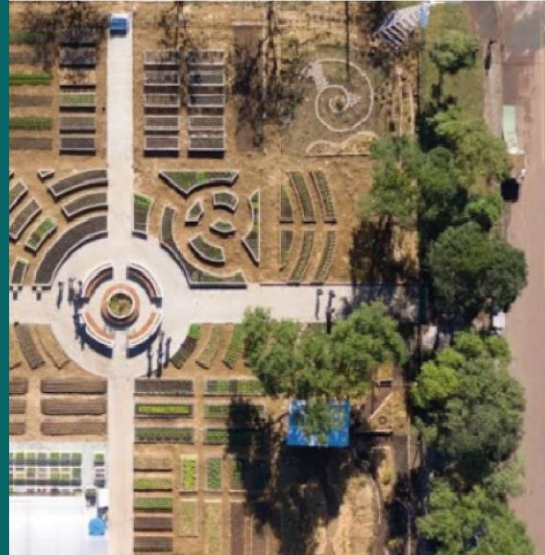


# EDIBLE CITIES:

by Ana Carla Sena de Assis e Rocha



an agroecological  
guide to fairer cities

2024



support



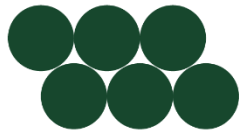
Alexander von  
**HUMBOLDT**  
STIFTUNG



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT

# EDIBLE CITIES:

an agroecological guide to fairer cities



Ana Carla Sena de Assis e Rocha  
(2024)

support



Alexander von  
**HUMBOLDT**  
STIFTUNG



## TECHNICAL FILE

Citation required: Rocha, A. C. S. A. (2024). Edible cities: An agroecological guide to fairer cities. Frankfurt am Main. Available at [www.cidadescomestiveis.com](http://www.cidadescomestiveis.com).

This study was conceived and carried out by Ana Carla Sena de Assis e Rocha, a lawyer, specialist in Public Law from PUC Minas, Master of Geography from the Federal University of Minas Gerais, and founder of the “Cidades Comestíveis” Movement in Brasil.

Contact: [ana.rocha@cidadescomestiveis.com](mailto:ana.rocha@cidadescomestiveis.com)

### Supported by:



Alexander von  
**HUMBOLDT**  
STIFTUNG



The research was sponsored by the Alexander von Humboldt Foundation as part of the German Chancellor Fellowship and supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) as the host institution.

URL links: When links to external sites are included, the responsibility for the content of these sites lies solely with the provider. The author expressly disclaims all such content.

Editor's note: This guide shows Brazil spelled with S as Brasil. This editorial option considers the Brazilian government's recommendations to those organizations who promote Brasil abroad, and it represents a manifestation in favor of the valorization of our national identity and signs.



# TABLE OF CONTENTS

<b>ACRONYMS AND ABBREVIATIONS</b>	<b>5</b>
<b>ACKNOWLEDGMENTS</b>	<b>6</b>
<b>ABOUT THIS WORK</b>	<b>7</b>
<b>INTRODUCTION</b>	<b>9</b>
<b>Cities and Food: Unraveling a Deep Connection</b>	<b>9</b>
<b>Key Concepts: The Foundations of Urban Agriculture</b>	<b>12</b>
Food and Nutrition Security (FNS):	12
Food sovereignty:	12
Human Right to Adequate Food (HRAF):	12
Urban and peri-urban spaces	13
Right to the City	13
Urban Agriculture	13
Agroecology	14
<b>Methodology Applied</b>	<b>16</b>
<b>CHAPTER 01</b>	<b>19</b>
<b>Why Consider Urban Agriculture?</b>	<b>19</b>
<b>Embracing Multifunctionality: More Than Just Growing Food</b>	<b>19</b>
<b>Diverse Formats: The Many Faces of Urban Agriculture</b>	<b>20</b>
<b>Empowering Food Security and Sovereignty</b>	<b>20</b>
<b>Towards Greener and Fairer Cities</b>	<b>22</b>
<b>Overcoming Implementation Challenges: Paving the Path Forward</b>	<b>23</b>
<b>CHAPTER 02</b>	<b>25</b>
<b>Why does Agroecology Matter?</b>	<b>25</b>
<b>Agroecology: Reflecting on the Past to Shape a Sustainable Future</b>	<b>25</b>
<b>Agroecological Transition: Paving the Way to a Fair Food Future</b>	<b>27</b>
<b>Urban Agroecology: Redefining Agriculture for a New Urban Experience</b>	<b>27</b>
<b>CHAPTER 03</b>	<b>29</b>
<b>What Can Southern and Northern Practices Teach?</b>	<b>29</b>
<b>Urban Agriculture in Brazil: From Agroecology to Food Security</b>	<b>29</b>
Belo Horizonte	33
Curitiba	40
Maricá	47
<b>Urban Agriculture in Germany: A Sustainable Lifestyle and Community Engagement</b>	<b>56</b>
Berlin	61
Andernach	67
Kassel	72
<b>CHAPTER 04</b>	<b>81</b>
<b>How Has Germany been Driving the Transformation of Food Systems?</b>	<b>81</b>
Bangladesh	83
India	89
<b>CHAPTER 05</b>	<b>95</b>
<b>How to Develop Effective Municipal Urban Agriculture Policies?</b>	<b>95</b>
<b>CONCLUSION</b>	<b>100</b>
<b>REFERENCES</b>	<b>102</b>



# Acronyms and abbreviations

<b>ABA</b>	Brazilian Agroecology Association
<b>ANA</b>	National Articulation of Agroecology
<b>AS PTA</b>	Family Farming and Agroecology
<b>BMU</b>	German Federal Ministry for the Environment
<b>BMZ</b>	German Federal Ministry for Economic Cooperation and Development
<b>CEPAGRO</b>	Center for the Study and Promotion of Group Farming
<b>CONSEA</b>	National Council for Food and Nutrition Security
<b>COOPERAR</b>	Cooperative working to advise social enterprises in land reform settlements
<b>CRISC</b>	Climate Resilient and Inclusive Smart Cities
<b>Embrapa</b>	Brazilian Agricultural Research Corporation
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FBSSAN</b>	Brazilian Forum on Food Sovereignty and Security
<b>FGV</b>	Getulio Vargas Foundation
<b>FNS</b>	Food and Nutrition Security
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
<b>HDI</b>	Human Development Index
<b>HLPE</b>	High Level Panel of Experts on Food Security and Nutrition
<b>HRAF</b>	Human Right to Adequate Food
<b>MTST</b>	Homeless Workers' Movement
<b>NbS</b>	Nature-based solutions
<b>OECD</b>	Organization for Economic Cooperation and Development
<b>SDGS</b>	Sustainable Development Goals
<b>UN</b>	United Nations
<b>UNEP</b>	United Nations Environment Program
<b>UNDP</b>	United Nations Development Program
<b>SenUMVK</b>	Senate Department for Urban Development, Transport and Environment
<b>SuATI</b>	Support to Agroecological Transformation Processes in India
<b>UA</b>	Urban agriculture
<b>UA+</b>	Urban Agroecology
<b>UPA</b>	Urban and Peri-urban Agriculture
<b>CCP</b>	Community Collective Production Units

# Acknowledgments

I would like to thank the **Alexander von Humboldt Foundation** for selecting and funding this project under the German Chancellor Fellowship and for recognizing its potential contribution to relations between Brasil and Germany and the urban agriculture and agroecology ecosystem in both countries.

I would also like to thank the **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** for their technical and material support during the twelve months this research was conducted (Oct./2023 to Oct./2024). Many thanks, particularly to Dorothee Baum and Karl Moosmann, the two professionals who welcomed and guided me throughout the process, and to the entire Rural Development and Agriculture department (G500), which kindly accepted me as part of the team.

I would like to thank the municipalities of Belo Horizonte, Maricá, and Curitiba in Brasil; Andernach and Kassel in Germany; as well as the representatives of the associations Essbare Stadt Kassel, Allmende-Kontor in Berlin, COOPERAR in Maricá and the organization Anando in Bangladesh for all their availability and material contributions throughout this work for the production of the case studies.

I would also like to express my gratitude to the Brazilian Ministry of Social Development and Fight against Hunger, in the person of Kelliani Fuscaldi, to the Brazilian Ministry of the Environment, in the person of Salomar Mafaldo, to the Brazilian Agricultural Research Corporation, in the persons of Gustavo Propino, Fernando Curado, Mariella Camardelli and Maria Elizabeth Correia, the Geography Department of the Federal University of Minas Gerais, in the person of Heloísa Costa, INKOTA, in the person of Tina Maria, Agronauten, in the person of Peter Volz and Anstiftung, in the person of Gudrun Walesch for the interviews they gave me, which enabled me to understand better the dynamics of urban agriculture and agroecology in Brasil and Germany.

Finally, I would also like to thank Sérgio Ritheli, Dr. Felipe Jardim, and Lara Palhares for their support in reviewing the content presented here and all the friends and family who contributed ideas, suggestions, and contacts, helping this work to take shape.

# About this Work

This guide was developed as part of the **German Chancellor Fellowship**, a program run by the **Alexander von Humboldt Foundation** that supports young professionals from various countries, including Brasil. The program aims to promote future leaders in their fields by offering the opportunity to develop a research or innovation project in Germany for twelve months, in my case, between October 2023 and October 2024. The idea is that during their stay in the country, the researcher can contribute to strengthening relations between their country of origin and Germany by exchanging knowledge and experiences. In the context of this work, agroecological urban agriculture was the link between the two countries.

In addition, the project must be hosted by a German institution. **The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** was chosen to this role. GIZ is an implementation agency that plays a key role in implementing projects on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ). The support provided by the organization made it possible to delve deeper into agroecological projects and consolidate the lessons learned in this material.

During the *fellowship*, I had the opportunity to interview key players in promoting more sustainable agriculture (urban and rural). I also visited the three German cities (Berlin, Kassel, and Andernach) mentioned in this guide to talk to farmers and get a closer look at how urban agriculture and agroecology are developing in the country. At the same time, I understood how Germany has financed the agroecological transition worldwide.

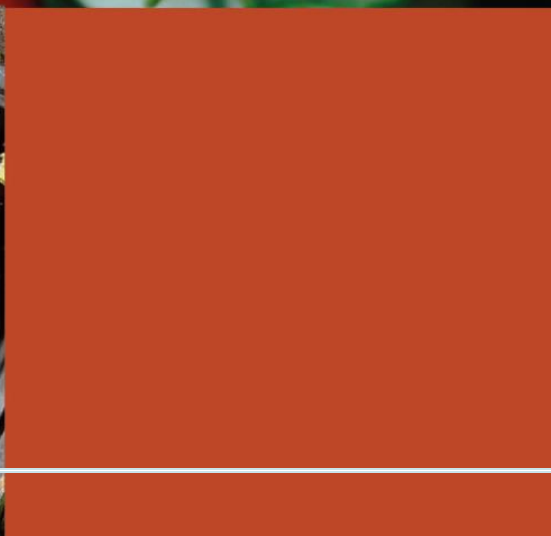
On the other hand, I proudly presented some of the urban agriculture initiatives developed in Brasil. These initiatives are gaining increasing recognition on the international stage as good examples of public policies. From a distance, I dialogued with a range of local actors, from municipal managers to federal government representatives and researchers from different institutions. Through the exchanges provided by these meetings, I realized how Brazilian resilience and creativity are already reflected in Brazilian policies through innovative and inspiring initiatives.

It was a period of intense and immersive learning, culminating in this material. I do not intend to exhaust the subject in such a limited time and number of pages. However, I hope the lessons learned throughout this journey contribute to municipal managers and inspire them to develop more robust urban agroecology policies. I also hope this material inspires concrete actions and helps foster fairer, more sustainable, and, quite literally, more 'edible' cities through agroecology.

Enjoy your reading!



Ana Carla Sena de Assis e Rocha



# Introduction

## Cities and Food: Unraveling a Deep Connection

Food and agriculture are fundamental ways of connecting people and the planet: properly nourished children can study, well-fed people lead healthier and more productive lives<sup>1</sup> and, with this, a scenario of social justice becomes a possible reality. That's why guaranteeing the **human right to adequate food** through **food security** and **food sovereignty** is fundamental and a collective and shared responsibility between all levels of power.

This shared responsibility has taken shape through **national, regional, and local policies around the globe**, as well as international cooperation projects, which aim to promote sustainable development in the terms proposed by the 2030 Agenda and the SDGs<sup>2</sup>. In the context of food, SDG 2: Zero Hunger.

### Box 1 – 2030 Agenda and the SDGs

The 2030 Agenda for Sustainable Development, adopted by all Member States of the United Nations in 2015, is a comprehensive plan that aims to guide policies and initiatives related to sustainable development.

At its core are the 17 Sustainable Development Goals (SDGs), which serve as a call to action for all countries to work together in a global partnership to achieve them. These goals address a wide range of issues, including poverty, inequality, climate change, environmental degradation, peace and justice, with the overall aim of creating a sustainable and equitable future for all<sup>3</sup>.



<sup>1</sup> FAO (2018).

<sup>2</sup> United Nations (2015).

<sup>3</sup> United Nations (2015).



However, despite all the existing initiatives, hunger remains a reality, and the guarantee of food and nutritional security is still not universal. According to data released by the FAO in 2024, **food insecurity** is still a reality for approximately **1 out of 11 people** in the world<sup>4</sup>.

At the same time, the future of humanity lies in cities, with all regions of the world expected to become more urbanized by 2050. Currently, more than 80% of the population in Brasil already lives in urban areas<sup>5</sup>, while in Germany, this figure is 78%<sup>6</sup>. If unplanned, the expected intensification of urbanization could increase **extreme poverty by up to 32%**<sup>7</sup>, affecting more than 200 million people across the globe.

In addition to climate change, political instability, and a consequent increase in inequalities, urban citizens worldwide are finding it difficult to guarantee their food sovereignty<sup>8</sup>. This challenge can be translated into data: currently, **1.7 billion of the world's 2.2 billion** people living with moderate or severe food insecurity live in **urban and peri-urban areas**.<sup>9</sup>

Furthermore, the future of cities is not uniform across the planet's regions. The scenarios vary: in the countries of the **Global South**, including Brasil, the most pressing challenges are combating increasing urban poverty, providing adequate infrastructure and affordable housing, and addressing high levels of unemployment<sup>10</sup>. In countries in the **Global North**, such as Germany, the main priorities are managing cultural diversity, modernizing infrastructure, and meeting the demands of increasingly aging populations.

On the other hand, the whole world faces several **common challenges** in its food systems. The significant contribution to greenhouse gas emissions through food supply chains<sup>11</sup>, the increased consumption of ultra-processed foods, and the rising rates of obesity and related chronic non-communicable diseases, such as diabetes and cardiovascular diseases, are points of common concern between countries from the South to the North<sup>12</sup>. Concerning Brasil and Germany, Table 1 explains this relationship better.

TABLE 1 / Food and nutrition security challenges in Brasil and Germany	
BRAZILIAN REALITY	GERMAN REALITY
<ul style="list-style-type: none"> <li>* More than 19.8% of the adult population is obese<sup>13</sup>.</li> <li>* In 2022, 75% of GHG emissions were related to agricultural production, either through the practice itself or through land use change<sup>14</sup>.</li> <li>* At least 20% of Brazilians' calories come from ultra-processed foods<sup>15</sup>.</li> <li>* Not even 10% of the Brazilian population consumes the amount of fruit recommended by the WHO<sup>16</sup>.</li> <li>* Although this figure is falling, today 6.6% of the Brazilian population is severely food</li> </ul>	<ul style="list-style-type: none"> <li>* In 2019, 53.5% of the German adult population was overweight, with 19% having some degree of obesity<sup>23</sup>.</li> <li>* More than one in ten people in Germany suffer from (type 2) diabetes<sup>24</sup>.</li> <li>* 14% of all deaths in Germany are attributed to an unhealthy diet<sup>25</sup>.</li> <li>* In OECD member countries, socio-economically vulnerable groups tend to consume less nutritious food, which leads to sub-optimal health outcomes<sup>26</sup>.</li> <li>* Almost 2.1 million children and young people under the age of 18 in Germany were at risk of</li> </ul>

<sup>4</sup> FAO *et. al.* (2024).  
<sup>5</sup> United Nations Population Division (2018).  
<sup>6</sup> United Nations Population Division (2018).  
<sup>7</sup> United Nations Human Settlements Programme (2022).  
<sup>8</sup> HLPE (2024).  
<sup>9</sup> HLPE (2024).  
<sup>10</sup> United Nations Human Settlements Program (UN-Habitat) (2022).  
<sup>11</sup> Batini (2019).  
<sup>12</sup> World Obesity Federation (2024).  
<sup>13</sup> Brazilian Association for the Study of Obesity and Metabolic Syndrome (ABESO) (n.d.).  
<sup>14</sup> TSAI *et. al.* (2023).  
<sup>15</sup> IDEC, (n.d.).  
<sup>16</sup> IDEC, (n.d.).  
<sup>23</sup> Schienkewitz, *et. al.* (2022).  
<sup>24</sup> BMEL (2024).  
<sup>25</sup> BMEL (2024).  
<sup>26</sup> Placzek (2021).

<p>insecure and 3.9% are undernourished, keeping the country on the "Hunger Map"<sup>17</sup>.</p> <ul style="list-style-type: none"> <li>* Low-income families buy 14.3 kilos of fruit a year per person<sup>18</sup>.</li> <li>* Meat, fruit and vegetables are expected to become more expensive than sausages, sweets and other treats and ultra-processed foods from 2026 onwards<sup>19</sup>.</li> <li>* The effects of climate change, such as floods, droughts and cyclones, directly affect the value of food, and have a greater impact on families in situations of vulnerability<sup>20</sup>.</li> <li>* 65% of households run by black and brown people live with food restrictions<sup>21</sup>.</li> <li>* 6 out of 10 households run by women experience some form of food insecurity<sup>22</sup>.</li> </ul>	<p>poverty in 2023<sup>27</sup>, which corresponds to 14.28% of the population in this age group<sup>28</sup>.</p> <ul style="list-style-type: none"> <li>* 6.3% of the German population cannot afford to buy a meal with meat, chicken, fish or an equivalent vegetarian option every two days, and among the unemployed this figure rises to 31.7%<sup>29</sup>.</li> <li>* The number of severely food insecure people went from 1.0% between 2014 and 2016 to 1.5% between 2021 and 2023, a percentage increase of 50%<sup>30</sup>.</li> <li>* 4.0% of the total population was moderately food insecure between 2021 and 2023<sup>31</sup>.</li> <li>* In Germany, the debate on food security is still not very widespread in public discourse, which is reflected both in the volume and availability of data on the subject and in the lack of characterization of the sample when data is available<sup>32, 33</sup>.</li> </ul>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Faced with these challenges, the question arises: **how will they be tackled?** The first part of this answer is that **there is no silver bullet**. No single action can solve the problems of disordered urbanization and unsustainable food systems. The UN recommends that local governments adopt **multidimensional approaches** to tackle them. Building resilient cities adapted to a wide range of shocks while promoting the transition to a sustainable, fair, and resilient future must be a priority.

At the same time as cities face these challenges, they must be viewed as territories of opportunity and recognized as key sites for social transformation. Municipalities are the level of government closest to most people, making them a strategic setting for developing transformative and anticipatory policies<sup>34</sup>.

Municipal commitment is therefore needed to ensure that **urban food policies are developed sustainably**, promoting greater dignity and social justice for its inhabitants<sup>35</sup>. Managers and other decision-makers must focus on mechanisms and initiatives that shape a new urban model that is planned and capable of mitigating the adverse effects of this accelerated growth<sup>36</sup>. When these policies are integrated, coherent, and built in a participatory way, with strategy and monitoring, the results are significant for citizens<sup>37</sup>, as seen throughout the guide.

In this context, **urban agroecology (UA+)** is a promising alternative for building more sustainable cities<sup>38</sup> while at the same time contributing to the food security and sovereignty of its inhabitants<sup>39</sup>.

<sup>17</sup> FAO *et. al.* (2024).

<sup>18</sup> IDEC, (n.d.).

<sup>19</sup> UFMG School of Nursing, (n.d.).

<sup>20</sup> Konchinski (2024).

<sup>21</sup> PENSSAN Network (2022).

<sup>22</sup> PENSSAN Network (2022).

<sup>27</sup> Destatis Statistisches Bundesamt. (n.d.).

<sup>28</sup> German Federal Statistical Office (Destatis), (n.d.).

<sup>29</sup> Destatis Statistisches Bundesamt. (n.d.).

<sup>30</sup> FAO (2024).

<sup>31</sup> FAO (2024).

<sup>32</sup> FAO (2024); Pfeiffer *et. al.* (2017).

<sup>33</sup> Pfeiffer *et. al.* (2017).

<sup>34</sup> Moragues-Faus & Battersby (2021).

<sup>35</sup> Dias da-Silva (2020).

<sup>36</sup> Grostein (2001).

<sup>37</sup> Food of Tomorrow (n.d.).

<sup>38</sup> Comitre (2019).

<sup>39</sup> Ribeiro *et. al.* (2012).

## Key Concepts: The Foundations of Urban Agriculture

In an attempt to contribute to the guidelines mentioned above, this guide is based on some fundamental concepts for the construction of public policies on the subject, which will be addressed in this topic.

### Food and Nutrition Security (FNS):

Food and nutrition security exists when all people, at all times, have **physical, social, and economic access** to **sufficient, safe, and nutritious food** that meets their dietary **needs** and food **preferences** for an active and healthy life<sup>40</sup>. However, food security is not uniform and can be divided into different degrees:<sup>41</sup>

<b>Food Security</b>	When <b>there are no problems</b> with access to food, either in <b>quality</b> or <b>quantity</b> , and there is no fear of future shortages.
<b>Mild Food Insecurity</b>	When <b>there is fear of a possible food shortage</b> in the near future, the budget and routine are planned to increase the durability of food.
<b>Moderate Food Insecurity</b>	When <b>quantity</b> is prioritized <b>over quality</b> , leading to a reduction in the variety of foods consumed by adults who prioritize feeding children.
<b>Severe Food Insecurity</b>	When <b>there is a quantitative and qualitative restriction of</b> food, causing hunger in both adults and children in the family.

### Food sovereignty:

This is a **broader concept** than food security, as it corresponds to the **right of peoples to define their own sustainable policies and strategies** for producing, distributing, and consuming food to guarantee the right to food for the entire population. This guarantee must be made with respect for **cultures** and the **diversity of** agricultural production methods, marketing, and space management, as well as taking into account the importance of women in food production<sup>42</sup>.

In Brasil, the formal concept of food security, set out in Law 11.346/2006<sup>43</sup> in its article 3, is innovative in recognizing sovereignty as an indispensable attribute<sup>44</sup>.

### Human Right to Adequate Food (HRAF):

The DHAA is a human right that guarantees **regular, permanent, and unrestricted access**, either **directly or through financial acquisitions**, to safe and healthy food in adequate and sufficient quantity and quality, in accordance with the **cultural traditions** of each people. It ensures a **dignified, full, and fear-free life**, both in the physical and mental dimensions and in the individual and collective spheres<sup>45</sup>.

In practice, this right has three main components:<sup>46</sup>

- \* Duty to respect: the government must not interfere with people's ability to seek, produce, or obtain food by their own means, individually or collectively.

<sup>40</sup> FAO (2001).

<sup>41</sup> FAO, (n.d.); Boas (2023).

<sup>42</sup> World Forum on Food Sovereignty (2001).

<sup>43</sup> Brasil (2006).

<sup>44</sup> Silva (2020).

<sup>45</sup> ABRANDH (2010).

<sup>46</sup> HLPE (2024).

- \* Duty to protect: the state must ensure that third parties do not interfere with citizens' right to food, protecting them against any action that threatens their access to food.
- \* Duty to facilitate and provide: the government must adopt proactive measures to ensure that people have access to resources that enable them to produce or obtain sufficient food.

As a last resort, states have an obligation to fulfill this right directly whenever an individual or group cannot enjoy the right to adequate food for reasons beyond their control.<sup>47</sup>

## Urban and peri-urban spaces

The concept of **urban space** arose from the industrialization process of society<sup>48</sup> and is marked by a higher population density, a greater supply of economic services, and cultural and social activities. These areas have a concentration of commercial environments, residences, industrial infrastructure, and a population engaged in various economic activities<sup>49</sup>.

There is no consensus on the concept of **peri-urban space** in scientific studies. Still, there is a common understanding that these are transition zones between urban and rural areas, promoting interaction between them and mixed use of the land, which can serve both rural and other economic activities.<sup>50</sup>

### Box 2 – The relationship between urban and rural

The contemporary approach to food and the city goes against this division between urban and rural to give way to an idea that understands this relationship as a **gradient between these two poles**. This opens up space for multifunctionality and different forms of land use in cities and the need for urban planning to be increasingly structured around the integration of nature and human production<sup>51</sup>.

## Right to the City

The concept of the "right to the city," developed from the ideas of French philosopher Henri Lefebvre, can be understood as the right of citizens to shape, access, and transform urban spaces according to their collective needs and interests<sup>52</sup>.

Through this right, citizens demand democratic control over urban processes, ensuring that everyone can influence the decisions that shape the environment. This guarantees that urban spaces meet the needs and aspirations of the population, promoting inclusion, social justice, and common well-being rather than serving exclusively financial interests.

## Urban Agriculture

The concept of urban agriculture most used in studies on the subject is that which understands it as an **activity located within** (intra-urban) **or on the outskirts** (peri-urban) of a city, municipality, or metropolis, which **cultivates, raises, processes, and distributes a diversity of food and non-food products**, largely reusing the human and material resources, products and services found in and around these areas<sup>53</sup>.

In short, the main characteristic that makes urban agriculture a different form of production from rural agriculture is that it is **integrated into the urban ecosystem**, i.e., cities' economic and ecological systems<sup>54</sup>.

<sup>47</sup> HLPE (2024).

<sup>48</sup> Lencioni (2008).

<sup>49</sup> Hutchings *et. al.* (2022).

<sup>50</sup> Sharma *et. al.* (2023).

<sup>51</sup> Sharma *et. al.* (2023).

<sup>52</sup> Lefebvre (1968); Harvey (2008)

<sup>53</sup> Mougeot, (2005).

<sup>54</sup> Biazoti & Leão (2024).

## Agroecology

Agroecology can be seen as **a science, a set of practices, and a social movement**<sup>55</sup>, and each of these dimensions stands out more or less depending on the country and region in which it is being debated<sup>56</sup>.

As a **science**, agroecology studies the integration of ecology throughout the food system, addressing **ecological, economic, and social** dimensions. It applies ecological principles to designing and managing sustainable food systems, intending to promote more resilient and sustainable agricultural practices. This field of study encompasses research, education, and action aimed at transforming food production, consumption, and distribution over the long term<sup>57</sup>.

Agroecological practices focus on optimizing agricultural systems by taking advantage of natural processes. These practices seek to create beneficial interactions between the components of the agricultural ecosystem, using ecosystem services to develop more sustainable techniques. In this way, there is an ongoing effort to combine food production with nature's cycles and processes rather than relying on external inputs or industrialized methods<sup>58</sup>.

As a **social movement**, agroecology proposes an alternative to the industrial model of food production, presenting solutions to contemporary challenges such as climate change and food insecurity through promoting local, fair, and sustainable food systems<sup>59</sup>. Agroecology, in this sense, is seen as **a bottom-up path to food sovereignty** based on traditional knowledge systems, supported rather than led by science, where small producers, traditional peoples, and communities and their organizations are the protagonists. Thus, agroecological approaches aim to build resilient and sustainable local food systems that are strongly linked and adapted to their territories and ecosystems<sup>60</sup>.

