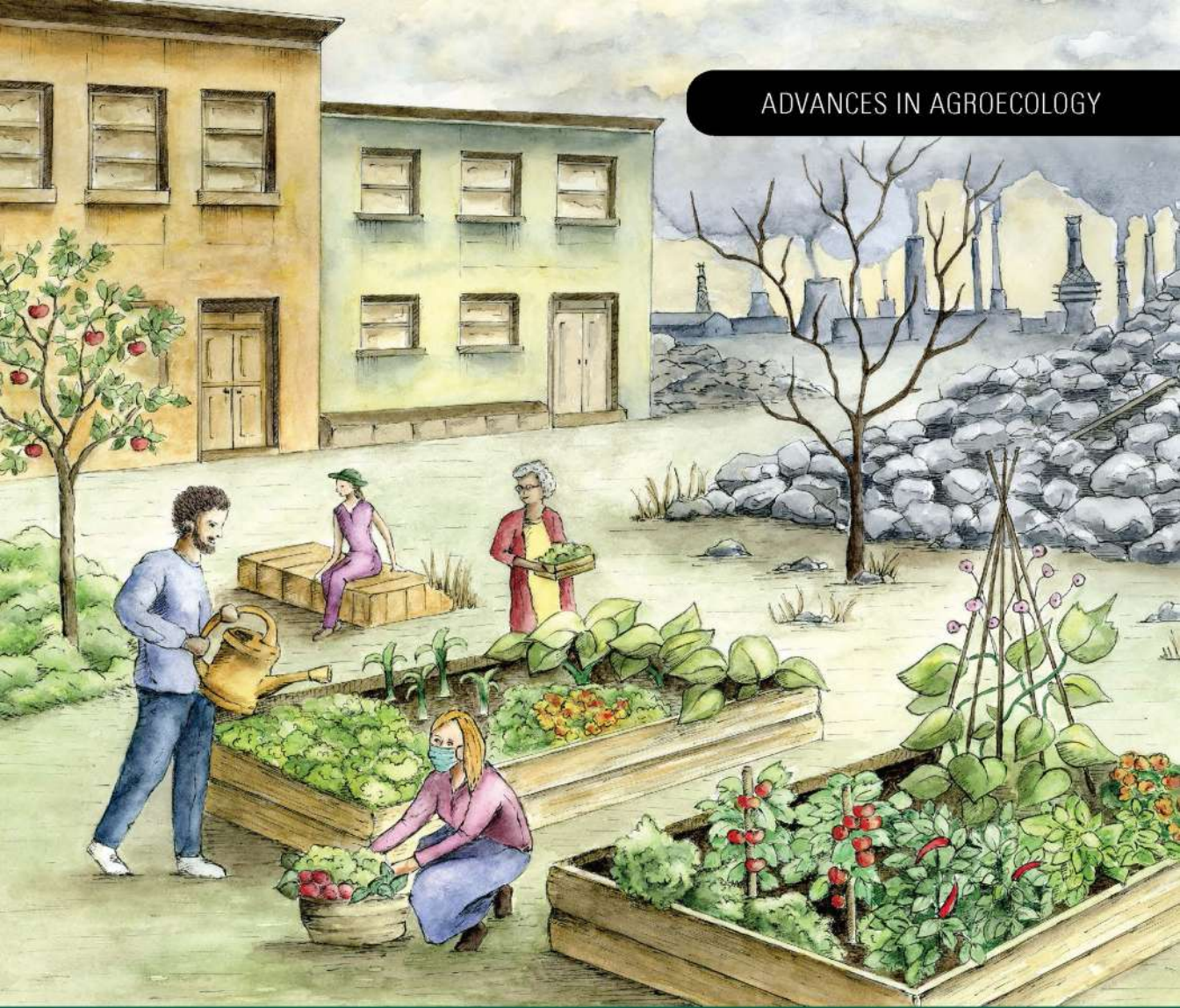


ADVANCES IN AGROECOLOGY



Crisis Gardening

A Global Perspective

Edited by

**Jonathan Kingsley
and Monika Egerer**



CRC Press
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Crisis Gardening

Gardening during times of crisis can have significant benefits to individuals and populations in terms of health, well-being, social and economic outcomes. So-called ‘crisis gardening’ can even be linked to transformative change in food systems through socio-ecological aspects of agroecology. In this book, crisis gardening is explored to better define, describe and provide recommendations about this activity globally. Diverse perspectives are offered from scholars around the world, providing an overview of gardening during crises with ties to agroecology. Such a perspective is critical as we grapple with food system crises, pandemics, climate change, biodiversity loss, mental health issues and political conflict globally.

- The first section defines and explains crisis gardening in relation to agroecology, transformative change in food systems and public health.
- The second section describes case studies from around the world of crisis gardening from various social-ecological perspectives.
- The third section provides policy and practice recommendations and how to scale up the lessons from crisis gardening to transform food systems, public health systems, and policy and landscape planning processes.

Bringing together leaders and experts (academics, policy makers and practitioners) from around the world, the book provides case studies of crisis gardening and develops recommendations to harness the lessons from this practice.

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CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

Designed cover image and book illustration: Valentina Arros

First edition published 2026

by CRC Press

2385 NW Executive Center Drive, Suite 320, Boca Raton FL 33431

and by CRC Press

4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

CRC Press is an imprint of Taylor & Francis Group, LLC

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ISBN: 9781032564609 (hbk)

ISBN: 9781032564067 (pbk)

ISBN: 9781003435631 (ebk)

DOI: [10.1201/9781003435631](https://doi.org/10.1201/9781003435631)

Typeset in Times LT Std

by KnowledgeWorks Global Ltd.

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About the Editors

Jonathan Kingsley is a senior lecturer in Health Promotion at Swinburne University of Technology. Prior to moving into academia Jonathan worked in Aboriginal Community Controlled Health Organisations, government bodies, and NGOs across Australia in public health and community development. Examples of these organisations include Oxfam Australia, VicHealth and the Victorian Aboriginal Community Controlled Health Organisation. Jonathan views the natural environment as having the capacity to bridge health inequalities (the basis of his Honours, Masters, PhD and previous Visiting Academic position at Cambridge University). Jonathan views himself as not only an academic but also an activist winning environment community engagement awards (for example, from Parks Victoria and the International Association for Ecology and Health) and sitting on multiple steering committees and research groups related to Indigenous and environmental health.

Monika Egerer is a professor at the Technical University of Munich in the School of Life Sciences. Her research investigates relationships between biodiversity conservation, ecosystem service provision, and human well-being in urban ecosystems, with a focus on urban agricultural systems such as urban gardens and farms. Monika's work aims to bridge theory and practice to create productive systems in cities that offer food, habitat and community.



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Contributors

Kurt Ackermann is chief executive of the SA Urban Food & Farming Trust, a civil society organisation working through food and farming to strengthen South Africa's urban communities and the ecosystems that sustain them. He is also a research fellow at the Global Risk Governance Programme at the University of Cape Town and sits on Cape Town's Food Systems Working Group and Food Systems Research Community of Practice, as well as the boards of health and human rights CSOs.

Patrícia Andresz-Dérer is an alumni associate research fellow at the Landscape and Conservation Ecology research group. She is interested in forest plant and conservation ecology, human ecology and urban ecology. Her current work focuses on the biodiversity of urban agricultural lands and gardens compared to other green urban areas.

Valentina Arros is a natural sciences illustrator and visual communicator based in Munich, Germany. Her work aims to contribute to the communication of scientific research projects, educate, and motivate nature conservation through illustrations and visual narratives. She has collaborated with research and cultural institutions, academia and private organisations, and has showcased her work in exhibitions. In 2023, she completed her master's degree in Sustainable Resource Management at the Technical University of Munich. Her thesis focused on the optimisation of interpretive signage in parks for wildlife protection, investigating the variables that make signage more effective and attractive.

Péter Batáry focuses on conservation biological-oriented research at the landscape scale as a scientific advisor at the HUN-REN Centre for Ecological Research. He is interested in agroecology, urban ecology, and how environmental interventions can be aligned with production or development. Major fields of his Landscape and Conservation Ecology research group are grassland fragmentation studies, biological effectiveness of agri-environment schemes, pest control and pollination, and meta-analyses.

Tarit Kumar Baul is a professor at the Institute of Forestry and Environmental Sciences, University of Chittagong, Bangladesh. His main research focus is on the climate impacts of carbon sequestration and material substitution by forest biomass, with implications for the management of forests, agroforests, and trees outside forests. His current research also looks at nature-based solutions (e.g., urban forests) to environmental pollution, conservation, utilization, and management of biodiversity, as well as forest-people-climate interactions, with an emphasis on indigenous knowledge.

Chris Blythe is currently a PhD student in psychology at Oxford Brookes University, where his research explores how different perceptions of the language of urban food growing can impact its success, as well as how we might apply behaviour change models to urban food growing. Before starting his PhD, Chris spent the last 15 years as a practitioner, project manager and leader of organisations in the urban food growing sector and is currently also chair of Trustees of Birmingham Open Spaces Forum, the umbrella organisation for parks and green space groups across the city.

Ana María Bonet is a researcher at the National Scientific and Technical Research Council of Argentina (CONICET, Argentina), Catholic University of Santa Fe (UCSF, Argentina), Center for Advanced Studies ECOCENO and associate researcher of the Global Studies Programme of FLACSO. Bonet has a postdoctoral degree from CONICET, a PhD in Law from the University of Bremen (Germany), a Master in Law, LL.M., from the University of Freiburg, (Germany) and a Law Degree from the UNL (Argentina). She is also director of the Socio-Eco-Legal Research

Team of the UCSF (Argentina), member of the research team CAI+D: ‘Derecho Humano a la Alimentación en Santa Fe,’ FCJS-UNL (Argentina), Visiting Researcher Max-Planck-Institut for International Law, Heidelberg (Germany) and Visiting Research Professor Institute for Sustainability, Universität Kassel (Germany). Her research interests include ecological and integral ecology, human rights, global commons, food policies, agro-legal transition, socio-ecological transition, among others.

