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REGULAR ARTICLE

The economic importance of the peanuts production chain

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Abstract

The importance and economic representativeness of the peanut production chain has grown exponentially in recent years, tending to gain more market share. Background: The study had as its theme the question: What is the economic, technological, social and environmental relevance of the peanut production chain for Brazil? Objective: Conduct a survey of information and data that allow inferring the economic, social and environmental importance of the peanut production chain for Brazil in the global scenario. Methods: The methodology applied was exploratory research "ad hoc" in exploratory theoretical essay of qualitative approach, and analytical descriptive in the report of the findings. Results: Exports grow on a logarithmic scale, in 2020 it had revenues of US$ 427.8 million. The sector generates 42 thousand jobs, and the culture makes it possible to meet social and environmental demands. Conclusions: The adoption of technologies and the improvement of production methods are essential for the continuous progress of the sector with the creation of jobs and the adhesion of new producers, with an increasingly sustainable production, with less environmental impact and reduction of fertilizer waste, with expansion of the productive capacity per planted bushel.

Keywords

Exports. Economic Impact. Development. Technology. SDGs.

Introduction

The present study seeks to briefly present the importance and economic representativeness that the peanut production chain currently has for Brazil in the world, as well as the influence of technological innovation, productive representativeness and the relationship of low environmental impact. It has proved to be one of the agricultural crops that makes the greatest significant contribution to sustainability, with a greater capacity to increase productivity per hectare, without the need to expand the planting area. (Franco Goulart et al., 2017; Jara-Rojas et al., 2020).

In Brazil, peanut production has reached relevance as a base element for the production of vegetable oil, meeting the demands of the internal and external market, as well as with other products derived from peanuts. (Akram et al., 2022).

The history of national production shows periods of growth from 1965 to 1974, and then a continuous decline until 1997, the year that "important technological changes in the cultivation and processing of the product, which have implications for the volume produced and the characteristics of the market" (EMBRAPA, 2014). In this way, the last 15 years were marked by technological innovation that expanded the techniques and national production capacity of peanuts. The impact of the changes was relevant and highly perceptible by the results achieved in the production and export volumes of "in natura" peanuts in shell and shell, crude peanut oil, and other derivatives (Franco Goulart et al., 2017).

The relevance of this market in global terms in 2019, when it comes to peanuts in grain, was US$ 3.3 billion, with 7% from Brazil, which is currently the fifth largest global supplier of the grain, preceded by: India, USA, Argentina and China (Trade Map, 2022).

Considering the possibilities of innovation and creation of value in agri-food systems and in particular in the peanut production chain, innovation in broad aspects, from commercial and economic dynamics, to those related to social and environmental responsibility and the creation of value and development of agri-food systems clearly align with the fulfillment of the Sustainable Development Goals – SDGs of the 2030 Agenda with:

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Goal: 2.3 By 2030, double agricultural productivity [...] productive resources and inputs, knowledge, financial services, markets and opportunities for value-adding and non-agricultural employment;

Goal: 2.b Correct and prevent trade restrictions and distortions in world agricultural markets;

Goal: 8.1 Sustain per capita economic growth according to national circumstances and, in particular, an annual growth of at least 7% of gross domestic product [GDP] in least developed countries;

Goal: 9.5: Strengthen scientific research, improve the technological capabilities of industrial sectors;

Goal: 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. (GT Agenda 2030, 2022).

Based on the arguments presented, the importance of carrying out this research is justified, for which the theme was defined: What is the economic, technological, social and environmental relevance of the peanut production chain for Brazil?

Objectives

In order to report assertive responses to the research topic, the study had the following general objective: To carry out a survey of information and data that allow inferring the economic, social and environmental importance of the peanut production chain for Brazil in the global scenario.

As specific objectives were set:

a) Identify the economic representativeness of peanut production in Brazil;

b) Relate production to environmental and social responsibility;

c) To determine the relationship of technology to the development of the sector.

Materials and methods

The methodology applied for the development of the present study was the exploratory research "ad hoc" to publications in the databases of FIESP, EMBRAPA, IBGE, Trademap and repositories (ScienceDirect and Scopus), on sector information and referring to exports to structure the exploratory theoretical essay with a qualitative and descriptive approach, and explanatory in the presentation of analyzes and findings in the exposition of results.

