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Community-Supported Agriculture in Brazil: Co-Responsibility in Agroecological Production to Strengthen Food Security

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Abstract

The current shape of the world's food system has promoted increasingly globalized food models, putting people's food sovereignty and security at risk. Community-supported agriculture (CSA), a movement grounded on ecologically-based agriculture and an alternative model for marketing and distributing food produced on small farms, was proposed as a means of improving consumers' eating habits, strengthening local food production, and promoting food sovereignty. This study aimed to identify the potential of CSA as a promoter of food security in Brazil. Based on an integrative literature review, results showed that CSA can guarantee a decent income for family farmers, reducing social vulnerability. Farmers see CSA as an opportunity for income security; consumers engaged with this initiative have perspectives on personal health interests, social justice, and solidarity with farmers. An essential potential for promoting food sustainability was observed, as CSA is strongly influenced by agroecology, and local food production and consumption have a lower impact on carbon dioxide emissions as they require less transportation. However, despite these positive aspects, CSA has suffered a significant limitation in the elitization of this movement, reflecting historical social inequalities in which only a relatively small portion of the population has the privilege of being able to pay for healthier food. It is necessary to think about strategies for getting people who are more socially vulnerable and food insecure to join the movement. In conclusion, CSA has significant potential to promote agroecology, but it needs to rethink better ways of promoting food security.

Keywords

community-supported agriculture; food security; social responsibility; solidarity economy; sustainable agriculture

1. Introduction

The current agro-industrial model of food production has led the world's food supply to display some concerning patterns (Khoury et al., 2014). The Green Revolution and agribusiness emerged with the promise of eradicating hunger by increasing food production. However, although more and more food is being produced, most of this is for animal consumption and is not sustainable (Esteve, 2017; Wojcichoski et al., 2021). A great amount of food produced is wasted, and food insecurity and hunger have not been eradicated (Food and Agriculture Organization of the United Nations [FAO], 2019).

The excessive use of pesticides and transgenic seeds (Ramos et al., 2018) has sustained large-scale food production. In addition to the negative implications for food security and sovereignty, consuming food with a high presence of pesticides harms the environment and the population's health (Carneiro et al., 2015; Instituto Brasileiro de Geografia e Estatística, 2015).

Despite so many chemical and technological resources, the agro-industrial production model has not only failed to solve the problem of food insecurity but has also proved fragile in the face of exceptional circumstances, such as the coronavirus pandemic, when several populations ran out of food (Lal, 2020; Lopes et al., 2020). This has called into question the market character that agribusiness imposes on food, where the priority is to produce commodities for profit. This scenario leads to an urgent need for healthier and more sustainable food production alternatives.

In that way, agroecology has been gaining prominence worldwide, with guidelines that respect and promote peoples' sovereignty and food security. Agroecology is a science that studies sustainable and ecologically based agro-production systems based on rural development from a social, local, and peasant perspective (Esteve, 2017; Souza et al., 2012).

In the specific case of Brazil, food and nutrition security is understood as the right of everyone to regular and permanent access to quality food, in sufficient quantity, without compromising access to other essential needs, based on health-promoting dietary practices that respect cultural diversity and are socially, economically, and environmentally sustainable. Closely related to this concept are the concepts of the human right to adequate food, which is part of the fundamental rights of humanity defined by a global pact to which Brazil is a signatory, and food sovereignty, which refers to the right of each country to determine its policies and sustainable strategies for the production, distribution, and consumption of food for the entire population, respecting the culture of its peoples (Presidência da República, 2006).

Community-supported agriculture (CSA) is a social movement based on agroecology. It is based on an alternative model for producing, marketing, and distributing locally grown food on small, agroecologically based farms, respecting seasonality (Bîrhală & Möllers, 2014; Cone & Myhre, 2000; Perez et al., 2005; Vasquez et al., 2017). It is committed to establishing direct communication between farmers and consumers, with a contractual co-responsibility agreement in which the consumer provides capital to the producer before food production. This proposal allows farmers to plan production according to an already guaranteed market, ensuring the flow of their production and providing more security and less waste (Cone & Myhre, 2000; Florisbelo et al., 2020; Soil Association, 2012).

