

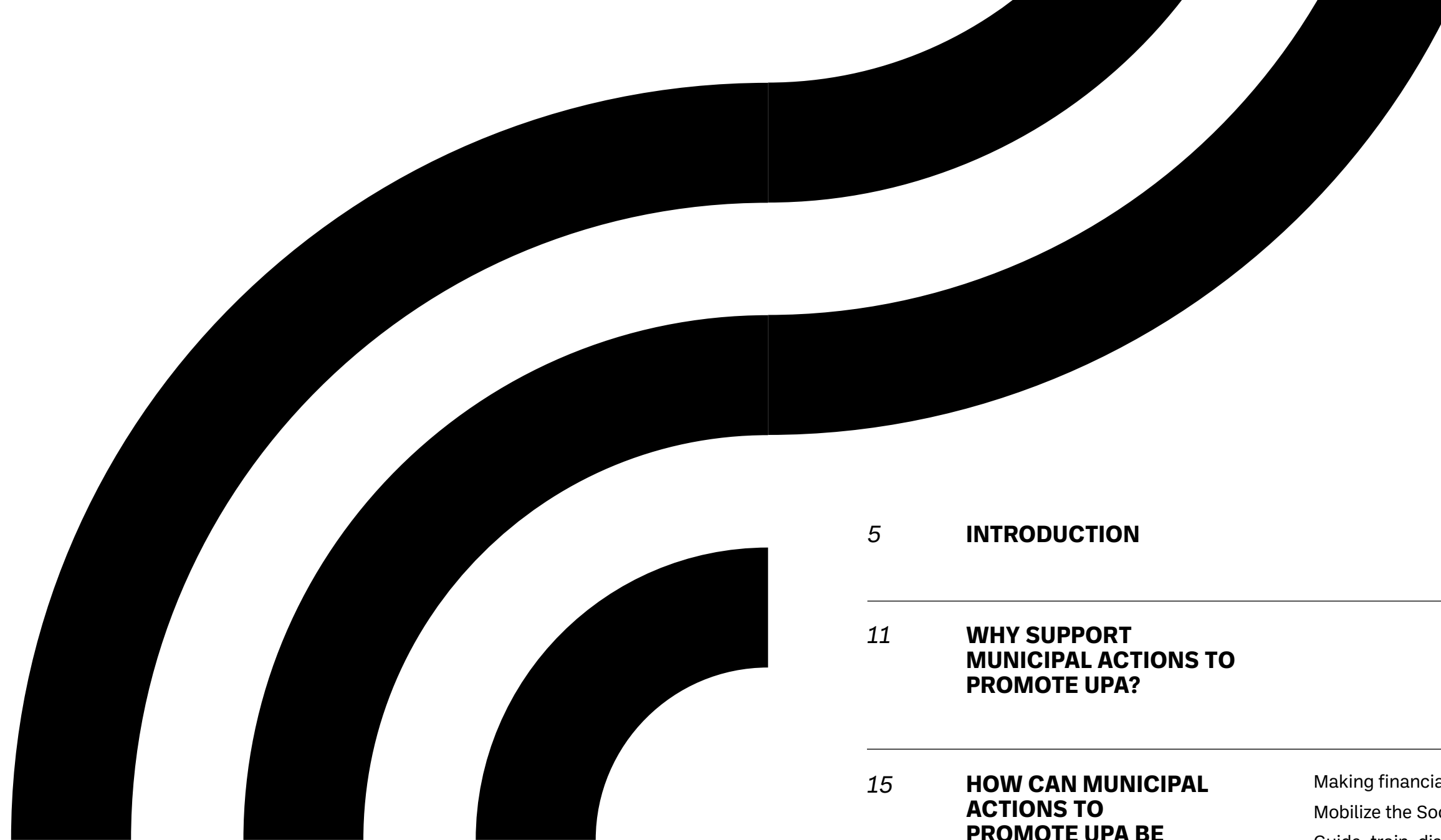


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How can the Federal Government support municipalities in fostering local food production?

INSTITUTO
ESCOLHAS





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Contents

5	INTRODUCTION	
11	WHY SUPPORT MUNICIPAL ACTIONS TO PROMOTE UPA?	
15	HOW CAN MUNICIPAL ACTIONS TO PROMOTE UPA BE SUPPORTED?	Making financial resources available 17 Mobilize the Society 20 Guide, train, disseminate knowledge about UPA 22
27	THE COST-BENEFITS OF PRODUCTION UNITS	Community production units 33 Private production units 37 Institutional production units 41
43	THE POSITIVE RESULT FROM UPA: INVESTMENTS AND BENEFITS OF EXPANSION	
55	CONCLUSION	

1. Introduction

Cabbage plantation.
Photo: Marwa Elsayed



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¹ Closer than one might think. Instituto Escolhas, 2022.

² Challenges and potential of urban and peri-urban agriculture in Belém. Instituto Escolhas, 2022.

³ Food production in Brazilian metro-polises. Instituto Escolhas, 2020

⁴ Available at <https://100politicas.escolhas.org>

⁵ The majority (over 50%) of the agricultural establishments mapped in eight metropolitan regions (Belo Horizonte, Fortaleza, Goiânia, Manaus, Rio de Janeiro, Porto Alegre, Salvador and São Paulo) are of family agriculture. In the Manaus Metropolitan area, the percentage of family agriculture reaches 81% of the total, and in Salvador, 76%.

Since 2020, Instituto Escolhas has been generating food production data in different Brazilian urban centers. Studies produced for the Metropolitan Region of São Paulo¹, the city of Belém²; a survey of the food production in eight metropolitan regions³ and, now for the cities of Curitiba, Recife and Rio de Janeiro, as well as the mapping of 100 municipal urban agriculture policies⁴, demonstrate the relevance of urban agriculture with socioeconomic feasibility for its expansion.

In addition to the generation of income for farmers - predominantly small farm producers ⁵ - and the increase of the physical and financial availability of food for city dwellers, urban and peri-urban agriculture (UPA) provides many additional benefits for promoting greater resilience of local markets to supply crises, as occurred during the pandemic; helping to reduce food waste and costs during its distribution and marketing; promoting the appreciation of local and regional food culture; increasing urban green areas, which are essential for mitigating the effects of the climate crisis, as for instance by reducing local temperatures; and contributing to the management of solid organic urban waste, which can be used in the production process; among other benefits.



So, what is missing for UPA to be recognized and incentivized in the country? A national policy, with principles, guidelines and transfer of resources, with the Federal Government playing the irreplaceable role of coordinating this promotion nationally. There also needs to be a solid covenant between the federal government, states, municipalities and the society to make this public policy viable, ensuring its alignment with strategies to combat hunger and food and nutritional insecurity in urban areas, one of the country’s main challenges, while still maximizing its remaining benefits.

The good news is that a first step in this direction has already been taken, with the publication of Decree No. 11,700, on September 12, 2023, establishing the National Urban and Peri-urban Agriculture Program. While the program’s strategic actions are being detailed by the working group instituted by the decree, **this study provides recommendations for effective federal support for municipal strategies to promote local food production, including actions to make resources available, mobilize the society and guide the dissemination of UPA in the regions.**

These recommendations were developed by systematizing the results and lessons learned from previous studies on the subject (such as the Urban Agriculture Public Policies platform, which identified the promotion of urban vegetable gardens as the most recurrent type of public policy for UPA practiced throughout Brazil), but also by deepening the analysis of municipal programs aimed at UPA present in three Brazilian cities – Curitiba, Recife and Rio de Janeiro. We identified how these municipalities have been boosting the activity, what their main challenges are, the costs involved and how the federal government could support municipal actions.

The case studies were supported by partnerships between Instituto Escolhas and the respective town halls, and were developed based on the following steps: 1) surveying and systematizing primary and secondary data on food production and potential areas for its expansion in the three cities, using qualitative research and geoprocessing techniques; 2) analysis of the institutionality of UPA promotion programs in these cities; 3) identification of structural challenges common to the municipalities that could be mitigated and/or solved through actions by the federal government; 4) identification of support actions by the type of UPA production unit (most frequent in cities); and 5) simulation of scenarios to promote the UPA expansion in cities by available area, considering the investment required and the potential impacts from such expansion.

Based on the data analyzed for these three capitals located in different country regions, it is expected to contribute to the discussion on the impacts of implementing public policy at the leading edge, as well as facilitating the sizing of investments in other capitals and regions and evaluating the best allocation of available budget resources, essential tasks for the design and implementation of any public policy.



Production in unbuilt area in neighborhood of the Mercês church, in Curitiba, production tanks at Ilha de Deus, in Recife, production on the banks of the highway in the district of Santa Cruz, in Rio de Janeiro. Photos: Instituto Escolhas Collection/Ecorural, 2023

6 The main assumptions of the simulation included: 1) the size of the production units based on the average size of the most identified potential areas in the three municipalities; 2) the selection of the production model and crop cultivations based on the prevailing occurrence in the three cities and the availability of information about the crop cultivations on the Conab Prohort platform, for monitoring of average prices; and 3) division of investment requirements between implementation and maintenance, based on the periodicity of the expenses incurred.

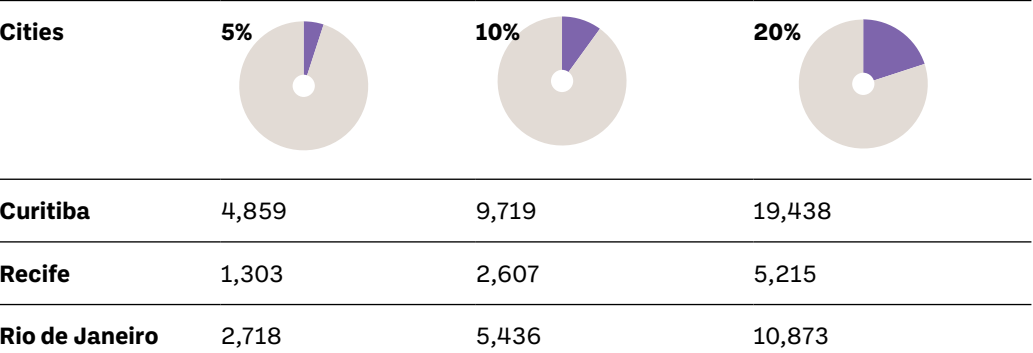
7 Expansion based on the characteristics of the model production unit (total area of 1,000 m2, production area of 558 m2, production capacity of 6.45 tons/year, with 15 types of vegetables, retail revenue potential exceeding BRL 41,000.00 with a production efficiency of 80%).

8 Potential spaces represent polygons of unbuilt areas, without vegetation or use (or underused) located on the municipal perimeter mapped through satellite images.

9 Considering a regional yearly average consumption of vegetables in kg/per capita: 35.22 in the South, 20.66 in the Northeast, and 29.20 in the Southeast. (IBGE - Household budget survey 2017-2018: analysis of personal food consumption in Brazil. Rio de Janeiro: IBGE, 2020).