Ouiam Fatiha Boukharta is a Researcher and PhD candidate at the University of Valladolid in the Department of Agricultural and Forestry Engineering (UVa, Spain). Ms. Boukharta holds a State Engineering Degree in Agronomy, specialising in Ecology and Management of Natural Ecosystems, from the Institute of Agronomy and Veterinary Hassan II in Rabat (IAV, Morocco), as well as a Master’s Degree in Management of Forest Resources from the Polytechnic Institute of Bragança (IPB, Portugal). Currently, she is working on different European and international projects, focusing on FUSILLI project (‘Fostering the Urban Food System Transformation through Innovative Living Labs Implementation’), and where her research work is related to urban agriculture food policy and governance aspects, both at national and international level, in order to achieve and ensure an effective transformation of the food system to provide a sustainable path based on participatory processes.

Victoria Bugni is an environmental economist with a PhD from the University of Wyoming. She is currently a postdoctoral researcher at East Carolina University. Her research spans environmental and natural resource economics, with applications in land use, recreation, and public health.

Silvio Caputo is a senior lecturer and Director of Research and Innovation in the Kent School of Architecture and Planning at the University of Kent. He has long standing experience as a practitioner and researcher. His research is highly interdisciplinary, focussing on nature-based solutions for cities in the areas of urban farming, care farming and sustainable food planning.

Constanza Cerda-Gosselin, hailing from Santiago, Chile, graduated in Architecture from Universidad de Chile in 2015. Since then, her passion has gravitated towards urban agriculture and urban development. She pursued complementary studies in planning and urban management at Pontificia Universidad Católica de Chile. In 2021, she completed her Master’s program in Integrated Urbanism and Sustainable Design at Stuttgart University, Germany. During her time there, she delved into topics of her interest, conducting research on home food gardening during the COVID-19 pandemic in her hometown. Over the past few years, Constanza has actively contributed to an international architectural firm, where she has been involved in developing architectural and urban projects spanning Latin America, Europe, and the Middle East. Simultaneously, she has remained engaged in academia at Universidad de Chile, and continuing her research endeavors focused on urban agriculture.

Natalia Urrego Díaz received her BSc degree in architecture at the Pontificia Universidad Javeriana in Bogotá, Colombia in 2018, and her MSc degree in Integrated Urbanism and Sustainable Design at the University of Stuttgart in 2022. Her research interests include healthier and more sustainable cities, nature-based solutions, community development, and food systems.

Lucy O. Diekmann is an Urban Agriculture and Food Systems Advisor for University of California Cooperative Extension, serving the South San Francisco Bay Area. She works with community-based organisations, local government agencies, and urban farmers and gardeners to develop equitable and resilient regional food systems and support vibrant urban agriculture in the core of California’s Silicon Valley.

Kelly Donati is Vice-Chancellor's Research Fellow at RMIT University, where her research focuses on community food infrastructure. A Rachel Carson Fellow at Ludwig Maximilian University Munich (2019–2020), she holds a PhD in human geography and brings an environmental humanities perspective to her research in urban agriculture, regenerative farming, fermentation and gastronomy. As co-founder of Sustain: The Australian Food Network, her policy work focuses on food security, urban food systems and place-based food initiatives. Working at the nexus of research, policy and practice, Kelly has a passion for thinking across scales, from the microbiomes of fermentation to the global food systems that undermine planetary health, and attending to the pleasures that sustain us materially, socially and politically.

Shureen Faris is Associate Professor in the Department of Landscape Architecture at Universiti Putra Malaysia. She holds a PhD in restorative outdoor environments from the University of Copenhagen. Her work focuses on healing landscapes and the design of therapeutic green spaces for vulnerable groups.

Leonie K. Fischer works as professor for landscape planning and ecology at the Institute of Landscape Planning and Ecology, University of Stuttgart. She is an urban ecologist with a focus on urban biodiversity and urban restoration as well as practical aspects of biodiversity conservation. She is also researching how people value urban nature and what influences their preferences.

Troy D. Glover is a Professor in the Department of Recreation and Leisure Studies and Director of the Healthy Communities Research Network at the University of Waterloo. Troy's research explores transformative placemaking initiatives aimed at shaping the public realm to facilitate social connectedness and improve the quality of community life.

Tapan Kumar Nath is a professor at the School of Environmental and Geographical Sciences, University of Nottingham Malaysia. His interdisciplinary research primarily focuses on community forest management, the livelihoods of forest-dependent people, the sustainability of traditional agroecological practices, the UN sustainable development goals, urban green spaces, and health outcomes. His scholarly works have significantly contributed to global sustainable development because of his multidisciplinary and cross-disciplinary research, which is strongly related to environmental sustainability, sustainable land use, climate change mitigation, public health, and socio-economic development.

Luis Manuel Navas Gracia is a Full Professor in the Department of Agricultural and Forestry Engineering at the University of Valladolid (UVa, Spain) and is specialised on sustainability and recycling in agricultural processes. He has directed 12 PhD theses. He is regular professor in three Doctoral Programmes at the University of Valladolid (UVa, Spain), Politechnic University of Madrid (UPM, Spain) and Federal University of Vicosa (UFV, Brazil). He has assessed more than 20 PhD Theses in Spain, Portugal and Brazil. He is coordinator of the Doctoral Programme of Science and Engineering for Food Technology and Biosystems of the University of Valladolid (UVa, Spain), and academic member of the ACREDITA national programme on which the Spanish Doctoral Programmes are evaluated. Prof. Navas has four research periods recognised by the National Research Board.

Solène Guenat is an environmental social scientist in the Social Sciences in Landscape Research Group of the Swiss Federal Research Institute WSL. She has interdisciplinary experience on the perception, use, well-being impact and biodiversity conservation potential of urban greenspaces. She is also interested in the impact of environmental stressors on well-being. She has worked in

various countries from the Global South, including Ghana, Malawi, Colombia and Brazil, as well as in Europe.

Michael Hardman is a Professor of Urban Sustainability at the University of Salford. Mike is an interdisciplinary researcher interested in urban sustainability and has published widely on topics from guerrilla gardening to urban agriculture and green infrastructure. His work is global in nature, with projects in Africa, North America, Europe and elsewhere, focussing on themes from the potential to upscale radical greening initiatives, to large-scale urban farming. This work has ranged from ethnographic initiatives with green activists to exploring the impact of pioneering sustainability schemes in cities.

Dorota Kotowska works at the HUN-REN Centre for Ecological Research and the Institute of Nature Conservation. Her main research area is conservation biology, invasion biology and landscape ecology with particular interest in the consequences of land use and climate change on spatio-temporal patterns of biodiversity in farmland and urban ecosystems. Her research aims to improve understanding of the mechanisms driving species population dynamics to support sustainable landscape management and effective conservation planning.

Sina Kuzuoglu is a PhD candidate in the Department of Recreation and Leisure Studies at the University of Waterloo. He received his MA in Sustainable Tourism Management from Boğaziçi University in Istanbul, Turkey, during which he investigated community well-being in urban cultural conservation areas in Turkey. With a keen interest in the relationship between politics of development and social forces in large urban settings – particularly in developing countries – his current research focuses on how public spaces are used and/or appropriated in the context of urban recreation and the related political and social mechanisms that foster (or inhibit) social collectivisation.

Tamás Lakatos is an associate research fellow at the Landscape and Conservation Ecology research group and a PhD student at the Eötvös Lóránd University. He is mainly interested in the ecology of birds in urban areas and other human-dominated landscapes, e.g., villages, cities and agricultural areas. His work also focuses on how socio-ecological systems affect biodiversity and ecosystem services. During his research, he aims to understand how different landscape features can influence biodiversity patterns, thereby providing information for conservation decision-making.

Astrid Ley is a professor for International Urbanism and course director of the international master program Integrated Urbanism and Sustainable Design (IUSD) at the Institute of Urban Planning and Design, University of Stuttgart. Prior to her position in Stuttgart, she was urban development research analyst at the German Advisory Council on Global Change (WBGU) and senior urban researcher in a project on ‘Housing for the Urban Poor: From Local Action to Global Networks’ at TU Berlin. She has a continued interest in localising sustainable development in the context of the complexity of cities. Her expertise and publication record include topics related to the urbanisation and housing processes, the role of local governance, co-production and civil society.

Pauline Marsh is an interdisciplinary health geographer, who explores innovative, community and nature-based solutions to improving well-being and quality of life. Pauline is a Senior Lecturer at the Wicking Dementia Research and Education Centre, at the University of Tasmania. Her research concerns the therapeutic benefits of nature connection for people with cognitive, emotional and physical health challenges. She utilises methods of participatory action research, story-gathering and filmmaking and publishes in a range of academic journals. One of her greatest achievements is the co-founding of DIGnity Supported Community Gardening. Pauline is a lead investigator on the Nature Connection Project (NESP), and co-lead of the Nature Connection Storytelling Project and Venture Out Nature-based Dementia Research group.

Paul Milbourne is a Professor of Human Geography in the School of Geography and Planning at the University of Cardiff. His main research interests lie in the field of social geography, specifically the geographies of welfare, poverty, homelessness and injustice. His current research focuses on urban food systems, food poverty and justice and migrant workers in the agri-food system.

Matt Morris commenced work in environmental NGOs in 1999, taking time out between 2002–2006 to complete a PhD in History at the University of Canterbury in which he focused on the gardens of Christchurch through a post-colonial lens. In 2009 he started work at the University of Canterbury Sustainability Office where he is still Sustainability Manager. He has published two books: *Common Ground: Garden Histories of Aotearoa* (2020) and *Bob Crowder: A New Zealand Organics Pioneer* (2024). He is currently working on a history of New Zealand's community gardens.

Cassandra Nguyen is an Assistant Professor of Cooperative Extension in the Department of Nutrition at the University of California, Davis. Dr. Nguyen received her BS in Dietetics from Central Washington University and her PhD in Human Nutrition from the University of Illinois at Urbana-Champaign. Her long-term goal is to bridge the gap between 'what we know' and 'what we do' about food insecurity in the U.S. Her research broadly aligns with one of three areas: 1) improve the implementation, evaluation, and effectiveness of extension and nutrition education programming; 2) support advances in diet quality and well-being among Native American community members; and 3) consider food insecurity within healthcare settings and services.

Nicole Paganini's research focuses on rethinking the urban-food nexus for more inclusive and resilient urban futures. Her specific interests include the social justice, co-creation of knowledge with local communities, and feminist research approaches. Nicole obtained a PhD from Hohenheim University for her work on a food justice perspective in urban agriculture in Cape Town and Maputo.

