Towards a Circular Food Landscape in Peri-urban Neighbourhoods

A case study of Brasilândia, a district in São Paulo, Brazil

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Abstract

This research investigates initiatives of agroecology and circularity in the contexts of social vulnerability in Brasilândia, a peripheral neighbourhood in the northern region of metropolitan São Paulo, to answer the research question "How to transition informal and peripheral settlements into healthier and climate resilient neighbourhoods via spatial strategies linked to urban agroecology?". The study is based on theories of Food Justice and Food Sovereignty, in addition to Community Food Security, Circularity, Agroecology and the understanding of Socio-technical Transitions towards sustainability.

It is based on the hypothesis that agroecology and circular practices can provide possibilities of decreasing social inequalities and food insecurity within the context of peripheral and informal settlements, by generating income; improving the quality of live of ecological innovators, increase production and access of nutritious food; and also contribute to preserving the environment and strengthening social resilience. The research identifies key actors in the local food system - government, civil society organisations, residents, farmers, and urban innovators - and their roles in the dynamics of local food production. The methodology involves qualitative research conducted through interviews with the key actors, in combination with a geo-spatial analysis of the neighbourhood of Brasilândia. In Brasilândia, results show (i) social vulnerability as a major challenge (ii) eco-pedagogic and therapeutic impacts on ecological innovations (iii) adaptation, technical innovation and challenges in relation to access to land (iv) the challenges in socio-technical transition in relation to land-regulation, commercialization and operations of farms and the need to diversify the sources of income (v) the increase of female role in agroecology, linked to local entrepreneurship (vi) the urgent need to improve waste management in the area (vi) and the opportunity of social innovation to achieve circularity and agroecology. The innovation potential of the territory is explored through a vision for Brasilândia in 2050. A final strategy recommendation addresses the conflicts and challenges that emerge from the dynamics established between multiple agents – responding to the goals of the proposed vision

Keywords: urban agroecology, entrepreneurship, northern regions of São Paulo, spatial justice.

Contents

[Figure 0.1]
Photograph taken by
Clayton João

INTRODUCTION

Problem Statement

Contemporary socio-environmental problems such as extreme climate change, loss of natural resources and biodiversity, along with population growth and increasing social inequalities present challenges for civil society, government, business and industry. These problems require profound structural changes with regard to improvements in the performance of the systems that impact our wellbeing and ways of life: agri-food systems, transport, energy and housing (Elzen et al., 2004).

The system under scope of this research is the urban agri-food system within the context of São Paulo, a large unplanned city in the global south hemisphere. In such a context, the urbanisation process is characterised by socio-spatial segregation, environmental degradation, increased poverty and food insecurity. The New Urban Agenda, approved at the Habitat III conference in Quito in 2016, placed large attention on urban food security challenges and the urgency to restrengthen urban-rural linkages by means of bottom-up approaches of urban food strategies.

Food and nutrition security is defined by the Brazilian government as the right of everyone to regular and permanent access to quality food, in sufficient quantity, without compromising access to other essential needs and based on a healthy diet that respects cultural diversity and is socially, economically and environmentally sustainable. Thus, when there is an instability in the access to quality food in sufficient quantity, situations of food insecurity are generated. The Food & Agriculture Organization (FAO) has estimated that out of 213.3 million Brazilians, 6 million encounter some level of food insecurity. Out of these, 15 million face severe food insecurity, referring to those that have run out of food and go over an entire day or more without eating (FAO, 2015).

Urban food insecurity is directly related to social vulnerability as it stems from a combination of social deprivation factors that have a negative impact on the level of well-being of families and communities (Ferreira et al., 2006). Low levels of income, high levels of unemployment, high population density, lack of infrastructure, the commodification of water and the precariousness of education all contribute to the limited access to food and nutrition (Frayne, 2010). These multiple deprivations that interfere with the supply as well as the physical and economic access to food exacerbate the health impacts of food insecurity (Hawkes et al., 2017). Furthermore, the food price inflation in Brazil remains high as a result of the supply chain disruptions, and the continued economic fallout of the COVID-19 pandemic. The 9.83% increase in food and beverages prices in the first seven months of 2022 (IBGE, 2022) has aggravated the risk for low-income families of experiencing the urgent problems related to poverty and food insecurity. And yet, reports show that the agricultural sector struggled to adapt to this sudden change: farmers around the world have been forced to

dump and destroy millions of tons of fresh produce that they can no longer sell (New York Times, 2020). Amidst concerns about the reliability and performance of the current model, the COVID-19 pandemic reiterates the need to reshape and rethink the organisation of our food systems.

In addition to the rise in food insecurity in socially deprived areas, there is increasing evidence of severe environmental risks at a global-scale. Climate change, depletion of the ozone layer, biodiversity loss or the alteration of the nitrogen cycle, are some of these risks that have been mobilising governments and civil society. Currently, the food system in cities depends on great distances, carbon intensive food production, soil and water contamination, biodiversity loss and high use of pesticides.

These social, environmental and economic issues underscore the urgent need to transition to more sustainable sociotechnical systems. How to strengthen a local food system, based on the ethics of care for the people and for the planet? How to include urban and peri-urban food production projects when planning for more just and equitable urban models?

Carolyn Steel's statement refers to food as a powerful tool to trigger a transitional change. This change could involve the transition from the current mechanistic paradigm of efficiency as the central focus to a deep ecological paradigm, presented by Fritjof Capra as a holistic worldview, where nature and humans are not seen as separate entities but as interdependent networks of the same system.

As one of the means to address the deep challenges referenced previously, the concepts of Agroecology and Circular Economy have recently gained importance on the agendas of policy makers around the world. Although Agroecology is still highly based on grass-root movements of small farmers, it has recently received spotlight in international debates by institutions such as the The Food and Agriculture Organization (FAO) and the United Nations Conference on Trade and Development (UNCTAD). The FAO (2020) has brought case studies of projects and initiatives of food production in urban and peri-urban areas as a way forward. In the context of the economic, political and climate crisis, enhanced by the pandemic, communities in the peripheral borders of cities in the global south have been testing new ways to organise the food economy. These cases offer a local perspective to shape transformation, articulating short circuits, bringing value and visibility to small entrepreneurs, engaging a network of public spaces and communities to solve local challenges. Usually, the solutions arise in an informal setting, through the notions of shared responsibility and management - being later on reproduced by the formalised structure of economy and society. This represents a key process in the agroecological transition, a main concept that will be discussed in this research paper.

In this scenario of climate change, global food crisis and new commitments towards a circular economy and an ecological model, what is the role of architects

"We live in a world shaped by food. It determines our survival, our politics and economics. How then, have we come to consider food as just another commodity? Our profound disconnection with food is the curious legacy of industrialisation. It is also the symptom of a way of life we can no longer afford. Food is not only a powerful shaper of our lives, but one that we can harness as a tool."

- Carolyn Steel in 'Hungry Cities'

and urban planners in this transition? Which spatial strategies can be planned to re-design the urban metabolism and resource flow in a community-led, circular and regenerative way, to ensure a healthy and climate resilient metropolitan area?

To address some of these questions, this thesis intends to firstly investigate the problems related to food security in urban areas through a case study of Brasilândia, a peripheral district in the northern region of São Paulo. Secondly, based on the circular economy model, the paper presents a vision for the future of this region positioning agroecology as a driver for a new sustainable, climate resilient and healthy urban environment. Lastly, this paper recommends spatial strategies to achieve the vision, addressing the issues on social-environmental justice.

Case Study of Brasilândia and EcoCidade

Although São Paulo is the economic epicentre of Brazil and its symbol of development and urban expansion, the city holds some of the sharpest contrasts of a metropolis shown by statistics of violence, unemployment and the increase in “favelização” (the phenomena of slum expansion). This contrast is evident by comparing the social-economic indexes in the centre of the city with the peripheral regions.

Brasilândia is a neighbourhood inserted in a peri-urban context, in the fringe of where the city meets nature. It's an extremely dense district, where many of the open green areas are linked to the public sector - being in public spaces or equipment - and suffering an enormous pressure from informal occupation in one of the biggest preservation parks of the metropolitan area.

The two districts Freguesia do Ó and Brasilândia are part of the same subprefecture in the north-west zone of the city of São Paulo and are examples of the many rapidly spreading informal settlements of the Global South. Together, these two districts occupy an area of 31.5 km² and approximately 407,000 inhabitants (Gov. SP, 2020). In Freguesia do Ó and Brasilândia 29.6% of the total households live in slums generally located on lands close to streams and areas that, in the rainy season, become flooded, spreading diseases due to deficient collection and treatment of sewage, which often runs in the open.

The northern peripheral region of São Paulo presents a high rate of deprivation and social vulnerability. The Social Vulnerability Index (IPVS) positions 29.8% of the residents in Brasilândia at the worst conditions in relation to social vulnerability. And, with only 2.9 natural food establishments and 3.6 ultra processed food establishments for every 100 thousand residents, Brasilândia presents some characteristics of a food desert.

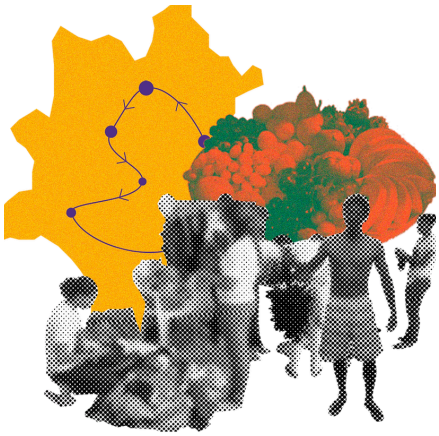
Inhabited by predominantly rural migrants who were searching for work opportunities and better living conditions, the district of Brasilândia or “Brasa”, as it is affectionately called by many of its residents, reveals that it is a "hot"

territory where conflict is pervasive. The region holds many stories of struggle and of inventiveness (Takeiti & Vicentin, 2017) and relevant efforts from civil actors.

Amongst some of the civil society organisations working within Brasilândia, this paper will present the efforts of the NGO A Cidade Precisa de Você" ("The City Needs You"), who started a project 3 years ago on regenerative and circular food systems. The project is called 'Eco-Cidade' which translates as "Eco-City" and it focuses on developing models of the local economy, fostering local innovation and building social networks to build a local food system. This project represents a step towards the agroecological transition in peripheral urban areas, which consists far beyond organic agricultural practices but also a political movement. Agroecology entails a broad approach to sustainable urban food policies, focusing on social and food justice and ecosystem services (Tornaghin & Hoekstra, 2017).

The incentives of Eco-Cidade on the food cycle in Brasilândia propose interesting prototypes for new models of the food economy. Its food ecosystem is distributed in different spots on the territory - places of farming, cooking and composting, which are connected by two transversal systems: an electric bicycle logistics and a digital exchange platform. Eco-Cidade project works on the activation of public space through Hands-On Activities. Education is an essential pillar through which they establish a collaborative management of public spaces.

[Figure 0.1]
Collage found in EcoCidade's website that shows the insitution's focus on linking the social aspect, with food, and spatial networks.



[Figure 0.2] Panoramic view of Northern region of Brasilândia, where city meets nature.

Research Objectives

This paper has two main aims: to enhance understandings of the marginalisation of peripheral São Paulo by bringing together notions of social and environmental justice and food insecurity under a single analytical framework; while also exploring the local social innovation opportunities, related to circular economy combined with spatial strategies to achieve more healthy and climate resilient environment. It does so by designing a methodology to develop a shared vision. The shared vision is based on field work, an analysis of existing visions from community members and stakeholder interviews and is accompanied by suggestions for concrete action plans.

As a first step, a set of themes for a sustainable future are framed based on the circular economy concept. Within these themes, different urban indicators which derive from the interviews with residents, urban farmers, health workers, administrative authorities, NGO's and semi-governmental organisations, are defined. These indicators are used to spatially analyse the territory and get a better understanding of the perspective of the different actors in terms of the challenges faced by the area and the potentials, always centred around the theme of food security, health and sustainability. Lastly, this paper will explore how urban and food resources' flows could be redesigned, considering the cooperation between spots of production, logistics, consumption, and destination.

Accordingly, the main research question posed is as follows:

How to transition informal and peripheral settlements into healthier and climate resilient neighbourhoods via spatial strategies linked to urban agroecology?

And the following sub-research questions:

- ***What are the social and urban problems related to food security in the peripheral neighbourhoods of São Paulo?***
- ***Who are the main actors in the food system and in Brasilândia, considering both Food security and Food Sovereignty?***
- ***What is the role of civil society associations in relation to Food Sovereignty in Brasilândia?***
- ***What are the opportunities of scalability of agroecology and circular food practices projects in the territory of Brasilândia?***
- ***What strategies and spatial interventions could drive Brasilândia's territory towards agroecology and circular food practices?***

By tackling this research question, the paper aims to contribute to a better understanding of the potential on how to achieve socio-environmental justice at a local scale through empowering the community and civil society organisations to envision a future for their neighbourhood and then translating these into spatial strategies. The findings could be relevant and in consequence be replicated to assist other social movements in marginalised and segregated communities living in spaces and contexts with similar characteristics and those beyond studied in this paper.

The theoretical discussion begins with an understanding of the problem of food security related to health in informal peripheral settlements, and the different social movements that rise as a response. Followed by an introduction of socio-technical and socio-ecological transitions and the theories to understand the multi-level perspectives of societal changes.

The analysis for this research is based on the long-term engagement of an NGO in the communities of Brasilândia and Freguesia do Ó. Through interdisciplinary, cross-sectoral and collaborative approaches in public spaces, Eco-Cidade aims for a just agro-ecological transition by supporting a variety of community-led solutions. This paper intends to highlight the impact of organised civil society groups and their contribution in the transition towards decarbonized local systems.

The present analysis connects the particular field of São Paulo studies to wider global debates on urban food insecurity, segregation, socio-environmental injustice, and circular economy; and contemporary methods such as design-based research. By connecting these topics together in a single analytical framework, the artificial distinction of the several social and environmental aspects involving marginalisation is prevented, and it enables a dynamic understanding of how social and the spatial issues are interlinked in testimonials of São Paulo's historical urban development.

After an analysis of urbanisation challenges and the local food system, and an understanding of the key players and their needs, a vision is presented in

[Figure 1.0]
Photograph extracted
from Cidades Sem Fome

C H A P T E R O N E

THEORETICAL FRAMEWORK

Before starting the discussion of how spatial strategies combined with civil society efforts can trigger a transition toward peri-urban agroecology, it is crucial to understand the context of food security in peripheral São Paulo, and the different social movements of Food Justice, Food Sovereignty and Agroecology.

This chapter addresses the theoretical fields of Community Food Security, and the relationship to social vulnerability. The friction between the reformist notions of Food Security and the radical and progressive social movements of Food Sovereignty and Food Justice. The main differences between these movements will be pointed out and carefully framed to support this research in the context of Brasilândia. Urban Agroecology and Circular Actions are presented as possible routes towards Food Justice and Community Food Security. Considering that Agroecology theme is transversal and has an interdisciplinary character, this research discusses studies that establish the relationship between agroecology and the several social, environmental and political themes.

Lastly, the theories of socio-technical and socio-ecological transition using the Multilevel Perspective (PMN) are studiedas a framework to help unpack the complexities involved in disrupting the existing food system regime. This chapter ends with a conceptual framework that links multiple theories to guide the research and design.

1.1 - A problem of Food Security and health in informal peripheral settlements

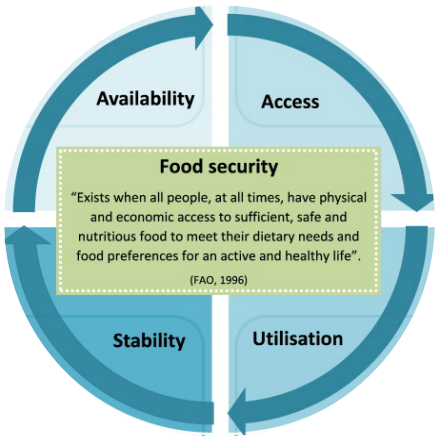
Identifying the trends and challenges of food security and defining food deserts and food swamps

In order to understand the concept of food security in peripheral São Paulo, it is critical to emphasise the relationship between the sustainability of agrifood systems, human health and environmental preservation.

Food security is a concept used to think systematically about how and why malnutrition arises, and what can be done to address and prevent it (Fraanje and Lee-Gammage, 2018:5). The most widely accepted definition of food security, which was adopted at the 1996 World Food Summit, takes multiple dimensions of food security into account. It states that food security exists "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). The conceptual framework of food security is built on four pillars of availability, access, utilisation and stability as shown in Figure 1.1.

Hennen et al. (2019:957) describes the four dimensions of food security as below:

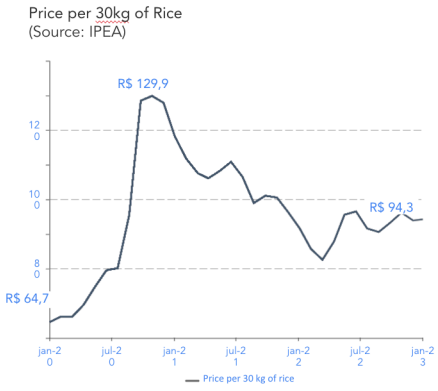
- **Availability**; the overall ability of the agricultural system to meet food demand, including the agro-climatic conditions affecting crop and pasture production and the socio-economic and cultural factors determining where and how farmers respond to markets.
- **Accessibility**; the access to adequate resources, given existing political, economic and social conditions, to acquire appropriate food for a nutritious diet.
- **Utilisation**; the food safety and quality aspects related to nutrition and health, including the sanitary conditions across the entire food chain.
- **Stability**; the extent to which there is a risk of temporarily or permanently losing access to the resources needed to consume adequate food.



[Figure 1.1]
Elements of Food Security (FAO, 2014)

In 2008, the number of inhabitants in urban areas exceeded the number of inhabitants in rural areas on the planet – which represents almost half of the world's population (UNFPA, 2008). 1 billion people live in slums, of which 30% are below the poverty line (FAO, 2012). Current food production would have to increase by 70% to meet population growth and feed a projected population of 9 billion people by 2050 (IFPRI, 2015). Population growth associated with increasing poverty and unemployment in the world represents an even greater challenge associated with food and nutrition insecurity (FAO, 2010; 2012).

According to the FAO's Food Insecurity Experience Scale (FIES) survey in 146 countries, 50 percent of urban populations in the least-developed countries experience some level of food insecurity. Urban food security has to be assessed



Prices of Rice reached its peak after COVID pandemic, and are ~50% higher after 2 years

[Figure 1.2] Nos seque inisciditis evellaccab

[[Figure 1.3] Print on Food Justice by Meredith Stern

alongside social vulnerability and urban poverty. Urban poverty is usually linked with a lack of access to secure employment (Crush & Caesar, 2014), basic infrastructure, services, social protection and healthcare (Satterthwaite, 2014) - conditions that further aggravate the impacts of food insecurity.

São Paulo has a high proportion of its urban population living in informal settlements. Although the glossary definition of Informal settlements is limited to "areas where groups of housing units have been constructed on land that the occupants have no legal claim to, or occupy illegally" (OECD, 2001), it certainly comes along with indistinguishable characteristics. Informal settlements are urban and peri-urban spaces with high rates of formal unemployment, high level of poverty, heavy reliance on the informal economy, poor health outcomes, very limited basic services provision, and heightened vulnerability to climate change (Crush, 2018).

In informal settlements around the world, where urban poverty can reach extreme levels, food insecurity reaches 70–95 percent of the population (Battersby, 2010). The people mostly affected by urban household food insecurity are often recent rural migrants and female-centred households and the central problem is access to food, rather than a shortage of food availability (Riley & Dodson, 2016).

The hunger and malnutrition in Brazil is indeed a matter of limited access to good quality food, despite the abundant supply of food. As a major global food supplier, Brazil has produced enough food to provide for the demands of its population, however it has not been able to promote an equitable distribution of these foods. The changes in the food system caused by the rise of a global food retail and the limited availability of healthy food in low-income neighbourhoods signal an unjust food system and the urgent demand for a food justice agenda (Gottlieb & Joshi, 2010).

Food justice is defined as action towards (i) seeking to challenge and restructure the presiding food system, (ii) focus on equity and struggles by highly vulnerable social groups (iii) setting up links with other forms of social, spatial and environmental justice advocacies (Gottlieb & Joshi, 2010). Food Justice activists view food as an entitlement to deal with the issues of social inequality, unemployment, low income, and the government's inability to provide sufficient services and infrastructure to the urban poor (Levkoe et al., 2011). By assessing a peripheral informal settlement, this paper explores how food justice crosses with social, environmental and spatial justice in the topics of transportation and access, land use, labour and education.

Community Food Security (CFS)

When studying food security related issues in a neighbourhood scale it is pertinent to refer to the Community Food Security (CF) area of study. The concept of Community Food Security (CFS) was recently developed to create systemic

approaches to reconnect food production and consumption (specifically for low-income people) and ensure an adequate and accessible food supply (Levkoe et al., 2011). Community Food Security initiatives integrate the perspectives of both anti-poverty activism and agroecology to address the challenges in the food system (Levkoe et al., 2011).

Measuring CFS is hard due to its complex and multifaceted nature, the lack of standardised tools, and the needs of different communities (Anderson, 1999). CFS can be divided into four main dimensions:**personal and household food security, food environments, sustainability, and strength of the local food system** (Fig. 1.4). The understanding of these dimensions is key in analysing the current risks in community food security in Brasilândia, included in chapter 3 of this report.

Personal and household food security refers to the pillars of availability, accessibility, adequacy, acceptability and agency (Knezevic, 2014). The first three have been defined previously when describing the food security framework, however acceptability and agency need further defining. Acceptability applies to food that is culturally appropriate and doesn't harm one's dignity, and agency refers to the democratic process of being able to directly influence food policies that enable food security (Knezevic, 2014).

Food environments refer to the conditions that have an effect on the food choice and accessibility. Examples of these could be one's home, work or school setting can influence one's food choices; the lack of job opportunities in proximity can affect one's ability to afford or the lack of time or skills to prepare food in a household. Food deserts environments provide a lot of fast food choices and very limited access to healthy organic foods, making it challenging for residents to purchase nutritious foods (Larsen & Gilliland, 2008).

In terms of sustainability, to achieve CFS, food should be provided in a socially, economically and environmentally sustainable way to aim to achieve community self-reliance (Hamm & Bellows, 2003). For this food must be grown ecologically, with the participation of the community and in a way in which the local economy is strengthened. Resilience is a key component of CFD, which links to the final dimension of CFS of strength of local food system

It is important to have a strong local food system that aims to produce and process its food locally as much as possible. External economic, environmental and health stressors can have great impact on food systems, as it has been experienced in the recent COVID-19 pandemic. Therefore ensuring a strong local food system that accounts for a diverse food source is key in increasing resilience (Levkoe et al., 2011).

From the CFS research a indicators are developed to guide the diagnosis of Brasilândia's Community Food Security in Chapter 3, to answer the question of how urbanisation affects household's access to food, food environments, sustainability, and strength of the local food system.

Community food security is "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice."

- Hamm and Bellows, 2003

[Figure 1.4]
Dimensions for assessing CFS

Accessibility & Health

The second edition of The Lancet on food systems concludes that in recent years the world has been facing three concurrent pandemics: malnutrition, obesity and climate change - based on data presented in 2021 in the FAO report on food and nutrition security. It is estimated that 828 million people go hungry in the world (FAO, 2020), 135 million more than in 2019.

Access to food is at the centre of food justice advocacy. Even though the urban poor population uses multiple strategies to obtain food, they rely on informal market vendors, open markets and small traditional retail outlets (J. Tefft et. al, 2017). They are usually limited to shopping at nearby stores, which often have a small selection of food items and an even smaller choice of nutritious products (Cannuscio et. al, 2013). The high concentration of the food retailers that sell ultra-processed foods in addition to the low availability of healthy foods is seen as a risk factor for the obesity pandemic in several countries worldwide, especially in deprived regions (Swinburn et al., 2019).

The grocery gap can be also linked to a problem of transportation (Gottlieb & Joshi, 2010) as the growth of supermarkets in this century coincided with the increasing use of the automobile as the main transport mode. Large supermarket stores tend to be located near large avenues and freeway exits. This is a specifically relevant point in terms of inequality in food access, as owning a car becomes a big limitation in access to a supermarket. In areas without food stores or adequate transportation systems, people depend more on the informal sector and purchase prepared food more frequently (Battersby, 2012). Shopping decisions of the urban poor are also strongly conditioned by the following factors (Frayne et al., 2010);

I. difficulty and cost of transporting large volumes of food from supermarkets;
II. the lack of storage and refrigeration;
III. the cost of electricity or cooking gas, and the lack of time or hygienic areas to prepare food.

A study explored differences in the types of stores and restaurants available in comparison to the neighbourhood's level of education in São Paulo. Evidence showed systematic differences in the location of stores and in the supply of nutritious food and socio-economic characteristics of neighbourhoods. Firstly, supermarkets were proven to provide more healthy items than local grocery stores and convenience stores and full service restaurants scored higher, in terms of access to healthy foods, than fast food restaurants and bars. Low education neighbourhoods in São Paulo, mostly in the periphery, tended to have more local grocery stores and fewer supermarkets than higher education neighbourhoods (Duran et al., 2013). It was also observed a higher number of bars, fast food restaurants, and lower number of full service restaurants in the periphery.

A grocery gap within neighbourhoods can be characterised as "food deserts" - a term that was introduced in the UK in the 1990s to characterise areas without

affordable fresh food or full-service markets. The high concentration of the food retailers that sell ultra-processed foods in addition to the low availability of healthy foods is seen as a risk factor for the obesity pandemic in several countries worldwide, especially in deprived regions (Duran et al., 2013). In Brazil, overweight prevalence in adults increased from 18% to 50% in male and from 29% to 49% in females in the past 30 years (IBGE, 2010). The main reason for this increase is the inability of food systems to support healthy diets. While the low cost of ultra processed foods, rich in fats and chemical additives, make them increasingly accessible and available to most of the population, fresh and nutritionally rich foods usually become more expensive and exclusive products (Swinburn et al., 2019).

Other than location, affordability is also a major factor for determining the accessibility of food. Food price is also a major factor that limits access to healthy foods and inactivates the consumption of ultra-processed foods. A study confirmed that in Brazil fresh foods (such as meat, milk, fruits, and vegetables) tend to cost more than ultra-processed foods (Costa et al., 2016). The following characteristics of ultra-processed foods contribute to the predominance of these foods in most retail stores and their frequent consumption by the Brazilian population (Monteiro et al., 2018) :

- hypertaste, due to high quantities of sugar, salt, and fat
- aggressive marketing
- convenience and practicality, food that is ready to eat without the need for culinary preparation

This research provides understanding on the level of urgency of addressing challenges of accessibility to adequate food in relation to health, especially in the context of high social vulnerability like Brasilândia.

Environmental challenges linked to the current Food System

Environmental justice advocacy and food justice advocacy are strongly linked. When food is produced through an intense industrial system distributed through a global supply chain, the resources used for food production, processing, and shipping cause extensive environmental stresses that cause pollution of the land, air, and rivers (Gottlieb & Joshi, 2010) and also generate enormous amounts of waste. Plus, the long distances covered by food production chains at an industrial level compromise food security, in terms of accessibility and safety.

In addition, climate change adds further stress in the food system and is an important factor for the increase in malnutrition. Climate variability and extreme weather events directly impacts the lives of people who depend directly on renewable sources of food for nutrition and financially, such as farmers, fishermen, livestock of animals, among others. One of the main effects of this is on the availability of food (Silva, 2019).

Food security, Food Sovereignty or Food Justice?

There are some frictions between the different approaches in regards to urban food systems when comparing the frameworks of Food Security, and the social movements of Food Justice and Food Sovereignty. As it is crucial to have international guidelines set by the FAO on how to ensure accessibility, safety, utilisation standard, and stability in food systems, there are yet some unseen issues in regards to the democratisation of food policies. Food Security policies can be limited to maintaining power within the current food system regime composed of large multinational corporations, and large industrial food processing companies that commonly lack the understanding of the impacts of their activity on a local scale. Therefore movements of Food Justice and Food Sovereignty take the lead in conversations that relate to the empowerment of local actors in decision-making for policies that influence the provisioning, distribution and supply of food. This paper attempts to combine both the use of factors to understand food security as well as essential elements inspired by social movements that fight for a more just and less environmentally harmful system.

Many actors that contribute to the global food movement have a radical and critical view on the corporate food regime, and advocate for Food Sovereignty. The concept of Food Sovereignty is defined, according to Via Campesina (1996), as the right of all people to decide on their own policies related to agriculture and food. These policies need to be structured, therefore, in a way to prioritise local production in the provision of food to nearby areas, maintaining and developing its own capacity to produce, respecting the cultural, environmental, and productive diversity. The concept emerged through the understanding of challenges experienced by the people on whom food supply depends: the small scale food producers. Food sovereignty emphasises farmers' access to land, seeds and water, focusing on local autonomy, local markets, local consumption and local production cycles, energy and technological sovereignty, and farmer-to-farmer networks (ALTIERI, 2010, p. 24). It also certifies that food is produced respecting culture and in harmony with the local ecosystem, referring to the traditionality of food production and the techniques used to treat their soils, water and biodiversity, for generations (FAO, 2013).

In this sense, the movement of Food Sovereignty alongside Food Justice could be considered as providing a more holistic view than Food Security. The main element that distinguishes these movements from Food Security lies in the fact that food security, according to FAO, focuses on the provision of access to food in sufficient quantity and quality to meet the needs of the population. However it does not bring a concern about which model of agriculture should meet this aim, leading to the belief that reforms in some bases of capitalism are sufficient for the problems of the food system to be solved (Coca, p.75, 2016). Whereas, Food Sovereignty and Food Justice go beyond this capitalist conception, since it points out the need for greater valorisation of local food circuits (Coca, 2016), through

the strengthening of family agriculture and indigenous communities.

Food Sovereignty and Food Justice are two movements that are strongly aligned, however due to the different historical, geographical and political context in which these movements arised, they differ in relation to strategies and approaches. This research has found that Food Justice as an approach aligns best to the socio-historical context of the periphery of São Paulo, due to its focus on marginalised groups defined by race, gender and income (Clendenning et al, 2016). The movement of food Justice, similarly to environmental justice, gained force in the US in the 1960s in response to the inequalities faced by Black people; (Bullard 2000) the movement addresses the injustices that impact disproportionately people in relation to race and social class (Gottlieb and Joshi 2010).

To conclude, the fight against food and nutrition insecurity goes far beyond the second item (Zero Hunger) of the SDGs, having direct impacts on reducing poverty, encouraging education, generating jobs, empowering women and reducing inequalities, in addition to contributing to food waste, and environmental, social and health damage to populations. Food justice is a powerful idea with the ability to stir up community change and a different kind of food system (Gottlieb & Joshi, 2010). In this direction of change, the next chapter will explore the socio-technical transition of the agri-food system, applying the concepts of agroecology and circularity.

1.2 - Urban Agroecology and Circular Actions as foundation for change

Peri-Urban Agriculture

As one of the means to face food insecurity and malnutrition; the fight against poverty; and unemployment in large cities in the coming decades the has pointed to projects and initiatives for food production in urban areas – which is referred to as Urban and Peri-urban Agriculture (UPA). (FAO, 2021).

The research by Santandreu and Lovo (2007) is one of the first surveys of urban and peri-urban agriculture experiences in Brazilian metropolitan regions. Peri-urban Agriculture is defined as the production, transformation and provision of services for the generation of agricultural products transformed into self-consumption, donations or commercialization, reusing, in a sustainable way, local resources and inputs (Santandreu & Lovo, 2007). These activities are carried out in urban or peri-urban spaces, linked to metropolitan logistics and articulated with the territorial and environmental management of cities. Furthermore, it must be guided by respect for local knowledge, the promotion of gender equity, the use of appropriate technologies and participatory management processes. Those who participate are individuals or groups, with people in vulnerable conditions, such as women, the unemployed, migrants, children, young people and the elderly

(Santandreu & Lovo, 2007, pg.11).

Finally, the typology presented by the authors about the places used is highlighted. In private spaces, there are vacant lots, vacant lots (private or with doubts about the property), slabs and ceilings, backyards or patios and green areas in housing projects. In public spaces, there are land (municipal, state or federal) of urban green areas, such as squares and parks; institutional, such as schools, day care centres, health centres, hospitals, prisons and buildings; in non-buildable places, such as the sides of railways, roads and avenues, banks of water courses, flooded areas and lanes under high voltage lines; in areas of conservation units and in areas of environmental treatment.

Urban agriculture (AU) is not a recent activity in Brazil and in the world. This activity has existed since cities were created, but over time many types of urban agriculture have emerged according to different contexts. Urban agriculture was shaped as a social movement mainly when the Green Guerillas emerged in the 1970s in the US. In Brazil, something similar took shape in 2011 with the creation of the Hortelões Urbanos movement.

It is important to note that urban agriculture is a multifunctional activity (LI and ZHOU, 2016), which has been investigated from different angles, including the following studies:

- poverty reduction, income and employment generation (Mkwambisi et al., 2011)
- community development and female empowerment (Slater, 2001);
- the promotion of health and food and nutrition security (Ribeiro et al., 2015);
- activism and social action (Nagib, 2018);
- social justice (Reynolds & Cohen, 2016);
- instrument of urban planning policies, public governance and democratic deepening (Mendes et al., 2008);
- environmental impacts, ecosystem services and biodiversity (Lin et al., 2015).

Urban Agriculture in socially vulnerable contexts aligns with 5 out of 17 SDG's (Fig. 1.5). Due to the many benefits to soceity, urban and peri urban agriculture are part of a larger political movement of Agroecology.

[Figure 1.5]
Urban Agriculture (AU) in socially vulnerable contexts aligns with 5 out of the 17 Sustainable Development Goals (SDGs).

Urban Agroecology

Agroecology has several meanings and applications. It is both a science, a set of agricultural practices and social movements that consists of the application of ecological concepts into the design and management of sustainable agro-ecosystems. Agroecology encompasses three objectives: economic, social and environmental - thought of in a relational way, such as economic viability, integrated rural development, local and stable development, food self-sufficiency,

maintenance of biodiversity, low-cost technologies and satisfaction of local needs (Altieri, 2012). In this research agroecology is referred to as more than a production technique or system: it is a movement, a science, a political vision and a practice. It adds to the fields of agriculture, certain values and ethics, for instance social relations of mutuality and respect, a commitment towards a more equitable change and land stewardship (Tornaghin & Hoekstra, 2017).

Under this context, the emerging concept of 'Urban Agroecology' relates not only to practises within the urban setting that aim to rebuild a sustainable local food system, but also a movement that advocates ecological, social and political terms. The ecological pillar is based on respecting all forms of life and protecting land and soil from pollution and degradation. The social pillar is about aspiring for mutual support and learning from cultural diversity. The political pillar of Urban Agroecology focuses a path towards food justice, and equitable access to resources and benefits (Tornaghin & Hoekstra, 2017).

In addition Urban Agroecology also involves influence in the field of economy and geography. In economic terms, it includes the actions in social enterprises and commons, enhancing aspects of a solidarity economy, a concept that will be further explored in this paper. Whereas in geographical terms, Urban Agroecology links to how the urban environment and process affects and shapes the cultivation of food in cities and puts forward models of urbanisation that account for food justice (Tornaghin & Hoekstra, 2017).

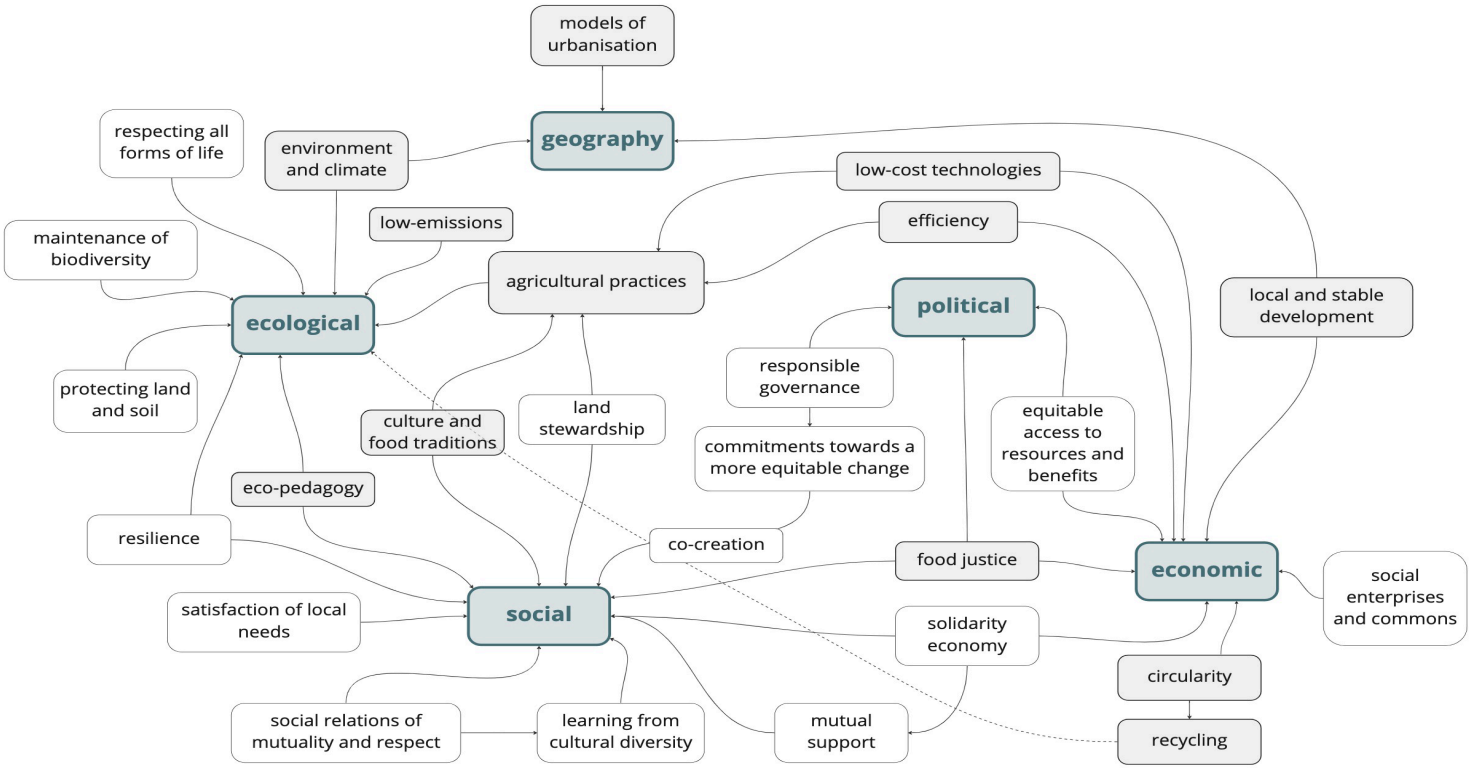
Urban agroecology differs from agroecology in terms of the social tissue, the potential impact it can create and the day-to-day practices of farmers. On this topic C.M. Deh-Tor (2017) suggests that we should move towards building and empowering a "resourceful reproductive and agroecological urbanism". This idea sets forward a perspective of using agroecology as a new driver for urban development and spatial planning for achieving community food security. Initiatives for this which will be explored in chapter 5 of this paper, which presents a vision for the peri-urban neighbourhood of Brasilândia in São Paulo.

