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Implementing a community garden in a socially vulnerable urban area of Brazil

Implementação de horta comunitária em área urbana de vulnerabilidade social em Brasília, Distrito Federal

Michele Hartmann Feyh

Agroecologist at the Federal Institute of Brasilia, Statistician at the Federal University of Rio Grande do Sul; Master in Production Engineering at the Federal University of Santa Catarina, Brazil.

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ABSTRACT

Community urban gardens are a type of urban agriculture. They provide spaces for social interaction and increase in life quality of maintainers and consumers. This study implements a community garden in Vila Buritis II, Planaltina, Brasília, Federal District, Brazil. The population of Planaltina has low purchasing power and high indices of social vulnerability. The implementation of the vegetable garden resulted from a partnership between agroecology students from the Federal Institute of Brasília, the local community, and the government. The work relied on donations, reuse of materials, and volunteer labor. Educational actions in the neighborhood approached the relationship between production in the garden and food choices, with a focus on healthy eating, consumption of fresh food, and reduction of industrialized items. The building of the vegetable garden converted an idle area, with a history of accumulating garbage and rubble, into a productive space for social coexistence and leisure. Twenty-seven edible species and an undefined number of ornamental plants were planted. Between 30 and 40 residents visit the space regularly and collect food for their daily meals. However, the maintenance and increase of garden productivity still need technical assistance and resources.

Palavras-chave:
Agricultura urbana
Agroecologia
Horta urbana
Políticas públicas
Sustentabilidade

RESUMO

Hortas urbanas comunitárias representam uma das diversas formas de agricultura urbana e são espaços de convívio social com forte potencial sociocultural e de incremento na qualidade de vida dos seus mantenedores e consumidores. O objetivo deste estudo foi implementar uma horta comunitária na Vila Buritis II, em Planaltina, Brasília, Distrito Federal. A região de Planaltina é caracterizada pelo baixo poder aquisitivo da população e elevada classificação de vulnerabilidade em indicadores de qualidade de vida da população residente. A implementação da horta resultou da parceria entre estudantes de Agroecologia do Instituto Federal de Brasília, comunidade local e poder público, e foi realizada por meio da doação e reaproveitamento de materiais e mão de obra voluntária. Foram realizadas ações educativas com os moradores do entorno sobre a relação entre a produção na horta e escolhas alimentares, com foco na alimentação saudável, consumo de alimentos frescos e redução de itens industrializados. A construção da horta transformou uma área ociosa com histórico de acumulação de lixo e entulho em um espaço produtivo e de convivência social e lazer. Foram plantadas no local 27 espécies de vegetais comestíveis e um número não definido de espécies de plantas ornamentais. Entre 30 e 40 moradores frequentam o espaço regularmente e colhem alimentos para complementar as refeições diárias. No entanto, há, ainda, demanda técnica e de recursos para manter e aumentar a produtividade da horta.

INTRODUCTION

Urban agriculture is the agricultural practice in urban or peri-urban spaces (MOK et al., 2014) and can be useful for development of sustainable cities (ARAÚJO, 2016). Community gardens, portions of land cultivated by a group of people (SCHEROMM, 2015), are collective spaces for socializing and learning with powerful potential to increase life quality of maintainers and consumers. Agriculture in urban spaces may promote food security, income generation, social inclusion and socio-environmental interactions (MEDEIROS et al., 2015).

In Brazil, the cultivation of urban gardens increased from the 1980s onwards as an alternative policy to reduce poverty and improve the food conditions of families. Support for urban and

peri-urban gardens became part of the national policy to reduce poverty and guarantee food security. Some of these gardens were financed with federal resources and were included in the National Urban Agriculture Program.

The presence of community gardens in urban environments causes positive impacts on the environment, society and economy of local communities (DAMBRÓS; MIORIN, 2011). Together, the environmental, social and economic spheres form the conceptual tripod of sustainability (MARTINE; ALVES, 2015).