Ranaivo Rasolofson is Assistant Professor at the University of Toronto's School of the Environment. His research focuses on planetary health and nature-based solutions, using methods such as causal inference and geospatial analysis. He has led studies in Madagascar, Haiti, and Honduras on the health and wellbeing impacts of conservation and environmental change

Ulises Reno is PhD in Biological Sciences and assistant researcher at the National Scientific and Technical Research Council of Argentina (CONICET, Argentina), with a workplace in the Ecotoxicology Laboratory of the Faculty of Humanities and Sciences of the National University of the Litoral, Santa Fe (UNL, Argentina). He teaches in the Environmental Management and Education Chairs of the Faculty of Humanities and Sciences and in the master's degree in environmental management of the Faculty of Engineering and Water Sciences of the National University of the Litoral, Santa Fe (UNL, Argentina). He has published research articles and book chapters in indexed journals and national and international conferences on topics related to environmental management, ecotoxicology and bioremediation.

Nick Rose is a specialist in sustainable food systems, food policy and food movements and a Senior Lecturer in the Bachelor of Food Studies at William Angliss Institute. Nick received his PhD (RMIT University) for investigating the transformative potential of the global food sovereignty movement, whilst also co-founding and coordinating the Australian Food Sovereignty Alliance (2010–2015). As a Churchill Fellow (2014), he investigated innovative models of urban agriculture in the US, Canada and Argentina. As co-founder and Executive Director of Sustain: the Australian Food Network (2016–present), he supports food system policy and programme work in local government and beyond, with consultancies into urban agriculture, food security and urban food systems.

Recognised as one of Australia's leading champions of sustainable food systems, Nick's expertise has been a driving force behind Sustain's impactful initiatives, positioning it at the forefront of food system innovation and sustainability. This includes the ground-breaking Pandemic Gardening Survey (2020) and the coordination of four national Urban Agriculture Forums.

Mina Samangoeei is a Senior Lecturer in Architecture at Oxford Brookes University. She specialises in ecological and regenerative building design, with a focus on urban greening and healthy spaces. Mina's research specifically explores how edible urban gardening can be integrated with architecture and the built environment.

Victoria Schoen is a researcher in the Kent School of Architecture and Planning at the University of Kent. She is an agricultural economist by training and has worked on EU and UK agricultural policy, as well as more recently turning her attention to urban agriculture. Her research now looks at the value of green and blue spaces for mental health.

Theresa Scott is a Senior Lecturer in Clinical Geropsychology at The University of Queensland, and former National Health and Medical Research Council (NHMRC) Dementia Research Fellow. Her research and teaching focuses on functional outcomes for older people and people living with dementia in both community and residential aged care settings, dementia carer support programs, driving cessation, and fitness to drive assessment. Her research expertise encompasses both qualitative and quantitative research methods, and evaluation research. Her approach embraces participatory research and co-design, actively involving individuals with lived experiences as experts in the field. Theresa's PhD was the first in Australia to systematically examine the therapeutic benefits of gardens and gardening activities for older adults residing in the community and in aged care facilities.

Naomi Shimpō was an Associate Professor at the Graduate School of Landscape Design and Management, University of Hyogo and is currently an Associate Professor, at the Center for Spatial Information Science, University of Tokyo. She is also a specially appointed associate professor at the Graduate School of International Cultural Studies, Tohoku University. She received her PhD from the University of Tokyo and has held visiting positions at the Vienna University of Technology in Austria, and Lincoln University in New Zealand. Dr. Shimpō's expertise lies in landscape planning, with her primary research focusing on the roles of urban gardening in addressing various societal and environmental challenges, including social cohesion, disaster recovery, and climate change.

Francisco Tomatis is a Researcher and PhD candidate at the University of Valladolid in the Department of Agricultural and Forestry Engineering (UVa, Spain). Mr. Tomatis also holds a Master's Degree in Advanced Technologies for Agroforestry Development from the University of Valladolid (UVa, Spain) and a Bachelor's Degree in Environmental Sciences from the Catholic University of Santa Fe (UCSF, Argentina). Considering the current climate emergency, the increase in urban population and the concern for food production, his PhD thesis relates urban gardens and climate change. The research contributes to international research projects such as FUSILLI ('Fostering the Urban Food System Transformation through Innovative Living Labs Implementation') and CIRAWA ('Agro-ecological strategies for resilient farming in West Africa'). Mr. Tomatis has led an interdisciplinary team working to analyse the development of urban agriculture for his country, Argentina, as initiatives to help address times of social, economic and environmental crisis.

Agnes E. van den Berg is a pioneering researcher with nearly 30 years of experience in the field of people-nature interactions. Her research focuses on the causes, mechanisms, and health consequences of these interactions. She has authored over 100 publications on the importance of contact with nature for various groups, including residents of deprived neighborhoods, children,

hospital patients and gardeners. Van den Berg has served on multiple scientific advisory boards and assessment committees. From 2012–2022, she held a chair in Nature Perception and Health at the University of Groningen and is currently affiliated with the University of Twente. Through her research company, Nature for People, she participates in national and international research projects. For the chapter in this book, she collaborated with academic partners from across the world, including Malaysia (Shureen Faris), Madagascar (Rainovo Rasolofson) and the USA (Victoria Bugni).

Laura Vollmer, MPH, RD, is a Community Nutrition and Health Advisor at the University of California Cooperative Extension serving San Francisco, San Mateo, and Santa Clara counties. She provides oversight to a federally funded nutrition education program and conducts locally relevant evaluation and research, primarily focused on food and nutrition security and diet quality for children and families, with the goal of creating a more equitable food system.

Andreas Wesener is a Senior Lecturer in Urban Design and Head of School of Landscape Architecture at Lincoln University (New Zealand). In his research, he explores approaches for more sustainable and resilient cities including topics such as authenticity of place and urban atmospheres, post-disaster temporary urbanism, bottom-up governance and community resilience, and integrated (green-grey) urban infrastructure systems. Andreas has been involved in research on urban community gardens since 2013. He participated in the EU-funded COST Action ‘Urban Allotment Gardens in European Cities’ (TU1201) and co-authored some of the first international peer-reviewed research publications on urban community garden case studies from New Zealand.



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Crisis Gardening

An Act of Resistance and Resilience during Times of Hardship

Monika Egerer and Jonathan ‘Yotti’ Kingsley

INTRODUCTION

What makes societies, cities and landscapes resilient during crises?

Resiliency can come in the form of self-provision, self-sustenance and multifunctionality within a system. Resiliency can be defined as a system’s ability to absorb various shocks, and its capacity to adapt to changing conditions without losing any of its key functions (Meerow et al., 2016). In the context of resilient landscapes, we can consider landscapes that can withstand, adapt and recover from disturbances caused by challenges such as climate change, socio-economic inequalities, political strife or public health crises. Resilient landscapes are proposed to be resourceful, flexible, redundant, robust and integrated, characteristics which make them ‘safe to fail’ rather than fail-safe in the face of challenges (Ahern, 2011; McMillen et al., 2016). Landscape resilience involves various systems, actors, institutional frameworks and decision-making processes.

Agriculture, particularly at the small scale, is one way in which societies can build resilience (Reckling et al., 2023). Not only large-scale agricultural production but also small-scale farms and gardens integrated across a landscape can be stabilising forces for regional economies and regional food systems (Abson et al., 2013). In turn, regional food systems are the key determinants of health and well-being at a population level (Marsden & Sonnino, 2012). Indeed, poor diet and nutrient deficits are one major cause of non-communicable diseases, malnutrition and related deaths worldwide (Di Angelantonio et al., 2016; Roy et al., 2023; WHO & UNICEF, 2020). Thus, the resilience of society during a crisis in part requires securing access to sufficient amounts of nutritious food for populations (Tendall et al., 2015).

This book focuses on gardening, specifically gardening in the context of a social, public health or environmental crisis or disturbance. In this book, we consider ‘gardening’ to include many forms of horticultural activity (cultivating food, herbs and flower crops for consumption or non-consumption purposes) undertaken in diverse spatial contexts, from private properties to median strips or public spaces such as schools or allotments (McClintock, 2014; Milbourne, 2021; Vávra et al., 2018). Gardening has a rich history. For example, ancient forest gardens in monsoon regions consisted of useful fruit and nut trees and vines; Persian gardens in the Middle Ages were filled with fragrant fruits, flowers and pools; intensive production-focused kitchen gardens and cemetery orchards were common in Europe during Medieval Times for self-sufficiency (Campbell, 2016). Throughout history, we see that gardening encompasses diverse practices, actors and forms of land use for different motivations. Gardening can consist of home gardening for self-provision, market gardening for sales or community gardening for social cohesion alongside food production. Gardening is integrated into a range of institutional contexts from prisons to aged care facilities and hospitals, for example through horticultural therapy. The diversity of gardening as practice and gardens as systems reflects the ways in which gardening is described in scholarship. For example, we see how examples of gardening arose during the COVID-19 pandemic: home gardening (Corley et al., 2021; Mercado & Mercado, 2021), urban farming (Anggita & Waluyati, 2021), home food procurement

(Niles et al., 2021), green infrastructure (Marques et al., 2021), community or allotment gardening (Joshi & Wende, 2022; Mejia et al., 2020; Niala, 2021), food growing (Millard et al., 2022), edible gardening (Donati & Rose, 2020) and urban agriculture (Pulighe & Lupia, 2020).

While new focus has been placed on urban gardening within the realm of urban agriculture, in this book, we consider perspectives on crisis gardening across urban and rural landscapes. We focus on how gardening activity has arisen out of or been amplified by a disturbance, disaster or form of socio-economic adversity. During crises, one of the ways in which associated perturbations impact us is through disruptions to agricultural production and our food system (Ryan et al., 2024). Whether it be labour shortages, constraints on energy and resource inputs or interference to trade and transportation networks, all of these disruptions create tears in the food system structure and functioning at the local, regional and global scale (Fan et al., 2021; Mehrabi et al., 2022). Although industrial agriculture and capitalist modes of production have sought to create the dichotomy between agriculture and society, this dichotomy is a fallacy. *Agriculture* is a part of and tied to human civilisation – it is a part of a functioning society, of and for resilient landscapes (Sgroi, 2021, 2022).