In Latin-America there have been large contributions from citizen and social movement-led initiatives in urban agroecology. These movements differ in scale, social context, cultural settings however they all share the same goal towards social transformation by means of a local food system. For example, in São Paulo, the Movimento Urbano de Agroecologia, MUDA-SP (Urban Movement of Agroecology), is a movement with significant political presence that promotes a series of actions to create awareness and apply practices to offer opportunities related to agroecology in cities. The Urban Movement of Agroecology of São Paulo (MUDA-SP) emerged from a group of people who had participated in a permaculture course at UMAPAZ in 2010 and had the idea of creating actions linked to solidary consumption, planting efforts and healthy living in cities. Similarly to the project of EcoCidade (ECOCity) from the NGO 'A Cidade Precisa de Você' (The City Needs You), these movements are key in spreading ideas and

[Figure 1.6] Urban farm in east region of São Paulo supported by NGO *Cidades Sem Fome*

practices of agroecology through eco-pedagogy and collaborative action. The social organisations develop communication actions, organic fairs and solidarity economy, learning, festivals and articulation with the public power. All these actions have the ability to disseminate agroecology ideas and practices among people.

In Brazil, agroecology is historically practised as a movement of ecological activism in agriculture, whose ideas and practices were consolidated in the Associação de Agricultores Orgânicos – AAO (Association of Organic Farmers). The political movement fights for the human right to have access to adequate and healthy food (Justo, 2020). Among the subjects, there are activists from the Landless Rural Workers Movement - MST, permaculture activists, collectives of urban gardens, groups of young people from the periphery, farmers and Guarani indigenous people, associations of organic producers, student groups and university researchers. Like in many political movements, territories are in dispute: sites, squares, vacant lots and settlements that can be used for organic agriculture or production with pesticides.



[Figure 1.7]
Complex schema of Urban Agroecology theory. In grey are the topics most predominant in this research, and which relate the most to the spatial initiatives presented in chapter 4.

The State of São Paulo issues a Certificate on Agroecological Transition to attest that producers are in this process of transitioning towards Agroecological production. Such documents are issued to farmers who receive technical visits and assistance. The state defines the Agroecological Transition as a gradual process with guidance and monitoring to transform the productive and social systems to recover the fertility and ecological balance of the agroecosystem, that ban the use of pesticides that are not permitted by current organic agriculture , prioritising the development of local and sustainable agro-food systems, considering the social, cultural, political and economic aspects. The Certificate can be presented for sale, such as in fairs, events, markets and even for collective purchases by groups of consumers and institutional purchases (public and private). The Certificate and Declaration are a recognition tool for farmers as well as a safety tool for consumers and commercial establishments who wish to support this crucial moment for farmers and acquire more sustainable products (Secretaria de Agricultura e Abastecimento, 2019).

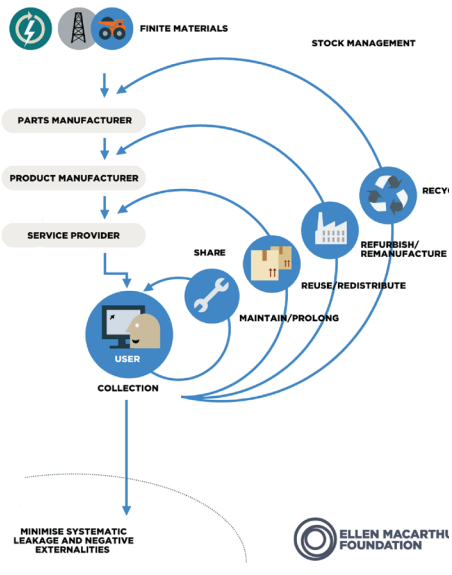
In all, this movement sets forward a perspective of using agroecology as a new driver for urban development and spatial planning for achieving community food security. For this, agroecological urbanism should incorporate the multiple systems it involves. The complexity that is embedded in the understanding of Urban Agroecology is shown below (Fig. 1g)

Circular actions linked to agroecology

In relation to the Urban Ecology concept, cities are perceived as complex, dynamic ecosystems through which resources flow between actors, various scales and sectors. cities should be viewed as complex, dynamic ecosystems through which resources flow between a myriad of actors, across multiple scales and sectors. The ecosystem's health relies on actions of protecting and regenerating ecosystem services , looping waste resources of and maximising the localisation of resource flows (Williams, 2019).

Currently, 60–80% of extracted natural resources are consumed by cities, 50% of global waste and 75% of greenhouse gas emissions are produced in cities (Camaren and Swilling, 2012). To reduce waste streams and emissions, governments, and the private sector, have started to agree on the urgency to transition towards circular economies (Liang and Zhang, 2011). In response, the Ellen MacArthur Foundation (EMF) designed the RESOLVE framework for circular economy which indicates the key principles and actions, and the relationship between them to achieve a Circular Economy (Fig. 1h). The RESOLVE framework presents six actions: regenerate, share, optimise, loop, virtualise and exchange.

The RESOLVE framework is used mostly as a guide to industries and businesses towards this transition. However, in the paper 'Circular Cities', Joanna Williams critically investigates the RESOLVE framework as some critical aspects



[Figure 1.8] RESOLVE framework on Circular Economy by Ellen MacArthur Foundation

are overlooked in the application of this scheme from a city wide perspective. One of the main points that is highly relevant to the purpose of this research is that to use circularity in an urban scale, the frameworks should reflect characteristics on spatial logistics and localisation of resources.

> "RESOLVE provides a useful basic framework for conceptualising a circular approach to urban resource management. The three principles and six circular actions provide a useful guide for those developing and implementing resource management strategies for cities. However, it is a framework for an economic system (industrial sector or business) rather than an urban ecosystem." - Williams,. Joanna - Circular Citie

Williams structures her argument in the topics of; consumption, land, infrastructure, adaptation and scale and localisation. She states that EMF's framework focuses merely on production rather than consumption, yet changing the consumption patterns of people living in cities will be crucial for a circular economy (Zaman and Lehmann, 2011). In addition to lacking a focus on lifestyles and willingness of consumers to adopt circular practices, land and infrastructure are important resources which are overlooked in this framework. As well as the important aspects of localisation of resource flows and adaptation of infrastructural systems.

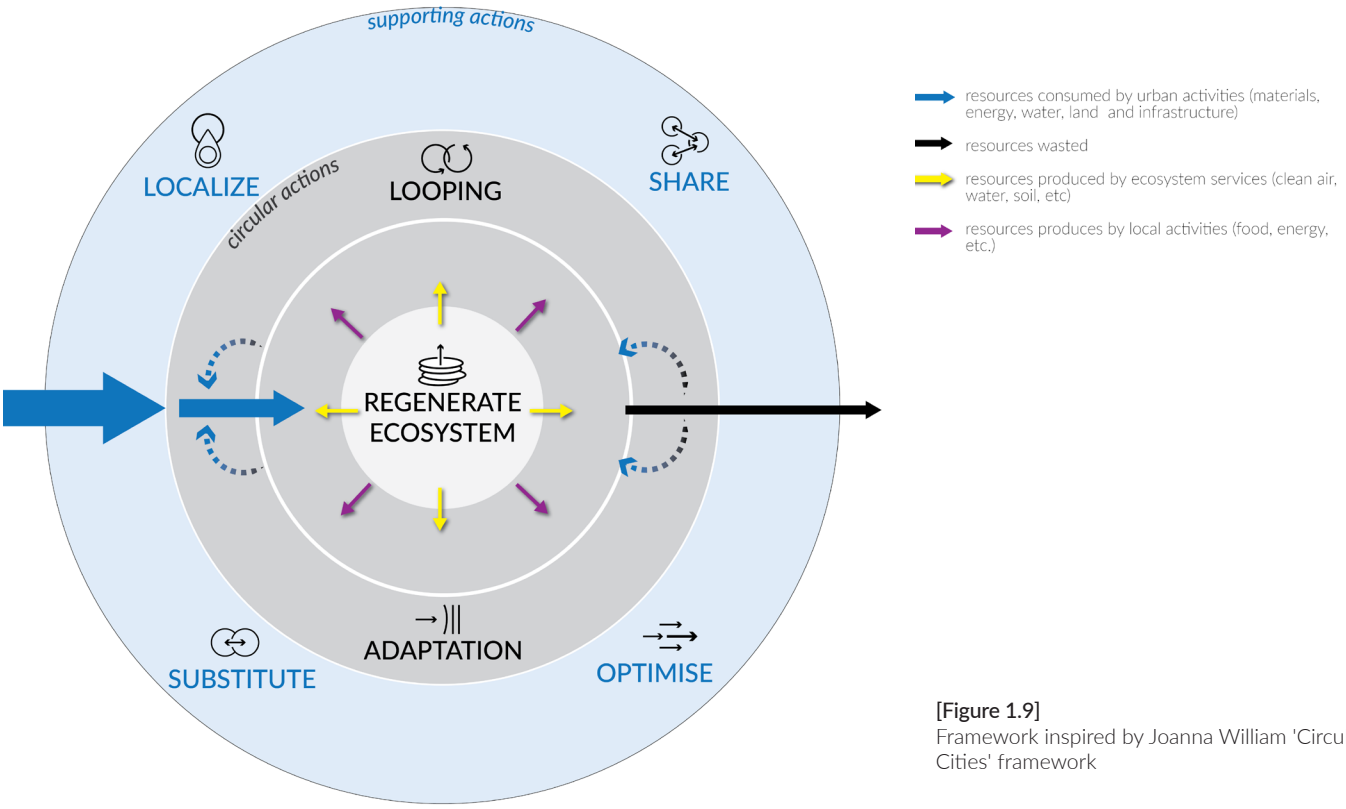
By identifying the principles and components that are lacking in the REVOLVE framework, J. Williams develops her own conceptualisation of a circular approach to resource management in a city. This conceptualisation defines two types

Circular actions	definition	example
Looping	reduces resource wastage by closing resource loops through recycling, re-use and energy recovery.	*grey-water recycling, composting and waste-to-energy plants*
Regeneration	restoration of the urban ecosystem, preservation of natural capital and essential ecosystem services through the incorporation of green and blue infrastructure in the city.	*urban farms, permeable surfaces, retention ponds, green roofs*
Adaptation	planning and designing of the city to enable the adaptation and renewal of existing infrastructure with minimal resource wastage.	*modular farm systems, flexible spaces*
Supporting actions	**definition**	**example**
Localization	localization of resources and activities to unite production and consumption within local boundaries and therefore reduce resources consumed emissions by transportation.	*Local symbiotic capital (ex: local food and energy production) social capital (ex. local currencies)*
Substitution	Reduce finite resources consumed to reduce extraction of natural resources and waste.	*Energy-efficient infrastructure and renewable energy supply*
Share	Maximise use of products and keep product loop speed low	*Co-working, shared mobility services*

[Table 1.1]
Circular and supporting actions, definitions and example

of actions (circular and supporting) needed to deliver cities in which resource consumption and waste are reduced; infrastructure adapted and renewed; and ecosystem regenerated (J. Williams, 2019). Figure 1.9 provides a diagrammatic representation on how these actions lead to circular transition in cities. however it lacks information on who are the key actors that play a role in a circular urban ecosystem, what are the types of activities, infra-systems and resource flow.

In this research paper about Community Food Security in the context of the peripheral metropolitan region of São Paulo, Williams' definitions of circular and supporting actions (Table 1.1.) will be used as guidelines to characterise the interventions that will be proposed for a future vision. Therefore, the aim is to investigate how circular actions (resource looping, sharing, optimisation, substitution, localisation etc.) can be used to address challenges related to food security for an urban context of social vulnerability.



[Figure 1.9]
Framework inspired by Joanna William 'Circular Cities' framework

Transitions theories and Theory of Change

Socio-technical transitions and the Multi-Level Perspective

The need for a bottom-up change

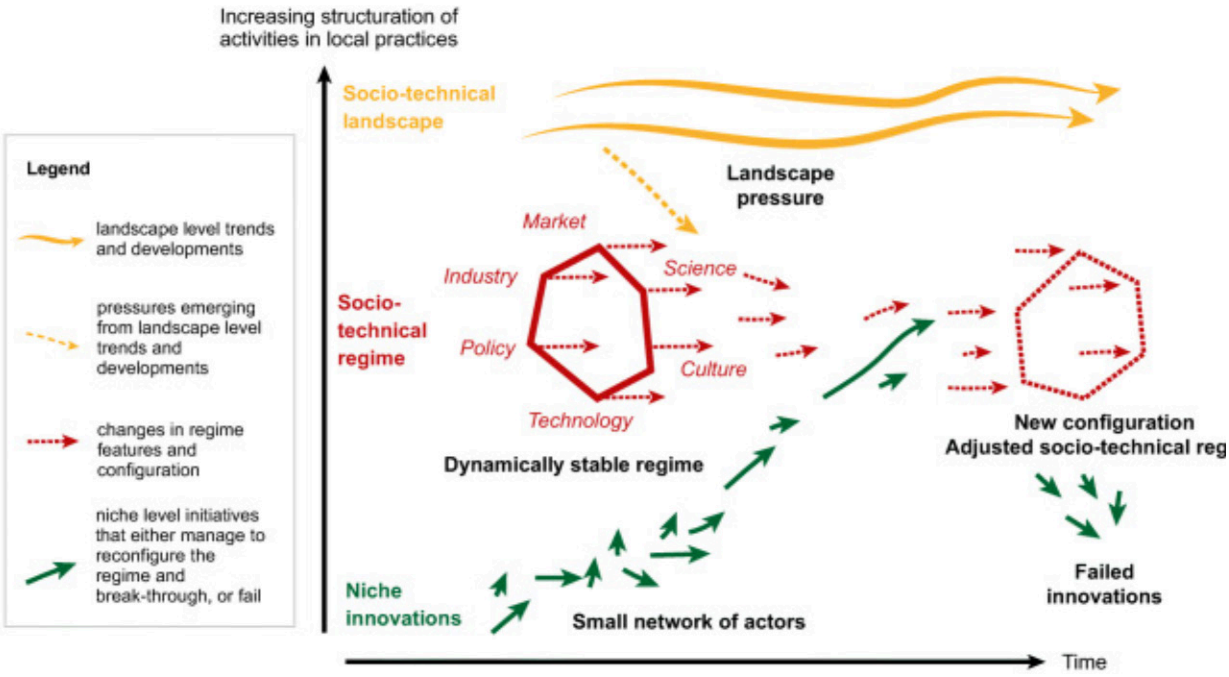
To respond to the critical risks on humanity presented in the previous chapter, our agri-food system needs a reform. The socio-environmental problems such as extreme climate change, the loss of biodiversity and natural resources, along with population growth and increasing social inequalities present challenges for civil society, government, business and industry. These problems require a re-configuration on the systems that define our way of life: agri-food systems, transport, energy and housing (ELZEN et al., 2004). This re-configuration demands a set of processes that leads to a fundamental shift in the socio-technical system referred to as 'Socio-technical Transitions' (Geels & Schot, 2010).

Transitions are idealised, implemented, maintained or transformed by a chain of agents, which include industry, companies, government, organised civil society and individuals, whose actions imply their relationship with culture, with the market, with consumption, technology, infrastructure, scientific and non-scientific knowledge. Transitions are broad, complex and long-term processes, caused by the action of these multiple agents, triggering a change in culture in relation to the environment and sustainability (GEELS, 2004). Socio-technical transitions are analysed through a popular framework known as the Multi-Level Perspective (MLP). This framework provides a way of understanding innovations of Sustainable Transitions (ST), postulating three levels at which processes interact and align to result in transformations of the sociotechnical system; landscapes, regimes and niches (GEELS, 2018) as shown in Figure 1.10.

The 'regimes' represent the structures, practices and rules of institutions and technologies that want to maintain their dominance and reinforce each other. Despite implementing innovations, they are controlled, predictable and do not represent a threat to the status quo (GEELS, 2010). In relation to the modern food system, the regime is composed of multiple and interrelated domains such as food policy, agrifood industry, technologies of ultra-processing and cold chains, the global market of food trading, and the fast-food marketing that has been influencing food culture. All the groups of actors linked to these domains are coordinated so that the regime is kept sustained. Therefore, it could be said that there is a series of semi-coherent rules and relations to keep the socio-technical food system regime in place. MLP theory determines that transformations occur when the regime dimensions are redirected and rearranged (red dotted lines in Figure 1.10).

'Landscapes' are the broader contexts of transitions, such as deeply ingrained cultural patterns, macro politics, macroeconomics and spatial structures. Landscapes stimulate, exert influence and direct pressure on other level. The

landscape level pressures on the current food system are for example the global crises due to the 2020 Coronavirus pandemic, climate change and its pressure on agriculture and also in relation to consumer patterns as environmental awareness increases. The transition theory can help unpack the complexity of which this research paper attempts to address by envisioning an agroecological and circular local food system in the peri-urban context of Brasilândia. A landscape characteristic is the population growth in the large city of São Paulo, a significant stress factor in agricultural production, which in turn is increasingly dependent on favourable circumstances from an environmental, water and technological point of view, as well as on techniques for environmental preservation and climate adaptation. Another level of complexity in this "landscape" of large cities in developing countries, is that urbanisation is characterised by socio-spatial segregation, environmental degradation, increased poverty and food insecurity (FAO, 2015).



[Figure 1.10]
Multi-level Perspective (Geels & Schot, 2010)

At the lowest level are the socio-technical niches, the least table level (Lawhorn and Murphy, 2011). The 'niches' are "where radical innovations emerge", as agents are motivated by innovations and are open to more radical and transformative ideas (TWOMEY and GAZIULUSOY, 2014). Because they are not market-influenced or constrained by state regulations, niches promote innovations that fundamentally differ from the regime and generally demand landscape changes, promoting regime-level opportunities. Numerous civil society

organisations are currently working across all of Brazil to tackle challenges of food insecurity in urban spaces. The strategies of these NGOs include steering innovation within the community. The project of EcoCidade in Brasilândia has focused their efforts in identifying these agents of change that promote new sustainable, ecologic and circular solutions to the local food system. This will be explored in chapter 3.4, about the role of civil society in such transitions.

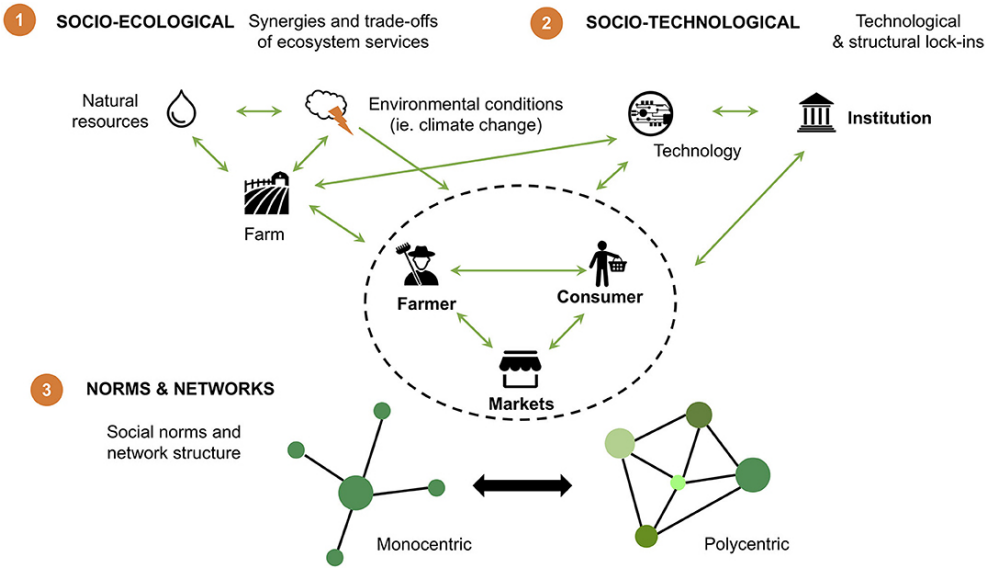
Lawhorn and Murphy, in their paper, make a commentary on the importance of addressing political ecology within urban environmental management. Apart from analysing the multi-level dynamics of system innovations, "socio-technical transition research has been used to develop a prescriptive formulation – transition management – to foster and guide transitions towards sustainability". The final two chapters of this paper will attempt to suggest tools for spatial and political strategies to stimulate a socio-ecological transition, focusing in the peripheral context of São Paulo. Once the vision is designed based on several interviews with local actors, interventions and policy ideas are developed and pitched to municipal agents, and other relevant political, economic, and social actors, "namely elite policy-makers, industry leaders, and representatives from major civil society organisations" (Lawhorn and Murphy, 2011).

In relation to its role in political ecology, Lawhorn and Murphy present a series of critiques on the mainstream transition approach. Firstly they defend that socio-technical literature largely focuses on technology and replacements of systems of supply as a strategy to achieve sustainability, relating to the idea of technological determinism (van den Heuvel and van den Bergh, 2009). There is a need to analyse beyond technological artefacts, to explore the tensions and complementarities between the societal norms, geopolitics, landscape features, niche innovation and the desired changes in the regime (Lawhorn and Murphy, 2011). Secondly, they state that socio-technical transitions tend to focus on only elite actors to shape transitions, and overlook the perspective of consumers, activists and social workers. This has been appointed as a main struggle of the current urban development of the periphery, as the planners and "those from the outside mostly assume our needs and how those needs will be solved (...) they do very little in understanding what the periphery actually wants" (personal interview with activist from Brasilândia, October 2022).

Thirdly, Lawhor and Murphy bring the point that socio-technical transition framework lacks a representation of the dynamics of the MLP in space and scale. The final critique presented is the one that socio-technical transition studies tend to avoid the issues of power. The four critiques presented by Lawhorn and Murphy about techno-centrism, focus on elite actors, lack of spatial and scale factors, and the evading of power relations, are all highly relevant to the complex context of Brasilândia, which will be analysed in chapter 3.

Socio-technical transitions take decades or more to be concluded, and yet some never do. Whether such socio-technical transformation happen relies on

several factors (Geels & Schot, 2007), such as: (i) whether niches exist and what is their level of readiness; (ii) whether the interactions and exchanges between regime and niche are cooperative or hostile; and (iii) whether pressures caused by the landscape are unforeseen or gradual. This paper will address all the levels, however will focus mostly on analysing the key agentes and niches in Brasilândia



[Figure 1.11]
The conceptual diagram of key agents and interactions in the transformation of food systems. Source: Ong, 2020

striving for agroecology and circularity and how their role in innovation and development of new rules and practices can be stimulated through spatial interventions.

A framework for Agroecological Transitions

Agroecology can be understood as a framework that combines both socio-technical and socio-ecological transitions to respond to the threats in the agri-food system. There is emerging literature on Urban Political Agroecology. A field that proposes ways to build an alternative food system which includes tackling challenges in the topics of urbanisation, land management, finance, cultural and social norms, education and governance (Deh-Tor, 2017). Urban Political (agro) ecology set forth a framework that ties the political debate with the science of ecology to urban settings. Challenging the traditional perspective of distinction between urban and rural, and society and nature (Dyck et al., 2017). The research on urban political ecology aims to answer questions such as: how do the social geometries of power shape the production and consumption of food, and therefore its access? A question which is even more relevant to the context of São Paulo and Brazil, as will be explored in the Analysis section of this paper.

To understand the agroecological transition Theresa W. Y. Ong and Wenying

Liao identify three general frameworks that have been primarily implemented by scholars to assess food systems change: a socio-ecological framework, a socio-technological framework and a framework that investigates social norms and networks. These frameworks reveal the key main agents in the decision-making of the transformation of the food systems; the consumers, markets and institutions. The overlaps and interactions across these frameworks provides a visualisation of the complexity of the food system (Ong & Liao, 2020).

The third framework on norms & networks describes the structure of interactions of the first two frameworks. Their actions influence one another and have consequences in the environmental sustainability or degradation and technological development of farming practices (Ong & Liao, 2020). Three main topics of research on agroecological transitions are highlighted within these frameworks: synergies and trade-offs in ecosystem services, technological and structural lock-ins, and social norms and network structure (Ong & Liao, 2020).]

The socio-technological framework refers to the technological and structural obstacles that restrain the agroecological transition. This framework investigates how advances in technology are influenced by institutional policies and investments. These technologies directly affect farming practices, which influence market conditions, farmer revenues and dependence on the development of future technologies (Arthur, 1989; Russell, 2001).

Whereas the third framework explains the effects of social norms and networks on agricultural change. This framework describes the importance of market structure in changing food systems, classified as a central monocentric trading network vs. a polycentric locally based network. The market structure and consumer demands directly influence the food producers' decisions to adopt alternative farming practices, and in return, the producers' decisions impact the evolution of trading networks (Ong & Liao, 2020). This framework is insightful in understanding how agroecological transitions can be facilitated through alterations in social norms and collective action.

Thus, starting from the hypothesis that UPA and urban agroecology can enable possibilities of combating structural inequalities in contexts of social vulnerability, providing: income generation; improvements in the quality of life of urban farmers; expansion in the production and access of food suitable for human consumption; environmental awareness and preservation. In this perspective, the following question was structured: How to transition informal and peripheral settlements into more healthy and climate resilient neighbourhoods through circular food practices attached to spatial strategies?

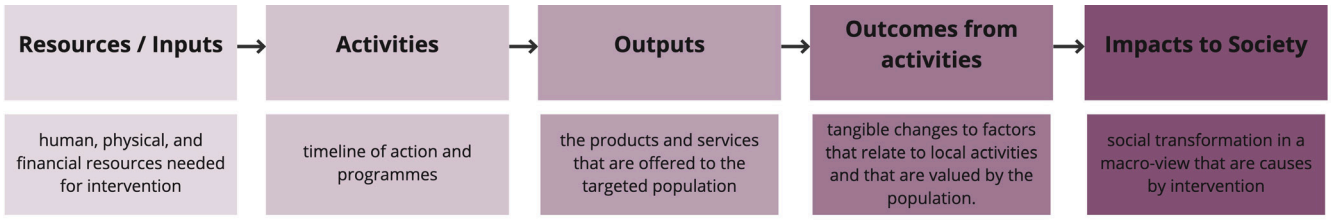
Sub research questions intend to respond to how is Urban Agriculture and agroecology constructed in regions of social vulnerability in the northern region of São Paulo and how the civil sector operates in these locations? The study investigates a specific region in São Paulo, the neighbourhood of Brasilândia and the general objective is to unravel the agroecological practices in the neighbourhood, as well as the potential for innovation, conflicts and challenges

that emerge from the dynamics established between the multiple agents present in these locations. And finally provide a vision of how the landscape could be impacted by this socio-technical transition.

1. Contextual aspects of São Paulo in terms of urbanisation, food system, climate and governance that build the concept of 'landscape' from the Multilevel Perspective;
2. Key actors involved in agroecology and urban agriculture, and the dynamics structured between them. The limitations and potentials these agents have through semi-structured interviews - guided by the concept of 'regime' from the Multilevel Perspective.
3. Analyse the social dimension (the relationship with the community, buyers and multiple agents); the environmental dimension (types and techniques of cultivation, whether or not it promotes awareness and environmental preservation); the economic dimension (income generation, financing of gardens, pricing, commercialization and popular entrepreneurship); and the challenges faced by the studied urban farms– guided by the concept of "niche" (micro level) of the Multilevel Perspective.

Theory of Change

The Theory of Change (ToC) framework is used to guide chapter 4 and 5 on the vision and strategies to transition the local food system towards agroecology. The ToC concept provides a framework to assess interventions in a given context of change, and articulate the connection between activities done and the positive socio-environmental results. This approach is used to describe how the intervention works in a given context and the quality of implementation, why the intervention works through cause and effect relationships and which activities, steps and players are needed for this intervention. The concepts of ToC interlinked with the Transition Theory and MLP will be used to structure the argument on the potential scalability of agroecological and circular practices and the possible impact in the community.



[Figure 1.12]
Theory of Change - how to frame impact of initiatives.

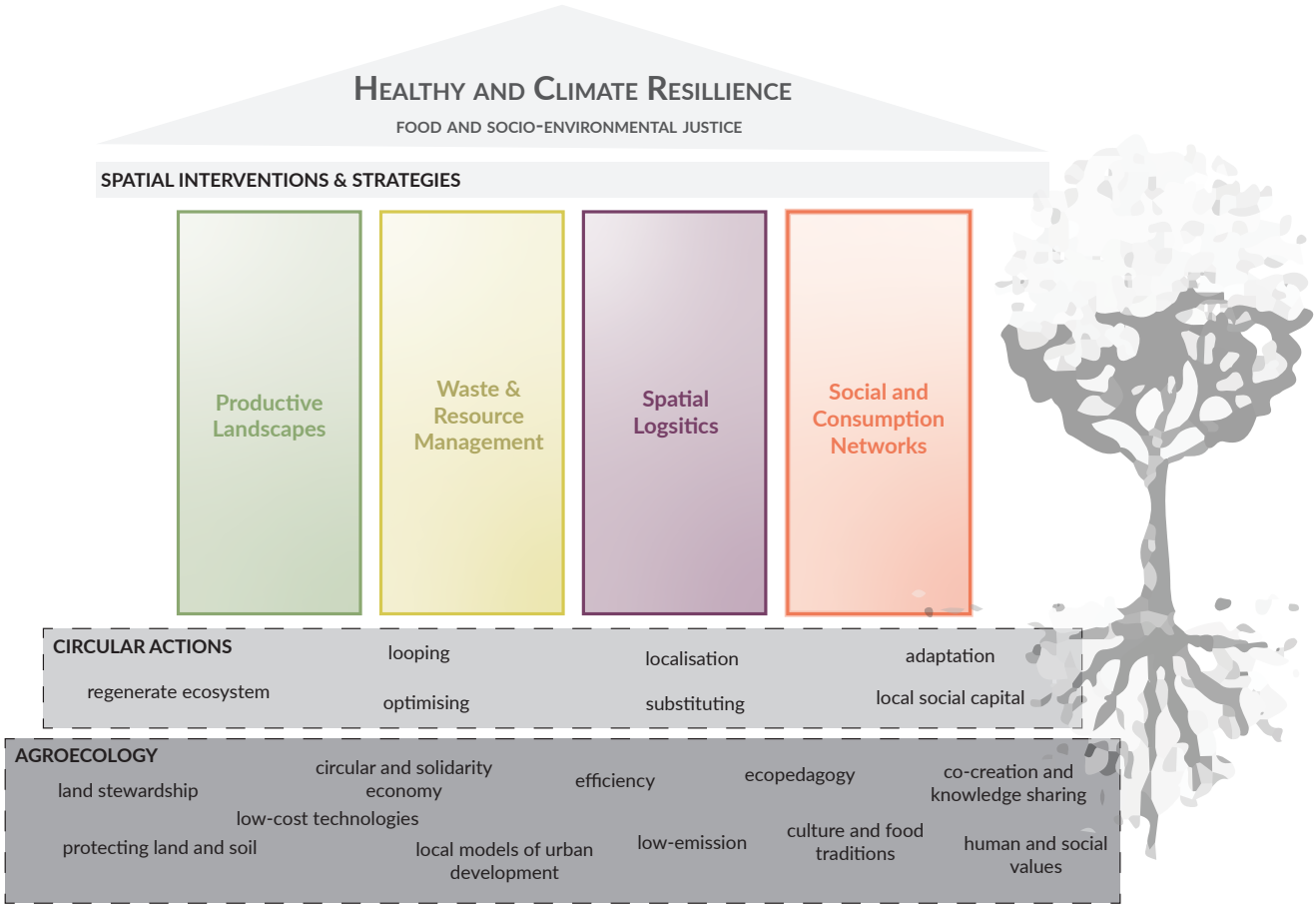
1.4 Conceptual framework

This paper proposes a vision to achieve community food security and food justice through spatial planning and a strengthened civil sector. The literature review on Community Food Security, Food Justice, Urban Agroecology and Circular Actions provided an understanding to develop a conceptual framework to guide the main research on how peripheral neighbourhoods can transition to more healthy and resilient environments. As this paper's focus is mainly on spatial interventions and the linked interactions between key players, four pillars were established to guide this change. When reflecting on how neighbourhoods can contribute to CFS and Food Justice it is important to ask the questions; where and how can food be produced locally? How and where can resources be optimised so that the nutrients from food waste are recovered from soil? If we aim for localisation of resources, how can our spatial logistics provide a low-emission local distribution? And how can our neighbourhood plan provide spaces to boost community exchange to achieve social resilience? Therefore, the four pillars for interventions relate to the topics of landscape, logistics, waste recovery and community.

Considering that Agroecology theme is transversal and has an interdisciplinary character, this research proposes four pillars to relate to the relationship of agroecology and urban agriculture and ecological landscapes, waste management, spatial logistics and, finally, the key aspect of the social exchanges and mutual support. The schema to visualise the conceptual framework demonstrates how the elements of agroecology and circular actions are the foundation principals to design spatial intervenions towards healthy and climate resillience with a foucs on food and socio-environmental justice. The choice for this format that reminisces a greek classical façade, is due to the will to demonstrate how agroecology can propose a new way of designing cities and a new way of thinking of soceity.

		Literature review		
		Topics of Agreocology	Circular Cities actions	Community Food Security and Food Justice
Pillars of change	Productive landscape	agricultural practices; environment and climate resillience; protection of land and soil; maintenance of biodiversity; low-cost technologies; land stewardship	regenerate ecosystem	productive landscape strategies can provide food to houseul increasing availability and accessibility. In addition a food landscape can influence food decision and increase organic food acceptability refering to food environment dimension of CFS.
	Waste Recovery	circular economy; recycling; efficiency; low-cost technologies	looping; optimising	recovery of nutrients in organic waste provide fertilizers that boost production and strengthen local resillience, relating to the sustainability aspect of CFS
	Spatial Logistics	low-emissions; local and stable development; models of urbanisation	localisation; substituting	ensures a distribution of locally produced food, ready-made meals and for waste recovery, to fill in the gaps of accessibility
	Community Exchange	eco-pedagogy; culture and food technologies; learning from cultural diversity; solidarity economy	adaptation;	strengthens social resillience; and boost food justice advocacy which refers to the agency pillar within the personal and household dimension of CFS

[Table 1.2]
Table shows the relationship of each field of study with the pillars for interventions.



[Figure 1.13]
Conceptual Framework

CHAPTER TWO

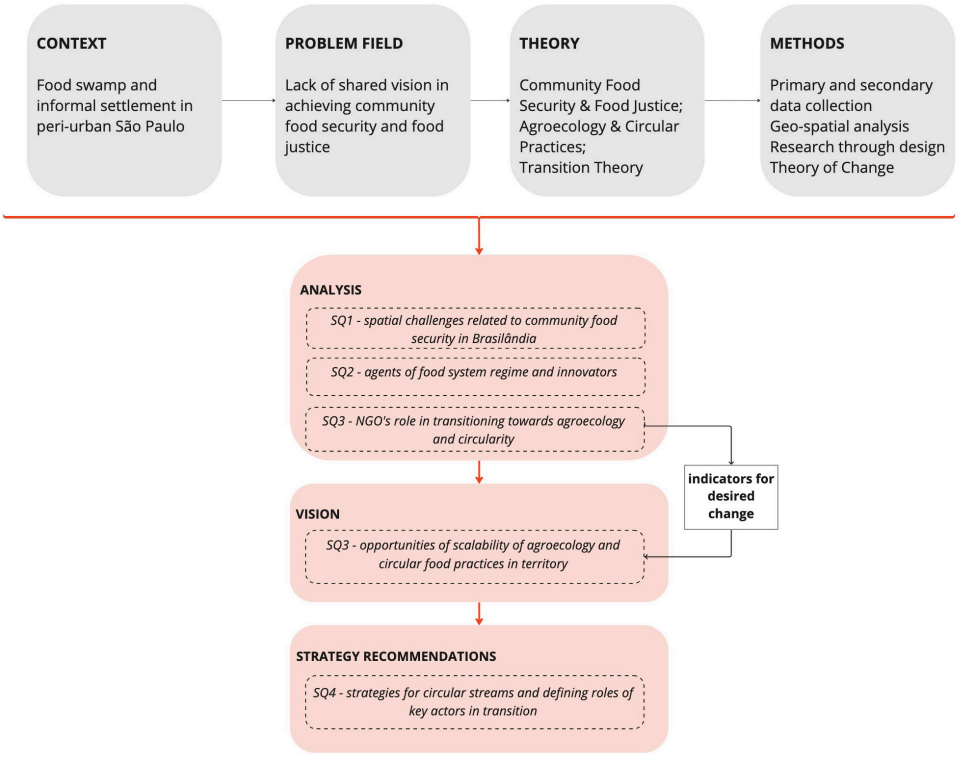
METHODOLOGY

[Figure 3.0]
Photograph extracted from Cidades Sem Fome

2.1 – Research Structure

This research is a qualitative and spatial analysis of the dynamics installed between the multiple players involved in agroecological practices in the peri urban neighbourhood Brasilândia in the north of São Paulo. The final goal is to present a vision and opportunities for a more healthy and climate resilient neighbourhood through agroecological practices. This thesis paper is separated into three main sections; the analysis; the vision; and recommendations for the strategy to achieve this vision. The spatial and demographic analysis of Brasilândia (SQ1) and the understanding of the key players in the local food system (SQ2), provide an understanding of the current complexities entangled within the territory of Brasilândia that link to food accessibility and health.

The last chapter of the analysis sections present the current programme by EcoCidade, a NGO project that aims to tackle some of these challenges (SQ3). The understanding of the impacts and challenges of EcoCidade in combination with the spatial challenges identified in SQ1, provide indicators for a desirable vision towards Food Justice in Brasilândia. The synthesis of the analysis is followed by the vision chapter which, through a spatial exploration, presents opportunities of scalability of agroecology and circular practices in the four pillars of the conceptual framework (SQ4). Interventions for each pillar are presented that then link to SQ4 on the recommendation of strategies to achieve the vision.



[Figure 2.1]
Scheme of the different sections and research questions of this paper

2.2 – Methods of Analysis

SQ1 - What are the social, urban and environmental problems related to food security in the peripheral neighbourhoods of São Paulo?

SQ2 - Who are the main actors in the food system in Brasilândia?

SQ3 - What is the role of civil society associations in the food landscape of Vila Brasilândia?

The analysis section will address the natural and social aspects of the context to guide the interventions for the strategic vision for Brasilândia. A method that persists within the entire chapter is a qualitative analysis with data collected through semi-structured interview. In May 2022 11 interviews were conducted with key players linked to this research, as summarised in Table 2.1 (next page). Out of the interviewees, 80% lived in Brasilândia, had somehow collaborated with the project of EcoCidade and had a key role in either production, consumption and distribution of food. The findings of the interviews were used to address the local perception of the main challenges related to community food security (SQ1), understand the role and needs of the key players in the local food system (SQ2) and the assessing the NGO's role and impact in transforming the local food system (SQ3). These interviews were conducted predominantly online and in a semi-structured format.

The literature review on Community Food Security, Informal Settlements and Vulnerability, provided an understanding to assess the context of peripheral São Paulo in relation to these matters (SQ1). A socio-economic, environmental, and spatial analysis presents the current urban challenges experienced in the territory of Brasilândia due to its historical development. To make sense of this problem, observable evidence using qualitative and quantitative research will be analysed. Empirical methods are an essential component to address and answer such a broad range of questions. Desk-based research was used to collect secondary quantitative data to compare the demographic, socio-economic and urban characteristics of Brasilândia, a peripheral neighbourhood with Pinheiros, a traditional central neighbourhood of São Paulo. By comparing these two areas, the reader is presented with the alarming contrast of the spatial inequalities in São Paulo, to highlight the relevance and context problem of this research.

To complement the findings of the semi-structured interviews and desktop research, a geo-spatial analysis is conducted to map the socio-economic challenges within the region and get insights on food access. This is done through GIS - in a process of data collection, data management and data visualisation. By providing a broad view of the territory in relation to the local food system, geospatial analysis is important to understand the inequalities in terms of food accessibility (Serafim et al., 2022). It makes it possible to identify hotspot areas with low food retailer availability or where the only purchase option is mainly based on ultra-processed foods. The data is collected from open data sources

such as GEOSampa, xxx; database of EcoCidade and extraction from google maps database on food retailers.