It's important to investigate the feasibility of establishing CSA in urban areas. CSA can bring sustainable and agroecological food production to cities, with consumers having easier access to food producers and getting more knowledge about the production process. CSA can be a space for coexistence and rapprochement between those involved (Florisbelo et al., 2020).

CSA emerged in Japan, where a group of women was alarmed by news of the growing pesticide poisoning, and in parallel, in Europe in the 1970s, when concerns about food safety and sustainable organic food production began. Initially, the system was called "Teikei," and it proposed reconnecting producers and consumers through direct marketing supplies (Vasquez et al., 2017). Only later, in the 1980s, did this movement, CSA, grow in the United States, gaining significant momentum worldwide and establishing itself on five continents (Lopes et al., 2020; Vasquez et al., 2017). A growing number of people interested in healthy eating and concerned about the environment has contributed to the expansion of CSAs worldwide (Dong et al., 2019). There is currently a network of around 2 million families who are part of CSA initiatives around the world under different names, such as Associations pour le maintien d'une agriculture paysanne (AMAP) in France and Relação de Cidadania entre Produtores e Consumidores (Re.Ci.Pro.Co) in Portugal (URGENCI, 2020).

In Brazil, the first CSA was established in São Paulo in 2011, and since then, the movement has been growing throughout the country (Abrandh, 2013; CSA Brasil, 2022; Trivellato et al., 2019). Currently, there are 284 CSAs in operation and 34 CSAs in the process of being created (CSA Brasil, 2022), with a greater concentration in the Southeast and South regions.

The number of studies examining the emergence of CSA initiatives and their impact on food security is still limited. Considering the importance and need to disseminate this topic, both because of the high prevalence of food insecurity and the need to rethink the agro-industrial production model, this study aimed to identify the potential of CSA as a promoter of food security, reflecting on the Brazilian context.

2. Methodology

This is an exploratory analytical study, through a scoping review of the literature, on CSA. The cut-off point for this research was the potential of CSA to promote food security. The literature review was carried out between August 2019 and July 2021 using the Scientific Electronic Library Online (SciELO), National Library of Medicine (PubMed), Web of Science (WoS), and Virtual Health Library (VHL) databases. The descriptors used were: "community-supported agriculture," "CSA," "food security," and "sustainable agriculture," in English and Portuguese. Complementary searches were also carried out on official CSA websites around the world.

Articles, books, and reports on CSA, its history, application techniques, and experience reports were considered eligible. The year of publication was not an exclusion criterion. Articles that did not present CSA as the object of research but only as a mention were excluded. Initially, the articles' titles and abstracts that met the aforementioned eligibility criteria were read. In addition, the references of the eligible studies were also analyzed, as these could broaden the scope of the search. Once selected, an exploratory and analytical reading of the articles was carried out, and the wording was interpreted according to the defined cut-off point. Information was sought on CSA and its potential for promoting food security.

A total of 204 articles were identified by correlating the descriptors shown in Table 1, based on the combination of at least two descriptors during the search. After reading the titles and abstracts, 73 articles of interest were selected, and 40 were considered eligible as they met the objectives of this review—analysis of the relationship between CSA and food security. The publication period ranged from 2000 to 2021, with the most significant volume of publications concentrated between 2015 and 2021.

Table 1. Descriptors underlying the search for scientific articles.

Theme	Number of references found*
CSA	1,421
Food security	7,526
Agroecology	398
Small farms	3,284
Solidarity economy	22,381

Note: * number of references found with independent and uncorrelated variables.

The data from the articles were assessed in terms of the type of study (quantitative, qualitative, or mixed), the year of publication, location, and relevance to the topic, selecting the publications most aligned with the research question. The data were extracted using an Excel table to systematize the information with thematic analysis, calculating the frequency of trends in the findings without using specific software. The discussion below considered the similarities and differences between the studies analyzed. The methodological parameter adopted was the approach proposed by the Joanna Briggs Institute for scoping reviews.