Thus, we aim to highlight forms of gardening during times of crisis from an agroecological, public health and a social resilience perspective. In the practice itself, agroecological gardening may encompass terms such as organic gardening, biological gardening or ecological gardening. We can study how gardening may work towards addressing a given crisis – how do agroecological gardening practices promote food security, resource conservation and human health in times of crisis? From the perspective of agroecology as a discipline, we can consider not just the practices but the social movement dimension of agroecology – how does crisis gardening embody a social movement, and how may this lead to transformative change across diverse landscapes?

In this book, we bring together stories from around the world on how gardening can be a response to a crisis. We explore how gardening can be a potential adaptive capacity strategy during a crisis, a strategy to reduce negative socio-ecological impacts of a crisis and how it can build system resilience during various crises. Whether a natural disaster, a pandemic or economic fall-out, gardening can become an act of resilience, resistance, autonomy and self-provision (Kingsley et al., 2023). Gardening promotes autonomy as well as collective agency and community (White, 2011). It can be a political statement, an act of defiance to loss. Gardening becomes a way in which people both exert and gain strength to cope with perturbations (Egerer et al., 2022). Exploring this complexity of gardening during crises, this book will focus on elucidating the relationships between gardening and various crises to explore the potential outcomes of gardening activities during diverse stressful social, economic or catastrophic events. This goes well with an agroecology lens and includes fields such as public health, social welfare, security and every element of a stable society as our ecosystems are impacted by a range of human and non-human influences. In addition, we aim for the stories and perspectives told within this book to discuss the potential of gardening to scale up and out towards sustainable and resilient food system transformation in a given time and place that build not only ecological resilience but also social capital. We note that many of the examples presented in this book are from relatively contemporary examples of crisis gardening from recent decades. In this introductory chapter, we briefly provide key concepts that we believe are essential to guide the interpretation of the book and to understand the details in case studies presented within the chapters.

DEFINING CRISIS AND CRISIS GARDENING

Today we face many crises, which come in all shapes and sizes, contexts, geographical locations, cultures and impacts. The act of crisis gardening touches on these issues. As described above, we define ‘crisis gardening’ as participation in any diverse gardening activity during crises, hardships and stressful life events, whether it be wartime, economic collapse or a global pandemic (Kingsley et al., 2023). We place this activity with a primary focus on food growing, using agroecological practices and incorporating other non-edible gardening practices. We also consider ‘crisis

gardening’ as participation in gardening to address a crisis, or actively work towards minimising the social or environmental impacts of a crisis.

To explain further with examples, the climate crises prompt considering how resources such as water are used or which crops may be grown in the future under future climate conditions (Egerer et al., 2020; Tomatis et al., 2023). The public health crisis around loneliness, ageing populations or malnutrition in urban areas call for strategies around community gardening and increasing fresh food provision. The biodiversity crisis can motivate considerations on how gardening practices may promote or affect wildlife, motivating us to grow different plants that attract or support plants and animals and bring back biodiversity in anthropogenic landscapes (Mumaw & Bekessy, 2017).

Our relationship to food and agriculture can also be considered a crisis – where food is less healthy or nutritious, and increasingly homogenised and empty of meaning (Pretty, 2007). Here, we may garden to address the crisis in ourselves and the food system, to take back control of our nutrition and health. In landscapes broken by urban plight and deindustrialisation, urban gardening and urban farming can become a form of political action at the grassroots level (White, 2011). Gardening becomes a form of self-autonomy, political action, food sovereignty and security. We may even consider gardening for nature connection and food connection as a form of crisis gardening, as the loss of nature experience is a somewhat invisible yet critical pandemic itself (Soga & Gaston, 2016). In response, many schools and not-for-profit organisations are starting gardening education programmes, with affiliated school and campus gardens. Pedagogical approaches are grounded in education for sustainable development principles and concepts to combat this crisis. Finally, gardening may also be a way in which people flee *from* a crisis. For example, refugees in intercultural gardens may use gardening to cope with stress of being in a new place, to preserve cultural heritage and to socially integrate during a difficult time (Hughes, 2018; Müller, 2012; Storm et al., 2023).

What may these gardening practices look like during a crisis? We must consider which practices are employed. For example, to address the biodiversity crisis, people may transform parts of their garden for self-provision to habitat for wildlife – for example, planting a wildflower meadow or installing nesting resources for animals (Mumaw & Bekessy, 2017). On the other hand, to address a food security crisis, people may increase the amount of high-yielding crops in their gardens (Egerer et al., 2022). The particularities of gardening activities during a crisis or to address a crisis are worthy of study and documentation, to understand how exactly a crisis influences gardening activities and practices.

AGROECOLOGY, TRANSFORMATIVE FOOD SYSTEMS AND FOUNDATIONS FOR CHANGE THROUGH CRISIS GARDENING

In this book, we take an agroecological approach and perspective because agroecology is a systems-approach to transform the food system and to reconcile economic, social and environmental sustainability (S. R. Gliessman, 2020). Thus, agroecology is a way in which we can also address issues and topics within the realm of public health, economics and governance. Agroecology provides tools not only for food system change but also for transformational change in social and environmental dimensions of our world associated with institutional structures and goals. Following S. R. Gliessman (2020; pp. 1), we define agroecology as:

the use of ecology – the science of how nature works – to design and manage sustainable food systems. Agroecology is transdisciplinary, participatory, action-oriented, and integrates social and environmental components. Agroecology offers an integrated set of solutions with transformational potential that reconciles three central challenges that agriculture faces today: feeding a growing population, conserving natural resources, and providing sustainable lives and livelihoods for farmers, for food system and farm workers, and for people who consume their products.

Through gardening, communities and societies can potentially create transformational change at the individual and community levels. What are the characteristics of transformative food systems?

How do we build the foundation for change through gardening in crisis? For food system transformation, we must work towards multiple levels of food system change. This includes the production and consumption levels, as well as the bottom-up and top-down processes that influence how food is produced and consumed (S. Gliessman 2014). Crises provide an opportunity to push towards long-term, transformational change through resilience building, which comes through (ecological and social) diversification, multifunctionality, relocalisation of food production and consumption and food justice and equity (S. R. Gliessman, 2020).

Here, we review visions around food system sustainability, and what is required for sustainable and resilient food systems (S. Gliessman, 2016). From a resilience perspective, agroecosystem resilience considers the changes, responsiveness, productivity, stability, resistance and recovery of the ecosystem under stress, but also considers the social system of those managing agroecosystems; thus, agroecosystem resilience must be considered at multiple spatial, temporal and social scales (Peterson et al., 2018). Resilience theory can be helpful in monitoring the status of current systems and planning for a future system that achieves productivity, sustainability and social goals (Peterson et al., 2018). Transformative processes that lead to change may require rebuilding and reintegrating diversification practices within the system or the landscape. As stated by S. R. Gliessman (2020, p. 1):

The change process begins with rebuilding resilience and reintroducing diversification, re-localizing food production and distribution, reducing input and import dependency, prioritizing food justice, equity and fairness, as we link all parts of the food system. This means reconnecting producers and consumers through short supply chain initiatives such as CSAs, farmers' markets and public procurement programs. Local food chains are not only resilient in the face of crises and trade restrictions, but also to get fresh food to people.

What are the roles of gardens and gardening in this context and what are the key mechanisms that make gardens more resilient during a crisis? There are diverse characteristics of gardens that contribute to system resilience, socio-economic security and the potential to be transformative. One is the aspect of agroecosystem complexity in that they utilise and incorporate perennial species, plants with multiple purposes and functions, as well as deep local knowledge and experience of local conditions. Here, the system should be 'dynamic, diverse and flexible' and suited to a specific locality or region. As discussed above, the specific practices employed may be tied to the crisis experience itself. An example used in agroecology is the traditional home gardens where diverse subsistence crops are grown among small livestock. Home gardens can contribute to household economic security and survival during hard times, which can stabilise regional economies and the social structure of a community (S. R. Gliessman, 2015). These systems, while in the past a common agroecosystem around the world that provisioned families and communities, are increasingly a rarity or exception (S. Gliessman, 2016).

There are multiple ways towards food system transformation through crisis gardening. We see gardening during crisis as a way to work towards the transformation of food systems and a more resilient and sustainable food system. Crisis gardening in various contexts can be a way to challenge the contemporary paradigms of urban versus rural, and of industrial agriculture. Crisis gardening may rely on local knowledge, agroecological practices that incorporate functional redundancy and multifunctionality and social systems that create or support autonomy. Excellent examples exist from around the world, some of which will be highlighted in this book.

CRISIS GARDENING FROM HISTORICAL EXAMPLES TO CONTEMPORARY CRISES

Recent crises including the COVID-19 pandemic, but forms of crisis gardening have existed for a long time (Kingsley et al., 2023). Here we mention some interesting cases that we find worth touching on, from the most historical in the past to the most current, around the world. Some examples

will be discussed in the book, but we find it valuable to mention here some key recent instances of this throughout history.

VICTORY GARDENING IN THE USA AND EUROPE

During the two World Wars and the 1930s Great Depression, governments promoted urban agriculture and ‘Victory Gardening’ campaigns as a strategy for self-provision at a population level (Bassett, 1981). For example, in World War I, as Europe became a war zone and many farmers entered the conflict, problems with producing enough food in Europe caused the prices of food such as butter, eggs and coffee to increase worldwide. In the USA, there were meatless and wheatless days to reduce consumption (Bassett, 1981). The burden of providing food for the 120,000,000 people in Allied countries fell on North America, which subsequently led Charles Lathrop Pack to establish the National War Garden Commission in 1917 (Bassett, 1981). The number of gardening allotments grew from 3 million in 1917 to over 5 million in 1918. This produced over 500 million pounds of fruit and vegetables per year, and the idea of the urban farmer was born (Bassett, 1981). In World War II, this trend again came to the forefront of food security strategies in the USA, and in 1942, approximately 5.5 million gardeners participated in the Victory Gardening Movement with around 20 million gardens planted, growing approximately 9–10 million pounds of fruits and vegetables per year, which represented 44% of the fresh vegetables in the USA (Bassett, 1981). The results of this movement included benefits to food production and food security, as well as a positive impact on mental and physical health, social cohesion and community benefits and a sense of productivity needed by citizens on the home front.