Here are the results of the simulation of production promotion in the three cities

QUANTITY OF VEGETABLES PRODUCED PER YEAR IN MODEL PRODUCTION UNITS⁶ SET UP⁷ IN 5%, 10% & 20% OF POTENTIAL SPACES MAPPED IN EACH CITY⁸ (IN METRIC TONS)



POTENCIAL BENEFITS FROM THE ESTABLISHMENT OF NEW PRODUCTION UNITS IN 5% OF MAPPED SPACES

Cities	Total yearly number of people subject of supply with the food produced ⁹	Percentage of the total number of people living in poverty who could be supplied with the food produced, per year ¹⁰	Number of people directly involved in the activity ¹¹
Curitiba	137,978	96%	1,506
Recife	63,106	18%	404
Rio de Janeiro	93,094	7%	843



Using only 5% of the potential spaces mapped and distributing the implanting of new vegetable production units over a period of seven years - in reference to the target set by the Brazil without Hunger plan,¹² launched by the Federal Government on August 31, 2023, with the aim of taking the country off the hunger map by 2030 - the annual investments per city would be:

ANNUAL INVESTMENT (2024-2030) TO SET UOP NEW PRODUCTION UNITS IN 5% OF THE MAPPED AREAS¹³

Cities	Yearly production units established	Yearly investments required to establish the production units
Curitiba	108	BRL 2,780,244
Recife	29	BRL 745,909
Rio de Janeiro	60	BRL 1,555,206

As Brazil and the world move towards an increasingly urbanized population, the discussion about food in cities becomes ever more urgent. As this urbanization increases, so do hunger, poverty, food and nutritional insecurity. Of the 33 million people who had nothing to eat in Brazil in 2022, 82% lived in urban areas¹⁴.

The proposals for a new model of urban development dialogue with the construction of healthier, more equitable and sustainable food systems, which, in turn, can also be made possible by promoting urban and peri-urban agriculture.

10 Considering a regional yearly average consumption of vegetables in kg/per capita and data from the single cadaster (Cadastro Único - CadÚnico) provided by the Ministry of Social Development (Cecad 2.0 platform for August 2023, by city). CadÚnico is a registry that identifies who the low-income families are and how they live in Brazil. The registry is used as a reference for participation in social assistance programs and policies.

11 Considering the types of funding with the hiring of grant holders (2 people per unit), therefore only people directly involved.

12 Brazil without Hunger Plan: Basic Technical Document. Brazil, 2023.

13 To calculate the cost of setting up the new units, we considered preparing the seedbeds directly on the soil and acquisition of tools for two people, totaling BRL 25,841.96 per unit.

14 II VIGESAN: Final Report. Rede PENSSAN, 2022.

Urban agriculture gardens under Copel power lines in Curitiba. Photo: Valdenir Daniel Cavaleiro/Copel

2. Why support municipal actions to promote UPA?



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¹⁵ Ordinance No. 467/2018 of the then Ministry of Citizenship (now MDS) was updated by Decree No. 11.700/2023, establishing the National Urban and Peri-urban Agriculture Program (PNAUP) and creating the PNAUP workgroup.

¹⁶ The Milan Urban Food Policy Pact (MUFPP). Available at: www.milanurbanfoodpolicypact.org.

¹⁷ Araraquara, Belo Horizonte, Campinas, Curitiba, Maricá, Osasco, Porto Alegre, Recife, Rio de Janeiro, Salvador and São Paulo.

The debate on UPA within the federal government is still quite recent, formally institutionalized in 2018 with the publication of Ordinance No. 467 of the Ministry of Social Development (MDS)¹⁵. At the local government level, although some municipal programs to promote UPA were implemented starting in the 1980s (as for instance in the city of Curitiba), the issue only received increased attention in recent years. Examples of this rise of interest in UPA at local governments include some Brazilian cities joining the Milan Pact on Urban Food Policy.¹⁶, launched in 2015¹⁷.

We know that there are many actors involved and different experiences with UPA, but why should the federal government support municipal strategies to promote it?

The municipality is the administrative unit closest to the area where UPA takes place and is where the most important resource for the activity is managed: the land. There is no way to encourage a significant increase in food production in cities if the municipality does not look at its potential spaces and considering their possible use for UPA.

URBAN AND PERI-URBAN AGRICULTURES

In this publication, we use the term urban and peri-urban agriculture (UPA) to refer to the activities related to the production of foodstuff (vegetable orchards, crops, agro-forestry, livestock farming, forest management), as well as herbal medicines or ornamental plants that are managed by different groups and individuals (secretariats, agencies and departments of public institutions, social organizations, associations, groups, collectives, social movements, individuals, families and companies), with different purposes (self-consumption, donation, education, socialization, health, production of inputs, marketing), located in different urban and peri-urban areas. Examples include large areas or smaller unbuilt or underused areas, sheds, backyards and house roofs, parks, squares, environmental protection areas, schools, health units, social assistance units, churches, small flatlands and residual infrastructure areas (power lines, gas pipelines, oil pipelines, highways, etc.).

Man planting vegetable seeds in his garden. Photo: Nawaitesuga



UPA initiatives promoted by other actors (state governments, power companies, composting companies, organizations of the civil society) struggle when the municipality is not a partner, either to guarantee land access, or to provide legal, institutional, logistical and technical support, among others.

Furthermore, an UPA policy coordinated in the region with other public initiatives has more impact potential than isolated actions carried out by other agents. In the region, urban production units under public, private or collective management can be linked to educational, health, food and nutrition security, environmental and cultural policies, among others.

Today, the UPA agenda receives little or no attention from townhalls in more urbanized cities. One possible explanation is the sheer size of the urbanized areas - especially in state capital cities¹⁸, which contributes to making existing agricultural activities invisible, as well as hindering the emergence of new ones. If agriculture is considered strictly rural, it ends up being seen as incompatible with the urban dynamics.

The federal government has great power to change this invisibility of UPA, if it encourages a national pact in favor of the agenda involving all levels of government, public and private institutions and the civil society.

For this reason, the study sought to answer the question “how can the federal government support municipalities in promoting local food production?” and started from the UPA experiences implemented by different municipal public administrations.

However, the study’s focus on municipalities did not hinder the identification of a number of other actions that the federal government could take to promote UPA, such as including it as a beneficiary of different policies aimed at traditional agriculture (technical assistance, credit, public procurement, etc.) and allocating idle and/or underutilized federal areas to it - among more than 50 actions identified and listed in the annex to this study, which can also serve as a work agenda for the federal government (see the QR Code on this page).



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OUR PROPOSALS
FOR AN EFFECTIVE
FEDERAL ACTION IN THE
UPA

¹⁸ Urbanized areas of Brazil. IBGE: 2019.



Community garden in the Morro da Formiga, Rio de Janeiro. Photo: Tomaz Silva/Agência Brasil

3. How can municipal actions to promote UPA be supported?

The study identified the main bottlenecks related to municipal initiatives and programs to promote UPA, found to a greater or lesser degree in the cities analyzed - Curitiba, Recife and Rio de Janeiro - and which may reflect to some extent to the reality in other Brazilian municipalities:

- Low capacity for planning, coordinating, monitoring and evaluating actions to promote UPA initiatives implemented in the territory
- Difficulty for access to own resources, from other government bodies and non-governmental partners
- Reduced or absence of regulation and guidance on production and its characteristics (where, what and how to produce), leading UPA to be perceived as something to be merely tolerated, not related to urban planning
- Limited integration and coordination with other policies, programs and bodies of the municipal administration (health, education, social assistance, food security, environment, etc.)
- Little knowledge of the different characteristics of production and producers in the territory, resulting in lack of municipal programs to attend all types of existing UPA initiatives
- Little or no knowledge of available and suitable areas for expansion of the production
- Poor connection between UPA producers and consumers in the region

Overcoming these bottlenecks reaffirms the need to improve the capacities of municipal administrations, which depends fundamentally on the relevance given to the issue by municipal managers. Below are three recommendations for the federal government on how to support municipalities in their strategies to promote local food production, that also apply for state governments and can serve as inspiration for private actors who wish to take part in these initiatives.

I. Making financial resources available

The low capacity to mobilize resources - either own, from other state bodies or from private partners - impacts all types of actions, from the most practical (such as setting up new production units, supplying inputs and technical assistance) to the most structural (such as planning, coordinating and monitoring the strategy for UPA promotion).

Compared to the average Brazilian municipality, Curitiba, Recife and Rio de Janeiro have a relatively high budget availability. However, all three cities have difficulties to obtain resources to promote urban and peri-urban agriculture.

Among the municipalities analyzed, Rio de Janeiro is the one that dedicates the largest financial resources for UPA, as it provides subsidies for community agents of the Carioca Vegetable Garden (*Hortas Cariocas*) program's productive units. The subsidies are paid out in a stable manner, since they are funded from the municipal treasury, which, for being included in the public budget, tend to be replicated in subsequent years. In addition, the city has used temporary environmental compensation funds to enable technical assistance, for instance.

Curitiba has found a more stable path by setting up its own fund, the Curitiba Food Supply Fund (FAAC – *Fundo de Abastecimento Alimentar de Curitiba*), which supports municipal actions to promote UPA based on the strategy of promoting food and nutritional security, which reduces its dependence on intermittent resource supplies.

In the three cities, there is also a growing movement of funds coming from parliamentary amendments ¹⁹ for community units, with or without mediation from the city hall.

It is paramount that the municipal administrations themselves provide more resources to guarantee the structuring and stability of actions to promote UPA over time. However, resources from the federal government would be very valuable in promoting the consolidation of the agenda at municipal level.

As a way of handling the bottlenecks listed above, it is very important that the transfer of federal funds be linked to the commitment of municipal administrations to create or strengthen a local governance body dedicated to the UPA issue, with the capacity to implement the issues described on the side of the page.



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19 Resources allocated by legislative (federal, state and municipal) and senate representatives through amendments to the public budget, voted on annually by parliamentarians. In theory, the amendments aim to improve money allocation.

20 One example is the call for proposals for composting and urban and peri-urban agriculture issued by the National Secretariat for the Urban Environment and Environmental Quality (SQA No. 1/2023) of the Ministry of the Environment and Climate Change (MMA). With a total value of BRL 7 million (and transfers ranging from BRL 700,000 to BRL 1 million per project), the call for bids was aimed at municipalities, the Federal District and inter-municipal public consortia. It established a mandatory financial contribution proportional to the total value of the project (between 0.1% and 20%) and listed non-mandatory topics among the scoring criteria, such as the existence of an organic waste composting program and an urban and peri-urban agriculture program.