The concept of food security has been debated for many years, and, initially, it was defined only as ensuring the production of enough food to meet the population's needs (Abrandh, 2013; Trivellato et al., 2019). After the Second World War, its definition was gradually broadened, and it currently incorporates the notion of access to safe, quality food in sufficient quantity from sustainable, balanced production with respect for culture to guarantee the human right to adequate food. In line with the concept of food security, food sovereignty is the right of people to decide their own policies and sustainable strategies for the production, distribution, and consumption of food, respecting culture and food diversity (Asociación Nacional de Agricultores Pequeños, 2001). In this context, it can be considered an important strategy to promote the sustainable eradication of hunger and malnutrition (Maluf, 2022; Maluf & da Luz, 2016).

Although food is a human right, FAO reveals that hunger is rising. The report *The State of Food Security and Nutrition in the World*, published in 2023 jointly by five specialized agencies of the United Nations, revealed that 122 million more people have slid into hunger since 2019 due to various crises (pandemic, repeated climate shocks, and conflicts, such as the war in Ukraine). According to this data, around 735 million people will face hunger in 2023, compared to 613 million in 2019 (FAO et al., 2024).

Creating supply chains that are fairer and more responsible towards farmers and the environment, and facilitating access to regional, fresh, and healthy food, has been proposed to promote food security and help overcome a large part of this problem (High Level Panel of Experts on Food Security and Nutrition, 2017; Pedrosa, 2019). From this perspective, CSA has the potential to contribute to these demands, mainly due to the close proximity between consumers and the food growing process, which differs from the conventional food marketing model (Bîrhală & Möllers, 2014; Cone & Myhre, 2000; Perez et al., 2005; Vasquez et al., 2017).

3. Results and Discussion

3.1. CSA

Essentially, CSA takes place based on a contractual agreement of financial co-responsibility in which the consumer shares the production risks with the farmer in abundance and scarcity. In this way, farmers make production finances transparent, allowing consumers to cover the actual cost of food production and the producer's income (Perez et al., 2005; Santos-Neta et al., 2021). Consumers, in turn, participate in the budget planning required for the entire cultivation process over a period previously determined by the group (Amorim, 2018). Producers obtain a fixed income, without bank loans and debts, and consumers receive organic products, with quality and sound provenance (Lal, 2020).

With the movement's evolution, there are currently different CSA subscription models in which consumers receive food boxes weekly, monthly, or quarterly. Contracts are often made online, especially in large urban centers (Perez et al., 2005; Soil Association, 2012). This generates criticism because this virtual format maintains the distance between consumers and the production process, in opposition to what the proposal advocates (Bîrhală & Möllers, 2014).

Thus, CSA models reflect the culture of the communities they serve, the capacity of the farms, and the farmers (Soil Association, 2012). Table 2 shows the possible CSA models.

White et al. (2018), who conducted a study in the United States, noted that CSA initiatives can facilitate access to fruit and vegetables for low-income families. In agreement with this finding, a review of 12 studies, also from the United States, observed that consumers associated with CSA showed increased consumption of a greater variety of fruits and vegetables, contributing to positive changes in their eating patterns (Vasquez et al., 2017).

Table 2. Models of CSA that can be implemented.

CSA Models	Description
Managed by farmers	Organized and managed by the farmers themselves. The consumer provides the capital and has little involvement in the production process. The producer assembles a box of vegetables and the consumer goes to the farm to pick it up.
Managed by co-farmers (consumers)	Consumers participate in the production process by collaborating with the farmer. This involvement can vary according to the agreement between the parties.
Farmers' cooperative	Two or more farms cooperate to provide consumers with a greater variety of products.
Cooperative of farmers and co-farmers	A similar model to the farmers' cooperative, but with greater consumer involvement. In this case, consumers can share private properties and/or other resources with farmers, as well as work together in the production and distribution of food.

Source: Soil Association (2012).

A study carried out with CSA initiatives in São Paulo had similar results: Being part of a CSA provides healthier food, brings consumers closer to agriculture, and empowers farmers, as they receive support from the community to face the risks inherent in the food production process (Amorim, 2018).

In addition to the potential to improve eating habits, in a co-responsibility agreement, the consumer, in some cases, can also play the role of co-farmer since, ideally, they are not restricted to purely financial support. Closer relationships, as the basis of CSA principles, allow consumers (co-farmers) to participate in and accompany the process of growing food, and with more significant contact with the field there is an increase in learning and awareness of seasonal, climatic, and regional issues (Florisbelo et al., 2020).