To understand the main drivers and roles needed for an agroecological transition key players are identified and stakeholders of the local food system and roles described (SQ2). The players are identified through desk-based research, the stakeholders are categorised in the topics of production, distribution, consumption, waste and governance and policy. The semi-structured interviews with actors provide understanding on their needs to inform the vision. This second part focuses mostly on urban farmers and ecological innovators, who compose the "niche" for a possible agroecological transition. This section ends by presenting indicators to inform the vision on the desired needs and changes for a more sustainable, healthy and desired local food system.

Lastly, the analysis chapter ends with an assessment of the role of the civil society in the food landscape and in the transition towards agroecology through a case-study of the EcoCidade project, a project from the NGO 'A Cidade Precisa de Você'. This section includes both a qualitative and quantitative research on the role impact of the civil society organisation's efforts in the territory by collecting data provided by EcoCidade practitioners and ordering it in the themes of; food production, access to locally produced food, reuse of organic waste and community engagement. The impact is assessed by evaluating (quantitative and qualitative) three dimensions: individual, community and environment.

The samples for data gathering were divided in three profiles of interviewee: community (individuals who orbit and benefit from the Project), collaborator (person who actively participated of the Project working as farmers, delivery man or woman, cooker or composting master) and community leaders (people who lead key initiatives of the Project). Primary evidence was collected through observation during a festival organised by 'A Cidade Precisa de Você' in Brasilândia in November 2022. The festival was focused on the topic of Climate, Justice and Cooperation and offered activities to reconnect the city's inhabitants with nature and food through a series of circle talks, workshops, lectures and musical performances. In addition to the data collected in the semi-structured interviews and direct observation on site, the qualitative research of the project is done through desktop research of the reports published by the NGO 'A Cidade Precisa de Você'. Images and photographs shared by the NGO are also used to visualise the various programmes and projects of EcoCidade. The data is collected from internal documents and records provided by the NGO.

In summary, evidence collected through primary and secondary data supports the conceptualization of Brasilândia's social and urban challenges in the theme of food security, the key player involved and the important role of organised civil society. The limitations of using data collected from interviews to describe complex phenomena is that as Silverman (2010) argues, qualitative research approaches often overlook contextual sensitivities, and focus on meanings and experiences.

Organization/Sector	Interview - role for analysis	Explanation	Interview Booked
ECOCidade	EcoCidade Project Director	The purpose of this interview is to gather information on the organisations goal in Brasilandia, the history of how the project was established and the development of the project.	29/05/2022
ECOCidade	Architect - EcoCidade Employee	Works in the project, assisting with documenting the process and results of the NGO's activities.	23/05/2022
Local Actors linked to NGO's progam	Vendor at food street market	These interview was key to gain insight on the impact of an educational programme from the perspective of a participant, resident of the neighbourhood.	22/05/2022
	Cyclist for delivery of goods	Participated of some of the educational modules and contributes to ECOCIDADE's program of food delivery. She also receives technical assistance for the garden in her house.	26/05/2022
	Composting yard steward	These interview was to key to learn about composting motivations, challenges and opportunities of scaling up.	26/05/2022
	Consumer of vegetable box	Participated of some of the educational modules and contributes to ECOCIDADE's program of food delivery. She also receives technical assistance for the garden in her house. This interview provided insights on challenges in Brasilândia and uprising innovations.	31/05/2022
	Technical assistant to urban farms	This interviews provided insights from the perspective of a professional in educating agroecology and urban agriculture. She shared learning and challenges on ecopedagogy in urban environments.	17/06/2022
Social Organizations in the territory			
Fundação Porta Aberta - POT Redemção	Urban Farm manager	Resident in Brasilândia, has technical training in logistics, a degree in environmental management and a postgraduate degree in environmental engineering and basic sanitation. He has been working with horticulture for 5 years, playing the role of social educator at Fundação Porta Aberta in the POT Redenção program and is a steward of a community garden.	19/05/2022
Health Association for the Families of Brasilandia	Health worker at PAVS	works for the program of the Health Strategy of the Family started in 2005 at the Secretariat of Green and Environment and incorporated in 2008 for Primary Careshe works to incorporate environmental issues into health promotion actions. In the interview she expresses her many concerns on populations health relating the environment.	20/05/2022
Food providers - Terra Liberdade , Irma Alberta	Peri-rural farmer	Lived 27 years in the Serra da Canatareirs, but now has her farm in a peri-rural area, 35 kilometers from the center of Sao Paulo 40 live families from the Landless Rural Workers Movement (MST) of the Comuna da Terra Sister Alberta camp. Amid agroecological food production and the expectation of land regularization . In the area of about 100 hectares, families grow foods such as cassava, avocado and grapes. The interview was extremely powerful in regards to understanding more about the food sovereignty	02/06/2022
Governance			
SDG's Coordinator for the State of SP	Public Authority	She is currently Executive Coordinator of the State Commission for the Sustainable Development Goals, UN 2030 Agenda, in the Government of SP. As the coordinator of the implementation of the Sustainable Development Goals (SDGs) in the regional scale, she provided valuable insights in regards to the current agenda and challenges in implementing SDGs. This information is discussed in the General Strategy section in chapter 5	24/06/2022

[Table 2.1]
Summary of key interviews for qualitative data collection

This research has focused on residents that participated from the programmes of EcoCidade, therefore the data collected is restricted to the experience of residents that have a pre-existing interest in agroecology and sustainability. Secondly, another limitation of focusing research on qualitative empirical evidence is that policy-makers tend to give low credibility to results from qualitative approaches (Rahman, 2016).

2.3 - Methods of Vision

SQ4 - What are the opportunities of scalability of agroecology and circular food practices projects in Brasilândia?

The second section of this thesis paper intends to present a vision for a climate resilient and healthy neighbourhood by scaling up circular and agroecological practices in Brasilândia. The term "vision" is used in reference to a desirable state in the future. Visions can serve as guideposts for specific and detailed plans and the visioning process is commonly used as an important method to involve community members into the planning process (Minowitz, 2013). Therefore, different insights related to a desired future gathered from the semi-structured interviews with residents of Brasilândia were grouped in the themes of; local food production, food accessibility and livability. A vision statement is presented by determining the main goals for achieving a desired future, and inviting the reader to imagine a circular and inclusive local food system. When envisioning futures that are significantly contrasting from the present day, endpoints are usually defined on a timeframe of 25–50 years into the future (Robinson, 2003). The endpoint chosen for the purpose of this paper is the year of 2050 as it is enough time to freely depict such transformation of a today considered radical vision, but yet close enough in order for the reader to still relate.

The main method for the vision section is Research by Design (RbD). This method provides the possibility of expressing the qualitative aspects of a certain context and adding something new to the existing through experiments and proposals. The intention is to produce new knowledge about Brasilândia through the act of designing. The alternatives are designed by combining the findings of qualitative, quantitative and spatial analysis in chapter 1 with literature research on agroecology solutions for urban areas. To achieve a desired and effective communication, a target audience must be defined and the research must be disseminated, original and contextualised (Biggs and Buchler, 2008). As set out by the theoretical framework, the target audience is the community of research on the topic of agroecology in informal and peri-urban settlements and improving community food security through local production. Alongside quotes from the semi-structured conversations are linked to the maps and interventions.

As interviewees were asked to imagine a desired future and to point out what solutions they foresee to the problems they highlighted, these statements are used to relate the vision to the local desires.

To integrate the visions proposed into a common understanding of sustainable development, the Sustainable Development Objectives (SDG's) are used as anchors to relate the realistic alternatives to the environmental goals of the regional planning. A semi-structured interview was conducted with Ana Paula Fava, the Executive Coordinator of the State Commission for Sustainable Development Goals, UN 2030 Agenda, in the Government of the state of São Paulo. This interview provided valuable insights on the regional planning objectives for sustainability and their main priorities to guide the envisioning of a desired future for Brasilândia. A series of maps and visual examples that present a vision of what Brasilândia's territory could look like if sustainable food practices were to be scaled up.

2.4 - Methods for Strategy Recommendation

SQ-4 What strategies could drive Brasilândia's territory towards agroecology and circular food practices?

The literature review on Transition Theory helps to unpack the complexity of which this research paper attempts to address by envisioning an agroecological and circular local food system in the peri-urban context of Brasilândia. The Multi-level Perspective framework of regimes, landscapes and niches will guide the research question of who are the main stakeholders needed to transition towards a more desired future and what are the external and landscape stressors.

The literature review of the elements of Agroecology and Circular Actions provide a framework to categorise the vision interventions into four main pillars; productive landscapes, waste management, spatial logistics and community exchanges. These interventions are linked to specific challenges, methods and practices, spatial levels, and strategies and policies.

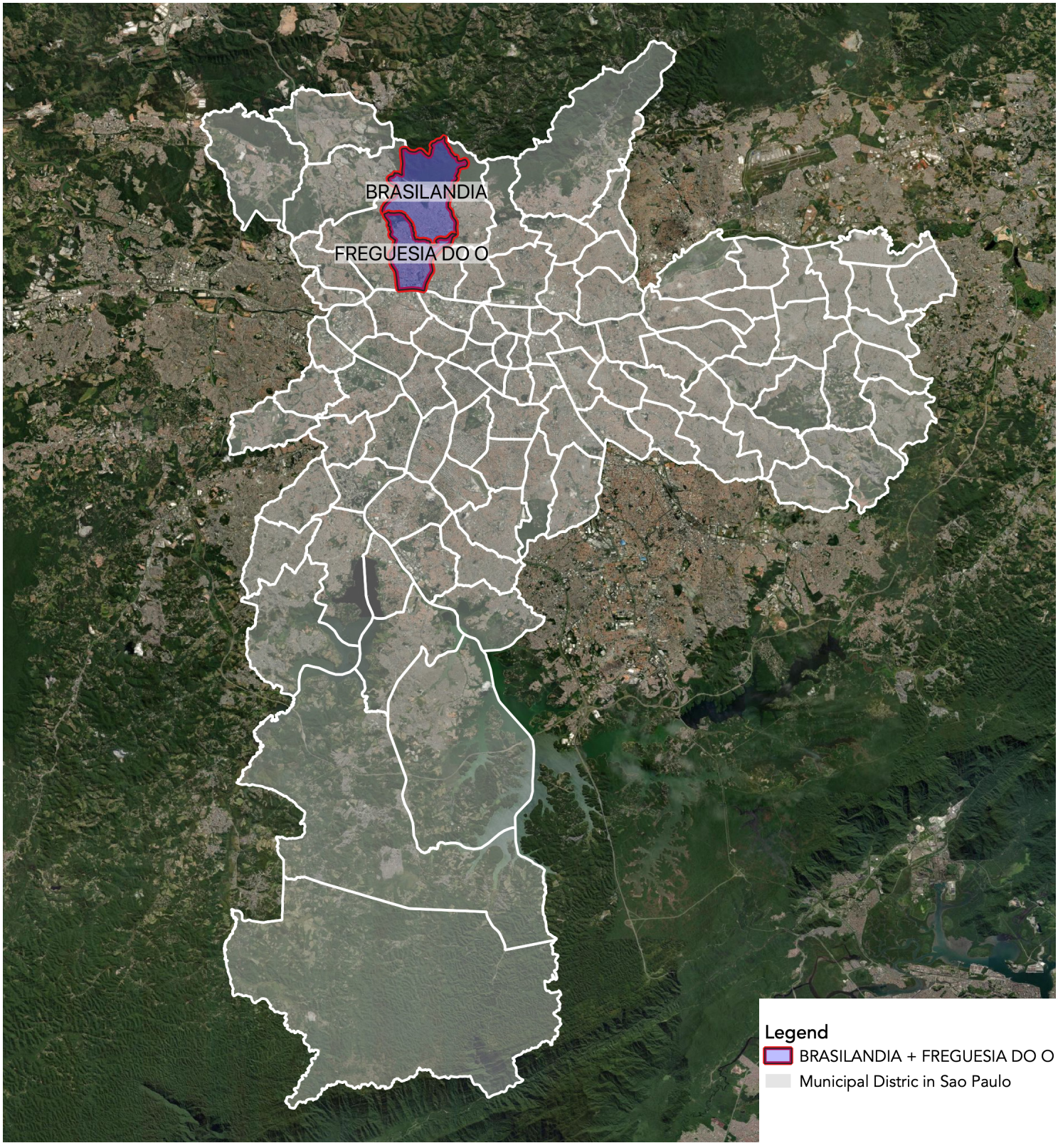
In relation to exploring the roles and engagements of the different stakeholders and community leades in this transition, a power-interest matrix will be used to map the role of the main players identified in SQ-2. As some of these players and organisations have the power to either block or stimulate this change, it is important to identify these so that strategies can be designed. Plotting stakeholders on a power-interest matrix, determines who has high or low power to drive the transition, and who has high or low interest. Players with high power need to be persuaded, somehow compensated or sometimes regulated, while people with high interest need to be kept involved, informed and become more empowered.

CHAPTER THREE

ANALYSIS

[Figure 3.0]
Photograph taken by
Clayton João

[Figure 3.1]
Shows the district of Freguesia do Ó/
Brasilândia in relation to the city of São Paulo



3.0 – Goals and Challenges

This section sets forth an analysis on the local food system and organic and agroecological production in the northwestern region of São Paulo, in the context of setting a vision for the agroecological transition of the periphery of São Paulo. The methodology is based on desktop and literature research and open interviews with key players in agroecology in Brasilândia. The concepts of agroecology, urban and peri-urban agriculture and socio-spatial and socio-territorial movements are used as analysis tools to justify that the complementary action of social movements and socio-spatial strategies is necessary for the expansion of urban agroecology.

3.1 - A peripheral neighbourhood in the North of São Paulo

The Municipality of São Paulo is divided into 9 zones and administered in 32 boroughs that manage the 96 districts in the city. Brasilândia is a district within the northwestern zone, an area delimited in between Inajar de Souza Avenue, Marginal Tietê and the limit with the municipalities of Santana de Parnaíba and Cajamar. Brasilândia and Freguesia do Ó, a southern neighbouring district, have been combined to compose one Subprefecture.

This chapter sets the scene of the case-study of Brasilândia. It includes a brief explanation of the urban sprawl in São Paulo, an overview of the history of the urban development of Brasilândia and explores the different inequalities and problems in Brasilândia that relate to community food security in the topics of: population, land use, work and income, education, mobility and transport, health and environment.

3.1.1 Urban Growth of São Paulo & its defined pivots

Introducing the context of São Paulo

The municipality of São Paulo, capital of the state of São Paulo, is the main financial, corporate and commercial centre in Latin America. It is the largest city in Brazil, the Americas and the entire Southern Hemisphere (IBGE, 2009) in 2010 it had 11,253,593 inhabitants (IBGE, 2010).

The primitive accumulation of capital in Brazil took place mainly from the exploitation of African labor during the period of slavery (1550 – 1850). From the second half of the 19th century onwards, technological modernization began, however, from a social point of view, Brazil's modernization was conservative. During the late period of slavery (1851 – 1888), the Brazilian aristocratic and slave-owning elite developed racist political, economic and social strategies that ensured and maintained their privileges. During this period, the elite created mechanisms of control and segregation of the Black population, through restraining

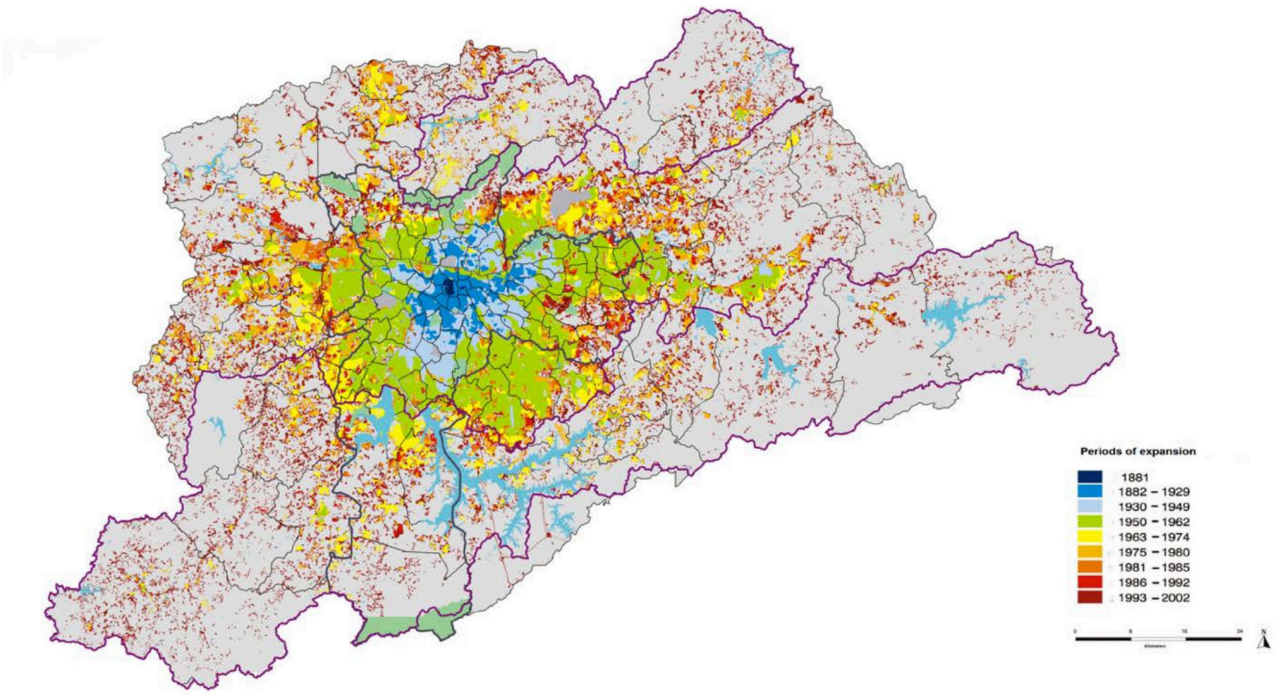
policies such as the Land Law and the implementation of the Immigrant Policy, which resulted in the systematic segregation of this population (MOURA, 1989).

These policies determined the land ownership and land use regime in the country, as until then the land concessions were carried out by the Portuguese Crown. The Land Law, created in 1850, essentially maintained the land structure with the former slave masters. In this way, the land was given to those who already occupied it. In addition, with the Immigrant Policy the land owners began to lease land to European immigrants and not to the newly freed enslaved african descendents by the Abolition of Slavery in 1888. In this way, the systematic exclusion of Black men and women from access to land and paid work on farms and factories was posed (MOURA, 1989). This population and their descendants made up most of the peripheral population in all cities in Brazil. Access to land and paid work on farms and factories (MOURA, 1989).

São Paulo, one of the largest urban conglomerates of vertical and horizontal density, grew organically, following no plan. In the past decades, the city has suffered significant transformations. This living organism has spread and absorbed adjacent towns to create one single metropole with 39 municipalities.Until 1890, São Paulo was a small administrative village and a commercial entrepôt with just 65,000 people connecting coffee production centres in the countryside with the Santos harbour (Bortoluci, 2016). Demographic growth initiated in the mid 19th century (Figure 3.2), shortly after the end of slavery and monarchy, driven by migration from the poorest regions of Brazil, the north and north-east. The 'nordestinos' were attracted to the profitability of the coffee industry and the opportunities provided by national industrialization. This influx was boosted in the early 20th century by another 900,000 individuals that arrived, mostly from Italy, Portugal, and Spain; around 50,000 Syrian and Lebanese immigrants and 35,000 Jews also made their way to the city3. Along with foreign immigration, there was a huge flow of suburban population into the city, which accentuated the urban concentration drastically. The growth of São Paulo perpetuated so that by the fifties it was the highest urban concentration in South America (Casamonti, 2014).

The process of fast urbanisation, in combination with lack of planning and insufficiency of social housing policies, led to the unplanned occupation of the territory with precarious housing solutions. Poor residential settlements in increasingly more distant areas in the borders of the city defined a clear pattern of social and spatial segregation. This segregation materialises the formation of the peripheries of the city of São Paulo, housing clusters composed of irregular dwellings. This process is also referred to as 'favelização'. The slum process involves economic and social variables. Its central issue is the absence of housing policies that focus on access to decent housing.

The children mortality rate is 20 times larger in the poor peripheral neighbourhoods than in the central area of the city. Those who live in the



[Figure 3.2]
Diagram showing São Paulo Metropolitan Region from 1881-2002.
Source: Prefeitura de São Paulo, Departamento de Estatística e Produção de Informação.

periphery have a life expectancy of 23 years lower than in central areas of the city. The central area covers the highest concentration of jobs, therefore the population in the peripheral area are highly disadvantaged and have very limited access to opportunities. And in the area where 70% of all the jobs are, there is an extremely low densification. The city forces that ⅔ of the population has to travel around 2 hours to simply get to their job.

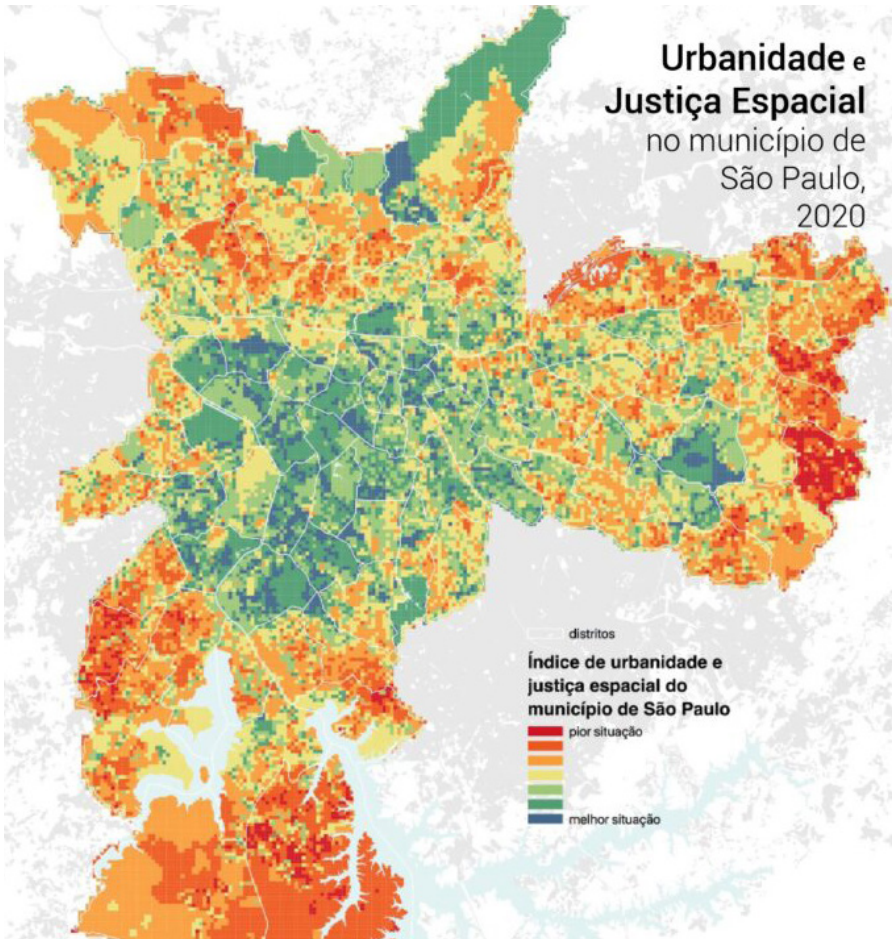
The consequences of the slums are environmental deterioration and the increase in violence. The current reality of the borders of the city is quite complex. Composed by a mosaic of small rural properties reminiscent from a previously existing agricultural belt around the urban area; irregular settlements, sheltering part of the most vulnerable population in the municipality; and preservation areas including Atlantic Forest remnants and water springs that supply one of São Paulo's main water reservoirs (Mendonça et al., 2016).

The horizontal spread of the city makes the overall cost of infrastructural provision and services significantly higher than more compact and dense cities. São Paulo has a low density of 120 inhabitants per hectare. While Unesco suggests an ideal density would be around 400 hab/ha. From the 7 million middle class residents, only 2 million live in the central area of the city. 5 million live in the periphery. Therefore there are 17 neighbourhoods, all extremely densified, in the borders of the city, with very little urban infrastructure, no urban plan, limited green areas and limited education. Also, by expanding the city horizontally, peripheries are pushed into natural areas invading water springs, which is one of the main causes of water shortage in São Paulo.

By combining the topics of urbanity and spatial justice presented by Jacque Lévy, Katia Canova developed the IPVS, which is used to determine the index of social vulnerability in São Paulo. The map below compares the level of social vulnerability in the city of São Paulo. We can observe that the city of São Paulo

presents a situation of high level of inequalities in its territory. The areas with the highest index of urbanity and spatial justice (in blue and green) certify the history of public investments and private interests. It is also evident how these conditions are associated with the areas alongside the rivers (Pinheiros and Tietê). Contrastingly, in red are the areas that concentrate the highest conditions of vulnerability with high social injustice based on Katia Canova's research. Together with Guaianazes e Cidade Tiradentes in the east, Capão Redondo, Grajaú and Cidade Ademar in the south, Perus, Freguesia do Ó and Brasilândia are in have the highest IPVS in the city. In Brasilândia, 29.8% of the population are in the most vulnerable groups.

The city has transformed between the central city and the peripheral city. The separation isn't only divided physically and economically. The separation is cultural, and ideological. The next chapters will explore these disparities through the comparison of socio-demographic linked to qualitative evidence from interviews with residents of Brasilândia.



[Figure 3.3]
Urbanity and spatial justice index in the city of São Paulo by Katia Canova

3.1.2 History of Brasilândia

[Figure 3.4]
Photograph of Brasilândia in early development. source: facebook page

> "A pattern of irregularity, which stemmed from opportunistic real estate developers, a lack of state investment, and a citywide housing shortage, would characterise the urbanisation of the region" - Andrew G. Britt

In the 1930s, a lot of the sugarcane farms in the northern part of São Paulo were transformed into residential areas. The growth of the northern occupation came to form the neighbourhood called Brasilândia. Brasilândia was subdivided into allotments in 1947, after Brasílio Simões sold his large sugarcane farm to a construction and land company. According to reports, one of the agreements when selling the land was that the neighbourhood would be named after him. The subdivision was an immediate success, as the then mayor, Prestes Maia (1938 to 1945), had started a plan to transform the centre of São Paulo. The first residents of Brasilândia came mostly from popular housing and tenements in the Centre, which were demolished to make way for Avenidas São João, Duque de Caxias, Ipiranga, during the administration of Mayor Prestes Maia. Thus began the story of a neighbourhood marked by exclusion and abandonment.

In the late 1940s, the neighbourhood received a large influx of migrants from the northeast of the country, who were fleeing the drought in their states, and also in search of employment in the 50s and 60s. In addition, Brasilândia was also occupied by the entire wave of migrants that arrived to the city from the rural areas of São Paulo looking for job opportunities, as well as Portuguese and Italian immigrants – all attracted by the ease of payment to purchase land offered by the real estate company (Subprefeitura Freguesia do Ó / Brasilândia, 2002).

> "The first residents of Brasilândia, those who founded the neighbourhood, produced their own food" - Interview with local resident in Brasilândia

The story from a resident that was born in Brasilândia and whose parents arrived at a very young age, shows that Brasilândia was established not so long ago as an area where rural migrants settled and brought their farming traditions and ancient knowledge on nature and understanding climate.

> "We sold a piece of land with no payment entry and a plan to pay it off in 12 months without interest, in addition to providing part of the material for construction" - Director of real estate company, José Munhoz Bonilha, 1980.

Although the land was not equipped with any infrastructure, whoever

bought a plot would receive a donation of bricks to encourage the construction of houses. Another element that encouraged the occupation of the neighbourhood was the installation of a quarry by the company Vega-Sopave, which offered housing to its employees. The neighbourhood quickly grew over its hills and lowlands. From the 1960s onwards, adjacent neighbourhoods emerged, such as Vila Santa Teresinha, Jardins Carumbé, Damasceno, Vista Alegre, etc. – all informal settlements intended for low-income families. With tiny plots of land and narrow streets, they did not include public squares (C. Pires, 2015). Brasilândia hosted some of São Paulo's earliest favelas, or informal settlements, and by the 1970s, the highest concentration of them in the city (A. Britt, 2015).

All available open spaces, public and private, were occupied by favelas - leaving Brasilândia with very little free areas to build schools and other public buildings, in 1984, when the local population managed, after ample popular mobilisation, to build a educational and sports centre in the neighbourhood, the mayor Mário Covas (1983 to 1985) had to expropriate the area where it was built. It was the last large unoccupied plot of land in the neighbourhood and, shortly after its construction, the surroundings were completely taken over by a favela (C. Pires, 2015).In the 1980s the Vega quarry was gradually deactivated. Today, on Av. Domingos Vegas, there is a water reservoir from the main water utility company.

[Figure 3.5]
Aerial photograph of Brasilândia taken by Victor Paris

By 1990 the neighbourhood became the most populous district of São Paulo, exceeding 200,000 residents. Brasilândia gained the reputation of a 'bairro dormitório', which translates as 'bedroom neighbourhood'. This refers to a neighbourhood where people only go to sleep and pursue all the other activities in other parts of the city. There is little historical demographical data due to the lack of formal registration of these houses and their residents, as most of the district was developed either informally or in semi-legal ways, with land swindlers playing the role of informal developers.

The displacement of low-income families and informal urban development is a common feature of peripheral urban areas in the global south, and is a recurrent challenge that planners face. The high demand of low-cost housing and very limited social housing provisioning has pushed the urban occupations to advance to the limits of the Cantareira State Park, the largest urban forest in Brazil.

3.2 Diagnosis of Brasilândia

The following diagnosis will identify the socio-economic, urban and environmental challenges in Brasilândia that could be related to food insecurity in relation to accessibility, availability utilisation and safety. This chapter reviews the following indicators;

- Demographic indicators that provide relevant information about Brasilândia's population (age, race and gender)
- The history of racial displacement to the periphery
- Socio-economic challenges that indicate challenges in accessibility (income, IPVS, employment, etc.)
- The distribution of population density within the boundaries of the neighbourhood
- The availability of organic and raw products and ultra processed products within the boundaries of the neighbourhood
- Zoning and Land-use that indicate areas of irregular settlements and potential hotspots for transformation
- Public transportation systems and their ability to connect low-income population to affordable, high quality food shops and farmers' markets
- Water and green network to inform the current ecosystem services, and areas that propose high risk in relation to loss of biodiversity and deprivation and should be highlighted in an urban ecology policy.

To provide a degree of relativity to the challenges of Brasilândia in the overall urban contexts of such a complex city as São Paulo, some of these indicators are set side-by-side with the neighbourhood of Pinheiros, located in the west of the central city and considered by some historians one of the oldest districts in São Paulo. This list of indicators will guide the diagnosis of Brasilândia's Community Food Security, to answer the question of how urbanisation affects household's access to food, food environments, sustainability, and strength of the local food system.

Brasilândia's Population

According to the 2010 IBGE Census, Brasilândia had approximately 264,918 inhabitants, which presents a population growth of 0.7% since 2001, whereas the 'Rede Nossa São Paulo' estimates the population to have grown another 6% in 2021 to become 281,977. Such a high degree of population growth can represent a high stressor in the community's food security. Table X indicates that the residents in Brasilândia are in majority Black as 50.5% of the residents have declared themselves to be Black and 'pardo'. 'Pardo' is a race/colour category used by the Brazilian Institute of Geography and Statistics (IBGE) in Brazilian censuses

that includes various shades of brown. The comparison with Pinheiros, where there are only 7.3% of Black residents, provides clear evidence of the racial segregation in São Paulo in relation to centre vs. periphery conflict. These population dynamics could be referred to as part of a socio-technical landscape factor where rapid urban growth and social segregation puts pressure on the existing food system regime and could also trigger innovators to react (Geels, 2011). The issue of racial segregation in São Paulo is of high relevance to this research, and explains the choice of using Food Justice Advocacy as a main field of study.

The following table presents demographic indicators for the population of Brasilândia in comparison to Pinheiros and the average of São Paulo.

Population			
Demographic indicator	Brasilândia	Pinheiros	São Paulo
total population	281,977	61,711	11,253,503
percentage of infant population under 6	11.6%	5.6%	9.3%
percentage of people over 60	10.2%	22.5%	11.9%
percentage of the young population under 29	47.6%	25.5%	40.3%
percentage of white population	48.62%	89.7%	63.1%
percentage of Black population	50.60%	7.3%	37.0%
percentage of indigenous population	0.10%	0.07%	0.12%

[Table 3.1]
Table with population indicators comparing Brasilândia, Pinheiros and the average for São Paulo

Source: Rede Nossa São Paulo. (2021) *Mapa da desigualdade*

Racialized spaces: Displacement and local migration of African descendants

> "The racialized space of Brasilândia tells a layered story of Black enslavement, forced migration, urban redevelopment, and Black self-determination, with echoes far beyond São Paulo." - Andrew G. Britt

Brasilândia, which can be translated as "Brazil-land", was identified as São Paulo's "Little Africa" by urbanist Raquel Rolnik in a 1989 article about “Black territories”. At that time, she recorded that 49% of the population living in Brasilândia was Black. Sociologist Edward Telles recognized Brasilândia as one of the neighbourhoods in the country in which “afro-Brazilian music and culture are produced” (E. Telles, 2004). Aspects of Portuguese colonisation and administration in Brazil are still felt today - in numerous aspects - but, with regard to this research, the issue of territorial expansion of the North of São Paulo is marked by the displacement and local migration of African descendants. The enslavement of African populations and the lack of a well structured abolishment of slavery plan

- that could provide these populations with land, water, food and opportunities of education, caused a high level of social segregation. This segregation defines the peripheral neighbourhood of Brasilândia.

In addition to conversations with long-term residents, digital mapping has provided historian Andre G. Britt with a way of reconstructing the history of demolitions, displacements, and informal urban development in Brasilândia. This approach has revealed geographies of African descent in São Paulo that were "razed, dislocated, and reconstituted" in the course of spatial changes in the area. Compiling a series of layers of historical maps from the early twentieth century indicated that, through the 1950s, one of the principal roadways in this region was named Congo Road (Figure 3.6). The name dates at least to the early twentieth century and existed in the city's official linguistic landscape until 1960, when São Paulo's mayor renamed Congo Road after Elísio Teixeira Leite, the founder of the local stone quarry.

[Figure 3.6]
Congo Road from 1954 map. Source: "Mapping 1954 – Vasp Cruzeiro," GeoSampa

> "The traditional communities that descend from Africa have a strong connection to nature, it's our essence. Nature has been in the centre of African communities since the very start." - Interview with activist and resident of Brasilândia

This reflection of the ancestral relationship with nature explains why the big majority of urban farmers in São Paulo are afro-descendants. Therefore Brasilândia has a high potential and also needs to reconnect with nature through ecological and agroecological practices.

However, the issues of racial segregation in São Paulo can and should be linked to the issues of Food Insecurity. The Black and indigenous population compose a significant part of those in situations of food insecurity in Brazil (Rocha et al., 2013). The Black population also make up the majority of the poor Brazilian population, who live on the outskirts of large cities. They are the most vulnerable to the social consequences of the economic and health crisis and suffer the most from the so-called 'food deserts'.

> "We only have access to the corner shop or the more familiar market. And even these establishments do not have access to fruit and vegetable suppliers". - Interview with resident of Brasilanda

According to data from Vigitel 2018, from the Ministry of Health, the regular consumption of healthy nutritious food is 33% lower in the Black population when compared to the white population. Gottlieb and Joshi (2010, 43) point out a pervasive trend of lack of access to fresh food that links to "health related

disparities based on race, ethnicity and income" in communities in the Global South. The threats to community food security in Brasilândia links serious and urgent matters of racial inequalities, food justice and health.

The social movement of Food Justice was catalysed as a response to the inequalities and injustices that parallel race and social class. This led to a rise in distributive food organisations, such as the Black Panthers' Free Breakfast Program (Clendenning et al., 2016) which was a community service program run in the 1960s in Oakland, US that focused on supplying free breakfast for children before school. From these radical roots, food justice spread throughout the US and the world to address social inequality in relation to accessibility to food, and rights. This links to EcoCidade's project in Brasilândia, as it attempts to tackle a similar issue relating access to food and racial inequality.

Income and Access to food within Braslilândia

The socio-economic indicators make evidence to the high level of inequality in terms of household income, job opportunities, HDI and in social vulnerability of the peripheral neighbourhood Brasilândia and the central neighbourhood Pinheiros. Brasilândia also has the lowest values in all the indicators in relation to the average São Paulo. The low human development index (HDI) shows how the rapid urban growth in the peripheral districts prevents improvements in the quality of life of inhabitants.

Accordingly, the average population density in Brasilândia is 12,615 habitants per hectare, relatively high compared to Pinheiros (10,137 hab/ha). Figure 3.7. shows how the population density is spread inside the district. The population is highly concentrated in the northern area of the territory, by the limits of the Serra da Cantareira Park. And the maps below allow the comparison of the income distribution and IPVS within Brasilândia and Freguesia do Ó. It becomes evident that the further away from the centre, closer to the encounter with the natural borders, the lower the income and the higher the vulnerability.

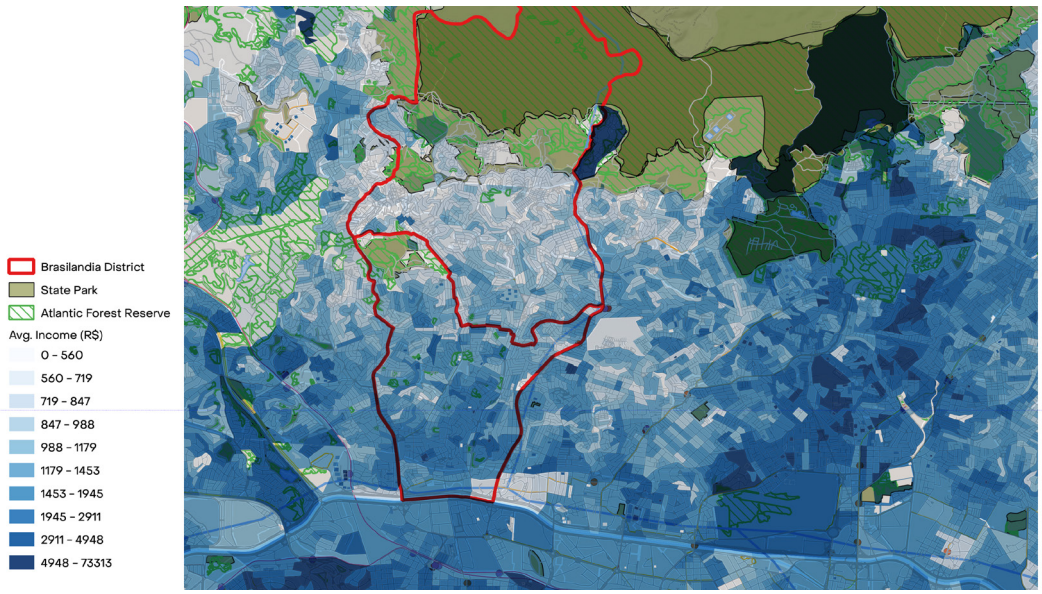
The income level affects the consumer demand for food. Several studies have proven the relationship between the healthiness of food retailers with sociodemographic factors, it was shown that living in a low-income neighbourhood with a higher percentage of Black population exposes this population to lower availability of healthy foods and poorer diet quality (Franco et al., 2009). Moreover, the lack of job opportunities is linked to Brasilândia's reputation as a 'bairro dormitório' (bedroom neighbourhood). This poses stress on community food security, as having to spend long hours commuting everyday for a job means that there is less time for cooking. Time is a key factor that determines the shopping decisions of the urban poor (Frayne et. al, 2010). The lack of time increases the demand for convenience stores and the consumption of packaged, ultra processed food, snacking, and a rise in the percentage of meals eaten outside the home (Tefft et al., 2017).