THE ‘SPECIAL PERIOD’ IN CUBA

With the fall of the Soviet Union in 1989 came a global socio-economic transformation. For those economies closely dependent on the USSR, this led to severe initial economic hardship with the loss of a trading partner and investor. In Cuba, the economic recession mobilised an increase in agroecological gardening, farming and food growing across the island nation (Altieri et al., 1999). Thousands of small, pocket-sized private farms and urban nurseries emerged, using low-input, recycled organic farming (compost, old Soviet hydroponic containers, etc.). The so-called ‘Organopónicos’ utilised agroecological practices, created a network of collectives for growers and overall increased food security. This is one example of a food system transformation that has been modelled as a success story. In 2009, Havana had over 35,000 ha for urban agriculture, residents received a daily portion of 280 grams of fruits and vegetables, and the number of people employed in urban agriculture in Havana increased from 9,000 in 1999 to 23,000 in 2001 and more than 44,000 in 2006 (Knoot, 2009). However, despite many successes in providing fresh, healthy food and employment during a food and economy crisis, contemporary organopónicos are facing challenges in their operation and long-term sustainability in urban Cuba. Organopónicos are highly regulated, with farms operating under the Ministry of Agriculture, which affects water access, competition for urban space and economic changes, including increased trade and food imports (McNamara, 2017). Additionally, urban farming can conflict with other urban planning and development priorities, creating a divide between agricultural advocates and urban planners (McNamara, 2017). Thus, the future of urban agriculture in Cuba beyond the crisis is unclear.

COVID-19 PANDEMIC GARDENING

During the COVID-19 pandemic, individuals, communities and nations turned to gardening to address the societal challenges that came with this public health crisis (Kingsley et al., 2023). At an individual level, people craved information on gardening, turning to the internet for support and

education around what to grow. The news highlighted the outcomes of this ‘boom’ in interest with sold out shelves of garden supplies as people rushed to address these daily pressures in their lives by getting their hands in the soil to garden (Kingsley et al., 2022; Lin et al., 2021). At a population level, people turned to gardening to address issues around food supplies and insecurities, improve public health outcomes and reduce issues around social isolation and stress by increasing connections and networks (Egerer et al., 2022; Kingsley et al., 2023). These gardening programmes were often led by individuals and the communities themselves who were grappling with these constant challenges and being restricted, in some part, by government policies that encouraged social distancing (Kingsley et al., 2022; Kingsley et al., 2023).

All of these examples highlight the diversity over time and space of crisis gardening.

OUR GOAL: SHARING VARIOUS PERSPECTIVES ON CRISIS GARDENING

What can we learn from gardening during crises? What do ways in which people cultivate the soil, care for their own provisions and utilise resources creatively tell us about human responses to crises? What are key practices that, for example, increase food provision, decrease resource use and increase biodiversity and human well-being? And how does gardening contribute to food system sustainability and resilience or progress towards sustainability? Can gardening, as a ‘small-scale’ practice, meaningfully contribute to food system transformation? And finally, can we amplify and scale out activities that occur during crises to be maintained and sustained in the landscape post-crisis?

This book will explore such questions. We use case studies and narratives from around the world to inform our understanding of these processes. We aim to show how past and current ways in which we garden and cultivate during crises can create ways in which we support landscape multifunctionality and economic diversity and build societal and (agro)ecosystem resilience. These actions and activities can be the ingredients for transformative processes, whether in the food system or our local communities. Through integrated, inclusive, public and institutional support, we can utilise gardening and farming activity to improve urban to rural landscape resilience at the individual, national and global scales. Policies that shape more than our ecosystems, but all societal structures must be in place. Here we see gardening as one piece in this puzzle towards landscape resilience.

The following chapters will explore some of these topics. We will begin with several recent case studies from the COVID-19 pandemic as it is one of the most prominent examples that has impacted scholarship. Here, we will learn from Blythe and colleagues (Chapter 6) the importance of gardening in the UK during the COVID-19 pandemic, specifically focusing on urban food growing on individual to community resilience. Cerda-Gosselin and colleagues (Chapter 8) will further discuss the benefits of home gardening during the pandemic and what challenges were identified from home gardeners respondents to a city-wide survey in Argentina, including procurement of knowledge and supplies for balcony gardening. Donati and Rose (Chapter 9) will take us to the continent level and bring information from an Australia-wide survey on how pandemic gardening supported the health of Australians. Beyond the case studies on pandemic gardening, Glover and Kuzuoglu (Chapter 7) will discuss gardening to address social disconnection. Lakatos and colleagues (Chapter 2) take us to rural Romania to learn how gardening builds rural resilience during turbulent times. Wesener and Morris (Chapter 13) also looked at how gardening strengthens resilience in urban Christchurch in New Zealand after the 2010–2011 Canterbury earthquakes. Baul and Nathan (Chapter 12) will show the value of home (forest) gardens in Nepal for climate change adaptation and food security, while Tomatis and colleagues (Chapter 3) will show the role of community gardening during the climate crisis using the example of Valladolid, Spain. Shimpo (Chapter 11) will discuss how community gardening is a response to natural disasters and crises, using earthquakes in Japan as a case study. Paganini (Chapter 4) and Diaz et al (Chapter 5) will show how gardening addresses food sovereignty in the Global South, using cities on the continent of Africa as case studies, while Diekmann and colleagues (Chapter 1) will

discuss the role of gardening in food security benefits in California, USA. While many of our examples are at the nation or city levels, we also explore the role of gardening during a family crisis – namely chronic illness and disease. Here, Marsh, Kingsley and Scott (Chapter 10) share an ethnographic exploration of how gardening supports crises within their families, specifically those related to dementia. Van den Berg (Chapter 14) then recommends some response options for how we integrate and apply gardening into action in times of crisis. We conclude by providing a sense of optimism about what can be learned from gardening during times of crisis to make us look with hope into the future.

In the future ahead, we will face a range of challenges. From the changes in our climate, we are witnessing drastically changing ecosystems and increasing occurrence of natural disasters. From economic globalisation issues, we are experiencing high inflation rates associated with conflicts around the world, as well as increased health, social and economic inequalities. The global situation at the time (2020–2025) was a key motivation to write this book. This book is timely because gardening may be a pathway to improving our response to future challenges. Agroecological practices and social movements that stand behind crisis gardening are essential. Our book provides some case studies to gain interest in solutions to these future challenges, which is the very purpose of this book. To provide some theories, examples and possible solutions to these crises, we call for readers to consider where we go from here to address impending problems and challenges.

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Section I

*Crisis Gardening in Relation to
Agroecology, Transformative Change
in Food Systems and Public Health*



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1 Gardening as a Response to Food Insecurity during Acute and Chronic Crises

A Narrative Review from the United States

Lucy O. Diekmann, Laura Vollmer and Cassandra J. Nguyen

As interest in gardening surged at the start of the COVID-19 pandemic (Lin et al., 2021), news stories in the United States were quick to draw parallels between pandemic gardens and the Victory Gardens of World War II (Weinberger, 2020). This coverage recognised gardens as an appealing strategy for food security when a crisis threatens food access (Rao, 2020). It also situated pandemic gardens as the most recent in a long line of garden movements that have arisen in response to *acute crises* (Bassett, 1981; Lawson, 2005). Economic downturns, wars and social upheaval have ushered in Potato Patch Gardens (1894–1917), Liberty Gardens (1917–1920), Relief Gardens (1930–1939), Victory Gardens (1941–1945) and the community garden movement of the 1970s (Bassett, 1981). Gardens have also been a grassroots response to natural disasters (e.g., Shimp et al., 2019), the global recession in 2008 (e.g., Gray et al., 2014) and the 2020 COVID-19 pandemic (e.g., Kingsley et al., 2023). As Laura Lawson (2005, p.11) observes, gardening programmes routinely emerge ‘as a satisfyingly direct and tangible means for people to improve the local manifestations of larger social, environmental or economic crises.’

Yet in the flurry of commentary early in the COVID-19 pandemic, some gardeners sought to highlight different gardening traditions. In particular, they argued for a crisis gardening framework that would acknowledge and address another set of *chronic crises*: structural injustices in the food system and society. For instance, Valle (2021, p. 3) writes that looking to earlier crisis gardens, like Victory Gardens, for inspiration too often ignores the history of gardening for autonomy and self-determination in communities that have been marginalised, oppressed or displaced. For these groups, gardens are not a reaction to acute crises intended to relieve anxiety about the food supply, but an ongoing practice to cope with ‘prolonged experiences of precarity’ and food insecurity (Valle, 2021, p. 3). Valle (2021) draws an important distinction between those who garden because an acute crisis might cause the food system to fail and those who garden because a failed food system is an everyday reality (i.e., a chronic crisis). Penniman (2020) similarly points out that gardening for self-sufficiency is a practice that communities of colour have long used to resist inequities in the food system. These articles invite people to reimagine their crisis gardening efforts as having ‘the potential to respond to historical inequities and re-frame yesterday’s Victory Garden in the vein of today’s food justice movements’ (Brimm, 2020).

These two perspectives on pandemic gardening reveal different approaches to conceptualising the relationship between crisis, gardening and food. In the context of this volume on crisis gardening, we use acute and chronic crisis to denote the timeframe of a crisis, not the severity. While an acute crisis could last months (in the case of a flood and recovery) or years (in the case of a recession and its aftermath), it is bounded in time and, significantly, the response to it is envisioned as temporary. In the terminology of disasters, an acute crisis is focused on the negative impact of a hazard

(e.g., hurricane, financial crisis) and the immediate response (Saulnier et al., 2022). In contrast, a chronic crisis persists for decades with no clear beginning or end. It is rooted in the same political-economic forces that produce disparate vulnerabilities and exposure to hazards. Unlike narratives of acute crisis which often focus on universal human precarity, studies of chronic crises explicitly examine differences in power, histories of exploitation and oppression and the different vulnerabilities they produce (Whyte, 2020). Subsequently, the resolution to a chronic crisis is not a return to the status quo, but deeper changes that address the root of the problem. Despite their differences, these two types of crisis are linked. The disaster literature explains that acute crises that disrupt food systems often unfold in ways that magnify ‘existing racial, geographic and socioeconomic inequalities’ and that disaster preparedness and response may perpetuate – rather than disrupt – oppressive systems (Moore et al., 2022, p. 7). In their study of post-disaster New Orleans, Kato et al. (2014, p. 1834) argue for the need to consider gardening’s potential when faced with ‘both acute and chronic social crises,’ namely the specific crisis of Hurricane Katrina overlaid on the ongoing ‘crises of abandonment and discrimination’ faced by residents of the city’s poor neighbourhoods.