PLANNING AND MONITORING



- Carry out a diagnosis to support the design of the municipal strategy to promote UPA (data on existent production areas, producers, production techniques employed, purpose of the production, potential areas for production expansion, consumer markets, target audience, etc.).
- Monitor the results of the strategy throughout its implementation: direct and indirect beneficiaries, volume and destination of the food production, impacts on the environment, health and education, etc.
- Design and plan the strategy for promoting UPA, defining objectives, target audiences, goals and funding sources.
- Contribute to the regulation or definition of guidelines regarding the allocation and transfer of new areas for production, the beneficiaries and forms of selection and the characteristics of the production allowed in each area.

PARTNERSHIP MANAGEMENT AND SOCIAL PARTICIPATION



- Promote coordination with other policies, programs and public entities.
- Raising and managing funds from its own budget, from federal and state government transfers or from donations and sponsorships from the private sector, the third sector, international cooperation or individuals.
- Promote and manage public-private partnerships (companies, civil society organizations, international cooperation, etc.).
- Foster the participation of the civil society in the planning, execution and monitoring of the strategy to promote UPA.

CUSTOMER SERVICE FOR BENEFICIARIES



- Provide technical assistance and training.
- Implement, renovate or maintain composting structures.
- Support food marketing and donation.
- (Considering the target public defined in the municipal strategy for promoting UPA).
- Setting up, renovating or maintaining production units.

The allocation of federal funds could support the maintenance of this local governance body with intermediate activities (such as planning and diagnosis) or end-activities (such as the supply of inputs to production units, the renovation or implementation of new production units and the implementation of composting structures ²⁰).



Urban Farm in Curitiba. Photo: Instituto Escolhas Collection/Ecorual, 2023.

TERRITORIALIZING
THE MUNICIPAL
STRATEGY TO
PROMOTE UPA

Local facilities focused on UPA, such as Fazenda Urbana in Curitiba, Sítio Agroecológico in Recife or the Seedling Nursery (*Viveiro de Mudas*) in Rio de Janeiro, have the potential to ensure greater capillarization of the strategy to promote the agenda in each region, serving the people and production units within their area covered.

Based on a network of physical support structures distributed throughout the territory, these facilities could carry out activities such as: (i) receiving and storing organic waste; (ii) producing and distributing inputs such as compost, seedlings and seeds; (iii) training farmers; (iv) food processing; (v) preparing meals with food from UPA production units; (vi) support with technical assistance; (vii) management; (viii) social coordination and participation. All these activities can also be carried out via partnerships with organizations of the civil society.

Other public policies also seeking greater capillary action in the territory through the implementation of a decentralized network of physical support structures can serve as inspiration. Examples include the Voluntary Delivery Point (PEV), or Ecoponto, a model of facility adopted at municipal level as a strategy to achieve the objectives of the National Solid Waste Policy (PNRS), and the Live Periphery program (*Periferia Viva*), conceived by the National Secretariat for Peripheries of the Ministry of the Cities, also provides for the creation of a territorial center and technical assistance to serve the population in regions of greater social vulnerability.

II.
Mobilize the Society

The federal government plays an important role in the mobilization of various players to form a pact to promote UPA, as for instance, encouraging states and municipalities to adopt the UPA agenda, to jointly design their action strategies and to participate in the calls for bids by the Federal Government ²¹.

In parallel, government entities, civil society organizations also play a leading role in promoting UPA initiatives, as can be seen in the three cities of this study. In these cities, community and religious associations, non-governmental organizations, social movements and collectives are responsible for implementing and managing production units of public interest and for sundry purposes. The federal government can provide for specific actions to strengthen these actors at national level - by encouraging exchanges and structuring meetings - as well as providing for promoting the object of agreements made with states and municipalities to be designed and executed via partnerships with civil society organizations.

In Recife, for instance, experiences of partnerships were carried out between the municipality and civil society organizations similar to the model proposed here. These collaborations seek to draw on the experience of community-based organizations in the capital of Pernambuco to adapt and replicate similar initiatives - composting and setting up/management of vegetable gardens - in other communities in the municipality, taking into account the capacity of social actors to penetrate the regions and mobilize their own local networks.

There is also a great potential for mobilizing private actors interested in supporting local food production as a socio-environmental commitment. The federal government can motivate and support municipalities in identifying these groups of actors to sponsor the municipal strategy.

The “Adopt a Square” program, in the city of São Paulo, and similar programs in Curitiba, Recife and Rio de Janeiro ²² can serve as inspiration. In order to raise funds for the implementation of new infrastructures and maintenance of spaces located in municipal squares, the city of São Paulo enters into partnership agreements with interested companies that assume responsibility for funding improvements and maintenance of these spaces, for an established period of time, in return for which they can display outdoors with their brand name on them. The same could be done to incentivize vegetable gardens, orchards, agroforestry, etc.

²¹ One of the most usual ways of transferring funds from programs stimulated by the federal government to other federal entities is through public notices, such as the one previously mentioned in footnote 20 - aimed at composting and UPA, launched by the Ministry of the Environment and Climate Change (MMA).

²² “Adote.Rio” Program of the company of Rio de Janeiro (Law nº 5.788/2014); Curitiba’s Program for the Adoption of Public Places (Decree nº 1.666/2013) and Recife’s “Adopt the Green” Program (Law nº 18.280/2016).



Another inspiration for partnering with the private sector are the various experiments carried out throughout the country by electricity companies to set up food production units as a way of occupying the safety areas located below the power lines under their responsibility. This is a win-win strategy for companies, governments and society. Irregular use of these areas poses risks to human health and the energy supply, and companies incur high costs to maintain and monitor these areas, preventing invasions. Food production there would mitigate the problems, as well as generating other positive balances, such as food production, income generation and better urban land management.

We found projects to set up gardens under power lines developed by private actors in all three cities, but always in a dispersed manner, company by company, and sometimes without support from the municipality. The development of national parameters, recommendations and instructions, together with the motivation and mobilization of power companies - by the Ministry of Mines and Energy - municipalities and civil society would be important catalysts for the expansion of UPA in these areas. And the same solution could be applied to other residual areas of infrastructure systems, such as oil pipelines, railroads and highways.



Production under transmission lines in Curitiba's Uberaba neighborhood; on a highway interchange in Recife; and next to a railroad in Madureira Park, in Rio de Janeiro. Photos: Instituto Escolhas/ Ecorural collection, 2023.

III. Guide, train, disseminate knowledge about UPA



In the promotion of UPA, municipalities encounter several difficulties in terms of “how to do it”, related to land use management, risk management, assignment of spaces, urban planning, environmental management and monitoring, among other. The federal government can and should support municipalities with guidelines, parameters, orientation, training, examples of experiences and technologies mapped throughout the country.

A very concrete example is the access to land, a basic and fundamental element for food production. Based on the observation of the cities in this study, the main obstacles for access and use of land for UPA were identified as: (i) defining and identifying the spaces available with potential for food production; (ii) defining the type of production suitable for each space; (iii) lack of knowledge about the instruments that support the implementation of productive units, especially authorization, permission and assignment for the use of public areas by third parties.

The federal government can help municipalities overcome these obstacles by developing and implementing a typology of potential areas for UPA and their types of use, as suggested in Table 1, below.

Table I.
Suggestions for typologies of areas with the potential to be used for UPA

Source: elaborated by the authors.

Types		Description	Instruments	References
Sustainable Conservation Units		Conservation Units (CU) ²³ allowing to balance nature conservation with the sustainable use of part of its natural resources, such as agroforestry systems and sustainably managed extractivism.	Inclusion of the activity in the Conservation Unit management plan and in Environmental Services Payment projects.	Mosaic of Protected Areas of the Extreme South of Bahia (Mapes), Central Fluminense Mosaic (MCF), in Rio de Janeiro, and Lagamar Mosaic, in the south of the state of São Paulo and the coast of Paraná ²⁴ .
Green areas		Parks, squares, green spaces and buffer zones ²⁵ may be partially earmarked for UPA, following the requirements and specificities of each area. Instruments for granting use to third parties , partnerships possible to replicate programs for adoption of public areas, as the Adopt a Square initiative of the city of São Paulo.	Instruments for granting use to third parties ²⁶ , partnership ²⁷ and possibility of program replicability for adoption of public spaces, as Adopt a Square, in São Paulo.	Municipal System of Protected Areas, Green Areas and Open Spaces (Sapavel) ²⁸ , established in the city of São Paulo.
Idle areas		Public or private unused, underutilized plots without native vegetation, which can be destined - including temporarily - to UPA as a way of conferring social utility to the area, with such use associated to compliance of the social function of the property.	Instruments for granting use to third parties, instruments of partnerships and urban planning instruments for the use of the space, such as Compulsory Parceling, Building and Use (Peuc) ²⁹ and the Transfer of Building Rights (TDC) ³⁰ .	Municipal UPA programs in Curitiba and Rio de Janeiro.
Areas with Infrastructure		Unbuildable spaces originating from the implementation of infrastructure networks, such as easement strips (for transmission lines, oil and gas pipelines) and domain strips (for railroads and highways) that follow the route of the infrastructure that could receive UPA production units, according to specific rules.	Guidelines, orientations and norms from the responsible public entities (ministries, regulatory agencies) that support the destination of these areas for UPA, according to specific use parameters, based on long, or short-term arrangements. Instruments for granting use to third parties and partnership instruments are also possible.	Cultivar Energia Program, by Copel, in partnership with municipalities in the state of Paraná. Integrated Community Garden Project, managed by the Pernambuco State Trade Union for Fruit and Vegetables, Flowers and Plants in partnership with Ceasa-PE on the highway loops of the BR-101 and BR-32 roads.
Areas with public facilities		Vacant areas in properties occupied by public institutions and sundry public services with the potential for their partial conversion into agriculture plantations and orchards.	Instruments for granting use to third parties and partnership instruments.	Pedagogical Gardens Project, developed by the Ministry of Social Development (MDS) and the Brazilian Agricultural Research Corporation (Embrapa), with support from the National Education Development Fund (FNDE). Live Drugstores Program (Farmácias Vivas), coordinated by the Ministry of Heawlth.
Private areas		Areas on private property: backyards, land plots, building roofs, common areas of condominiums, sheds, among others, that can be used for UPA.	Public campaigns to encourage private landowner interest, allocation of vacant areas for UPA activities in the interest of national social policies (as the case of the National System for Housing of Social Interest in general, and specific social programs as “My house, my life” (Minha Casa, Minha Vida) and the use of urbanistic initiatives, as the Transfer of Building Rights (TDC) or “environmental quota” ³¹ .	Bill No. 9,025/2017 in the Lower House, which provides for the inclusion of community-based UPA projects in housing programs for low-income populations.

²³ Include the following categories: I – Environmental Protection Zone; II - Area of Relevant Ecological Interest; III - National Forest; IV - Extractive Reserve; V - Fauna Reserve; and VI: - Sustainable Development Reserve

²⁴ Agroicone, Atlantic Agroforest Guide (Guia de Agrofloresta na Mata Atlântica): Experiences in Mosaics of the conservation Unit, 2021.

²⁵ Protection zone established around conservation units, with ruled human activity for maintenance of the ecologic processes within the respective unit.