[Figure 3.7]
Population density within Brasilândia

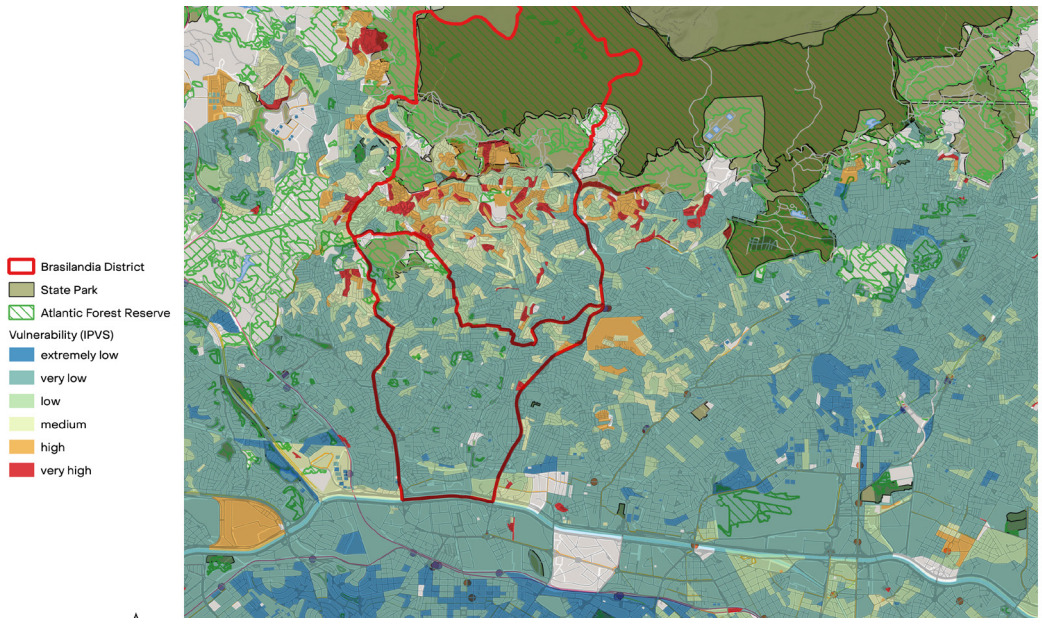
Socio-economic			
Demographic indicator	Brasilândia	Pinheiros	São Paulo
average household income	R$ 3,200	R$ 17,045	R$ 4,719
informal job opportunities per 10 residents	0.5	21.8	5.0
human Development Index (HDI)	0.765	0.960	0.805
index of Social vulnerability (IPVS) (% of people in most vulnerable groups)	29.8%	0%	13.3%
population density (hab/ha)	12,615	10,137	7,216

Source: Rede Nossa São Paulo. (2021) *Mapa da desigualdade*

[Table 3.2]
Table with socioeconomic indicators comparing Brasilândia, Pinheiros and the average for São Paulo



[Figure 3.8]
Income Distribution within Brasilândia



[Figure 3.9]
IPVS Vulnerability index within Brasilândia

Another key observation relates to population age. Brasilanda is composed of a young population with almost half of the population being under 29. This could point out a challenge in relation to food culture and consumption choices, as explained by a resident and urban farmer in Brasilândia.

> **"I observe that teenagers eat very poorly, I often see them eating 'salgadinhos' (tramp snacks) , coca-cola and those instant noodles that just cheat hunger. I think it is related to the fact that they have a very low purchasing power or lack contact with the traditional cuisine" -** Interview with a resident and urban farmer in Brasilândia

These statements bring about the challenge of culture in food insecurity. The Brazilian diet was influenced by a mix of cultures, including the Portuguese through colonization, slaves from Africa, and European immigrants. The typical Brazilian meal consists of a large variety of foods, being mainly; rice, beans, vegetables, and beef or chicken. A dish that is highly protein-based. However in the last decades, American influence has become prominent in Brazil, as fast-food franchises like McDonalds have been placed all around São Paulo — which sell a predominantly fried and processed food.

> **"A lot of fast food and supermarket advertising (...) you hardly see an advertisement talking about food culture and pesticides (...) There are very few spaces that bring other alternatives of consumption of the finished product" -** Interview with resident in Brasilândia

Another factor that poses high risk to health to Brasilândia's young population due to food consumption is the extremely high number of adolescent pregnancy, as 13% of new born are from mothers under 19 years old. This figure is alarming, and relates to the worries of food culture of one of the interviewees. This point contributes to stressing the importance of schools in relation to providing access to adequate food to children.

The indicators described can provide context to why the urban poor's diets tend to be deficient in terms of calories, diversity and nutrients (Tefft et al., 2017). Poor households are oftenly restrained into prioritising calories over quality—spending their scarce resources on affordable, calorie-dense, nutrient-poor food groups with high concentrations of fat, sugar and salt (Tefft et al., 2017). The frightening difference in average life expectancy of the population living in Brasilândia in comparison to that of Pinheiros could be related to the factors presented previously. As the peripheral conditions restrain the population to consume large quantities of ultra-processed food with high levels of saturated fats, sugar and refined carbohydrates, increase the risk factors for cardiovascular disease, obesity and diabetes.

Health			
Demographic indicator	Brasilândia	Pinheiros	São Paulo
average life expectancy	62.3	79.5	68.2
Infant mortality (infant deaths for every 1,000 born)	13,38	3,66	10,23
adolescent pregnancy (% of new born from mothers under 19 years old)	12.9	0.34	9.2
homicides in youth (per every 100,000 residents from 15 to 29 years old)	35.8	12.3	16.5

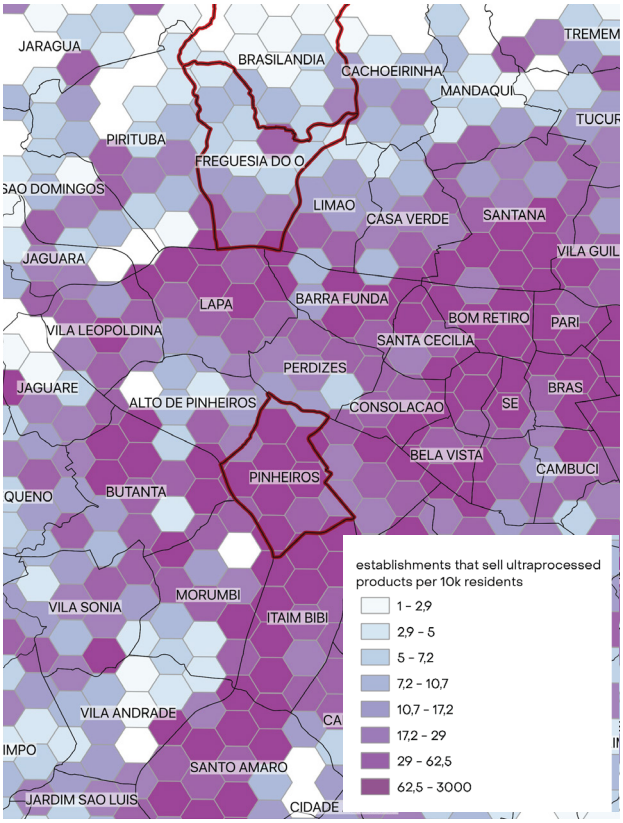
[Table 3.3]
Table with health indicators comparing Brasilândia, Pinheiros and the average for São Paulo

"The elderly population has a natural-based diet, they have the culture and pleasure of farming. Their diet is better in comparison to our younger population, (...) a lot of young mothers don't go to the street market to buy fresh vegetables, they go to the supermarket to buy snacks and soda." - Interview with health worker in Brasilândia

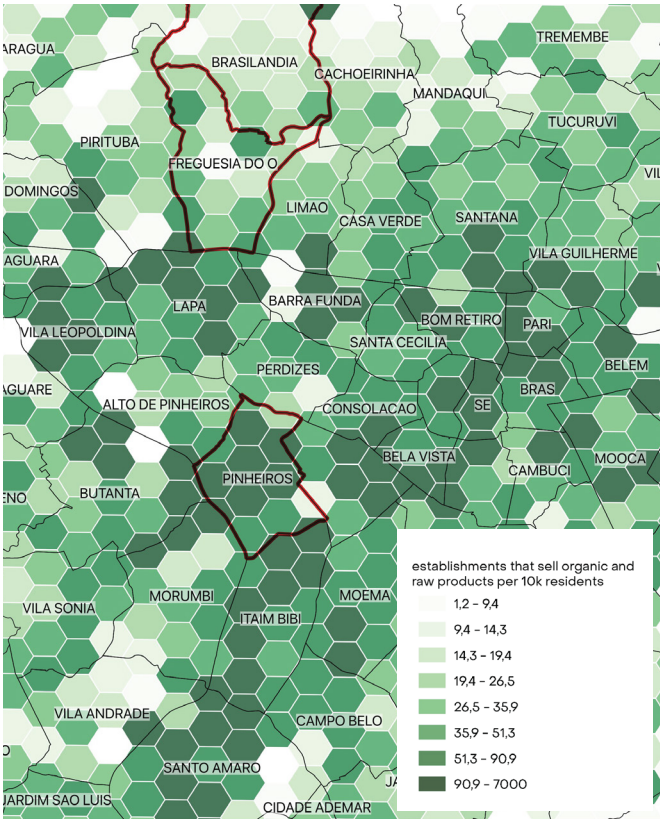
"I get desperate whenever I see teenage mothers buying soda and snacks to their very young kids" - Interview with resident in Brasilândia

[Figure 3.10 and 3.11]
Map of availability of ultraprocessed food and Map of availability of organic and raw products (data from EcoCidade)

Availability of ultraprocessed food



Availability of organic and raw



Zoning and Land use

The planning of neighbourhoods in Brazil is based on the 'Plano Diretor Estratégico - PDE' (Masterplan). The Freguesia do Ó/ Brasilândia Subprefecture contains its territory divided into two macro-zones delimited by the last PDE which was defined in 2014 by the Governor Fernando Haddad. The zoning of land-use for this area can be seen in Figure 3.12. The description of each main land-use zone is useful to understand the Municipality's planning intentions on the territory in Brasilândia.

The Land Use and Occupancy Law in the Municipality of São Paulo (Law 16,402/2016) establishes use zones classified into three main zonal characteristics; (i) transformation, (ii) qualification or (iii) preservation.

The transformation areas marked in red in the map, define the territories intended for development and population density. This corresponds to 11.85 % of the subprefecture, although mostly located in the central area of Freguesia do Ó extending south to the Tietê River. In brown are the areas classified as ZC-ZEIS: portions of the territory formed by the lots bordering the roads that exercise local or regional structuring, bordering the ZEIS-1, mainly intended to encourage non-residential uses, in order to promote diversification of uses with social interest housing, social interest land regularisation and environmental recovery.

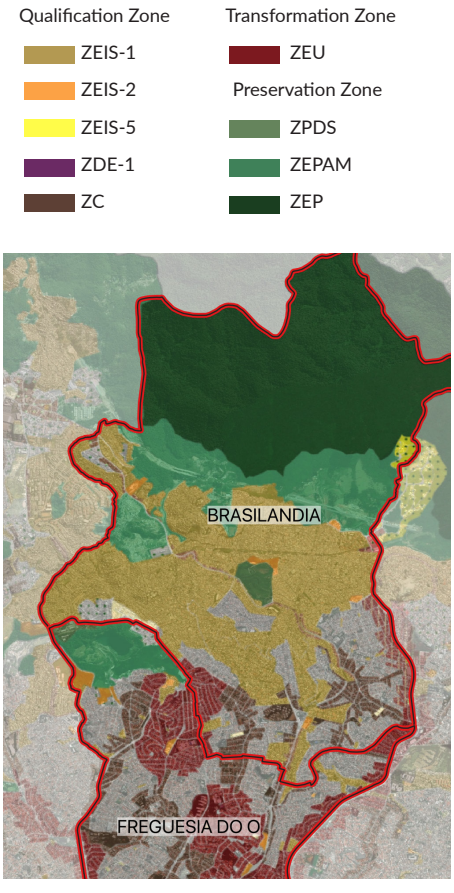
Approximately 22.47% of the Subprefecture's territory is listed as Special Areas of Social Interest (ZEIS) , which are areas intended for housing settlements for the low-income population. The ZEIS are mostly concentrated in the district of Brasilândia, taking up more than half of the urbanised area of the neighbourhood. This map shows that the regulatory framework recognizes the existing housing vulnerability in this district. Urban Vulnerability Reduction Macro Area, periphery of the urbanised area, characterised by high levels of social vulnerability, low levels of human development, low-income population, established in precarious and irregular settlements, located in risk areas and with deficits in services, equipment and infrastructure, and is concentrated in the district of Brasilândia.

Lastly, the preservation areas are territories delimited with the objective of preserving consolidated low and medium density neighbourhoods, that can help promote sustainable economic activities allied to environmental preservation and cultural preservation. They occupy 35.19% of the subprefecture.

The land-use in the district of Brasilândia is predominantly residential, with relatively low commercial and services activities. Brasilândia had a very high amount of vacant land, consisting of 22% of the total area. This presents a great opportunity for land-use to agroecological practices, specifically urban agriculture. A big portion of the vacant land in Brasilândia today is used as irregular waste points. This matter will be further explored in chapter 4.1.6 on the environment.

In Brasilândia, employment opportunities are restricted. Land use reflects this lack as only 12% of the built area is destined for commercial use. In addition, there is a very limited area destined for social and collective use (0.96%) in

[Figure 3.12]
Map of of the law and regulation for land-use and zoning



comparison to the average of São Paulo (4.4%). This reflects the need to develop cultural activities and opportunities for the residents to increase social resilience and provide spaces for community exchange.

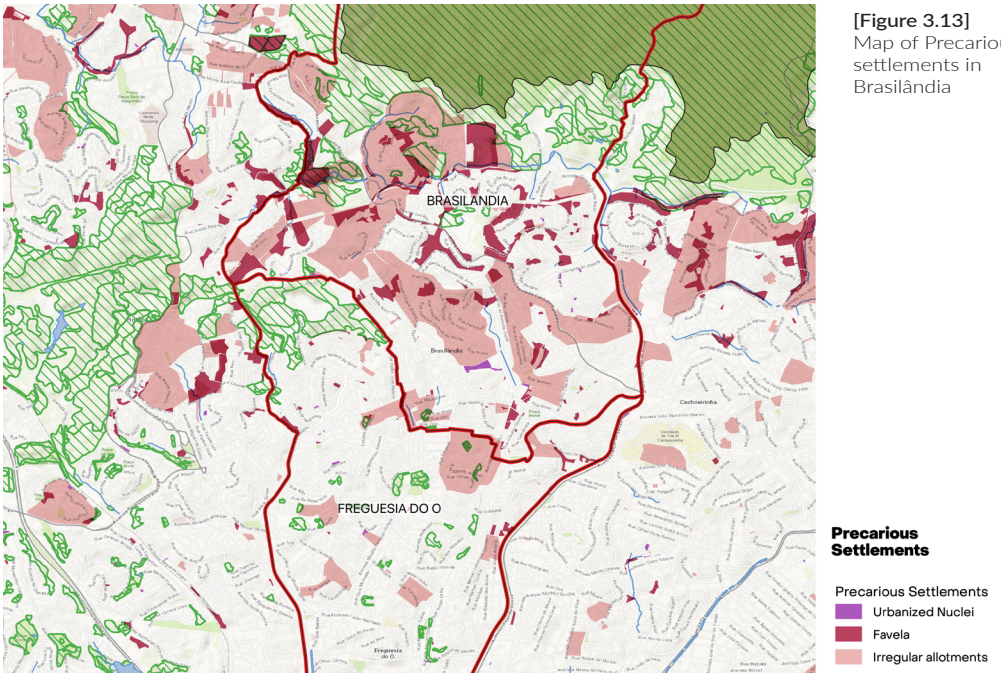
Approximately a quarter of Brasilândia's population lives in precarious settlements, named as 'Favelas'. These are the areas within the neighbourhood with highest population density, and lowest income levels. Figure 3.13. shows the distribution of precarious settlements in the neighbourhood in 2020 - it is important to mention that today's situation is different, and these areas have expanded evenmore.

These areas are classified into cortico, nucleo, favela and loteamento irregular. Most of the precarious settlements in Brasilândia are marked as 'irregular allotments' ; this is defined as a settlement where the allotments are registered however not regularised. This means that a promoter and/or trader, whose land subdivisions are aimed at the use of single-family and multi-family small, have been occupied without prior approval by the responsible bodies. This is mostly due to the fact that they do not comply with the requirements established by the City Hall, such as sanitary sewage, public lighting, the implementation of rainwater drainage, drinking water supply, public and domestic energy.

Favelas are defined as the occupations of land that happened against the urban and building legislation, predominantly disordered and with precarious infrastructure, with predominantly self-built and precarious buildings by low-income and vulnerable families. 'Nucleo Urbanizados' (Urbanised Nuclei) are slums that already have water, sewage, street lighting, drainage and garbage collection infrastructure.

"I believe culture to be the answer. Brasilândia needs more theatre, more dancing, more poetry. We need to reconnect with what it means to be human."

- Interview with local resident.



[Figure 3.13]
Map of Precarious settlements in Brasilândia

Transport and Mobility

Transport is an essential topic when assessing food justice linked to social vulnerability. The table presents different indicators of the transport and mobility situation in Brasilândia compared to Pinheiros and the rest of the city.

Brasilândia has a very low level of public transport, where even though most of the trips are done by bus, 0% of the population lives in a radius of 1km from a public transport station. There is also relatively low access to bicycle infrastructure, of only 25% of people living in a radius of 300m from any kind of bicycle infrastructure, compared to Pinheiros which is 76% and the average of São Paulo, 41%. Yet a lot of residents persist in using bikes as a main transport mode;

> **"Choosing this lifestyle of biking in Brasilândia, because yes, I see it as a lifestyle, is an act of resistance, but we are also risking our lives."** - Interview with local resident and bike activist in Brasilândia

The large supermarket stores are located near avenues and freeway exits, however 60% of families in Brasilândia don't own a car, this highlights another inequality in food access, as owning a car becomes a big limitation in access to a supermarket.

The high concentration of trips for education stands out in table 3.4. This links to the statement from one of the interviews:

[Figure 3.14]
Photograph taken on site by author

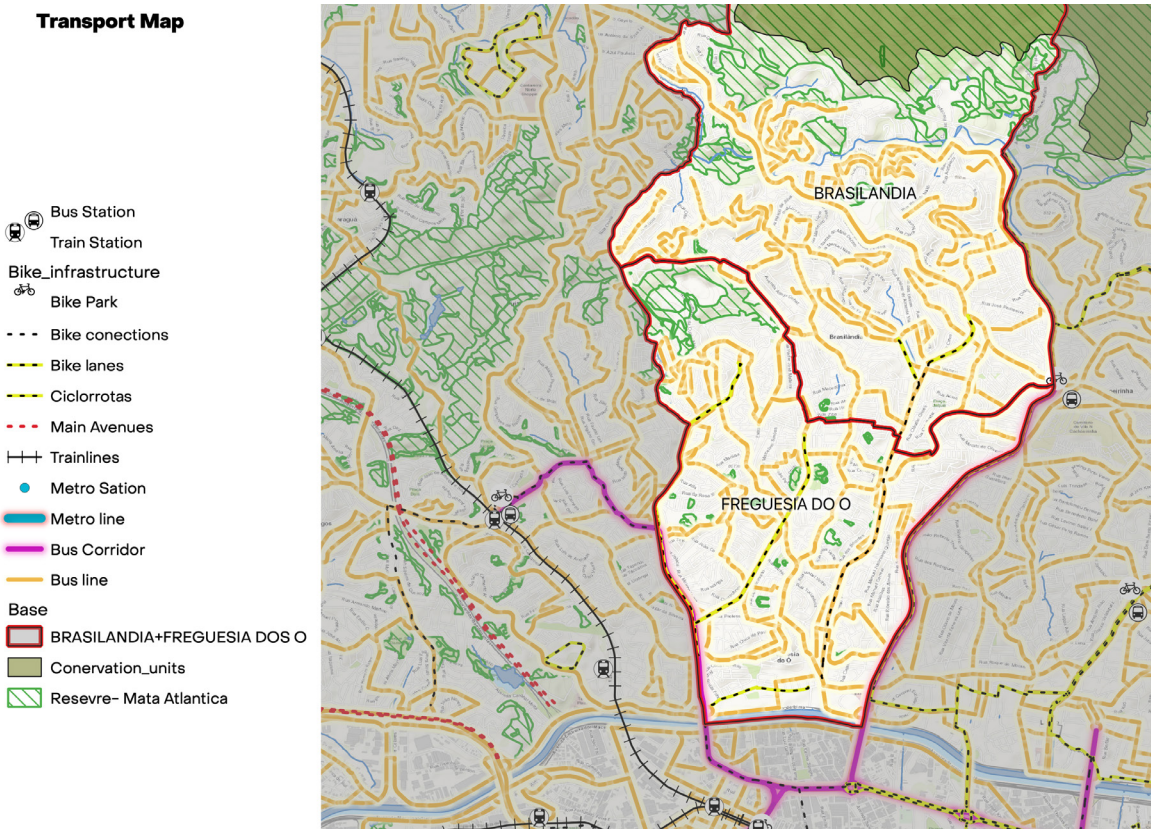
> **"It's not effective to demand for a person from low-income household to leave their peripheral neighbourhood, commute for more than an hour into the city centre, to reach technical education"** - Interview with urban farmer and social assistant in Brasilândia

The structural network of public transport of this subprefecture is formed by the axes of the Inajar de Souza/Rio Branco/Centro Corridor, on the border with the Subprefecture Casa Verde/Cachoeirinha on the East, and urban transformation planned in the area of influence of Line 6-Orange of the Metro. In a document released by the Municipality of São Paulo in 2018, there is a plan of interest to increase the cycling routes in Brasilândia and Freguesia do Ó. This can be seen in Figure 3.15.

Transport and Mobility			
Demographic indicator	Brasilândia	Pinheiros	São Paulo
access to public transport (% of population that lives in radius of 1km from public transport station)	0	57.7	18.1
access to bicycle infrastructure (% of population that lives in a radius of 300m from bicycle infrastructure)	25.1%	76.1%	41.0%
Percentage families that don't own a car	59.6%	34.6%	47.7%
Mobility index walking (number of trips per habitat)	0.57	0.67	0.65
Mobility index biking (number of trips per habitat)	0.00	0.10	0.02
Total daily trips	380,737	422,267	25,840,946
Percentage of daily trips for education	44.17%	13.70%	32.77%
Percentage of daily trips for work	35.81%	61.26%	44.96%
Percentage of daily trips for shopping	4.19%	3.37%	4.89%
Percentage of daily trips for meal	0.17%	6.96%	1.87%

Source: Rede Nossa São Paulo. (2021) *Mapa da desigualdade* ; Prefeitura de SP. (2017) INFOCIDADE

[Table 3.4]
Table with transport and mobility indicators comparing Brasilândia, Pinheiros and the average for São Paulo



[Figure 3.15]
Map of Precarious settlements in Brasilândia

Environment

The water and environmental network is formed by the Linear Park Córregos Bananal/Canivete, Serra da Cantareira State Park and 'área de amortecimento' (buffer zone). With the rapid growth of the northern peripheral districts, the urban fabric expanded into the Serra da Cantareira. The buffer zone where the city meets with the national park is characterised by, the high density of irregular housing, the immense viaduct of the 'Rodoanel Mário Covas' and the high voltage line that crosses and divides the district.

> "I have been living for 30 years in Brasilândia, and dedicating a lot of my time fighting against the degradation of the environment (...) It was really sad to see such a large construction being built (Ronoanel Mário Covas), and arising through this area of preservation. It's the little we have left of the Mata Atlantica" - Interview with elderly resident in Brasilândia

The Cantareira park is the largest urban forest in the world. It has the largest area of native tropical forest located in a metropolitan region, with 7,900 hectares of remnants of the Atlantic Forest, a very rich biome of Brazil. The park ensures the protection of its springs and is home to endangered animal species, such as the howler monkey, the wild cat, the ocelot, the hawk 'pomba' and the jacuguaçu amongst others. (Prefeitura de São Paulo, 2019). The issue of degradation of this area causes serious risks to the population and the ecological networks in the whole region.

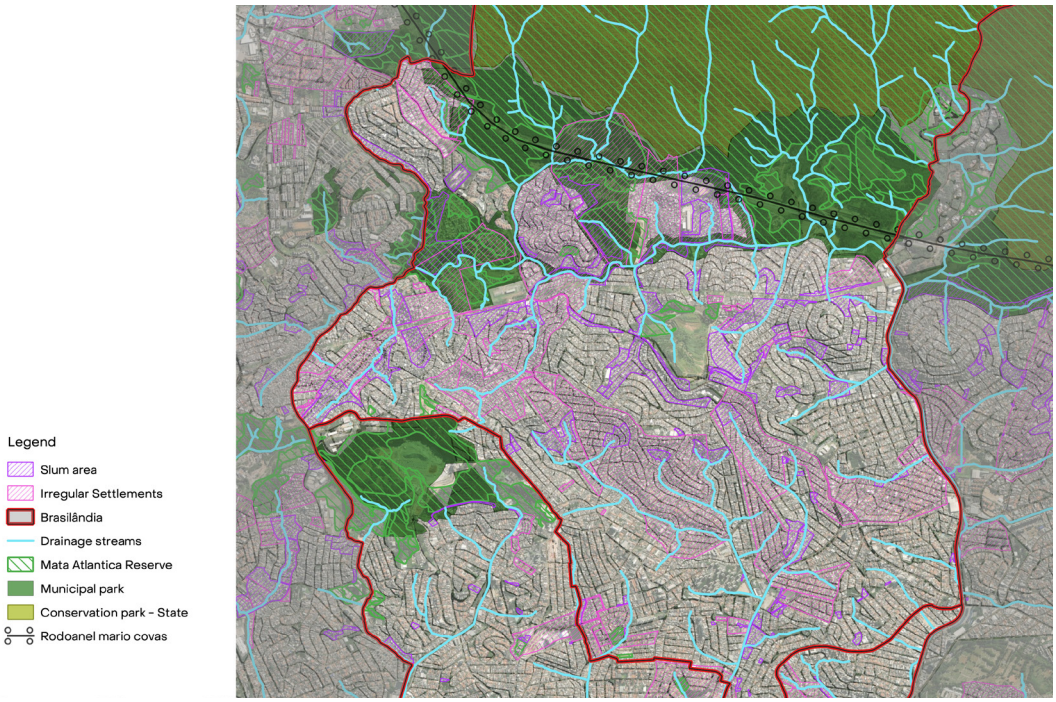
The intense occupation of the hills of Brasilândia increases the degree of impermeability of the territory, accelerating the flow of water towards the streams and generating serious problems of flooding. In addition, improper disposal of industrial waste in the region has caused high levels of contamination in the main sources of natural water.

The 'Parque Linear do Canivete' has been a recent project of the municipal government as a strategy to prevent the growth of the irregular occupations in the limits with the urban forest. There are further upcoming projects of environmental purposes planned by the PDE, these are; Parque Urbano da Brasilândia and Morro Grande, Córregos Bananal/Itaguaçu and Bananal Phase 2. However, the residents have complained that the execution of the 'Parque Linear' and other park projects have been done very poorly .

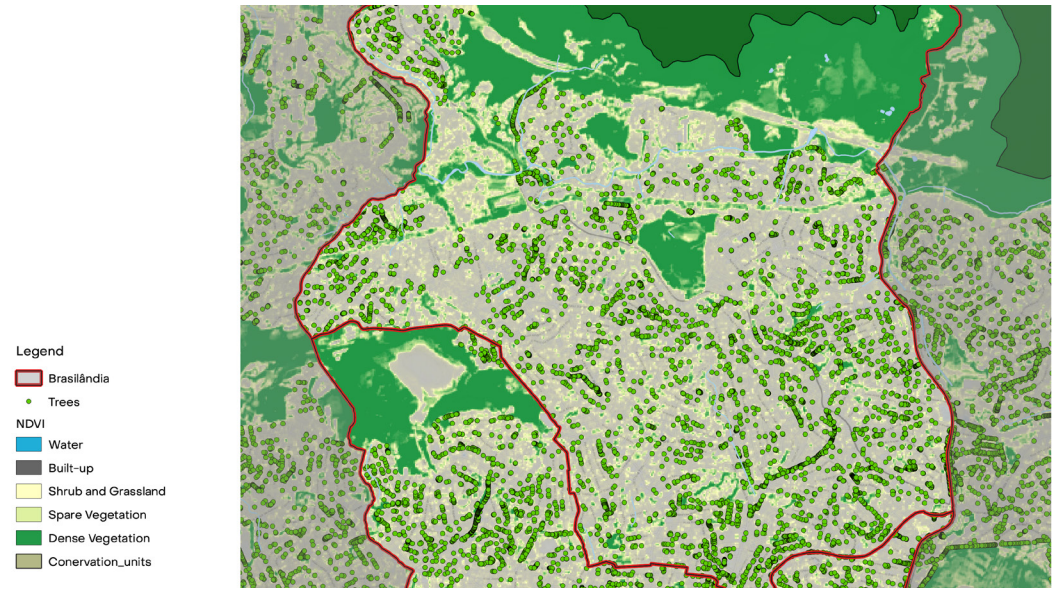
> "When the people from the municipality come to do the planting, they dig 3 holes, place some plants, leave and never come back for maintenance. We need to have a more thorough study of the landscape, select the correct native species." - Interview with local activist

The canopy cover in Brasilândia is estimated to be 30m2 per inhabitant higher in comparison to Pinheiro (22.2m2/hab). Figure 3.16 shows the canopy

cover in the neighbourhood, this spatial data indicated the existing flora to be preserved, and areas that are most deprived from the multiple benefits of trees in urban area, such as improvement of heat island effect, air and noise pollution, aesthetic qualities and flood runoff reduction.



[Figure 3.15]
Map showing natural elements of Brasilândia



[Figure 3.16]
Map of the distribution of trees and vegetation

Waste

"I'm not surprised when I see a person get a bag full of waste and throw it out the window, many times it even goes into the water streams. But if I go this person's house, and say that this is wrong she will never ask for my help again (...) then they call me saying there are scorpios in the houses I have to with delicacy explain, that the rubbish accumulated in front of your house, or the oil that you are throwing in the sink instead of collecting it into bottles is what brings the scorpio. Because it brings the cockroach that is the food of the scorpio."

- interview with health worker at PAVS

'Programa de Ambientes Verdes e Saudáveis' - PAVS (Programme of Green and Healthy Environments) provides socio-environmental actions in order to incorporate environmental issues into health promotion practices, mitigating the negative impacts of identified vulnerabilities on the health of the population. In an interview with the PAVS representative in Brasilândia, she expressed the importance of tackling the waste issue in the district.

Among the negative environmental impacts that can originate from the urban waste produced are the effects arising from the practice of improper disposal of solid waste in the bottom of valleys, along streets or watercourses. These habitual practices can cause, among other things, contamination of bodies of water, silting up, flooding, proliferation of vectors that transmit diseases, such as dogs, cats, rats, cockroaches, flies, worms, among others. Add to this the visual pollution, bad smell and contamination of the environment.

The region lacks waste recycling, and there are many irregular waste points, where waste is accumulated in walkways or vacant land (EcoCidade, 2021). There is a high potential of composting initiatives, even though most of the waste is taken to landfill.

The closest municipal composting centre is the composting yard of Lapa, located x km from Brasilândia. This centre composts the waste generated in street markets in proximity. In an area of 3,000 square metres in the district of Lapa, the yard receives around 35 tons of organic waste (fruits and vegetables) a week, collected at 26 markets in the region. Under proper management, there is no emission of odours or complaints from neighbours. The fertiliser produced is being used by the town hall in community gardens, parks, and also distributed to citizens. This allows for savings on fertilisers. The plan is for the strategy to be expanded and other yards and composting plants to be implemented in 2016 (Prefeitura de São Paulo, 2015).

Ecopoints are places for voluntary delivery of small volumes of waste (up to 1 m^3), large objects (furniture, tree pruning, etc.) and recyclable waste. There are currently 37 Ecopoints in the city of São Paulo, however none in Brasilândia, meaning that the population needs to drive long distances to dispose of recyclable and furniture waste. To contribute to this challenge, in São Paulo there are currently 2,120 waste pickers (registered) that are responsible for a large amount of the recycled materials in the city.

"Ecopoints are not close to the population (of Brasilândia) - you must have a car to recycle glass or plastic. We need to samba (referring to Brazilian dance) to be able to recycle toxic waste such as batteries." -

interview with health worker at PAVS

They account for almost 90% of all recycling done in Brazil, but they have been experiencing a critical scenario since the beginning of the pandemic. With social isolation, recyclable material collectors had an 80% reduction in their monthly income, which was about a minimum wage, according to the National Movement of Recyclable Material Collectors (MNCR) and today hovers around R$ 200. Currently, Amlurb has a network of 25 qualified cooperatives, which generate income for around 900 families. In order to professionally develop recyclable

Waste			
Demographic indicator	Brasilândia	Pinheiros	São Paulo
% of domestic waste collected for recycling	0.9	7.3	2.5
solid waste collected per capita (ton/year/capita)	0.30	0.37	0.30
Ecopoints (points of waste collection)	0	2	37

[Table 3.5]
Waste indicators comparing Brasilândia, Pinheiros and the average for São Paulo

material collectors, the municipality invested in 'Reciclar para Capacitar', a basic training program in recyclable materials to professionalise collectors.

"There are companies that collect common waste and there are companies that collect this special waste that we call 'entulho-bagulho'. There is a schedule, a communication to notify the schedule, but even so, the residents often do not respect it, the person thinks that if they throw garbage outside their house, it is the government's problem and not theirs. A very intense cultural issue"

In this statement, the problem of waste is directly linked to cultural perspectives. This indicates that beyond increasing waste collection and waste management facilities, this challenge has to be addressed through education to increase environmental awareness. Speaking to some residents it was perceived that schools have recently started to add environmental education in their curriculum, however there is still a long way to go.

The issues of waste in the territory represent serious landscape threats to the existing food system regime, and until the waste problem is not resolved, we cannot move on to envision a healthy and resilient future for Brasilândia.

"The number of pickers on my street has increased a lot in the recent years"

- Interview with local resident.

[Figures 3.17]
Photograph taken by author on site

[Figures 3.18]
Photograph taken by author on site

3.3 Brasilândia's Food System

To contribute to the understanding of the relationship of urbanisation and community food security it is key to map the food system in the region. According to the FAO, there are three main types of food systems in urban and peri-urban areas: a traditional food system; a rapidly emerging modern food system; and an informal food system, catering mostly to low-income urban people (J. Tefft et. al, 2017). All three systems exist in Brasilândia, overlapping and sharing certain functions.

Brazilandia's food system is composed mainly of the modern food system, characterised by modernised wholesale, capital-intensive food processing, integrated cold chains and food service firms, and modern retail. This food system is determined by long cycles of production, food that travels long distances is transported to large distribution centres and supermarkets and is the system that gained strength since the development of the global Food Security Regime. In Brasilândia the main supermarkets are located in the highways that define the perimeter of the neighbourhood, making access a challenge to residents that do not own a car.

In parallel there is a more informal food system consisting of small volume retailers, street vendors and informal restaurants. In an informal food system, it is common that vendors extend credit to regular customers, contributing to the solidarity economy (J. Tefft et. al, 2017).

There is a significant influence of the traditional urban food system in Brasilândia. It consists of 26 wholesale street markets that are connected to rural areas via a diverse group of rural-based traders (assemblers, aggregators, etc.) and multiple scales of wholesalers who are in agriculture-based towns and small cities. The community of Brasilândia relies mostly on informal market vendors, open street markets and small traditional retail outlets.

The food system is generally a very complex system as it involves multiple elements and resources. To sum-up in a simplified schema the food system involves the stages of: input resources, farming, output, processing industry, wholesale & supply, consumption and waste processing.

All three systems follow a predominantly linear model where resources enter the system as input and end-up in municipal landfill. Food Security is sustained through a large system, full of interconnected elements and players. Each of these elements interact with each other, determining the particularities of this large system. These interactions are so dynamic as to generate interdependencies between elements. The system is highly complex due to the interconnected and interdependent heterogeneous elements. The system is also highly adaptive because of its ability to learn from these interactions and thus change throughout history.

The food system is illustrated in Figure 3.19. It shows the flows between the actors od the main food system regime (blue) and also the new arising agroecological initiatives (green). The next sections intends to address the question of who are the main actors in the food system in Brasilândia, considering both Food security and Food Sovereignty?

Firstly this chapter points out the key players that sustain the food system and are important for providing food security in the current regime. Secondly this chapter aims to understand the characteristics, roles and resources needed by urban farmers and ecological innovators in São Paulo. And finally this chapter points out the key players for the transition towards Food Justice and Food Sovereignty through circularity and agroecology.

Key Players in Food System Regime

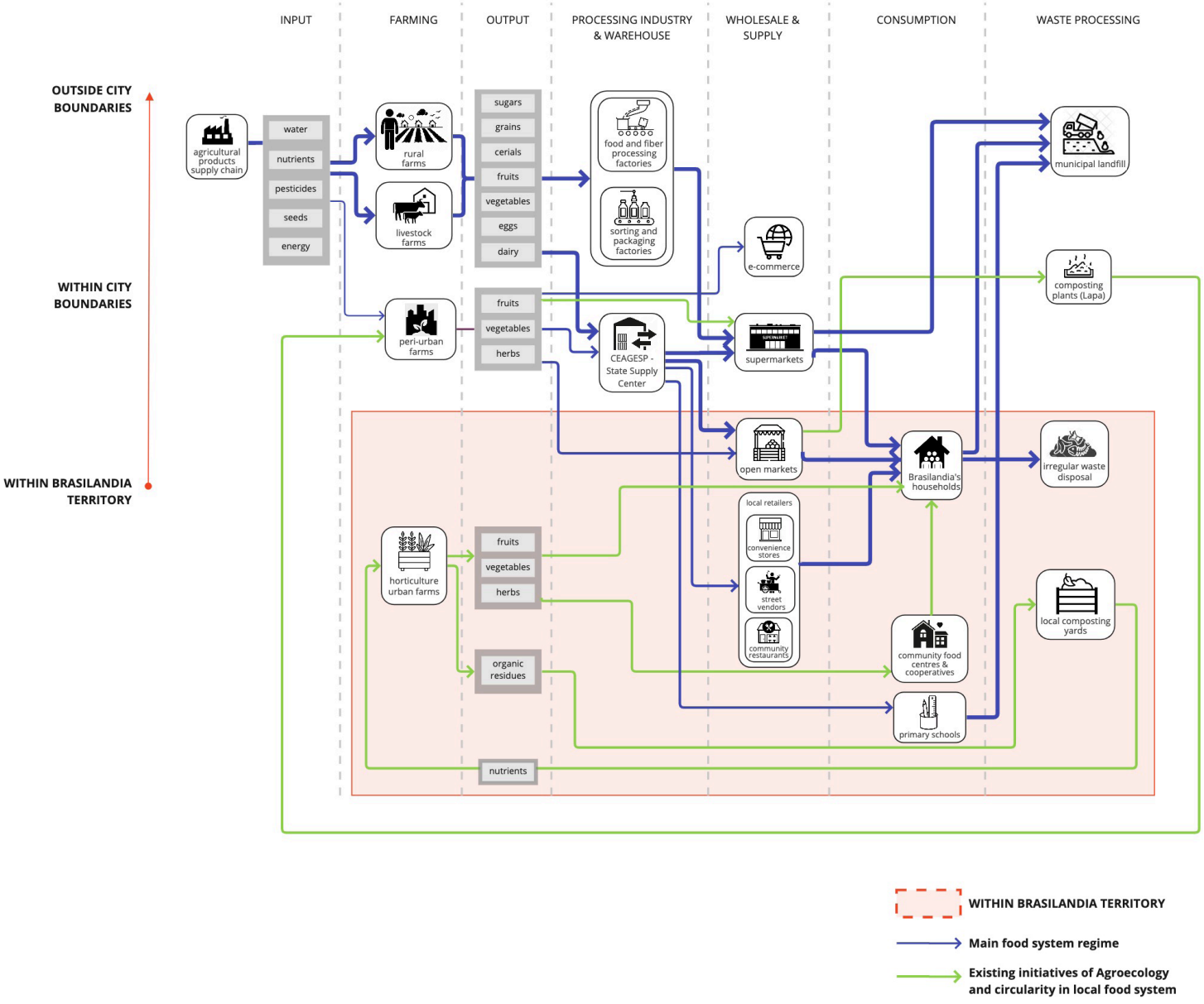
Socio-technical systems, such as those associated with energy, food, or water provisioning, are organized, transformed, and reproduced by multiple types of actors and institutions operating within or outside a certain territorial boundary and at different levels. Transitions – or system innovations – occur when there is a disruption in the system that results in a new 'architecture' or system structure (Geels, 2010).