CSA has significant economic potential and can help reduce poverty and inequality in rural areas. The high social vulnerability of family farmers (Altieri, 2013; Cechin et al., 2020; Santos-Neta et al., 2021) makes them deserving beneficiaries of a solidarity economy model capable of increasing and strengthening the expansion of organic food marketing (Bîrhală & Möllers, 2014; Santos-Neta et al., 2021). In his study of CSA initiatives in São Paulo, Amorim (2018) considered that this model could increase the earnings of organic farmers by eliminating middlemen, who make farmers invisible in the conventional marketing of their products.

Using ecologically responsible agriculture, CSA benefits consumers, farmers, and the environment. It encourages local food consumption, reduces the impact of carbon dioxide emissions from transportation, and reduces the use of plastic packaging (Henderson, 2010). This marketing system has had repercussions in several developing countries due to promoting more sustainable food production, conscious consumption, and the valorization of family, rural, and urban agriculture (Melo et al., 2020). In addition to several aspects that CSA and urban agriculture have in common, such as encouraging local food production, bringing consumers and farmers closer together, reducing the food route and, consequently, the carbon footprint, providing healthy food at fair prices, and improving people's socio-economic conditions, CSA can be carried out in urban spaces, creating green and biodiverse spaces in cities (Florisbelo et al., 2020).

Therefore, agroecology can significantly positively impact local income, the environment, and food sovereignty since family farmers produce on an agroecological basis and understand the value of their work and its importance in making healthy food that respects nature, consumers, and local culture (Nascimento et al., 2019). It also contributes to species biodiversity through sustainable, ecologically based agriculture (Haby et al., 2016; Reiniger et al., 2017).

These characteristics of CSA are reinforced by its solidarity economy model, which meets the demand to respect nature and value human labor without promoting wealth accumulation and, consequently, social inequality. It is based on a democratic alternative, in which it is possible to observe diversity among the actors in the production unit or the different areas and processes related to the community (Mira et al., 2018). In Amorim's study (2018), CSA initiatives included both traditional family farmers and people who decided to migrate to agriculture because they saw an opportunity for fair working conditions, which aligns with the principles of agroecology.

An important aspect to highlight is that consumers' motivation for participating in CSA is, in addition to issues related to health, the preservation of the environment. Most consumers participating in CSAs report concern for the environment and desire organic, high-quality, locally grown products (Ribeiro et al., 2023; Rotoli, 2016).

In this scenario, CSA can be considered a means of strengthening agroecology because it goes against the conventional and hegemonic model (Pedrosa, 2019; Santos-Neta et al., 2021). This brings consumers and local farmers closer through bonds based on ethical and trustworthy economic relationships (Ertmańska, 2015), favoring organic, agroecological, or biodynamic food production (Pedrosa, 2019).

In 2020, the Covid-19 pandemic changed the world in several areas, including food. The crisis caused by the pandemic exposed the fragility of the conventional model of food production and distribution in the face of adverse situations, highlighting the results of some studies that showed that alternative food networks, such as CSA, managed to be resilient in the process of readapting to the conditions imposed by the pandemic (Lal, 2020; Lopes et al., 2020). This is because the conventional model is characterized by transporting food over long distances, demanding energy/fuel and, consequently, being more vulnerable to unexpected interruptions (Lal, 2020).

The Covid-19 pandemic has had multidimensional impacts on small farmers in terms of production, marketing, income, and health. For example, the closure of schools during the pandemic significantly reduced the National School Feeding Program's food supply from small producers. However, collective movements such as CSA have also contributed positively to overcoming these difficulties (Futemma et al., 2020), fulfilling the proposal to respond to the social demands of small farmers, even in adverse situations such as the pandemic (Amorim, 2018; Torres, 2017).

When considering the Covid-19 pandemic context, it is essential to highlight the difficulty of accessing food due to the global economic crisis, the increase in mass unemployment, and the risks of contamination inherent in the long-chain industrial food system. That situation demonstrated the possibility of guaranteeing food for families through a sovereign system of local food distribution with short-chain agro-sustainable models such as CSA. Such strategy avoided increasing the risk of spreading the contamination from the virus (URGENCI, 2020).