²⁶ Authorization, Permission or Assignment of use, with the latter being the most common (art. 64 of Decree-Law no. 9,760/46 and art. 18 of Law no. 9,636/98: includes the free provision of federal properties to states, municipalities and civil society organizations, for purposes of social interest, for a specific timeframe).

²⁷ Promotion, collaboration or cooperation agreement, in accordance with the Regulatory Framework for Civil Society Organizations (MROSC), Law no. 13,019/2014.

²⁸ Established by the Urban Development Policy and Strategic Master Plan of the Municipality of São Paulo, Municipal Law no. 16,050/2014.

²⁹ Imposes an obligation for idle properties to be divided, built on or used within a certain period of time.

³⁰ AAllows the owner who uses his property with social interest purposes to allocate the unused building potential to another development.

³¹ Confers subsidized benefits to properties that achieve acertain score as a result of adopting sustainable solutions in their properties.



³² Available at: <https://cau.mma.gov.br/>. Accessed: Nov.13/2023.

A typology like the one proposed could be organized in digital registration systems, given that the availability of spaces for food production in cities is also one of UPA's major structural hindrances. The Urban Environmental Registry (*Cadastro Ambiental Urbano* - CAU)³² – already structured by the Ministry of the Environment and Climate Change - could fulfill this role, especially if its typologies were readjusted to focus on identifying green and open areas existent in municipalities in order to encourage UPA.

If mobilized in this way, the CAU could reveal/evidence

more potential areas for setting up productive units, becoming an important vector to make the agenda viable. This systematization could even stimulate connections between available land and initiatives interested in using it for UPA. The tool could also contribute to the bureaucratic issue, indicating the appropriate legal instruments models for granting land use, as well as models of partnership instruments.

With more resources, more engagement by the society and more available areas, what would be the impacts of implementing this policy at the leading edge? That's what we will see in the following sections.

Cabbage plantation on a family farm. Photo: Leila Melhado

4. The cost-benefits of production

Organic family farm. Photo: Amanda Caroline da Silva

Information from the municipal programs carried out in the cities of Curitiba, Recife and Rio de Janeiro helped to identify the main challenges experienced by the respective administrations. The data was also used to simulate the implementation and maintenance of new production units in these cities, based on model units developed according to the most frequently encountered experiences.

HISTORICAL OF THE MUNICIPAL PROGRAMS ANALYZED

Concerning the municipal program, Curitiba's city hall has been promoting UPA since the 1980s, focused on production in peripheral areas (the Tillage Program – *Programa Lavoura* of 1986) and production in the backyards of homes (the Our Backyard Program – *Programa Nosso Quintal* - 1989). Since 2018, this agenda is part of the Municipal Secretariat for Food and Nutritional Security (SMSAN).

In contrast to the capital of Paraná, the city of Recife established an administrative action for UPA in 2021, with the creation of the Executive Secretariat for Urban Agriculture (Seau), linked to the Municipal Secretariat for Urban Policy and Licensing (Sepul). The city council's actions follow the Urban Agroecology Plan, developed with the participation of the civil society and approved in the same year the secretariat was created.

Rio de Janeiro has a long history of mobilizing the civil society with UPA projects, which began early in the 1980s. However, it was only in 2006, with the creation of the Carioca Orchards Program (*Programa Hortas Cariocas*), that this agenda gained institutional relevance within the local government, with incentives to expand production in schools and areas of greater socio-economic vulnerability.

Table II.
General aspects of the municipal
programs analyzed

Source: 100políticas.escolhas.org and
elaboration by the authors, 2023.

		Curitiba	Recife	Rio de Janeiro
Current location in the structure		Municipal Department of Food and Nutrition Security (SMSAN)	Municipal Department of Urban Planning and Licensing (Sepul)	Municipal Department of the Environment and Climate (SMAC)
Origin of funds		Curitiba Food Supply Fund (FAAC) and Parliamentary Amendments	Portion of Municipal Resources allocated to Sepul by the Municipal Treasury and parliamentary amendments	Portion of Municipal Resources allocated to SMAC by the Municipal Treasury, Supplementary Credit and Resources from Environmental Compensation
Beneficiaries -Types of supported productive units		Community* and institutional **	Community* and institutional **	Community* and institutional **
Ways of selecting beneficiaries		Selection of beneficiaries by request from people organized in associations	For community units: selection of beneficiaries through partnerships with collectives, networks and civil society organizations. For institutional units: internal administrative appointment	Request for support via letter and internal administrative selection
Support modes		Implanting new units, offering technical assistance, training and inputs	For community units: training, support for marketing (fairs) and coordination with civil society to strengthen the UPA For institutional units: training, technical assistance and inputs	Implementation of new units, provision of technical assistance, inputs and payment of subsidies for the workers responsible for the agriculture gardens
Destination of the food		Donation, self-consumption, marketing	Donation, self-consumption, marketing	50% for donation and/or self-consumption, and 50% marketable
Program highlights		UPA strategy linked to other public bodies and facilities focused on Food and Nutritional Safety and SAN, including food bank projects, solidarity kitchens and popular restaurants	Partnerships with different types of organizations (academia, NGOs, collectives, etc.) and construction of an Urban Agroecology Plan	A strategy for generating income and donating food in neighborhoods where people are more socioeconomically vulnerable



***Community production units** run by social organizations, associations, groups, networks or social movements. With a public interest purpose, they can use their production for self-consumption, donation, educational activities, research and technological development, socialization, income generation and environmental recovery.



**** Institutional production units** managed by a public institution, body or sector, such as schools, health units, social assistance units, prisons and food or input production units (seedlings, seeds). With a public interest purpose, their production for can be used for educational purposes, research and technological development, production of inputs, training, donations, income generation and environmental recovery.



With or without support by the municipal government, there are various modalities of UPA practiced in the three aforementioned cities. In order to support the design of strategies to promote UPA, the study looked for characteristics common to these different experiences in terms of: i) the implementation and maintenance of a productive model unit (as shown in the Table below) and ii) Types of productive units according to their management (community, private or public). This distinction facilitates the definition of the types of support, the accounting of different investment amounts, especially if proceeding from public resources, and the evaluation of impacts.

Examples of productive units with municipal support: community garden of a residents' association in the Sítio Cercado neighborhood in Curitiba; Productive Backyard Orchard (Quintal Produtivo Escolar) in the Engenho do Meio neighborhood in Recife; community garden of a cultural association in the Bangu neighborhood in Rio de Janeiro. Photos: Instituto Escolhas Collection/Ecorual, 2023.

PRODUCTION UNIT MODEL - GENERAL ASSUMPTIONS FOR SIMULATION OF IMPACTS

Total area ³³	1,000 m ²
Productive area ³⁴	558 m ²
Production ³⁵	15 cultures: zucchini, lettuce, garlic, sweet potato, eggplant, beet, broccolini, onion, carrot, cabbage, cauliflower, cucumber, bell pepper, cabbage and tomato
Total production ³⁶	6,452.71 kg/year
Revenue that would be generated if all food were fully marketed ³⁷	BRL 41,556.80/year
Supply potential ³⁸	183 consumers in Curitiba ³⁹ 312 consumers in Recife ⁴⁰ 221 consumers no Rio de Janeiro ⁴¹



Set up: The cost of setting up the model unit – including the cost of preparing the area and the soil, planting the beds directly on the soil and purchasing tools and equipment according to the number of consumers involved ⁴² ranged between BRL 25,841.96 and BRL 27,654.16. The variation reflects the quantity of materials purchased to meet the participation of 2 to 15 consumers.



Maintenance: The value of maintenance - costs of inputs (seedlings, seeds and fertilizer), payments for services (water, electricity, repairs), technical assistance, hiring labor (if any) and replacement of personal protective equipment (PPE) for the consumers involved. ⁴³ were spent between BRL 8,863.18 and BRL 23,449.40 per year. The second figure links the promotion of the UPA to the income generation strategy, with the hiring of consumers with subsidies (2 consumers), as already occurs in some production units managed by the public authorities.

³³ 20 m wide and 50 m long, to suit the potential areas most frequently identified in the municipalities. ³⁴ The beds are distributed in 2x1 m wide rows, with a 0.5 m walkway between the beds and a 1 m walkway between 2 rows of beds. An area of 50 m² was set aside as support space for the production of organic fertilizer from composting, fertilizers and other inputs storage, or handling/preparation of products for disposal from the garden. The planting of the beds followed the direct-soil model. Other methods were also simulated (using PVC and concrete blocks) and are available in the technical report. ³⁵ The plants chosen for the calculation were those with highest occurrence in the field survey carried out in the three cities. Twenty main crops were first identified, which were later reduced to fifteen due to the availability of marketing data for each crop on Conab's Prohort platform (described below). ³⁶ In addition to the reduction in total production efficiency to 80%, the loss of 20% of seeds and plants in each growth cycle was included. ³⁷ Figures calculated based on the annual production of the 1,000 m² model unit (6,452.71 kg/year) and its respective retail sales. The average monthly sales values for each of the fifteen species in the model production unit came from Conab's Prohort platform, with averages available for the years 2021, 2022 and 2023. 50% was added to each figure per species, to calculate the product's retail price, since the platform shows wholesale values. ³⁸ Figures calculated based on the annual production of the 1,000 m² type model unit (6,452.71 kg/year) and the regional average consumption kg/capita per day presented in the report "Analysis of Personal Food Consumption in Brazil", with data from POF 2017-2018. The calculation is made up of the sum of the items associated with the survey's vegetables category (from lettuce to other tuber vegetables). ³⁹ 35.22 kg/year per capita is the average consumption of vegetables in the Southern region. ⁴⁰ 20.66 kg/year per capita is the average consumption of vegetables in the Northeast region. ⁴¹ 29,20 kg/year per capita is the average consumption of vegetables in the Southeast region. ⁴² This does not include the cost of obtaining (purchasing) the area. Implementation with a scholarship workforce was calculated at BRL 25,841.96, including the involvement of two people. With community labor, the value is BRL 27,654.16, as there is a demand for more tools, simulated for fifteen people. If the construction sites are prepared with concrete blocks, the cost varies from BRL 37,289.05 to BRL 39,101.25, following the same parameters as for labor. The details of each calculation memory are available in the technical reports. ⁴³ The depreciation of the tools has been forecast for a period of 2.5 years, and is included in projections of long-term maintenance costs.



I. Community production units

Community-run production units are predominant among the UPA experiences practiced in various cities across the country. They are generally fostered and maintained by civil society organizations (associations, non-profit organizations, collectives, social movements) and financed with resources from public policies or raised from partners (philanthropy, parliamentarians, companies, the community, individuals, etc.).

Aimed at the public interest - education, socialization, health promotion, income generation, self-consumption and food donation - they generally serve consumers in situations of socio-economic vulnerability.

The labor involved in these units is voluntary, which means a greater flow of consumers engaged in production.