To determine the regime actors in the current modern food system the Table 3.6 classifies them between stage of the food chain, and defines resources needed and interconnected topics to be addressed when studying in depth each one.

	Production	Distribution	Processing and Packaging	Food Retailers	Food Consumers	Waste Collectors
Players	Rural farmers, Livestock farmers, Peri-urban farmers Agricultural products suppliers	Food distributors	Food and fibre processing industries, sorting and packaging industries	Supermarkets, E-commerce, Convenience stores	Families, Schools and other Institutions	Municipal Landfill, Municipal Cleaning Agents
Resources	Labour, soil, water, insects, pollinators, seeds	Vehicles, laws, fuel	Sugar, grains, vegetables, fruits, plastic, metal, energy, water	Marketing, laws, packaging, labels	Income, refrigerator and other kitchen utensils	Vehicles, laws, fuel
Interconnected topics	Climate, Biodiversity, Industry,	Transportation, Fuel economy	Distribution networks, Plastic and Metal Industry, Economy	Distribution networks, Economy	Media, Health, Education, Culture	Transportation, Recycling

[Table 3.6]
Key players in regime of modern food system

[Figure 3.19]
Flow diagram to visualize Brasilândia's Linear Food System



Key Players for the Transition

This section assesses the main key players in activating the local food system towards a more food just society. A local food system provides an accessible way for citizens to be part of the economy, public life and society: one can be a farmer, a vendor, a cook, a composter, a garbage picker, a delivery person - as much as only having a fruit tree in your garden. Everybody needs and can offer food.

Peri-rural farmers (Production)

The Rural Zone defined in the PDE covers 420 km² (28 % of the municipal area). Half of the Rural Zone consists of areas of preservation of natural ecosystems, such as the natural forest of the Parque da Cantareira, watercourse banks, and water springs and creeks that have been little impacted by anthropic activity. In the other half, around five thousand hectares are currently occupied by agricultural production (de Mello et al., 2016). The situation of the Rural Zone is of extreme economic vulnerability. These farmers face challenges related to the lack of access to proper infrastructure and lines of credit to obtain appropriate means of production. In an interview with one of these rural farmers, she shared that they "don't receive any public funds, and there are no asphalted roads. We are not regulated so we can't asphalt or dig a new hole to extract water (...) yesterday I harvested 35 kilos of turmeric but had to carry that myself on a muddy road".

[Figure 3.20]
Photograph in Assentamento Irmã Alberta.
Source: National Geographic

The interviewee's farm is located within the 'Comuna da Terra Irmã Alberta', just 25km away from Brasilândia. The 'Comuna da Terra Irmã Alberta' is a camping site of 40 families which is part of the 'Movimento Sem Terra - MST' (Landless Rural Workers Movement). In an area of around 100 hectares, families grow foods such as cassava, avocados, grapes, corn, a variety of fruits and way more. The area belongs to the Water and Sanitation Company of the State of São Paulo (Sabesp) which had the area defined as a landfill site. The Comuna da Terra Irmã Alberta, together with two other settlements located North, Dom Tomás Balduíno and Pedro Casaldáliga, produces an average of one ton of organic food per week, which is sold through solidary consumption networks, including some open markets in Brasilândia.

Despite the precarious conditions, there are around 400 farming units in the municipality of São Paulo. Most of these units are still located south, where Japanese and German farmers migrated (de Mello et al., 2016). However, there are also around 30 farming properties in the north, located between the urban occupation and Cantareira's State Park. For most of these rural farmers, agriculture is their only source of income. In São Paulo there are currently only 14 producers with organic production certification, 25 in the ongoing process of Agroecological Transition (de Mello et al., 2016).

The peri-rural farmers are key players in a socio-ecological transition towards circularity and Food Justice, especially the ones associated with MST. The fight "not

for an agrarian reform, but yes for a popular agrarian reform" (personal interview, May 2022). MST is a left movement and was born in the military dictatorship - "it's an old struggle, since 1984". The autonomous movement acts on three main objectives in the fight of Food Sovereignty; "occupy the unproductive land, struggle for a popular agrarian reform and towards social transformation" (personal interview, May 2022). MST farms are the main providers of agroecological produced food, being accountable for 70% of the organic food produced without agrotoxins in all of Brazil.

Urban Farmers (Production)

Valuable information can be extracted from interviews carried out by EcoCidade in May 2021. Eight semi-structured interviews were carried out with family farmers, collectives and those directly responsible for vegetable gardens. The interviews were done by means of phone calls, where the script of questions was established through categories of analysis, aiming to get to know the following points: (1) socioeconomic situation; (2) about the agro; (3) support, interest and participation in the solidarity economy; and (4) considerations about the project of EcoCidade.

The age range of the urban farmers interviewed varied from 37 to 77 years old, 50% being over 50 years old. The monthly family income is on average R$ 2.500 (equivalent to €500) and only one of them relies on the vegetable garden as his only source of income, from Horta do Sabares. This farm is supported by the 'Programa de Operação de Trabalho - POT (Work Operation Program). A program to assist people living in the city of São Paulo in situations of social vulnerability in the re-integration in the job market through monthly financial aid. Currently, POT develops a projects called “Hortas e Viveiros Urbanos”, launched in 2015, whose objective is the

[Figure 3.21]
Photograph in Horta dos Saberes captured by Clayton João

> "formation of local multiplier agents, to work together with community organisations and social groups in the implementation of urban agriculture projects that should generate work and income and contribute to preserving and recovering natural resources in the city. (...) The training proposal intends that the agents of agroecological production become agents of education and environmental protection through agriculture and food issues and encourage collective work in the region where they operate. (...) The main focus is the strengthening of the community that participates in the Project, recognizing its role in the conservation and transformation of the space and the food and nutritional security of the communities" (Municipality of São Paulo, 2017).

The grant was also an embryonic incentive for the possibility of generating one's own income through the horticulture activity. The duration of the scholarship is a maximum of two years per person, even in different projects and after this period, the same person can apply for the POT again only after 5 years. The reason for such short durations is to prevent the program from taking on a welfare nature (Municipality of São Paulo, 2017).

"Gardening as a therapeutic capacity (...) Developing non-violence and restructuring hope in families of people with drug abuse through the involvement in farming" - Interview with the main agent of Horta dos Saberes supported by POT.

[Figure 3.22a]
Photograph in Horta dos Saberes captured by Clayton João

Moreover, all the interviewees stated to have family-rooted ties with farming and soil management, and they all agreed that they indulge into gardening for pleasure. Except for three of the interviewees, all answered that their practices of planting is based on a learning experience of trial and error and experimentations, without much didactic basis. The other three had experience of training on SAF (Agroforestry System), ecological succession and intercropping.

With the exception of one, the gardens operate on average with 4 people on a daily basis. An interesting point to highlight, that indicates a main challenge for achieving a transition towards agroecology was that the permanent collaborators of these gardens were mostly elderly, aged between 60 to 82 years old. The areas these farms occupy vary a lot in size - from 50m2 to 10,000m2 and they are predominantly areas lent by companies or the Municipality.

"...I plant whatever is being asked for..."

"(...)I adopt the SAFS system (Agroforestry System), which looks at crop diversity... even native, ornamental, fruit trees." - Interviews with local farmers

Cultivation choices mainly follow the ease of planting, seasonality and demand. Places with a larger and older area also offer fruits. They all shared a high interest in medicinal herbs and some are starting to take interest in PANCS - non-conventional food plants. The crops mentioned were: medicinal herbs (coriander, parsley, chives, min), vegetables (all kinds of lettuce, cabbage, chicory, catalonia, alfavaca, almond, carrots, courgette and beans), roots (manioc, saffron and cassava) and fruits (banana, avocado, lemon, jackfruit, iná, orange, tangerine, passion fruit, mango, guava, dew, lemon, apple, pomegranate, papaya, cane, jaboticaba, acerola, atemoya, grape and apple).

"There is a compost bin on site, fed with the leftover organics that each person brings from home and from the staff that work on the gas station next door." - Interviews with local farmer (source: EcoCidade)

The resources to sustain the farming comes from food sales, investments by the co-workers themselves and eventually donations from neighbours. Some have a compost bin within the garden itself and go out in the neighbourhood collecting organic waste (schools and community) and others have a domestic composting system. This brings an essential point about the strength of local social capital, included in the conceptual framework as an action of circular cities. The physical proximity of food related resources can support resource looping, sharing and optimisation (Williams, 2019). In addition the sharing of resources also strongly links to the agroecology element of Solidarity Economy, which is based on ethical and human values of prioritising welfare to people rather than capital returns.

In the topic of solidarity exchange networks, the interviewees expressed that they have interest in exchanging some of the production for time and labour help in the gardens. The idea is that "our garden can be a learning centre for the volunteers. (...) it would work as an exchange system, you come here, help activate the orchard and are then entitled to a parcel of what is developed (...)". However there is a noted difficulty in relation to volunteering as a source of labour, due to lack of commitment. "The community collaborates, but they are not permanent. As the work is in the vegetable garden, we can't wait for the volunteer to show up to water the plants, for example."

In terms of the technology used in site, the interviewees mentioned; sprinkler irrigation systems, rainwater harvesting pumped or sent by gravity and drip system, transpiration irrigation test, worm composting, curve planting. And in regards to production surplus , half of the gardens don't produce any surplus, 3 donate to the community and 1 uses it in the compost bin.

A key point for the growth of local food production is to understand the technical capacity and support in the gardens. Most of the urban farms have never received technical support. From the two that received non-regular support, it was provided by Universities and Institutions (Emater, Inst. Tecnológico de Campinas, Inst. Biológico). All of them stated to have interest in bringing more knowledge to their practices.

"The only support we have is our own arm muscles, our sweat. (...) I do a lot of desktop research for my practice (...) I rely a lot on literature." - Interview with urban farmer (source: EcoCidade)

In all, the main benefits tagreed between all urban farmers are that growing food in their own backyard is not only economical practice, but also offers a toxin-

"Through the garden we take environmental and food education to people in the community. Despite producing 9 tons per year (...) It is not a garden that has the objective of commercialising and yes, educating. The idea is to donate the food and teach people to produce their own food, sustainably balanced, without any kind of chemical, physical or biological contaminants."

- Interview with urban farmer (source: EcoCidade)

free diet and promotes social isolation by reducing trips to the supermarket. Challenges shared in the interviews related to the difficulty of having consistent labour in the production and distribution of food, in the provision of inputs such as; quality seeds, fertiliser, maintenance of space and infrastructure and plastic bags for distribution.

Open markets (provision)

[Figure 3.22b]
Photograph taken on site by author

Open markets generally involve the retail sale of fresh food in covered, open buildings or open-air stalls. They are typically managed by public authorities such as municipalities or public-private companies, who collect fees from vendors for space rental, garbage disposal, utilities, security and facility maintenance. Many markets in São Paulo provide their organic residues to the Municipal composting centre in a nearby neighbourhood called Lapa.

Open street markets vendors are important players in the local food system transition as they are the key supply points of fresh vegetables and fruits to residents in Brasilândia. In order to increase the commercialization of food produced in local and nearby urban farms, a strong collaboration and coordination between the farmers and the vendors will be key in providing income to farmers and boost production.

'Sacolões' - fresh products grocery stores (provision)

From an informal conversation in a site visit it was possible to learn more about the challenges of the owner of a 'Sacolão', which are small grocery stores that offer fruits and vegetables. According to her experience, in the first months of the pandemic, "people were buying much less. Many people lost their jobs, others went back to work and are not at home to cook", she says. The price of food is also an issue evaluated by her. "The price of goods increased for us to buy from CEAGESP (the State's Supply Centre), so it is difficult for us to maintain the same price". The Covid 19 pandemic and the rising food inflation represents factors of stress on the commercialization of healthy food, as it links to the statement from an interview with a local resident:

> "In between spending R$ 5,00 in one lettuce or in a kg of sausage to feed your family, what would you choose? You eat whatever you can afford." - Interview with local resident.

Brasilândia Families (consumption)

The diagnosis of Brasilândia in chapter 3.1 provides some understanding on the challenges that families in Brasilândia face in relation to food security. There is a large tendency in purchasing ready made meals, and easy quick snacks provided in convenience stores. A resident claimed that one has to "drive more than 10km for a big market" (personal interview, May 2022). However the problem is not only related, there is a high challenge in food culture and choices, "Health is not the priority for a lot of Brasiliandia's residents, they buy a pizza and pay R$ 35 reais, and yet don't buy a vegetable basket for the R$ 25".

For the circular and agroecology transition to be catalysed, the support from consumers is of course indispensable. In relation to the Multi-level Perspective, culture and consumer patterns are factors of the socio-technical landscape which can pressure the food system regime. This has already started globally, as a rising number of consumers, especially those in middle and higher incomes, are prioritising value related to health and wellness, and animal welfare (Tefft et al., 2017). However it is important that consumers not only base their choices on health and environmental factors but also take into consideration food justice and food sovereignty, to give more power to the small food producers. However a main friction point is in the question of; how can Brasilândia's consumers consider the nutrition, health, sustainability and equity impacts of their consumer behaviour in parallel to all the socio-economic challenges faced by the vulnerabilities in the periphery.

One of the interviewees shared a hint on a possible route to address this as she points out that "few spaces really bring other alternatives of consumption". A potential food environment factor that could catalyse change could be the increase of healthy retail options in the city, not only in relation to fresh products, but also in the form of healthy street food such as the already existing informal vendors that sell Açai bowls and tapioca crepes. This leads us to the next key player in the transition.

Informal Street Vendors

These sell a big part of the food consumed in Brasilândia. They are based as kiosks, stands, pushcarts, food-trucks and small restaurants selling prepared food on sidewalks/roadsides. In informal settlements, vendors very often do not pay rent or transport (Teff et al., 2017). Street vendors hold contextual knowledge of a certain district and develop close relations with the customers who many times depend on trust for late payments (Teff et al., 2017). In Brasilândia, the food they prepare is sourced from supermarkets, wholesalers and fresh produce markets, mainly CEAGESP.

Most of Brazilian cities public squares are like a large open-air cafeteria, these public spaces welcomes a series of street vendors who feed thousands

[Figure 3.23]
Photograph taken on site by author

[Figure 3.24]
Photograph taken on site by author

of people daily with food such as: hot dog, barbecue sticks, green corn and hot mush, popcorn, cotton candy, stuffed churros, cakes, coffee, water, soda, tapioca, pastries and fruits of all kinds the types. The main reason why there are more than 40 thousand street vendors in São Paulo links to the arrival of immigrants in the 1950s with very little money, and innovative ideas in different options of easy food that could be eaten on the go. The sale of food takes place in the streets, alleys, squares, parks, in front of schools, at train stations, subways, buses, in commercial streets, at traffic lights, in front of nightclubs, and more.

Street vendors play a key role in providing easy access to food to the population, and are essential collaborators to a transition towards a healthy and sustainable future. They should be convinced and stimulated to commercialise healthy and locally produced food, this could be through subsidies, incentives and also exchange deals with local producers themselves.

Schools and other Institutions

The School Feeding program in the city of São Paulo is one of the largest in the world (Municipality of São Paulo, 2022). Every day, around two million and three hundred thousand meals are served to more than one million students from the Municipal Education Network. Committed to offering healthy and varied food, the Municipal Department of Education has teams of nutritionists, logistics, quality and management. In 2012 São Paulo's Municipal Government passed a law that requires that at least 30% of school meals are prepared using food sourced from family farming. The school menu prioritises organic items from families of farmers. During COVID-19, when schools were closed, there was an increase in food insecurity in the periphery as mothers had to provide for the daily meals of their children.

As schools play a predominant responsibility in providing healthy food to children, they are considered key agents of the food system regime that could have the power and will to change the food system by supporting and embracing agroecological and circular practices in the neighbourhood.

Community Restaurants

The Government of the State of São Paulo, started a program in 2002 called the 'Bom Prato' (Good Plate) Program. It aims to establish community restaurants to provide low-income populations with healthy, high-quality meals at an affordable cost through subsidies. The food is balanced, consisting of rice, beans, salad, vegetables, a protein and dessert (usually a seasonal fruit). In Brasilândia there are currently two Bom Pratos, however they are both placed in the southern area, and there are none in the northern region, where there is the highest levels of vulnerability.

An incentive to local food producers would be to establish partnerships with community restaurants, and also other local restaurants in the neighbourhoods. This could be established through the commercialization of locally produced fresh greens and fruits to the restaurants, or also through an exchange of organic waste residues for composting.

Local Food Distributors

Since the development of new-delivery platforms such as UberEats, Rappi and iFood, a lot of young low-income and peripheral residents rely on delivery of food as their main source of income. These distributors deliver food using motorcycles or bicycles and drive long distances everyday. Many platforms even provide the service of these agents selecting products of the customers choice in the supermarket to deliver it to their home. Due to the low-income levels in Brasilândia and the relatively low number of restaurants, these distributors need to work outside their neighbourhood.

Waste pickers

A group that is very often forgotten in food system assessments are the waste collectors. This paper considers them to be essential in the transformation towards a circular food system. They account for almost 90% of all recycling done in Brazil, but they have been experiencing a critical scenario since the beginning of the pandemic. With social isolation, recyclable material collectors had an 80% reduction in their monthly income (Folha de São Paulo, 2021). From one of the interviews with a agroecological practitioner, a very interesting idea was presented:

> "We must stop looking at the waste picker through a distant look and start seeing them as street entrepreneurs".

This raises the question of how these waste collectors can be supported to generate income. Currently, Municipal Urban Cleaning Authority - AMLURB has a network of 25 qualified waste pickers cooperatives, which generate income for around 900 families. In order to professionally develop recyclable material collectors, the municipality has invested in 'Reciclar para Capacitar', a basic training program in recyclable materials to help 2,120 collectors working in the municipality (Prefeitura de São Paulo, 2021).

The local waste pickers working in Brasilândia have to be included in the strategy towards a sustainable future for Brasilândia, they play a key role in circularity as they are the real experts on material resources that are discarded on the street, and know how to see their value.

[Figure 3.25]
Photograph of waste picker in São Paulo

Local Subprefectures & Municipal Governments

There are two main key players related to policy and governance, the Local Subprefecture and Municipal Governments. These players have a strong influence in the current food system regime and are essential collaborators of such transition. They can support through laws, implementation of programmes and plans, subsidies on positive externalities and taxes on negative externalities. This will be further explored in chapter 6, relating to the policy recommendations.

Organised Civil Society

Lastly, but definitely not least, are the non–profit civil society organisations. These institutions focus efforts in strengthening and empowering residents to fight for Food Justice, innovate for sustainable solutions. The next chapter will be on assessing the role and impact of the NGO 'A Cidade Precisa de Você' through its project in Brasilândia called EcoCidade.

3.4 - Role of Organized Civil Society

What is the role of civil society associations in the food landscape of Brasilândia?

This study is based on the hypothesis that Civil Society Organizations (CSOs) contribute towards achieving food sovereignty in informal peripheral settlements by strengthening community capacity. According to Brazilian law, civil society organisations are defined as "(...) non-profit legal entities governed by private law, whose activities are aimed at teaching, scientific research, technological development, protection and preservation of the environment, culture and health" (Brasil, 1998).

[Figure 3.26a]
Photograph captured by Clayton João

It was after the Military Dictatorship (1964-1985), that CSOs gained a lot more visibility, as there was an increasing emergence of entities in defence of human rights and democracy. CSOs roles grew as a result of several criticisms of the bureaucratic management, in addition to the efforts to meet the new social demands established by the Federal Constitution of public administration in 1988. One of the measures taken in this direction was the decentralisation of several services of collective interest executed directly by the State. Thus, several non-profit private

organisations became responsible for these non-exclusive services in areas such as health, education, environment, culture, and science and technology. Although they do not depend on the State, in Brazil many CSOs carry out their activities in partnership with the Government to provide services of public interest.

The main roles of CSOs could be classified as; educational, communicative, representational and cooperative . These roles are indispensable in a democracy and help achieve good governance, which justifies why municipal governments should aim for a vibrant and strengthened civil society.

Advocacy is key in CSOs roles, it refers to the process of influencing actors to develop political, social and economic change based on a collective interest. Through advocacy, CSOs may influence decision makers, strengthen the voice of marginalised groups, and challenge the unequal power relations which maintain poverty and exclusion (Ministry of Foreign Affairs of the Netherlands, 2019). According to the Dutch framework, advocacy processes can be divided in three non-linear overlapping phases.

First, the activation phase concerns the recruitment and political activation of individual citizens. Second, the mobilisation phase refers to the process of aggregation and sensemaking. CSOs act as vehicles for translating individual concerns into collective action by mobilising resources and support, and by framing the message for communication in the public sphere. The third phase is the participation phase, when mobilised resources and framed messages are translated into action in the form of a range of advocacy strategies.

EcoCidade is an NGO contributing to sustainable development in Brasilândia through dissemination of agroecological practices as a means for food sovereignty. In addition to understanding the educational, communicative, representational and cooperative roles of EcoCidade, it is relevant to assess the potential impacts of these roles on food sovereignty, this is the right of people to healthy and culturally appropriate food produced through ecologically sound and sustainable methods.

EcoCidade - A proposal to place food cycle as a central focus

'A Cidade Precisa de Você', (which translates as The City Needs You) is an NGO that focuses on urban public spaces. Since 2015, the institution has been working on the articulation between the local community, the organised civil movements, the third sector, companies and public authorities, to promote the co-creation of public space use. The overall aim of the NGO is to promote self-regulation and civic responsibility over the use, care and management of public space, through training programs that allow citizens to contribute to proactive and positive actions that generate social integration to improve the city's quality of life (A Cidade Precisa de Você, 2017). This aim relates strongly to the food sovereignty indicator of concentrating local control, by promoting local governance and giving voice to communities.

EcoCidade is a project of 'A Cidade Precisa de Você' that aims to show that peripheral and informal settlements can be a platform for innovative potential, prototyping socio-economic and environmental pathways to sustainability in a local food system based on short and circular circuits (EcoCidade, 2020).

> **"How can we, as architects and planners, positively impact cities through the design of urban material flows in a community-led, circular and regenerative way?" -** Director of EcoCidade Personal Interview, May 2022

This is one of the questions that established the project of EcoCidade, and the involvement of the institution in the territory of Brasilândia. Through interdisciplinary, cross-sectoral and collaborative approaches in public spaces, EcoCidade aims for a just agro-ecological transition by working with community-led solutions (EcoCidade, 2020).

From the conversation with the project director of the project a few questions were raised such as; what features of the urban tissue does the food cycle activate in a local ecosystem? Which are the social platforms and resource flows that work within the urban food system? What kind of strategies and actions can be triggered to catalyse the local food economy?

Enabling the local economy through food cycle

EcoCidade's approach to activating the local economy is through "placing the food cycle as the central focus" (M. Arruda, personal interview May xx 2022), by recognizing that food can be an "interesting entry point to discuss socio-environmental justice, public spaces and community resilience". In the context of the peripheral region of São Paulo, of lack of access to work opportunities, no digital delivery platforms such as UberEats or iFood, no presence of big food retail companies, there is therefore a potential for catalysing solutions from available resources to achieve a local circular economy.

Despite the vulnerable condition of Brasilândia, the incentives of EcoCidade in the food cycle proposes interesting prototypes for new models of the food economy. Their programmes to activate the local food system are distributed in different spots on the territory - places of farming, cooking and composting, which are connected by two transversal systems: an electric bicycle logistics and a digital exchange platform.

The EcoCidade project connects already existing food culture spots on the territory, experimenting with a community economy framework - based on exchanges of resources, services and care. The digital network fosters the formation of territorialized networks between neighbours that didn't know each other before, allowing for the connection of supply and demand digitally and physically with the use of bicycle logistics.

"ECO-CITY is also about working with exchanges, with the idea of exchanging time for food for care, for the collective. And this idea of care in the community economy". - Director of EcoCidade Personal Interview, May 2022

"It is also important to mention that most of the people who work with us are women (...) We are talking about development of capacities of caring for the collective, for the territory, the natural resources, the human and more than human bodies, that inhabit this territory and talking about how we manage these commons together." - Director of EcoCidade Personal Interview, May 2022

Supporting Devices

The activator trailer is a specially designed trailer with infrastructure and equipment for hands-on activities, artistic, educational and integration activities. The objective of this is to facilitate interventions in the territory (construction of irrigation system, fair furniture, disintegrator) providing support for courses, workshops and all activities related to the project.

[Figure 3.26b]
Photograph and 3D model of Ecocidade's trailer
Source: EcoCidade and

Programmes and Actions in Project EcoCidade

EcoCidade's actions are based on three main guiding themes; urban education, hands-on and collaboration. And the project consists of four main programmes;

- Educational Courses
- Urban Community Gardens
- Cultural Food Centre
- Bike Collective for food distribution
- Digital Platform

This next section explains each programme and the main impacts and challenges identified. The understanding of these programmes is useful in grasping the opportunities further catalysing community-driven solutions to achieve a desired vision.

Education Programme 'Food, Justice and Cooperation

EcoCidade ran a pedagogic programme from October 2021 until May 2022. The course was free, and provided both theoretical and practical classes. The hybrid format provided the flexibility of more people to join. The topics explored were within the themes of circular economy, social entrepreneurship and sustainable local development. Eventhough applications were open, the communication was focused to people that played a role in the local food system. There were in total 30 participants from the various neighbourhoods of Brasilândia - but also adjacent neighbourhoods; Freguesia dos Ó and Perus. Participants ranged from urban farmers, local leaders, socio-environmental activists and others.

> "The course was very diversified. There were people from different neighbourhoods of Brasilândia, which is a very large district. It definitely had a lot of impact and motion." - Colaborator, personal Interview May 2022

The aim of the educational programmes was to promote autonomy in initiatives relating to agroecology and sustainability. To some participants, financial support was provided to enable their participation. Furthermore, "the local knowledge was valued, focusing all modules in the current challenges of Brasilândia". and at the end of each module there were "surveys and reflection sessions to build upon the desires of the participants" (EcoCidade Project Director, personal interview May 2022).

[Figures 3.27, 3.28 and 3.29]
Photographs that show different ecopedagogic activities, through circle talks and hands-on activities

Impact in relation to transition towards Food Sovereignty and Justice

The educational process was key to the project of EcoCidade as it created a group of local agents that share the same mission of sustainability, and marks an important step in the fight for Food Sovereignty and Justice. "It brought together different initiatives in the territory", as shared by one of the participants during an interview. It was also key in strengthening the collaboration between urban farmers and local food producers, and fostering the intergenerational exchange between young residents, adults and the elderly of the community. In relation to Food Sovereignty, this program relates to the indicator in building knowledge and skills to increase human capital through training and expertise.

> **"All the participants of the course have now progressed with their farming. A lot of young people got involved, this is really important!"** - Colaborator, personal Interview May 2022

The Circular Cities and Right to the City module presented "inspiring initiatives about businesses of social and environmental impact that work within the principles of circular economy" (EcoCidade's project director, May 2022). By bringing the opportunity of participants to learn about the right to the city, it can potentially stimulate the conversation between social groups in the community in transforming their environment to fit their desires and needs.

The Health and Environment module focused on three main themes; reforestation, food culture and waste. By exchanging knowledge on practical forms of taking care of the environment and the importance of water, soil, maintenance of green areas, and waste management, links to the food sovereignty value of establishing a healthy relation with nature.

> **"The course provided a lot of information such as how to make a dry toilet, grey water treatment, biodigestor (...) It taught us that it is possible to start these technologies in our own territory, consume responsibly, without paying expensive prices and reuse a lot of our waste."** Colaborator, personal Interview May 2022

Together with looping and adaptation, regeneration is one of the three main circular actions to achieve circular cities (Williams, 2019). By teaching regeneration and methods of maintaining, revitalising or developing blue and green infrastructure, EcoCidade contributes to the process of restoring the urban ecosystem, preserving natural capital.

The microentrepreneurship module provided guidance on structuring of projects, logistics, organisation, planning, digital marketing, and finances to stimulate local innovation for agroecology and circularity. By strengthening access to financial assistance, the local innovators are further capacitated to take on their ideas for the territory. The module about cooperative structures delivered

information on how to set up cooperatives, the documents needed, the regulations and invited existing cooperatives in the territory to share their experience. The establishment of cooperatives are key for the Food Sovereignty and Justice aim to localise the food system, as it helps farmers to collaborate, adopt appropriate rules to reduce conflicts and promotes local governance and decentralisation.

> "Through the creation of the support network, a lot of projects that were happening in isolation were given more attention. The network helps them to keep going and motivates others to join the existing projects and also start their own initiatives" - Colaborator, personal Interview May 2022.

Overall, the educational programme was impactful by capacitating residents to build groups of entities that share or are motivated by a common mission, strengthening the social resilience of the community.

Challenges and Learnings

The main challenge from the educational programmes was the oscillation in the number of participants. This is linked to the restrictions caused by the Covid-19 pandemic, a lot of the classes that were planned to be in the community centre had to be held online. There was a difficulty in accessing online classes due to lack of internet service or devices. The learning from the educational course was that the frequency of meetings is essential to strengthen relations between participants; practical 'hands-on' activities were extremely fruitful to incorporate the learnings in the technical classes; and the territory has a lot of ancestral knowledge within itself. "Beyond the technical classes, the local knowledge brings traditions and years of experience", it is very powerful to remind these elderlies that they have the capacity to teach and pass on their knowledge.

[Figures 3.30]
Photograph show a hands-on eco-pedagogic activity on implementing water strips into garden.
Source: EcoCidade

Support to Urban Community Gardens

To encourage and support the production of food in the neighbourhood, EcoCidade provides technical support on nine existing community gardens. The aim was to set up "a network of urban farms that have the potential of a socio-environmental transformation, by providing access to locally produced food to the most vulnerable populations" (personal interview with Project Director). These productive yards are located in different public spaces, in squares, parks, schools, community centre's, cultural occupations etc. EcoCidade put together a team of experts to improve the ecological infrastructure of the gardens, to help on the planning and strategy of cultivating and composting, and to assist in the economical sustainability. Overall the programme assisted in total 10 urban gardens that together can feed 200 people. The project ran a one year programme to qualify a group of urban farmers.

The courses were based on agroecological practices of:

- teaching on soil cultivation, maintenance techniques, and harvesting schedules.
- activities were organised to exchange and commercialise "sementes crioulas" (traditional seeds).
- Most farm activities happened through "mutirões" (collective efforts) of collaborative farming.
- Logistics of pick-up of organic waste buckets as a fertilisation technique for the soil.
- Harvesting of vegetables to be distributed locally

[Figure 3.31]
Photograph of 'Mutirão.
Source: EcoCidade

Impact in relation to transition towards Food Sovereignty and Justice

By providing planning, technical and labour support to the 9 urban farms in Brasilândia, the project plays a key role in boosting the local productivity of food. The nine urban farms associated with the project of EcoCidade sum up to an area of 7,000 m2. Around 3,000 seedlings were planted in this area. Together, the farms have the capacity of producing around 400 kg of food per month. Plus the combined capacity of composting facilities in all farms is around 7,000 litres.

The strengthening of a network of urban farms in the northeast region of São Paulo using the community food centre as main pivot point, has enabled synergies of mutual support, exchanging labour, seeds, compost and knowledge. The existence of these urban farms not only increases food provision for the community but also contributes to the environmental sustainability of the region, by preserving the environment and as a form of increasing awareness on sustainable practices.

Community Food Centre

EcoCidade established a community food centre for the exchange and distribution of food articulated between local producers and the community. The main aim of the community food centre programme was to establish a space to promote a sustainable and healthy food culture by supporting small organic farmers, providing fresh healthy food for an accessible price. The food centre was implemented by requalifying the infrastructure of the existing Cultural Centre of Jardim Damasceno. The programme consisted of bringing together women interested in agroecology and healthy food provisioning to share their knowledge and traditions. As a result the 'Perifa Alimenta' group was formed, a collective of women living in Brasilândia that prepare "quentinhas" (translated to meal-boxes). The "quentinhas" are produced with the fresh fruits and vegetables harvested from the urban farms partners of the project and Comuna da Terra Irmã Alberta located in the peri-rural area of São Paulo.

The activities in the Community Food Centre were:

- Organised events in the community kitchen for exchange of knowledge in food preparation and recipes
- Events in the community garden to exchange knowledge on nutritional qualities of the different vegetables
- Educational courses about business, finances, entrepreneurship and marketing in collaboration with SEBRAE (Brazilian Support Service for Micro and Small Enterprises)
- Weekly food markets in partnership with the cooperative Terra e Liberdade, local food producers
- The renovation of the building to adapt to the new program, with specific focus in the community kitchen
- The commercialization of the "quentinhas" and vegetable boxes

[Figure 3.31]
Cultural Centre Jardim Damascceno (CCJD)
Photograph source:

[Figure 3.32]
Photograph of community kitchen in action, captured by author on site.

[Figure 3.33]
Photograph meal prepared by Perifa Alimenta in the food centre, taken by author on site

Impact in relation to Food Sovereignty and Justice

According to the project director, "the community food centre Jardim Damasceno was extremely fruitful in creating new networks and possibilities of exchange, between local food producers and local consumers. The programme was really focused on promoting the maintenance of a healthy food culture based on the foundations of agroecology". From the perspective of one of the female collaborators of the programme shared in an interview that they "are managing to generate income through the Cultural Food Centre, by teaching people how to eat better, how to cultivate their own food, and teaching people how to organise their business". A food community centre is extremely powerful in providing a space to exchange knowledge, establish values for food providers and sustainable innovators.

In addition they began a scheme of organic food distribution by partnering with local farmers from the Assentamento Irmã Alberta. As the production in the urban farms of the neighbourhood is yet not enough to provide for a weekly food market, by articulating a partnership with local farmers they are able to provide a wider range of fresh fruits and vegetables, whilst also increasing the regional cooperation.

The programme addresses the challenges brought up on unhealthy food habits within the young mothers in Brasilândia. "When we organise events in the cultural centre of Jardim Damasceno, we meet with a lot of local farmers of our partners. These are mostly migrants from other regions of Brazil. What is nice is that they bring the food culture of their different region with them and share some new recipes". The articulation of the community with local food producers can promote sustainable and healthier food diets through the exchange of food culture and effective memories of the region they migrated from.

Exchanges in a local scale are viable and increase the networking and spreading of the word. It is possible to promote and increase awareness about a healthy and sustainable food culture. The different vegetarian recipes elaborated by the community kitchen stimulated consumers to "perceive new alternatives of meals without the need of animal-based protein" (consumer interviewed, May 12th 2022).

A challenge identified according to one of the collaborators perspective "the activities demand a lot of organisation and commitment of the ones involved, there is a lot of logistical work keeping up with all the partnerships". This challenge connects to the challenge of making this profitable so that people can dedicate time to the centre and also have their needs supplied.

A Collective for Bike delivery - VivaBike

> "A logistic system is crucial to bring the food produced locally to a population that will consume locally". - Interview with participant of the collective

EcoCidade assisted in the formation of a local organisation of cyclists responsible for delivering organic food and other resources to the community, with the main objectives of income generation, promotion of active mobility and circular economy. The VivaBike collective delivers within Brasilândia, on both conventional bikes and electric bikes. A key partner for the formation of this collective was the Institute Aromeiazero, who provided training to the group on how to be a bike entrepreneur. The Aromeiazero institute's mission is to promote an integral vision of the bicycle, as transportation, artistic expression, work, leisure, sport and also as a tool for changing the way of life and relationships in urban centres and rural communities - an essential aspect in transitioning towards a more circular city.

The founders of VivaBike identified that "central points of the local food system were disconnected, the production space was disconnected to the distribution centre (food community centre) and the organic waste source was disconnected to the composting spots" (VivaBike collaborator, Interview May 2022). The collective had to build partnerships with the local initiatives, such as the urban farms, the collective of women in the community kitchen, local retailers, and the consumers within the community. "All the partnerships we focused on are with initiatives that align with the same mission of sustainability and taking care of our environment, they all see the value of biking" (VivaBike collaborator, Interview May 2022). By establishing these partnerships the collective starts to gain autonomy and security in maintaining a constant number of team members (deliverers).

With the mission to fill in this gap, VivaBike was formed to also respond to the rising interest of young residents in bike delivery as a form of generating income. VivaBike wishes to propose an "alternative to the new delivery platforms, and the precarious conditions" related to these large corporations, by promoting equal conditions between the members of the collective, in a horizontal power structure.

> "I am new to this topic. I just started to gain awareness as I joined VivaBike, where the main objective is to approximate people that want to know more about bikes to those that already live from it, and to also bring awareness to all the benefits that bikes bring to the city." - VivaBike collaborator, Interview May 2022

> "My dream is that people take awareness of the importance of taking care of our environment, and how we all need to play our part, as the action and attitude of each one of us makes a big difference in the space we live in." - VivaBike collaborator, Interview May 2022

[Figure 3.32]
Photograph bike shop taken by author on site.

Impact related to Circularity and Social Justice

Collectives like VivaBike are key in promoting a low-emission mobility system for São Paulo and in the localisation of resource flows. These collectives help build local symbiotic capital needed to support more pro-environmental behaviours which underpin successful looping and regeneration actions (Williams, 2019). By linking new methods of generating income with efficient and sustainable logistics, VivaBike reinforces the role of bicycles in the transition towards spatial and environmental justice, as well as adding value to the local economy.

VivaBike aims to strengthen the local food system and provide socially just employment for those wishing to work as bike deliverers. EcoCidade educational programme provided a series of courses to guide bike entrepreneurs that wish to act to strengthen the local food system, whilst establishing a circular way of income generation. The VivaBike initiative strongly relates to the concept of Local Social Capital in the Circular Cities theoretical paper of J. Williams. Local Social Capital is central to the functioning of a sustainable local economy and localisation of resource flows (Curtis, 2003). VivaBike is an example of how investing in strengthening local knowledge can create appropriate solutions for the protection of natural capital (Williams, 2019). Moreover, the linking of the different actors in the local food system provides symbiotic local capital, as it comprises natural, social, financial, human and physical capital, which aim to behave independently and self-reinforcing at a local level (Williams, 2019).

Normally, the food space logistics would be done by motorized vehicles, whereas a bike collective puts forward a transportation of goods with less pollution emissions and less noise pollution. VivaBike has stimulated the discussion of the importance of "public policies that focus on sustainable transport modes and that also bring a lot of benefits to social health" (VivaBike Collaborator, Interview May 2022).

Challenges and Learnings

The main challenges faced by the Bike Collective is in finding sufficient bikers to form the team. The challenge is that they "struggle to make this the main source of income of the bikers, so they eventually lose interest or choose to work for iFood (largest new-delivery platform in São Paulo)". In relation to the consumer, it has been a challenge to achieve collective awareness in relation to the benefits of sustainable delivery initiatives in terms of reducing emissions and reducing noise pollution. Vivabike has found it challenging to reach to "convince residents to be part of this mission with" them.

Safety is a big challenge, similarly to most cities in the world, in São Paulo motorised vehicles are prioritised when it comes to planning streets. In addition, the topography of Brasilândia is characterised by steep slopes. These two factors

pose high risks to cyclists of suffering accidents.