In this chapter, we review the literature on gardening for food security during a crisis. Following Valle (2021), Penniman (2020) and others, we argue that when trying to make sense of motivations for and impacts of food gardening in the context of a crisis it is important to consider both chronic and acute crises and their interplay. While food security – the condition when ‘all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and preferences for an active and healthy life’ (FAO 2015, p. 6) – is a goal for both types of crisis gardening, those situating their work within the context of structural inequities also connect their gardening efforts to the food justice and food sovereignty movements. Food security, food justice and food sovereignty are among the variety of terms used to describe, monitor and motivate change in the inequitable distribution and accessibility of food in modern society (Cadieux & Slocum, 2015; FAO, 2015; Jarosz, 2014; Larson et al., 2009). As Table 1.1 illustrates, each term has a different meaning and implications for action, with food justice emphasising addressing systemic injustice and food sovereignty centring people’s right to define their own food systems.

Though food security is limited in its scope, we have elected to use it as the framework for organising the data presented in this chapter. In reviewing the literature, food security was commonly used to motivate, describe or evaluate acute and chronic crisis gardening activities. We also found that in articles focused on food justice or food sovereignty, upstream community- or food system-level interests had implications for individual or household food security, whether or not this was explicitly addressed. Thus, framing outcomes in the literature as food security-related allowed

TABLE 1.1
Four Key Terms Describing the Distribution and Accessibility of Food in Society

Term	Definition	How Commonly Employed
Food access (Larson et al., 2009)	Social, physical and economic availability of food	Described with geospatial analyses
Food security (FAO, 2015)	Regular access to enough safe and nutritious food for an active and healthy life	Evaluated at the individual or household level with questionnaires
Food justice (Cadieux & Slocum, 2015)	Movement to ensure the right to food by addressing systemic injustices	Used to describe and motivate initiatives, efforts and programmes
Food sovereignty (Jarosz, 2014)	Transformation of the food system wherein people have a right and responsibility to participate in deciding how food is produced and distributed	An envisioned goal which is worked to create in reality

Note: The above descriptions are informed by the authors’ professional experiences as well as the referenced sources.

for connections to be made across articles, while incorporating studies that expanded beyond food security into issues of food justice and food sovereignty.

The effort of some to expand the discourse around crisis gardening to include the structures that shape uneven access to food has parallels with the science and practice of agroecology, particularly forms of agroecology that challenge political-economic structures and seek to transform power relations in the agrifood system for greater justice and sustainability (Méndez et al., 2013). By offering a holistic framework for agricultural production, agroecology allows consideration of the full suite of impacts associated with gardening, including those important to resilience, self- and community-determination and well-being (Siegnier et al., 2020). These impacts, which fall outside common definitions of food security, have more in common with food justice and food sovereignty (Chappell & Schneider, 2016). Food sovereignty, food justice and agroecology all acknowledge the deeply rooted injustices faced by both producers and consumers and aim to identify participatory strategies that address structural and political obstacles to food system change through analysis of root causes and increased agency in the food system.

METHODS

To better understand how crisis gardening intersects with food security, we conducted a narrative review. Relevant literature was identified using key terms in academic databases (e.g., PubMed, Web of Science, Google Scholar). All disciplines and article types were considered for inclusion to address the key research question: ‘how does gardening, particularly during acute crises, relate to food security outcomes?’ The country where the study occurred was not used as inclusion criteria for the review. After reviewing the initial results, additional literature was identified based on searching reference lists, cited reference searches, and other targeted searches based on perceived gaps or remaining unanswered questions. Results from this review are used to describe individuals who engage in gardening during acute and chronic crises and to document food security outcomes associated with gardening.

To frame the results of our literature review, we developed a conceptual model of gardening outcomes in relationship to acute and chronic crises (Figure 1.1). This model recognises that the people, places and plants that make up a garden are part of a larger web of social and environmental relationships. While gardening activities are influenced by a combination of gardeners’ environmental attitudes and cultural practices (Pham et al., 2022), these individual behaviours shape and are shaped by the natural, built and food environments in which they take place. Therefore, as Pham and colleagues (2022, p. 3) explain, individual gardeners’ preferences and actions are ‘mediated

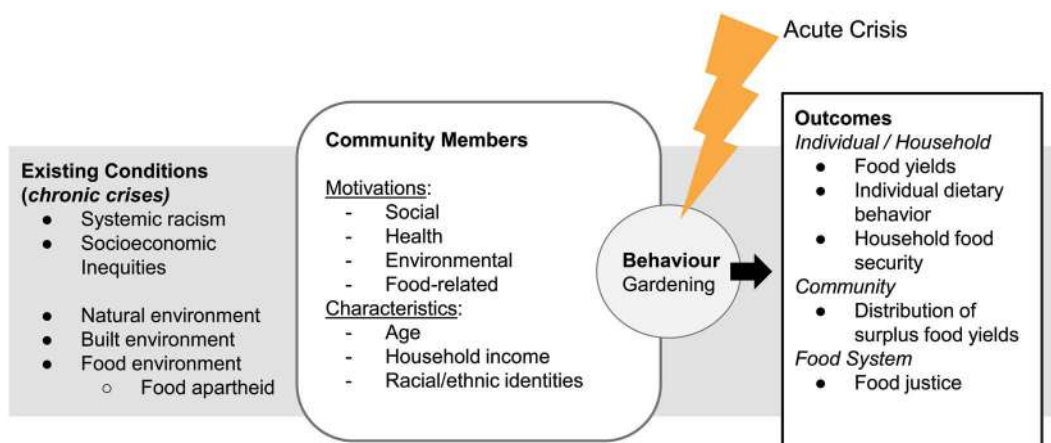


FIGURE 1.1 Conceptual model of gardening outcomes and their relationship to acute and chronic crises.

and bounded by socio-cultural, socio-economic and political-economic relations,' such as historical race-based segregation and ongoing immigration, which are enacted through policies and the form of the natural, built and food environments. These factors shape the conditions that some gardeners of colour or low-income gardeners are responding to (Figure 1.1). They exist outside of periods of acute environmental, economic or social crisis and they persist through them, affecting the trajectory of disaster impact and recovery for different groups.

RELEVANT LITERATURE

EXISTING CONDITIONS: CHRONIC CRISIS

While not the norm, a subset of garden studies explicitly examine the structural conditions that produce health and food disparities and then situate gardening motivations and impacts within this broader set of circumstances. Many of these studies use historical and/or political-economic analyses to unearth root causes of food insecurity, describing the chronic conditions to which gardeners respond. In general, these authors look at a range of processes – economic, political and social – that have excluded or dispossessed different groups of people (Joyner et al., 2022; McClintock, 2018; Minkoff-Zern et al., 2024).

Two of the chronic crises these studies explore are environmental and food injustice – i.e., unequal food, work and living environments developed through the cumulative effects of discriminatory practices and policies over time. Some gardeners are explicitly responding to the ways in which racial discrimination has shaped their environment and the ways the environment shapes and reinforces racial discrimination (McClintock, 2018). One such example is the case of Japanese Americans who gardened while imprisoned in internment camps during World War II. Internment camps were racialised spaces created by the US government when it confined people of Japanese descent in harsh locations (Chiang, 2010). Not only were detainees excluded 'from environmental resources and amenities' when they lost the farms, gardening businesses and fishing equipment they were forced to leave behind, they were also exposed to environmental hazards at the camps (Chiang, 2023, p. 15). In this context, gardens at the internment camps – some of which were Victory Gardens – took on unique symbolic, material and psychological dimensions. Through gardening, Japanese American detainees 'resisted their exclusion from American society and asserted some control over the conditions of their confinement' (Chiang, 2010, p. 248). Gardens also provided material support to survive incarceration in the form of food and helped gardeners cope with the trauma of incarceration by fostering a feeling of control and a connection to place.

Another manifestation of racialised spatial inequities is food apartheid – 'a human-created system of segregation that relegates certain groups to food opulence and prevents others from accessing life-giving nourishment' (Penniman, 2018, p. 4). Gripper et al. (2022) and Joyner et al. (2022) examine food apartheid in Philadelphia and Salt Lake City, respectively, as the context in which urban agriculture operates. Gripper and colleagues (2022) focus on urban agriculture as resistance to food apartheid and a vehicle for community self-determination and healing. While examining differences in land access, disposable income and affordability, Joyner and colleagues (2022) note the ways in which the same factors that create food apartheid limit urban agriculture's potential as a tool for food sovereignty and food justice.

Policy also plays a role in the production of chronic food insecurity. In a study of farmworker gardens, Minkoff-Zern (2014) traces farmworker food insecurity to inequities in the global food system, such as farmworkers' dispossession from land as a result of free trade agreements and their undocumented immigration status within the United States which results in fewer labour protections, lower wages and less access to food assistance programmes. Tsu (2021) explores the political context and limitations of the widely heralded refugee community garden programmes that served thousands of the Southeast Asian refugees who came to the United States from 1975 to 1997. At the time, refugee community gardens were intended to satisfy the belief that the United States had an

obligation to assist refugees its foreign policies had helped to create (Tsu, 2021). While gardens did help participants make ends meet, they did not change refugees' economic circumstances to such an extent that they no longer depended on low-wage work or required government assistance (Tsu, 2021). In line with the literature on food justice, these studies point out where programmes address symptoms rather than making deeper societal changes.

While exploring the limitations and challenges marginalised gardens face, these case studies share the conclusion that gardens and other forms of agriculture are practices that help promote agency, autonomy and self-determination. Many analyses highlight ways in which agriculture, including gardening, is a 'longstanding site of Black resistance to a food system shaped by racial, economic and environmental discrimination' (Tsu, 2021, p. 98). As an example, McClintock and Coplen (2023) argue that the Albina community garden project in Portland, OR, was part of the tradition of Black agrarianism, linking land, economic independence and political freedom. Black farmers and gardeners' embodiment of the food sovereignty rallying cry 'To free ourselves, we must feed ourselves' (Loker & Francis, 2020, p. 1118) can be seen from rural Southern Cooperatives of the 1960s to the contemporary Detroit Community Food Sovereignty Network (White, 2018). These works show that agriculture has been a form of resistance, self-determination and agency for Black, Asian and Latino gardeners for generations, helping them to navigate inequities while sustaining their communities (Reese, 2019; Tsu, 2021; Valle, 2022).