Environmentally, urban gardens provide local ecosystem services such as the regulation of urban microclimates (COSTA; SAKURAI, 2021), reduction of surface runoff, increase in air quality, and decrease in noise pollution (MEDEIROS et al., 2015; AMATO-LOURENÇO et al., 2016). Socially, community gardens encourage the rational use of public spaces by transforming idle areas, commonly used for the disposal of wastes (e. g., dumps), into spaces for social coexistence. Epidemiologically, urban gardens promote agriculture as a therapeutic activity, allowing body movement, social interaction, leisure, and creativity. The aesthetic value of community gardens also affects people's quality of life and improves the income of those involved (MELO, 2016).

Implementing urban gardens in communities of high social vulnerability can promote positive environmental, social, and economic impacts on the locality and its inhabitants. Thus, this work aimed to implement a garden in the community of Vila Buritis II, Administrative Region of Planaltina, Brasília, Federal District.

MATERIAL AND METHODS

Study area

The study occurred in Planaltina, the oldest Administrative Region of the Federal District (DF), in the Center-West region of Brazil (15°36'54.1"S, 47°38'29.7"W). The regional climate is typical of the Cerrado ecoregion, the second largest biome in the country, which occupies 21% of the national territory. Brazilian Center-West has two annual seasons: a rainy season, from October to March, and a dry season, from April to September. The average rainfall is 1,500 mm per year, and temperatures are generally mild, between 22 ºC and 27 ºC on average. The Cerrado is heavily impacted by agricultural expansion in Brazil, with a deforestation rate of native vegetation estimated at 1.1% per year (GUARESCHI et al., 2012).

Founded in 1859, Planaltina was integrated into the Federal District in 1960, including regions with a population arising from migrations and invasions, such as Vila Vicentina, the Residential Sector Leste (Vila Buritis I, II and III), and the Residential Sector Norte A (Jardim Roriz) (CODEPLAN, 2015). The population of Planaltina has low purchasing power and low levels of quality of life, with monthly per capita income below the Brazilian minimum wage. The spatial analysis of the labor market in the region of Brasília and in the 31 Administrative Regions (RAs) of the Federal District reveals a high concentration of occupations in a few RAs (most jobs centralize in the downtown - RA I, Plano Piloto). Of every thousand people in Planaltina, only 31 have a formal job (CODEPLAN, 2020).

The Administrative Region of Planaltina has a Brasília Federal Institute campus (IFB), which provides a higher education course in Agroecology. The region is a field of action and experimentation for several initiatives and innovations of technological and socioeconomic development promoted by researchers, students, and partners of the IFB. The Pedagogical Project of the course includes disciplines on Experience in Agriculture and Livestock with Ecological Bases, in which students develop applied projects in various areas of agroecology. During the studies, there was a proposal to implement an urban garden in Vila Buritis II, in Planaltina, focusing on the theme of healthy eating habits in the community.

Stages of the urban garden implementation process and schedule

The urban garden implementation process comprised four stages between August 2019 and February 2020 (Table 1). After completing the academic discipline linked to the IFB in November 2019, some students continued to participate in the initiative voluntarily until delivering the garden to the community.

Table 1: Timetable and description of urban garden implementation activities in partnership among students from the Federal Institute of Brasília (IFB), the local community, and the government in Vila Buritis II, Planaltina, Brasília, Federal District, Brazil.

Month/Year	Activities
	Step 1: Infrastructure design and fundraising
August/2019	Meeting with community leaders; site visit; project design with the support of IFB teachers.
September/2019	Support request from Planaltina Regional Administration to implement the vegetable garden (authorization to use the space; cleaning and leveling the land).
	Step 2: Community education and bonding actions
September/2019	Conversation circles with the community approaching eating habits.
October/2019	Educational activity during the Children's Day event (healthy breakfast; seedling planting workshop; information on healthy eating).
	Step 3: Land preparation and planting
October/2019	Lot clearing.
November/2019	Ground leveling.
January-February/2020	Structuring of beds and planting of species.
	Step 4: Process evaluation and future prospect
September/2020	Visiting and interviewing community leaders about the current situation of the garden, community perceptions, and perspectives for the future.