Results and discussion

After searching and identifying information from several databases and institutions that have information on the sector, it was possible to identify the participation of the peanut production chain in Brazil and its participation in the international market.

In the domestic market, peanut consumption has seasonality given the relationship to the harvest period, occurring at its peak in the months of June and July. The peanut production chain generates around 42 thousand jobs, of which 19% are in industry, 24% in farming and 57% are indirect jobs related to the sector.

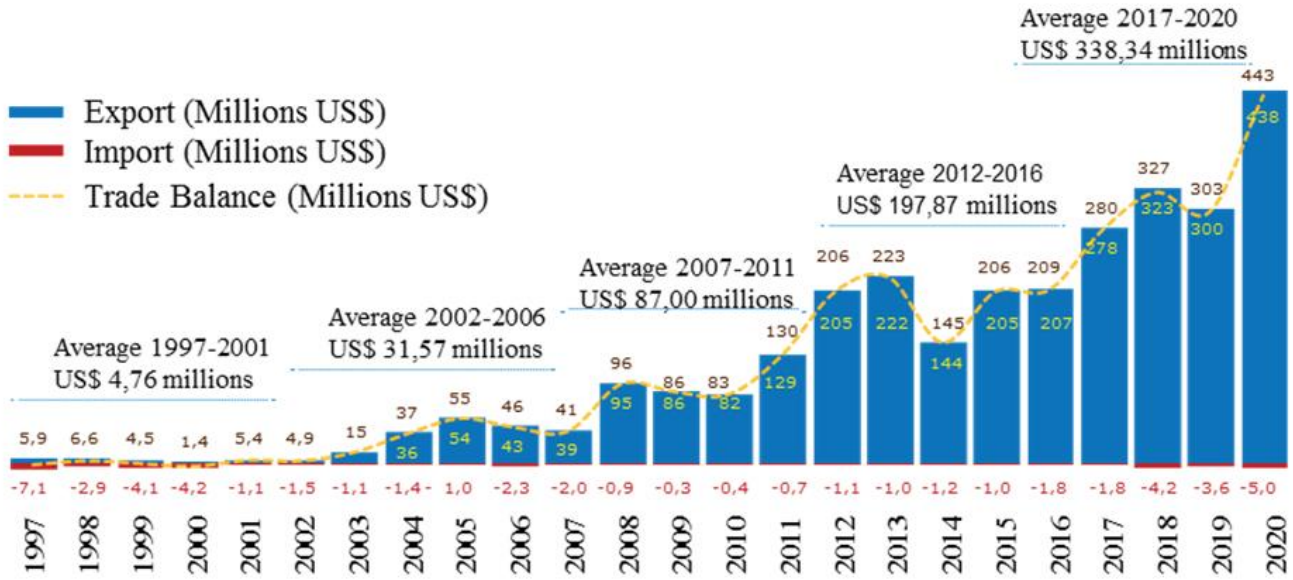
The social and economic dynamic generated by the market potential of peanuts drives rural entrepreneurs to adopt a "variety of resources to create distinctive business opportunities that meet economic and lifestyle goals" (Bosworth et al., 2023, p. 552). Since “the social structure that results from the interaction between social organization, social change and a technological paradigm constituted around digital information and communication technologies” (Castells, 2004, p. xvii), generating healthy work environments.

As different models of work fronts emerge in the peanut production sector, one sees the "importance of inclusion and identity in determining its relationship with other actors in the local economy" (Bosworth et al., 2023, p. 550).

It is estimated that around 150 companies are responsible for around 92 thousand tons of final products (flour, oil, peanut butter, peanut candy, etc.), forming a market of around US$ 443 million, of which in around 64% of the State of São Paulo, 24% of Paraná and the rest of the other producing states such as Rio de Janeiro, Espírito Santo, Minas Gerais, southern and northeastern states (Joao & Lourenzani, 2007; Trade Map, 2022).