GARDENERS' CHARACTERISTICS AND MOTIVATIONS

There are relatively few systematic evaluations of gardening – especially in acute or chronic crisis conditions – at city, state or national level, making it difficult to generalise about gardeners' characteristics. Larger-scale evaluations have revealed contradictory trends. For example, the relationship between prevalence of gardens and income is different in different US cities (Smith & Harrington, 2014). The built environment is an important factor explaining the prevalence of gardens. In both Ohio (Schupp et al., 2016) and Montreal (Pham et al., 2022), occupants of single-family homes were more likely to garden than residents of apartment complexes. Other explanatory variables are household income and life-stage (e.g., presence or absence of children) (Pham et al., 2022; Schupp & Sharp, 2012). While there is considerable variability in what, where, how and why people garden, food gardening is a widespread activity in the United States, with the National Gardening Association finding that 41% of households participate (Hayes, 2022).

Both in and outside of a crisis, reasons for food gardening fall into a few main categories: social, health, educational, environmental, political and food-related motivations (Calvet-Mir & March, 2019; Cattivelli, 2022; Kingsley et al. 2019; Pourias et al., 2016; Taylor & Lovell, 2014). Typically people have multiple reasons for gardening (Mullins et al., 2021), even in a crisis and these reasons are varied, differing between individuals and garden sites (Kato et al., 2014). Indeed, gardens are sources of support during crises precisely because of the multiple benefits they have the potential to provide (Diekmann et al., 2023). Famously, Victory Gardens were not only promoted for food production, but also boosting morale and promoting physical and mental health (Lawson, 2005), themes that were echoed in studies of pandemic gardens (Kingsley et al., 2023). Studies of pandemic gardens reveal a variety of reactions to the crisis: while some people experienced no change in their motivation for gardening, others reported a shift in their goals for their gardens (Diekmann et al., 2023; Kato & Boules, 2022). Similarly, following an economic crisis in Spain, Calvet-Mir and March (2019) found that different collective gardening projects articulated quite different motivations for gardening (e.g., leisure v. political change).

Gardeners' motivations are dynamic and may shift during a crisis in response to shifting social, economic, political and environmental circumstances (Calvet-Mir & March, 2019), but access to fresh produce remains a common motivating factor for food gardening (Pourias et al., 2016). For instance, a survey and interviews with gardeners in Toronto revealed that access to food is a primary motivator and may enable some gardeners to access food they could otherwise not afford

(Elton & Cole, 2024). Food gardening also enables communities to access culturally valued and difficult to find food (Zail, 2023). An ethnographic inquiry of gardening among rural households in Pennsylvania revealed that the desire to save money on food was a primary motivator among the lowest-income households (Darby et al., 2020). During the COVID-19 pandemic, some studies found that job disruption, food insecurity status or other pandemic-related hardships were positively related to home food procurement, including gardening (Egerer et al., 2022; Niles et al., 2021). In California, gardeners – regardless of food insecurity status – reported a desire to produce more food during the first months of the pandemic (Diekmann et al., 2023). However, after the Christchurch earthquake in New Zealand, food production and food security were not primary motivations for community gardeners (Shimpo et al., 2019). In chronic crises, having control over the food they eat and the conditions of production is a recurring theme for gardeners (Diekmann et al., 2020; Minkoff-Zern et al., 2024), which speaks to an interest in food sovereignty and its commitment to people's right to 'define their own food and agricultural systems' (Jarosz, 2014, p. 174).

Other motivations that have been found to take on new significance during a crisis are social connection, community resilience and political gardening (Cattivelli, 2022; Joshi & Wende, 2022; Kato et al., 2014). Social motivations include a desire for opportunities to socialise, to strengthen relationships and for greater social cohesion. A survey of gardeners in South Australia, for example, found that connection to others was a key motivator for community gardeners (Pollard et al., 2018). During the pandemic, community and social resilience emerged as a more prominent motivator as gardens offered a space to gather and rebuild community connections (Joshi & Wende, 2022). After a crisis, gardening may take on additional political characteristics, as gardens are reimagined as places of community empowerment, where people come together to combat feelings of powerlessness, address structural injustices and shape disaster recovery (Calvet-Mir & March, 2019; Kato et al., 2014).

FOOD SECURITY-RELATED OUTCOMES OF GARDENING IN THE UNITED STATES

Individual/Household

Many studies consider food security through the lens of food availability, evaluating the amount of produce yielded by gardening. Studies of urban gardeners in Santa Clara County have suggested yields of 0.75 vegetables per square foot (Algert et al., 2016), enough produce for an adult to consume the recommended intake of vegetables over a growing season (Diekmann et al., 2020) and perceptions that households saved money because of the food they produced (Algert et al., 2016; Gray et al., 2014). When accounting for inputs and outputs, analyses of home food gardens in Australia suggested they are financially viable methods to produce fresh foods but may not break even until five years after their initial development (Csortan et al., 2020). The majority of studies evaluating produce yields have been outside of acute crisis contexts.

Other studies focused on individual food security outcomes have highlighted the quality of the foods consumed and the garden's impact on dietary quality. In a 2019 scoping review, eight of 11 studies reported positive impacts of urban agriculture on nutrition outcomes (Audate et al., 2019). A qualitative study of predominantly African American members of a gardening support programme suggested that gardening was related to increased consumption of vegetables and trying new vegetables, which is less easily characterised by quantitative surveys (Beavers et al., 2020). A randomised controlled trial found that community gardeners had greater increases in their vegetable intake from baseline to harvest than a control comparison group (Alaimo et al., 2023). One study in an acute crisis context was conducted during the first year of the COVID-19 pandemic in Chicago, IL; it found that individuals participating in a Grow Your Groceries programme felt they had increased their healthy food consumption (Kersten et al., 2023).

The relationships between household-level food security and urban agriculture or community gardening have been the subjects of two recent literature reviews, which both suggested positive relationships (Audate et al., 2019; Burt et al., 2021). However, study quality was deemed poor in the urban agriculture review (Audate et al., 2019) and the second review found that several of the

12 studies reported no significant relationships between participation in community gardening activities and lower food costs or perceived food security (Burt et al., 2021). Notably, research with urban gardeners in California found that gardeners described their gardens' impact in both qualitative and quantitative terms and across multiple dimensions of household food security (availability, access, adequacy, acceptability and agency; Diekmann et al., 2020). The body of literature on these relationships within acute crisis contexts is smaller. Two observational studies from the UK and Canada both reported food security as a key outcome of gardening during the COVID-19 pandemic (Elton & Cole, 2024; Mead et al., 2021). A 2021 intervention study on the Chicago Grows Food programme, which provided home gardening kits to families at risk of food insecurity as a response to the COVID-19 pandemic, found that 20% of participants reported they improved their food security due to the programme (Kersten et al., 2023).

When studies look at the multifaceted impacts of chronic crisis gardening, the outcomes are remarkably similar to those identified in studies of acute crisis or non-crisis gardening. For instance, Minkoff-Zern et al. (2024) found that fewer refugees participating in a garden programme in New York reported experiencing a household food shortage or utilising food assistance programmes than non-gardeners. California farmworkers reported increasing their consumption of fresh, organic produce and saving money by spending less at the store as a result of their gardens. Gardeners also reported being able to access culturally relevant foods that met their cultural definitions of health (Minkoff-Zern, 2014; Minkoff-Zern et al., 2024).

Community

Many studies have described how gardeners contribute to food security at the community level by distributing their surplus yields. In observational surveys of low-income gardeners in San Jose, excess produce was given away or traded with family, friends and neighbours (Algert et al., 2016). Several authors have suggested that home gardening helps build social connections within the community, in part, through this sharing (Budowle & Porter, 2022; Furness & Gallaher, 2018; Gray et al., 2014). In a mixed methods ethnographic study of home gardening in Wyoming, one participant specifically shared food with women from her church who she said otherwise 'don't have money or the ability to have a lot of fresh vegetables' (Budowle & Porter, 2022). It's possible that receiving produce from local gardens is a less stigmatising way to receive food assistance when in need, as was suggested by researchers of the Orono Community Garden which distributed fresh produce to older adults (Tims et al., 2021). In a crisis setting, Pourias et al. (2016) hypothesise that gardens play an important role in community food security not only by sharing food, but also by developing social networks that maintain and spread knowledge of how to produce food and by maintaining spaces for food production. In one instance, California gardeners, surveyed during the COVID-19 pandemic, reported sharing seedlings, labour and information (Diekmann et al., 2023).

Food System

Explicitly acknowledging chronic crises, the literature on gardening and urban agriculture suggests these activities can contribute to a more just food system. Organisations that run urban farms see food work as a way to facilitate improvements for individuals and communities who have been marginalised due to race or social class (Block et al., 2012; Bradley & Galt, 2014; Porter, 2018; White, 2011). In fact, spatial analysis of neighbourhoods in Philadelphia showed significant associations between urban agriculture and Black neighbourhoods or poverty (Gripper et al., 2022). In addition, Indigenous communities have also identified unique benefits from food production and sovereignty activities. The Growing Resilience programme which supports home gardens for families in the rural Wind River Reservation found that engaging with gardening was a way to cultivate intergenerational resilience (Budowle et al., 2019). In urban settings, individuals engaged with Indigenous food sovereignty activities felt that these efforts support reciprocity, responsibility and relationality (Miltenburg et al., 2022). In qualitative interviews with migrant women, gardens were reported as providing opportunities for them to exert their autonomy (Hammelman, 2018). Various authors have

also suggested that community gardens facilitate community empowerment through connections with neighbours (Freedman et al., 2022; Hammelman, 2018; Hite et al., 2017).