In the first stage, a meeting was promoted between the local leadership and the IFB students to understand the needs and uses of the available space. In addition to the construction of a vegetable garden, the community aimed to revitalize the surroundings of the sports court, once the main meeting and leisure point for residents, which accumulated garbage and rubble and had collapsing bleachers. Figure 1 shows the project for the sports court area and surroundings. With the exception of the stands, which were already present, the other elements of the project represent the community's aspirations for the space, with a vegetable garden, orchard, sand field, children's playground, and living space for the elderly.

Authorization to use the area for vegetable gardening was requested from the Planaltina Regional Administration. Also, a request was made for the administration to clean and level the land. The request was prepared based on Decree nº 39,314, of August 29, 2018, which regulates Law nº 4,772, of February 24, 2012, providing guidelines for the Policies to Support Urban and Peri-urban Agriculture in the Federal District (DISTRITO FEDERAL, 2018); and Decree n° 39,690, of February 28, 2019, which regulates Law No. 448, of May 19, 1993, on the adoption of squares, public gardens, and road balloons, by entities and companies (DISTRITO FEDERAL, 2019).

The second stage involved student activities with community residents: conversation circles about eating habits and participation in the event to commemorate Children's Day (a popular festival in Brazil held annually on October 12). The conversations aimed to address the topic of healthy eating, highlighting the link between fresh food production and consumption. During the events, the proposal to implement the vegetable garden aroused the interest of residents.

The conversation about eating habits took place on a Sunday morning and brought together people from the community interested in healthy eating. The IFB students offered a breakfast with healthy food and drinks in a joint action among students, community leaders, and residents.

Participation in the event to celebrate Children's Day had the following specific objectives: promoting healthy eating from fresh foods, creating a link between residents and the community garden, and holding a workshop for children to plant seedlings (Figure 2). The event is held annually on the sports court by the residents themselves with the support of local merchants. A booth was set up for the activity, which included a breakfast of healthy food prepared by the students and food donated by bakeries.

The recipes of the served food were printed and left on display for participants to photograph or copy. Posters exposed in the space informed about healthy eating and quality of life based on the Food Guide for the Brazilian Population (Ministry of Health) and materials provided by CERPIS (Reference Center for Integrative Health Practices, a Basic Unit of Health Department of the State Health Department of the Federal District, located in Planaltina, Federal District).

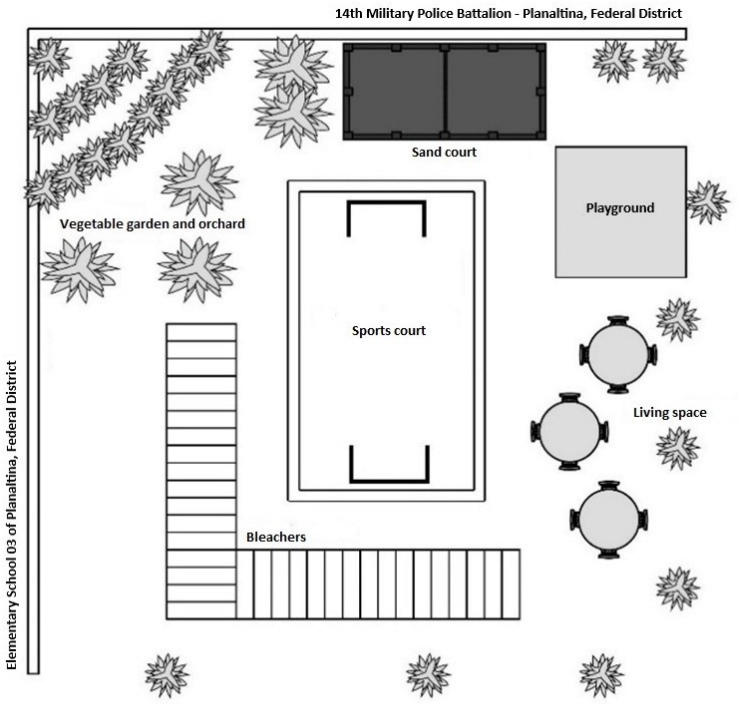

Figure 1. Revitalization project for a living space in Vila Buritis II, Planaltina, Brasília, DF. The project was developed by students and professors from the Federal Institute of Brasília (IFB) to implement an urban garden in partnership with the local community and the government.