---

<sup>55</sup> Anderson *et. al.* (2021).

<sup>56</sup> Cotê *et. al.* (2019).

<sup>57</sup> HLPE (2019).

<sup>58</sup> HLPE (2019).

<sup>59</sup> HLPE (2019).

<sup>60</sup> HLPE (2019).



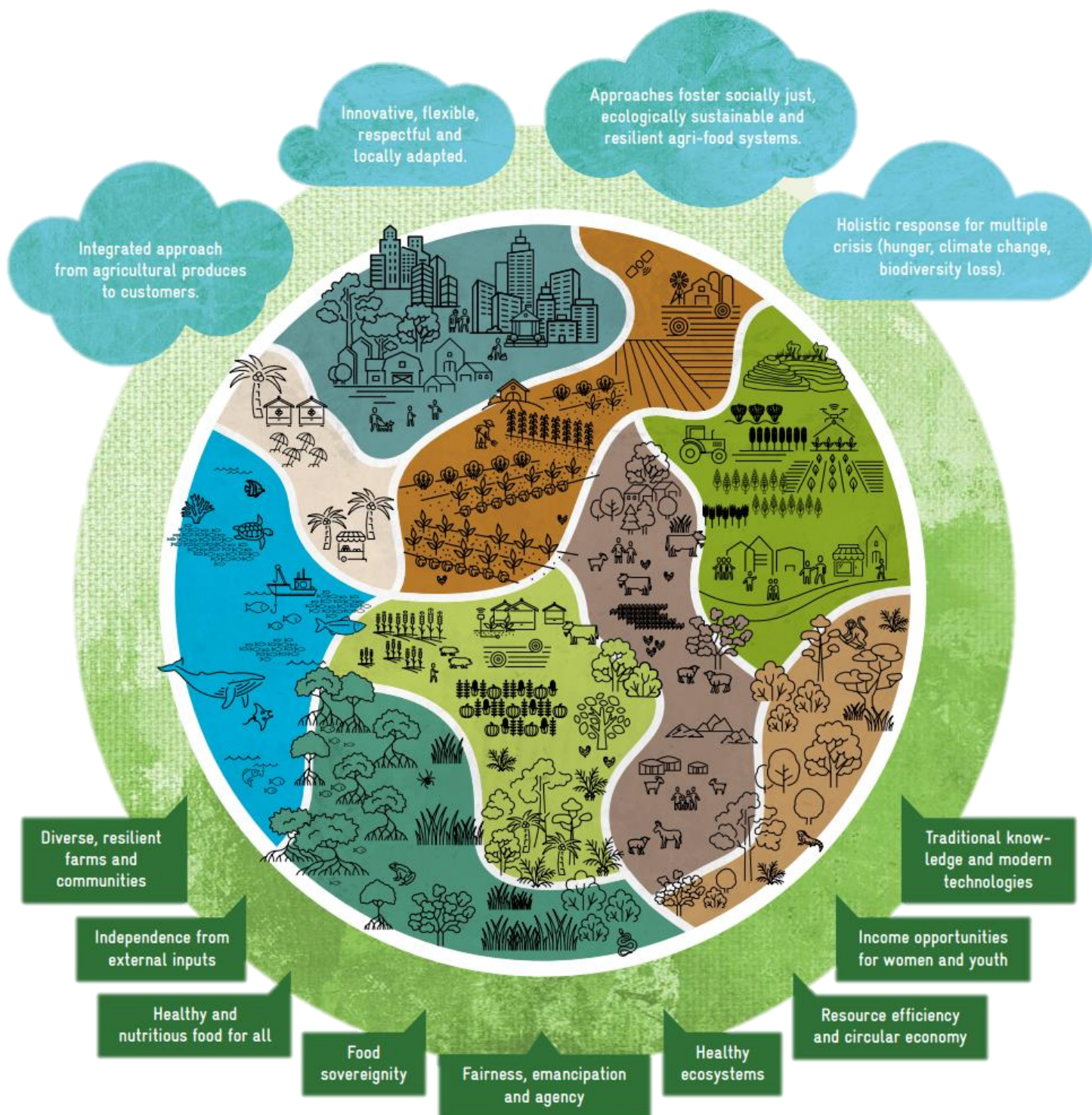


Figure 1 | Agroecological approaches as levers for socioecological transformation <sup>61</sup>.

<sup>61</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2023).

## Methodology Applied

This work was based on the hypothesis that analyzing urban agriculture practices in Brasil and Germany and agroecology projects implemented by GIZ around the world makes it possible to develop more robust public policies. The guide, therefore, sets out to offer recommendations to help public managers make decisions when creating policies aimed at environmental sustainability, food security, and social inclusion in urban areas based on concrete cases.

For this purpose, the following route was used:

Figure 1 - Methodological path

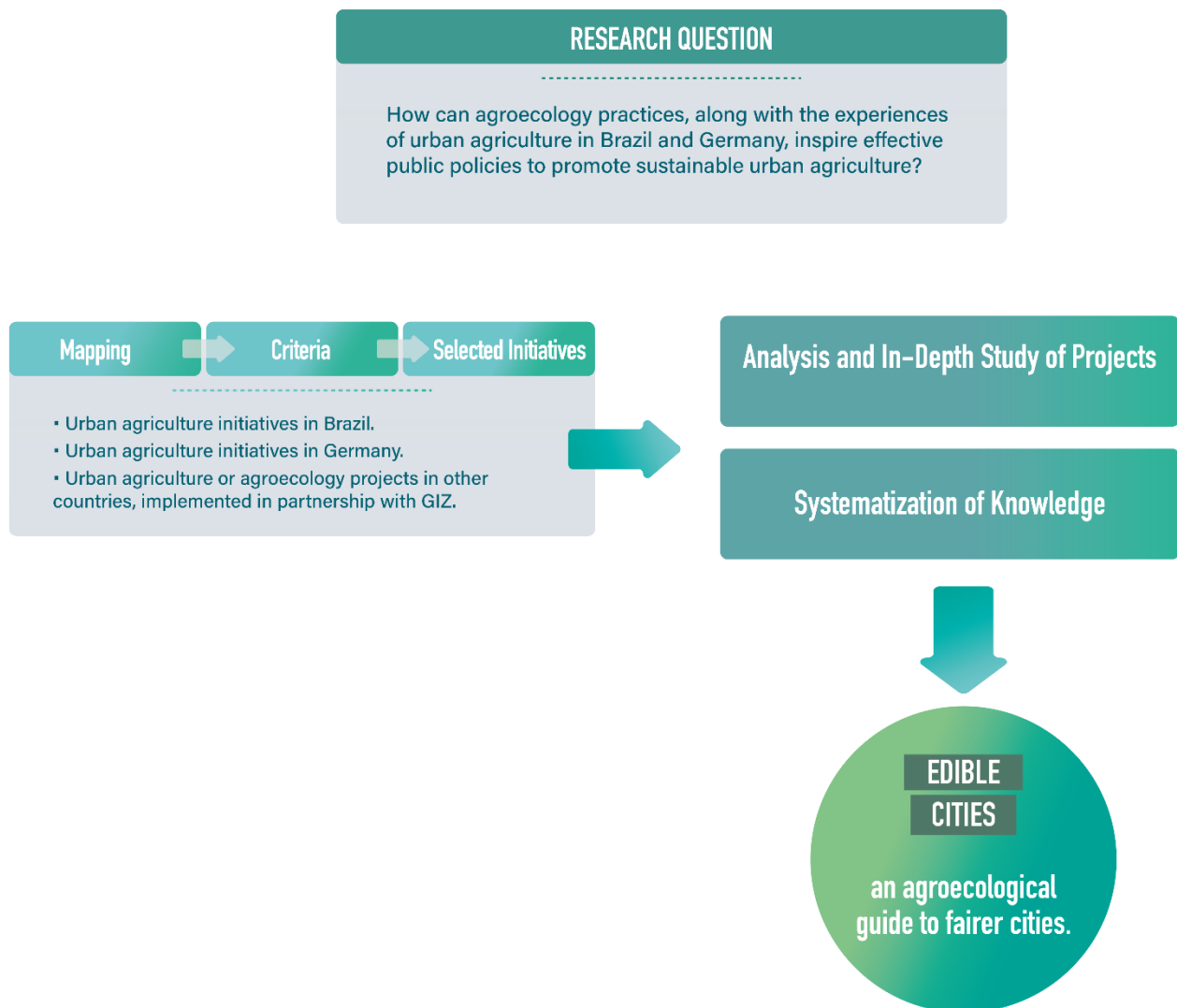


Figure 2 | Methodological path.

The starting point for this work was a **literature review**, using scientific articles and international reports to build a theoretical framework to guide the next steps. Next, a series of **exploratory interviews** were conducted with different agents related to urban agriculture or agroecology in both countries to better understand the scenarios. Twelve representatives of civil society organizations, academia, and the public sector participated in the interviews.

Secondly, **the cities presented** were chosen. The focus was on identifying initiatives seen as success stories and understanding what lessons could be learned from these experiences and recommended for other contexts based on the following criteria:

TABLE 2 / Criteria for selecting the cities analyzed	
<b>POLITICAL ASPECTS</b>	Preferably created or supported by the local government.
<b>ECOLOGICAL ASPECTS</b>	Agroecological, organic or similar production.
<b>SOCIAL AND HUMAN ASPECTS</b>	Declared focus on guaranteeing social benefits, such as (but not limited to) poverty reduction, food security, inclusion of vulnerable groups, guaranteeing the right to the city, food and environmental education, creating spaces for leisure and community cohesion, valuing diverse socio-cultural identities.
<b>REPLICABILITY AND RELEVANCE</b>	Have relevance and/or public recognition in their potential to influence similar initiatives and recommended by the interviewees.
<b>AVAILABILITY</b>	Availability of the municipal government or representatives of the initiative to contribute to the research.

Based on these criteria, the following cities were selected: Belo Horizonte [1], Curitiba [2], and Maricá [3] in Brasil. In Germany: Berlin [4], Kassel [5] and Andernach [6]:

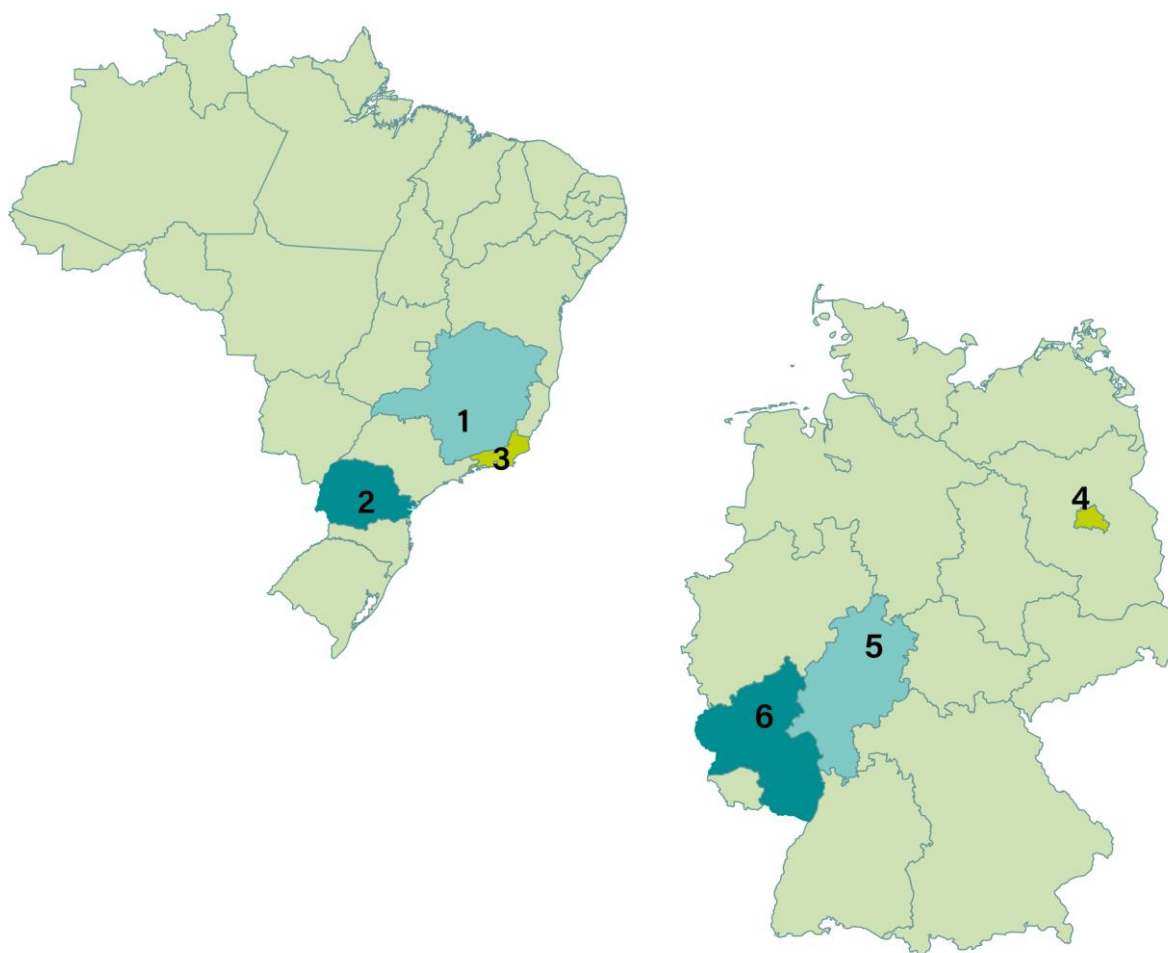


Figure 3 | Maps of Brasil and Germany, indicating the cities studied (own elaboration).

With regard to the projects implemented by GIZ, one initiative related to urban agriculture and another to agroecology were selected. They complement the municipal examples and show how international cooperation plays an important role in strengthening projects on the subject

The selection criteria used were:

TABLE 3 / Criteria for selecting projects implemented by GIZ	
<b>POLITICAL ASPECTS</b>	Implementation in partnership with public authorities.
<b>ECOLOGICAL ASPECTS</b>	Support for agroecological transition or promotion of urban agriculture
<b>SOCIAL AND HUMAN ASPECTS</b>	Declared focus on guaranteeing social benefits, such as (but not limited to) poverty reduction, food security, inclusion of vulnerable groups, guaranteeing the right to the city, food and environmental education, creating spaces for leisure and community cohesion, valuing diverse socio-cultural identities.
<b>AVAILABILITY</b>	Availability of consolidated and public materials on the projects.

To analyze the projects, a mixed approach was used, integrating semi-structured interviews, document analysis, literature review, direct observation, ethnographic research, and the application of questionnaires, divided according to the context studied:

BRAZILIAN CITIES	GERMAN CITIES	PROJECTS IMPLEMENTED BY GIZ
<ul style="list-style-type: none"> <li>* Literature review.</li> <li>* Documentary analysis and data provided by the municipality.</li> <li>* Interviews.</li> <li>* Questionnaire application.</li> </ul>	<ul style="list-style-type: none"> <li>* Literature review.</li> <li>* Documentary analysis and data provided by the municipality.</li> <li>* Interviews.</li> <li>* Direct observation.</li> <li>* Ethnographic research.</li> </ul>	<ul style="list-style-type: none"> <li>* Literature review.</li> <li>* Documentary analysis.</li> <li>* Interviews.</li> </ul>

The culmination of this journey is **Edible Cities: an agroecological guide to fairer cities**. This material offers an **overview of** urban agriculture and agroecology, examples of successful initiatives on the subject, and recommendations on how to implement or foster agricultural initiatives that promote a more sustainable and inclusive urban experience.



## Why Consider Urban Agriculture?

There are many policies that municipal governments can adopt related to food sovereignty and sustainable urbanization. This guide focuses on presenting the reasons why urban agriculture should be considered a simple, viable alternative capable of addressing many of the challenges faced.

### Embracing Multifunctionality: More Than Just Growing Food

Urban agriculture is characterized by its central feature of multifunctionality. By using and regenerating local resources, urban agriculture meets the growing needs of populations and contributes to achieving sociocultural, economic, and environmental goals, as outlined in Table 4.

TABLE 4 / Multifunctionality of urban agriculture <sup>62</sup>		
SOCIO-CULTURAL DIMENSION	ECONOMIC DIMENSION	ENVIRONMENTAL DIMENSION
<ul style="list-style-type: none"> <li>* Food and nutrition security (FNS).</li> <li>* Health.</li> <li>* Social cohesion.</li> <li>* Requalification of the urban space.</li> <li>* Public safety.</li> <li>* Female empowerment.</li> <li>* Reconnecting with nature.</li> <li>* Food education.</li> <li>* Cultural development.</li> <li>* Valuing cultural heritage.</li> <li>* Leisure and recreation.</li> <li>* Rescuing socio-cultural identities.</li> </ul>	<ul style="list-style-type: none"> <li>* Poverty reduction.</li> <li>* Generating jobs and income.</li> <li>* Valuing social contact between producers and consumers.</li> <li>* Encouraging new forms of distribution and marketing.</li> <li>* Less dependence on the world food market.</li> <li>* Diversification of economic activities.</li> <li>* Shortening the supply chain.</li> <li>* Productive occupation of urban voids.</li> </ul>	<ul style="list-style-type: none"> <li>* Preservation and conservation of biodiversity and natural resources.</li> <li>* Nutrient cycling</li> <li>* Efficient management of water resources.</li> <li>* Greener cities.</li> <li>* Reducing the ecological footprint.</li> <li>* Mitigation and adaptation to climate change</li> <li>* Scenic beauty.</li> <li>* Reduced risk of flooding.</li> <li>* Organic waste management.</li> <li>* Microclimate regulation</li> </ul>

The multifunctional nature of urban agriculture underscores the importance that public policies on the subject, to be successful, must consider all its dimensions and understand UA as a way of interacting with the urban space, capable of generating both material and immaterial benefits, contributing to the health and well-being of the community and the balance of the urban metabolism<sup>63</sup>.

<sup>62</sup> Curan & Marques (2021); Centro de Estudos em Sustentabilidade da FGV de São Paulo (FGVces), (n.d.).

<sup>63</sup> Clinton *et. al.* (2018).



Diverse Formats: The Many Faces of Urban Agriculture

There are many models of urban agriculture. This concept encompasses different agricultural practices and structures practiced in or around cities. **This diversity is central to understanding UA**, both in terms of production methods and farmers' profiles and motivations<sup>64</sup>.

UA includes cultivation in soil, greenhouses, aquaponics, and aeroponics. It can take place in public spaces, private land, green roofs, or even areas under power lines. It includes smallholdings focusing on commercial production, home gardens, community gardens, urban farms, startups<sup>65</sup>, and many other forms that fit the reality you want to achieve.

At the international level, urban agriculture has been divided into four main categories, as shown in Table 5, to facilitate understanding of the plurality of formats that it encompasses.

TABLE 5 / Categories of urban agriculture <sup>66</sup>	
RESIDENTIAL AGRICULTURE	<p>This is the most common type in urban and peri-urban areas and is practiced indoors.</p> <p>For example, crops grown in backyards, on balconies, on windowsills or around the home.</p> <p>Its main benefit is that families have direct access to food, savings in the household budget and low implementation costs.</p>
COMMUNITY GARDENS AND OTHER SHARED SPACES	<p>This category includes community gardens, public squares and allotment gardens. This practice usually takes place in public or private spaces provided for this purpose.</p> <p>In addition to food production, there are other clear benefits, such as social integration, community development, leisure, health and education, for example.</p>
COMMERCIAL PRODUCTION	<p>Especially in the cultivation of vegetables, the use of urban and peri-urban spaces for commercial production is also a common practice.</p> <p>In these spaces, especially when in peri-urban areas, production can be more intensive and technological, with access to more complex irrigation equipment, for example.</p>
INSTITUTIONAL CULTIVATION	<p>This category includes a wide variety of food production in institutional spaces, such as schools, religious organizations, prisons and hospitals.</p> <p>Gardens can be for self-consumption, therapy, leisure, skills development and job creation, for example.</p> <p>At an institutional level, there are gardens of all sizes and even urban farms.</p>

Given the different forms of production and possibilities for adaptation, urban agriculture has been increasingly encouraged by international organizations such as the United Nations Development Programme (UNDP) and the Food and Agriculture Organization (FAO), as well as various civil society entities and governments around the world, especially at times of social and economic fragility<sup>67</sup>.

Empowering Food Security and Sovereignty

Urban agriculture has already been used as an effective strategy to ensure the supply of fresh and nutritious food<sup>68</sup>. It provides a **stable source of food** for families, helping to build resilience in the face of fluctuating

<sup>64</sup> Nagib (2024).  
<sup>65</sup> Nagib (2024).  
<sup>66</sup> FAO *et. al.* (2022).  
<sup>67</sup> Batitucci *et. al.* (2019).  
<sup>68</sup> FAO *et. al.* (2022).

wages and food prices<sup>69</sup>. In addition to **facilitating access to foods** such as vegetables, fruit, and herbs, UA also enables the preservation and storage of food, contributing to a more diverse and healthy diet<sup>70</sup>.

Despite its potential to improve food and nutrition security, especially in low- and middle-income urban areas and for vulnerable groups in wealthier countries, more than urban agriculture alone will be needed to solve food and nutrition insecurity globally. However, as **part of a broader effort** to transform food systems, UA plays an important role.

Various studies (Box 3) have shown that urban cultivation reduces food costs, allowing families to direct their resources to other essential needs<sup>71</sup>. In many cases, increased vegetable consumption significantly improves the availability of fresh food and the nutritional quality of meals. This impact is especially relevant for women, who represent 65% of urban farmers globally<sup>72</sup>. Budget savings are another benefit observed in practice.<sup>73</sup>

### ***Box 3 – Empirical evidence: successful cases of urban agriculture***

In Kenya, **40% of urban farmers** said that without the possibility of farming, they would face hunger<sup>74</sup>. In Buea, Cameroon, **66% of the farmers** interviewed considered UA to be the main source of calories for their families<sup>75</sup>. Farmers in Kibera, a slum in Nairobi, reported that urban agriculture guarantees a **constant source of food**, which protects them from food crises. These farmers rated their **families as more secure** compared to those who did not practice UA<sup>76</sup>.

Other evidence also highlights the benefits of community gardens in combating food insecurity **in low-income and mostly black neighborhoods**, especially in food deserts<sup>77</sup>, taking advantage of vacant lots. These gardens improve access to fresh food, benefiting vulnerable groups such as **students and the elderly**, as well as promoting **food acceptance through education and cultural exchange**. In addition, they contribute to sustainability by increasing biodiversity, supporting **local markets** and promoting equity by ensuring **equal access to nutritious food** for marginalized communities<sup>78</sup>.

### ***Box 4 – Urban agriculture in Havana: a popular response to the crisis***

In the 1990s, in response to food shortages in Cuba after imports from the Soviet Union were cut off, Havana's citizens began planting food in different available spaces, including terraces, patios and vacant lots. The government supported this popular initiative and, in 1994, created the Department of Urban Agriculture, implementing strategies such as legalizing the use of public land, training community agents to promote gardens, creating "seed houses" to provide resources and creating infrastructure for direct sales at farmers' markets. By 1998, Havana already had more than 8,000 recognized gardens, responsible for around 50% of the country's vegetable production, all organic.

On a global scale, it is estimated that UA produces between 100 and 180 million tons of food annually, corresponding to 5% to 10% of the production of legumes, tubers, and vegetables<sup>79</sup>. With the proper incentives and political structuring, there is great potential to significantly increase this volume, as shown by the Cuban example in Box 4.

<sup>69</sup> Zezza and Tasciotti (2010).

<sup>70</sup> Poulsen et al. (2015).

<sup>71</sup> Poulsen et al. (2015).

<sup>72</sup> Orsini et al. (2013); Poulsen et al. (2015).

<sup>73</sup> Poulsen et al. (2015).

<sup>74</sup> Memon & Lee-Smith (1993).

<sup>75</sup> Ngome & Foeken (2012).

<sup>76</sup> Gallaher et al. (2013).

<sup>77</sup> Food deserts are places where access to fresh or minimally processed food is scarce or impossible, forcing people to move to other regions to obtain these items, which are essential for a healthy diet (Instituto Brasileiro de Defesa do Consumidor, 2019).

<sup>78</sup> Jardim (2024).

<sup>79</sup> Poulsen et al. (2015).

# Towards Greener and Fairer Cities

With multifunctionality as a key element in the concept, urban agriculture offers a range of benefits for cities of all sizes and profiles. UA can be understood as a **nature-based solution** capable of contributing to a more resilient, fair, and local food and urban system<sup>80</sup> while at the same time promoting community mobilization. It fosters better relations and interactions between inhabitants and influences social articulation and participation in solving community problems<sup>81</sup>.

## Box 5 – Nature-based solutions (SbN)

**Nature-based solutions (NBS)** is an umbrella concept that includes different interventions developed in urban centers from nature, in which natural ecosystem processes are reproduced to deal with problems related to the environment, such as floods, heat islands, landslides.

In this sense, many practitioners see urban agriculture as a way of reappropriating public and unused spaces, defending the values of agroecology and organic farming, valuing traditional knowledge and the collective management of spaces. It is also a new way of connecting with cities and other citizens<sup>82</sup>.

In addition, the diversity of the population involved fosters the construction of knowledge, skills, and the exchange of experiences and wisdom, contributing to social inclusion<sup>83</sup>. The UA also ensures proximity to markets and shortens the value chain, bringing consumer centers closer together and reducing the number of intermediaries or eliminating them when production is destined for self-consumption or direct sale to the end consumer<sup>84</sup>.

Translated into the language of the 2030 Agenda, the UA has the potential to promote some of the sustainable development goals, as exemplified below:

TABLE 6 / Illustrative list of the relationship between the SDGs and urban agriculture <sup>85</sup>		
SDG		RELATIONSHIP WITH URBAN AGRICULTURE
1	Eradicating poverty	Urban agriculture can create jobs and provide fresh food for vulnerable families, contributing to food security and income generation.
2	Zero hunger and sustainable agriculture	It promotes resilient and fair food systems, encouraging the consumption of fresh and minimally processed foods, supporting food and nutritional security.
3	Health and well-being	It contributes to physical and mental health by providing healthy food and promoting outdoor activities, reducing stress and improving well-being.
4	Quality education	It acts as an educational tool, promoting environmental and food education through school and community gardens, in line with emancipatory pedagogical practices.

<sup>80</sup> Bertolini *et al.* (2024).

<sup>81</sup> Batitucci *et al.* (2019).

<sup>82</sup> Nagib, (2024).

<sup>83</sup> Batitucci *et al.* (2019).

<sup>84</sup> Centro de Estudos em Sustentabilidade da FGV de São Paulo (FGVces) (FGVces), (n.d.).

<sup>85</sup> Bertolini *et al.* (2024); Centro de Estudos em Sustentabilidade da FGV de São Paulo. (n.d.) (FGVces)(n.d.).