Financial vulnerability is a significant problem that small farmers face in the countryside due to the historical unfair competition with the agro-industrial model. This has also led to the complete alienation of consumers from the food production process (Bîrhală & Möllers, 2014; van Nieuwkoop, 2024). In the opposite direction, local production offers potential strategies to overcome these difficulties. By removing intermediaries from the production network, food prices become fairer, and farmers are guaranteed income and autonomy, not least because of the security of the sale, which is contracted in advance. In addition, CSA also removes the farmer from the position of anonymity, meeting the actual demands of consumers and establishing a link between producer and consumer (Mira et al., 2018).

CSA presents itself as an essential model of solidarity economy, capable of increasing the supply of jobs in rural areas and strengthening the expansion of organic food production and consumption (Bîrhală & Möllers, 2014). It challenges the agro-industrial model through shortening food supply chains so that the capital invested in food production remains at the local level, strengthening family farming (Allen et al., 2017).

The CSA model, however, has also shown some limitations. Some studies, for example, have pointed out a fluctuation in the number of consumers from one year to the next, undermining the security the model promises farmers. Some of the reasons pointed out for such fluctuation have included the waste of food,

which is often provided in large quantities, and the lack of variety and/or freedom of choice of the items that would be consumed by families (Curtis et al., 2013; Pedrosa, 2019), reflecting the commodity value that the agro-industrial model has attributed to food.

Another significant limitation of CSA concerns the "elitization" of the movement, reflecting social inequality, in which a small group of society has the privilege of being able to afford healthier food, while the rest have no choice. Although CSA is proposed as an alternative model to promote food and social justice (hence, food security), studies show that its growth has not occurred in a socially equalitarian way. The greater adherence has come from people (consumers) with higher purchasing power, who can afford higher food prices for higher quality food, and who have the financial security to share production risks with farmers. Because of this, CSA is often criticized as an elitist movement (Bîrhală & Möllers, 2014; Galt, 2011). Elitization is a key criticism because those most in need continue to be unable to benefit from CSA programs.

Some strategies can potentially reduce the elitist nature of the CSA movement. The implementation of public programs and policies can have a very positive impact on reducing social inequalities, making the model more inclusive and accessible to vulnerable populations. To encourage the development of CSA initiatives, more investment by the public sector is needed (Altieri, 2013; van Nieuwkoop, 2024). This could include programs for infrastructure (improvement of roads in rural areas, internet access to facilitate the flow of production and communication, construction of irrigation systems); credit programs to strengthen family farming among small and medium-sized producers and cooperatives; training in assistance and technical support for sustainable practices, as well as the expansion of the National Program for Strengthening Family Farming; incentives for marketing and selling products (creation of fairs, local markets, and government purchase programs for rural producers); programs to encourage and value sustainability and environmental conservation (subsidies for farmers for ecological services that preserve forests and water resources, incentives for sustainable management practices and recovery of degraded areas); and programs for social inclusion and strengthening cooperatives (support for farmers' associations and cooperatives, programs to encourage rural succession).

Although CSA initiatives do not have the power to bring about more significant changes in the food system because they operate on a small scale, this alternative model of the relationship between consumers and producers is an excellent seed for this transformation (Santos-Neta et al., 2021). With the right public policies, CSA can move from diversifying food availability to strengthening food production, encouraging people to stay in rural areas and grow food.

3.2. Food Insecurity and CSA in Brazil

In Brazil, food sovereignty is proposed as necessary to contemplate the human right to adequate food (Abrandh, 2013). The Brazilian state has carried out essential actions to meet this right, such as popular restaurants, food banks, direct income transfer programs, the Food Acquisition Program (PAA), and the National School Feeding Program (PNAE). These programs recommend that respect for diversity, tradition, food culture, citizen autonomy, food sovereignty, and the principles of food security are considered (Fagundes et al., 2022).