⁴⁴ A minimum of ten participants from associations/groups is required to apply for support from the municipality. The average participation in units of a similar size to the 1,000 m2 model unit is fifteen people.

⁴⁵ After the first twelve months, the municipality continues to offer some specific support (such as seedlings, fertilizer and technical assistance), upon request.

The main strategy of Curitiba City Hall, for example, is to support community units. At the request of a residents' association and/or formalized groups⁴⁴, the municipality facilitates access to land (transfer of public or private land), implementation and maintenance for a period of one year⁴⁵.

As a premise for simulating the investments needed to promote this specific production unit with public funds, we considered that the aim would be to promote food and nutritional security, through self-consumption and/or the donation of 100% of the food produced, directly benefiting the consumers involved (fifteen consumers), their families and the surrounding community.

Vegetable garden in Curitiba's Rio Bonito neighborhood. Photo: Instituto Escolhas Collection/ Ecorual, 2023.

TOTAL COSTS OF SETTING UP AND MAINTAINING THE PRODUCTION UNIT



Set up expenses	in BRL
Land preparation ⁴⁶	BRL 21,464.58
Tools and infrastructure ⁴⁷	BRL 6,189.60
Total set up costs	BRL 27,654.16



Maintenance cost	in BRL/year
Inputs ⁴⁸	BRL 2,473.48
Technical assistance ⁴⁹	BRL 3,000.00
Services ⁵⁰	BRL 1,680.00
Labor ⁵¹	BRL 0.00
PPE ⁵²	BRL 1,709.70
Total maintenance cost/year	BRL 8,863.18

In the first year, when investments for implementation and maintenance occur, the total costs reach BRL 36,517.34. From the second year onwards, maintenance costs are reduced to BRL 8,863.18, as shown in the Table. In the experience of the city of Curitiba, the local government pays for the implementation and maintenance of the production units in the first year, after which these costs are borne by the community management itself, although inputs and technical assistance are still made available by the local government on request.

Considering its purpose of public interest, the public policy - whether implemented with federal, state and/or municipal resources - has every interest in supporting the implementation and maintenance of these community units, in view of their potential positive impacts. Given the high cost of maintaining these productive units, support can be structured within municipal planning, by defining priority areas and priority populations, and also through partnerships with organizations of the civil society as well as mobilization of private resources.

The production unit has the potential to provide fresh, healthy food for 183 consumers, using the average rate of vegetable consumption South Brazil, for example. If only self-consumption by the fifteen consumers participating in the simulation and their families is considered (three consumers per family, therefore a total of 45 consumers), the reduction in household expenses with the purchase of products by this group of consumers on the market would be more than BRL 10,000/year in total ⁵³.

In the community model, with an average of fifteen consumers participating in a 1,000 m² area, the marketing of production, if this were considered the purpose of the production unit, is not capable of generating financial autonomy for those involved. This result could be altered by reducing the number of participating consumers or increasing the cultivated area.

⁴⁶ Preparing the area (fence, concrete stake, gate, labor), soil preparation (analysis, lime, organic fertilizer and substrate) and planting the beds directly in the ground.

⁴⁷ Sundry tools calculated for 15 farmers including the basic infrastructure (water tank, grinder and mini shed).

⁴⁸ Annual costs for seeds, seedlings and organic fertilizer consistent with the production capacity of the 1,000 m2 model unit.

⁴⁹ Monthly visits for technical assistance, considering a cost of BRL 250/h.

⁵⁰ Annual costs for water, electricity and minor repairs.

⁵¹ In the community modality, the simulation followed a model of voluntary participation by the people.

⁵² Annual replacement costs for a set of personal protective equipment (boots, pants and reflective vest) for fifteen people.

⁵³ Proportional value of retail sales (BRL 41,556.80) based on the Southern region's consumption of vegetables (35.22 kg/person per year) and a total of 45 consumers (1,584.90 kg/year).

II. Private production units

Extractive agroforestry production in the Guabiraba neighborhood, in Recife. Photo: Instituto Escolhas Collection/Ecorural, 2023.

Production units managed by a private agent – whether a company, individual or family - are aimed at marketing and/or self-consumption. Public support for these units can be provided via tax incentives, credit, marketing (fairs, public purchases), transfer of spaces, technical assistance and inputs, etc.

In the simulation of the required investments to promote this type of UPA, we considered the parameters of a private managed production unit by a family. All the cities analyzed in this study have many family production units, but Recife’s experience stands out here, given that the main steps in the design of its Municipal Agroecological Plan took place in the midst of discussions and mobilizations by groups of private producers - family and non-family - already committed to agroecology in the territory.

Currently, the design of the promotion of UPA in Recife involves identifying these different experiences so that, in the next step, the city government can better structure and promote this already existent production, but which encounters various hindrances in the region, since production to commercialization.

It is important to remember that there is a national legal milestone⁵⁴ that defines family farming according to criteria related to the size of the establishment (area of up to 4 fiscal modules), the family’s participation in



running it (using predominantly their own labor) and the income derived from it (with at least half of the family’s income coming from agricultural activity).

The income criterion is the most difficult for urban family farmers to be reached, being common for family income to be made up of other sources specific to the urban context. As a result, only some private family-run production units, those that fit all the criteria, can access public policies aimed at family farming (credit, technical assistance, institutional purchases, etc.).

Considering that the purpose of this family production unit is to produce food for marketing, there were no plans foreseen to invest public funds (federal, state and/or municipal) in for implementation.

However, the public authorities could support implementation, for instance through credit provision policies.

For the maintenance of this production unit, the simulation of the volume of public investment potentially borne by a municipal program to promote UPA considered only the offer of technical assistance and inputs as support modalities. Based on these two modalities, the total investment envisaged was BRL 5,473.48/year per family production unit.⁵⁵

TOTAL EXPENSES FOR IMPLEMENTATION AND MAINTENANCE OF THE PRODUCTION SITE



Set up expenses	in BRL
Land preparation	BRL 0.00
Tools and infrastructure	BRL 0.00
Total set up costs	BRL 0.00



Maintenance costs	in BRL/year
Inputs ⁵⁶	BRL 2,473.48
Technical assistance ⁵⁷	BRL 3,000.00
Services	BRL 0.00
Labor	BRL 0.00
PPE	BRL 0.00
Total yearly maintenance costs	BRL 5,473.48

⁵⁴ Law no. 11.326/2006 & Decree no. 9.064/2017 & no. 10.688/2021.

⁵⁵ Another important support that could be structured by the public authorities would be for marketing.

⁵⁶ Annual costs for seeds, seedlings and organic fertilizer consistent with the production capacity of the model garden of 1,000 m2.

⁵⁷ Monthly visits for technical assistance at the hourly rate of BRL 250.00.

POTENTIAL
HOUSEHOLD
EXPENSES AND
INCOME

⁵⁸ In view of the challenges involved in simulating logistics costs, depending on the location and the marketing promotion practiced by the municipalities, this data was not included in the analysis.

⁵⁹ Preparing the area (fence, concrete stakes, gate, labor), preparing the soil (analysis, lime, organic fertilizer and substrate) and implanting the beds directly on the ground.

⁶⁰ Sundry tools for 2 people, as well as basic infrastructure (water tank, grinder and mini shed).

⁶¹ Annual costs for seeds, seedlings and organic fertilizer consistent with the production capacity of the 1,000 m2 model garden, assumed by the public policy and therefore zero.

⁶² Monthly visits for technical assistance covered by public policy and therefore zero.

⁶³ Annual costs for water, electricity and minor repairs.

Excluding the expenses incurred with public funding, the remaining costs would total BRL 25,841.96 for Implementation and BRL 2,135.92 for maintenance per year (to pay for services - water, electricity and small repairs - and the annual replacement of PPE). Since its first year, there has been a positive balance generated by the full sale of the annual production, which totals BRL 13,578.92 (i.e. the total sale value

Year 1



Set up expenses	in BRL
Land preparation ⁵⁹	BRL 21,464.58
Tools and infrastructure ⁶⁰	BRL 4,377.38
Total set up costs	BRL 25,841.96



Maintenance expenses	in BRL/year
Inputs ⁶¹	BRL 0.00
Technical assistance ⁶²	BRL 0.00
Services ⁶³	BRL 1,680.00
Labor ⁶⁴	BRL 0.00
PPE ⁶⁵	BRL 455.92
Total annual maintenance costs	in BRL 2,135.92
Total expenses	BRL 27,977.88
Total Sales	BRL 41,556.80
Net revenue	BRL 13,578.92

minus the costs of implementation and maintenance, which are fully borne by the family).

The income for subsequent years (i.e. after discounting the initial value of Implementation and the costs assumed by the public administration) is BRL 1,642.54 per person per month, considering two family members. This means that for every BRL 1.00 of monetary investment made by the family in year 2, the monetary return is BRL 19.46 ⁵⁸.

Year 2



Set up expenses	in BRL
Land preparation	BRL 0.00
Tools and infrastructure	BRL 0.00
Total set up costs in	BRL 0.00



Yearly maintenance expenses	in BRL
Inputs ⁶⁶	BRL 0.00
Technical assistance ⁶⁷	BRL 0.00
Services ⁶⁸	BRL 1,680.00
Labor ⁶⁹	BRL 0.00
PPE ⁷⁰	BRL 455.92
Total annual maintenance costs	BRL 2,135.92
Total expenses	BRL 2.135,92
Total sales	BRL 41,556.80
Net revenue	BRL 39,420.88

⁶⁴ The income obtained from the sale of the produce will go to the family; therefore, values do not apply.

⁶⁵ Annual replacement costs for a set of personal protective equipment (boots, pants and reflective vest) for 2 people.

⁶⁶ Annual costs for seeds, seedlings and organic fertilizer in line with the production capacity of the of the 1,000 m2 model garden, covered by public policy and therefore zero.

⁶⁷ Monthly visits for technical assistance covered by public policy and therefore zeroed out.

⁶⁸ Annual costs for water, electricity and minor repairs.

⁶⁹ The income from the sale of the produce will go to the family; therefore, values do not apply.

⁷⁰ Annual replacement costs for a set of personal protective equipment (boots, pants and reflective vest) for two people.

III. Institutional production units

⁷¹ Similar to Rio de Janeiro's Fomento Program - via subsidies - is the Operation Work - Guardian Mothers (Operação Trabalho - Mães Guardiães), in the city of São Paulo, for unemployed women for more than four months, with family income of up to ½ minimum wage and a child enrolled in the municipal school system or belonging to the school community.

Finally, institutional units are those managed by a public institution and located in public facilities or areas, such as schools, research institutions, hospitals, health centers, social assistance institutions, prisons, underused public land, etc.

These units are aimed towards promoting the public interest, with a variety of purposes: education, health promotion, socialization, research and technological development, production of inputs, management of risk areas, environmental conservation and recovery, job and income generation, self-consumption and food donation.