5	<b>Gender equality</b>	It promotes social inclusion and empowerment, especially of women, by creating opportunities for leadership and financial autonomy through urban agriculture.
8	<b>Decent work and economic growth</b>	Creating local jobs and supporting the local economy, especially in times of economic crisis, by offering an alternative source of income and financial security.
10	<b>Reducing inequalities</b>	It reduces inequalities by providing access to fresh, healthy food in low-income communities, promoting social and economic justice.
11	<b>Sustainable cities and communities</b>	It contributes to urban sustainability by reducing environmental impact, improving the microclimate and managing natural resources efficiently.
12	<b>Sustainable production and consumption</b>	It promotes sustainable production and consumption practices, such as composting and growing local food, reducing waste and the ecological footprint.
13	<b>Action against global climate change</b>	It works to mitigate and adapt to climate change, reducing greenhouse gas emissions and increasing urban resilience against extreme weather events.
15	<b>Terrestrial life</b>	It fosters urban biodiversity by promoting the cultivation of a variety of food plants, including native and unconventional species.
17	<b>Partnerships and means of implementation</b>	It facilitates community partnerships and intersectoral collaborations, strengthening the capacity to implement sustainable and resilient practices.

UA is a promising solution, but its success depends on robust institutional support, the implementation of appropriate public policies, and coordination with other strategies for building more sustainable cities<sup>86</sup>.

## Overcoming Implementation Challenges: Paving the Path Forward

Despite the numerous benefits that urban agriculture offers, it faces a number of challenges that must be considered when formulating policies on the subject. These obstacles are wide-ranging and involve socio-cultural, legal, political, and economic issues<sup>87</sup> and relate to<sup>88</sup>:

- I. **Cultural prejudices and institutional barriers:** gender, ethnic, and class inequalities, as well as a lack of attention from decision-makers, can limit access to and support for urban agriculture;
- II. **Difficulty accessing resources:** conflicts related to land use, access to water, tools, seeds, seedlings, and financing are recurring obstacles for urban farmers;
- III. **Specific urban risks:** contamination by pollution, vandalism, and gentrification are inherent risks when farming in urban areas;
- IV. **Organizational challenges:** the lack of support networks, technical expertise in agriculture and management, and limited access to crucial information hinder the implementation and sustainability of initiatives.

Two critical points are worth highlighting: **land ownership** and the **professionalization of the activity**. In rural areas, agricultural production areas are mostly private properties officially designated for agriculture, and

<sup>86</sup> Poulsen et. al. (2015).

<sup>87</sup> Feldmann et. al. (2023).

<sup>88</sup> Jardim (2024).

producers are experienced professionals. In contrast, in cities, many urban farmers have yet to gain experience, and their practices are limited in scale and marketing<sup>89</sup>.

In addition, a large part of the areas used for urban agriculture belong to the public sector, are part of the green infrastructure, or consist of abandoned private land. This situation creates instability, as spaces are not always available, and farmers depend on resources and technical support often provided by social movements, universities, or governments<sup>90</sup>.

Overcoming these challenges requires a collaborative approach between all stakeholders, coupled with a legal framework that offers stability. Partnerships that promote technical and operational knowledge are also essential for the success and sustainability of urban agriculture initiatives.

---

<sup>89</sup> Feldmann *et. al.* (2023).

<sup>90</sup> Feldmann *et. al.* (2023).



## Why Does Agroecology Matter?

When poorly implemented, with **inadequate practices, and disconnected from ecological principles**, urban agriculture can negatively impact human health and the environment. Problems such as soil pollution and improper use of natural resources can be aggravated, compromising its potential benefits<sup>91</sup>.

Thus, considering urban agriculture as a solution is the first step; for it to be effective, it must be guided by the approach proposed by **agroecology**. From this integration, UA can become a policy that respects both the environment and people, promoting a new vision of food and cities.

### Agroecology: Reflecting on the Past to Shape a Sustainable Future

Agroecology is based on **techniques and practices inspired by ancestral knowledge**, including the knowledge of indigenous peoples, the African diaspora, and other traditional communities. These groups, which have for centuries shown resilience to socio-environmental changes, show that it is possible to build a **more sustainable** agriculture **capable of mitigating the impacts of climate change** while **preserving biodiversity and natural resources**<sup>92</sup>.

Agroecology also puts **people at the center of** initiatives, promoting **social equity**. It empowers farmers and local communities to manage their food systems, strengthening autonomy and contributing to better health outcomes and social justice<sup>93</sup>.

Recently, agroecology has gained more prominence, especially after being recognized by international bodies. In 2019, the High-Level Panel of Experts on Food Security and Nutrition (HLPE) consolidated the "**13 agroecological principles**", which summarize the essential characteristics of a production that adopts the approach:

TABLE 7 / Principles guiding the transformation of food systems through agroecology <sup>94</sup>	
Improving resource efficiency	
Recycling	Preferably use renewable local resources and close the nutrient and biomass cycles as far as possible.
Reducing inputs	Reduce or eliminate dependence on purchased inputs and increase self-sufficiency.

<sup>91</sup> Orsini *et. al.* (2013).

<sup>92</sup> Frontiers Research Topic, (n.d.); Schipanski & Blesh (2024).

<sup>93</sup> FAO (2018-b); FAO (2024).

<sup>94</sup> HLPE, 2019.

Strengthening resilience	
<b>Soil health</b>	Ensure and improve the health and functioning of the soil for better plant growth, especially by managing organic matter and increasing the soil's biological activity.
<b>Animal health</b>	Ensure the health and well-being of animals.
<b>Biodiversity</b>	Maintain and increase species diversity, functional diversity and genetic resources, and thus preserve the overall biodiversity of the agro-ecosystem in time and space, at field, farm and landscape levels.
<b>Synergy</b>	Increase positive ecological interaction, synergy, integration and complementarity between the elements of agro-ecosystems (animals, crops, trees, soil and water).
<b>Economic diversification</b>	Diversify income from agricultural production, ensuring that small farmers have greater financial independence and opportunities to add value, allowing them to respond to consumer demand.
Ensuring equity/social responsibility	
<b>Co-creation of knowledge</b>	promote the co-creation and horizontal sharing of knowledge, including local and scientific innovation, especially through exchanges between farmers.
<b>Social values and diets</b>	Build food systems based on the culture, identity, tradition, social and gender equity of local communities, which provide healthy, diverse, seasonal and culturally appropriate diets.
<b>Justice</b>	Support dignified and robust livelihoods for all actors involved in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.
<b>Connectivity</b>	Ensure proximity and trust between producers and consumers by promoting fair and short distribution networks, reintegrating food systems into local economies.
<b>Governance of land and natural resources</b>	Strengthen institutional arrangements to improve recognition and support for family farmers, smallholders and peasant food producers as sustainable managers of natural and genetic resources.
<b>Participation</b>	Encourage social organization and greater participation of food producers and consumers in decision-making to support decentralized governance and adaptive local management of agricultural and food systems.

By integrating ecological, social, and economic aspects, agroecology promotes solutions beyond agricultural production. It involves the entire food chain and strengthens resilience and equity in food practices and policies<sup>95</sup>.

## Agroecological Transition: Paving the Way to a Fair Food Future

Achieving a food system based on agroecology depends on an agroecological transition. This transformation process is continuous, dynamic, and multilinear and does not occur instantaneously but through progressive stages. Although agroecology has many benefits, it requires a profound reorganization of agricultural practices and the social relationships involved.

The transition process can be divided into five levels:<sup>96</sup>

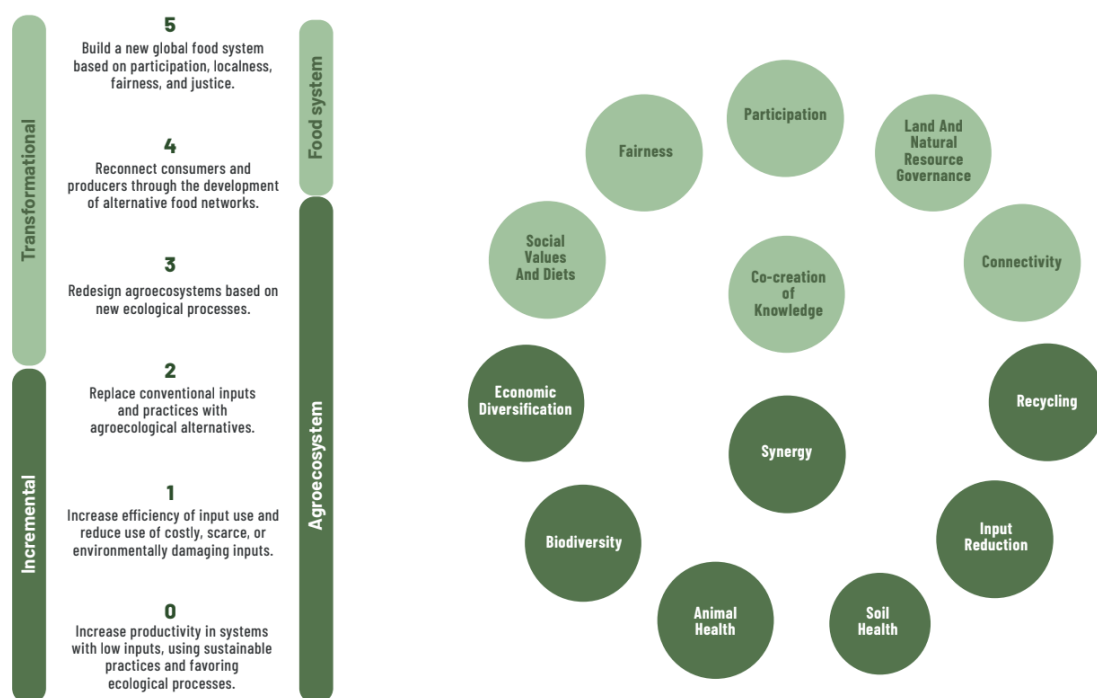


Figure 4 | The five levels of agroecological transitions with the principles adapted from Gliessman levels and the 13 principles of Agroecology (HLPE)<sup>97</sup>

This framework can serve as a guide to inform policies and direct funding, positioning agroecology as a priority in redesigning food systems. It is important to emphasize that this process does not have a definitive end, as agroecology adapts to each historical moment's social and ecological changes, with new management and organizational forms emerging over time and from generation to generation<sup>98</sup>. The same applies to urban agriculture.

## Urban Agroecology: Redefining Agriculture for a New Urban Experience

Although agroecology is commonly associated with agricultural practices in rural areas, its guidelines can be adapted to the urban context<sup>99</sup>, giving rise to the concept of Urban Agroecology (UA+), a proposal for urban agriculture in line with what agroecology proposes and capable of enhancing its benefits and increasing productivity, reducing dependence on global markets, diversifying diets in urban areas, reducing greenhouse gas emissions, as well as production costs<sup>100</sup>.

<sup>95</sup> HLPE (2019).

<sup>96</sup> Gliessman (2016).

<sup>97</sup> CGIAR (2023).

<sup>98</sup> Caporal (2020).

<sup>99</sup> Altieri & Nicholls (2018).

<sup>100</sup> Pimbert, 2017; Aquino & Assis (2007).

Regarding productivity, recent studies show that conventional urban agriculture can produce between 1.5 and 6 kg of food per square meter, but urban agroecology can generate 15 to 20 kg in the same area<sup>101</sup>.

In addition, urban agroecology creates green areas in cities, mitigating environmental impacts such as drainage problems, flooding, and heat islands, as well as regenerating degraded areas and contributing to better environmental management<sup>102</sup>.

On the social and political side, it promotes a deeper reflection on the use of urban space. It offers solutions that respect local ecosystems while building solidarity markets and short consumption chains<sup>103</sup>. This strengthens the fight for the right to adequate food and to the city, creating support networks that offer alternatives to the conventional food system<sup>104</sup>.

---

<sup>101</sup> Altieri & Nicholls (2018).

<sup>102</sup> Valdiones (2013).

<sup>103</sup> Costa *et al.* (2024).

<sup>104</sup> Tornaghi & Hoekstra (2017); Deh-Tor, 2017.

# Chapter 03

## What Can Southern and Northern Practices Teach?

There is an imaginary line that divides countries around the globe, especially considering economic and social aspects. The terminology adopted may vary, but it is common to see terms such as **"developed and developing countries"**, **"countries of the North and South,"** and **"high, middle or low-income countries,"** reflecting different ideological and economic alignments<sup>105,106</sup>.

According to the World Bank's classification, **Brasil and Germany are in different categories:** while Germany is considered a high-income country, Brasil is upper-middle income<sup>107</sup>. In addition to income, the marked **cultural differences** between North and South create specific challenges and opportunities for each country<sup>108</sup>. In this sense, before exploring the examples of urban agriculture and agroecology practices selected, it is important to briefly contextualize UA from each country's perspective.

### Urban Agriculture in Brazil: From Agroecology to Food Security

In Brasil, debates on urban agriculture intensified in the 1990s, especially through the work of civil society organizations linked to agroecology, which disseminated both practices in the country<sup>109</sup>, promoting a direct connection between them<sup>110</sup>. In the 2000s, the agenda gained even more strength, especially with the start of the Zero Hunger program. This policy considered UA as a strategy to be adopted in the repertoire of initiatives related to guaranteeing food security<sup>111</sup>.

During this period, the concept of urban agriculture was developed in conjunction with social mobilization processes, public policy formulation, and knowledge on the subject. This explains why in Brasil, unlike in other countries, urban agriculture is institutionalized and reflects the diversity of subjects and practices in everyday life, especially the protagonism of black women and peripheral territories. These initiatives are connected to the knowledge and cultural expressions of native peoples and the African diaspora, creating a direct link between food production in cities and the cultural legacy of these peoples<sup>112</sup>.

---

<sup>105</sup> Khan *et. al.* (2022).

<sup>106</sup> While useful for economic analysis, these categories can oversimplify the complexity of national realities and mask internal inequalities, suggesting the need for a more nuanced approach in the discussion of global development. To find out more, we recommend reading Amartya Sen's "Development as Freedom" (2010).

<sup>107</sup> World Bank Group (2023).

<sup>108</sup> Genaro (2019).

<sup>109</sup> Adil *et. al.* (2023).

<sup>110</sup> Costa *et al.* (2024).

<sup>111</sup> Silva (2014).

<sup>112</sup> Adil *et. al.* (2023).



## Box 6 – Main movements and articulations related to UA in Brasil

The main movements and organizations responsible for promoting urban agriculture in Brasil are:

- \* **ABA** – Brazilian Agroecology Association
- \* **ANA** – National Articulation of Agroecology
- \* **AS-PTA** – Family Farming and Agroecology
- \* **Cepagro** – Center for the Study and Promotion of Group Agriculture
- \* **Consea** – National Council for Food and Nutrition Security
- \* **FBSSAN** – Brazilian Forum for Food Sovereignty and Security
- \* **MTST** – Movement of Homeless Workers
- \* **Rede** – Alternative Technology Exchange Network
- \* **Ecovida** Agroecology Network

Regarding the **terminology** adopted, urban agriculture practices can be found under various names: community or pedagogical gardens, production units, urban and peri-urban farms, and agroecological squares. The name given varies according to the group practicing it, the territory or municipality it is located, and the intended objectives, reflecting its multifunctionality<sup>113</sup>.

The federal government has dedicated itself to creating legal frameworks capable of providing guidelines that enable municipalities to integrate urban agriculture into their policies and projects. Table 8 lists the main mechanisms developed and supported by the Brazilian government, which can serve as interesting examples for the institutionalization of UA in other countries:

TABLE 8 / Main instruments related to urban agriculture in Brasil	
Document	Objective
<b><u>National Urban and Peri-Urban Agriculture Program</u></b> Decree No. 11.700/2023	It aims to promote food and nutritional security, socio-economic inclusion and environmental sustainability in cities. The program involves agricultural activities in urban and peri-urban areas, aimed at producing healthy food and managing waste. It will be implemented by various ministries and encourages climate adaptation actions, social participation, and female and youth empowerment. It also provides for the inclusion of urban farmers in the National Family Farming Register.
<b><u>National Policy for Urban and Peri-urban Agriculture</u></b> Law no. 14.935/2024	It promotes agricultural and livestock production in urban and peri-urban areas to improve food security, generate income and occupy idle spaces. The law encourages agroecological and organic production, waste recycling and the sustainable use of water, as well as integrating this production into public supply programs, such as schools and hospitals. It provides for cooperation between governments and civil entities to provide technical assistance, credit and create direct marketing fairs between urban farmers and consumers.
<b><u>Municipal agendas urban agriculture and</u></b>	Developed by FGVces, TEEB Agriculture & Food/UNEP and the Ministry of Citizenship, it responds to the demand from Brazilian municipalities for <b>conceptual and methodological guidance on urban</b>

<sup>113</sup> Centro de Estudos em Sustentabilidade da FGV de São Paulo (FGVces), (n.d.).

<p><b><u>peri-urban: a guide to incorporating agriculture into urban planning processes</u></b><sup>114</sup> (in English)</p>	<p><b>and peri-urban agriculture (UPA).</b> In addition to systematizing the literature and practices in Brazilian cities, the Guide highlights the potential of UPA to tackle urban challenges, emphasizing that its benefits are achieved when UPA is treated as a strategic agenda, with the gradual development of policies and the strengthening of local initiatives.</p> <p>In this document there are clear instructions for characterizing urban agriculture according to location, motivation, land situation, size, management structure, financial resources and workforce, which can help public managers identify the clearest profiles of urban agriculture in their respective municipalities.</p>
<p><b><u>National Policy on Agroecology and Organic Production (PNAPO)</u></b> Decree 7794/2012</p>	<p>Its aim is to integrate, articulate and adapt policies, programs and actions that induce agroecological transition and organic and agroecological-based production, contributing to sustainable development and the population's quality of life, through the sustainable use of natural resources and the supply and consumption of healthy food.</p>
<p><b><u>National Plan for Agroecology and Organic Production (Planapo)</u></b></p>	<p>Also known as Ecological Brasil, it is one of the instruments of the National Policy on Agroecology and Organic Production. Its objective is to articulate and implement programs and actions that induce agroecological transition, organic and agroecological-based production, as a contribution to sustainable development, enabling the population to improve their quality of life through the supply and consumption of healthy food and the sustainable use of natural resources.</p>

With the support of these documents, the Brazilian government has established a **clear concept of urban agriculture**, positioning it as an efficient strategy for facing the challenges of intensive urbanization and guaranteeing food security for vulnerable urban populations, and **encouraging agroecology**, establishing clear criteria and parameters for the agroecological transition.

Synthesizing the knowledge that has been produced in the country, urban agriculture in the Brazilian context can be understood in three main approaches<sup>115</sup>:

- \* **Emergency and anti-hunger approach:** focused on income generation and reducing food insecurity, UA acts as an emergency solution for low-income families and individuals, offering a quick way to improve access to food.
- \* **Environmental and social approach:** integrated with sustainable urban solutions, UA contributes to an increase in green areas, greater biodiversity, and solutions for adapting to climate change. It promotes more efficient use of urban land, creating greener and more resilient city spaces.
- \* **Political and food sovereignty approach:** this perspective values autonomy and traditional knowledge, tied to the agroecological movement, reaffirming the right to the city and to food. It promotes practices that not only produce food but also strengthen the bond between citizens and their territory.

With this strong connection between urban agriculture and agroecology, Brasil has made progress in creating a legal and theoretical framework that strengthens these practices as essential tools for sustainable urban development. Through the support of social movements and national organizations, the country has united the efforts of activists and public managers, creating a favorable scenario for advancing urban agroecology, as seen in the following cases.

<sup>114</sup> Centro de Estudos em Sustentabilidade da FGV de São Paulo (FGVces), (n.d.).

<sup>115</sup> Costa *et al.* (2024).





**Brazilian  
cases**



# Belo Horizonte

## Advancing Equitable and Sustainable Urban Agriculture<sup>116</sup>

© Luiz Felipe Faria



### About the Municipality

Belo Horizonte, known affectionately as BH, is the capital of the state of Minas Gerais and is located in the southeastern region of Brasil. With a population of 2,315,560 (2022), it is the sixth most populous city in the country, and its HDI is 0.810 (2010)<sup>117</sup>. It stands out for being the first modern planned city in Brasil and for having 100% of its territory considered urban. The city is a synthesis of Minas Gerais culture, reflecting the traditions, history, gastronomy, and hospitality characteristic of the state<sup>118</sup>.

### Contextualization of Urban Agriculture

At the beginning of the 1990s, Brasil faced a severe economic crisis that made food prices unsustainable for many of the population. In Belo Horizonte, 11% of inhabitants lived in poverty, and 20% of children were food insecure. In response to this situation in 1993, the city implemented a food security policy based on the human right to adequate food<sup>119</sup>. This policy prioritized universal access to food and food security as a public responsibility, changing the logic of food shortages as the object of charity or purely emergency actions.

In this context, the municipality's urban agriculture policies were developed. Initially focused on food supply, they evolved into a more integrated approach to food security and agroecology. The implementation of school and community gardens became a fundamental part of this strategy, promoting not only access to healthy food but also education and community engagement.

<sup>116</sup> All data and quotations, unless expressly stated otherwise, come from statements made by the municipality itself, either in interviews or on a form filled out exclusively for this research between June and August 2024.

<sup>117</sup> IBGE (2022).

<sup>118</sup> G20, (n.d.)

<sup>119</sup> IPES-Food (2017)





© Patrícia Nogueira. PBH

## Program Overview

Belo Horizonte has a wide network of initiatives related to urban agriculture, especially the Community Collective Production Units (CCP). CCP are community gardens where the citizens themselves carry out the production and management of the space. Created to meet the demand for food in the city and make use of idle land for production, the CCP allow groups of at least three families to register annually, indicate the area to be cultivated, and, after a selection process, receive the land for a minimum period of five years, which can be renewed.

The municipality provides support through the transfer of land, training, technical assistance, input donation, and marketing support.

<b><u>Number of Collective Production Units</u></b>  61 CCP	<b><u>Monthly Production</u></b>  It is estimated that 2.62 tons of food are produced each month <sup>120</sup> . However, there is no municipal methodology for monitoring production.	<b><u>Municipal budget</u></b>  R\$4,804,284.00 in 2024.
<b><u>People involved</u></b>  481 <sup>121,122</sup>		<b><u>Cost of reproducing a unit<sup>123</sup></u></b>  R\$6.83 per square meter.

<sup>120</sup> Instituto Escolhas (2022).

<sup>121</sup> AUÊ Estudos de Agricultura Urbana & Prefeitura Municipal de Belo Horizonte (2022).

<sup>122</sup> Families, surrounding communities, employees, volunteers and users were counted.

<sup>123</sup> The amount estimated for reproduction refers to an estimate of the amount that the public authorities would need to spend to set up a new CCP in the context of Belo Horizonte. The budget forecast above is more comprehensive and concerns the budget allocation for the entire department.

## Political and Legislative Structure

The management of urban agriculture in Belo Horizonte is coordinated by the Department for the Promotion of Agroecology, Urban Family Farming, and Urban Agriculture, which is part of the Undersecretariat for Food and Nutritional Security.

The Urban Agriculture Incentive Program, established in 2011 by Municipal Law No. 10.255<sup>124</sup>, has the following main objectives:

- \* Support and expand agroecology initiatives in dialog with family farming;
- \* Promoting the construction of healthy and sustainable food systems;
- \* Contribute to the fulfillment of the city's social functions through the use of productive or underutilized areas;
- \* Support networks, collective action fronts, and local initiatives that promote agroecology in the municipality.

## Production Destination

The destination of the food varies according to the type of garden. In general, the main consumers are the farmers themselves and their families. In some cases, the produce is marketed to the local community, the Urban Agriculture Fair promoted by the city council, or the Food Acquisition Program. In addition, part of the produce is donated to the Food Bank.



© Amira Hissa. PBH.

<sup>124</sup> Belo Horizonte (2011); Belo Horizonte (2023).



## Socio-Cultural Aspects

The CCP s primarily serve vulnerable groups, such as peripheral populations, the elderly, young people at risk, and LGBTQIA+ people. In most of the gardens, most of the public are women and people over 60. Some units are located in Territories of Local Traditions, such as *Quilombos*<sup>125</sup>, *Terreiros*<sup>126</sup>, and Romani settlements, reinforcing the importance of urban agriculture in preserving and valuing traditional cultures<sup>127</sup>.

Belo Horizonte has seen a positive impact on participants' mental health, with some accounts showing that UA has given farmers a sense of purpose and emotional well-being, boosting self-esteem and promoting mental health.

*"We have countless reports that we deal with, of people who have gone to redeem their lives through urban agriculture. Rescuing their lives in the broadest sense possible: part of mental health, part of economic integration, learning a trade, rescuing a trade. After all, we're talking about Belo Horizonte, which is a city of migrants, mainly from the interior of the state. So, we have this very, very latent dimension."*

Wagner Chagas / Belo Horizonte City Hall employee.

## Agroecological Aspects

The law mentioned above establishing the Policy contains a legal provision stating that the initiatives promoted by the municipality must be agroecological. In this sense, the city supports agroecological training through the **Trails of Agroecology** (Trilhas da Agroecologia) program, which in 2023 trained more than 1,300 people. Currently, 88% of the units have productions that can be classified as agroecological, while the remaining 12% are in the process of transition<sup>128</sup>.

Belo Horizonte's policy seeks to promote agroecology as a tool to strengthen intersectionalities between different communities, considering issues such as social inclusion, gender equity, and the empowerment of marginalized populations. The primary agroecological references used in the construction of the policies are the teachings of Miguel Altieri<sup>129</sup> and Ana Primavesi<sup>130</sup>, complemented by traditional knowledge and the experiences of the community itself.

<sup>125</sup> A **quilombo** is a community formed by descendants of enslaved Africans who escaped slavery in Brazil and created settlements in isolated areas. During Brazil's colonial and imperial periods, many enslaved people fled from plantations and gathered in quilombos, which were spaces of resistance, preservation of African culture, and the pursuit of freedom. The most famous of these was **Quilombo dos Palmares**, led by **Zumbi**. Today, quilombos are recognized for contributing to Brazil's cultural diversity, and many of these communities still exist, protecting their traditions and rights.

<sup>126</sup> A **Terreiro** is a sacred place where ceremonies and rituals of African-based religions, such as **Candomblé** and **Umbanda**, are held. These religions were brought to Brazil by enslaved Africans. Terreiros are spaces dedicated to spiritual practice, the celebration of the **Orixás** (deities), and the worship of ancestors. These places function as temples, community centers, and cultural schools, where African heritage is preserved and passed on through dances, songs, offerings, and rituals.

<sup>127</sup> Instituto Escolhas (2022).

<sup>128</sup> AUÊ Estudos de Agricultura Urbana, & Prefeitura Municipal de Belo Horizonte (2022).

<sup>129</sup> [Find out more about Prof. Miguel Altieri.](#)

<sup>130</sup> [Find out more about Prof. Ana Maria Primavesi.](#)



© Daniel Morais. PBH.

## Lessons Learned

- \* **Continuity of public policies:** Belo Horizonte's experience demonstrates the importance of transforming public policies into state policies, guaranteeing their continuity regardless of political or management changes. This awareness must involve both society and civil servants and is essential for the permanence and evolution of initiatives.
- \* **Social and international recognition:** local support and global recognition have strengthened the legitimacy of the policies. The city is widely recognized for its food security initiatives, which integrate international networks such as the Milan Pact and serve as a reference in Brasil and beyond.
- \* **Physical milestones that perpetuate the policy:** structures such as popular restaurants, market stalls, and community gardens are concrete examples that demonstrate the lasting impact of policies and perpetuate their achievements in the urban landscape.
- \* **Education and training:** programs such as **Trails of Agroecology** have been fundamental in disseminating agroecological practices. The "Peasant to Peasant to Peasant" methodology allows farmers to act as multipliers of knowledge in their communities.
- \* **Integration with other public policies:** urban agriculture integrates various dimensions of public policies, such as combating hunger, promoting mental health, economic integration, and education. Initiatives such as school and community gardens involve children in healthy eating and sustainability.
- \* **Partnerships with Academia:** collaboration with the Federal University of Minas Gerais (UFMG), through AUÊ —the Urban Agriculture Study Group, has been essential in strengthening and giving visibility to urban agriculture initiatives. This partnership promotes technical and scientific knowledge exchange between universities, the community, and public authorities.
- \* **Intra-governmental coordination:** one of the main challenges is to improve integration between the various government sectors. The need for coordination between public bodies still hinders the efficient implementation of urban agriculture projects.

