzić swoją działalność z gwarancją bezpieczeństwa.

**Słowa kluczowe:** Brazylia, Canvas, owoce, centra zaopatrzenia, warzywa

## Introduction

According to EMBRAPA[1], Brazil is the third largest fruit producer in the world, with about 45 million tons per year. Most of this production is aimed at the domestic consumer market – only 2.5% is exported. The Brazilian vegetable market is highly diversified and segmented, with production volume concentrated in six species – potatoes, tomatoes, watermelons, lettuce, onions, and carrots, with family farming responsible for more than half of production.

The behavior of Brazilian consumers in the consumption of fruits and vegetables has changed, as in addition to seeking healthier products with a good body shape, they are more attentive to quality and origin, following global trends[2].

In Brazil, approximately 26 million tons of food are wasted annually, of which 5.3 million tons are fruit and 5.6 million tons are vegetables[3].

An important piece in this production chain is the Supply Centers, as a large part of the sale of vegetables, fruits and flowers in Brazil has been carried out through the Supply Centers. The creation of these allowed the organization and expansion of the commercialization of horticultural products, through the concentration of buyers and sellers in the same place[4].

The purpose of this article is to present the importance of the fruit and vegetable production chain in Brazil and to analyze the value proposition of the largest supply center through the Canvas Business Model.

## Literature review

### Production chain of fruits and vegetables

Many fruit and vegetable production chains in Brazil are becoming economically, financially, and organizationally complex. They are formed by a group of economic agents such as input industries, machinery, packaging and food processing, farmers and logistics, transport, wholesale, and retail companies, etc.[5]

The productive chain of fruits and vegetables is one of the most important chains, as Brazil is one of the main producers of fruits and vegetables in the world,

[1] EMBRAPA, *Ciência que transforma*, Available at: https://www.embrapa.br/grandes-contribuicoes-para-a-agricultura-brasileira/frutas-e-hortalicas. Access on: May, 20 2023.

[2] J.R.F. de Lima, M.T.M. Pedroso, *Impactos da crise do coronavírus nas cadeias produtivas de frutas e hortaliças brasileiras*, Revista De Economia E Agronegócio, 2020, vol. 18, no. 2, p. 2-10.

[3] Centro de Estudos e Debates Estratégicos, *Perdas e Desperdício de Alimentos: Estratégias para Redução*, 2018, no. 1, p. 272.

[4] J. Lima, *Criação, importância e funcionamento das centrais de abastecimento*, Agrarian academy, 2015, vol. 2, no. 03, p. 35.

[5] J.R.F. de Lima, M.T.M. Pedroso, *Impactos da crise…*, p. 2-10.

it reached the 3rd place in the world ranking of production, reaching 45 million tons per year, an expressive number if considering the enormous amounts wasted throughout the entire production chain[6].

The increased consumption of fruits and vegetables seems to be a reality in developed countries, such as the United States and Japan, in addition to Europe. However, it may not correspond to reality in underdeveloped or developing nations, such as in Latin America, the Caribbean, Africa and some regions of Asia and the Middle East[7].

The Brazilian fruit and vegetable chain has shown an increase in demand and consumption, following a global trend, and leading to greater quality demands on the part of its final customer. (CEASAs) and the emergence of large supermarket chains, in the distribution and wholesale segment[8].

According to Lima and Pedroso[9] the main aspects of fruit and vegetable production chains are:

The first characteristic is that fruits and vegetables are highly perishable products, which prevents them from being stored for a prolonged period, as occurs with grains.

The second characteristic is that, in general, production, harvesting, packaging, transport and marketing depend on a lot of manpower.

The third characteristic is that, due to their high perishability, an important proportion of fruits and vegetables depend on the "cold chain", but which is not fully developed in Brazil, as occurs in so-called "more advanced" countries.

The fourth characteristic is that fruits and vegetables are not based on the production of a single commodity, like the soy or chicken production chains. They consist of numerous products.

The fifth characteristic is related to the commercialization channels, which are countless. Although the economic agents of the fruit and vegetable production chains differ greatly in a gradual way, as shown above, the authors chose to present each production channel in a binary form (large/small, specialized/diverse) to enable the presentation of an overview in a didactic way in a short space.

## Supply centers

Most of the commercialization of vegetables, fruits and flowers in Brazil takes place through supply centers. The creation of these allows organizing and expand-

[6] EMBRAPA, *Ciência que…*, 2023.

[7] J.P.T. Dias, *Trends in the production and consumption of vegetables: the world and Brazil,* In: Perspectives in horticulture, Belo Horizonte: EdUEMG, 2021.