Most of the institutional experiences rely on voluntary labor of civil servants and the directly benefited population - such as the student body and family members of the school community. However, there are experiences with paid labor that have proven to be quite successful in connecting food production and income generation. The Hortas Cariocas program, in Rio de Janeiro, is one such example, as it provides subsidies to workers in production units installed in public facilities and idle areas as an income generation strategy, especially for socially vulnerable consumers.⁷¹

For this reason, the premise of the simulation for this production unit was to promote food security (by donating 50% of the food produced), as well as the purpose of generating income (by paying scholarships to two consumers, and the availability of marketing the other 50% of the total production by the scholarship holders), with public resources covering 100% of the expenses. A total investment of BRL 49,291.36 is planned for the first year with implementation and maintenance. For subsequent years, the forecast for maintenance is BRL 23,449.40.



School garden in the neighborhood of Santa Cruz, Rio de Janeiro. Photo: Instituto Escolhas/ Ecorural Collection, 2023.



Implementation expenses	BRL/year
Land preparation ⁷²	BRL 21,464.58
Tools and infrastructure ⁷³	BRL 4,377.38
Yearly Implementation expenses	BRL 25,841.96



Maintenance costs	BRL/year
Inputs ⁷⁴	BRL 2,473,48
Technical assistance ⁷⁵	BRL 3,000.00
Services ⁷⁶	BRL 1,680.00
Labor ⁷⁷	BRL 15,840.00
PPE ⁷⁸	BRL 455.92
Total yearly maintenance costs	BRL 23,449.40

Based on the general assumptions of the model production unit and accounting for the value of the subsidies and the sale of 50% of the production by the subsidy holders, there would be an annual income generation of BRL 36,618.40 for two consumers. The individual monthly income would therefore be BRL 1,525.77.

⁷² Preparing the area (fence, concrete stake, gate, labor), preparing the soil (analysis, lime, organic fertilizer and substrate) and planting the beds directly in the ground.

⁷³ Sundry tools for two people, as well as basic infrastructure (water tank, grinder and mini shed).

⁷⁴ Annual costs for seeds, seedlings and organic fertilizer consistent with the production capacity of the 1,000 m2 model unit.

⁷⁵ Monthly visits for technical assistance, accounting for the value of the technical hour cost of BRL 250.

⁷⁶ Annual costs for water, electricity and minor repairs.

⁷⁷ Allowance of BRL 660 per month, per person. Considering two subsidy holders working 22 hours a week.

⁷⁸ Annual replacement costs for a set of personal protective equipment (boots, pants and reflective vest) for two people.



Seedling nursery in the Guaratiba neighbourhood, Rio de Janeiro. Photo: Instituto Escolhas Collection/Ecorural, 2023

5. The positive result from UPA: investments and benefits of expansion



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ALL LINKS
MENTIONED
IN THE
FOOTNOTES

The cities analyzed in this study are at the top of the ranking of the most densely populated in the country. Among the 5,570 Brazilian municipalities, Curitiba ranks 23rd (with over 4,000 inhabitants per km²), Recife is 12th (with more than 6,000 per km²) and Rio de Janeiro 18th (with more than 5,000 per km²)⁷⁹.

Given these figures, it is reasonable to ask whether there is agriculture in these municipalities or whether there is still room for it to develop. The answer is: yes, there is significant agriculture already practiced within the urban perimeters of the three cities, as shown not only by the data on agricultural establishments⁸⁰ identified by the 2017 Agricultural Census, but also the agricultural polygons⁸¹ mapped by this study using satellite images⁸². Below are the UPA figures for the cities.

⁷⁹ Demographic density according to the 2022 Census. IBGE, 2022.

⁸⁰ They cover any production or exploitation unit totally or partially dedicated to agricultural, forestry and aquaculture activities, regardless of its size, its legal form or whether it is in a rural or urban area.

⁸¹ Polygons are identified from visual agricultural markers, such as the orthogonal planting layout, vegetation planted in rows, beds separated by land, among others. The mapping was carried out manually and regardless of size, using geoprocessing techniques from Google Earth® satellite images (2020/21) and Quantum GIS software. Fieldwork was carried out in the three municipalities (between March and June) to verify the polygons in situ, by sampling, with photographic recording and the use of a drone. Activities carried out inside closed establishments (warehouses, buildings, etc.) and with low visibility via satellite were not counted.

⁸² The establishments counted by the Census are georeferenced by points and not by polygons. For this reason, the Census points and the polygons mapped by the study were not added together. Especially in contiguous areas, as the city maps show, it is possible to assume that the agricultural polygons identified by satellite may overlap with the georeferenced points from the 2017 Agricultural Census.

Mapping agriculture in cities

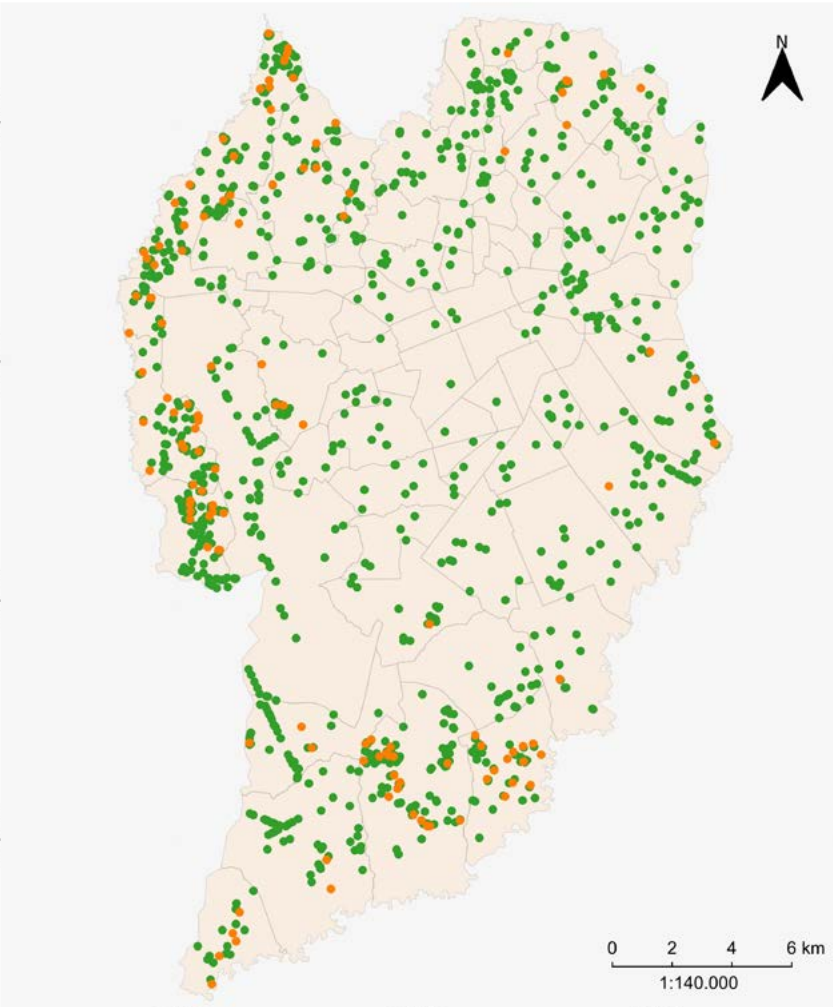
-  Polygons of agricultural production areas mapped by this study using satellite images
-  Urban and peri-urban agriculture
-  Agricultural and livestock breeding establishments (IBGE, 2017)
-  Neighborhood boundaries
-  City limits (IBGE, 2021)

CURITIBA

123
agricultural establish-
ments totaling 745
hectares

1,118
agricultural polygons
totaling 728 hectares





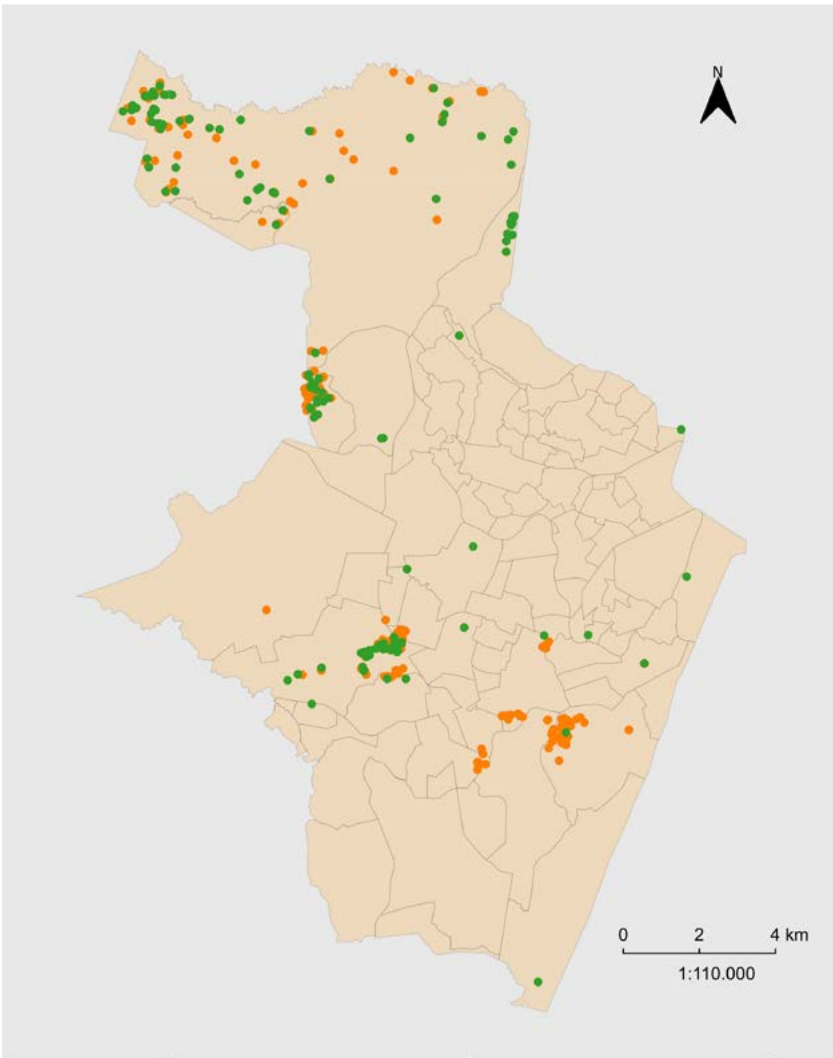
Source: elaborated by the authors, 2023.

RECIFE

242
agricultural establish-
ments totaling 837
hectares

128
agricultural poly-
gons totaling 105
hectares





Source: elaborated by the authors, 2023.