Lastly, the lack of bike infrastructure is the main and largest limiting factor to the growth of this initiative. The lack of a headquarters poses a challenge to the collective in providing space for collaboration. "It would help a lot to have a physical base as a central meeting point to provide support and a place to rest to the bikers. This place could also be a bike workshop" (VivaBike Collaborator, Interview May 2022). In addition the city lack the basic infrastructure needed to host bikers such as bike lanes, bike parking and bike services and shops.

From an interview with the originator of VivaBike the main learnings from their experience so far is that bike collectives need some financial support to ensure that the initiatives don't break down if demand of service is lowered and not enough profit is generated. Prioritising the safety of cyclists is very important. Courses for guidance on safety procedures and on the use of safety equipment (helmets) is an effective method.

Digital Platform

The Institute also began to develop an easily accessible digital platform that connects producers and consumers, creating a local cooperative network and supporting the exchange of products and services. The objective is to promote a solidarity economy, encourage circularity and citizen innovation. The intention is to provide a shared platform to help organise the logistics of VivaBike and the agenda of the initiatives. Any person can subscribe to be notified via email or text message about events and possibilities to collaborate.

The idea of a digital platform came from the observation that there were "a lot of existing initiatives, but they don't know about each other (...) very little collaboration" (M. Arruda, EcoCidade project director, personal interview May 2022). The platform was also a tool to support the circularity in the territory, "we observed an opportunity to help manage the resources streams" (M. Arruda, EcoCidade project director, personal interview May 2022).

The platform includes four main features:

- Listing of spaces and collectives in the territory
- Shared calendar to share agenda of the different initiatives and events related to food
- A page for managers of an establishment in Brasilândia
- Integration with text message and whatsapp messages to reach to those that are not used to using online platforms.

Impact

A digital platform could increase the number of exchanges within the

community. These exchanges could range from raw material for farming, fresh vegetables, herbs and fruit boxes, prepared meal boxes, and organic waste for composting. By moving these exchanges from the limited word of mouth interactions into automatic and digital processes, this project proposes a solution to stimulate circular city practices. The digital platform aims to facilitate the exchange of resources which could potentially reduce resource wastage by closing resource loops through recycling, re-use and energy recovery (Williams, 2019). Also, by uniting production and consumption within local boundaries, the platform contributes with localisation of resources, significantly reducing the resources consumed by longer distance transportation and the emissions produced. Localisation is an essential action to develop local symbiotic capital and encourage pro-environmental behaviour (Williams, 2019). Finally, the platform could host a place for articulating the sharing of resources in Brasilândia, in relation to the Circular Cities concept, sharing allows to keep product loop speed low and maximise the use of products (Williams, 2019).

Challenges

From the results of the survey conducted, it is understood that the digital platform has still not been implemented into the day-to-day lives of the collaborators of ECODIDADE, a lot of the interviewees have expressed the difficulty of learning how to use a new platform and would "prefer to use whatsapp" (Colaborator, survey May 2022). Therefore it has been clear to the EcoCidade team that it is essential to think of a digital inclusion strategy, in designing an intuitive user experience and to have a good integration with the technologies already used by the population, such as WhatsApp and Facebook (EcoCidade, 2022). Another challenge is on effectively publicising and convincing residents to use the platform. The topic of data privacy has started to become a concern worldly and people have been more reluctant in engaging in new digital platforms.

This concludes the assessment of the programmes within the EcoCidade project. The next and final section of this chapter will conclude all the findings of the analysis of the current problems and opportunities within Brasilândia, to transition towards a healthy, climate resilient and food just neighbourhood.

[Figure 3.34]
Photograph taken by
Victor Paris

[Figure 3.35]
Photograph taken by
Victor Paris

3.5 - Conclusion & Reflections of Analysis

In the context of setting a vision for the agroecological transition of the periphery of São Paulo, this analysis of Brasilândia's context provides understanding of the current issues related to food insecurity and, in parallel, the rising agroecological and circular initiatives.

To approach SQ1, on the food security issues related to urban peripheral contexts, the main challenges observed was that the multiple deprivations that interfere with the supply, physical and economic access, to food exacerbate the health impacts related to inadequate nutrition. In addition the lack of access to adequate food in Brasilândia, due to availability but mostly affordability, contributes to the racial inequalities that persist in São Paulo. The health related disparities that are linked to living in such contexts affect unequally afro-descendants, that have suffered from spatial segregation, and severe inequalities due to the history of slavery in Brazil.

In addition, the main challenges regarding food culture have been pointed out to be the lack of time and the high number of adolescent pregnancy. The lack of time in relation to food consumption is highly relevant to the territory of Brasilândia due to its characterization as a dormitory neighbourhood, where people commute long hours for work and return exhausted and hungry. It was observed that young mothers in Brasilândia feed their children with ultra-processed foods which pose a high threat on children's health, a group of high vulnerability in terms of food security. To address the health threats posed by eating a high concentration of ultra-processed food, public planners must ensure that this young population has firstly access to organic, fresh and nutritious food in terms of availability and affordability. And secondly, social activities that promote healthy diets such as "tasting and culinary festivals", as was proposed by one of the interviewees.

As previously discussed, since the creation of PROARUP in 2004, urban and peri-urban agriculture has become an object of interest for civil society organisations. In this context, there are multiple NGO acting in the expansive territory of São Paulo. From these some stand out; NGOs Cidades Sem Fome, Vida Integral SP, the East Zone Farmers Association (AAZL) and the Permaperifa network which operates in the field of permaculture in the periphery and witnessed the formation of the 'Rede de Agricultoras Paulistanas Periféricas Agroeclógicas' (RAPPA), which operates in the context of the articulation of women involved with agriculture in the peripheries of São Paulo. However the EcoCidade project from the NGO 'A Cidade Precisa de Você' stands out in terms of how it tackles topics beyond local food production, and links practices that involve a circular system. They do this by supporting projects of local food production, local food distribution, local food preparation and entrepreneurial and environmental education. The NGO A Cidade Precisa de Você has demonstrated to play an

"Each of us has our own abilities, and our own preferences. We aim for being auto-sufficient, a mutual collaboration, by always remembering that we all have something to offer. So that we can create a territory that is more integrated, not only in terms of our activities, but also with nature and the cultural historic memories that lay in the territory"

- Collaborator of EcoCidade projects. (personal interview, May 2022)

important part in the agroecological transition in regards to its educational, communicative, representation and cooperative roles in efforts toward food sovereignty. The analysis of SQ3 showed that the different programmes were all strongly linked and interconnected, which strengthened the initiatives and built a strong network of people with the same mission of sustainability and agroecology.

In the theory of Circular Cities, the emergence of innovations is encouraged to increase economic self-reliance, promote local environmental protection and build human capital (Williams, 2019). By linking SQ2 and SQ3, the three dimensions of initiatives towards agroecology are addressed: the social dimension (the relationship with the community, buyers and multiple agents); the environmental dimension (types and cultivation techniques, whether or not it promotes environmental awareness and preservation); the economic dimension (income generation, funding for gardens, pricing, commercialization and popular entrepreneurship); and also the challenges faced by the social innovators. The impacts and learnings unfolds in seven topics, as follows:

(i) Social Vulnerability

A common theme with all agroecological and circular practitioners was that they all mentioned the challenge of working with participants in situations of social vulnerability. The social vulnerability of residents in Brasilândia is mainly marked by the low level of formal education; long periods of unemployment; and low socioeconomic status. Regarding the work in the garden, the managers of the urban farmers stated that they had enormous difficulties for the farmers to take full ownership of the work and act autonomously. In this direction, these gardens demonstrate the need for greater training of these subjects so that they are not so dependent on the manager.

(ii) Eco-pedagogic and Therapeutic practices

From the nine different urban farms that were technically supported by EcoCidade, many of those received pedagogical visits from primary schools, demonstrating that they develop enormous pedagogical potential. However, there is a great challenge of having a more stable number of steward collaborators to work on the maintenance of the gardens. The pedagogical potential can involve different sectors of society such as schools, commerce and companies to increase awareness on social and environmental diversities in the city. Gardens in Brasiândia are also used as therapeutic capacities and to requalify and empower people in vulnerable conditions. The Horta do Saberes, which is part of a program to assist unemployed residents from a low-income family, provide technical, personal and citizen training to be re-integrated in the job market. Therefore, beyond providing locally produced food, urban farms have the valued capacity to teach human and social values which can empower residents to face the severe challenges of living in precarious and informal contexts.

(iii) Adaptations and technical innovations

In relation to urban agriculture, adaptation methods where observed in the way that urban farms adapt to the demands of consumer desire to decide on which species to cultivate, this shows the high potential of urban agriculture in connecting local food culture to local production. Whereas, in relation to technical innovation, EcoCidade provided support in installing low-cost technologies relating rainwater harvesting, composting systems, and dry-toilets. By combining the two programmes of the educational course and the support to the local urban farms, the 'mutirões' (collective efforts) organised by EcoCidade were impactful on both the instalment of innovative solutions for the development of local production and the exchange of knowledge of agroecological anc circular practices through hands-on activities.

(iv) Access to Land

There is a challenge identified in regards to the access of land for agricultural activity. This process is marked by enormous informality and does not provide guarantees for permanence in these places, especially for farmers. In an interview with EcoCidade's director, the desire to further support urban farmers to achieve land regulation of these public and vacant sites was stated. Land is probably the most valuable resource in cities that is many times ignored by sustainability frameworks such as the RESOLVE on circular economy by the Ellen MacArthur Foundation. In agroecology vacant land is seen as a waste of a valuable resource. In urban centres land speculation prevents low-value activities such as circular actions of regenerative urban forestry; recycling industries; pop-up activities on derelict land (Williams, 2019). However this is not the case for peripheral areas like Brasilândia, as the value of land is lower. Thus opportunities emerge for these low-value activities in the periphery, a similar example is the well known case of Detroit where urban farming took a huge leap after an economic crisis linked to the abandonment of large industries which left the city with unprecedented amounts of vacant lots. However a great challenge in Brasilândia is in relation to a poor land regularisation in regards to urban illegal settlements that lack public policies meant to recognize land rights and provide land tenure to dwellers living in informal communities.

(iv) Financing

Central to circular practices is the creation of symbiotic local capital (Curtis, 2003). Symbiotic local capital has the power of comprising natural, social, financial, human and physical capital, which are interdependent and self- reinforcing at a local level. In these studies of agroecology, it can be observed that local social capital reinforces the preservation and restoration of natural capital (Williams, 2005) through the localisation and exchange of resources that trigger sustainability and circularity. With regard to funding, most of the urban farmers supported by

EcoCidade's program don't rely on farming as a main source of income. However, for the one exception who does rely on farming as his main source of income, his work is supported by the POT grant. Many urban farms in the East and South of São Paulo have already received a POT grant, demonstrating that the grant from the City of São Paulo has generated positive results and encouraged, even if indirectly, popular entrepreneurship, as seen in the case of the farmers of Saberes Ambientais. However, the POT grant is subject to fluctuations in party-political interests and there is no guarantee of its continuity in the event of a change in management. Therefore income generation of farming and other circular practices has become the main challenge for the development of the project of EcoCidade. EcoCidade's future plans are majorly focused on solutions to finance circular practices through seed funds, and searching for partnerships with private companies.

(v) The Female predominance in relation to agroecology

It was apprehended that female farmers and innovators are protagonists in the fight towards food justice and sustainability. It was observed that EcoCidade plays an important role in supporting the process of female popular entrepreneurship, this is observed through the Viva Bike initiative, a collective of bike delivery founded by a woman and through the support on founding the Perifa Alimenta, a community kitchen initiative composed of female cooks. During site visits, it was observed the high level of participation of women farmers in the conversation circles provided them with a space to express themselves on controversial issues and raised awareness about the different struggles they face. According to Moura and Lima (2014) the 'Roda de Conversa' (conversation circle) is a unique moment of sharing, and brings a sense of being part of a community. By setting-up these 'conversation circles, the EcoCidade project proportional space for training, exchanging experiences, fraternising, venting, changing paths, and forging opinions. The constraints faced by women in urban agriculture and in sustainable practices also point to the following needs: access to formal education; access to digital education to use social media resources; education about rights and participation policy; skills training for economic empowerment; access to reproductive and maternal health care; access to collective savings and credit programs; advocacy on domestic violence issues; and property rights.

(vii) Waste Management challenges

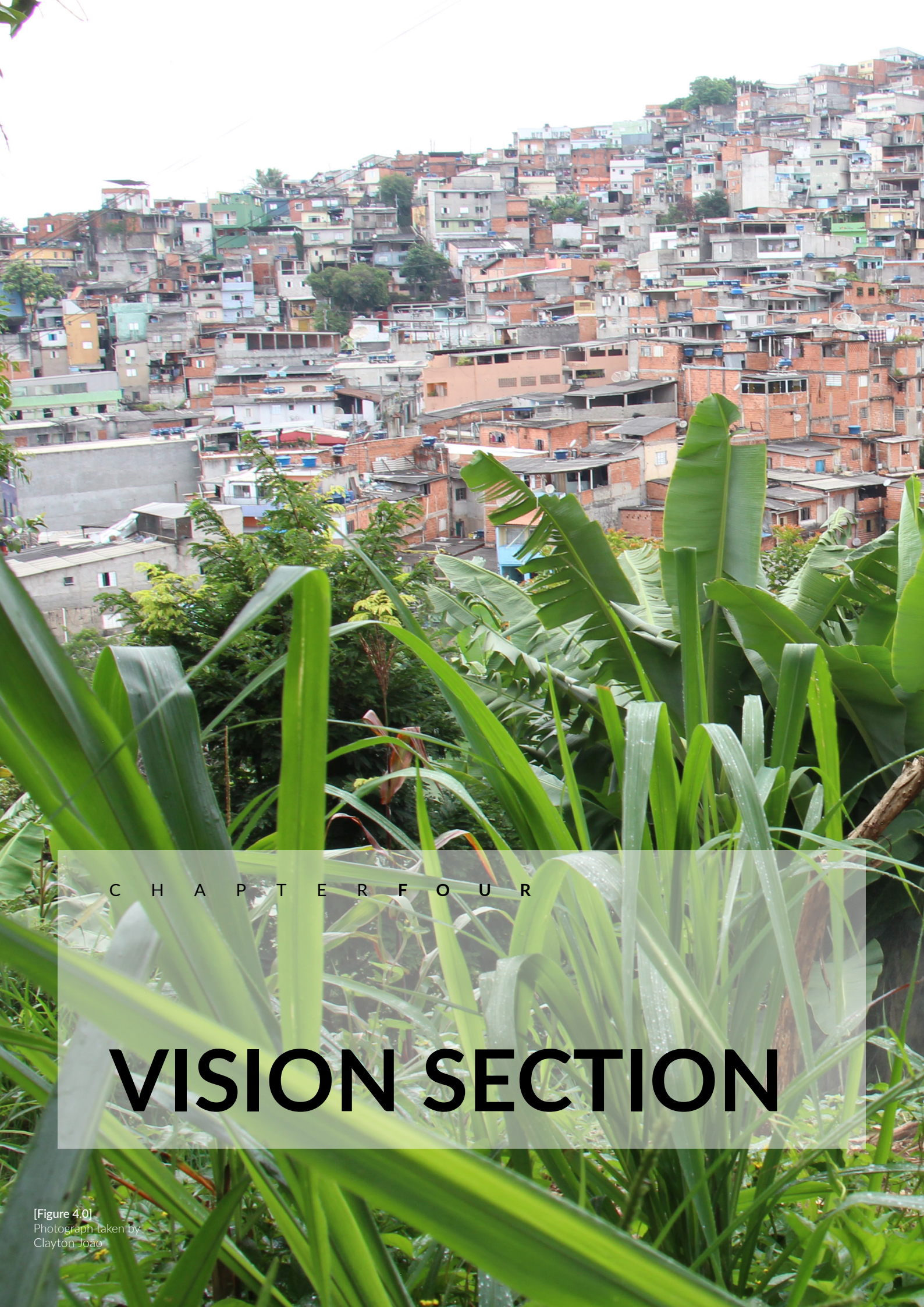
There is an urgent need to improve waste management in the area. The region lacks waste recycling, and there are many irregular waste points, where waste is accumulated in walkways or vacant land. There is a high potential of composting initiatives, even though most of the waste is taken to landfill.

(viii) Climate change and environmental awareness

The managers of the agroecological gardens comment on the effects of climate change on cultivation, are aware of the need to preserve the environment and mitigate the effects of climate change through the ecological management of agriculture. The history of São Paulo's exacerbated urban expansion forced low-income populations, and mainly rural migrants, to the peripheral boundaries of the city, pushing through natural areas. This stresses the urgent need to study the resulting tension of the periphery in clash with nature, and the risks of this relating to climate change. This paper's main focus on envisioning a transition towards agroecology and circularity from a social perspective is highly linked to the issue of degradation of nature and urban forests, and further research is recommended to explore these complexities in depth.

Overall this research contributes to the understanding that practices of food sovereignty and food justice exist in how NGOs and local activists understand their roles in contributing to community food networks, social networks, and the local economy.

This paper addresses the dynamics between food safety and socio-economic inequalities. As higher income groups have begun to manifest their preference on consuming and purchasing local food and short value chains with direct contact with producers, including those who provide food through e-commerce, how can the low income families living in Brasilândia have access to the same choices, and value health over fast-food and ultra-processed snacks. The next chapter will present a vision for a thriving healthy environment for Brasilândia in 2050 where healthy food is produced locally and is affordable.



C H A P T E R **F O U R**

VISION SECTION

[Figure 4.0]
Photograph taken by:
Clayton Joao

4.1- Guiding Principles & SDG's

To achieve an agroecological transition and scale-up initiatives that link to EcoCidade's project the following **core assumptions** that will lead the vision are:

- → The challenges faced in peripheral areas in big cities present an **opportunity of inequality reduction** through the means of sustainable economic practices, engaging poor, racially or marginalised people - with a specific focus on women who cultivate places of care.
- → To transition towards decarbonized local systems, urban and food resource flows should be redesigned - considering the cooperation between spots of production, logistics, consumption, and destination.
- → The network of public spaces that constitute the local food system is accompanied by an online platform of communication, resources and time exchange.
- → For a local circular transition, social networking and community cooperation are essential for fostering tools and infrastructure for community organisation and local democracy.

The goals for a healthy and resilient Brasilianda in 2050 are defined based on the information gathered from the urges pointed in the diagnosis chapter and the potential opportunities presented by the EcoCidade Project.

1. In 2050 **healthy food, produced locally, is accessible** to residents. Peri-urban farming becomes a common job for residents;
2. In 2050 the periphery has reestablished **harmony with nature**. Nature connectivity is strengthened, the local biodiversity and soil health is protected and the community gains access to quality green open space;
3. In 2050 the **circular mindset** is established in Brasilândia, waste is no longer part of the streetscape and resources are valued through a circular loop of material flows
4. In 2050 the **civil society plays a key active role** in decision making for food policies.
5. In 2050 the neighbourhood is **resilient to climate change** through natural flood management
6. In 2050 the **spatial logistics is centred around low-emission** mobility services. Biking cooperatives are empowered to self-manage and coordinate the local delivery goods.

These guiding principles are directly linked to the Sustainable Development Goals (SDG) defined by the United Nations. The SDGs that will guide this transition will be presented. Firstly, the main goal for 2050 is that access to healthy and affordable food which is produced locally will be granted to all residents. This

will certainly address **SDG 2** on Zero Hunger and **SDG 3** for providing food for Good Health and Well-being. In Addition, the increase of local production of food will increase job opportunities for peri-urban farming which should be regulated following the guidelines of **SDG 8** that establish sustained, inclusive and decent work conditions to residents. Morevor this first goal contributes to the **SDG 1** about poverty, as it reduces exposure to certain risks faced by poor communities relating health, food security and unemployment.

The second goal for this vision is to establish harmony with nature in the urban peripheral fringes, in specific focus is the area of the Serra da Cantareira park. This goal relates to **SDG 15** to protect, restore and promote the sustainable relationship with the natural ecosystem. This links to practice of sustainable forest management, reverse land degradation and combat biodiversity loss. And by relating to an urban area this goal also addresses **SDG 11** on sustainable cities.

Directly linkes, is the third goal on responsible waste management. The third goal establishes a circular mindset in Brasilândia, where waste is no longer part of the streetscape and resources are valued through a circular loop of material flows. Besides linking to **SDG 11**, this goal refers to **SDG 12** on responsible consumption and production, as it includes targets of waste management through prevention, reduction, recycling and reuse of resources and decrease of food waste.

The fourth goal is to empower civil society in taking roles of decision making relating to the local food system and in participating in the urban design of their neighbourhood, in addition to it's powerful role of providing quality education (**SDG 4**). This goal follows the guidelines of **SDG 16** which aims for inclusive societies to achieve sustainable development. By building effective, accountable and inclusive institutions at a local scale, contributes to achieving food and socio-environmental justice. In addition, **SDG 5** is also linked to reducing gender inequality by promoting women in entrepreneurship.

The fifth goal is linked to **SDG 13** by tackling climate change and the increasing risks of surface water and river flooding through natural flood management. It also strongly links to **SDG 6** in regards to water quality improvement through nature-based solutions (NBS).

Lastly, the sixth goal brings about the need to establish spatial logistics centred on low-emission vehicles, such as bicycles. This links to **SDG 11** on developing sustainable communities, **SDG 9** for the need for innovative infrastructure, and also **SDG 3** for substituting polluting motorised vehicles and promoting an active form of mobilisation to boost physical activity.

[Figure 4.1]
Sustainable Development Goals (SDG's) from the United Nations

This section invites the reader to imagine a more circular and inclusive local food system and supply chain in peripheral São Paulo. This is done through a spatial vision that could guide a new peri-urban land-use plan, based on values of agroecology.

[Figure 4.0]
Photograph taken by Clayton João

4.2 - Vision Statement

In 2050, the peripheral region of São Paulo will have a strengthened, accessible and engaging local agrifood system for its community. The current linear extract-manufacture-waste model has been transitioned into an integrated, collaborative, and circular system. The northern border where the city of São Paulo meets with nature has been revitalised to ensure the preservation and restricting further informal urban growth. In this future-scenario of a circular local food chain, peri-urban food production will be the new norm, waste streams will be drastically reduced and the local food economy will be thriving.

Achieved through an agroecological urbanism, this transition is spatially planned by principles that no longer devalues food, degrades soils, increases waste streams and displaces farmers (Deh-Tour, 2017). This vision will be achieved through a peri-urbanism that enables food production through accommodating different typologies of land-use for urban farming. To increase climate resilience, the landscape will be transformed to mitigate flood risks through sustainable urban drainage systems that mimic the natural flood management, through increasing storage and infiltration capacity. The planning of Brasilândia will be aimed at stimulating circular practices for local resources, by reconsidering the necessary infrastructure to promote low-emission logistics. The circular actions that will be promoted by the several initiatives are classified as; looping, regeneration, adaptation, localisation, substitution, sharing and optimisation (Williams, 2019). And the streets of Brasilândia will be filled with cargo bikes of different shape and form to facilitate the circulation of goods.

Healthy food will be accessible and affordable, and a circular food system will provide the community of Brasilândia with green labour opportunities based on time for growing, cooking and delivering. Urban gardens will become essential life-sustaining infrastructure and the soil will be maintained to regenerate ecosystem services and will be understood as a living organism. There will have to be a cultural shift, or better to say, a recovery of the ancient traditions of growing food. By 2050, new organisational forms, partnerships and cooperatives, will be established to boost local food provision and processing, and close the loops for resource streams. This new vision will be based on commitments of social transformations from citizen movement-led initiatives, and the urban farmer of the future will have a series of incentives to produce nourishing food.

4.3 - Circular Local Food System

Four main elements are added to the food system to trigger circularity and agroecology. These elements relate to the stages of production, distribution, consumption and nutrient recycling. The new circular environment will provide opportunities to social innovators, urban food producers, delivery cooperatives and waste pickers. Urban agriculture will be practised in different organisational forms, different scales and in both public and private land.

In the flow diagram shown in Figure 4.2, the key urban farming units are differentiated as (i) the large scale commercial urban farms, who will manage land close to the fringe of the northern boundary (ii) Community farms located within the densified residential areas, and will be led by organised stewardship activities from residents in the proximity and the (iii) institutional farms, located in schools, health units, community centres, and other public institutions mainly provide gardening opportunities as therapeutic and educational activities.

Secondly, in relation to the supply, urban farmers cooperatives will provide a local food source to the community, while the community will provide a market to farmers. By partnering with cooperatives, the informal street vendors will become key players in ensuring accessibility of healthy meals and snacks prepared from locally sourced products.

Household's food consumption behaviours will be inclined to prefer locally-sourced products. A key strategy to trigger this food culture change will be the education of environmental issues and the importance of healthy nutrition in school. Schools will also install growing gardens in their yards as a form of educational practice, to teach residents at an early stage on the cycles of nature, and how seeds grow into plants which then provide vegetables, herbs and fruits.

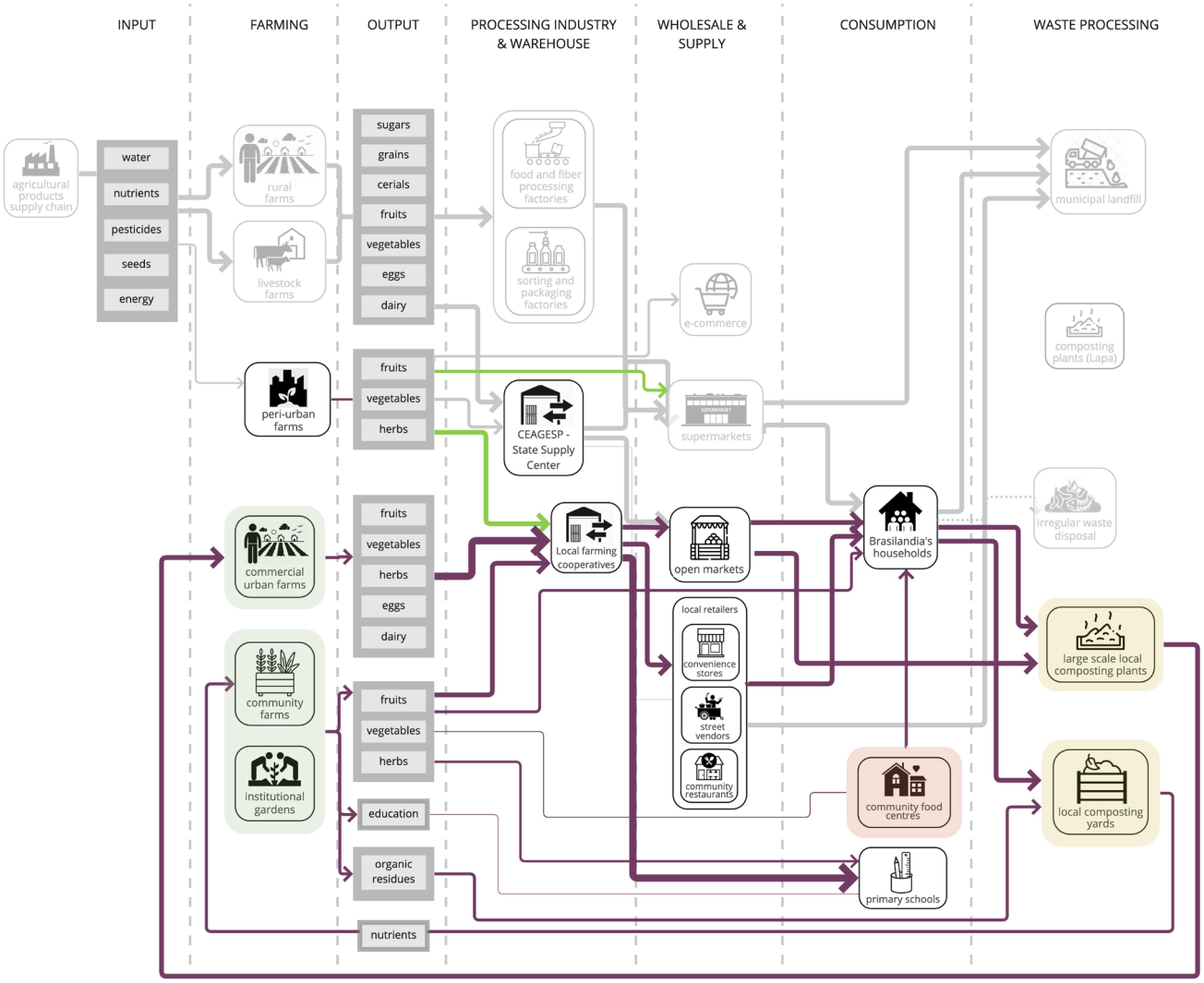
Residents will have the stimuli to consider farming and land stewardship as a job opportunity. In addition to financial strategies to provide these opportunities, a key element to triggering this change will be the food community centres such as the existing Espaço Cultural of Jardim Damasceno (ECJD). The community centre will provide local knowledge exchange which will contribute to strengthening local resilience, a key element of community food security (CFS).

To conclude the cycle, the neighbourhood will have multiple opportunities of composting to recover nutrients in organic residue. The composting yards will be located within or in proximity to the new community urban gardens, and institutional gardens. To increase local capacity of handling larger quantities of waste, composting plants will be located close to the commercial urban farms in the north of the neighbourhood, adjacent to the green bugger ring. This composting plant will work similarly to the existing Composting plant in the Lapa and will receive waste produced in the street markets, households, restaurants and street vendors, to generate fertiliser to the commercial farms to grow food back to the community. Closing the nutrient loop through composting methods

is an essential element of agroecology. Compost is used to recover degraded soils and restore its fertility, carbon sequestration, its use substitutes the need of chemical inputs (fertilisers, pesticides, fuel) resulting in lower production costs and negative impacts on the environment (Pergola et al., 2018).

For a circular local food system, there must be intelligent logistics for the distribution of goods such as food, ready-made meals, organic residues, and fertilisers. VivaBike collective has demonstrated the existing desire of local cyclists to work as distributors of goods in their own neighbourhood, avoiding the need to go to the centre and work for the well established new delivery platforms. In 2050, the streets will become safe and the public realm will be well equipped with infrastructure to support the work of local bike collectives. Cargo bikes present a solution for this sustainable transition as it provides efficient, low-cost, low-emission transport of goods within the town. The purple lines in Figure 4.2. represent the different connections that will be done through collectives of cargo and normal bikes in Brasilândia.

[Figure 4.2]
Circular local food system for 2050



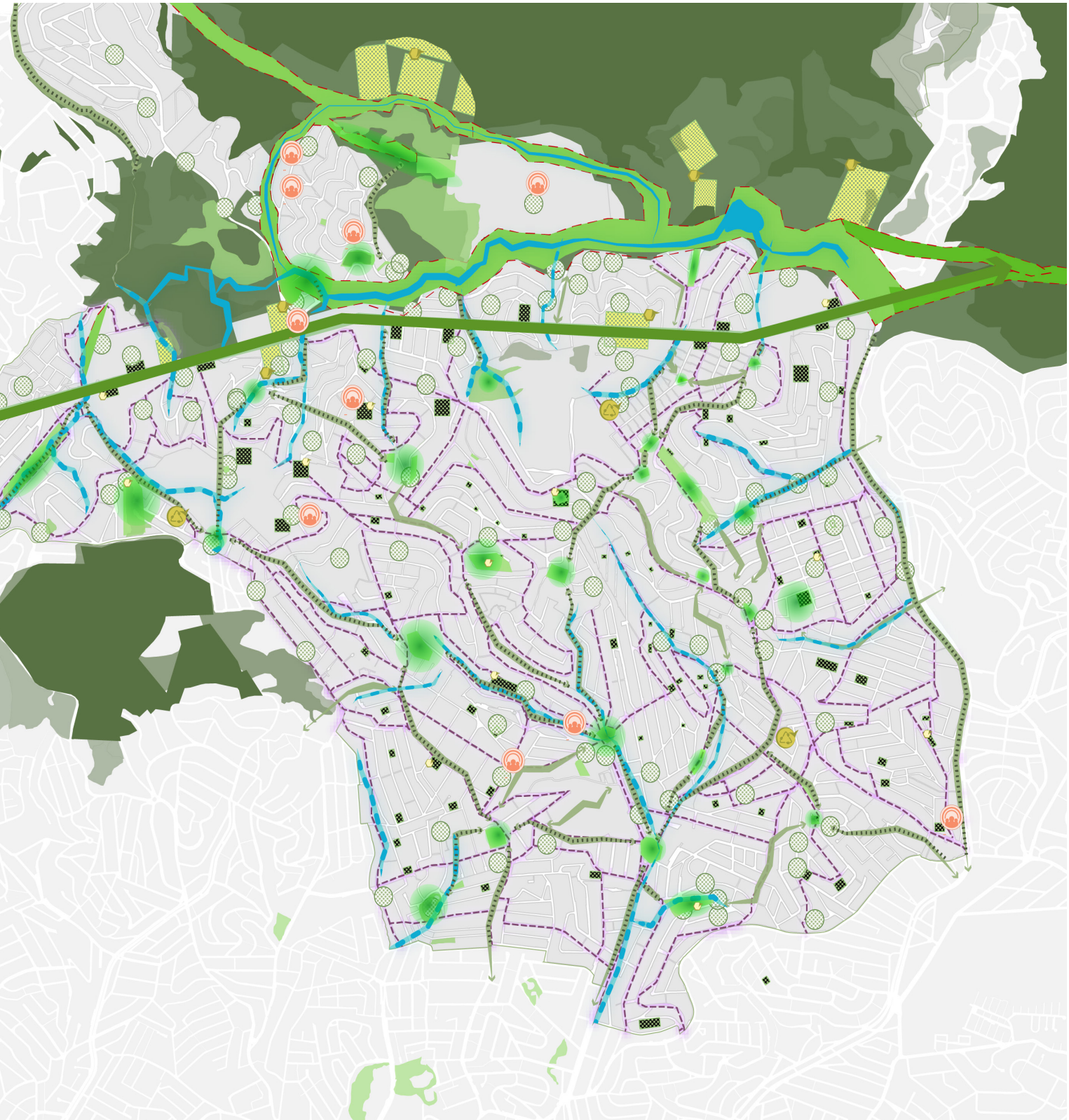
"We are talking about a society that diversifies the modes of production. Placing limits on industrial production has for us the goal of liberating the future. . . . A stagnant society would be as untenable as a society of endless acceleration. In between the two, there lies the society of convivial innovation"

- Illich, Ivan; 94–97, (2015)

Vision Map for Brasilândia 2050

Based on the challenges and opportunities of Brasilândia's territory, a spatial vision for 2050 was designed using the four pillars from the conceptual framework: Productive and Natural Landscapes (PNL), Waste & Resource Management (WRM), Spatial Logistics (SL) and Social and Consumption Networks (SCN). The interventions for each pillar are presented in the next chapter of the socio-spatial strategy

[Figure 4.3]
Vision map showing the four pillars of actions



C H A P T E R F I V E

STRATEGY RECOMMENDATIONS

[Figure 3.35]
Photograph taken by Victor Paris

[Figure 5.0]
Photograph taken by
Clayton João

5.1 Interventions to achieve vision

Based on the urges concluded from the analysis of Brasilândia and the potential opportunities presented by EcoCidade project, this research presents a vision divided into four main pillars. The interventions to achieve this vision are divided into four categories: Productive, Nature-inclusive Landscapes (PNL), Circular Streams of nutrients and water (CS), Spatial Logistics (SL) and Social and Consumption Networks (SCN). These interventions vary in scale levels, as some apply for the large Brasilândia area as a whole, while others are specifically related to individual sites or street and digital networks. Therefore the actions are further categorised into the following levels: whole area, networks, public space, site level, building level and digital level. These actions will be presented divided and colour coded based on the four vision categories.

[Table 5.1]
Toolkit schema for strategy interventions

Pillars for change	Circular Actions	Levels	Agents
Productive & Nature-Inclusive Landscapes	looping	Whole area	PRODUCERS
Circular Streams of nutrients and water	adapt	Networks	CONSUMERS
Spatial Logistics	regenerate	Public Space	DISTRIBUTERS
Social & Consumption Networks	locate	Site	POLICY MAKERS
	substitution	Building	ORGANISED CIVIL SOCEITY
	share	Digital	
	optimise		

5.1.1 Productive and Natural peri-urban Landscapes (PNL)

This first pillar addresses the interventions needed in regards to goal 1 of the vision to achieve a landscaoe by 2050 in which **healthy food, produced locally, is accessible** to residents and farming becomes a common job and costum for residents; and goal 2 that by 2050 the periphery has reestablished **harmony with nature**. Nature connectivity is strengthened, the local biodiversity and soil health is protected and the community gains access to quality green open space.

As shown in table 5.2 a vision for a productive and natural landscape for Brasilândia will address the challenges of urban expansion in the natural borders of the city, lack of access to quality green open space, issues of natural water pollution, and lack of space for food production in parallel to the under-used space in the neighbourhood. In the following pages these interventions will be explained, illustrated, and strategies and policies will be recommended.