- \* **Economic insertion of urban farmers:** obstacles such as market access and product marketing persist due to logistical and infrastructure limitations. Technical assistance and logistical support still need to be improved, restricting farmers' participation in fairs and the sustainable sale of their products.
- \* **Budget constraints:** Budget constraints affect areas such as technical assistance, inputs, and logistics, limiting the scope of the programs. Funding depends on municipal resources and parliamentary amendments.
- \* **Agroecological transition:** Although significant progress has been made, fully adopting agroecological practices in all production units still faces challenges. Pesticide-free production is progressing but has not yet been fully achieved.

*"When a policy proves to be important, receives support and recognition from society, this generates mobilization around it. This recognition, both locally and internationally, as well as the support of civil servants, is what sustains and strengthens the continuity of these policies."*

Bruno Starling / Belo Horizonte City Hall employee.

## Conclusion

Belo Horizonte's experience in promoting urban agriculture by integrating agroecological practices, combined with the active participation of society and institutional support, demonstrates that, with continuity and adaptation, it is possible to create resilient food systems that promote social inclusion and strengthen communities. However, challenges such as budget limitations, intra-governmental coordination, and the complete transition to agroecology indicate that the path to improving policies still requires continuous efforts. Collaboration between public authorities, academia, and communities has been fundamental. Belo Horizonte's trajectory reflects the importance of policies that adapt to local needs, contributing to a fairer, healthier, and more sustainable future.





© Patricia Nogueira. PBH

## To Learn More

- \* [Urban Agriculture Productive Units](#): A study by the Instituto Escolhas explores urban agriculture policy in Belo Horizonte.
- \* [Information on Belo Horizonte's Urban Agriculture Collective/Community Productive Units](#): Material that presents data on CCP s in the municipality by garden and region.

# Curitiba

## Fostering Innovation and Empowering Self-Sufficiency in Urban Agriculture <sup>131</sup>

© Yes Drone/Shutterstock.com



## Overview of the Municipality

Curitiba, the capital of the state of Paraná, located in the southern region of Brasil, stands out for its innovative and sustainable urban planning. With a population of 1,773,718 (2022), it is the eighth largest city in the country and has an HDI of 0.823 (2010)<sup>132</sup>, considered very high. Known as the "Ecological Capital of Brasil"<sup>133</sup>, Curitiba is recognized for its extensive green areas, parks, and intense cultural scene and was recently voted the Smartest City in the country<sup>134</sup>.

## Contextualization of Urban Agriculture in the Municipality

Since the 1970s, Curitiba has been a pioneer in urban planning, prioritizing environmental integration, mobility, and the efficient use of urban areas. Urban agriculture (UA) was introduced in 1986 with the *Lavoura* and *Nosso Quintal* programs, which aimed to implement vegetable gardens in urban voids and small spaces in the city<sup>135</sup>. These programs evolved into the current Urban Agriculture Program, which understands agricultural practices in the town as a nature-based solution capable of guaranteeing the local supply of food without pesticides, using urban spaces in an orderly and sustainable manner, and promoting the municipality's food resilience<sup>136</sup>.

<sup>131</sup> All data and quotations, unless expressly stated otherwise, come from statements made by the municipality itself, either in interviews or on a form filled out exclusively for this research between June and August 2024.

<sup>132</sup> IBGE, (n.d.).

<sup>133</sup> Federal University of Paraná (n.d.).

<sup>134</sup> Paraná State Tourism Office, (n.d.).

<sup>135</sup> Instituto Escolhas (2022).

<sup>136</sup> Information provided by Curitiba City Hall in June 2024.



# Program Overview

The Urban Agriculture Program supports the creation and maintenance of institutional spaces and idle land, whether public or private, for the production of pesticide-free food. The main objective is to guarantee food and nutritional security while simultaneously making planned use of urban voids. In the background, the program promotes social inclusion, income generation, environmental protection, and recovery, as well as offers food and sustainability education.

The policy classifies gardens into three categories: **school, institutional, and community**. Focusing on community gardens, implementing a new unit begins with a formal request, requiring the engagement of at least ten people, and requests are answered on a first-come, first-served basis. When a garden is selected for implementation, the municipality offers technical and material support, including an agronomic assessment of the space, land transfer (with a 5-year term for public land), as well as training for the management group and volunteers through the courses and training available at Fazenda Urbana<sup>137</sup>.

During the first year, the gardens are considered "in care". During this period, the municipality provides inputs such as soil, fertilizer, seedlings, seeds, and technical assistance at pre-established intervals. After a year and an assessment of technical capacity, ongoing support is suspended. From then on, the gardens are classified as "implemented" and citizens assume full responsibility for maintenance and costs. However, even after implementation, producers can still participate in training and occasionally request inputs. Given the high demand for new gardens, the municipality considers this transition essential to implement more units.

<b><u>Number of community gardens</u></b>	<b><u>Monthly Production</u></b>	<b><u>Municipal budget</u></b>
50	Community gardens produce 172.4 tons of food a month <sup>138</sup> . The municipality has its own methodology, which considers the useful planting area and the estimated production per m².	Not informed.
<b><u>Number of beneficiaries</u></b>		<b><u>Reproduction costs</u></b>
481 <sup>139,140</sup>		R\$60 m², taking into account the inputs for implementing and maintaining the garden for 1 year.

<sup>137</sup> A space dedicated to the education of sustainable agricultural practices in cities. More in "Agroecological aspects".

<sup>138</sup> Instituto Escolhas (2022); Information provided by Curitiba City Hall in June 2024.

<sup>139</sup> AUÊ Estudos de Agricultura Urbana & Prefeitura Municipal de Belo Horizonte (2022).

<sup>140</sup> Families, surrounding communities, employees, volunteers and users were counted.





© Gabriel Dalmazo. Prefeitura de Curitiba.

## Political and Legislative Structure

The program is managed by the Municipal Secretariat for Food and Nutritional Security. It has a well-defined operational structure and stable, formally established rules.

The policy's legal instrument is Law No. 15.300/2018, which authorizes the occupation of public and private spaces for the development of urban agriculture activities, understanding it as "*practices related to food security and sovereignty processes, the maintenance and increase of quality of life, as well as the democratization of practices and spaces, serving both the supply of the Municipality and the education of the population*"<sup>141</sup>.

## Production Destination

The food produced by the community gardens is used for **a variety of purposes**: self-consumption, direct sale in the neighborhood, donations to vulnerable communities or food banks, and supply to local restaurants and businesses.

<sup>141</sup> Curitiba, 2018

**Each garden decides the destination of its production**, with the majority of the food being used for self-consumption and sold directly at the garden. Although the city hall offers spaces for occasional activities in institutional markets, there is little demand from the producer.

## Socio-Cultural Aspects

The program uses urban agriculture as a tool for social transformation, rehabilitating degraded urban areas, combating violence, and strengthening the sense of community through the productive use of space. Although there are no formal initiatives to prioritize vulnerable groups in the technical support offered, in practice, the peripheral communities benefit most. In addition, input donations are restricted to vulnerable groups or non-profit institutions.

Curitiba emphasizes promoting autonomy and innovation, seeking the long-term sustainability of initiatives. The current focus is on developing entrepreneurial urban agriculture with a commercial vision that encourages entrepreneurship, offers microcredit, generates jobs and income, and stimulates short and sustainable production and markets. The city also seeks to strengthen food resilience by increasing the local fresh food supply and reducing dependence on large distribution chains.

The continuous education of communities through courses and training in sustainable practices is fundamental to the success of the AU. This education allows more people to take ownership of the techniques and start practicing them in their own contexts, expanding the impact of the policies.

*"As a nutritionist, I see people distancing themselves from the way food is produced. When you do this, you encourage urban agriculture in the city, you create a movement for people to get closer, to know where it comes from, to have this concern [about food], right? And it meets the great challenges we have in the area of food and nutrition, which is real food, fresh, minimally processed [...], especially for people who are more vulnerable."*

Natalie Alves / Nutritionist in Curitiba.

## Agroecological Aspects

Although the term **"agroecology"** is not explicitly mentioned, the legislation stipulates that food production must occur without pesticides and follow specific formats that **align with agroecological principles** and reinforce the commitment to healthy and environmentally responsible agricultural practices. In addition, the state of Paraná has the Paraná Reference Center for Agroecology - CPRA, which provides the knowledge that guides municipal policies.

The municipality also has the **Urban Farm**, a public facility that plays a central role in promoting sustainable agricultural practices and innovations. With the motto "Adopt a Practice", the Urban Farm positions itself as a reference center for new agricultural technologies, offering courses, workshops, and training so that citizens can replicate these practices in their own gardens.

The Urban Agriculture Policy also includes the **Honey Gardens** project, which promotes breeding native stingless bees. With more than 90 bee boxes scattered around the city, including in urban gardens, the project reinforces biodiversity in the town. It educates the population about the importance of bees for the preservation of ecosystems and sustainable food production.

In addition, compost use in community and school gardens is encouraged. This allows **the reuse of organic waste, closes the nutrient cycle, and promotes** soil health, a fundamental practice for sustainable agriculture.





© Gabriel Dalmazo. Prefeitura de Cutitiba.

## Lessons Learned

- \* **Self-management and local ownership:** experience with community gardens has shown that when communities take over the management of the gardens, the projects tend to be more sustainable and long-lasting. The importance of the gardens' self-sufficiency is promoted by continuous training, reducing dependence on public resources.
- \* **Urban agriculture as a tool for social transformation:** UA has proven to be a powerful strategy for rehabilitating degraded and socially vulnerable areas, transforming spaces once hotbeds of violence into productive and safe environments. Gardens help to rehabilitate idle urban spaces, reduce violence, and strengthen the sense of community.
- \* **Recognition of urban agriculture as a priority:** it is necessary to integrate UA as a central component in urban planning, not just as an occupation of idle spaces, but as a tool for transforming the urban environment and a food security strategy with well-defined criteria and parameters.
- \* **Integration with other food security policies:** integration with programs such as *Mesa Solidária*<sup>142</sup> and the Food Bank enhances social impact, ensuring that surpluses are used by vulnerable populations and reinforcing the social function of urban agriculture.
- \* **Continuous education and training:** continuous training, through the Urban Farm and other initiatives, empowers those involved, promoting sustainable practices and innovation.
- \* **Sustainability and continuity of the gardens:** after the first year of technical support. The transition to self-management is seen as essential, but communities only sometimes manage to maintain the garden without continued support from the municipality.
- \* **Growing demand for new gardens:** the growing demand for new gardens requires efficient planning to meet all requests, which can be a challenge for available resources.

<sup>142</sup> A public restaurant that serves breakfast, lunch and dinner to people living on the streets, at social risk and with food and nutritional insecurity, during the week and on public holidays.

- \* **Engaging the private sector:** although companies are interested in participating, more concrete indicators on the impact of urban agriculture initiatives are needed to attract investment and create more structured collaborations.
- \* **Social and economic inclusion:** a challenge is to promote UA as a viable economic activity and encourage entrepreneurship among urban farmers. Many urban farmers still need to see themselves as entrepreneurs, which limits the expansion of economic models within the program.

## Conclusion

Urban agriculture in Curitiba is an example of how agricultural practices can be integrated into urban life with technical competence and political structuring. The municipality has a trained team and transparent procedures for citizens and management. The highlight is encouraging innovation and entrepreneurship among urban farmers, building opportunities to create creative solutions based on their own experiences, and strengthening the community.



© Gabriel Dalmazo. Prefeitura de Curitiba.

However, despite the commitment to pesticide-free food production and the democratization of space and sustainability, a legal framework lacks to establish agroecology as an official approach. This provision in municipal legislation is essential, as it links the policy to adopting a holistic vision of urban agriculture. In the long term, this measure tends to impact both the discourse and the sustainability of the approach by binding future managers and decision-makers.

Nevertheless, Curitiba's policy model, which combines innovation, sustainability, and the promotion of entrepreneurial urban agriculture, serves as a benchmark for other cities seeking to implement similar initiatives.

## To Learn More

- \* [Urban Agriculture Program](#): A study conducted by Instituto Escolhas provides more details on the policy.
- \* [Cities100: Curitiba - Urban Voids Turn into Community Gardens](#): Study case about Curitiba's Community Gardens.



# Maricá

## Pioneering Agroecology as Brasil's First Agroecological City<sup>143</sup>

© Prefeitura de Maricá



## Overview of the Municipality

Maricá, located in the metropolitan region of Rio de Janeiro, is a coastal city with 197,277 inhabitants (2022) and an HDI of 0.765 (2010), classified as high<sup>144</sup>. The municipality is characterized by its vast countryside, rich biodiversity, and an extensive lagoon complex, as well as being home to two indigenous villages<sup>145</sup>. Thanks to its coastal location near an *offshore* oil exploration area, Maricá receives a significant amount of royalties<sup>146</sup>, which are directed towards social programs and economic development initiatives, aiming to ensure the municipality's feasibility beyond the exploration activity.

## Contextualization of Urban Agriculture in the Municipality

Maricá is traditionally known for its fishing and agricultural production. However, rapid urban growth and real estate speculation have transformed the city's profile. In response to these changes, the local government has turned to urban agriculture to revive peasant traditions, use agroecology as a central tool, and improve food and nutritional security as a secondary consequence. In this context, the municipality started a series of urban agriculture initiatives that consolidated Maricá as an "**Agroecological City**," making it a reference in Brasil and abroad<sup>147</sup>.

<sup>143</sup> All data and quotations, unless expressly referenced otherwise, come from statements made by the municipality itself or COOPERAR, either in interviews or on a form filled out exclusively for this research between June and August 2024.

<sup>144</sup> IBGE (n.d.).

<sup>145</sup> Tangari & Porpino (2023).

<sup>146</sup> Última Hora (2023).

<sup>147</sup> Tavares (2023).





© Equipe Cooperar. Maricá

## Program Overview

Urban agriculture in Maricá follows a dynamic that is different from the other municipalities mentioned earlier. There is no specific urban agriculture policy but rather a set of interconnected initiatives with a central focus on promoting agroecology in the city.

To implement these initiatives, the municipality relies on the support of the **Cooperative for Advisory Work to Social Enterprises in Agrarian Reform Settlements (COOPERAR)**. This organization acts as a technical partner in food production, developing agroecological knowledge and disseminating the concept within the city<sup>148</sup>.

The work began with two Agroecological Production Units<sup>149</sup>: one in a peri-urban area, Manu Manuela, and another in a rural area, Public Farm Joaquín Piñero<sup>150</sup>. These productive spaces are focused on food production, seedling cultivation, and the development of training, capacity-building, and knowledge exchange. Subsequently, in 2020, the Emilton Santos Agroecological Square, also known as "Praça Araçatiba" by residents, was inaugurated.

Today, these initiatives are part of the Edible Gardens project. Focusing on the Agroecological Square, this space comprises 36 garden beds, where vegetables, non-conventional edible, and medicinal plants are grown. It also serves as a venue for workshops on agroecological practices and distributing seedlings and heirloom seeds to citizens.

<sup>148</sup> Souto (2020).

<sup>149</sup> The Agroecological Production Units serve as reference centers for farmers and those studying agroecology, both nationally and internationally. In these spaces, the implementation of agroecological principles in all their dimensions merges with the educational aspect, strengthening the discussion on the future of agricultural production and the broader feasibility of this approach (PREFEITURA MUNICIPAL DE MARICÁ, 2024).

<sup>150</sup> The Municipal Public Farm, although located in a rural area, aims to enhance and promote agroecological production and local consumption, fostering food sovereignty and generating income for residents. It hosts a 2-hectare Agroecological Production Unit, designed to serve as a reference in agroecology. This space offers training sessions and exchanges on topics related to agroecology, seedling production, and heirloom seeds, and it functions as a support center for other municipal initiatives, such as the agroecological squares (TÂNGARI and PROPINO, 2023).

The food cultivated in the square is freely accessible to the community. However, harvesting is allowed according to each species' productive cycle. Although residents harvest the produce themselves, an agroecology technician is present in the square to guide management and explain the food production process.

Located in the city center, the square hosts the **Baldinho do Bem** (In a free translation, Bucket of Good) initiative, a project that promotes the culture of recycling organic waste through composting, using environmental education and the principles of the circular economy. In this initiative, residents voluntarily sign up to receive a "little bucket" and collect compostable organic waste in their homes.

Every two weeks, on Fridays during the **Circular Agriculture Friday** event, residents bring the collected material to the square and, in exchange, select and receive harvested produce and items from the **Municipal Dehydrated Products Factory**<sup>151</sup>. This process includes weighing and recording the waste, as well as discussions with the project team on related topics.

This material is composted at the Agroecological Unit of the Municipal Public Farm, but different composters are maintained in the square to demonstrate the process to residents. Part of the fertilizer is used for food production in the square itself and the agroecological units. At the same time, another portion is given back to the volunteers, thus closing the nutrient cycle.

The square also hosts the **Agroecological Saturday** event on the first Saturday of each month. This event features a series of educational and participatory activities related to agroecology and the agroecological transition, and it is open to all residents, including children.

Amidst so many initiatives, this multifunctional space in Maricá links the agroecological units and the city center. Its goal is to integrate rural, peri-urban, and urban areas into a single project. The agroecological production methods have unique characteristics depending on their location, but they are adapted to different contexts and interconnected.

The municipality also boasts other urban agriculture practices, including five community gardens (with three more to be inaugurated), eight school gardens, and the **Garden at Home** program, which provides technical support in agroecology and urban agriculture to help residents implement initiatives in their homes.

---

<sup>151</sup> Aiming to generate income and reduce waste, the Municipal Dehydrated Products Factory is an initiative that processes foods from family farming that no longer hold retail value in their fresh state. Once dehydrated, these foods gain an extended shelf life and contribute to the free supply of social institutions and public facilities (TÂNGARI and PROPINO, 2023).





© Equipe Cooperar. Maricá

## Political and Legislative Structure

The urban agriculture and agroecology programs are carried out, especially under the Secretariat of Agriculture, Livestock, Fisheries, and Supply, but in constant dialogue with other secretariats, such as Education and Works, to boost the initiatives.

Although Maricá has made significant progress in urban agricultural policies, it still faces the challenge of consolidating specific legal frameworks that encourage and regulate these practices and ensure they remain on the municipal agenda. Law 3.449/2024 was recently approved, establishing the Program to Encourage the Implementation of Agroecological Gardens in the municipality's squares. In addition, the action is supported by the agricultural policy that allows these activities.

## Production Destination

The food cultivated at the Manu Manuela Unit and the Municipal Public Farm is allocated to social institutions that serve vulnerable communities, such as nursing homes, indigenous villages, and shelters.

During the circular market, the produce from the Agroecological Square is distributed to the local community and to the *Baldinho do Bem* project volunteers. When there is a surplus, it is directed to the Popular Restaurant or one of the supported institutions.

From October 2020 to September 2024, a total of 34.3 tons of agroecological food was produced, supporting 14 social institutions and including 122 crop varieties.

## Socio-Cultural Aspects

As can be observed, urban agriculture policies in Maricá do not target a specific audience, as they take place in spaces distributed throughout the city and, in general, are accessible to the entire population. In this regard,

the city fully embraces the concept of agroecology in its initiatives, promoting sustainable cultivation in public spaces and using this practice as a catalyst for fostering a culture of cooperation, solidarity, and respect for the environment and the community itself.

The interactions provided by the municipality through urban agroecology are always horizontal and involve the collective construction of knowledge, respecting local experiences, and promoting citizens' autonomy while increasing their sense of belonging and commitment to the common good. Through workshops, events, educational visits, and theoretical and practical courses, the residents of Maricá understand and experience the importance of soil care, sustainability, and the circular economy.

*"We've already reached a number of residents that has led to this growth in urban agriculture because many, through the training sessions they attended with us, began to produce in their backyards or in their own production units and no longer have this production for subsistence only. [...] This has boosted the growth of urban agriculture in the municipality, but it has also boosted this revival of the municipality's ancestral practices, in addition to human ancestral practices, because it was once a very productive municipality, and now we are seeing this revival, even by the local youth."*

Magali Rodrigues / COOPERAR.

## Agroecological Aspects

"Healthy soil, healthy plants, healthy humanity." This famous phrase by Ana Primavesi<sup>152</sup> inspires local initiatives and translates the philosophy adopted by Maricá. The initiatives are based on a holistic vision that sees the soil, the environment, and society as interconnected. Agricultural production in rural and urban areas promotes diversified and regenerative agriculture that seeks to provide pesticide-free food and create an ecological, economic, and social balance.

In this context, the technical assistance provided by the Garden at Home project and the training spaces offered by the agroecological units project, both developed by Cooperar in partnership with the city government, ensure that the municipality has a specialized technical team in agroecology at its disposal. This expertise was built upon the experiences of the Landless Workers' Movement (MST) in rural areas and adapted to the urban context. This allows the public authorities to expand and implement their agroecological initiatives with greater robustness and technical quality, as well as ensure closer engagement with the citizens.

---

<sup>152</sup> Primavesi (2016).





© Equipe Cooperar. Maricá

## Lessons Learned

- \* **Continuity of public policies is essential:** the persistence of municipal administrations over the years, including urban agriculture and agroecology as a state policy, is fundamental to guaranteeing the success of agroecological and urban agriculture initiatives, which need time to generate significant and lasting impacts.
- \* **Popular participation, community engagement, and education as fundamental pillars:** as the initiative in the municipality came from a municipal policy aimed at citizens rather than a direct demand from the community, the need for effective and continuous education, as well as clear communication with the population, was identified as essential for the success of the projects. Investing in environmental education and training programs, such as those carried out by COOPERAR, empowers residents to adopt sustainable practices in their own spaces, promoting greater community engagement and active participation in initiatives.
- \* **Circular economy integrated into the dynamics:** projects such as **Bucket of Good** exemplify the viability of the circular economy, where organic waste is reused to produce food, closing the loop between consumption and production, reducing waste, and valuing waste. In addition, this practice can become a strategy for connecting citizens with public authorities.



- \* **Intersectoral integration increases efficiency:** coordination between various government departments and agencies optimizes resources, improves project management, and broadens the scope of public policies, favoring the implementation of more robust and integrated initiatives. However, internal bureaucracy is one of the biggest obstacles to implementing these initiatives, which hinders agility and efficiency in adapting ideas and projects to the municipality's reality.
- \* **Innovation and partnerships accelerate development:** strategic partnerships with universities, research institutes, and civil society organizations, such as COOPERAR, are essential for innovation, the development of new agroecological technologies, and the promotion of the exchange of technical knowledge.
- \* **Internal alignment:** one critical challenge is to ensure that the technicians, managers, and workers involved in the initiatives are constantly updated and trained in the practices, objectives, and concepts of agroecology, presenting an aligned and coherent discourse to the public.
- \* **Sustainability and continuity of the initiatives in the long term:** the need for solid legal frameworks, such as specific municipal laws for agroecology, risks the continuity of the initiatives. Although Maricá has agricultural policies that favor agroecological development, the absence of formal legislation that guarantees the continuity of the projects in future municipal administrations puts the perpetuity and sustainability of the initiatives at risk.



© Equipe Cooperar. Maricá

## Conclusion

Maricá stands out as the first city in Brazil to implement integrated and declaredly agroecological initiatives, setting itself as a vanguard reference for other municipalities wishing to follow this path. The focus on education, training, and community participation is a strong point, ensuring citizens are actively involved. This amplifies the impact of the policies, transforming agroecology into a central aspect of municipal culture.

However, one of the main challenges is the creation of legal mechanisms to ensure the permanence and expansion of agroecological and urban practices. Without a clear legal framework, these policies are



vulnerable to changes in management and lose strength in the long term. A well-defined and stable legislative framework will bind future administrations, ensuring stability and continuity for agroecological initiatives.

Another critical point is that Maricá did not start these policies out of a direct demand for food security but out of a desire to preserve the municipality's cultural traditions. This reveals a broader perspective on urban agriculture policies, which go beyond food production, highlighting their role in the city's social and cultural dynamics. In this way, Maricá shows that agroecology can be a transformative element in both environmental aspects and in strengthening identity and social cohesion.

## To Learn More

- \* **Agroecological Production Units—Maricá [in Portuguese, but possible translation]**: This is a page from COOPERAR explaining more about the experience in Maricá.
- \* **City and Food: EU-Brasil Dialogue on Sustainable Urban Food Systems [In Portuguese]**: Maricá was a case study in the report City and Food. This document presents all the town's food policies.

# Urban agriculture in Germany



# Urban Agriculture in Germany: A Sustainable Lifestyle and Community Engagement

In Germany, as in much of Europe, urban agriculture is seen as something whose central aspect is not food production<sup>153</sup>. In the country, UA is perceived as a lifestyle choice that promotes sustainable alternatives for using urban spaces and encourages greater community engagement<sup>154</sup>.

The focus is mainly on the indirect benefits that this practice brings to Cities<sup>155</sup>, such as environmental sustainability, community empowerment, and the creative use of urban spaces, rather than being a direct response to food insecurity, which is not a widely debated issue in the German context<sup>156</sup>, as shown in table 1 above.

Considering the UA is understood as any agricultural production system or method that uses land, bodies of water, or even buildings in and around cities and can be commercial or non-commercial, it is estimated that at least 25% of agricultural land in the country can be classified as urban agriculture, showing the growing importance of this practice in the German context and its potential is being increasingly recognized<sup>157</sup>.

## Box 7 – Urbane Landwirtschaft versus Urbane Gärten

Urbane Landwirtschaft versus Urbane Gärten:

In Germany, there is no consensus on the definition of urban agriculture, and the term Urban Agriculture (or Urbane Landwirtschaft) is commonly used to refer to a more professional form of agricultural production in urban and peri-urban areas, often with a commercial focus and employing modern cultivation and animal husbandry techniques .

When used in this way, it is often contrasted with the term Urban Gardens (or Urbane Gärten), which refers to community gardening and urban horticulture practices where groups transform underutilized spaces into green areas. Unlike commercial urban agriculture, the focus of these initiatives is social, educational and political.

In the context of this guide, urban agriculture will be understood as a broad concept that includes various forms of agricultural production in and around cities, following the international perspective.

In this sense, following the logic of urban agriculture as an umbrella term, practices in Germany, based on studies carried out in the country<sup>158</sup>, can be structured into three main categories, taking into account their protagonists:

### Private for-profit farming

Commercial enterprises operating in Germany's peri-urban and intra-urban areas use modern, sustainable farming techniques such as greenhouses, aquaponics, and hydroponics to produce high-quality food for local markets. These profitable enterprises are highly diversified, covering vegetable growing, animal husbandry, and services such as education, rural tourism, and direct sales<sup>159</sup>. These businesses provide a sustainable source of income while meeting the food demand of urban areas. In addition, officially registered farms can benefit from subsidies from the European Union's Common Agricultural Policy, which helps to ensure the economic viability of these enterprises<sup>160</sup>.

<sup>153</sup> Krikser et. al. (2019).