Despite various policies, Brazil still suffers from a high prevalence of food insecurity (Instituto Brasileiro de Geografia e Estatística, 2015, 2020; Osanes, 2018), mainly due to the difficulty in accessing quality, safe food that respects food sovereignty. Between 2014 and 2016, around 4 million people lived in a situation of food vulnerability in Brazil, corresponding to 1.9% of the population. Aggravating the problem, the Household Budget Survey (Pesquisa de Orçamento Familiar) showed that, in 2018, around 36.7% of the population had some level of food insecurity (84.9 million), with 24.0% suffering from mild food insecurity, 8.1% from moderate food insecurity, and 4.6% from severe food insecurity (Instituto Brasileiro de Geografia e Estatística, 2020).

During the Covid-19 pandemic, the food insecurity scenario got even worse, reaching 55.2% food insecurity at the end of 2020. Of this total, around 9% of the population, 19.1 million Brazilians, lived in severe food insecurity, suffering from hunger. In 2022, this figure reached 33.1 million, more concentrated in the North and Northeast regions of the country (PenSSAN, 2022). To aggravate the debate, these results were measured using the Brazilian Food Security Scale, which only measures access to food, regardless of quality (Almeida et al., 2017). Food insecurity in the country may be even more critical from a perspective that considers food quality, respect for culture, and the environment.

Regarding CSA initiatives in Brazil, a country with a sizeable territorial extension, there is a very uneven distribution between its regions. There are around 22 CSA initiatives in operation or in the process of being created in the Northeast (poorer region), while the Southeast (more affluent region) has more than 120 CSA examples (Figure 1; CSA Brasil, 2024). The Northeast has the highest concentration of family farming establishments (Landau, 2013), with the states of Pernambuco, Sergipe, and Alagoas leading the highest

Figure 1. Distribution of CSA initiatives in Brazil, 2024. Source: CSA Brasil (2024).

densities of these establishments. It is also the region with the highest concentration of households presenting some level of food insecurity—50.3% of the population (Instituto Brasileiro de Geografia e Estatística, 2020). These numbers may indicate an inverse association between the number of CSA initiatives and the Human Development Index in those regions (Bezerra et al., 2020).

In addition to food insecurity due to lack of access to food, changes in eating habits due to increasingly globalized food markets put people's food sovereignty at risk because, in most cases, people don't even know what they are eating, where the food came from, or how it was produced (Paiva, 2014). The globalization of food is resulting in a loss of food heritage and diversity (Esteve, 2017). The current globalized production model consequently leads to the standardization of people's palates, overshadowing the understanding of food as a historical, cultural, and sovereign heritage (Paiva, 2014; Stedile, 2013).

4. Conclusion

The CSA movement has grown worldwide due to its proposal for a sustainable food system and its economic, cultural, and political advantages. Despite the limitations of unequal territorial expansion and elitization reflecting social inequality in many places, CSA has promoted an increase in the consumption of healthier food based on a model that contributes to respecting seasonal, climatic, and regional issues, as well as strengthening local production of food supplies. It is a community solidarity initiative that supports local production, connecting the countryside and the city.

Moments of global crisis, such as the Covid-19 pandemic, highlight the need for food models with ever-smaller production networks. These networks should meet local demands, as with CSA, and be based on local production and reducing the long distances traveled by food, causing less impact through carbon dioxide emissions. In this way, it is possible to promote the economic sustainability of farmers, access to safe food for the population, and a better synergy between the food production process and the environment. Unfortunately, choosing a better quality and environmentally sustainable food is still not everyone's right. It is the privilege of a few, especially given the social inequality that exists in some places. There is a need to think about more democratized production formats that can also attract a low-income public.

Despite all its potential, studies so far have not shown a significant impact of CSA in reducing food insecurity – neither among farmers nor among consumers. The elitization associated with CSA results from the type of producers and consumers who can better afford to participate in it. The consumers who access CSA are in a relative privileged situation under which they can finance the products in advance. Thus, while many studies have demonstrated the benefits of CSA, such as healthy eating and a more sustainable environment, a more detailed assessment on how it can impact social justice would be desirable. It would be interesting to conduct longitudinal and cost studies of CSA baskets and determine to what extent they reach small farmers and the poorest populations. It is necessary to think about strategies to increase the uptake of CSA among the most socially vulnerable and food insecure people, who, along with family farmers, are the ones most in need of movements like this.

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Conflict of Interests

The authors declare no conflict of interests.

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