The main buyers of Brazilian production are the Netherlands, Indonesia, China, Russia, Germany, Mexico, Canada, the United Kingdom, Vietnam and Poland, which together account for 64% of the total value of imports in 2019. Of this market share, Brazil holds 48.3% of the Russian market, followed by Poland with 14.3%, the Netherlands with 5.7% and the United Kingdom with 4.3%. If there are opportunities to increase participation in these markets, as well as the possibility of new agreements with other consuming nations (EMBRAPA, 2014; Trade Map, 2022).

The commercial impact of the product, in addition to the increase in value and volume exported, the sector had an exponential gain that almost doubled the number of nations with which it traded from 56 markets in 2010 to 100 markets in 2020. However, the main exported product is peanuts in grain, with an average of 73% of the amount in the 2018-2020 triennium. Noticing, however, an increase in exports of peanut oil that corresponds to 22% on average for the same period (FIESP-DEAGRO, 2022; Trade Map, 2022), observe in Graph 1, contribution to the trade balance.



Graph 1. The contribution of peanut production to the trade balance. Source: Fiesp Deagro based on Comex Stat data (FIESP-DEAGRO, 2022.

As demonstrated in Graph 1., the ratio between imports and exports related to the sector shows a gain of US$ 338 million in 2020. In this specific case, it is worth noting that the State of São Paulo was the main exporting player with 97% of total peanut products in 2020 , that is, a turnover of US$ 427.8 million. The regions and municipalities with the highest share were Tupã with 20.7%, Borborema with 13.5%, Jaboticabal with 12.7% and Catanduva with 10.6%, together adding up to 57.6% of total revenue generated by exports in 2020. There are still strong indications of opportunities for increased production and exports, both to current and new markets (FIESP-DEAGRO, 2022; Trade Map, 2022). Peanut production referring to the planted area, based on information gathered from official data sources, the level of productivity is still below the reality pointed out by the sector, with some need for planning and adoption of public policies for the sector. (EMBRAPA, 2014; Rodrigues, 2021)

In accordance with the IBGE's Agricultural Census, it can be identified that the smallest producers have less than 200 ha of planted area and represent 23.7% of production, those with a size of 200 to less than 500 ha with 25.2%, those with 500 to less than 1,000 ha of 21.3% and producers with 1,000 to less than 2,500 ha of planted area are responsible for 22.5%. Since the average productivity grows as the property increases, however, there is no increase in the planted area in equal measure. (FIESP, 2021; IBGE, 2017).

Opportunities were identified to increase production only with improvements in production factors and technologies applied in production to increase productivity, considering that the indicator varies between 3.3 tons/ha and more than 5.0 tons/ha (FIESP, 2021; IBGE, 2017). In addition to the ability to increase production, without increasing the planted area, peanuts have the ability to use peanuts in crop rotation with sugarcane to reduce production costs and help prevent problems such as lack of of nitrogen in the soil, and promotion of environmental sustainability, conservation and recovery of soil nutrients. Regarding technology, even in the face of advances in the use of digital equipment, tracking and mapping of production and application of inputs with state-of-the-art systems, there is still a great need for development and adoption on the part of producers, which can enable greater increased productivity and lower environmental impact (FIESP, 2021; Joao & Lourenzani, 2007).

Conclusions

The productive chain of peanuts, highly promising with a relevant impact on the economy with its substantial contribution to the economic and social balance with the generation of direct and indirect jobs. The work fronts in the field, giving small producers the opportunity to work with a crop that has been generating foreign exchange and less environmental impact. And, throughout the production chain with the provocation of a sector institutionally interrelated with other crops such as sugarcane, soy and coffee.

It can be seen that in the global scenario, it supports the supply of a need in more than 100 different markets with a participation as 10th place, but with strong possibilities of increasing market share.

The foreign exchange generated contributes to the generation of jobs both in the field and in the industry, meeting the guiding principles of the SDGs. Contributing to national competitiveness and development. The peanut crop can be used in crop rotation, making it possible to increase productivity without the need to increase the planting area, contributing to soil preservation and having a low environmental impact. Your "in natura" product and/or derivatives such as oil, flour, pastes, etc. contribute to sustainability by generating nutritious food and producing energy with biodiesel from peanut oil.