<sup>154</sup> Grunenberg (2017).

<sup>155</sup> Lohrberg et. al. (2016).

<sup>156</sup> Grunenberg (2017).

<sup>157</sup> Feldmann and Vogler (2023).

<sup>158</sup> Feldmann et. al. (2023).

<sup>159</sup> Feldmann et. al. (2023).

<sup>160</sup> Feldmann et. al. (2023).



## Private non-profit farming

Community initiatives have a predominantly socio-environmental and political focus<sup>161</sup>. These projects aim to create a sense of belonging among participants and promote sustainable agricultural practices in urban spaces. Community gardens, for example, offer opportunities for individuals to grow their food while learning about ecological agriculture and sustainability<sup>162</sup>. Beyond food production, these initiatives promote social inclusion, education, and community well-being<sup>163</sup>. They are also experimental spaces where citizens can test new cultivation methods and engage in collective activities, contributing to building a more participatory society<sup>164</sup>. This category includes home, community, and Kleingärten (allotment gardens)<sup>165</sup>.

### Box 8 – About the Kleingärten

**Kleingärten**, or allotment gardens, have existed in Germany for around 200 years. Initially, their focus was on food production for family sustenance, and they were essential for food security during the two great wars. Today, in addition to food production, these gardens function as a kind of "backyard away from home", where families go to relax and reconnect with nature. There are approximately one million allotments in the country, mainly located in urban areas and regulated by specific association statutes.

This form of agriculture is fundamental because it becomes an incubator that encourages the emergence of different forms of food production. It also functions as a laboratory for economically oriented urban agriculture initiatives, constituting an experimental space for citizens to learn and, therefore, for constructing society<sup>166</sup>.

## Municipal Administrations

Local governments play a vital role in the development of UA, integrating these practices into green infrastructure and urban planning strategies, with action geared towards the joint good<sup>167</sup>. The main concept that permeates this classification is that of *Essbare Stadt*<sup>168</sup>, or in English, *Edible Cities*, which indicates the vision of a city in which food production becomes "an integral practice, both in its function and in its form"<sup>169</sup>.

Effectively, this means growing food in public areas, allowing citizens to harvest and consume produce directly from urban spaces<sup>170</sup>. City administrations also develop policies to ensure the expansion of UA as part of a sustainable agenda, contributing to food security, climate resilience, and the strengthening of urban social networks. In addition, they ensure access to land for urban agriculture, promoting organic farming and encouraging the creation of new cooperatives and local market networks.<sup>171</sup>

In the national context, no legal framework has been found that concerns urban agriculture, but some materials seek to promote the practice in the country, supporting the articulation between actors and providing knowledge on the subject. These include:

---

<sup>161</sup> Urbane Gärten (n.d.).

<sup>162</sup> Müller (n.d.).

<sup>163</sup> Feldmann et. al. (2023).

<sup>164</sup> Urbane Gärten (n.d.).

<sup>165</sup> Feldmann et. al. (2023).

<sup>166</sup> Feldmann et. al. (2023).

<sup>167</sup> Feldmann et. al. (2023).

<sup>168</sup> Feldmann et. al. (2023).

<sup>169</sup> Goldstein et. al. (2017).

<sup>170</sup> Müller (2011).

<sup>171</sup> Feldmann et. al. (2023).



**TABLE 9 / Main instruments related to urban agriculture in Germany**

Players	Objective
<b>Manifesto "Die Stadt is unser Garten"</b>	The manifesto, signed by more than 200 urban agriculture initiatives in the country, aims to express the political position of the urban garden movement and contribute to discussions about the future of the city and the importance of common goods.
<b>„Urbane Gemeinschaftsgärten" network</b>	A network to promote urban agriculture through connections, events, advice, teaching materials and funding, which includes initiatives from all over the country.
<b>Deutscher Städtetag (Association of German Municipalities)</b>	It prepared a Position Paper on urban agriculture in the country, in which it compiled examples of urban agriculture and food styles, formulating demands for the European Union, the federal and state governments.
<b>Anstiftung Foundation</b>	Anstiftung is an organization that promotes, connects and researches do-it-yourself initiatives such as urban gardens, open workshops and repair projects, encouraging collective practices to tackle contemporary social and environmental issues.

Finally, although Germany does not usually use the term agroecology in the context of urban agriculture, producers are committed to growing organic food based on **permaculture** concepts, especially in community gardens and edible cities. In the interviews conducted with local actors (and as will be seen in the cases presented), agroecology is still an approach that is not very widespread in the country, even in rural areas. Still, organizations such as Inkota, Agronauten, and La Via Campesina have dedicated themselves to disseminating the term.

On the other hand, **permaculture** is more widespread and adopted in the country's urban agriculture experiences. This shows that German urban agriculture is committed to promoting more sustainable agricultural production for people and the planet.

### **Box 9 – Definition of permaculture**

Permaculture is a science aimed at planning sustainable human settlements, promoting systemic integration between different elements to generate efficient energy cycles and based on three components: care for the Earth, care for people and fair distribution of resources.

It can be defined as a philosophy of production that works with nature, considering the complexity of natural ecosystems and classified as one of the multiple schools of alternative agriculture under the umbrella of agroecology, proposing a relationship between humanity and the environment based on ethics<sup>172</sup>.

The cases selected to illustrate urban agriculture experiences in the country do not necessarily originate from public policies because, as discovered during the research, a minimal proportion of urban agriculture initiatives in Germany have been implemented by the local government's decision. In this material, only Andernach stands out as a purely municipal policy, representing a very successful model of *Essbare Stadt*, or, in free translation, "Edible City."

The other two examples present different contexts: Berlin, the capital of Germany, is a cosmopolitan and culturally diverse city with multiple urban agriculture initiatives. However, these initiatives are developed by associations, voluntary groups, and projects that seek to make the city greener while creating spaces for

<sup>172</sup> Foletto et. al. (2020); HLPE (2019).

meetings and cooperation between participants<sup>173</sup>. The third example, Kassel, presents another edible city concept, which arises from a grassroots initiative with occasional support from the local government. In addition, Kassel has an urban forest promoted by the city council, which makes the city a "mixed" model of edible city, combining community and municipal initiatives.

The selected cases give an overview of the country's most prominent and outstanding initiatives recommended by key players in urban agriculture in Germany.

---

<sup>173</sup> visitBerlin (n.d.).

# German cases



# Berlin

## Autonomy and Engagement in a Decommissioned Airport <sup>174</sup>

© ViewAllpapers.com



## Overview of the Municipality

Berlin is the capital of Germany and has a population of 3,782,202<sup>175</sup> and an HDI of 0.956<sup>176</sup>, which is classified as very high. As far as its cultural aspects are concerned, defining Berlin in a paragraph is a challenging task. The first records of the city date back to the 13th century, and from then until today, many historical events have marked the city: it was the capital of the Prussian Empire, it survived two major wars, the division by the wall during the Cold War and less than 40 years ago it was reunited<sup>177</sup>. This past makes Berlin a city that is constantly evolving and has a remarkable ability to reinvent itself. This dynamic is evident in its urban agriculture practices.

## Contextualization of Urban Agriculture in the Municipality

Urban agriculture in Berlin is a relevant movement marked by community involvement, the promotion of sustainability, and collaboration between different social groups. The diversity of uses, locations, and forms of organization of these projects reflects their importance to the city with one common point among these gardens: voluntary commitment and collective operation, which enables the creation of social ties, citizen empowerment, and environmental education.<sup>178</sup>

<sup>174</sup> All data and quotations, unless expressly stated otherwise, come from statements made by the representative in an interview conducted exclusively for this research in June 2024.

<sup>175</sup> Amt für Statistik Berlin-Brandenburg (n.d.).

<sup>176</sup> Global Data Lab (n.d.).

<sup>177</sup> Erb, et. al. (2024).

<sup>178</sup> Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz (n.d.); visitBerlin (n.d.).



With more than 200 community gardens distributed throughout the city, urban horticulture is no longer a trend but an integral component of sustainable urban development in Berlin.<sup>179</sup>

In 2023, the Berlin Community Garden Program was approved and coordinated by the Senate Department for Environment, Mobility, Consumer, and Climate Protection (SenUMVK), part of a broader initiative to promote the development of socially and environmentally sustainable urban spaces. The program is aligned with other initiatives, such as the Urban Landscape Strategy and the Urban Green Spaces Charter. It aims to integrate urban gardening into city planning, addressing nutrition and urban sustainability issues.<sup>180</sup>

## Program Overview

Among the many urban agriculture initiatives in Berlin, the *Allmende-Kontor* community garden stands out as a successful example. Founded in April 2011 at Tempelhofer Feld<sup>181</sup>, with an initial group of 20 people and 10 beds, the project expanded rapidly. Today, the garden has over 250 raised beds and 500 gardeners, all organized independently. In June 2014, the initiative was formalized with the creation of the *Gemeinschaftsgarten Allmende-Kontor e.V.* association, strengthening its structure and legitimizing the movement.<sup>182</sup>

The space's financing is managed independently. The gardeners pay an annual fee, which varies between 45 and 90 euros, to maintain a garden bed and a membership fee of 12 euros per year. This financial self-sufficiency allows the project to sustain itself without the government's financial support, reinforcing the garden's autonomy and ability to make decisions independently.



*The Allmende-Kontor community garden with the neighboring garden. © Karachoberlin*

<sup>179</sup> Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz (n.d.).

<sup>180</sup> Berlin.de (n.d.).

<sup>181</sup> Tempelhofer Park is a vast recreational area located in the south of Berlin. It used to be home to Tempelhof Airport, which was shut down in 2008, and is now the largest open space in the city and one of the largest in the world. With its 300 hectares, the park is used by locals and tourists for leisure, sports and urban agriculture. In 2014, a referendum was held to define the future use of the area, and the population of Berlin voted in favor of preserving the space as a recreational site (Tempelhofer Feld, n.d.).

<sup>182</sup> Allmende-Kontor (n.d.).



## Political and Legislative Structure

Like most of Berlin's community gardens, *Allmende-Kontor* is an example of self-management. Government support is limited to providing the project's space, with no additional financial support. The space is provided by *Grün Berlin*, a company that collaborates with the city administration. Still, the garden's autonomy allows for greater flexibility in internal decisions, especially concerning the allocation of financial resources.

The relationship between community gardens and Berlin's public administration has evolved. While these initiatives were primarily community-led in the past, in recent years, the government has started offering more institutional support. The launch of the Community Garden Program and the appointment of a specific representative in the public administration are examples of this progress. This program aims to provide ongoing support for developing and maintaining community gardens, favoring the expansion of these initiatives throughout the city.

## Production Destination

Although food production in community gardens is a relevant practice, there are other focuses besides this one. Spaces like *Allmende-Kontor* prioritize socializing, environmental education, and promoting sustainable practices, such as permaculture and the reuse of materials. What is produced is for personal consumption, although the scale is limited.



Garden space given over to a kindergarten. © Ana Carla Rocha

## Socio-Cultural Aspects

*Allmende-Kontor* stands out as an essential space for social integration and is positioned as a political act amid the intense urban transformations of the Neukölln neighborhood, a place historically known for its diversity and multiculturalism but currently facing an accelerated process of gentrification.

The garden area is open and integrated into the space and functions as a meeting point that promotes intercultural interaction spontaneously and harmoniously. Its structure and organization offer a creative environment where, in addition to planting, participants and visitors can rest, picnic, and play and share experiences and knowledge about ecological cultivation practices, having their cultural and national backgrounds respected and valued, promoting an exchange of knowledge.

In addition, the project partners with local schools and refugee initiatives, providing a place for these groups to interact with the local community and an opportunity for support in facing the bureaucratic and social challenges common to many immigrants in Berlin. This collaborative dimension reinforces *Allmende-Kontor's* role as a place of social empowerment and political engagement.

## Agroecological Aspects

Although the term "agroecology" is not used, many of the principles of this approach are present at *Allmende-Kontor*. Permaculture, the creative reuse of materials, and sustainable food production are standard practices. The space also encourages experimentation and creativity among participants, who develop innovative ways of maximizing the use of small areas for cultivation.

One aspect of agroecology encouraged by the initiative is that sustainability manifests itself in food production and the conscious use of resources. The project values using recycled materials to build beds and structures, promoting the idea of reusing rather than buying new inputs. In addition, the space houses sub-groups dedicated to specific practices, such as beekeeping, composting, and natural dyeing, encouraging the exchange of knowledge and ecological techniques between participants.

The garden also offers workshops on various topics, such as composting and biological pest control, turning it into an environmental learning center. Participants foster a more conscious and sustainable relationship with the urban environment through these activities. Creativity and collaboration are fundamental pillars in this process, which makes the garden a clear example of how agroecological principles can be applied in urban environments, promoting sustainability on a local and accessible scale.





© Ana Carla Rocha

## Lessons Learned

- \* **Networking:** exchanging information and experiences with other community garden projects is essential for long-term success. Visiting other initiatives and sharing experiences allows gardeners to learn new techniques and solutions applicable to their initiatives.
- \* **Legal certainty:** the lack of contractual certainty and a legal basis for urban agriculture in Berlin represents a significant challenge, making stable long-term planning difficult.
- \* **Popular support:** the community's continued support and collaborations with Berlin's public administration demonstrate that community garden projects are essential for socially and environmentally sustainable development.





© Ana Carla Rocha

## Conclusion

*Allmende-Kontor* presents itself as a practical example of how urban agriculture can become a powerful tool for environmental and political development in a metropolis like Berlin and smaller municipalities. Through sustainable and innovative cultivation practices, the project creates living spaces that promote diversity and inclusion while tackling challenges such as gentrification and unequal access to land.

Even without adequate public support, limited to the temporary assignment of space, *Allmende-Kontor* works well thanks to the self-organization of its participants, demonstrating the transformative potential of grassroots initiatives. The practice shows how redefining the relationship of vulnerable groups, such as refugees and immigrants, with urban space, nurturing social cohesion, and promoting the construction of fairer and more sustainable cities is possible.

## To Learn More

- \* [Official Allmende-Kontor website](#) [in German, but possible to translate].

# Andernach

## Cultivating Sustainability through the "Edible City" Model<sup>183</sup>

© Andernach Tourismus



## About the Municipality

Andernach is a small town of 30,277 inhabitants<sup>184</sup>, located in Rhineland Palatinate, between Koblenz and Cologne. It is a lovely town over 2000 years old and was part of the German part occupied by the Roman Empire. Andernach has carefully preserved its history through its medieval buildings and the archaeological site in the town's historic center. Today, the city is known nationally and internationally for its urban agriculture policy.<sup>185</sup>

## Contextualization of Urban Agriculture in the Municipality

In Andernach, urban agriculture follows the format of the *Essbare Stadt*, or "Edible City," in a "top-down" scheme<sup>186</sup>. This means the initiative comes from the city administration, which establishes and maintains the project. At the same time, residents and visitors can enjoy the food planted in various public spaces in the city.

The initiative's origins go back to 2007, when a permaculture initiative began to be implemented in a municipal district. As part of the "Join Rhineland-Palatinate" funding project, the action planned to use a specific area as a learning site and meeting place. The idea was to create a sustainable urban design model that was ecologically and aesthetically relevant<sup>187</sup>. The project's first phase involved the creation of a community garden where citizens could cultivate together and share the results. In 2010, the initiative gained momentum by planting

<sup>183</sup> All data and quotations, unless expressly stated otherwise, come from statements made by the representative in an interview conducted exclusively for this research in June 2024.

<sup>184</sup> Wegweiser Kommune (n.d.).

<sup>185</sup> Andernach Tourismus (n.d.).

<sup>186</sup> Artmann & Sartison (2021).

<sup>187</sup> Rosbach (2024).



101 varieties of tomatoes in public spaces, evolving over the years into the current format, with plantations spread throughout the municipality.<sup>188</sup>



© Stadtverwaltung Andernach

## Program Overview

With the motto **"Gathering is encouraged - help yourself,"** the town of Andernach has developed a structure where food production is integrated into various public spaces. Fruit trees such as almonds, peaches, and pears can be found in the squares around the castle moat, and animals, such as chickens and sheep, are exhibited seasonally for educational purposes. There is also honey production in medieval portals and educational plantations on the archaeological site, while the town hall walls are covered with grapevines, lavender, and rosemary. In the municipality, urban agriculture practices conform to the public space, making it greener and more sustainable through diversified food production.

The project aims to promote the multifunctionality of public spaces, supporting ecological, economic, and aesthetic functions. Urban vegetation goes beyond the function of beautifying the city, as with a conventional flowerbed, offering a complete sensory experience, including aroma and taste. In addition, the policy makes drinking water available to the population through public drinking fountains in some parts of the city.

## Political and Legislative Structure

The city implemented the project as a top-down solution, in which city managers are responsible for ensuring its continuity. At an operational level, the municipality has a partnership with Perspektive gGmbH, a company that employs and trains long-term unemployed people to work on the maintenance of green areas. This arrangement contributes to social inclusion, promoting a virtuous cycle between environmental sustainability and social development.

## Production Destination

The food produced in the edible city public areas is intended for the local population and visitors, free to pick fruit, vegetables, and herbs.

---

<sup>188</sup> Stadt Andernach (n.d.).

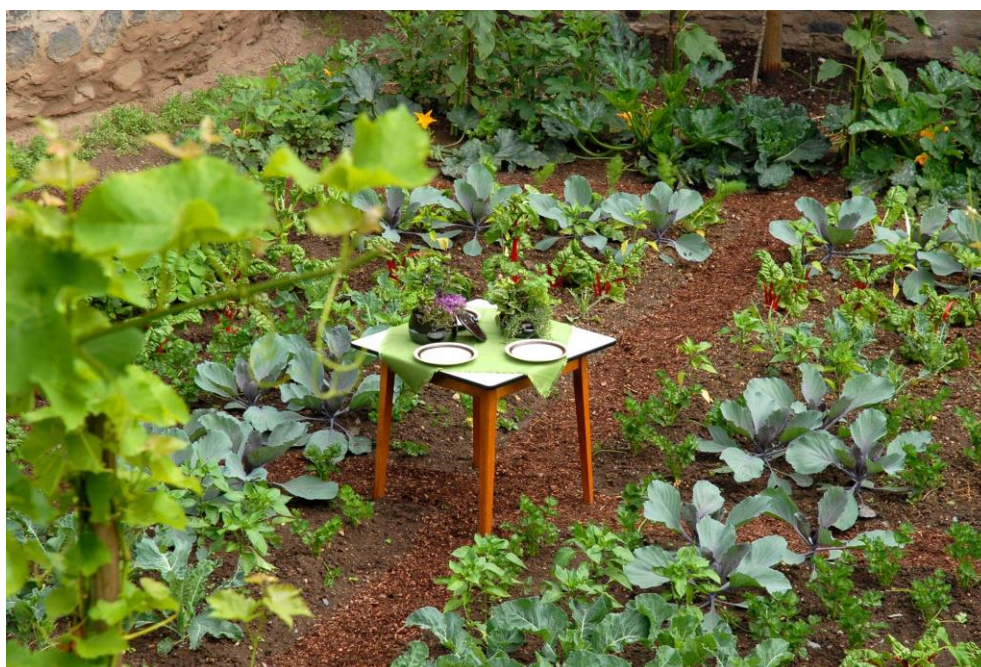
## Socio-Cultural Aspects

Studies indicate that the initiative strengthens local identity and social ties, creating a sense of belonging and promoting environmentally conscious food consumption<sup>189</sup>. In addition, the project is widely publicized through guided tours organized by the Andernach Tourism Agency, which offers tours and visits to the initiatives, stimulating tourism and generating more significant interaction between citizens and the urban environment.

Another important socio-environmental aspect is the project's promotion of employability. In partnership with the aforementioned Perspektive gGmbH, the city of Andernach maintains the production spaces. Through this partnership, the municipality employs people who find it difficult to enter the local labor market, such as immigrants, refugees, and Germans, in vulnerable situations, thus promoting their productive inclusion.

## Agroecological Aspects

From an agroecological point of view, Andernach's "Edible City" doesn't explicitly use the term in its communication, but it offers an exemplary model of sustainable urban transformation. The project follows permaculture practices and cultivation techniques that respect the environment, avoiding using herbicides and chemical fertilizers, prioritizing mixed crops and mulches, and integrating human well-being with environmental balance. According to Lara Lindemann<sup>190</sup>, the municipal policy manager, agroecology is not explicit in the discourse, but its precepts are adopted in the plantations.



© Stadtverwaltung Andernach

## Lessons Learned

- \* **Taking the first step**, Andernach started with an idea that consolidated over time. One of the success factors was beginning the project on a small scale, allowing for a gradual and controlled implementation, making it easier to gain the support of the municipal administration and the local community.
- \* **Effective communication**: clearly communicating Edible City's benefits to residents and the media was crucial to increasing support for the project. The positive attention it received both nationally and internationally helped strengthen its credibility.

<sup>189</sup> Artmann *et. al.* (2020).

<sup>190</sup> In an interview granted for this research in June 2024.



- \* **Public relations and community engagement:** as this is a policy that the municipal administration initiated without direct demand from the population, community engagement is a challenge. A study carried out in Andernach revealed that although a significant portion of the population is proud of the city and the concept implemented, many are not directly involved in the initiative<sup>191</sup>. In this sense, activities such as guided tours, partnerships with gardens, and educational events were essential to increase the population's knowledge of the project and to promote public debate around the initiative.
- \* **Committed public managers:** the project's success depended heavily on the commitment of the managers and the team involved. The belief that an initiative of this size, initiated by the municipal government, can be successful must come from within the team, and the implementation strategies are built on this commitment.
- \* **Maintenance of green areas:** as labor is the municipal government's responsibility, regular maintenance requires human and financial resources and demands constant attention from the local administration.

*"Perhaps the key element is to have a really motivated team and also engaged politicians. It's their decision, we just present our ideas. They have to decide what to do with the city's money. We love doing our job, but it's their decision. If you can motivate them and convince them in favor of an edible city, that's the best thing that can happen."*

Lara Lindermann / Manager of the Edible City of Andernach.



© Ana Carla Rocha

<sup>191</sup> Artmann & Sartison (2021).

## Conclusion

One of the main strengths of the Andernach model is the multifunctionality of public spaces. These spaces provide a complete sensory experience and promote the well-being of citizens while making the city greener and more resilient. In addition, the project demonstrates a strong potential for social inclusion by employing people in vulnerable situations and connecting environmental sustainability with human development.

However, as it is a "top-down" initiative maintained by the city council, the community's active involvement is essential to guarantee the project's success and continuity, regardless of changes in power, ensuring long-term political and institutional support.

Andernach's example is significant because it offers a concrete reference to what can be achieved. Seeing a town that has turned the utopia of becoming edible into reality inspires other municipalities in Germany and beyond to analyze the strategies adopted and adjust them to their context, creating tailor-made solutions to promote sustainability and food justice in different regions.

## To Learn More

- \* [Edible City | City of Andernach](#) [in German, but possible to translate]: Official website.
- \* [What really is... An edible city? | Gota \(gierschmagazin.de\)](#) [in German, but possible to translate]: More about the Edible City concept.

# Kassel

## Bridging Grassroots and Institutionalized Urban Agriculture<sup>192</sup>

© Municipality of Kassel



## About The Municipality

Kassel is a city of 201,585 inhabitants located in the state of Hesse in central Germany. As well as being one of the greenest cities in the country, with more than 63% of its area covered by parks and green areas, it is widely known for its cultural and historical heritage. The city was home to the Brothers Grimm, famous for their fairy tales, and *Documenta* one of the world's most prominent contemporary art exhibitions. Another highlight is the *Bergpark Wilhelmshöhe*, a park that is part of the UNESCO World Heritage Site<sup>193</sup>

## Contextualization of Urban Agriculture in the Municipality

The city of Kassel has two distinct urban agriculture models that coexist and complement each other. Both aim to promote sustainability, food sovereignty, and social cohesion through different strategies. In this guide, they are presented in parallel to show the reader a model of urban agriculture that combines community initiatives and projects institutionalized by the local government.

## Program Overview

Regarding social initiatives, Kassel has the *Essbare Stadt Kassel* project (or, in free translation, "Kassel's Edible City"). The dynamics of this project are similar to those of Andernach, which were previously presented. Through a series of actions, it aims to make Kassel a city with more urban agriculture initiatives. However, its structure

<sup>192</sup> The information presented here, unless expressly stated otherwise, is part of an interview conducted with a representative of Essbare Stadt Kassel and the City of Kassel in June 2024.

<sup>193</sup> WOW Kassel (n.d.); Germany Travel.(n.d.)



differs from the Andernach model, as it arises "from the bottom up," i.e., from organized civil society, which structures itself autonomously to make the project happen.

Started in 2009, the project was a pioneer in bringing the concept of edible cities to Germany. Volunteers maintain community gardens, autonomous vegetable plantations, and fruit trees throughout the city. In addition, *Essbare Stadt Kassel* promotes events, campaigns, collective harvests, movie nights, concerts, workshops, and lectures on edible and sustainable cities. The group sees urban agriculture as a way of connecting people with each other, the city, and nature, using food and cultivation as central links in this connection.

One exciting aspect is that on the association's website, there is an interactive and editable map showing the location of the associated fruit trees and community gardens, available to the whole community (Figure 8):

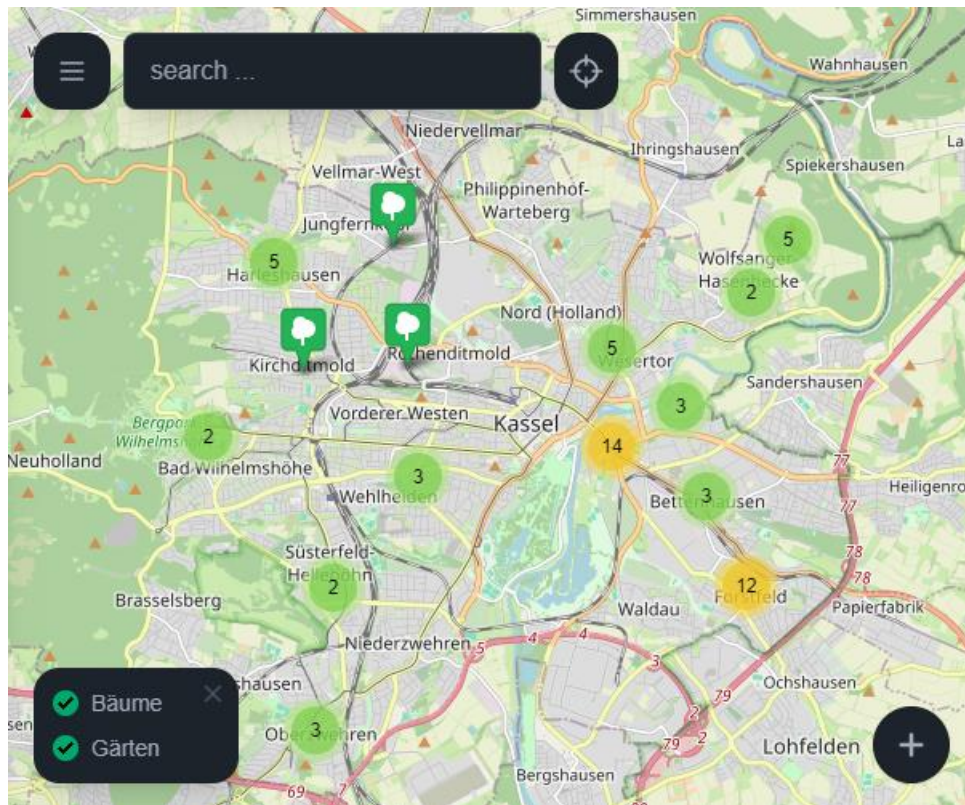


Figure 5 | Map of initiatives related to Essbare Stadt Kassel.