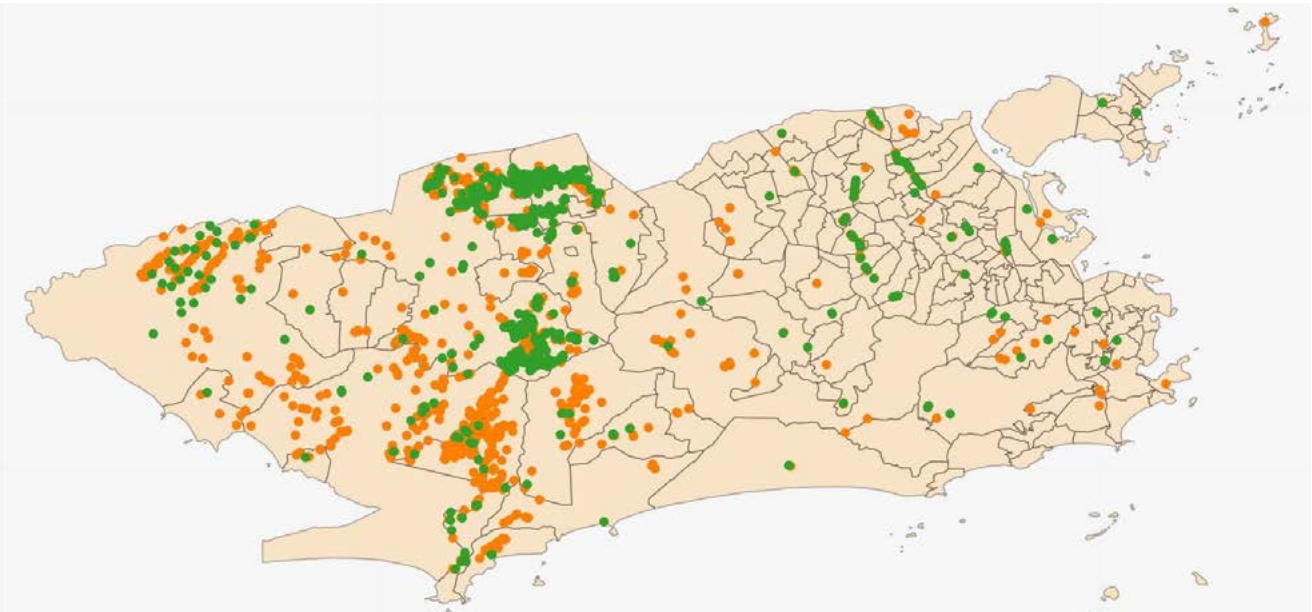
RIO DE JANEIRO

1,101

agricultural establishments with a total of 7,157 hectares

573

agricultural polygons that add up to 1,526 hectares



Source: elaborated by the authors, 2023.

- Urban and peri-urban agriculture

Agricultural and livestock breeding establishments (IBGE, 2017)

Neighborhood boundaries

City limits (IBGE, 2021)
- Polygons of agricultural production areas mapped by this study using satellite images

Highlights of the existing UPA in the cities, according to the Agricultural Census of 2017⁸³

	Curitiba	Recife	Rio de Janeiro
Result from horticultural production	BRL 3,306 million/year	BRL 1,388 million/year	BRL 5,014 million/year
Establishments with horticulture identified as family farming ⁸⁴	74%	78%	70%
Main horticultural horticulture products (in tons)	Lettuce 204 t Cabbage 116 t Chives 84 t	Okra 258 t Green Corn 170 t Lettuce 155 t	Chayote 1.500 t Zucchini 748 t Okra 296 t

In addition to the agriculture already practiced, the study also identified polygons of areas without buildings, vegetation or used (or underutilized areas), located within the municipal perimeter (which may be public or private), with potential to be used for food production⁸⁵. These areas confirm that there is also room for expansion of UPA.

CURITIBA

Potential expansion areas for UPA⁸⁶

2,308

polygons, totaling 1,506 hectares

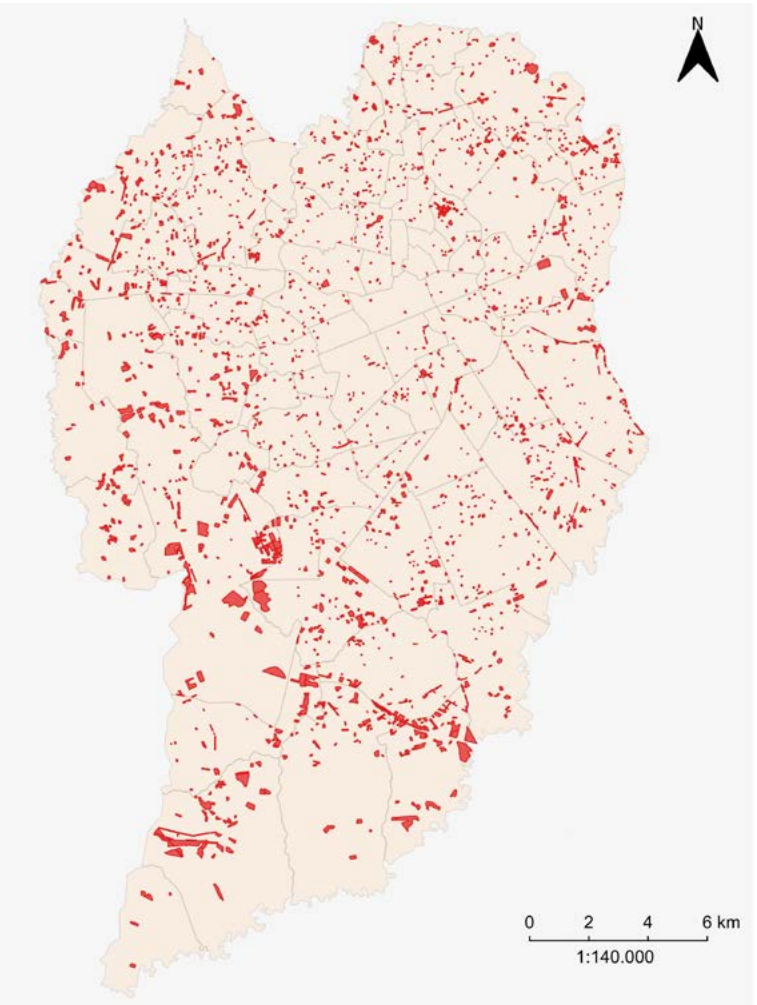
Urban land is a highly contested territory. Various activities, such as transportation, housing, leisure and services, compete for its occupation, which is limited. For this reason, the use of these identified spaces for UPA activities will also be restricted and will need to be assessed on a case-by-case basis.

Polygons of unbuilt areas without forest cover, unused or underused.

Potential spaces for UPA

Neighborhood boundaries

City limits (IBGE, 2021)



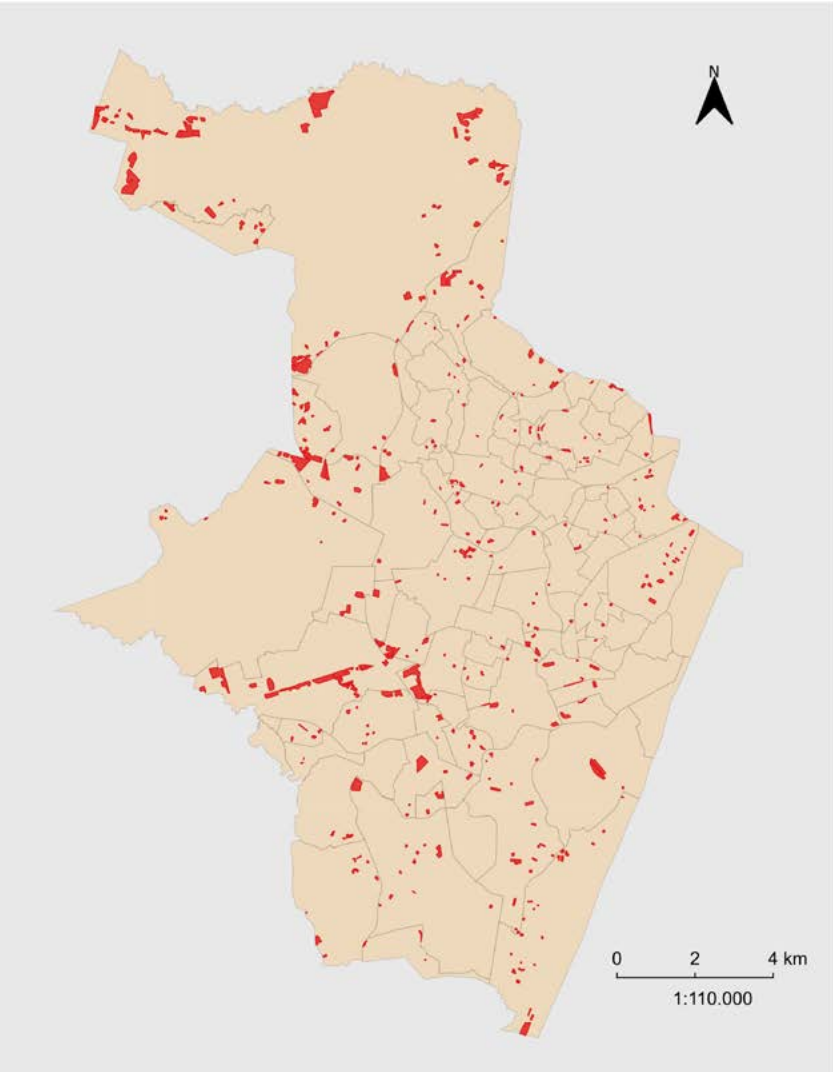
Source: elaborated by the authors, 2023.

⁸³ Horticulture data from Census Tables 6953 and 6954. ⁸⁴ Following the variable “number of agricultural establishments with horticulture” and the typology “family farming - Yes/No” recorded in the Census. More information on the calculation methodology and algorithms for defining the typology is available at: Methodology Family Agriculture (IBGE) DelGrossi final 5jun2019.pdf. Accessed on: November 14, 2023. ⁸⁵ Images represent undeveloped plots of land and unbuilt plots of 1,000 m2 or more, identified using the same techniques described in the previous note. In denser areas, the survey was revised to identify polygons of less than 1,000 m2 as vacant lots. The mapping did not include new land subdivisions (land parcels), squares, school areas and agricultural science research units. ⁸⁶ The mapping prioritized the identification of areas with a minimum of 1,000 m2. However, in areas of intense density, a new scan to identify polygons of less than 1,000 m2 was carried out.