Figure 2. Educational activity with residents of Vila Buritis II, Planaltina, Brasília/DF. The action included a workshop on planting seedlings and information on the consumption of fresh food and healthy eating as part of the process of implementing an urban garden in partnership between students from the Federal Institute of Brasília (IFB), the local community, and the government.

The students donated seedlings of plant species (vegetables, spices, and trees) and soil for a seedling planting workshop, which was aimed at children. Community residents gave empty milk and soft drink containers to the seedlings. The activity attracted the children's attention, who took the plant seedlings home. During the workshop, students informed local residents about plants' nutritional and medicinal properties.

The third stage focused on technical activities for cleaning and leveling the land for later structuring the beds and planting species. The space had a garbage dump containing dead animals, work remains, demolition materials, and household waste. The Planaltina Regional Administration (DF) collected the garbage and rubble for proper disposal. A wheel loader leveled the land with resources from the community itself. Construction leftover materials, such as tiles and bricks, were used to structure the beds and limit the planting areas, creating physical barriers (Figure 3). The structures were filled with soil and fertilizer to form raised beds. Several planting techniques were used, such as seedlings, seeds, and cuttings. Fertilizers were donated by the community and visitors.

The fourth and final stage aimed to gather information about the community's perceptions regarding the use and situation of the garden after 7 months of its implementation.

Figure 3. Raised bed built with tiles in the urban garden implemented in partnership among students from the Federal Institute of Brasília (IFB), local community, and public authorities in Vila Buritis II, Planaltina, Brasília/DF.

Problems solution

A fence was built to prevent the entry of animals (dogs and horses) attracted to the garden. The material used for the construction came from reuse (collected from discards and donations) and the labor was voluntary by students and residents. The community suffered a complaint that the garden could contain breeding sites for mosquitoes and the spread of diseases, such as dengue. The Health Department of the Federal District inspected the garden and did not identify a health risk.

All participants or involved to some extent in the actions taken to implement the garden were voluntarily and aware of the nature of the project. The project followed the guidelines of Resolution No. 466, of December 12, 2012, of the National Health Council, which deals with ethics in research involving human beings.

RESULTS AND DISCUSSION

Motivated by an academic course, the partnership among students of Agroecology from the Instituto Federal de Brasília (IFB), the local community, and the government in Vila Buritis II, Planaltina, Brasília, DF, resulted in the implementation of an urban garden and the revitalization of the surroundings of the living area of the local community. The partners planted twenty-seven edible plant species and an undefined number of ornamental plant species (Table 2). The second stage (conversation circle and educational activity) addressed the following issues: types of food consumed in the community (fresh, processed, ultra-processed); whether foods are cooked at home or bought ready-made; whether meals are eaten as a family or individually; how the food is purchased; whether there are food-related illnesses in the community; the perception about their food; if there are eating habits considered wrong; what would be the food they would like to have and what are the impediments to the desired food.

About 25 people participated in the educational activity. Participants showed interest in talking about food. Topics such as concern for the family's health and daily food appeared in the conversation. Among the problems in improving the diet, people reported the lack of time in everyday life, lack of information, no access to fresh food, and difficulties in reducing consumption of sugary and ultra-processed products.

After the creation of the garden, 30 to 40 residents from the surroundings frequent the space to collect food and complement their meals. With the established dynamics of continuously planting available seeds, there is an offer of seedlings of different species for donation.

As in the community garden of Vila Buritis II, urban agriculture initiatives have been growing around the world and gaining evidence in the literature, such as the study of metal concentration in vegetables grown in urban gardens in Germany (SÄUMEL, 2012) and the methodology proposal for planning urban gardens in Madagascar (AUBRY, 2012). Few articles address urban agriculture in Brazil, although the topic has social, environmental, and economic relevance (LARA et al., 2019). Recently, the struggle for using urban space in agricultural activities has gained strength through Law 6,671/2020, enacted on September 21, 2020, which expands Law 4,772/2012 and establishes that idle public and private spaces can be used for urban agriculture in the Federal District (DISTRITO FEDERAL, 2020).