[8] R.H. dos Santos, F.C.F. Malacoski, S.M. de Alencar Schiavi, J.P. de Souza, *Cadeia de frutas, verduras e legumes no brasil: uma revisão bibliográfica sobre as transações e estruturas de governança*, Organizações Rurais & Agroindustriais, 2022, vol. 24, p. 1-17.

[9] J.R.F. de Lima, M.T.M. Pedroso, *Impactos da crise*…, p. 2-10.

ing the marketing of horticultural products by bringing together buyers and sellers in one place[10].

The distribution of fruits and vegetables in Brazil operates at two main levels: wholesale and retail. Wholesale is mainly represented by CEASA, independent wholesalers, large retail chains and intermediaries' own distribution centers[11].

Wholesale companies, colloquially known as "box", are usually located in or close to supply centers (Ceasas). For a better understanding, the author divides them into two categories: a) wholesale companies specialized in the commercialization of a certain vegetable or fruit; b) diversified wholesale companies that sell different vegetables or fruits. The savings of "expertise" are greater. Its customers are mainly small and medium-sized supermarkets without a Distribution Center[12].

According to Lima[13], in 1970 the Strategic Development Program was created which, together with the I Development Plan, created between 1972 and 1974, established the construction of Supply Centers (CEASAs) as a priority. The creation of CEASAs in Brazil was established from the search for existing organizational models in other countries.

Based on existing organizational models in other countries, a supply center was created in Brazil. Supply markets in Spain is a model that combines private commercial operations with systematic management of the public and was the inspiration for its creation[14].

The main CEASA in Brazil is the Company of Warehouses and General Warehouses of São Paulo (CEAGESP), linked to the Ministry of Agriculture, Livestock and Supply (MAPA), which has unique importance in the commercialization of vegetables in Brazil. CEAGESP is considered the largest wholesale warehouse (mainly in storage and warehouse) in Latin America, working with vegetables and various products (fruits, vegetables, flowers, garlic, potatoes, onions, dried coconut, eggs and fish)[15].

## Business Model Canvas

The Business Model Canvas (BMC), Figure 1, was developed by Alex Osterwalder and Yves Pigneur, and co-created with a host of 470 practitioners from around the world. It offers a simple, visual, one-page canvas on which to design, innovate and dialogue about business models[16].

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[10] J. Lima, *Criação, importância* …, p. 35.
[11] A.E.B.S. Lourenzani, *Conditions for the inclusion of small producers in distribution channels: an analysis of collective actions,* (Doctorate Thesis), Federal University of São Carlos, 2005, p. 218.
[12] J.R.F. de Lima, M.T.M. Pedroso, *Impactos da crise*…, s. 2-10.
[13] J. Lima, *Criação, importância*…, p. 35.
[14] Ibidem, p. 35.
[15] J.P.T. Dias, *Trends in the*…, 2021.
[16] I. Burkett, *Using the business model canvas for social enterprise design*, Knode, vol. 2, 2013.

Osterwalder [17] introduced this business model to provide an efficient means of fully capturing the key aspects of how a company might approach a particular business proposition, and it is comprised of nine "building blocks" encompassing a relatively complete set. and comprehensive set of business planning measures.

Canvas dimensions can be interpreted through the building blocks: such as – key partnerships, key activities and key resources; what – value proposition; for whom – relationship with customers, channels and customer segments; how much – structure of costs and revenues.

## Methodology

This work can be classified as exploratory research of a qualitative nature. For Gil[18], exploratory research aims to provide greater familiarity with the problem, with a view to making it more explicit.