Even with the technological advance, there is still a need for the adoption of certain mechanisms by a considerable part of the producers, to reduce waste and boost results both in economic terms and in terms of environmental responsibility. Considering, therefore, the integration and engagement of producers in the adoption of technologies and improvement of larger and better production methods will be the chain's productivity and market growth.

References

Akram, F., Haq, I. ul, Raja, S. I., Mir, A. S., Qureshi, S. S., Aqeel, A., & Shah, F. I. (2022). Current trends in biodiesel production technologies and future progressions: A possible displacement of the petro-diesel. Journal of Cleaner Production, 370, 133479. https://doi.org/10.1016/j.jclepro.2022.133479

Bosworth, G., Whalley, J., Fuzi, A., Merrell, I., Chapman, P., & Russell, E. (2023). Rural co-working: New network spaces and new opportunities for a smart countryside. Journal of Rural Studies, 97, 550–559. https://doi.org/10.1016/j.jrurstud.2023.01.003

Castells, M. (2004). The Network Society. Edward Elgar Publishing. https://doi.org/10.4337/9781845421663

EMBRAPA. (2014). Sistemas de Produção Embrapa Sistema de Produção de Amendoim. Embrapa Algodão, Sistema de Produção, 7. https://www.spo.cnptia.embrapa.br/conteudo?p_p_id=conteudoportlet_WAR_sistemasdeproducaolf6_1ga1ceportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1&p_r_p_-76293187_sistemaProducaoId=3803&p_r_p_-996514994_topicoId=3432

FIESP. (2021). Agronegócio do Amendoim no Brasil: Produção, transformação e oportunidades (p. 30). FIESP.

FIESP-DEAGRO. (2022). Agronegócio | Sindicato Nacional das Indústrias de Café Solúvel – SINCS. https://www.fiesp.com.br/sincs/guia-fiesp/agronegocio/

Franco Goulart, D., Porfirio de Almeida, R., Costa Resende, K., Melo da Costa, F. A., & Cortez Bezerra, J. R. (2017). O DESAFIO DA ESTRUTURAÇÃO DA CADEIA PRODUTIVA DO AMENDOIM NO SEMIÁRIDO DO NORDESTE. Organizações Rurais e Agroindustriais, 19(1), 47–59. https://doi.org/10.21714/2238-68902017v19n1p047

GT Agenda 2030. (2022). VI Relatório Luz da Sociedade Civil da Agenda 2030 de Desenvolvimento Sustentável Brasil (Relatório Luz sobre a Agenda 2030 no Brasil 2022 VI). https://gtagenda2030.org.br/relatorio-luz/relatorio-luz-2022/

IBGE. (2017). IBGE - Censo Agro 2017. IBGE - Censo Agro 2017. https://censoagro2017.ibge.gov.br/1999-novo-portal/trabalhe-conosco/33078-2022-02-agente-de-pesquisas-e-mapeamento-complementar.html

Jara-Rojas, R., Canales, R., Gil, J. M., Engler, A., Bravo-Ureta, B., & Bopp, C. (2020). Technology adoption and extension strategies in mediterranean agriculture: The case of family farms in Chile. Agronomy, 10(5). Scopus. https://doi.org/10.3390/agronomy10050692

Joao, I. S., & Lourenzani, W. (2007). Análise da cadeia agroindustrial do amendoim na região de Tupã e Marília—SP. Sistemas Agroalimentares e Cadeias Agroindustriais, 20. https://www.researchgate.net/publication/242125709_ANALISE_DA_CADEIA_AGROINDUSTRIAL_DO_AMENDOIM_NA_REGIAO_DE_TUPA_E_MARILIA_-_SP

Rodrigues, R. (2021). Segurança Alimentar Global—Artigo—Portal Embrapa. https://www.embrapa.br/olhares-para-2030/artigo/-/asset_publisher/SNN1QE9zUPS2/content/roberto-rodrigues?inheritRedirect=true

Trade Map. (2022). Trade statistics for international business development Monthly, quarterly and yearly trade data. (Market Analysis and Research, International Trade Centre (ITC)) [2021 global trade indicators in Trade Map]. International Trade Centre. https://www.trademap.org/Index.aspx