*"My idea of an edible city is that there is an apple tree, planted by the people who are there, in a public area. Under the tree, they build a table and seats. Grandma bakes the apple cake, and everyone is there - children, adults, several generations - sitting together, enjoying the apple cake, drinking coffee and having fun. That's my ideal idea of an edible city, which means sharing, having good times together and also becoming a little more independent of the things you can buy in the stores. This brings back responsibility to the people living in the city and also the right to use this area sustainably, which provides the creation of social contacts, access to good food and the feeling of finding a home outside their own homes."*

**Bernd Walter** / *Essbare Stadt Kassel*.



*Initiative ForestFeldGarten. © Essbare Stadt Kassel*

The second project is called **Urbane Waldgärten** (Urban Forest Gardens). It is part of an initiative by the city of Kassel in partnership with the University of Potsdam and other organizations, funded by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety, and Consumer Protection.

Launched in 2021, the project will receive financial support for six years. The aim is to build forest gardens in Berlin and Kassel, fostering quasi-natural and sustainable forms of urban agriculture. These spaces combine social interaction with ecologically based food production, promoting environmental education, soil protection, climate adaptation, and biodiversity.

The project involves using large green areas integrated into the city to plant fruit trees, berry bushes, vegetables, and herbs arranged in different layers. It also involves the local community in creating social networks and promoting collaboration in using and maintaining these spaces.





Urbane Waldgärten Kassel. © Andreas Weber.

## Political and Legislative Structure

### Essbare Stadt Kassel

The initiative is structured as a non-profit association whose statutes state that it aims to promote the conservation of nature and the landscape, art, and culture, provide assistance for public health, education, popular training, assistance for young people and older adults, and civic engagement, and promote and respect traditional knowledge and solidarity between different cultures.

Regarding the relationship with the local government, there is no direct connection with the municipal administration, which occurs occasionally and only upon project request.

### Urbane Waldgärten

The project is 70% financed by the German federal government through environmental incentive programs and 30% by the city of Kassel. The city council, in partnership with the University of Potsdam, is responsible for technical management and is conducting research into the project's ecological and social impacts.

## Production Destination

In both cases, the productions are aimed at the local community.

In the case of *Essbare Stadt Kassel*, part of the produce is dedicated to the producers' consumption in the community gardens that are part of the initiative.



## Social Aspects

### Essbare Stadt Kassel

The socio-cultural aspects are fundamental to the success and engagement of the initiative. Creating environments where people can plant, harvest, and even cook together reflects a movement to recover a sense of belonging and autonomy within the city, creating urban spaces that promote encounters and interaction between generations and cultures. In this sense, the spaces used for the projects, such as urban gardens and public areas with fruit trees, allow citizens to come together, share moments, and strengthen community ties.

In addition, these places help reaffirm the idea that urban areas belong to everyone and should be used sustainably, promoting social interaction and access to fresh food. This increases the sense of belonging and restores people's connection with the urban environment while encouraging a new look at food production and the relationship with the traditional market.

### Urbane Waldgärten

Urban forest gardens promote community relations and environmental education through municipal action. Today, the municipality has two units. These spaces serve as public policy that supports a place for residents to meet and learn. There is constant concern for the involvement of the local community since active participation is fundamental to the long-term success of the forests, which will take years to reach their real potential. The aim is to build a collective and shared care dynamic for this space.

In addition, forest gardens represent a public policy that promotes awareness of sustainable agricultural practices and healthy eating. By growing a variety of plants, both domestic and exotic, residents learn about the preservation of traditional species and how healthy soil has a direct impact on productivity and climate balance. This hands-on learning also helps increase understanding of more extensive food system processes, connecting local practices to global issues.

In both cases, these places become not only a space for coexistence and education but also a means of social transformation, encouraging a new distribution of responsibilities and raising awareness about the impacts of agriculture and food on urban life.

*"On the one hand, you have the ecological aspect with biodiversity, climate and soil, affecting both animals and plants. But equally important is the social part, where people come together, experience nature and learn about food - where it comes from, how it grows and the effort it takes to grow it. This connection increases the appreciation of food and helps reduce waste, as people understand the energy needed to grow it."*

Lena Chmielewski / City of Kassel.

## Agroecological Aspects

Neither project uses the concept of agroecology in its discourse. However, both initiatives use sustainable cultivation models based on permaculture and ecological management for agricultural production.

### Essbare Stadt Kassel

The project's practices include using sustainable methods such as pesticide-free cultivation, composting, and crop rotation, which favor biodiversity and soil health. The stated aim is not only producing food but also regenerating the urban environment and promoting a more sustainable lifestyle.

In addition, the initiative promotes permaculture courses. It offers weekly meetings on Tuesdays called **"Earth Care Day,"** where participants get together to experience the community garden, manage the soil, sow and compost, and cultivate social relationships between group members and visitors.



*Essbare Stadt Kassel – ForestFeldGarten. © Ana Carla Rocha*

## Urbane Waldgärten

From an agroecological point of view, urban forest gardens are a model of sustainable cultivation that mimics natural ecosystems. Using permaculture principles, these spaces adopt practices that integrate agricultural production with local biodiversity without using pesticides or chemical fertilizers. Layered cultivation favors resilience to climatic variations, and garden species diversity ensures greater resistance to pests and diseases. In addition, the project prioritizes soil conservation and the efficient use of water, which are fundamental elements for long-term sustainability. The municipality provides training and garden visits to strengthen its educational role.





© Urbane Waldgärten Kassel

## Lessons Learned from Urban Agriculture Models in Kassel

The two urban agriculture models in Kassel, *Essbare Stadt Kassel*, and *Urbane Waldgärten*, offer valuable lessons for municipalities around the world, especially considering the implementation of two initiatives with different structures in the same municipality:

### Essbare Stadt Kassel

- \* **Start small and think big: starting** with small, manageable actions that can grow over time is essential. Permaculture projects and edible cities should be started modestly, ensuring the foundations are solid and the community gradually gets involved. Although the end goal is big - such as urban transformation and the promotion of food sovereignty - gradual growth allows for adjustments and learning along the way, increasing the chances of long-term success.
- \* **Adapting to the local context:** each community has its own social and environmental particularities. The ability to observe and adjust permaculture practices to the specifics of each location is essential for projects to be relevant and have a positive impact.
- \* **Fostering social ties and autonomy:** the initiative's central aim is to create a place where people can interact, collaborate, and learn, strengthening the social fabric through agricultural production. This empowers communities and increases their sense of autonomy and belonging, both in terms of food production and the management of shared spaces.
- \* **Mainly financed by volunteers:** the project is sustained mainly through funding from the association's volunteers, who pay a symbolic annual fee, as well as occasional support from companies or calls for proposals. However, predominantly private funding for an activity that serves the common good restricts the possibilities for growth and impact.
- \* **Lack of resources to create formal positions:** the direct impact of the funding issue is the difficulty of establishing an employment relationship with the workers who regularly dedicate themselves to the initiative. This can lead to financial instability and job insecurity, limiting the initiative's growth.



- \* **Lack of targeted public policies:** as the edible city model is not provided for by law or municipal planning, this gap becomes an obstacle to more structured government support. Without a legal framework for the edible city, government support is fragmented and uncertain, and initiatives end up with limited visibility.

## Urbane Waldgärten

- \* **Community involvement:** one of the key lessons learned was the importance of involving the community right from the start of the project. Residents' active participation ensures the successful implementation and the long-term continuity of the gardens. However, community interest and participation varied significantly between the different regions. On one site, the project attracted many participants from the start, while on the other, it was more challenging to engage residents.
- \* **Urban forest gardens are versatile.** Their planting structure efficiently combines ecological and social functions, making them a multifunctional model.
- \* **Environmental education:** through gardening, children and adults learn about food production, sustainable practices, and the importance of biodiversity. This direct connection with nature increases the value placed on food, raises awareness about waste and sustainability, and brings residents closer to the dynamics of the food system.
- \* **Suitable location:** one of the biggest challenges was finding suitable land for the project. The soil needed to be fertile and close to the community, but available city areas tend to have other planned uses, such as construction or parking lots.
- \* **Environmental restrictions:** the gardens were established in landscape preservation areas, which brought strict limitations on which plants could be grown (only regional species) and infrastructure, such as the impossibility of installing permanent structures.



Urbane Waldgärten Kassel. © Andreas Weber.

## Conclusion

The coexistence of the two urban agriculture models in Kassel, *Essbare Stadt Kassel* and *Urbane Waldgärten*, demonstrates the diversity and complementarity of approaches that can be adopted to promote sustainability, food sovereignty, and social inclusion in cities. Analyzing the two initiatives reveals how civil society and public authorities have different perceptions and solutions to similar issues. While the first model, led by the community, values local autonomy and the creation of social ties through autonomous and collaborative initiatives, the second offers an institutionalized structure with technical and educational support, integrating sustainable practices with a robust environmental awareness component. In this sense, these initiatives must establish a more excellent dialogue with each other so that they can be strengthened, allowing them to work together to build a more sustainable city where food strengthens social cohesion and connection with the territory.

## How has Germany been Driving the Transformation of Food Systems?

Through its "Transforming Agricultural and Food Systems" strategy<sup>194</sup>, Germany has played an important role in combating global hunger and malnutrition. The Federal Ministry for Economic Cooperation and Development (BMZ) invests around 2 billion euros annually in global food security and rural development. In doing so, the country reinforces its commitment to transforming agricultural and food systems within planetary boundaries and to the right of all people to have access to sufficient, safe, and nutritious food.

To achieve this result, however, these systems need to be more effective and efficient, resilient to shocks of all kinds, and be established in an environmentally, economically, and socially sustainable way. This will allow them to contribute to generating income and jobs, overcoming poverty, and creating prosperity. It is essential that the rights and interests of producers, especially small producers, are balanced with the interests of consumers, protecting the climate and conserving natural resources such as land, water, and biodiversity.

Germany works together with its partners to foster a social-ecological transformation of our agriculture and food systems. BMZ works with a wide range of partners, including governments, civil society, international organizations, academia, and the private sector, to establish a basis for solid social cohesion and create opportunities for future generations as outlined in the strategy "Transforming Agricultural and Food Systems". The strategy is divided into three areas of intervention:

- I. **Food and Nutrition Security:** the central focus is realizing the human right to adequate food, especially for vulnerable groups. Germany supports governments in countries of the Global South in incorporating this right into their policies through production measures, access to food, income generation, social protection systems, and nutritional interventions.
- II. **Rural Development:** the aim is to improve living conditions in rural areas and reduce inequalities compared to urban areas while taking advantage of the links between the two. Rural governance, social participation, land tenure rights, regional economic development, and the conservation of natural resources, in accordance with agroecological principles, are essential pillars of this area.
- III. **Agriculture:** the emphasis is on strengthening agricultural value chains and sustainable food systems, from local production to global markets. Germany especially supports small farmers by promoting innovation, investment, and agricultural research. Protecting the climate, biodiversity and adapting to climate change are also priorities, as is encouraging sustainable consumption in Europe.

The "Transformation of Agricultural and Food Systems" strategy follows a holistic and multi-sectoral approach in which the areas of intervention complement each other. GIZ implements, on behalf of BMZ, different types of projects within this framework. GIZ works with c partners to generate political, social, and economic ideas for change, develop them into a concrete plan, and facilitate their implementation. In doing so, it offers practical solutions that give people better prospects and sustainably improve their living conditions.<sup>195</sup>

Two of these projects have been selected as they relate to agroecology and/or urban agriculture, which are the central themes of this guide: one located on the outskirts of Bangladesh, which promotes urban agriculture as a strategy to mitigate heat islands while empowering women and girls, and the other in India, a country that is at the forefront of the agroecological transition and which, in partnership with the German government, has made further progress along this path. The lessons learned from these experiences can contribute to local public policies and also show how the international cooperation and solidarity mentioned at the beginning of this guide translate into practice.

<sup>194</sup> Federal Ministry for Economic Cooperation and Development (BMZ) (2021).

<sup>195</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (n.d.-a).





**Projects  
implemented  
by GIZ**



# Bangladesh

## Enhancing Resilience of Urban Poor<sup>196</sup>

© Canva Pro



## About the Country

Bangladesh, a young country that gained independence from Pakistan in 1971, faced a series of military coups between 1975 and 1990. Only in 2008 did it establish itself as a full democracy<sup>197</sup>. Located in South Asia, the country borders India and Myanmar and has an extensive coastal area along the Bay of Bengal. With a population of 165.16 million, Bangladesh is one of the most populous countries in the world. Its Human Development Index (HDI) was 0.661 in 2021<sup>198</sup>, classified as medium. The textile industry strongly drives the country's economy and is one of the most promising economies in Asia<sup>199</sup>.

## Context

Bangladesh has one of the highest urbanization rates in Asia while being at high risk and susceptible to the impacts of climate change<sup>200</sup>. Heavy rains, floods, cyclones, river erosion, heat waves, and other natural disasters are a reality in the country. Around 30% of its land area is submerged yearly due to monsoon rains and river flooding<sup>201</sup>. In this context, urban services need to be better adapted to the needs of the most vulnerable urban population and the consequences of climate change.

<sup>196</sup> The entire content of this session was based on conversations with actors involved in the project and internal and public documents made available by GIZ and Anando Bangladesh for this work.

<sup>197</sup> CIA World Factbook (2023-a).

<sup>198</sup> United Nations Development Programme (UNDP) (2022).

<sup>199</sup> World Bank (2023).

<sup>200</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2022).

<sup>201</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2024-b).

In addition, traditional building formats and methods, combined with inadequate planning and the destruction of green spaces, promote the emergence of increasingly intense urban heat islands<sup>202</sup>. Internal migration, caused by environmental and climatic disasters, has yet to be integrated into the country's public policies and land use planning<sup>203</sup>.

These variables must be taken into account in urban planning. City governments and national authorities need to target their investments more sensitively to the climate and the needs of local populations. In this sense, on behalf of BMZ and in partnership with local actors, GIZ contributes to resilient urban development through locally-led solutions. This occurs within the framework of innovation labs, implemented in selected cities to show concrete examples of livable city models.

Therefore, the solutions present concrete approaches to inclusive, sustainable, and appropriate urban development, contributing directly to achieving the SDGs and related targets for cities and urban regions. The experiences provide a closer look at reality, enabling effective, needs-oriented policymaking and increasing the visibility of urban solutions.



© Anando Bangladesh/GIZ.

## Project Overview

Bangladesh's slums have a high population density, limited resources, and lack of opportunity, making the population highly vulnerable. The climate crisis has made the temperature in Bangladesh's slums exceed 40°C for most of the year. As a result, the well-being and health of the residents, especially women and children, are jeopardized, as are their food security and sovereignty.

Faced with this challenging scenario, the Enhancing Resilience of Urban Poor project was born and implemented in a slum in *Satkhira Pourashava*. The initiative aims to reduce the effects of heat islands through urban agriculture, generate income, promote environmental protection activities, and raise awareness among citizens.

<sup>202</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2024-b).

<sup>203</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (n.d-b).



*"Most of the people in the urban area came from rural areas affected by climate change. They already had agricultural skills. In the urban area, they face problems such as a lack of nutritious food and limited employment opportunities, especially for women who stay at home. Agriculture has made it possible to address several problems at the same time: food security, nutrition, income generation and reducing the temperature in homes."*

Zillur Rahman / Anando Bangladesh.

The initial problem the project set out to solve was overheating homes. However, in the construction of solutions, urban agriculture emerged as a strategy capable of meeting the central objective (mitigating heat islands) while offering solutions to other challenges mapped out in the context of its implementation. Around 70% of the residents on the outskirts of Bangladesh have migrated from rural areas for environmental reasons and, therefore, have some previous experience with agriculture or at least a familiarity with the practices. Hence, opting for a project that incorporated it as a nature-based solution, valuing the residents' previous knowledge and experience, became a viable option.



© Anando Bangladesh/GIZ.

## Partners Involved

The project was carried out in partnership with community representatives, the municipal government of *Satkhira*, the civil society organization Anando, and the Climate Resilient and Inclusive Smart Cities (CRISC) project. During its implementation, between January 2022 and March 2023.

## From Execution to Result

To start the project, a detailed census survey was conducted to identify the beneficiaries and understand their socio-economic conditions. This step was crucial to effectively targeting the interventions. Next, home gardening training was offered, giving residents skills in cultivation techniques suited to the urban context. Rooftop gardening was encouraged as a practical solution to reduce the temperature inside houses. Using recycled materials such as plastic pots and containers, residents could create vertical and horizontal gardens around their homes.

The results of this initiative were significant. The measurements showed that the houses with roof gardens had an internal temperature reduction of up to four degrees Celsius, improving the comfort and health of the residents. In addition, the practice has increased green cover in communities, contributing to air quality and creating a more pleasant and healthier environment.

In addition, the project succeeded in improving the community's livelihoods. To this end, community groups were formed, and they met regularly to discuss sustainable practices and climate issues. These groups strengthened social cohesion and served as a platform for knowledge exchange and mutual support. Training in vertical organic farming allowed the residents to maximize production in limited spaces, using innovative techniques that circumvented challenges such as the lack of land for cultivation.

One innovative aspect was the establishment of a community revolving fund. This fund offered interest-free loans that could be used for children's education, medical expenses, or other emergencies. In addition, a Sales and Exhibition Center was created to facilitate the marketing of surplus products. In addition to allowing agricultural products to be sold, this space promoted entrepreneurship and creativity among the beneficiaries. These mechanisms have strengthened the families' economic resilience, creating a safety net and encouraging savings and community investment.

Finally, female empowerment was another significant gain of the project. The initiative dedicated its efforts to addressing gender inequalities and social injustices. In the format proposed by the project, agricultural practices allowed the community women to carry out the activity in their own homes, increasing their independence and autonomy. To this end, women's and girls' groups were formed, providing safe spaces for discussing challenges and building strategies for dealing with sexual and gender-based violence, as well as developing leadership and other skills that helped them develop the confidence to influence community decisions.

Regular access to fresh, nutritious vegetables has improved families' food security. Generating income through the sale of surpluses has strengthened families' financial stability and allowed them to invest in other essential areas.

### ***Box 10 – Results of the Enhancing Resilience of Urban Poor project***

- \* 150 families involved, around 900 people benefited.
- \* 93% of the 150 families are producing on their roofs.
- \* 66% of families sell their surplus production.
- \* 88% of residents used recycled material as a production space.





© Anando Bangladesh/GIZ.

## Lessons Learned

- \* **Adapting to physical limitations:** the availability of productive land is a constant challenge in urban agriculture, and this project revealed this. However, roofs and vertical gardens made from recyclable materials were successful alternatives to overcome the problem.
- \* **Attention was paid to the territory's socio-economic issues:** problems such as conflicts between neighbors and topics related to drug use were challenges that had to be faced and circumvented during the project.
- \* **Access to water:** small rainwater harvesting facilities have been provided, contributing to agricultural production's water management.
- \* **Transversality of challenges:** the problems faced by vulnerable communities are not isolated but interconnected. This calls for multifaceted solutions that integrate environmental and socio-economic needs, and urban agriculture is emerging as a solution.
- \* **Thermal comfort:** the project showed how urban agriculture can provide thermal comfort for vulnerable groups by reducing the internal temperature of houses by planting food, even with limited resources.
- \* **Active listening and collaboration between the parties involved:** the participation of various actors, including the beneficiaries and the municipal government, in constructing the solution was fundamental to the project's success.
- \* **Creating opportunities:** the project showed that with the proper support, solutions emerge from the community itself. During the training sessions, workshops, and other activities carried out as part of the project, the beneficiaries created their innovations and improved the quality of life for the whole family.





© Anando Bangladesh/GIZ.

## Conclusion

The Enhancing Resilience of Urban Poor project demonstrated that innovative and integrated solutions can address many of the challenges vulnerable communities face on the outskirts of Bangladesh.

By promoting urban agriculture as a central strategy, the initiative mitigated the effect of heat islands by improving the thermal comfort of homes, strengthening food security, generating additional income for families, and empowering women and girls. The active participation of the community and the involvement of various stakeholders were fundamental to the project's success, demonstrating that with adequate support, the creation of opportunities, and the valuing of local knowledge, communities themselves are capable of developing solutions to their challenges.

# India

## Support to Agroecological Transformation Processes in India (SuATI)<sup>204</sup>

© Canva Pro



## About The Country

India is a country located in South Asia, home to some of the world's oldest civilizations. It is the seventh largest country in the world by land area and the second most populous, with more than 1.4 billion inhabitants (expected to overtake China by 2028)<sup>205</sup>; its HDI is 0.644, considered to average<sup>206</sup>. The country is a regional and global economic powerhouse but faces urgent problems related to extensive poverty, widespread corruption, and environmental degradation<sup>207</sup>. It is also renowned for its ethnic, linguistic, and religious diversity, with over twenty official languages.<sup>208</sup>

## Context

Agriculture and food systems are fundamental to India's economy, providing livelihoods for more than 50% of the population. Since the Green Revolution, the country has been able to produce enough food to combat food shortages. Although it has played an essential role in providing calories, the Green Revolution has prevented the diversification of production and diets, and the environmental and social problems associated with industrial agriculture are becoming increasingly evident: 71% of cultivated land in India is being overused, which affects its productive capacity. Climate change is further exacerbating these challenges.

---

<sup>204</sup> The entire content of this session was based on conversations with actors involved in the project internal and public documents made available by GIZ for this work.

<sup>205</sup> BBC News (2023).

<sup>206</sup> United Nations Development Programme (UNDP) (2023).

<sup>207</sup> CIA World Factbook (2023-b).

<sup>208</sup> CIA World Factbook (2023-b).



In India, there are a growing number of sustainable business models that combine traditional circular farming practices with innovative technology and management approaches. Agroecological approaches promise to increase farmers' incomes, reclaim degraded land, improve nutritional security through diversification, and reduce negative environmental impacts. The Indian government is increasingly promoting agroecological approaches, for example, through the National Mission for Sustainable Agriculture and the recently launched National Mission for Natural Agriculture. Similarly, several states have begun the transition to organic and natural farming.



Members of Self-Help Group actively participate in a demonstration on preparation and use of organic manure and bio-pesticides such as Jivamrit. Location: Beryali village, Solan district, Himachal Pradesh. © GIZ/Harsh Kamat (Common Thread Media)

## About the Project<sup>209</sup>

In this context, the Indo-German Partnership for Green and Sustainable Development has played an essential role through the Support to Agroecological Transformation Processes in India (SuATI) project. Commissioned by BMZ as part of the global initiative "Transformation of Agricultural and Food Systems" and implemented by GIZ, the project is part of this process of supporting agroecological transformation in India. It is being carried out between 2021 and 2027.

Agroecological transitions require society-wide involvement, a cross-cutting policy for innovation and change, and concrete benefits for farming communities and consumers. SuATI, therefore, places a strong focus on fostering the exchange of knowledge and dialog between stakeholders in different sectors and scales, as well as forming alliances from the local to the global level. The project is structured around five areas of action:

- I. Improving knowledge of agroecological and sustainable agricultural practices.
- II. Support the implementation of agroecological programs focusing on market development, crop diversification, and income at the state level.
- III. Establish agroecological principles and approaches in national programs.
- IV. Demonstrate the planning, implementation, and monitoring of agroecological approaches.
- V. Strengthen Indo-German dialog and cooperation on agroecology.

<sup>209</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (n.d.-c).



At the local level, Women's Self-Help Groups have become vital agents of change in agroecological transformation processes. Their role is being increasingly recognized and reflected in a new campaign under the Ministry of Rural Development's National Rural Livelihoods Mission, which aims to scale up natural farming at the level of agricultural hubs managed by these groups. The project supports this campaign by building capacity and facilitating agroecological transitions in productive sub-sectors such as moringa, beekeeping, and aquaculture.

### **Box 11 – Gender highlight**

While agroecology offers opportunities to promote gender equity by encouraging diverse roles, inclusive decision-making and greater community involvement, its effects on gender dynamics can vary depending on contextual factors, traditional norms and local practices. Recognizing these variables, SuATI understands the potential of agroecological transformations to boost the empowerment of marginalized groups, especially rural women.

With this, SuATI adopts gender transformative approaches, aiming to contribute to the sustainable social and economic empowerment of women, while addressing social norms and structural barriers that perpetuate gender inequality. This reflects the project's commitment to making agroecology not only a sustainable practice, but also a route to social transformation.

## **Partners Involved**

GIZ India implements the SuATI project in cooperation with the Ministry of Agriculture and Farmers' Welfare (MoA&FW), the National Bank for Agriculture and Rural Development (NABARD), and the Ministry of Rural Development (MoRD). The project is concentrated in the states of Karnataka, Madhya Pradesh, and Assam.



*The members of the Women's Self-Help Group engage in preparing and selling their diverse range of farm products to fellow villagers. Among their offerings are specialised livestock feeds for chickens and goats. Location: Banjikusum village, Singhbhum district, Jharkhand.*  
© GIZ/Harsh Kamat (Common Thread Media)

## From Execution to Result

The principle of knowledge co-creation, envisioned by HLPE, is a key entry point in this project. It involves identifying the similarities between India's diverse approaches to sustainable agriculture and translating them into customized agroecological messages for policy and practice. In the field, support groups enable women to share experiences and knowledge. Governance of land and natural resources is reflected as a cross-cutting principle guiding the integration of agroecology into policies and funding schemes at the central and state levels.

This also involves the convergence of political instruments favorable to agroecological change. By promoting agroecological business models and interactions between producers and consumers at a regional level and integrating social values and diets, SuATI also fulfills the principles of economic diversification and connectivity. Soil health and input reduction are central concerns of farming communities, which are addressed by supporting agroecological practices at the farm level that address these concerns (Figure 12).

Thus, the project harnesses India's wide range of approaches to sustainable agriculture (such as sustainable intensification, natural farming, and agroforestry) under the agroecology paradigm, thereby enabling the mainstreaming of agroecology into large-scale policies and funding schemes and creating momentum for the transformation of agriculture and food systems at multiple levels.

Supporting livelihood opportunities based on agroecology enhances rural women's adaptive capacities. Under the Indo-German Reference Initiative on Agroecology and Sustainable Natural Resource Management, with SuATI as the anchor project, the agroecological momentum is carried forward to international platforms, underlining India's growing leadership in global change in agricultural and food systems. Results at the national level will materialize over time, including the adoption of agroecological practices by hundreds of Women's Self-Help Groups and Farmers' Organizations.