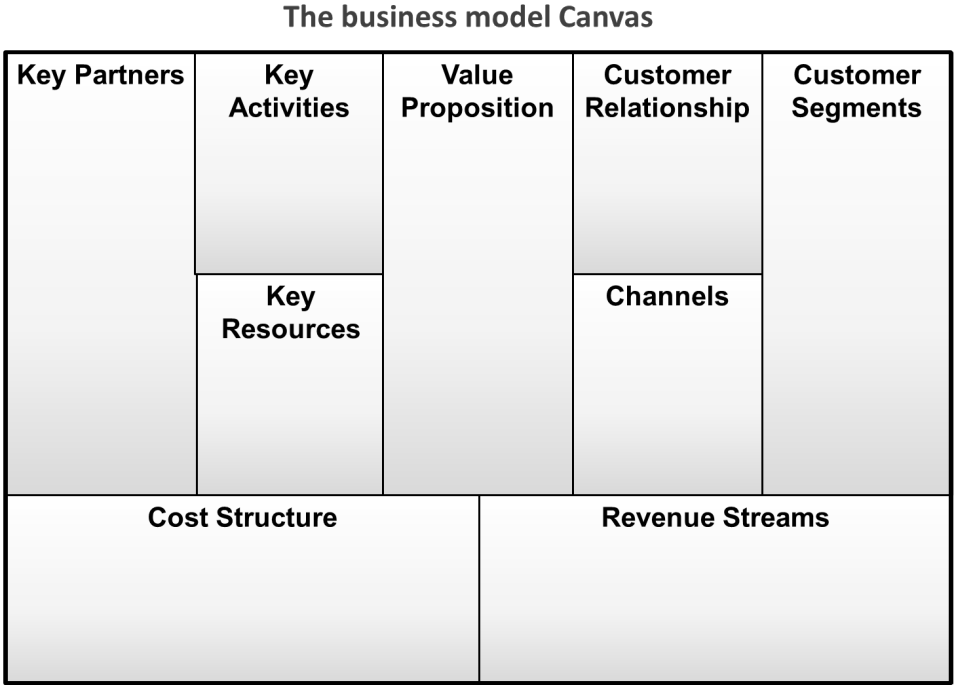
The case study methodology is adopted because it is appropriate for such exploratory research [19]. The case study is the chosen strategy when examining contemporary events. However, the richness of the phenomenon and the extension of the real-life context require the researcher to face a technically different situation, as there will be many more variables of interest than data points[20].

To collect the necessary information for the analysis, it was decided to use interviews with managers and employees of CEAGESP and an interview script with open questions was organized.

The analysis of responses/data was carried out by comparing the responses with the literature review carried out based on the Canvas business model.

[17] A. Osterwalder, *The business model ontology a proposition in a design science approach* (Doctoral dissertation), Université de Lausanne, 2004.
[18] A.C. Gil, *Como elaborar projetos de pesquisa*, Editora Atlas SA, Sao Paulo 2002.
[19] S.L. Pan, B. Tan, *Demystifying case research: A structured–pragmatic–situational (SPS) approach to conducting case studies,* Information and organization, 2011, vol. 21, no. 3, p. 161-176.
[20] R.K. Yin, Estudo de Caso: Planejamento e métodos, Bookman 2015.

Figure 1. Business Model Canvas (BMC)
Rysunek 1. Model Biznesowy Canvas




Source: Adapted from Burkett (2013).

## CEAGESP[21]

It makes it possible for the production from the field, coming from several Brazilian states and other countries, to reach people's tables with regularity and quality. To this end, it has two distinct and complementary business units: storage and warehouse.

In this way, the Company guarantees, in a sustainable manner, the necessary infrastructure for wholesalers, retailers, rural producers, cooperatives, importers, exporters and agribusinesses to develop their activities with guaranteed safety, efficiency and qualified services.

CEAGESP maintains the largest public network of warehouses, silos (large deposits, in the shape of a cylinder, to store agricultural products) and bulk carriers (places that receive or house bulk goods) in the State of São Paulo, totaling 13 active units distributed throughout the state of Sao Paulo.

[21] CEAGESP, Institutional, Available at: https://ceagesp.gov.br/a-ceagesp/institucional/ Access on: May 23, 2022.

It also has a network of warehouses (warehouses or sales of goods) with 13 active units, also distributed throughout the State of São Paulo, including the largest supply center for fruits, vegetables, flowers, fish, and miscellaneous products (garlic, potatoes, onion, dried coconut, and eggs) from Latin America – the Terminal São Paulo (ETSP). Located in the west zone of São Paulo, around 50,000 people and 12,000 vehicles circulate daily through the site.

## Results and analysis

Having the Canvas Business Model as the theoretical model to evaluate the characteristics of CEAGESP:

Value offer

- Warehouses located in important consumer and producer centers in the State of São Paulo.
- Credibility in warehouse and storage services.
- Offer of services that allow better commercialization conditions, adding value to the product.
- CEAGESP brand recognition.
- CEAGESP Price Index as a guide for the wholesale prices of fruit and vegetables.

CEAGESP SP is the largest supply center in Latin America and one of the largest in the world, in 2021 the volume of fruit and vegetables sold was 3,097,895 tons. The CEAGESP Storage network is made up of silos, bulk carriers, and conventional warehouses; operates with the storage of grains, sugar, and various industrial products. It is the largest network in the State of São Paulo and one of the largest in Brazil. Static capacity: 1,172,550 tons.