[Table 5.2]
Toolkit Intervention for Productive and Natural Landscape

Pillar	PRODUCTIVE & NATURE-INCLUSIVE LANDSCAPES									
Challenges	Urban expansion pushing city borders towards Natural Area	Flooding risks due to destruction of Natural Flood management	Lack of access to green open spaces	Insufficient food production Space vs not fully exploited Public realm, Institutional buildings, street network and private land						
Methods of Intervention	reactivation regeneration rehabilitation Preservation	recovering	reactivation revitalization creation	land stewardship low-cost technologies land and soil protection Regeneration of ecosystem						
Scale level of intervention	whole area	network	public space	network	public space		site level		building level	
ID	PNL 1	PNL 2	PNL 3	PNL 4	PNL 5	PNL 6	PNL 7	PNL 8	PNL 9	PNL 10
Spatial Intervention	Reactivation of a large natural ring to reinforce the buffer zone	Recover freshwater banks to provide sustainable urban drainage	Reactivation of green zones for recreational activities	Productive gardens & fruit trees in street network	Multi-functional community farms (medium-large scale)	Gardens in peri-urban vacant plots (small-medium scale)	Institutional gardens (schools, churches and hospitals)	Multi-functional commercial farms (Medium-large scale)	Private gardens: terraces, rooftops and balconies (household scale)	Integrated vertical gardens (household scale)
Strategy and policies	strengthen local agents for land stweardship and restorative activities	apply the sponge city guidelines in the neighbourhood's development plan.	Link management of green public spaces to the agenda of the Municipal Public Health Secretary	civic engagement through awareness campaigns, consolidation of local food chain market, subsidies and financial tools to support local production						

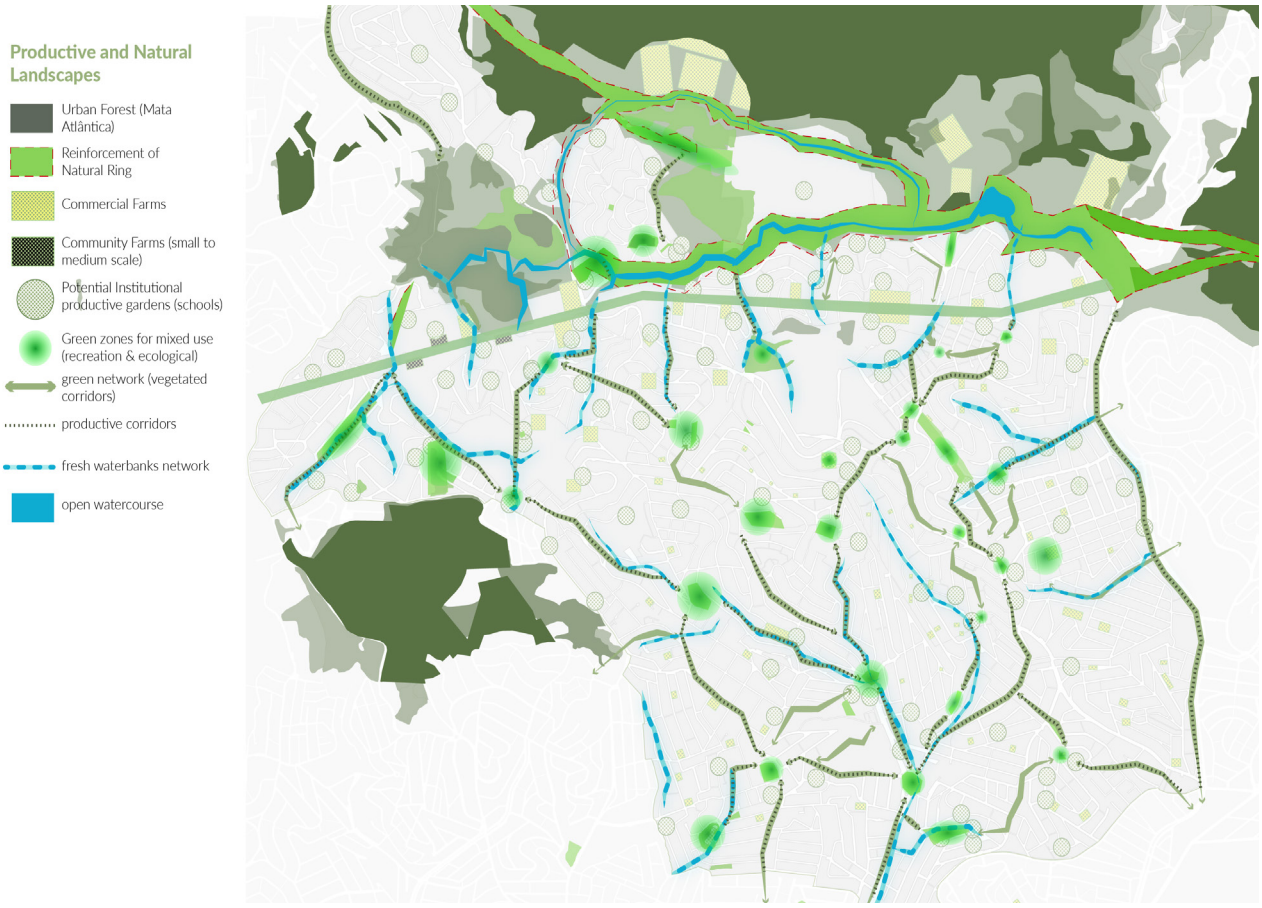
Reinforcement of a large natural ring (PNL 1) and Recover of freshwater banks in the neighbourhood (PNL 2)

To address the challenge of urban expansion pushing the borders of the city to the natural area of the Serra da Cantareira park, a large natural ring area will be reactivated and reinforced to ensure a buffer zone. To protect the natural reserve of the Serra da Cantareira State Park in the north of Brasilândia, a project of reinforcement of the Parque linear do Córrego do Bananal/Canivete will be implemented. By reinforcement and reactivation it is meant that this area should be highly valued for its ability to connect the urban and rural components of Brasilândia. The multi-functional natural ring of ecological, agricultural and civic

"The way out is to break up the soil of a part of the parking lot to plant vegetable gardens as well to reduce the heat".

- Interview with resident, 2022

[Figure 5.1]
Map of Spatial Intervention for Productive and Natural Landscapes



[Figure 5.2]
Photograph of the Bananal strem taken by author.

spaces will be key in preventing unplanned urban expansion into the natural area as it is kept active and protected by environment agents. In addition, the ring will create multiple social and transport links for the low-income community through pedestrian walkways, bike paths and sport activities.

A large green and blue infrastructure management corridor will connect freshwater courses flowing from the Cantareira hill into the Bananal stream to watercourses that flow downstream into the neighbourhood. The recovery of freshwater banks is a key strategy of natural flood management. By connecting freshwater banks through swales, filter strips and other sustainable urban drainage systems, the neighbourhood will achieve a resilient urban landscape. The water-buffering strips will facilitate rainwater runoff sustainably and provide freshwater for irrigation to the community gardens. To achieve this, a recommendation strategy is to apply the sponge city guidelines in the neighbourhood's development plan. The sponge city focuses on urban water-resource management, urban flood and climate risk mitigation, ecological enhancement and social wellbeing (Chan et al., 2018, p. 776). The sponge city relies on four key principles: resourcing rainwater, ecological water management, green infrastructures and permeable pavements. (Li et al., 2017).

Network of green zones in the neighbourhood (PNL 3)

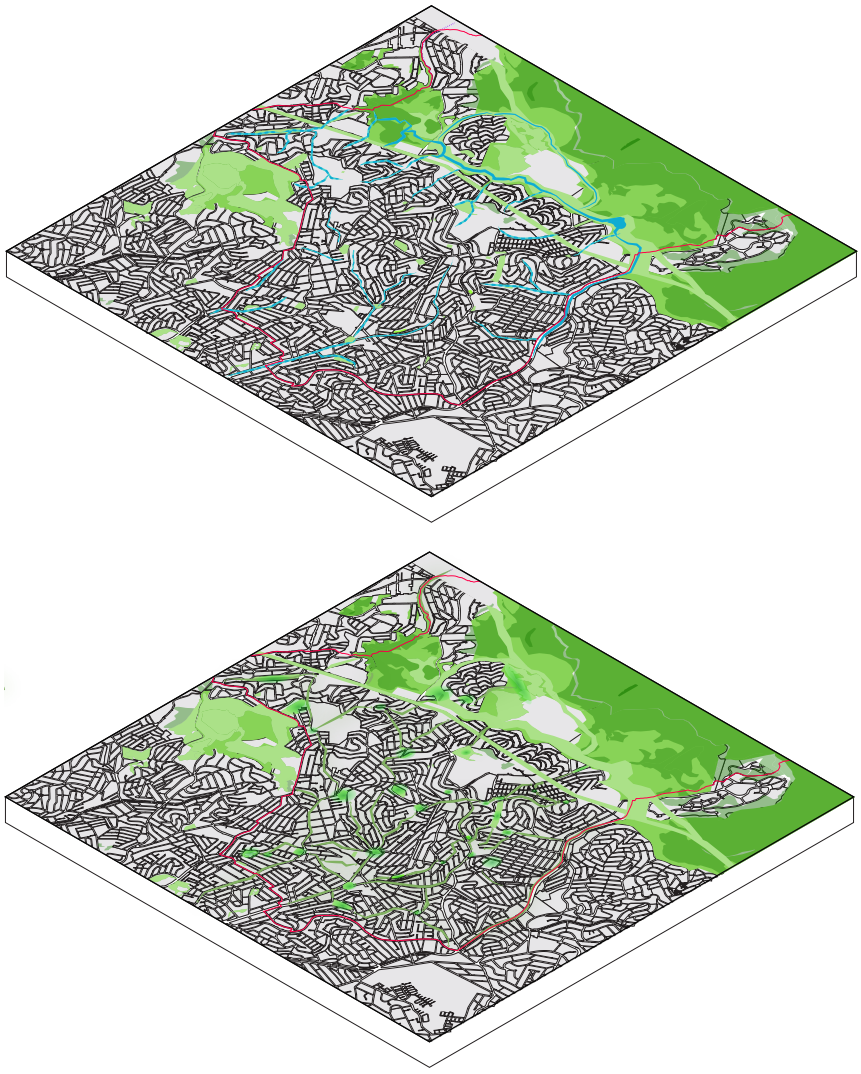
Having access to green public spaces provide important benefits to mitigate crippling environmental and social issues, and are essential for social, education and moral improvement (Cunningham, 2016). To tackle several of the challenges related to the vulnerability in peripheral areas, a revitalization of existing parks and creation of new pocket parks is recommended as part of this vision. Brasilândia's residents will have access to green open space to stimulate human values of harmony with nature, social interactions, reduce anti-social behaviour, isolation and stress, and optimise opportunities for eco-pedagogic activities (Bull et al., 2013) . These strengthened pocket parks will establish a green network in Brasilândia, aimed to provide ecosystem services to the human and natural systems of Brasilândia, by boosting the habitat connectivity of the region.

Established in existing public spaces, these green zones will be developed and maintained through community-led initiatives. The areas to develop these green zones will be existing public squares, current irregular waste points and vacant and derelict plots. These spaces will host the other public space initiatives presented in this vision, such as activities of community farming, street vendors, bike parking infrastructure, and more. The green zones will be connected through well maintained green corridors in the street network. Pulled from the natural ring into the dense area of Brasilândia, these green connections will provide quality of life to local residents (Moreno et al., 2020), improve urban ventilation, connect small wildlife habitats (Aziz et al., 2014) and form the base of urban regeneration. Planned along the watercourses, the green corridors will protect the bank zones and provide green open space to the community for sports, recreation and urban agricultural practices.

A policy strategy is to revise the standards for liveable space that help create healthy places as part of a strategy from the Public Health Secretary. By linking the management of green public spaces to the agenda of the Municipal Health department, more public resources can be directed towards ensuring well maintained spaces for interaction with nature, and provide green jobs to local residents on stewardship activities.

"I work in the housing movement and since the past years we began to see green areas as extremely important for people's health and for the issue of permeability in cities".

- Interview with local activitst, 2022



[Figure 5.2]
PNL 1 Reinforcement of large natural ring PNL 2 Recover of freshwater banks and PNL 3 Network of Public Green zones

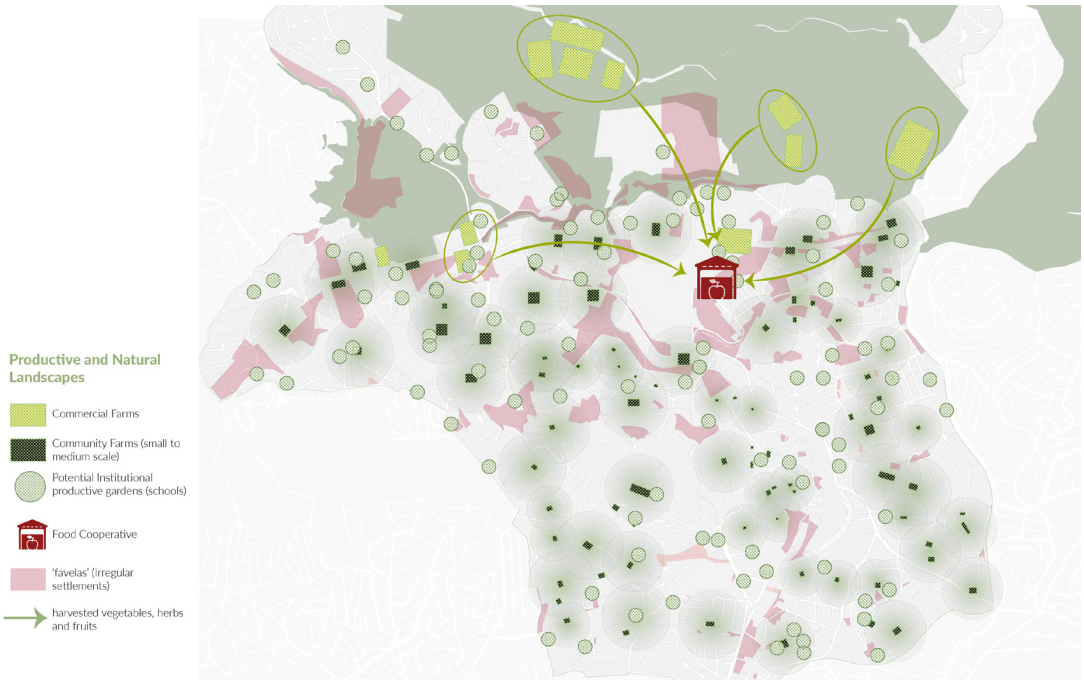
Productive Landscapes for Urban Agriculture (PNL 4 - 9)

To tackle the challenge of space for food production, and achieve the potential of under-used spaces in public space, institutional buildings, street networks and buildings, the territory will accommodate different typologies of urban agriculture. The agricultural activities will range in scales, types of land use and ownership and planting methods.

At a network level, as mentioned in the previous intervention, green corridors will provide connecting lines of existing street trees with fruit trees and pop-up community gardens. At a public-space level, multi-functional community farms will be established in the green zones or in vacant and derelict land. Vacant plots and areas of current irregular waste disposal will be transformed into open-field community gardens or allotments for urban agriculture. This will be achieved with assistance of civil society organisations such as 'A Cidade Precisa de Você'. The stewardship activities will be led by the community, and will be technically assisted by the civil society organisations. The idea is that everyone in Brasilândia has access to a community garden to cultivate their own vegetables and herbs. The areas shown in the map, identified as potential areas for local food production, were defined using the Normalised Difference Vegetation Index (NDVI).

[Figure 5.3]
Photograph taken of Institutional farm

Institutional gardens are key in scaling up urban agricultural practices in Brasilândia. Implementing urban farming into existing schools, churches and hospitals will contribute to the socio-cultural change towards agroecology. The stewardship activities will be led by children and students, teachers, the community and civil actors. The food produced will be mostly dedicated to be provided to the institution and the participants' families. A strategy to encourage institutions to develop urban farming in their backyards is through increasing the awareness of the benefits of ecopedagogy through agricultural practices in relation to its therapeutic capacity, the development of human values such as mutual respect, and education nutrition and biological systems. This awareness is increased through media campaigns and increased activity of programmes of Civil Society Organizations such as EcoCidade.



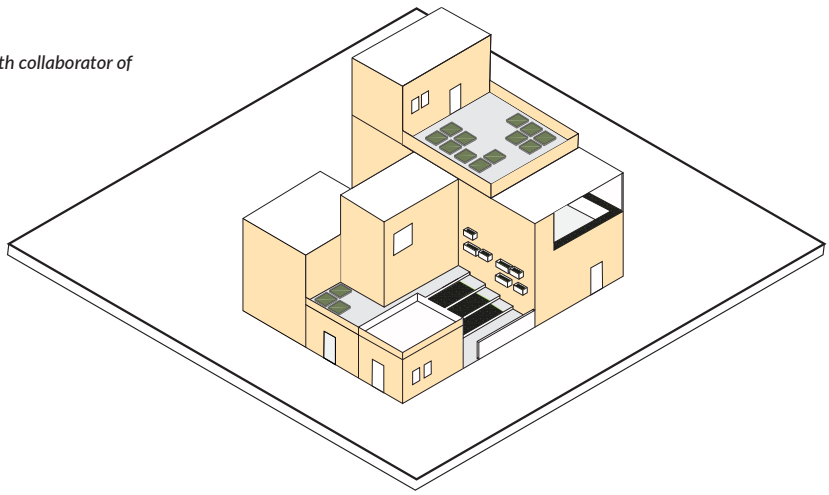
[Figure 5.4]
Map showing sites for productive landscape at network, public space and insitutional (PNL 4 - 8 sites)

To recover the multiple economic dimensions of the border of the city, large scale commercial farms will be established in the large natural ring of the Bananeira stream and in the green corridor under the network of power grids. The main function of these multi-functional farms will be to provide food to the street markets, local retailers and the community through different farming technologies on ground, ponds and potentially greenhouses for winter. The stewardship labour will be structured by formal green jobs. The programme of these peri-urban farms could include horticulture, livestock, fish, orchards, fruit trees, flowers, education and research.

Lastly, integrating gardening into building structures presents a great opportunity in Brasilândia, especially due to its large built-up area. New technologies will be implemented such as; modular vertical green structures, semi-intensive green roofs and raised-beds. The creative solutions that already exist for reusing objects such as wheels, plastic bottles, and containers to serve as pots for planting herbs or even vegetables, will become even more common in the houses of Brasilândia.

"Gardening as a therapeutic capacity"

- Interview with collaborator of EcoCidade



[Figure 5.5]
PNL 8 & 9 Gardening in building structures

5.1.2 Waste and Resource Management (WRM)

This second pillar addresses the interventions needed in order to improve waste management for a circular economy. As shown in table 5.3 a vision for Waste Management and Circular Streams for Brasilândia will address the challenges of lack of proper recycling logistics, accumulated waste in sidewalks and vacant land, and the contamination of soil due to landfill waste disposal and the un-meet opportunity of recovering nutrients from organic waste. In the following section these interventions will be explained, illustrated, and strategies will be recommended.

"It is obvious to me that a healthy environment promotes human health"

- interview with health worker at PAVS

[Table 5.3]
Toolkit Intervention for Waste and Resource Management

Pillar	WASTE & RESOURCE MANAGEMENT						
Challenges	lack of proper recycling strategy and waste accumulation in public space		Waste pickers face challenges of: physical effort, discrimination, and mixed waste disposal	Contaminated land due to waste disposal and missed opportunity of recovering nutrients from organic waste			
Methods of Intervention	looping localization optimization	revitalization	local social capital efficiency	nutrient recovering looping low-cost technologies			co-creation and social innovation
Scale level of intervention	whole area	public space	whole level	site level	site level	network level	digital level
ID	WRM 1	WRM 2	WRM 3	WRM 4	WRM 5	WRM 6	WRM 7
Spatial Intervention	Development of new Ecopontos (waste recovery centres)	Transform irregular waste points into public spaces and green zones	New technical solution for vehicles used by waste pickers for collection of recycling and organic waste	Shared composting yards (small-scale)	Industrial organic fertilizing hubs (large-scale)	collection and distribution of domestic, institutional and commercial organic residue	Build digital platform indicating closest composting yard
Strategy and policies	Establishing shared responsibilities between residents, civil soceity and sub-municipality		Financial policies that promote circular economy increase value of recycled materials. Waste collectors will have a higher financial incentives	Engage residents, farmers, retailers, and street market vendors. Increase awareness of the value of organic residues to boost social innovation of the design of circular solutions for nutrient recovery.			

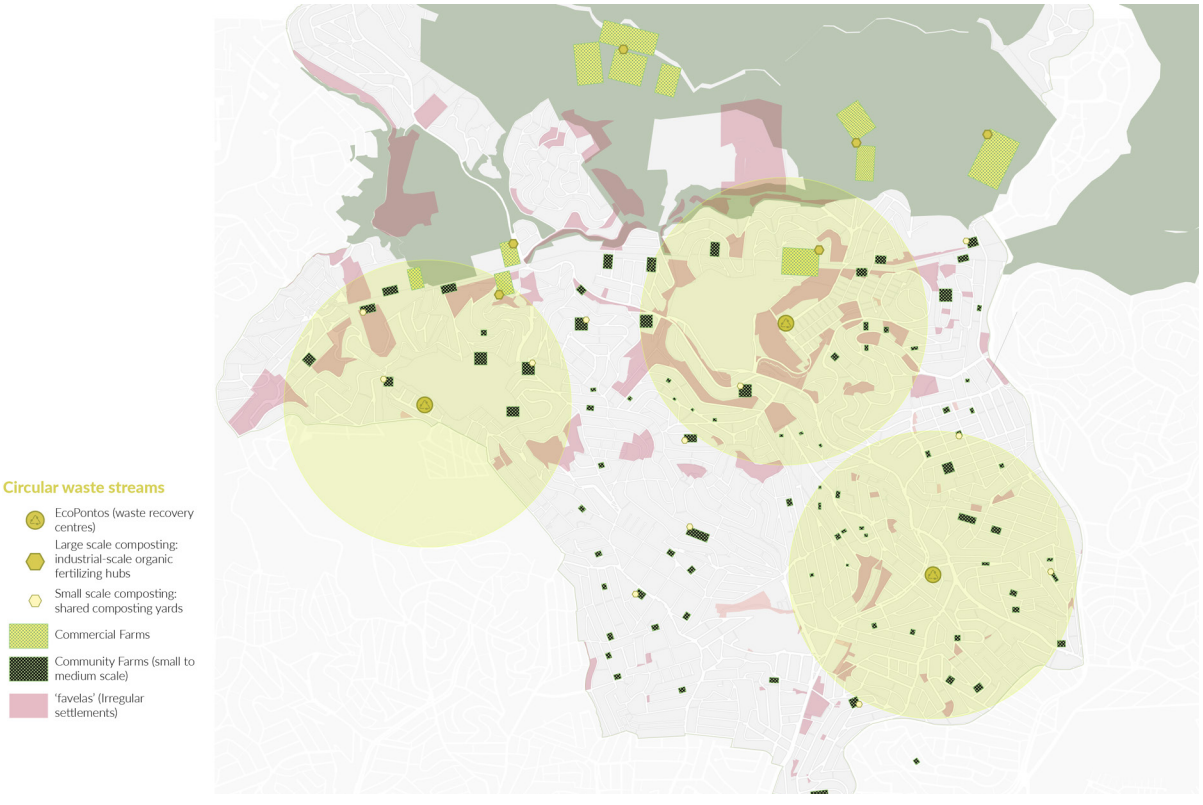
Development of new 'Ecopontos' (waste recovery centres) in the neighbourhood (WRM 1)

By 2050 there will be the installation of 3 new 'Ecopontos', on average one per every 80 thousand residents. These are waste recovery centres to facilitate the collection, sorting and recycling of resources. To combat irregular waste disposal, the City of São Paulo, through the Municipal Department of Sub-Municipalities (SMSUB), provides areas for the regular disposal of construction and demolition waste from households, institutions and small retailers, in addition to facilitating and encouraging the recycling of these materials. The centres collect old furniture, mattresses, broken appliances, and pieces of wood and metal. Examples of these initiatives have started to pop-up around the world, such as the e-waste recycling pilot facility set up by Blacksmith Institute and GreenAd Ghana in Accra, where workers learn how to disassemble items to valuable parts that are then sold at a higher value.

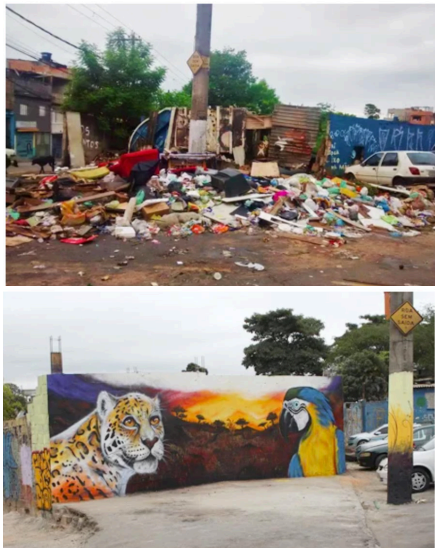
"What this neighbourhood needs is its own Ecoponto - a small, decentralised recyclable material delivery post, which is then taken to larger spaces."

- Interview with collaborator of EcoCidade

[Figure 5.6]
Map of Spatial Intervention for Waste & Resource Management



[Figure 5.7a]
Before and after project Nossa Vila Limpa



Transform irregular waste points into public spaces and green zones (WRM 2)

Urban cleaning is an instrument that not only gets rid of the accumulated waste in public space but is also about repurposing areas to the use of the community. Projects like Nossa Vila Limpa as shown in Figure 5.7a show the benefits achieved by transforming irregular waste points into public spaces and green zones. The awareness and joint efforts between the municipality and the residents of Brasilândia, will be the main tools for urban cleaning projects. The initiatives are carried out by the Department of Services, through the Municipal Urban Cleaning Authority (Amlurb).

By establishing shared responsibility with the community on combating irregular disposal of waste in public spaces, initiatives from organised civil societies can revitalise areas to create new pocket gardens for the community. An example is in the Passagem Cícero Dias, a side street on Rua Rômulo Naldi, which gained a colourful aspect by the art of local graffiti artists.

Better technologies for Waste Pickers (WRM 3)

A lot of the city's recycling strategy relies on the efforts of hard-working waste pickers. One of the main challenges faced by them is the high level of physical effort required to carry the non-motorized trolleys with heavy weights on the hills of the city. As suggested by a local activist, cities "must stop looking at waste pickers through a distant look and start seeing them as street entrepreneurs". In this way, by implementing financial instruments of a circular economy that can increase the value of recycled resources, their work can be promoted and their wages increased. By seeing waste as a source of income, the community's perspective in relation to how they manage their own waste will be transformed, and technical innovations on waste management will start to appear. There is an opportunity to test new technologies of e-cargo trolleys to alleviate the physical effort, however it is highly recommended these solutions must be designed by the waste pickers themselves, with the support of the public and private sector.

[Figure 5.7b]
Image of waste picker.
Source: Voz da Serra

Strategies towards improving the working conditions of waste pickers are extremely impactful to the city. In addition to encouraging the circularity of resources, the waste removed and sorted out by waste pickers has direct benefits to the sanitation and public health benefits, they also divert tons of material from landfill and irregular waste points.

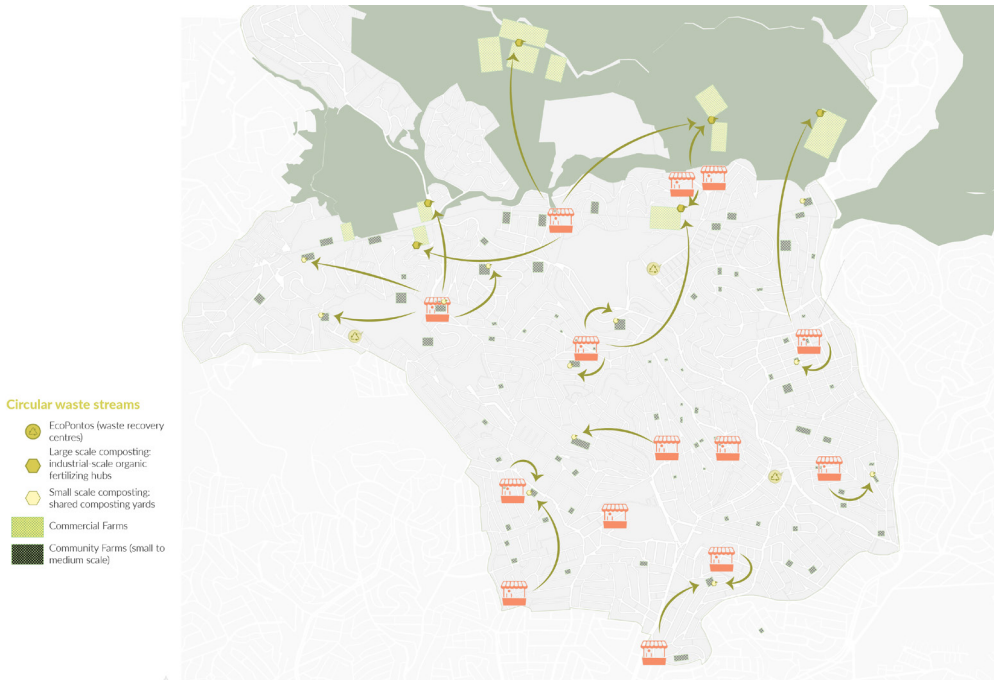
Circular Stream of Nutrients (WRM 4-7)

Industrial organic fertilising hubs (WRM 5) will be established in the North of Brasilândia close to the commercial farms in the natural ring, as shown in Figure 5.8. The hub aims to further solidify the new position of Brasilândia as the centre for circular food supply chain by processing organic waste collected from the 37 street markets in Brasilândia and others in the region into fertiliser. Meanwhile, there are shared composting yards (WRM 4) dotted throughout the already established agricultural landscape. From planting to consumption, the multiple organic fertiliser plants will increase circularity within the nutritional flow, and generate fertiliser that will be sold for more accessible prices, or also exchanged with urban farmers for more organic residue.

To close the loop of the nutrient cycle, the collection and distribution of organic waste (WRM 6) is essential at a network level. The collection of organic residues in households, schools, restaurants and other retails, especially coffee beans and green waste, will scale-up the production of the organic fertilising hubs. The organic waste produced from the street markets and restaurants will be sent to the large-scale composting hubs. Whereas the domestic organic waste will be sent to the small scale composting yards located in proximity to the small-medium community gardens.

The circularity of nutrients from organic residues to soil fertiliser requires the engagement of local multi-stakeholders these are: the residents, retailers, school agents, restaurant owners, street market vendors and the other players that produce organic residues, and the farmers who will be accountable for the composting and all the urban farmers that will demand the fertile soil. These stakeholders must form a group to co-create and establish the new rules for the logistics, and test them through pilot projects.

[Figure 5.8]
Map of Spatial Intervention for Circular Streams of Nutrients



5.1.3 Spatial Logistics

This third pillar addresses the need to re-think the spatial logistics based on fossil-free transportation for the distribution of local resources. As shown in table 5.4. a vision for a low-emission spatial strategy for Brasilândia will address the challenges of a transportation system which is highly dependent on motorised vehicles that increase the risks of air pollution and climate change and unsafe traffic conditions, the lack of accessibility of food and essential services of vulnerable populations that do not own cars, the limited resources and available infrastructure to transition to cycling, the increasing demand of a local distribution on an highly steeped landscape, the fact that new delivery platforms don't offer delivery services in the periphery and there is an unmet need of local job opportunities. In the following section these interventions will be explained, illustrated, and strategies will be recommended.

[Table 5.4]
Toolkit Intervention for Spatial Logistic

Pillar	SPATIAL LOGISTICS							
Challenges	Network designed for cars but only 30% of population owns cars, and increasing pressure in reducing intensive emission transportation due to climate change				residents have limited resources to purchase bikes or e-bikes	Increasing demand of local distribution on a extremely steep landscape	New-delivery platform apps are not available and unmet need of local job opportunities	Traffic conditions are very unsafe for the increasing number of bikers
Methods of Intervention	substitution to low-emission vehicles				sharing	low-cost and energy-efficient technologies	local social capital and solidarity economy through social innovation	adaptation
Scale level of intervention	network				network	whole area	digital	network
ID	SL 1	SL 2	SL 3	SL 4	SL 5	SL 6	SL 7	SL 8
Spatial Intervention	transition to low-emission mobility (ex: bikes, electric public bus, electric cars)	Revitalised and improved sidewalks for pedestrians	Provide connected network of bicycle infrastructure	Secure and ubiquitous bike parking	Shared mobility services	Cycling and electric cargo-bikes for local resource distribution for domestic, institutional and commercial exchanges	Decentralised digital platform to optimise local logistics of food, waste and nutrients streams	Implement 30 km/h speed limits on urban streets
Strategy and policies	Apply a "polluter pays" principle taxation policies	Include in neighbourhood panning the need to implement signposted bicycle lanes and bike infrastructure for road development, and design schemes to re-develop sidewals. Strategies of tactical urbanism can also be applied by civil soceity		Implementation of bike infrastructure in public space	Provide free trials of cargo bikes or low-cost rental schemes. Partner with private companies to invest on shared mobility services	Promote cycle logistics in procurement procedures for municipal deliveries Include cycle delivery as a preferred option on public bids for municipal supply. Promote cargo bikes through funding and rental schemes	engage bike cooperatives to develop digital innovation through support of private funding	Strengthen road traffic laws and enforcement

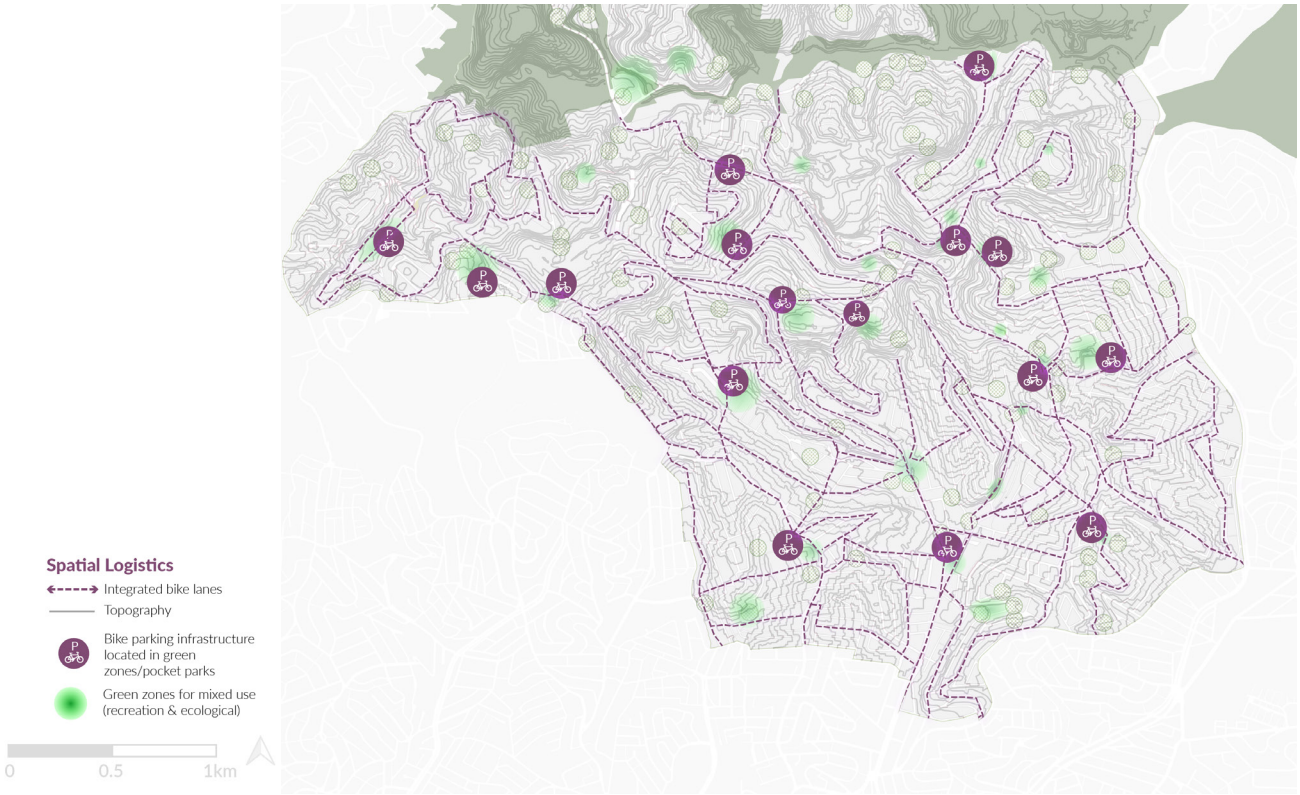
Substitution to low-emission vehicles for local mobility

This goal aligns to the circular cities actions of substitution to low-emission vehicles for local mobility, by reducing the consumption of finite fossil fuels and greenhouse gas emission through the replacement of energy-efficient infrastructure, reducing pollution and other related risks. This is also a measure of substitution to achieve the transition to low-emission mobility such as cycling, electric public buses, electric cars (SL 1). A strategy being applied by European governments and cities is to apply "polluter pays" principle taxation policies. Regulations and incentives that support the decarbonization of the road transport seem like a distant reality for São Paulo, but with the COP 27 agreements and the increasing arrival of electric-vehicles technologies may change this. As an example, the "US federal government has called for zero-emission vehicles to make up half of all new passenger car and light-truck sales by that year" (McKinsey, 2022). Another key spatial strategies to achieve this change will be to revitalise

"A lot of people in the neighbourhood have started switching bikes... Imagine Brasilândia without all these cars occupying street space."

- Interview with resident

[Figure 5.9]
Map of Spatial Intervention for Spatial Logistics



[Figure 5.10]
Photoraph during activity led by EcoCidade with VivaBike. Photograph captured by Clayton João

and improve sidewalks for pedestrians (SL 2) and increase drastically the network of bicycle lanes and infrastructure (SL 3). The integration of bicycle lanes intended for the circulation of cycles, will connect the neighbourhood so that it can become a mode of transport for residents but also for the localised logistics of resources. The main routes physically separated from common traffic on the public road, can be arranged on the sides of the lanes. This measure should be integrated with educational programmes to teach residents how to ride a bike and public spaces well equipped with essential infrastructure to support the mobility of residents such as bike parking and shared e-charging stations (SL 4). In addition, to reduce the safety risk, policy makers should consider implementing 30 km/h speed limits on streets of high activity (SL 8).

A main obstacle in the transition to low-emission mobility is the limited resources of residents to purchase bikes and electric vehicles. Therefore this strategy includes the establishment of services for sharing vehicles (SL 5) The new uprising technologies providing Mobility as a Service (MaaS), can be a great partner of the circular agroecological transition in the periphery. Switching to low-emission vehicles is not enough to achieve circularity, it still implies a large number of manufactured vehicles occupying roads, parking spaces and public space. Whereas, this vision includes shared transport services to complement public transit modes. By providing sharing services, product loops are kept at low speed and maximises utilisation of products (Williams, 2019). To engage citizens with this change will be necessary to provide free trials of cargo bikes and low-cost rental schemes.

Use of bicycles and electric cargo-bikes for distribution of local resources (SL 6)

The new vision for the local circular food system will demand for a dynamic local in a territory of high slopes. Bikes and electric vehicles will be used to ensure the circular processes within Brasilândia. The food service sector has been one of the first to unlock the potential of bike and cargo-bike delivery in cities. Cargo bikes are useful in all aspects of the supply chain including ingredients delivery, mobile street vending, delivery service, and food waste redistribution and management (Wrighton & Reiter, 2016). This goal aligns to the circular cities actions of substitution, through the replacement of the use of carbon intensive vehicles to bicycle or electric vehicles. As an example, research has estimated that 50% of all motorised trips that happen for the transport of goods in European cities could be shifted to cargo bikes and bicycles (Wrighton & Reiter, 2016). With a strong local distribution system, the circularity of materials is boosted, and localisation of resources can be achieved. For this it is important to involve local biking cooperatives and strengthen their capacity allowing them to rely on bike delivery as their main source of income. The cargo bike logistic model provides

[Figure 5.11]
Cargo e-bike for distribution source: Patrickgoud

a quick, energy-efficient and cost-effective solution and has a considerable potential to reduce motorised traffic.

For retailers the cargo bike has been an important part of this shift. From product delivery to small pop-up street shops, the cargo bikes flexibility, PR potential, and low buy-in costs have made it a key element to the modern food business (Wrighton & Reiter, 2016). The cargo bikes have been a useful tool to social organisations and NGOs to provide multi-activities in public space, engage citizens, and connect neighbours. Strasbourg serves as an example of how the public sector can use cargo bikes to be used for everyday tasks of street cleaners, public libraries, and the road safety department alike

[Figure 5.12]
'Bike System' is social initiative that combines music and cycling. Photograph taken on site by author

Digital platform to optimise the logistics of food, waste and nutrients streams (SL 7)

New-delivery platforms have boosted the e-commerce and distribution of food in the central area of São Paulo, however these platforms have not reached the periphery. This means that there are a lot of unemployed residents that cannot reach these job opportunities of bike delivery, residents don't have access to restaurant meals and retailers miss the opportunity of increasing sales. A decentralised digital platform that works for the northern peripheral region is key in optimising the local food logistics, waste and resource streams. These digital tools could further contribute to the localisation of resources flow, through algorithms that can connect organic food consumers to the closest urban farm. By uniting production and consumption within local boundaries, the resources consumed by transportation and the emissions produced are significantly reduced and also ensures that both positive and negative externalities of resource consumption are localised (Rosales, 2017).

[Figure 5.13]
Cyclists captured by author on site

5.1.4 Social and Consumption Networks

To achieve a socio-ecological transition, an urban landscape strategy, or a waste and logistics management plan, is not effective unless linked to a strong and resilient community that impulsionates the transformation. The fourth and final pillar addresses the social and consumption networks to achieve the transition. As shown in table 5.5. a vision to stimulate social and consumption networks towards a local and resilient food system, the challenges to be overcome are the lack of accessibility to fresh organic food in the periphery, the lack of time to dedicate to farming and cooking, and the need to increase environmental awareness of residents on waste management, health and nutrition and climate change. This chapter is about highlighting some interventions and strategies that could support local agents to advocate, collaborate, grow and engage towards agroecology and food sovereignty.