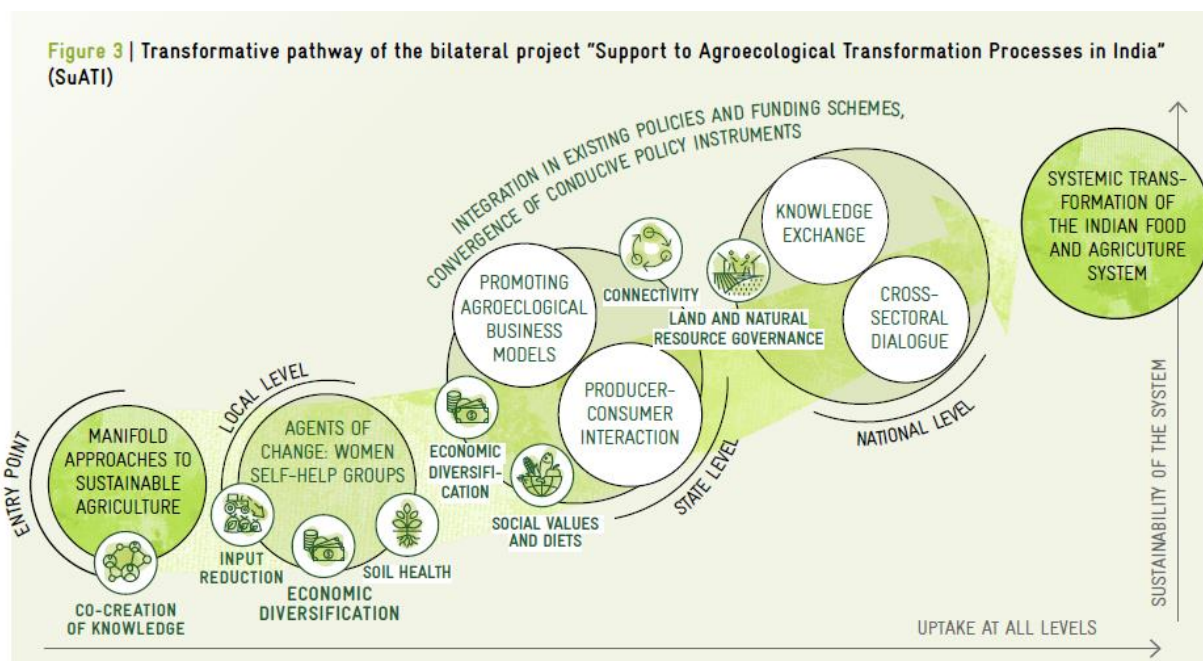


Figure 6 | Transformative pathway of the SuATI bilateral project<sup>210</sup>.

## Lessons Learned

- \* **The need for familiarization and continuing education:** agroecology is a relatively new concept for most stakeholders, including governments, farmers, and support organizations. The learning curve is steep, and there is a clear need to build a solid knowledge base at all levels to facilitate adopting and implementing agroecological practices.

<sup>210</sup> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (2024-c)

- \* **Shortage of specialized support:** The lack of specialized consulting and technical support agencies limits access to essential information and strategies for agroecology. There is also a shortage of local agencies trained to implement these practices at the field level, which delays dissemination and the development of ready-made models.
- \* **Low awareness and lack of incentive among farmers:** Farmers' low awareness of agroecology makes large-scale adoption difficult. In addition, the budget allocated to agroecology and natural farming is still low compared to conventional farming methods.
- \* **Challenges in multi-level implementation:** Managing the complexity of implementing agroecology at different levels, from the central government to the farmer level, is challenging and requires effective coordination and clear communication between the other actors.
- \* **Confusion between agricultural approaches:** overlapping concepts such as agroecology, organic farming, and climate-smart agriculture create confusion among farmers and policymakers, making it difficult to understand the specific benefits of agroecology and, consequently, its adoption.
- \* **Taking advantage of women's social capital:** women play a fundamental role in driving agroecological innovations. They are responsible for deciding which practices best meet the community's needs, demonstrating that women's social capital can be a powerful multiplier in disseminating these practices.
- \* **Recognition of diverse knowledge systems:** agroecology is based on a diversity of knowledge systems, and honoring these identities contributes to greater acceptance of agroecology as a unifying approach to achieving shared sustainability goals.
- \* **Co-benefits through policy integration:** the convergence of agroecological solutions with other areas of public policy, such as biodiversity and climate change, demonstrates co-benefits and strengthens the case for a broader transition to agroecological and sustainable food systems.

## How Could the Lessons Learned from this Project be Adapted to Cities?

Although the main focus of the project is on rural areas, many of the principles, practices, and lessons learned through the implementation of SuATI apply to the urban context, for example:

- \* **Knowledge co-creation and continuous learning:** for urban agriculture to thrive, it is necessary to continuously educate stakeholders and facilitate knowledge exchange between urban farmers, technicians, and the public. The creation of learning networks can be a starting point for promoting the adoption of sustainable practices.
- \* **Creation of support groups:** The Women's Self-Help Groups occupy a prominent place within the project. Agroecology, in this context, promotes female empowerment and creates a solid support network that addresses cross-cutting issues such as gender inequality. Urban agroecology can use this strategy to empower women and other vulnerable groups.
- \* **Integration between local, regional, and national approaches:** SuATI builds a strategy that starts at the local level and scales up to the national level, promoting different principles of agroecology along the way. This experience reveals the importance of an open dialog and articulation between governments in the construction of public policies for urban agroecology to promote a transformation at scale.
- \* **Building public policies and incentives:** urban agroecology must be integrated into public policies that promote sustainability, biodiversity, and climate resilience. Financial and programmatic incentives can encourage more citizens and communities to engage in sustainable agricultural practices within cities.
- \* **Valuing diverse knowledge systems:** Urban agroecology must respect, promote, and incorporate the different knowledge systems that exist in cities, from traditional knowledge to technological innovations.



It must promote an inclusive and collaborative approach that values the cultural and environmental diversity of urban areas.

- ✱ **Translation of existing practices:** one of the tools used by the project is to take advantage of the sustainable agriculture approaches already practiced in India and review them in the light of agroecology. In this way, the practices already taking place are valued, and the insertion of the agenda into the public debate makes more sense. The same can be done in municipal urban agroecology policies: "What is already being done in the municipality?" "How do these practices dialog with agroecology?" These are two questions that can contribute to this discussion.

## Conclusion

With the support of SuATI, agroecology is emerging as a viable solution for tackling the challenges facing India's agriculture and food systems. For decades, the country has depended on the intensive and unsustainable production models, from a social and ecological point of view, promoted by the Green Revolution. Going against this model, the project demonstrates the potential of agroecology to boost sustainable practices by integrating public policies, promoting technical knowledge, and strengthening vulnerable social groups, especially women. The convergence of traditional and innovative approaches and government support is building a path toward a significant transformation in Indian agriculture.

SuATI's experience shows that adopting agroecological practices requires a coordinated effort between different levels and actors, from local self-help groups to national policymakers. This is why exchanging knowledge and dialog is fundamental to building solutions adapted to local realities. Implementing sustainable business models, including social values, and involving consumers are necessary steps to consolidate a more inclusive, resilient, and ecologically sustainable agriculture through agroecology.



Members of the Women Self-Help Group and the facilitating agency for the JIVA project (a NABARD supported programme under SuATI project) gather in a village meeting to exchange knowledge and share experiences on natural farming activities. © GIZ/Harsh Kamat (Common Thread Media)

This approach adopted by India has put the country at the forefront of transforming food systems. The lessons learned through the project can serve as a model for other countries facing similar challenges and can be adjusted to urban agroecology initiatives. They demonstrate how the dynamics of the countryside can be translated to the demands of cities and strengthened in favor of agricultural practices that promote social cohesion, gender justice, and environmental sustainability.

# Chapter 05

## How to Develop Effective Municipal Urban Agriculture Policies?

It is typical for the processes of formulating, implementing, evaluating, and controlling public policies to be developed without a solid structure or strategic planning that allows the decision-maker to make the best choices for the collective interests. The result is that resources end up being allocated inefficiently and/or outside the priorities or needs of the municipality.<sup>211</sup>

This lack of guidelines leads to a waste of public money and society's access to public goods and services that are incompatible with the amounts spent on building that solution. This guide has, therefore, been designed to present fundamental concepts, justify urban agriculture and agroecology as interesting approaches for municipalities, and present examples of initiatives on the subject.

In this chapter, all the learning has been consolidated and translated into a series of recommendations to support municipal managers in building efficient, effective, and agroecological urban agriculture policies:

### Recommendation #1:

**Understand urban agriculture as a practice capable of addressing challenges beyond food and nutrition security.**

As the examples have shown, urban agriculture goes far beyond the function of providing fresh and nutritious food, and its principal characteristic is its multifunctionality. Therefore, UA policies should recognize and promote it, considering the multiple benefits and functions that the practice can offer, such as improving mental health and well-being, strengthening social cohesion, and environmental education, as well as being a nature-based solution capable of mitigating the consequences of the climate crisis and making cities greener. UA initiatives should be considered instruments of urban regeneration, social inclusion, and sustainability, holistically transforming the city and integrating solutions to complex challenges.

### Recommendation #2:

**Map the initiatives that already exist in the municipality to understand how to support what is already being done.**

Municipal urban agriculture policies should begin with a detailed mapping of existing initiatives in the city. This identification can reveal informal projects, community gardens, groups engaged in agricultural practices, and civil society initiatives aligned with the theme. With this, it will be possible to understand the real potential and build a plan that indicates where resources are most needed and how municipal support can be more efficient, avoiding duplication of efforts and promoting collaborative networks between local initiatives, as well as more effective and participatory management.

### Recommendation #3:

**Make urban agriculture a state policy.**

---

<sup>211</sup> Government of the State of Maranhão (2019).

In a democratic system, the alternation of power is a reality. Ensuring that urban agriculture policies are perpetuated beyond the change of government and generate lasting and permanent benefits for the population is fundamental. For this to happen, UA must be seen as more than an action of the mandate in question but as a municipal policy. Education, popular support, and physical marks on the territory are strategies that can be used to ensure the stability of the policy.

### **Recommendation #4:**

#### **Create solid legal frameworks and guarantee legal certainty for farmers.**

In direct relation to the previous recommendation, the examples presented demonstrate the importance of legal certainty and legal frameworks to ensure the continuity of urban agriculture initiatives. This security involves allocating space and resources for agricultural practice and legislative frameworks that consolidate urban agriculture as a municipal agenda, allowing for better financial investment and government support and binding future municipal managers.

### **Recommendation #5:**

#### **Promote intersectoral policies and coordination between the government, civil society, and universities.**

Often, the municipal authority's capacity to act is limited in terms of resources (financial, human, and technical). For this reason, coordination with other administrative bodies and organizations outside the municipality can be an alternative to compensate for these shortcomings. Thus, urban agriculture policies can be coordinated between departments such as the environment, education, and social development, for example, but also with universities in the region, social movements, and civil society organizations, which can contribute to community engagement, building technical knowledge and helping to implement the municipal initiative.

### **Recommendation #6:**

#### **Commit to agroecology as an official approach.**

Urban agroecology should be a municipal goal and priority, as this approach has the potential to amplify the benefits of UA, especially from an environmental and social point of view. When the municipality explicitly commits to this science, practice, and movement, it clearly defines what urban agriculture should be and what guidelines it should follow. In doing so, it offers more than a set of tools for sustainable agricultural production; it is a philosophy that integrates agriculture with nature, respecting social dynamics and promoting food sovereignty. This commitment, both in practice and speech, makes all the difference.

### **Recommendation #7:**

#### **Strengthen education and training in agroecology.**

Although agroecology has gained increasing prominence nationally and internationally, not everyone inside and outside the government understands precisely what it stands for. As shown in the examples of Maricá and India, one major challenge is ensuring that knowledge about this approach is consolidated and coherent among the different spheres of power and among the farmers themselves.

Therefore, it is fundamental to train the population, managers, and operators of urban agriculture policies on the importance of these initiatives being agroecological through training, events, and workshops. The format of this training can vary, as the examples show, but it is an essential component of a good agroecological urban agriculture policy.



## **Recommendation #8:**

### **Promote urban agroecology as a strategy for urban resilience and adaptation to climate change.**

Urban agriculture policies should promote it as an essential strategy for resilience and adaptation to climate change. The case of Bangladesh demonstrates how these practices can mitigate the impacts of heat islands, regenerate degraded areas, and improve the quality of life of vulnerable urban populations. Integrated policies should encourage it as part of climate action, especially in regions with high levels of climate vulnerability, contributing to creating productive green zones, increased biodiversity through agroecological practices, and better soil permeability, helping to control flooding, for example.

## **Recommendation #9:**

### **Advocate and encourage urban agroecology with local, state, and federal governments.**

In India, SuATI has promoted agroecology at various decision-making levels, from local communities to state and federal policies. In Brasil, urban agriculture and agroecology, through the intense action of social movements, are now provided for in federal legislation, with recommendations and projects aimed at the state and municipal levels. This articulation between the different spheres of government encourages more robust and structured initiatives, establishing nationally consolidated parameters that encourage the creation of local regulatory frameworks and increase the legal certainty mentioned in Recommendation No. 4.

## **Recommendation #10:**

### **Monitor the impact of municipal policies through indicators that allow an overview of the results to be created.**

Measuring the success of initiatives through monitoring systems based on clear and measurable indicators, such as garden productivity, social inclusion, nutritional quality, and environmental impact, allows policies to be evaluated and adjusted to ensure that their objectives are being met. Data management systems and annual reports can ensure transparency and strengthen initiatives, attracting more investment and better targeting institutional support. This recommendation is directly linked to No. 5 since partnerships with universities and research centers, or even outsourcing impact measurement activities can help local governments overcome the lack of human resources for this function.

## **Recommendation #11:**

### **Create opportunities for citizens to create their urban agriculture solutions.**

In Bangladesh's Enhancing Resilience of Urban Poor project, residents were offered technical and organizational support to develop their own urban agriculture solutions, fostering creativity and social entrepreneurship. This community empowerment, combined with the creation of opportunities and autonomy in developing and implementing solutions, is essential for citizens to create initiatives that suit their reality. Public policies on urban agriculture can foster this through technical training programs, access to resources, input donations, urban laboratories, and financial incentives.

## **Recommendation #12:**

### **Make urban agriculture a mechanism for social inclusion and the requalification of idle spaces.**

All the initiatives presented demonstrated the social nature of urban agriculture. In Berlin, for example, the urban agriculture initiative helped to give a social function to a disused airport, integrating immigrants and refugees into the dynamics of the garden. In Belo Horizonte, vulnerable groups and peripheral populations are the priority focus of municipal policy. In India, the Women's Self-Help Groups, as well as promoting agroecology, have boosted women's empowerment and highlighted their centrality in developing this approach.

These examples clearly show how UA policies should act as a mechanism for social inclusion and the qualification of underutilized spaces in cities, improving access to food, environmental and food education, generating income, promoting the right to the city, and serving as a platform for reducing inequalities. To do this, municipalities can adopt various strategies, such as prioritizing certain social groups, choosing geographically marginalized areas, and reconciling urban agriculture with existing social assistance mechanisms.

## **Recommendation #13:**

### **Develop strategies to emancipate farmers, empowering them to self-management.**

As beneficial as proactive action by municipal governments can be, the success and maintenance of urban agriculture policies depend on community engagement. In the case of production units or community gardens, when the interest is in strengthening the local economy by selling the surplus, offering not only food security and environmental benefits but also some financial return to the farmers, they need to be encouraged to self-manage that productive space and become autonomous. To this end, in addition to technical training in agroecology and urban agriculture, producers should have access to content related to entrepreneurship and self-management, preparing them to market their production and promoting productive inclusion.

## **Recommendation #14:**

### **Facilitate access to local markets and fairs, encouraging short circuits.**

In direct relation to the previous recommendation, when urban agriculture policy seeks to promote the commercialization of agricultural production, an important strategy to consider is the creation and strengthening of local markets and fairs. This encourages short circuits of production and consumption, benefiting both farmers and the environment by reducing the carbon footprint of food transportation and offering fresh, healthy products to the population. In Belo Horizonte, for example, there is the Urban Agriculture Fair, and purchases are made through the Food Acquisition Program. In Curitiba, there is a dialog with the food bank and local restaurants. In Bangladesh, a marketing center was created for surplus products. These initiatives are examples of how municipal administrations can act to promote the economic character of UA.

## Recommendation #15:

### **Promote edible cities by integrating widespread policies and initiatives.**

By definition, edible cities are those that prioritize and promote the sustainability of the local food system. They are designed and managed to support the production, distribution, and consumption of locally grown food, aiming to increase food security, promote health and nutrition, improve biodiversity, reduce food waste, and minimize the environmental impact of food production and transport.<sup>212</sup>

All of the municipalities presented have used mechanisms that include them, to varying degrees, in this concept. Based on the successful examples, the final recommendation is that urban agriculture policies, in addition to committing themselves to agroecology, take on the mission of making the municipality an edible city in terms of the concept. Build cities in which a sustainable and fair food system is a management priority and a state policy, with initiatives spread throughout the territory democratically and equitably.

Planting fruit trees in public squares, encouraging community gardens, productive backyards or green roofs, and supporting startups and urban farms are all examples of mechanisms that can be used to this end. However, creativity and an attentive look for local potential can reveal other paths that local managers can decide.

---

<sup>212</sup> Edible Cities Network (n.d.).



# Conclusion

In today's global scenario, marked by intense urbanization and multiple crises, including food systems and climate change, national, regional, and local governments must come together to act and propose new ways of producing, consuming, and disposing of food more sustainably. Urban agroecology is emerging as a viable and strategic solution and paradigm in this context.

By integrating sustainable agricultural practices carried out within the urban space with the principles proposed by agroecology, it is possible to promote food security and social and environmental justice, making it possible to produce healthy food while reusing local resources, respecting natural cycles, contributing to climate change mitigation, reducing dependence on global food chains and reframing the relationship between city dwellers and the environment. The practice can also foster social aspects, such as guaranteeing leisure spaces, empowering vulnerable groups, increasing social cohesion, and offering economic gains for low-income families.

By reading the cases, it is possible to see the similarities and differences between Brasil and Germany in terms of implementing urban agriculture initiatives. Although there are obvious contrasts, such as the strong institutional support in Brasil and the greater autonomy of the initiatives in Germany, these variations suggest possibilities for mutual learning, especially when considering urban agriculture as a tool for promoting sustainability and social inclusion.

In Brasil, the consolidated legal framework, coupled with a closer relationship between governments, social movements, and farmers, has been fundamental to the development of urban agriculture as part of food security policies. This institutionalization allows local initiatives, especially in peripheral areas, to receive government support, contribute directly to the fight against hunger, and promote social justice. The connection with agroecology further strengthens these practices.

Germany stands out for its independent UA models. In some cases, such as Berlin and the *Essbare Stadt Kassel*, there is citizen autonomy and little or no state intervention, but with a strong network of urban farmers, strengthened by the *Anstiftung*. In initiatives promoted by public authorities, such as Andernach and the Kassel Forest Gardens, governments independently commit to urban agriculture. Although only sometimes focused on food security, these approaches promote sustainability and environmental education, strengthen social cohesion, and value cultural diversity, a crucial element for vulnerable groups such as refugees and immigrants.

The economic and cultural differences between Brasil and Germany certainly influence how urban agriculture is implemented in each country. However, the German model, characterized by greater independence and self-management, can inspire Brazilian public managers seeking to promote greater emancipation of farmers in local initiatives. This approach can foster innovation in urban agriculture practices in the long term.

On the other hand, Germany can benefit from Brasil's legal framework, which encourages urban agriculture through legal and administrative frameworks, providing more significant support for existing practices. In addition, Brasil's relationship with agroecology is a highlight that Germany can observe, especially as the approach has gained relevance on the international stage and is essential for transforming food systems, especially in the face of the climate crisis.

In addition, the projects implemented by GIZ in countries such as Bangladesh and India highlight that international collaboration can amplify the impact of these practices, building together with the parties solutions adapted to local crises, from mitigating heat islands to combating food insecurity, as well as empowering vulnerable groups, especially girls and women, using agricultural practices promoted at the local level as a gateway to dialogue on tackling gender-based violence.

International cooperation is also important for expanding access to technical and financial resources, which are often an obstacle for countries in the Global South. It also serves as a conduit for replicating best practices and lessons learned in similar contexts.

These examples demonstrate that urban agriculture, when practiced under the aegis of agroecology, supported by coherent public policies, with community participation and good resource management, can tackle systemic

crises and promote fairer, more resilient, and sustainable cities. As seen throughout this guide, UA alone cannot guarantee food security or solve all urban problems. However, when seen as an integrated response to contemporary challenges, it becomes an indispensable tool for reconfiguring food systems, with direct impacts at the local level.

Given this exchange of experiences and learning, it is hoped that the knowledge gained over twelve months of research on German soil can contribute to the construction of agroecological urban agriculture public policies capable of reaching their full potential and consequently promoting inclusive, ecological, and solidarity-based urban development.

# References

- ABRANDH. (2010). *Direito humano à alimentação e à nutrição adequadas no contexto da segurança alimentar e nutricional*. Ação Brasileira pela Nutrição e Direitos Humanos.
- Adil, D., Freitas, K., Portela, L., & Ferrer, L. (2023). Agriculturas urbanas: Uma agenda política necessária para a construção de sistemas alimentares justos e saudáveis. *Revista Agriculturas: Experiências em Agroecologia*, Número Especial.
- Allmende-Kontor. (n.d.). Der Garten. Allmende-Kontor. <https://www.allmende-kontor.de/der-garten/>
- Altieri, M. A. (2012). Agroecologia, agricultura camponesa e soberania alimentar. *Revista NERA*, (16), 22–32. <https://doi.org/10.47946/rnera.v0i16.1362>
- Altieri, M. A., & Nicholls, C. I. (2018). Urban agroecology: Designing biodiverse, productive and resilient city farms. *Agro Sur*, 46(2), 49–60. <https://doi.org/10.4206/agrosur.2018.v46n2-07>
- Altieri, M., Funes-Monzote, F., & Petersen, P. (2011). Agroecologically efficient agricultural systems for smallholder farmers: Contributions to food sovereignty. *Agronomy for Sustainable Development*, 32, 1–13. <https://doi.org/10.1007/s13593-011-0065-6>
- Amt für Statistik Berlin-Brandenburg. (n.d.). Bevölkerung. Amt für Statistik Berlin-Brandenburg. <https://www.statistik-berlin-brandenburg.de/bevoelkerung>
- Andernach Tourismus. (n.d.). Andernach. *Andernach Tourismus*. <https://www.anderenach-tourismus.de/en/anderenach>
- Anderson, C. R., Bruil, J., Chappell, M. J., Kiss, C., & Pimbert, M. P. (2021). *Agroecology now! Transformations towards more just and sustainable food systems* (205 p.). Palgrave Macmillan. <https://link.springer.com/book/10.1007/978-3-030-61315-0>
- Aquino, A. M. D., & Assis, R. L. D. (2007). Agricultura orgânica em áreas urbanas e periurbanas com base na agroecologia. *Ambiente & Sociedade*, 10(1), 137–150.
- Artmann, M., & Sartison, K. (2021). Umsetzung und Auswirkungen essbarer Städte: Eine naturbasierte Lösung für gesellschaftliche Herausforderungen der Urbanisierung? *pnd – rethinking planning*, 2021(1), 231–247.
- Artmann, M., Sartison, K., & Vávra, J. (2020). The role of edible cities supporting sustainability transformation: A conceptual multi-dimensional framework tested on a case study in Germany. *Journal of Cleaner Production*, 255, 120220. <https://doi.org/10.1016/j.jclepro.2020.120220>
- Associação Brasileira para o Estudo da Obesidade e da Síndrome Metabólica (ABESO). (n.d.). Mapa da obesidade. <https://abeso.org.br/obesidade-e-sindrome-metabolica/mapa-da-obesidade/>
- AUÊ Estudos de Agricultura Urbana, & Prefeitura Municipal de Belo Horizonte. (2022). *Informações sobre as unidades produtivas (UPs) coletivas/comunitárias da agricultura urbana de Belo Horizonte acompanhadas pela SUSAN/SMASAC - PBH*.
- Batitucci, T. D. O., Cortines, E., Almeida, F. S., & Almeida, Â. A. D. (2019). Agriculture in urban ecosystems: A step to cities sustainability. *Ambiente & Sociedade*, 22, e02773. <https://doi.org/10.1590/1809-4422asoc02773vu19L4AO>
- BBC News. (2023, October 6). India country profile. *BBC*. <https://www.bbc.com/news/world-south-asia-12557384>
- BDG. (2022). Bundesverband Deutscher Gartenfreunde e.V. *BDG*. <https://kleingarten-bund.de/de/>
- Belo Horizonte. (2011). Lei Nº 10.255, de 13 de setembro de 2011. Institui a Política Municipal de Apoio à Agricultura Urbana e dá outras providências. <https://leismunicipais.com.br/a/mg/b/belo-horizonte/decreto/2023/1839/18385/decreto-n-18385-2023-regulamenta-a-lei-n-10255-de-13-de-setembro-de-2011-que-institui-a-politica-municipal-de-apoio-a-agricultura-urbana>
- Belo Horizonte. (2023). Decreto Nº 18.385, de 14 de julho de 2023. Regulamenta a Lei nº 10.255, de 13 de setembro de 2011, que institui a Política Municipal de Apoio à Agricultura Urbana. <https://leismunicipais.com.br/a/mg/b/belo-horizonte/decreto/2023/1839/18385/decreto-n-18385-2023-regulamenta-a-lei-n-10255-de-13-de-setembro-de-2011-que-institui-a-politica-municipal-de-apoio-a-agricultura-urbana>
- Berlin.de. (n.d.). Gemeinschaftsgärtnern: Das Berliner Gemeinschaftsgartenprogramm. <https://www.berlin.de/gemeinschaftsgaertnern/programm/>
- Bertolini, A. M., Machado, A. D., & Carvalho, A. M. (2024). Os Objetivos de Desenvolvimento Sustentável e as hortas. In M. T. Gracia, C. M. Bógus, & D. E. P. Coelho (Orgs.), *Hortas comunitárias urbanas: Promovendo a saúde e a segurança alimentar e nutricional nas cidades* (pp. 173–185). São Paulo: Instituto de Saúde.
- Biazoti, A. R., & Leão, V. O. P. de S. (2024). Políticas públicas de agricultura urbana: Trajetória, aprendizados e desafios. In M. T. Gracia, C. M. Bógus, & D. E. P. Coelho (Orgs.), *Hortas comunitárias urbanas: Promovendo a saúde e a segurança alimentar e nutricional nas cidades* (pp. 205–222). São Paulo: Instituto de Saúde.
- BMEL (Federal Ministry of Food and Agriculture). (2024, March 18). "Good Food for Germany" - The Federal Government's Food and Nutrition Strategy. *Federal Ministry of Food and Agriculture*. <https://www.bmel.de/EN/topics/food-and-nutrition/food-nutrition-strategy.html>
- Boas, L. (2023). A Escala Brasileira de Insegurança Alimentar (EBIA) e as principais condicionantes da (in)segurança alimentar no Brasil. *Geoconexões*, 1, 114–134. <https://doi.org/10.15628/geoconexes.2023.14258>
- Brasil. (2006). Lei Nº 11.346, de 15 de setembro de 2006. Institui o Sistema Nacional de Segurança Alimentar e Nutricional - SISAN com vistas em assegurar o direito humano à alimentação adequada e dá outras providências. Presidência da República. [https://www.planalto.gov.br/ccivil\\_03/\\_Ato2004-2006/2006/Lei/L11346.htm](https://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2006/Lei/L11346.htm)
- Brasil. (2023). Decreto Nº 11.700, de 13 de junho de 2023. Regulamenta a Lei nº 14.513, de 11 de janeiro de 2023, que dispõe sobre o Fundo Nacional de Apoio à Agricultura Familiar (FNAF). Presidência da República. [https://www.planalto.gov.br/ccivil\\_03/\\_ato2023-2026/2023/decreto/d11700.htm](https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/decreto/d11700.htm)
- Brasil. (2024). Lei Nº 14.935, de 8 de julho de 2024. Dispõe sobre a Política Nacional de Controle Biológico e dá outras providências. Presidência da República. [https://www.planalto.gov.br/ccivil\\_03/\\_ato2023-2026/2024/Lei/L14935.htm](https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2024/Lei/L14935.htm)
- Caporal, F. R. (2020). Transição Agroecológica e o papel da Extensão Rural. *Extensão Rural*, 27(3), 7–19.
- Centro de Estudos em Sustentabilidade da FGV de São Paulo (FGVces). (n.d.). *Agendas municipais de agricultura urbana e periurbana: Um guia para inserir a agricultura nos processos de planejamento urbano*. <https://eaesp.fgv.br/centros/centro-estudos-sustentabilidade/projetos/guia-para-agendas-municipais-agricultura-urbana-e-periurbana>
- CGIAR Initiative on Agroecology. (2023). *The agroecology transition: Different pathways to a single destination - Eight country experiences*.