Relationship with customers

- Initial contact through access points to the storage network and warehouses, located in business units or central administration.
- Institutional relationship with customers and service providers, seeking to reinforce the Company's guidelines and values and optimize the services provided.

CEAGESP works as a large fruit and vegetable trade hub, where the wholesaler rents a space (box) in the Distribution Center, receives large quantities of products transported by trucks from producers and sells the products as wholesale to supermarkets, retailers etc. In 2021, the number of wholesalers (Permit Holders) was 2,137, flow of people/day: 47.6 thousand and flow of vehicles/day: 12 thousand.

Channels

- Face-to-face service
- Announcements
- Periodic newsletters
- Official Website www.ceagesp.gov.br
- CEAGESP Official Blog
- Social Networks:
  - Facebook
  - Instagram
  - Twitter
  - YouTube

Although the main relationship is face-to-face or face-to-face, CEAGESP uses social networks and Internet tools to communicate with customers.

Customer Segments

Distributed in the main municipalities of São Paulo, producers and consumers of fruit and vegetables, flowers and fish, and depositors of agricultural and industrial products, can be: Rural Producer, Individual Company, Limited Company, Joint Stock Company, MEI, EIRELI and Cooperative. CEAGESP's customers are companies and organizations, as fruit and vegetables are sold wholesale rather than retail.

Key activities

- Network of business units, warehouses, and general stores, allowing the remunerated use of their spaces and/or facilities to third parties, for the purposes of marketing horticultural/agricultural products.
- Execution of related storage services.
- Operational and technical management of activities.

CEAGESP is responsible for two distinct but complementary main activities: storage (13 active units) and warehouse (13 units), located in strategic regions of the State of São Paulo.

Key resources

- Adequate marketing and storage infrastructure.
- Expertise in preparing statistical data for market price formation.
- Elaboration of Technical Norms for services and classification, standardization and labeling of products.
- Expertise in carrying out phytosanitary controls.
- Know-How of the production chain, production / distribution / consumption of products.

CEAGESP has the following resources:

Material resources: total area: 637,897.46 m², commercial area (useful): 150,073.08 m², Parking lots: 57,023.96 m² and built area: 231,000.00 m². With 47 warehouses for sale, 88 stores and various commercial rooms, 7 snack bars, 44 food kiosks, 3 banks and 1 gas station. Human resources: 547 career employees, 2137 permit holders, 384 street vendors and 3641 self-employed loaders.

Key partnerships

- Warehousing
  - Farmers
  - wholesale licensees
  - Distributors and wholesalers
  - miscellaneous merchants
  - small retailers
  - general users

- Storage
  - Farmers
  - Cooperatives and agroindustry
  - Traders
  - logistic operators

CEAGESP maintains several key partnerships as mentioned, one that can be highlighted is the CEAGESP Food Bank, which started in 2013 and has as its main objective to combat food waste from sales in the Warehouses. As a result, 2013 tons of food were donated, 252 entities were registered, 1263 were assisted and 110 Food Banks were assisted.

Cost structure

- Personnel applied in the provision of services – own, third-party, and temporary
- Electricity – operational consumption
- Water and sewage – operational consumption
- Inputs – used in the conservation and standardization of the quality of stored grains
- Taxes and fees

Sources of revenue

- Remunerated Usage Permission
- Remunerated Concession of Use
- Use Authorization

- Storage of agricultural, industrial, and miscellaneous products
- Cleaning, drying and phytosanitary treatments and transhipment services
- Vegetable classification

CEAGESP had a revenue of BRL 9 billion in 2021.

## Conclusion

Based on the results and analysis it was verified that CEAGESP SP is the largest distribution center in Brazil, its main function is to facilitate the commercialization, distribution, and storage of horticultural products, guaranteeing in a sustainable way the adequate and necessary infrastructure so that merchants to carry out their activities with guaranteed security.

In the storage activity, the company maintains its hegemony as the largest state public storage network of agricultural products and derivatives, in bulk and packaged in the country, which seeks to offer services in the post-harvest segment, guaranteeing safe structures and conditions at a fair price for the storage and/or processing of agricultural products and derivatives, in addition to ensuring their quality and rationalization of supply in the domestic market and providing support to the export sector of agricultural commodities.

CEAGESP stands out in the national scenario of agri-food supply due to its accumulated knowledge about post-harvest storage systems for agricultural products and derivatives, as well as about supply systems for fruit and vegetables, flowers, and fish.

As future research, it is recommended to delve deeper into marketed fruits and vegetables to study the evolution of prices, producers, countries of origin, etc.

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