RECIFE

429

polygons, with a total of
404 hectares

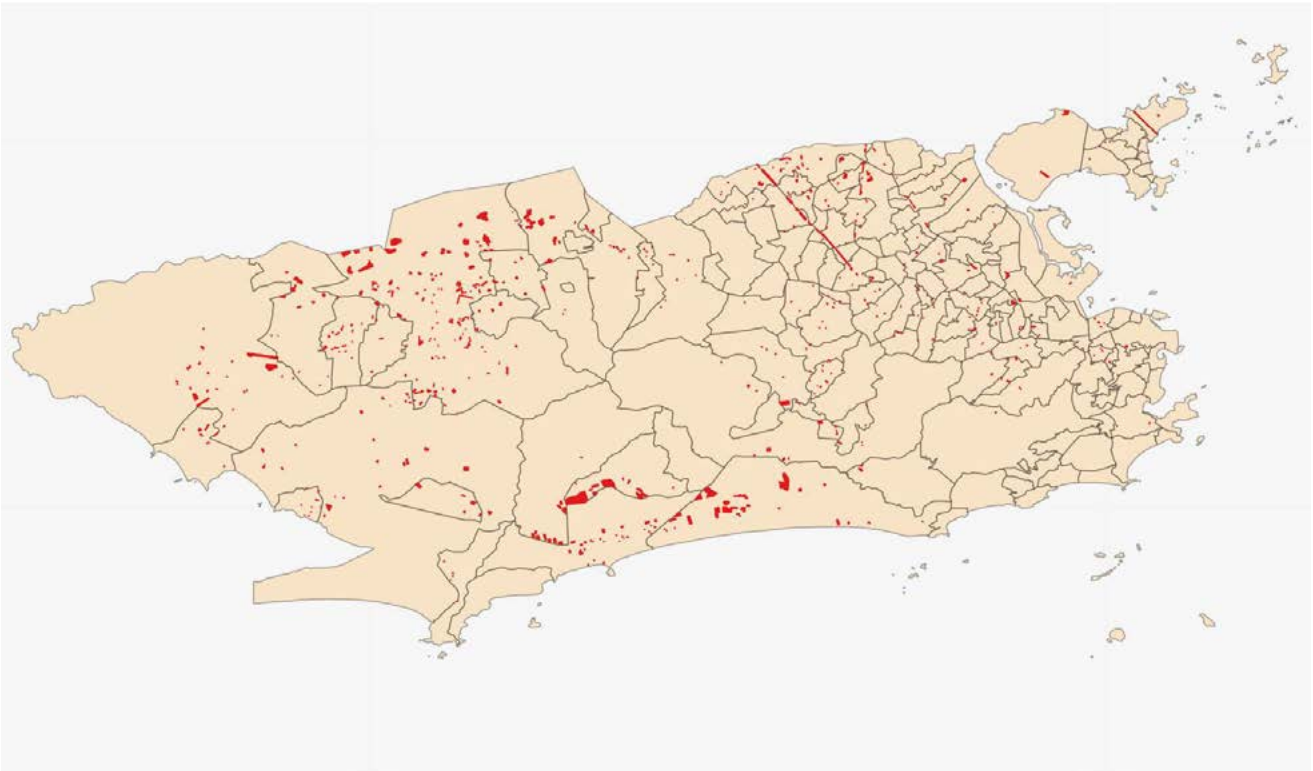


Source: elaborated by the authors, 2023.

RIO DE JANEIRO

656

polygons, with a total of
842 hectares



Source: elaborated by the authors, 2023.

Polygons of unbuilt areas without forest cover, unused or underused.

Potential spaces for UPA

Neighborhood boundaries

City limits (IBGE, 2021)

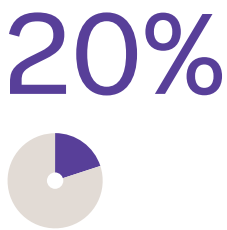
PRODUCTION AND REVENUE POTENTIAL IN 5%, 10% AND 20% OF THE MAPPED POTENTIAL SPACES



	Curitiba	Recife	Rio de Janeiro
Hectares	75.31	20.21	42.1
Production in tons/year	4,859	1,303	2,718
Revenue (BRL/year)	31 million	8 million	17 million



	Curitiba	Recife	Rio de Janeiro
Hectares	150.62	40.41	84.3
Production in tons/year	9,719	2,607	5,436
Revenue (BRL/year)	62 million	16 million	35 million



	Curitiba	Recife	Rio de Janeiro
Hectares	301.24	80.82	168.5
Production in tons/year	19,438	5,215	10,873
Revenue (BRL/year)	125 million	33 million	70 million

The table shows the potential for the production of legumes and vegetables based on the percentage of land occupied.

In view of the dispute over urban spaces, the simulation focused on encouraging municipalities to occupy **only 5%** of the total potential spaces with new production units, managed either by the public authorities or by other sectors of society.

The potential benefits of production units in 5% of the spaces mapped also include urban food.

URBAN FOOD PRODUCTION (USING 5% OF THE MAPPED SPACES)



Cities	Supply according to regional consumption ⁸⁷	% in relation to consumers registered in CadÚnico as living in poverty ⁸⁸
Curitiba	137,978 consumers/year	96%
Recife	63,106 consumers/year	18%
Rio de Janeiro	93,094 consumers/year	7%

A large part of the publicly or communally managed production in the three capitals is destined for consumption by the farmers themselves and/or for donation to consumers in a situation of socio-economic vulnerability, which has a positive impact on the income of the benefited families, since they no longer buy the food on the market.

Curitiba, with the use of only 5% of its potential areas, would be able to serve almost all the consumers registered in CadÚnico in the municipality (143,835 consumers living in poverty). For Recife, absolutely serving this group of registered consumers in the city (348,863) would require the occupation of 27% of the mapped potential areas.

Rio de Janeiro faces a greater challenge, as it has more than 1 million consumers registered in CadÚnico in a situation of poverty. To fully serve this contingent, it would be necessary to occupy 74% of the mapped idle areas. However, it is still possible to encourage production in unmapped spaces - rooftops, warehouses, squares or plots of land that are already occupied but suitable for receiving productive beds and strengthening the production that already exists in the city.

⁸⁷ Value calculated based on the annual production of the 1,000 m2 model unit (6,452.71 kg/year) and the average g/per capita/day regional consumption presented in the report “Analysis of Personal Food Consumption in Brazil”, with data from the POF 2017-2018. The calculation is made up of the sum of the items associated with the survey’s vegetables category (from lettuce to tubers), with 35.22 kg/year per capita of vegetables in the South region, 20.66 kg/year per capita in the Northeast region and 29.20 kg/year per capita in the Southeast region.

⁸⁸ Ministry of Social Development, data available on the Cecad 2.0 platform for August 2023.

The expansion of UPA also has the potential to generate direct income for the consumers involved in the initiatives, as shown in the Table above. Also noteworthy is the latent potential for income generation if new production units are set up exclusively for marketing purposes.

The values calculated for horticulture in the 2017 Agricultural Census are far below the sales potential of the products generated by occupying the 5% of spaces mapped (from BRL 3 million to BRL 31 million in Curitiba, from BRL 1 million to BRL 8 million in Recife and from BRL 5 million to BRL 17 million in Rio de Janeiro). Although it is not envisaged that all the space will be used for this purpose, the data indicates clear but underutilized economic potential in the urban territory, especially if we take into account the promotion of the local economy, bringing producers and consumers closer together and expanding the supply of healthy vegetables.

89 Considering 2 people per production unit receiving subsidies.

90 Considering the value of the bags plus the sale of 50% of the production, totaling BRL 1,527.77 per person.

91 According to World Health Organization (WHO) guidelines. Available at: <https://iris.who.int/bitstream/handle/10665/370420/9789240073593-eng.pdf?sequence=1>.

92 Strategic Action Plan to Combat Chronic Diseases and Non-Communicable Conditions in Brazil 2021-2030. Ministry of Health, 2021.

93 142 g/per capita/day, counting the categories vegetables and fruit from the urban total. Household budget survey 2017-2018: analysis of personal food consumption in Brazil. IBGE, 2020.

94 93.6 g/per capita per day, 1st income quartile.

Among the benefits mapped by this study, it is worthwhile to point out the relationship between the expansion of food production and its impact on health. Increasing the recommended consumption of VLF - vegetables, legumes and fruits - is one of the measures to prevent chronic non-communicable diseases (CNCD) with the recommended total of 400 g/day per person⁹¹.

Cardiovascular diseases, cancers, diabetes and chronic respiratory diseases, develop due to several factors linked to living conditions, including unhealthy eating. For this reason, the federal government has also set itself the goal of increasing the prevalence of adults with the minimum recommended intake of VLF by 30% by 2030 (the so-called DANT Plan)⁹².

These diseases are already the leading death cause in Brazil (54.7% in 2019), causing an impact on the lives of the population and on the Unified Health System (SUS), with rising economic burden of the treatments. This is a worrying statistic, given that in Brazil's urban areas the average VLF consumption is merely 36% per person of the recommended minimum.⁹³

In the lower income brackets, the figure drops to 23%⁹⁴. Clearly, the promotion of fresh and healthy food production near cities with large consumer centers is not merely a hunger combat mechanism, but also a strategy to strengthen preventive health preservation actions.

95 Value calculated based on the annual production of the 1,000 m2 model unit (6,452.71 kg/year), with occupation of 5% of potential spaces and the recommended consumption of 400g / per capita per day. It should be noted that the recommended consumption includes the fruit category, but this is not part of the food produced by the model unit. In the absence of a specific recommendation only for vegetables, the calculation was made using the reference of 400g/day per capita. It is therefore assumed that compliance would be even higher if the percentage of fruit consumption required was not considered.

96 With a consumption of 400 g/day, each model production unit has the potential to serve 44 people. The calculation was based on the 5% of potential areas and the necessary additional number of people with a prevalence of recommended consumption of FLV in the three cities in 2019, the target's base year (obtained from the 2019 Vigilal percentages per city - 27.8% in Curitiba, 21.4% in Recife, 21.8% in Rio de Janeiro - and preliminary data from the 2022 Census).

6. Conclusion

Community garden
in the city. Photo:
Wilton Mitsuo Miwa



The consolidation of a national UPA public policy - with the potential to gain scale and produce significant positive impacts for food security in urban areas - depends on different public and private actors.

For this reason, it behooves the federal government firstly to exercise the necessary leadership to create a pact between the different federal, state and regional levels of government and civil society.

Secondly, it is also necessary to bring the issue of food production, strongly centralized in the federal government, for the agenda of municipal administrations. As a forgotten agenda, especially in the more urbanized municipalities, agriculture must also be seen as part of sustainable urban development, helping to overcome challenges such as combating hunger, promoting food and nutritional security, generating employment and income and mitigating the effects of the climate crisis. From this standpoint, it is up to the federal government to strengthen local institutional capacities by providing guidance, mobilizing society and offering resources to make effective, permanent and participatory changes, as this study has shown.

More tons of vegetables produced each year could significantly improve access to the physical and financial availability of fresh, healthy food, especially for the food insecure and socioeconomically vulnerable population, as well as generating other benefits such as employment and income, and improvements in health and the environment.

The data and proposals provided by the study call on the federal government to rethink public policies to promote food production so that they do not exclude urban territories and, at the same time, to support municipal governments in integrating food production into their urban agendas, both to face the challenge of feeding 27 million hungry Brazilians in cities and to encourage a new model of healthier and more sustainable urban development.

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