- <https://cgspace.cgiar.org/items/0607f5cd-82e0-4fcd-94ac-ad1d159911f0>
- CIA World Factbook. (2023a). Bangladesh. CIA. <https://www.cia.gov/the-world-factbook/countries/bangladesh/>
  - CIA World Factbook. (2023b). India. CIA. <https://www.cia.gov/the-world-factbook/countries/india/>
  - Clinton, N., Stuhlmacher, M., Miles, A., Uludere Aragon, N., Wagner, M., Georgescu, M., Herwig, C., & Gong, P. (2018). A global geospatial ecosystem services estimate of urban agriculture. *Earth's Future*, 6(1), 40-60. <https://doi.org/10.1002/2017EF000536>
  - Comida do Amanhã. (n.d.). Trazer as cidades para o centro da discussão sobre o direito à alimentação. *Comida do Amanhã*. <https://luppa.comidadoamanha.org/>
  - Comitre, F. (2019). Sustentabilidade urbana e políticas públicas: As potencialidades das hortas urbanas em Curitiba e Pinhais (PR). *Revista Mundi Sociais e Humanidades*, 4(01), 42.
  - Costa, H., Almeida, D., Rodrigues, D., & Coimbra, M. (2024). Territórios saudáveis e sustentáveis: Agriculturas urbanas, agroecologia e a produção do espaço urbano. In M. T. Gracia, C. M. Bógus, & D. E. P. Coelho (Orgs.), *Hortas comunitárias urbanas: Promovendo a saúde e a segurança alimentar e nutricional nas cidades* (pp. 151-172). São Paulo: Instituto de Saúde.
  - Curan, R. M., & Marques, P. E. M. (2021). Multifuncionalidade da agricultura urbana e periurbana: Uma revisão sistemática. *Estudos Avançados*, 35(101), 209–224. <https://doi.org/10.1590/s0103-4014.2021.35101.013>
  - Deh-Tor, C. M. (2017). Da agricultura urbana para um urbanismo agroecológico: A via transformadora da agroecologia urbana (política). *Revista de Agricultura Urbana*, 33. RUAF Foundation.
  - Destatis Statistisches Bundesamt. (n.d.). *Income, consumption and living conditions*. Destatis Statistisches Bundesamt. [https://www.destatis.de/EN/Themes/Society-Environment/Income-Consumption-Living-Conditions/Living-Conditions-Risk-Poverty/\\_node.html](https://www.destatis.de/EN/Themes/Society-Environment/Income-Consumption-Living-Conditions/Living-Conditions-Risk-Poverty/_node.html)
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2022). *Bangladesh: Enhancing resilience of urban poor*. <https://www.giz.de/de/downloads/giz2023-en-factsheet-bangladesh.pdf>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2023). *Fact sheet agroecology*. <https://www.giz.de/en/worldwide/104357.html>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2024-a). *Position paper on agroecology*. <https://www.giz.de/expertise/downloads/giz2024-en-position-paper-agroecology.pdf>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2024-b). *Innovations for Climate-smart Urban Development (INCLUDE)*. <https://www.giz.de/en/downloads/giz2024-en-bd-include-project-factsheet.pdf>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (2024-c). *Agroecology – From principles to transformative pathways*. <https://www.giz.de/fachexpertise/downloads/giz2024-en-agroecology-from-principles-to-transformative-pathways.pdf>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (n.d.-a). Our profile. <https://www.giz.de/en/aboutgiz/profile.html>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (n.d.-b). Urban development and climate adaptation. Retrieved from <https://www.giz.de/en/worldwide/87295.html>
  - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. (n.d.-c). Support to Agroecological Transformation Processes in India (SuATI). <https://www.giz.de/de/downloads/giz2023-en-Support-to-Agroecological-Transformation-Processes-in-India.pdf>
  - Dias da-Silva, A. (2020). The construction of public policies for urban sustainability. *Geographical Journal of Central America*, 2(65), 33-61. <https://doi.org/10.15359/rqac.65-2.2>
  - Erb, H. J., & Reuter, L. R. (2024, September 20). Berlin. *Encyclopedia Britannica*. <https://www.britannica.com/place/Berlin>
  - Escola de Enfermagem da UFMG. (n.d.). Alimentação saudável será mais cara do que a não saudável a partir de 2026. UFMG. <https://www.enf.ufmg.br/index.php/noticias/1685-alimentacao-saudavel-sera-mais-cara-do-que-a-nao-saudavel-a-partir-de-2026>
  - Eurostat. (2019). Data available at [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hltl\\_ehis\\_bm1i&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hltl_ehis_bm1i&lang=en)
  - FAO, IFAD, UNICEF, WFP, & WHO. (2023). *The state of food security and nutrition in the world 2023: Urbanization, agrifood systems transformation and healthy diets across the rural-urban continuum*. FAO. <https://doi.org/10.4060/cc3017en>
  - FAO, IFAD, UNICEF, WFP, & WHO. (2024). *The state of food security and nutrition in the world 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms*. FAO.
  - FAO, Rikolto, & RUAF. (2022). *Urban and peri-urban agriculture sourcebook – From production to food systems*. FAO.
  - FAO. (2001). *The state of food insecurity in the world 2001*. FAO. <https://www.fao.org/3/y1500e/y1500e.pdf>
  - FAO. (2007). *Profitability and sustainability of urban and peri-urban agriculture* (Agricultural Management, Marketing and Finance Occasional Paper). FAO.
  - FAO. (2018-a). *Transforming food and agriculture to achieve the SDGs: 20 interconnected actions to guide decision-makers*. FAO. <https://www.fao.org/documents/card/en/c/19900EN/>
  - FAO. (2018-b). *FAO's work on agroecology: A pathway to achieve the SDGs*. FAO. <https://openknowledge.fao.org/handle/20.500.14283/i9021en>
  - FAO. (2024). *One health and agroecology for food system transformation*. FAO. <https://www.fao.org/one-health/highlights/highlights-detail/one-health-and-agroecology-for-food-system-transformation/>
  - FAO. (n.d.). *Hunger and food insecurity*. Food and Agriculture Organization of the United Nations. <https://www.fao.org/hunger/en/>
  - Federal Ministry for Economic Cooperation and Development (BMZ). (n.d.). *Global alliance for food security*. BMZ. <https://www.bmz.de/en/issues/food-security/global-alliance-for-food-security>
  - Federal Ministry for Economic Cooperation and Development (BMZ). (2021). *Transformation of agricultural and food systems: BMZ strategies* (BMZ Paper 5). Core area strategy. <https://www.bmz.de/resource/blob/100758/bmz-core-area-strategy-a-world-without-hunger.pdf>
  - Federal Ministry for Economic Cooperation and Development (BMZ). (n.d.). *Global alliance for food security*. <https://www.bmz.de/en/issues/food-security/global-alliance-for-food-security>
  - Federal Ministry for Economic Cooperation and Development. (n.d.). *Special initiative transformation of agricultural and food systems*. Retrieved January 11, 2024, from <https://www.bmz.de/en/issues/food-security/transformation-of-agricultural-and-food-systems>
  - Feldmann, F., & Vogler, U. (2023). Urbane Landwirtschaft in Deutschland. *Journal für Kulturpflanzen*, 75(01-02), 1. <https://doi.org/10.5073/JfK.2023.01-02.01>
  - Feldmann, F., Pierr, A., & Vogler, U. (2023). Die Formen der urbanen Landwirtschaft in Deutschland. *Journal für Kulturpflanzen*, 75(01-02), 9-36. <https://doi.org/10.5073/JfK.2023.01-02.03>
  - FiBL. (2024). *Cultivating change with agroecology and organic agriculture in the tropics: Bridging science and policy for sustainable production systems*. Research Institute of Organic Agriculture FiBL, Frick.
  - Foletto, L. R., Ferrari, C. T., & Pereira Filho, M. A. M. V. (2020). Agroecologia e permacultura: Um diálogo entre duas correntes

- ecológicas. In 9º Fórum Internacional Ecoinovar, Santa Maria, RS: Temas Emergentes em Sustentabilidade.
- Fórum Mundial sobre Soberania Alimentar. (2001). Declaração final: Pelo direito dos povos a produzir, alimentar-se e a exercer sua soberania alimentar, Havana, Cuba. Disponível em <http://neaepr.blogspot.com/2010/01/conceito-de-soberania-alimenta.html>
  - Frontiers Research Topic. (n.d.). *Indigenous and local knowledge for adaptive resilience in agriculture and food system transformation*. Frontiers. <https://www.frontiersin.org/articles/10.3389/>
  - G20. (n.d.). Belo Horizonte - MG. G20. <https://www.g20.org/pt-br/sobre-o-g20/cidades-sede/belo-horizonte-mg>
  - Gallaher, C. M., Kerr, J. M., Njenga, M., & Others. (2013). Urban agriculture, social capital, and food security in the Kibera slums of Nairobi, Kenya. *Agriculture and Human Values*, 30, 389–404. <https://doi.org/10.1007/s10460-013-9425-y>
  - Genaro, L. F. M. (2019). América Latina: Povo sem pernas, mas que caminha. *Outras Palavras*. <https://outraspalavras.net/descolonizacoes/america-latina-povo-sem-pernas-mas-que-caminha/>
  - German Federal Statistical Office (Destatis). (n.d.). *Population by age groups from 2011 to 2022*. <https://www.destatis.de/EN/Themes/Society-Environment/Population/Current-Population/Tables/liste-agesgroups-basis-2022.html>
  - Germany Travel. (n.d.). Kassel: Cities & culture. *Germany Travel*. <https://www.germany.travel/en/cities-culture/kassel.html>
  - Gliessman, S. (2016). Transformando sistemas alimentares com agroecologia. *Agroecologia e Sistemas Alimentares Sustentáveis*, 40(3), 187–189. <https://doi.org/10.1080/21683565.2015.1130765>
  - Global Data Lab. (n.d.). *Subnational Human Development Index (SHDI) for Germany*. *Global Data Lab*. <https://globaldatalab.org/shdi/table/shdi/DEU/?levels=1+4&extrapolation=0>
  - Goldstein, B. P., Birkved, M., Fernández, J., & Hauschild, M. Z. (2017). Assessing the edible city: Environmental implications of urban agriculture in the Northeast United States. *Journal of Environmental Management*, 202, 203–212.
  - Governo do Estado do Maranhão, Secretaria de Estado do Planejamento e Orçamento. (2019). *Manual de critérios para a elaboração das políticas públicas*. São Luís.
  - Grostein, M. D. (2001). Metrópole e expansão urbana: A persistência de processos "insustentáveis". *São Paulo em Perspectiva*, 15(1), 13–19. <https://doi.org/10.1590/S0102-88392001000100003>
  - Grunenberg, J. (2017). Multifunktionalität urbaner Landwirtschaft: Kurzzeitiger Trend oder Chance für die Stadtentwicklung? In Heft 1/2017 Vielfalt im öffentlichen Raum. VHW. <https://www.vhw.de/publikationen/forum-wohnen-und-stadtentwicklung/archiv/archiv-detail/magazin/heft-1-2017-vielfalt-im-oeffentlichen-raum/>
  - Gusted, E. (2016). Reflexions on urban gardening in Germany. *Challenges in Sustainability*, 4(1), 63–70. <https://doi.org/10.12924/cis2016.04010063>
  - HLPE. (2019). *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.
  - HLPE. (2020). *Food security and nutrition: Building a global narrative towards 2030*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.
  - HLPE. (2024). *Strengthening urban and peri-urban food systems to achieve food security and nutrition, in the context of urbanization and rural transformation*. Rome, CFS HLPE-FSN.
  - Hutchings, P., Willcock, S., & Lynch, K. et al. (2022). Compreender as transições rural-urbano no Sul Global através da turbulência periurbana. *Nature Sustainability*, 5, 924–930. <https://doi.org/10.1038/s41893-022-00920-w>
  - IBGE. (2022). *Panorama de Belo Horizonte*, MG. Instituto Brasileiro de Geografia e Estatística. <https://cidades.ibge.gov.br/brasil/mg/belo-horizonte/panorama>
  - IBGE. (n.d.-a). *Panorama de Curitiba*, PR. Instituto Brasileiro de Geografia e Estatística. <https://cidades.ibge.gov.br/brasil/pr/curitiba/panorama>
  - IBGE. (n.d.-b). *Panorama de Maricá*, RJ. Instituto Brasileiro de Geografia e Estatística. <https://www.ibge.gov.br/cidades-e-estados/rj/marica.html>
  - Instituto Brasileiro de Defesa do Consumidor (IDEC). (2019). *Desertos alimentares: Uma abordagem sobre a relação entre alimentação e território*. <https://alimentandopoliticas.org.br/wp-content/uploads/2019/03/Desertos-Alimentares.pdf>
  - Instituto Brasileiro de Defesa do Consumidor (IDEC). (n.d.). *A alimentação dos brasileiros*. IDEC. <https://idec.org.br/alimentacaoempauta/a-alimentacao-dos-brasileiros#retrato-da-alimenta%C3%A7%C3%A3o-do-brasil>
  - Instituto Escolhas. (2022). *Políticas públicas de agricultura urbana*. São Paulo.
  - Instituto Fome Zero. (2024). *Como acabar com a fome no seu município*. Instituto Fome Zero. <https://ifz.org.br/como-acabar-com-a-fome-no-seu-municipio/>
  - IPES-Food, IFOAM - Organics International, Agroecology Europe, FiBL Europe, & Regeneration International. (2021). *A unifying framework for food systems transformation: A call for governments, private companies & civil society to adopt 13 key principles*.
  - IPES-Food. (2017). *What makes urban food policy happen? Insights from five case studies*. International Panel of Experts on Sustainable Food Systems. [www.ipes-food.org](http://www.ipes-food.org)
  - Jardim, F. (2024). *The relation of community gardens and human right to food: A case study in Berlin and Rio de Janeiro*.
  - Khan, T., Abimbola, S., Kyobutungi, C., et al. (2022). How we classify countries and people—and why it matters. *BMJ Global Health*, 7, e009704. <https://doi.org/10.1136/bmjgh-2022-009704>
  - Konchinski, V. (2024, 18 de março). Falta de estoques e safra menor acendem alerta para preços de alimentos em 2024. *Brasil de Fato*. <https://www.brasildefato.com.br/2024/03/18/falta-de-estoques-e-safra-menor-acendem-alerta-para-precos-de-alimentos-em-2024>
  - Krikser, T., Zasada, I., & Piore, A. (2019). Socio-economic viability of urban agriculture: A comparative analysis of success factors in Germany. *Sustainability*, 11(1999). <https://doi.org/10.3390/su11071999>
  - Leibniz Institute of Ecological Urban and Regional Development. (n.d.). *Edible cities: Assessing urban greening strategies as systemic solutions for social challenges of urbanization*.
  - Lencioni, S. (2008). Observações sobre o conceito de cidade e urbano. *GEOUSP Espaço e Tempo (Online)*, 12(1), 109–123.
  - Lima, A. B. (2015). O modelo de agricultura urbana da Alemanha: A importância ambiental dos Kleingärten. *XXVIII Simpósio Nacional de História*.
  - Lima, A. B. (2019). *A trajetória histórica dos espaços de cultivo urbano na Alemanha: Interações e embates entre a urbanização e a natureza (do séc. XIX ao XX)*.
  - Lohrberg, F., Lička, L., Scazzosi, L., & Timpe, A. (Eds.). (2016). *Urban agriculture Europe*. Jovis Verlag GmbH.
  - Márquez, L. (2012). Agricultura urbana: O que Cuba pode nos ensinar. *ArchDaily Brasil*. <https://www.archdaily.com.br/01-78672/agricultura-urbana-o-que-cuba-pode-nos-ensinar>

- Memon, P. A., & Lee-Smith, D. (1993). Urban agriculture in Kenya. *Canadian Journal of African Studies/La Revue Canadienne Des Études Africaines*, 27(1), 25-42.
- Ministério do Desenvolvimento e Assistência Social, Família e Combate à Fome. (n.d.). *Agricultura urbana*. Recuperado de <https://www.gov.br/mds/pt-br/acoes-e-programas/inclusao-productiva-urbana/agricultura-urbana>
- Ministério do Desenvolvimento Social e Combate à Fome. (2014). *Escala Brasileira de Insegurança Alimentar – EBIA: Análise psicométrica de uma dimensão da segurança alimentar e nutricional*. <https://fpabramo.org.br/acervosocial/estante/escala-brasileira-de-inseguranca-alimentar-ebia-analise-psicometrica-de-uma-dimensao-da-seguranca-alimentar-e-nutricional/>
- Ministério Federal de Cooperação Econômica e Desenvolvimento. (n.d.). *Iniciativa especial transformation of agricultural and food systems (Transformação dos sistemas agrícolas e alimentares)*. Recuperado em 11 de janeiro de 2024, de <https://www.bmz.de/en/issues/food-security/transformation-of-agricultural-and-food-systems>
- Moragues-Faus, A., & Battersby, J. (2021). Urban food policies for a sustainable and just future: Concepts and tools for a renewed agenda. *Food Policy*, 103, 102124. <https://doi.org/10.1016/j.foodpol.2021.102124>
- Mougeot, L. J. A. (2000). Urban agriculture: Definition, presence and potentials and risks. In N. Bakker, M. Dubbeling, S. Guendel, U. Sabel-Koschella, & H. de Zeeuw (Eds.), *Growing cities, growing food: Urban agriculture on the policy agenda* (pp. 1–42). DSE.
- Mougeot, L. J. A. (Ed.). (2005). *Agropolis: The social, political, and environmental dimensions of urban agriculture*. IDRC.
- Müller, C. (2011). *Urban gardening: On the return of gardens to the city*.
- Müller, C. (n.d.). *Autoreninterview. Urban Gardening*. <http://urban-gardening.eu/autoreninterview/>
- Nações Unidas Brasil. (n.d.). *Agenda 2030 para o desenvolvimento sustentável*. <https://brasil.un.org/pt-br/91863-agenda-2030-para-o-desenvolvimento-sust%C3%A1vel>
- Nagib, G. (2024). Hortas urbanas e ativismo. In M. T. Gracia, C. M. Bógus, & D. E. P. Coelho (Orgs.), *Hortas comunitárias urbanas: Promovendo a saúde e a segurança alimentar e nutricional nas cidades* (pp. 307-320). São Paulo: Instituto de Saúde.
- Ngome, I., & Foeken, D. (2012). "My garden is a great help": Gender and urban gardening in Buea, Cameroon. *GeoJournal*, 77, 103-118.
- ONU. (2017). *Nova agenda urbana*. <https://habitat3.org/wp-content/uploads/NUA-Portuguese-Brazil.pdf>
- Orsini, F., Kahane, R., Nono-Womdim, R., & Gianquinto, G. (2013). Urban agriculture in the developing world: A review. *Agronomy for Sustainable Development*, 33(4), 695-720. <https://doi.org/10.1007/s13593-013-0143-z>
- Pfeiffer, S., Ritter, T., & Oestreicher, E. (2017). Insegurança alimentar e pobreza na Alemanha. In H. Biesalski, A. Drewnowski, J. Dwyer, J. Strain, P. Weber, & M. Eggersdorfer (Eds.), *Nutrição sustentável em um mundo em mudança*. Springer, Cham. [https://doi.org/10.1007/978-3-319-55942-1\\_7](https://doi.org/10.1007/978-3-319-55942-1_7)
- Pimbert, M. (2017). Towards a transformative urban agroecology. *Urban Agriculture Magazine*, 33, 15–17.
- Placzek, O. (2021, 10 de fevereiro). Socio-economic and demographic aspects of food security and nutrition. *OECD Food, Agriculture and Fisheries Papers*, No. 150. OECD Publishing. <https://doi.org/10.1787/49d7059f-en>
- Poulsen, M., McNab, P., Clayton, M., & Neff, R. (2015). A systematic review of urban agriculture and food security impacts in low-income countries. *Food Policy*, 55, 131-146. <https://doi.org/10.1016/j.foodpol.2015.07.002>
- Primavesi, A. (2016). *Manual do solo vivo: Solo sadio, planta sadia, ser humano sadio*. Expressão Popular.
- Rede PENSSAN. (2022). *Olhe para a fome 2022*. <https://olheparaafome.com.br/>
- Ribeiro, S. M., Azevedo, E. de, Pelicioni, M. C. F., Bógus, C. M., & Pereira, I. M. T. B. (2012). Agricultura urbana agroecológica: Estratégia de promoção da saúde e segurança alimentar e nutricional. *Revista Brasileira em Promoção da Saúde*, 25(3), 381–388. <https://doi.org/10.5020/18061230.2012.p381>
- Rocha, N. C. (2021). *Curso básico de direito humano à alimentação e à nutrição adequadas [livro eletrônico]: Módulo I: Histórico e conceito do DHANA*. FIAN Brasil.
- Rosbach, A. (2024, 19 de agosto). Interview mit Lara Lindermann. *Garten-News*. <https://www.kann.de/magazin/garten-news/magazin-detail/die-essbare-stadt-andernach/>
- Schipanski, M., & Blesh, J. (2024). Blending knowledge systems for agroecological nutrient management and climate resilience. *Journal of Agriculture, Food Systems, and Community Development*, 13(3), 45–48. <https://doi.org/10.5304/jafscd.2024.133.004>
- Secretaria de Turismo do Estado do Paraná. (n.d.). *Curitiba. Viaje Paraná*. <https://www.viajeparana.com/Curitiba>
- Senatsverwaltung für Umwelt, Mobilität, Verbraucher- und Klimaschutz. (n.d.). *Berliner Gemeinschaftsgartenprogramm*.
- Sharma, S. N., Dehalwar, K., Kumar, G., & Vyas, S. (2023). Redefining peri-urban urban areas. *Thematics Journal of Geography*, 12(3), 7-13.
- Silva, E. R. (2014). *Gestão da agricultura urbana*.
- Silva, M. Z. T. (2020). A segurança e a soberania alimentares: Conceitos e possibilidades de combate à fome no Brasil. *Configurações*, 25. <https://doi.org/10.4000/configuracoes.8626>
- Souto, R. (2020). *Ações de apoio à agroecologia e à economia solidária no município de Maricá*. Articulação Nacional de Agroecologia.
- Stadt Andernach. (n.d.). *Essbare Stadt*. <https://www.andernach.de/stadt/essbare-stadt/>
- Sustentarea - Núcleo de Extensão da USP sobre Alimentação Sustentável. (2023). *O que são sistemas alimentares?* <https://www.fsp.usp.br/sustentarea/2023/02/15/o-que-sao-sistemas-alimentares/>
- Tângari, J., & Porpino, G. (2023). *Cidades e alimentação: Relatório de pesquisa. Diálogo União Europeia – Brasil sobre sistemas alimentares urbanos sustentáveis*. Maceió: Embrapa Alimentos e Territórios; Instituto Comida do Amanhã.
- Tavares, I. (2023, 10 de outubro). Referência mundial em agroecologia e agricultura urbana, Maricá esbanja jardins comestíveis. *Extra*. <https://extra.globo.com/rio/cidades/marica/noticia/2023/10/ref-erencia-mundial-em-agroecologia-e-agricultura-urbana-marica-esbanja-jardins-comestiveis.ghtml>
- Tempelhofer Feld. (n.d.). *About Tempelhofer Feld*. <https://www.tempelhoferfeld.de/en/pflege-entwicklung/about-tempelhofer-feld/>
- Tornaghi, C., & Hoekstra, F. (2017). Editorial: Urban agroecology. *Urban Agriculture Magazine*, 33, 3–4.
- Tsai, D., Potenza, R., Quintana, G., Cardoso, A. M., Silva, F. B., Graces, I., Coluna, I., Carvalho, K., Zimbres, B., Silva, C., Silva-Junior, C. H. L., Souza, E., Shimbo, J., Alencar, A., Angelo, C., Herschmann, S., & Araújo, S. (2023). *Análise das emissões de gases de efeito estufa e suas implicações para as metas climáticas do Brasil*. SEEG.
- Última Hora. (2023). Maricá: Por que única prefeitura controlada pelo PT no Rio é a que mais recebe royalties do petróleo? Orçamento previsto de quase 8 bilhões; oposição em 2024 cresce. *Última Hora*. <https://www.ultimahoraonline.com.br/noticia/marica-por-que-unica-prefeitura-controlada-pelo-pt-no-rio-e-a-que-mais-recebe-royalties-do-petroleo-orcamento-previsto-de-quase-8-bilhoes-oposicao-em-2024-cresce>



- United Nations Development Programme (UNDP). (2022). *Bangladesh: Development progress and challenges*. <https://www.undp.org/bangladesh>
- United Nations Development Programme (UNDP). (2023). *Human development index: India*. <https://www.undp.org/india/human-development-index-india#:~:text=India's%20HDI%20value%20for%202022,an%20change%20of%2048.4%20percent>
- United Nations Human Settlements Programme (UN-Habitat). (2022). *World cities report 2022*. [https://unhabitat.org/sites/default/files/2022/06/wcr\\_2022.pdf](https://unhabitat.org/sites/default/files/2022/06/wcr_2022.pdf)
- United Nations Population Division. (2018). *World urbanization prospects: 2018 revision*.
- Universidade Federal do Paraná. (n.d.). *Conheça Curitiba*. <https://sbpc.ufpr.br/curitiba/>
- Urbane Gärten. (n.d.). *Gärten im Überblick*. Urbane Gärten. <https://urbane-gaerten.de/urbane-gaerten/gaerten-im-ueberblick>
- Urbane Landwirtschaft. (n.d.). *Was ist urbane Landwirtschaft?* <http://www.urbane-landwirtschaft.org/content/was-ist-urbane-landwirtschaft>
- Valdiones, A. P. G. (2013). *Panorama da agricultura urbana e periurbana no município de São Paulo* (Dissertação de Mestrado). Escola de Artes, Ciências e Humanidades, Universidade de São Paulo, São Paulo.
- visitBerlin. (n.d.). *Urban gardening Berlin*. visitBerlin. <https://www.visitberlin.de/de/urban-gardening-berlin>
- Woltjer, J. (2014). A global review on peri-urban development and planning. *Jurnal Perencanaan Wilayah dan Kota*, 25(1), 1-16.
- World Bank Group. (2023). New World Bank Group country classifications by income level for FY24. *World Bank*. <https://blogs.worldbank.org/en/opendata/new-world-bank-group-country-classifications-income-level-fy24>
- World Bank. (2023). *Bangladesh overview*. <https://www.worldbank.org/en/country/bangladesh/overview>
- WOW Kassel. (n.d.). *Green experience in Kassel*. <https://wowkassel.de/en/experience/green>
- Zezza, A., & Tasciotti, L. (2010). Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. *Food Policy*, 35(4), 265–273