The residents' receptivity to the implementation of the community garden demonstrates their interest in practicing healthy eating, which was reported in the activities of education and bonding with the community (step 2). Educational activities and the creation of a vegetable garden in an area close to the

community favor quick access to free fresh food, helping to overcome some of the main barriers pointed out by residents for healthy eating (lack of time, access, and information). Likewise, the community's enthusiasm for the project arose from the desire to revitalize the surroundings of the sports court, which changed from a garbage and rubbish dump area to a pleasant space for leisure, socializing, and obtaining healthy food.

The voluntary dedication of the residents to the creation and maintenance of the vegetable garden suggests the availability of the residents for community activities and contact with nature. Studies in psychology and occupational therapy reveal that activities related to the environment, such as the cultivation of vegetable gardens and orchards, benefit humans' mental and physical health. In these activities, it is possible to exercise cognition, patience, care, and emotional bonds with nature and the community, in addition to developing biophilia, an intrinsic characteristic of humanity (CARMO et al., 2020). Due to their small-scale, community gardens prioritize production without pesticides, as in the Vila Buritis II garden. In this sense, the literature shows the association between healthy eating and the consumption of food produced without pesticides (SANTOS; MACHADO, 2019).

Table 2: List of plant species planted in the urban garden implemented with a partnership among students from the Federal Institute of Brasília (IFB), the local community, and the government in Vila Buritis II, Planaltina, Brasília, DF.

Plants by consumption type	Common names	Scientific names
Vegetables	Lettuce	*Lactuca sativa*
	Cabbage	*Brassica oleracea* L.
	Arugula	*Eruca vesicaria* ssp. *sativa*
	Pumpkin	*Cucurbita* sp.
	Carrot	*Daucus carota*
	Chayote	*Sechium edule*
	Okra	*Abelmoschus esculentus*
	Radish	*Raphanus sativus*
	Tomato	*Solanum lycopersicum*
Aromatic and spice plants	Rosemary	*Rosmarinuns officinalis* L.
	Alfavaca*	*Ocimum selloi Benth*
	Rue	*Ruta graveolens* L.
	Aloe	*Aloe vera*
	Boldo*	*Plectranthus barbadus* L.
	Lemon grass	*Cymbopogon citratus* L.
	Welsh onion	*Allium fistulosum*
	Coriander	*Coriandrum sativum*
	Bushy matgrass	*Lippia alba* L.
	Peppermint	*Mentha piperita* L.
	Jesuit's tea	*Dysphania ambrosioides*
	Malagueta pepper	*Capsicum frutescens*
	Parsley	*Petroselinum crispum*
Fruit trees	Yellow mombin	*Spondias mombin* L.
	Papaya	*Carica papaya*
	Passion fruit	*Passiflora edulis*
	Pitahaya	*Hylocereus undatus*
	Grape vine	*Vitis* sp.
Ornamental plants	Common sunflower	*Helianthus annuus*
	Dogbanes	Apocynaceae Family
	Other unidentified species	

*Brazilian popular name

The lack of resources is one of the main difficulties in ensuring the maintenance of the garden, for example, the lack of water, considering the long dry season that the region faces annually. Other scarce resources for which the community depends on donations are seedlings, fertilizers, and gardening tools.

Although a group of residents frequents the garden regularly, few citizens can dedicate assiduously to watering or maintaining the beds. In addition to routine care, the community needs support for technical issues (planting techniques, fertilization, pruning, dehydration of herbs, and storage of teas and spices) and resources to redesign the beds to optimize space and increase productivity.

CONCLUSIONS

The implementation of a vegetable garden in the community's leisure area transformed a previously idle and garbage accumulation into a site for coexistence, benefiting the residents, providing feelings such as pride in being part of the community, the reward for collective work, and the feeling of belonging to the place. Partnerships among different social actors can facilitate practical actions to increase the quality of life of vulnerable populations.

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