[Table 5.5]
Toolkit Intervention for Social and Consumption Network

Pillar	SOCIAL AND CONSUMPTION NETWORKS					
Challenges	Lack of access to fresh organic food, lack of time to prepare healthy meals			Lack of awarenness of environmental issues and benefits of agroecology and circular practices		
Methods of Intervention	localisation of supply chain adaptative infrastructure			ecopedagogy culture and food traditions co-creation and knowledge sharing		
Scale level of intervention	public space	whole area	site intervention	public space	site intervention	digital level
ID	SCN 1	SCN 2	SCN 3	SCN 4	SCN 5	SCN 6
Spatial Intervention	Flexible and temporary market stalls	Increased availability of nutrituos food in local shops, street vendors and restaurants	Modern wholesale market	Programming and activating of public space	Community exchange centres (community kitchen, educational programme and garden)	Digital platform for exchange of knowledge, resources and shared calendar
Strategy and policies	Financial intruments to encourage social innovation	Partnership of food cooperatives with local organic shops, street vendors and restaurants	public and private partnerships and development in business environment	Strengthened civil soceity through innovative partnerships with academic institutions, NGOs, and others		education via ICT; support of PPP on local engagement for software innovation

Localisation of supply chain and adaptive infrastructure (SCN 1 - 3)

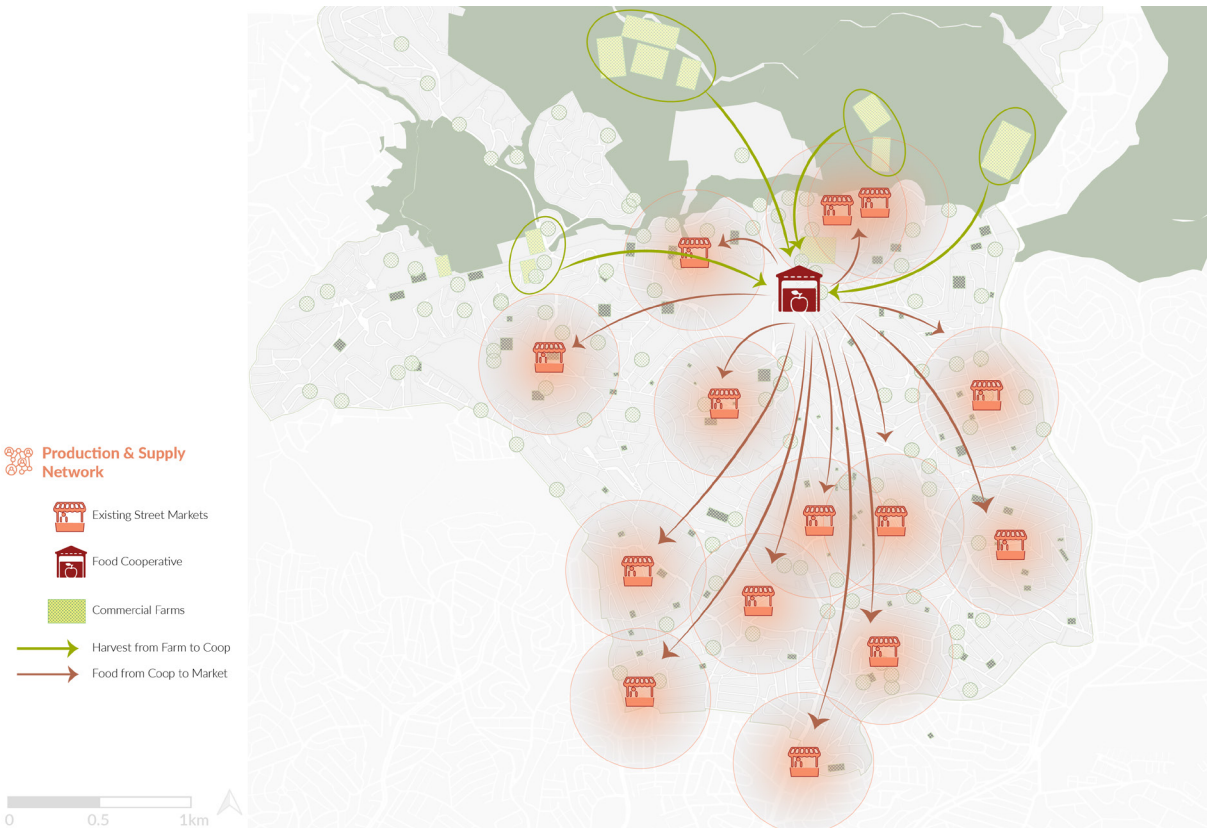
This pillar includes a range of actions that address the necessary improvements to supply chains, to improve their adaptability, efficiency, productivity and capacity to generate income to residents. These measures are directed to tackle the challenges relating the affordability and accessibility of healthy food and contribute to the inclusiveness through generation of jobs. To boost the accessibility to healthy food, adaptive infrastructure can provide solutions to proper farmers or vendors to sell their fresh vegetables and fruits in temporary stalls in key locations of the urban ecosystem that help the capillarity of these initiatives. Flexible and adaptive market stalls (SCN 1) will be spread in strategic places in the neighbourhood to increase accessibility to locally produced food. These spaces are linked to the existing social networks and places that concentrate public equipment such as schools, health centres, squares, community centres, bus stations and commercial centres. A strategy to stimulate the implementation of more adaptive infrastructure, financial tools need to be used by the Municipality to attract more residents to become street vendors.

In addition the existing local retail sector; the shops, restaurants and street vendors, must be encouraged to increase the commercialization of local and agroecological products (SCN 2). Partnerships that link the food cooperatives, that collect the food produced in all the urban farms, and the local retailers will be key

"We must engage locals to purchase and sponsor people who work for the local production of food"

- Interview with collaborator of EcoCidade

[Figure 5.11]
Map to show the cooperative role to supply locally produce food to street markets



to shorten the supply chain. As a strategy to engage street vendors, restaurants and local shops, certifications and subsidies can be offered to those that sell food produced within a radius of 10km. This would support the transition to increase the availability of lower-price and healthier food options, especially to residents that don't have time to purchase and cook.

In addition the creation of a modern wholesale market (SCN 3) could be highly beneficial for the local food system of Brasilândia. Besides contributing to the assembly, sale and purchase of fresh food, modern wholesale markets provide space for market actors to add value (such as washing, sorting, packaging, storage, logistics) needed by restaurants and modern retail (J. Tefft et. al, 2017). Large established food markets can also assist with waste management and the nutrient circular streams. In regards to these food retail facilities, developments in the business environment will benefit all actors, this could be in regards to contract enforcement, access to financing and ease of doing business (Hollinger & Staatz, 2015).

[Figure 5.12]
Photoraphs taken during activities of the EcoCidade project, captured by photographer Clayton João

Strengthening of local knowledge network (SCN 4 - 6)

From the interviews it was understood that a major obstacle for a transition towards sustainability is the general lack of awareness of environmental issues and benefits of agroecology and circular practices. A vibrant and activated public space is key in strengthening the social network, as it creates opportunities for people to meet, engage and cooperate (SCN 4). Public spaces are activated through both temporary and permanent placemaking measures. Placemaking is about understanding that the built environment alone isn't enough to sustain a sense of place and a virtualized environment, this depends on a collective vision and active community collaboration. Programming of organised festivals that discuss the topics of climate change, food, environment, sustainability, racial inequality and justice are great strategies at bringing people from different generations and show the power of this movement. EcoCidade organised a 4 day festival that included a series of activities: workshop on how to compost at home, a class on the medicinal and healing capacity of plants, round-the-table conversations about the history of Brasilândia and collage sessions with young children to learn about the environmental challenges. The festival also invited planners, the civil sector and policy-makers to share learnings from their efforts in the territory. The Municipality should boost the support to the organised civil society and volunteer groups that organise such events to increase awareness. Partnerships between the private food sector and civil society in promoting healthy and sustainable culture could also provide financial instruments to organise more events in the public space, through sponsorship and advertisement.

A key element to triggering this change will be to increase the scale and impact of the Espaço Cultural of Jardim Damasceno (ECJD) into an influential community food centre (SCN 5). Simultaneously, to address the growing

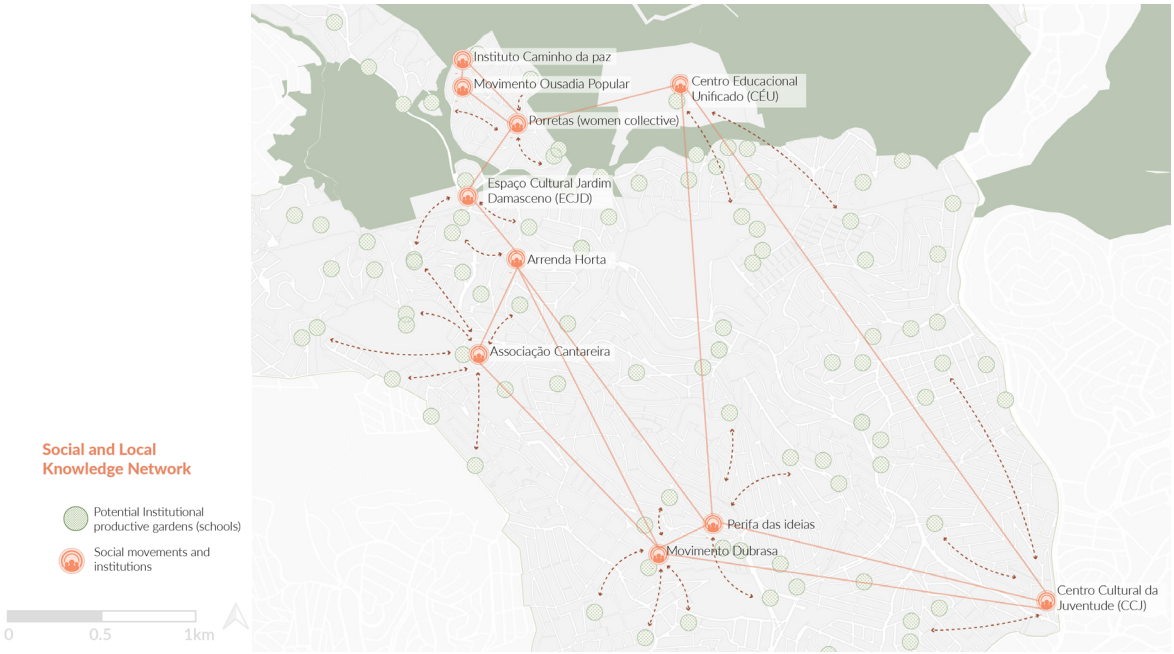
disconnect of people with the food chain as well as increasing social vulnerability in the periphery, community exchange centres will provide a bridge between the local production of food and food culture. Community food centres celebrate and value the various knowledge paradigms and backgrounds of Brasilândia's diverse population. Through the EcoCidade project it has been observed that community kitchens are key in presenting opportunities for women in Brasilândia. These community kitchens are essential elements to achieve a vision of a healthy and resilient Brasilândia as it promotes the fusion of culinary culture and heritage with the processing of products from the urban farms. In Community food centres difference and diversity are used as elements of connection (Mehrotra 2004), especially in such a context of a neighbourhood composed of migrants from all around the country. A strategy to engage citizens could be through a voucher programme tested by Farmers' Market at the Green Barn is a largely organic market operated at a profit in a higher-income neighbourhood (The Stop n.d. d). However, staff mentioned in interviews that The Stop CFCoffers a food voucher program for volunteers; the vouchers can be redeemed for fresh produce at the Good Food Market. The objective is to increase access to fresh, healthy food for volunteers, reduce reliance on the food bank, and introduce the benefits of shopping at the Good Food Market to a broader range of consumers

Knowledge and social innovation is one of the main drivers for the change towards agroecology. EcoCidade project has tested a digital platform that can be used to exchange knowledge, resources and provide a shared calendar to boost social engagement. By 2050 an assumption is that all residents will have access to devices and capacities to access information via a digital app, than can also serve as an education platform on topics of climate change and sustainability.

"EcoCidade has been good at identifying people in the community who can become multipliers of environmental education to prepare communities."

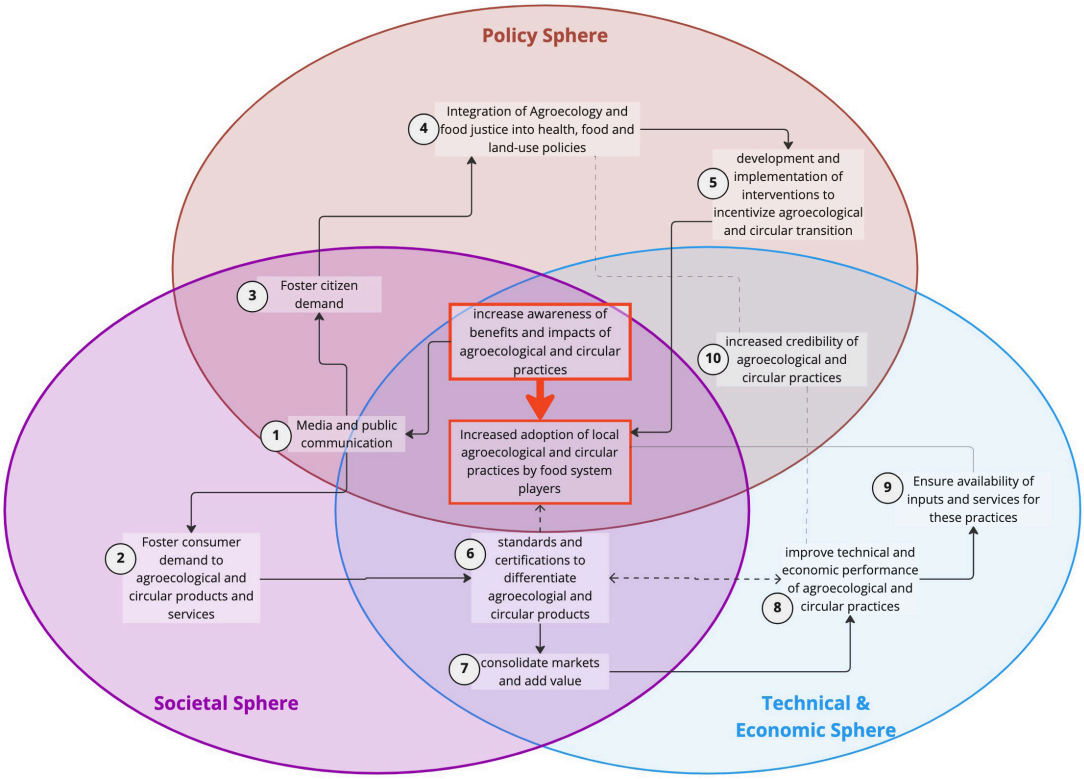
- Interview with local activist of EcoCidade, May 2022

[Figure 5.11]
Map of Social Organization network and exchange of knowledge with insitutional urban farms



5.2 General Strategy

Food production will have to be localised, land and soil will have to be regenerated, nutrients recovered and resources distributed through low-emission transport modes. The main drivers for this socio-technical transition will be (i) the generation of climate and critical consciousness (ii) urban farming stewardship and innovation (iii) enlightened public peri-urban policy (iv) public and private investments on ecosystem services. To achieve such an ambitious and radical transition in the food system there must be an integrated approach from the policy, societal and technical and economic sphere, as shown in Figure 5.14. The different types of actors that compose the spheres range from the public consumers and NGOs that compose the societal sphere, Municipality and policy-makers, and the private companies and knowledge and research institutions that compose the technical and economical sphere.



[Figure 5.14]
Diagram on systemic strategy for adoption of circular actions and agroecology

Overall the general strategy is anchored in the understanding that the increased awareness of benefits and impacts of agroecological and circular practices leads to the adoption of such practices by the food system players, Figure 5.14 shows the different steps recommended to achieve this logic. In

the societal sphere, consumer demands for safe agro-ecological products and services must be fostered, an effective strategy for this could be through a well formulated media and public communication campaign (indicated as step 1 in Figure 5.15). Digital media offers a powerful tool to disseminate ideas on a massive scale. However this must be used wisely and linked to social and human values. Meaning that regulation must be imposed on advertisements of brands that sell ultra processed products with high quantities of sugar using symbols that appeal to pop culture and cartoons to sell unhealthy food to children (O Joio e o Trigo, 2022).

An increasing demand to agroecological and circular practices from citizens will pressure policy makers to integrate agroecology and sustainability into health, food and land-use policies (step 4), and therefore foster the development and implementation of such interventions (step 5). These policies will have to be made by the existing local and state food system planning, such as food policy councils, composed of public agencies and private sector representatives. An interesting step that indicates a response from the regime level in a different State of Brazil, was a law that regulates land for urban farming in the city of Curitiba. This law was sanctioned by the Municipality of Curitiba (PR) in 2018 and it regulates and authorises the practice of urban ecological agriculture in the capital of Paraná. The initiative was based on the mobilisation of various entities and urban farmers and after successive penalties from the Municipality in relation to community gardens. The law aims to authorise "urban agriculture which is directly related to sovereignty and food security, maintaining the population's quality of life and democratising public and private practices and spaces". This example shows how Food Sovereignty and Food Justice movements, if well orchestrated, can pressure changes at a regime level.

In parallel as the campaigns of awareness on agroecology and circularity also foster consumer demands (step 2) this will pressure the adoption of standard and certifications of agroecological and circular products by the technical and economical actors (step 6). Only once the consumer demand exists and certifications are guaranteed to differentiate services and products will the value and local market of agroecological and circular products and services be consolidated (step 7).

As the market for agroecological and circular practices is consolidated, there will be a stimulus in the innovators and practitioners to improve models of technical performance and further optimisation, localisation, looping, sharing, adaptation and regeneration of resources (step 8). As technologies relating to agroecology and circularity improve and are scaled-up, this ensures the availability of more of these services and products, which helps to further disseminate and increase the adoption of such (step 9). Another effect of the improvement of technical models is that there is an increased credibility of agroecological and circular practices (step 10) within all spheres (societal, policy and technical) which

also further contributes to the integration of policies from governmental actors. The steps that interrelate the technical & economic sphere and the policy sphere pressure the adoption of agroecology and circular practices by the food system regime that influence the local system; such as supermarkets and food distributors.

In regards to increasing the local awareness of the benefits of agroecological and circular practices, a key element will be to increase the scale and impact of the Espaço Cultural of Jardim Damasceno (ECJD) into an influential community food centre. The landscape will provide opportunities for food-based entrepreneurship to farmers, urban food producers, delivery cooperatives and waste pickers. There might be a potential conflict in boosting economic opportunities to food entrepreneurs and also aiming to increase access to affordable and nutritious food to low income families. Therefore, a strategy recommendation would be to provide a form of subsidy into local food production and distribution supported by public and private funds. The subsidy would help families afford organic food and would be used to contribute to support the economy of food produced locally and regionally by small-scale farmers, and would also be directed in providing educational programs for farming skills and to boost sustainable urban innovation. To support the transition and boost the exchange of local products and support farmers' markets, a recommended coupon program. Community partner organisations would provide coupons to lower-income families, pregnant people and elderly population that participate in educational programs of the community food centres. These coupons would be used to purchase vegetables, fruits, eggs, dairy, herbs, seeds, soil and plants. A similar program was tested by the British Columbia Farmers Market in Canada.

In an interview with the Executive Coordinator of the State Commission for the Sustainable Development Goals (SDG's), it was identified that a main focus in the SDG's commission relates to the SDG 2 on Zero Hunger, as she stated that "we are aiming to strategies that ensures that all children have adequate and sufficient food to ensure health." The State Commission has the role of defining responsibilities and designing proposals, then it makes agreements with Municipalities, who then implement the programmes. In regards to the most pressing challenges, the executive coordinator pointed out the need to "integrate actors from the system and work collaboratively" and "high challenge in implementing sustainable solutions that can generate long-term job opportunities". Both corruption and capitalism came up as two obstacles in the implementation of the SDG's.

Another interesting point addressed in the interview was about the problems related to governing and planning for such a large State like São Paulo. "We face a big challenge in having such a large database of projects and initiatives for sustainability and we really struggle to have a real diagnosis of the local situation" - Executive Directors of SDG's in the State of São Paulo. From the point of view of the SDG agency, "there is a lot of money and resources, but not enough projects

that we can confidently measure". This challenge demands a solution in regards to developing applicable methodologies to measure the impact of NGOs and initiatives in regards to sustainability. Eventhough there are a few methodology frameworks out there, they still do not converse with public agencies, and can be highly time consuming. This points out an opportunity for a digital platform tool that collects information from a database of projects and can measure long term potential impact and link initiatives based on targeted benefits to areas of high risk.

In regards to the financial challenges of promoting local production in a context of high social vulnerability, new financial instruments arising from the ESG impact movement in the private sector present opportunities for this transition. ESG is an acronym that stands for environmental, social and governance practices and investments of a private organisation. And although deeply debated, and increasingly applied to the second sector, the ESG framework is used to fund projects through partnerships with the civil society organisations that have the instruments to trigger transformative ESG impacts at a local scale. Such a strategy would facilitate private investment in climate-resilient strategies for the food system that, as shown by this research, have an impact on all three dimensions of ESG.

[Figure 5.15]
Image of ecopedagogic activity on composting captured by photographer Clayton João

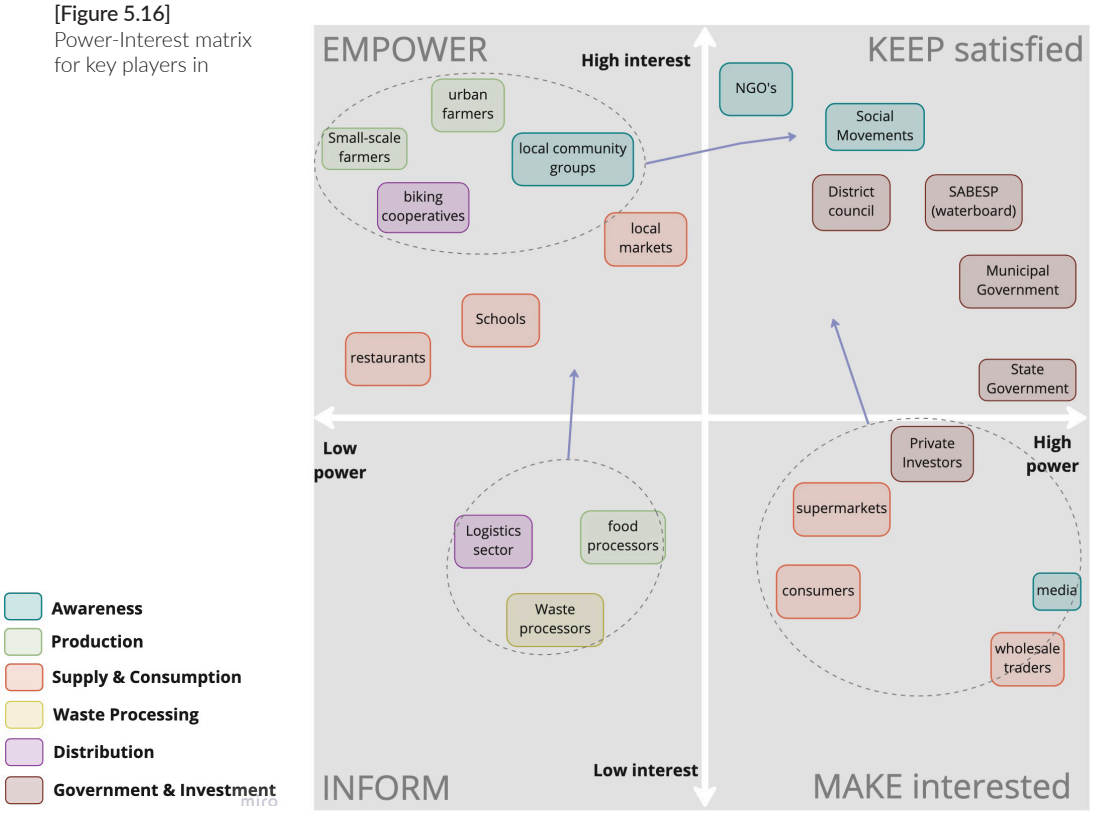
5.3 Key Players

To aim towards food justice, circularity and agroecology there must be the involvement of all the key players. Ideally, a strategy to really unlock the transition would be to establish a multi-stakeholder board for circular economy linked to agroecology in the Municipal scale. To meet the objectives of this proposed vision, the key players need to be on board and have a clear understanding of their roles. And it is highly important that this board includes citizen representatives.

The level of power and interest of the key actors will have to change in order to acheive a change in the local food system. These changes are shown in the Power-Interest matrix in Figure 5.16.

- → **High power | High interest:** in this unit are the decision makers that have the huge impact on the transition plan and therefore must be kept interested and expectation must be well managed.
- → **High power | Low Interest:** these players must be maintained in loop, these stakeholders must be kept satisfied, as they have influential power.
- → **Low power | High interest:** these actors need to be kept adequately informed and empowered to be able to connect local production to consumption.
- → **Low power | Low interest:** The players should be monitored but not pressured

[Figure 5.16]
Power-Interest matrix for key players in



too much, interest should be raised, especially in regards to the logistics sector.

"it's of no use to come-up with a plan for the area without the participation of the residents who are the ones who occupy that space"

- personal interview with local resident and activist, May 2022

As one of EcoCidade's future plans involve crowd funding and looking for seed funds, the interest of possible investors (project developers, private investors and banks) should be raised. To strengthen both the connection of education and agroecology, and the supply of locally produced food to children, primary and secondary schools should gain interest and more power in relation to determining where they source the food to feed the students from. The urban farmers need to be empowered and also obtain financial incentives to be able to provide local food. It is extremely important that at early stages of the transition plan these farmers receive technical and economical support so that they can develop towards a stable level of resilience and until the food market and consumers adapt.

Local community groups, such as the community food centre in Jardim Damasceno, need to gain power to be able to connect to the local markets and farmers. The convivial tools will have to be effective in fostering people's creative autonomy, social equity, and well-being, including collective control over work - which means that tools need to be subjected to a new kinkd of political process (Escobar, 2018). Strong links between residents and local farmers can create a two-way exchange. On one side, farmers can seize a greater share of the food retail by selling directly to local consumers (through farmers markets or community supported agriculture) or local retails (cafes, street vendors and restaurants). On the other hand, Brasilândia's residents benefit from access to fresh, local produce and from the opportunities to engage in ecopedagogic activities on nearby farms. A new local brand or form of certification could be introduced so that consumers and businesses can easily recognize food from the area and support local farmers. To improve access to locally grown food and increase the resilience of food systems to climate change, we need to build mutually supportive relationships between cities and the growers on their fringes, so that farms thrive as our cities grow." (Carey et al, 2018).

State and local governments have a key role in regards to defining food standards so that government services, such as hospitals, prisons and public schools are encouraged to buy food from local farmers. Similar government food procurements have been implemented elsewhere, such as the United States and Canada. Farmer incubators could be established to help new farmers access land and begin farming on the city fringe, mentored by experienced growers. An interesting programme involves "farmer-owned food-processing co-operatives that could enable these growers to add value to their produce and take greater control of the food supply chain." (Carey et al, 2018). SubPrefecture.

Sub-prefecture has expressed will to collaborate with the NGO in the EcoCidade project, however what would be needed is that the collaboration is directed into forms of accountability for taking high responsibility in improving ht spatial logistics, especially in regards to waste management. Secondly, EcoCidade has expressed the importance of the district council to "get intouch with the local farmers, go to see the farms, and develop a personalised relationship". This relationship is key in increasing

[Figure 6.0]
Photograph taken by author on site

CONCLUSION & REFLECTION

“Design has developed a new sensitivity to the environment and to human predicaments, and is more attuned to its ability to contribute to creating a better world; it becomes a medium in the service of society rather than solution-making expertise in the service of industry.”

- Escobar, Design for the Pluriverse, 2018, pg 10

Conclusion & Reflection

This research investigated the potentialities of transition towards healthy and resilient peripheral neighbourhoods in São Paulo, through practices of Agroecology and Circularity. A case study of Brasilândia, a relatively new neighbourhood that grew fast pushing the borders of the urban fringe into the natural reserve of the Serra da Cantareira. A literature review on food systems, informal settlements, agroecology and circular cities and transition theories, guides the analysis of the case-study, used to define challenges and opportunities to then guide the design of innovative metropolitan engineering solutions for a socio-spatial vision for the future of Brasilândia. The paper ends with interventions to achieve vision and strategy recommendations in engaging the different stakeholders to achieve the transition.

The current state of Brasilândia is analysed with a view to understand how the current initiatives of agroecology, circular food practices and urban agriculture are developed and how the agents involved operate in these processes. The analysis of the current food security and environmental challenges in combination with the exploration of existing initiatives that are arising in Brasilândia, sets the context in answering the main research question of "How to transition informal and peripheral settlements into healthier and climate resilient neighbourhoods via spatial strategies linked to urban agroecology and circular practices?".

Initially, the literature reviewed allowed to identify that the topic of food in cities has been studied from different theoretical-methodological perspectives, generating different axes of analysis, as previously discussed: multifunctional activity that examines the reduction of poverty; the generation of income and employment; attention to the promotion of health and nutrition security; activism and social movements of food justice and food sovereignty; environmental impacts, ecosystem services and biodiversity, and waste managements.

The frictioning relationship between the frameworks of Food Security, and the social movements of Food Justice and Food Sovereignty, were revealed to justify the importance of the democratisation of food policies in order to achieve localised food systems. Food Security policies tackle issues of accessibility to food however tend to maintain the power of the current food system regime, which represent the highest obstacle in transitioning towards sustainable food systems. Large multinational corporations, and large industrial food processing companies that take a big role in leading national programmes of Food Security, miss the understanding of the impacts of their activity on a local scale. Therefore movements of Food Justice and Food Sovereignty take the lead in conversations that relate to the empowerment of local actors in decision-making for policies that influence the local provisioning, distribution and supply of food. This paper attempts to combine both the use of factors to understand food security as well as essential elements inspired by social movements that fight for a more just and

ecological relationship with food.

The first steps of the analysis provided a historical exploration of the context, to set the grounds to the complexity of peripheral São Paulo. The diagnosis of the territory was essential to dive into the different factors that affect community food security in regards to the population characteristic, socio-economic factors, land-use, transportation systems, waste management and environmental conditions. At this point, the household and contextual challenges faced by the population to gain access to affordable, accessible and adequate food are unpacked. The obstacles regarding affordability link to the high unemployment and low-income levels. The challenges regarding availability are due to the modernised food system which concentrates food supply in wholesale markets located in highways, connecting to the issues of racial displacement to borders of the city. And finally, the lack of access to inadequate food poses the highest risks in regards to the population's health. This is mainly due to the recent shift in food culture to fast-food especially by the younger populations that can't afford the cost of healthier food, High levels of advertisement from ultra-processed industry and the readiness offered by these options are ideal to the population that have time and financial constraints.

The second part of the analysis looks into the current food system and key players. As discussed in chapter 1 on the Theoretical Framework, the Multilevel Perspective (MLP) proposes three dimensions – the landscape, the regime and the niche – to be analysed in the Transition to Sustainability. The MLP offers theoretical guidance to assess the multiplicity of agents and guiding values of their actions to achieve a Transition towards Sustainability which, in the case of this research, focuses on practices of agroecology and circularity. For this, the analysis section defined the important agents, and presented the dynamics established between them and the main difficulties they face. From this analysis arose the opportunity to link urban farmers to street vendors and local schools, through the formation of food cooperatives that organise the supply of local food.

The role of the NGO 'A Cidade Precisa de Você' through the EcoCidade project, present possibilities of combating structural inequalities on topics of social vulnerability; income generation; improvements in the quality of life of urban farmers; expanding production and access to food suitable for human consumption; awareness and environmental preservation. Through qualitative data collection it was observed that agroecological and circular practices in combination with educational programs generate an increase in quality of life of involved citizens, and promotes environmental awareness and more healthy and sustainable habits. The educational, communicative, representational and cooperative role of the NGO activated through a series of programmes that combine hands-on activities, with circle talks and supporting guidance impact the community by empowering the local residents towards ecological innovation. The social innovations that emerged from the EcoCidade project were unpacked to understand how they operate and the progress in relation to the social, environmental and economic

dimensions to explore the opportunities of scaling up such initiatives at a niche level to pressure a socio-ecological transition. However, as EcoCidade's project is still quite recent, more robust evidence on their performance and impact in the long run are needed to fully inform the scaling-up of these innovation processes that happen at territorial level.

The main findings of this paper that contribute to the literature of urban Agroecological Transition theory, in regards to the role of each agent at the landscape, regime and niche levels are summarised below.

(i) At the **landscape level** of the MLP, the most striking macrostructural characteristics of the region relate to the socio-historical process of territorial expansion – which are strongly associated with the presence of industry and working villages; the racial displacement of afro-brazilians to the periphery; and the multiple social, housing and environmental movements. The COVID-19 pandemic is also a key landscape factor that has shown the importance of transitioning towards higher resilient local societies. In addition there is an observed increase in environmental awareness that could influence governments and private companies to adopt circular and ecological practices to reduce impact on the environment.

(ii) At the **Regime level** of MLP, are the highest limiting factors to an agroecological transition. These factors relate to the centralised policies regarding land-use, the long-distance supply chains that favour monoculture and large industrial livestock farming and the strong incentives for the ultra-processed industry that invest highly in marketing to advertise products that harm the environment and population's health.

(iii) At the **niche level** of MLP, the study of EcoCidade's projects show the high potential of niche innovators in taking the lead towards circular and agroecological solutions at local scale. It has been observed that once the local community discovers the new possibilities of local productions, they become reference points in the neighbourhood.

Furthermore, this paper attempts to account for the high level of diversity in the complex territory of Brasilândia, contributing a design concept of the pluriverse, where difference is embodied in a world where many worlds fit (Escobar, 2018). Altogether, this paper explores mainly the role of niches in a possible socio-agroecological transition in Brasilândia, however there is a need for future research to investigate in more depth the strategies to disrupt the current food system regime. Regimes are the critical dimensions at which the food system is organised and functions firmly to maintain a stable dominance, that as described by Lahwon & Murphy imposes "certain lock-ins that hampers

the progression and survival of developments at niche level". This modern food system regime needs to be questioned and pressured, through academic research and regulation. Governments have the regulatory tools to enforce change on regime structures, whilst academics have the analytical and research tools to support decision-making on which policies will drive the desired change in the regime's practices and conventions (Lawhorn and Murphy, 2011).

Furthermore, additional research is needed in regards to land regulation and ensure access to land for agroecological practices in the urban periphery. Allocation of land to boost the provision of ecosystem services essential for regenerative processes in cities (Costanza et al., 1997), suffers from high competition for space against high-value activities. As suggested by Williams in her paper in Circular Cities, land recycling should be facilitated to provide space to low-value activities such as circular actions of regenerative urban forestry; recycling industries; pop-up activities on derelict land (Williams, 2019). 22% of the land is registered as vacant land, however due to the high level of informal occupancy, more research has to go into verifying this figure and updating to the current situation, this could be done through citizen sensing.

The vision chapter of this paper presents 6 main goals on the topic of local food production; harmony relationship with nature; circular nutrient streams; strengthening of NGO; climate change resilience; and low-emission spatial logistics. Altogether, these goals address all 17 SDGs directly or indirectly, and could be used to provide policy-makers and government officials with supporting arguments on the benefits and impacts of transitioning towards this vision. Therefore, the maps shown in the vision section serve as a tool to present to local governments the qualities and potential opportunities in the different geographical and social aspects of Brasilândia's territory. These opportunities can be summed up as:

i. The existing traditional farming heritage which was brought from the first settlers who migrated from rural areas provide opportunities to boost local production through residents leading stewardship activities in pocket parks and vacant land.

ii. (Brasilândia's geography presents a natural hydrological system that, if recovered, could contribute no only to flood prevention, but also provide freshwater for irrigation and household use and improve the regeneration of the landscape.

iii. The dense and compact urban form of the residential areas, that grew organically and mostly informally, provide opportunities for gardening in building structures and terraces.

iv. The current areas that are being used as irregular waste dumps could be revitalised to produce new public space to the community.

v. The increasing interest of residents in cycling as a form of income presents an opportunity in boosting the logistics around low-emission transportation, which can support the localisation, sharing, looping and recovering of resources at a local scale.

vi. Brasilândia is a vibrant neighbourhood with a lot of social innovation, through education and environmental awareness and a scheme that provides financial incentives. These innovations could be boosted to transform the territory towards sustainability.

The recommendation strategy chapter sets a ground for the development of a Toolkit to achieve resilient and healthy neighbourhoods through practices of circularity and agroecology. However, further substantial research is still needed to unpack the social geometries of power that need to be reshaped as part of a Urban Political Agroecology.

In all, this paper proposes ways for an alternative food system tackling challenges of urbanisation, land management, finance, cultural and social norms, education and governance. Challenging the traditional perspective of distinction between urban and rural, and society and nature. This research contributes to literature through an exploration of a potential food system regime shift towards agroecology and circularity through processes of niche formation linked to spatial planning and interventions, in a peri-urban context in the global south.

Reflection about positionality and local decision-making.

Through my experience on site, collecting data and conducting interviews with local residents, one conversation really struck me. I was speaking to a local architect that works for EcoCidade, and she shared her concern about "external architects and planners, from privileged backgrounds, come to Brasilândia to use it as a case study, and romanticise the periphery as a place where if a plan works it could work anywhere." Her statement instigated the reflection on the role of spatial planners when studying a foreign territory, especially on a local scale. What do we need planners for afterall? How could planners empower the community to envision and achieve a better future for their neighbourhood? Do the participatory toolkits existing in literature today really provide this empowerment when put in practice? These are questions I believe to be key for urban planning in peripheral and informal urban settlements and which will guide my work as a metropolitan engineer.

When reflecting about the positionality of planners, I understand that there is

an important role to approximate the community to the legislative and executive power, connecting the civil sector to the public sector. In this process of presenting a plan to government authorities, the planner's intentions should originate from an unbiased vision - detaching from any preconceived idea of what an ideal neighbourhood should look like. The method of delivering a neighbourhood plan must be based on a rigorous diagnosis. It is crucial that the diagnosis focuses on collecting primary data, to identify the concerns, wishes and unmeet needs of the community. This primary data, when combined with urban challenges identified through secondary data, will serve as a basis to begin the conversations around how to design a better environment.

Before building a neighbourhood plan to present to the municipality, there is a middle step which is extremely key in addressing the issue brought up by the conversation with the local architect. This step relates to organising co-creation sessions with the residents of the neighbourhood. It is essential that these co-creations are composed of a range of people to represent the different layers of society in relation to age, gender, race, and ethnicity, for this a social mobilisation plan needs to be put in action. These sessions should not only focus on what they believe would be a better future for their neighbourhood, but also should give people the role to think on how they believe would be the best way in achieving this vision. This difference on what vs. how is key in understanding the challenge of planners in relation to public-acceptance. Many times, people complain about the urban solutions because they aren't involved in the decision-making and haven't had the opportunity themselves to reflect on the how.

The importance of democracy has been given more and more attention, especially since the recent election in Brazil that highlighted the fragility of the country's democratic system. I believe that involving the population in the decision-making of their neighbourhood plans will be essential in guaranteeing socio-environmental and spatial justice. How to achieve this in such densified and peripheral neighbourhoods is a question that remains. There are new digital technologies that are being developed to provide political involvement, with the means to decentralise power.

Digital platforms that use blockchain technology could develop a new system of voting for local planning decisions. This digital platform would solve the drawback issues suffered by decentralised governance on accountability, transparency and trust (Merrell, 2022). Another point that is brought up by these new governance visions is that NGOs could play an important role in the integration of blockchain into new initiatives and policy-making (Merrell, 2022).

This is all to suggest new research opportunities on how new governance models could assist in re-thinking the role of urban planners to make the community feel more empowered. Could a new digital technology provide a platform where urban planners put forward designs and initiatives that are then voted on by the community?

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Photograph taken by author on site

Towards a Circular Food Landscape in Peri-urban Neighbourhoods

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