There are noteworthy critiques of gardening and urban agriculture as forces which can create a more just food system based on their location, who they serve and who leads them (e.g., Reynolds, 2015). In addition, food-insecure families' ability to participate may be constrained by access to adequate space, time and knowledge (Loopstra & Tarasuk, 2013). Local government or community-led efforts to address chronic food system challenges during times of acute crisis continue to arise. An ethnographic study of community gardening efforts in New Orleans in the years following Hurricane Katrina found that these efforts took on political characteristics, but authors were unsure to what degree social injustices could be addressed with these activities (Kato et al., 2014). In 2020, twelve Canadian municipalities developed home food gardening programmes due to increasing food insecurity, but few programmes remained active when reviewed in 2021 (Music et al., 2022). More research is needed to understand the magnitude of impact and sustainability of gardening efforts that acknowledge chronic crises but arise in response to acute crises.

FUTURE RESEARCH AND IMPLICATIONS

Though many gardeners are motivated by improved food security – broadly defined – the ability of gardens to consistently improve community food security remains unestablished. Quantitative evaluations regularly illustrate how gardening impacts the quality and quantity of food available in the home. However, the startup costs of home food production can take several years to recuperate and quantitative evidence about the impacts on household- or community-level food security are inconsistent. Numerous qualitative inquiries suggest that low-income and/or food-insecure gardeners may benefit from gardening practices in complex ways that are not well captured by quantitative evaluations. These benefits include feelings of control over one's food supply, suggesting that food sovereignty may provide a better framework for future inquiry. Considering gardening through a food sovereignty lens encapsulates not only the nutritional and financial outcomes of gardening, but also its relationship to health, place, community and agency in the food system (Diekmann et al., 2020; Minkoff-Zern et al., 2024). Food sovereignty and food security frameworks are not necessarily at odds; Clapp (2014) contends that food security can be seen as one part of a broader food sovereignty agenda, while newer definitions of food security include agency in the food system as an additional dimension (Chappell, 2018).

For researchers interested in the relationship between food security, food sovereignty, crisis and gardening, the results of this narrative review suggest two areas for future research. Researchers should work on operationalising and rigorously evaluating the broader food system outcomes of gardening, especially impacts on food justice and food sovereignty. There is some precedence for this in studies of Indigenous food sovereignty (Blue Bird Jernigan et al., 2021). Studies of gardening and community food production should also include analysis of their historical and sociopolitical contexts. Although the number of studies engaging in this type of analysis of history and power is growing, it is not yet the norm. From a practical standpoint, local government and nonprofit organisations should involve the community in decision-making about gardening and urban agriculture projects through a range of participatory processes. Examples include Philadelphia's Urban Agriculture Plan that emphasises supporting those residents growing food who are also most impacted by food apartheid (Gripper et al., 2022) and Salt Lake City's Resident Equity Food Advisor Program, which supports community-driven food access and urban agriculture (Joyner et al., 2022).

CONCLUSION

The purpose of this chapter was to investigate the relationship between food security and gardening in response to chronic and acute crises. Crisis gardening appears to draw diverse participants, with equally diverse motivations. Our review of the literature reveals a positive relationship between

gardening and perceived food security at the individual and household level. Distribution of surplus yield, knowledge and other forms of social support within communities may also contribute to community food security and a more just food system.

When examining gardening as a response to food insecurity, there are some practical challenges to consider. Communities must establish access to land, water and resources to garden. In addition to these inputs, it takes know-how and time to establish and maintain a garden. There are also logistical considerations of gardening in response to a crisis, e.g. the time between crisis and harvest, and as ever with gardening, luck – that the weather cooperates, that pests don't destroy the crop, etc. Finally, the relationship between gardening and improved food security has not been firmly established, although studies suggest a positive relationship to dietary diversity. Additional research is needed to understand how gardening addresses upstream drivers of food insecurity, like poverty and systemic racism. Initial research suggests that it provides individuals and communities with opportunities to engage in self-determination, to imagine and enact alternatives to the dominant food system and to develop relationships and skills to advocate for other changes in policy and the food environment.

A broadened frame for crisis gardening locates it within traditions of resistance and self-determination and future work, in both practice and research, should seek to understand and activate crisis gardening in support of food justice and food sovereignty.

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2 How Gardening Can Work towards Combatting the Biodiversity Crisis

A Landscape Perspective

*Tamás Lakatos, Patrícia Andresz-Déer,
Dorota Kotowska and Péter Batáry*

INTRODUCTION

Urban areas as nature conservation spots may seem counterproductive, as urbanisation contributes to global biodiversity loss through fragmenting and diminishing natural areas, and this process results in a global human population shift toward cities with a faster growth rate of urban areas than the global population growth (Müller et al., 2013; Seto et al., 2011; United Nations, 2018). With the rapid global population increase, it is estimated that global food production should double its yield to meet the ever-growing human demands, which poses enormous pressure on the already severely damaged global biodiversity and associated ecosystem functions (Tilman et al., 2011). As a result, land-use change, habitat loss, fragmentation and degradation of natural lands due to agricultural intensification and urban sprawl are among the most significant but inevitable and accelerating drivers of global biodiversity loss (Jaureguiberry et al., 2022; Tscharnkte & Batáry, 2023).

However, quite some urban areas can create or provide habitats for biodiversity to work towards mitigating the biodiversity crisis. Although urbanisation poses possible threats to the natural world and cities cannot be the sole conservers of species, cities also have the potential to support certain species, some of which have larger populations, faster growth rates and higher productivity compared to their ‘rural’ counterparts (Spotswood et al., 2021). Since there is no generally accepted definition of different urbanisation categories, the classification may vary among countries and continents (Batáry et al., 2018). A good approach to categorisation is to focus on broad measures, like human population density or percentage cover of natural/semi-natural habitats (Kaminski et al., 2021). Accordingly, urban areas are generally highly sealed (>50%), with commercial/industrial buildings often being dominant. Rural areas typically have low housing density embedded in a farmland matrix. Other categories may form a gradual transition between the above. Rural areas characterised by a simplified, high-intensity agricultural matrix cannot provide habitat for some species that can still survive in suburban or other little urbanised areas within cities. Thus, these areas could host several, mainly habitat generalist species (e.g., birds; Batáry et al., 2018). Thriving in these highly modified, well-urbanised environments depends on the combination of several species traits related to the presence of resources and liveable habitats, as well as threats, but also the structure of the surrounding landscape can be determinant (Lakatos et al., 2022).

For supporting biodiversity in urban settings, the emergence of local, small-scale food production units within the boundaries of urban areas could be beneficial. Such urban gardening represents a particularly valuable form of residents’ contribution to sustaining urban biodiversity when it adopts wildlife gardening practices. During these activities, private or domestic gardens undergo biodiversity-supporting processes (Shaw et al., 2013). These could be complex and wide-scale interventions, e.g., maintaining habitat patches and buffers, creating wildlife corridors and stepping

stones that can improve the remaining habitats' quality (Threlfall et al., 2016). There are also some easy-to-implement actions which may help to create and sustain habitats, e.g. removing weeds, installing habitat features for shelter or nesting sites, creating water bodies and ponds or planting native flora (Mumaw & Bekessy, 2017; Mumaw & Mata, 2022). While there is some advice available on wildlife-friendly gardening practices, evidence-based studies exploring the effectiveness of these interventions are scarce (Delahay et al., 2023). Thus, moving towards replicated experiments on the effects of wildlife gardening methods could be an important knowledge gap filler.

The scientific literature describes several forms of urban gardening, and the most common forms among them are private gardens of citizens scattered throughout cities. They can be placed close to buildings, next to them at the front or back, around non-buildable areas or on balconies or roofs. These are easy to access, or they are close to the dwellings. In these garden types, owners usually implement wildlife-supportive practices, such as planting native fruit or seed-producing plants, removing invasive species, limiting the use of agrochemicals or setting up bird feeders (Royer et al., 2023). Another distinguished representation of urban gardening is the community garden scene, the most well-known and well-studied form that appeared in the United States in the late 19th century (Lawson, 2004). These gardens emerged during different societal or environmental crises, and they refer to any open land situated in the urban context sustained by members of a local community in which food or ornamental plants are cultivated (Holland, 2004). Allotments are one of the oldest forms of food-producing facilities in cities and first appeared during the Industrial Revolution, mainly for factory workers (Royer et al., 2023). They are still present and are getting more popular, especially in European countries (Partalidou & Anthopoulou, 2017). For example, German cities have over one million allotment gardens (Korányi et al., 2021). Allotment gardens were initially used for vegetable and other food production purposes. However, currently, they have more of a leisure function, yet food production still plays a major role. A similar setting can be found in the shared gardens, which are popular in France. Their role is mainly to strengthen social cohesion and create a cultural and educational atmosphere for the public. The societal benefits of urban gardens are increasingly recognised, especially during crisis times, e.g., during the COVID-19 pandemic (Marques et al., 2021). Unlike the previously mentioned private and community gardens, urban farms are rather new initiatives that are developing rapidly in the US and Europe. This new initiative manifests in a wide variety of forms, which can be large or micro-farms, vertically installed or those that use alternative, soilless technologies, like aquaponics (Royer et al., 2023).

In this chapter, we present how different gardening activities may influence biodiversity patterns in urbanised environments. Through presenting studies, we describe the beneficial nature of urban gardening for urban wildlife at the local scale. Moreover, by emphasising the importance of the landscape-scale approach from urban ecological studies, we present a broad insight into the larger spatial nature of urban gardening and its biodiversity. Furthermore, we also show the negative consequences of some gardening practices. Finally, we provide some useful advice for more biodiverse cities.

URBAN GARDENING: A POTENTIAL BIODIVERSITY CONSERVATION TOOL

One of the most important benefits of urban gardens for biodiversity is the provision of habitats (such as roosting and nesting places) and food resources on which the presence of several taxa depends. For example, more bird species could fulfil their ecological needs with higher structural and plant species diversity in the gardens (Fernández-Cañero & González-Redondo 2010). Private gardens can enormously contribute to urban wildlife protection in strongly modified settings (Goddard et al., 2010). As urban landscapes are usually highly simplified, native biodiversity cannot thrive in drastically altered environments. Urban green spaces, including gardens, can bring some form of naturalness back into the urban system, providing space for biodiversity and their ecosystem functions and services across the fragmented habitats (Lin et al., 2015).

Clucas et al. (2018) performed a systematic review to summarise the current state of research on urban agriculture gardening and its biodiversity. However, they only found a few studies that

quantified urban biodiversity in food-producing areas, and those that considered species other than plants were mainly focused on invertebrates and originated from the US. They showed that urban gardens did not have higher biodiversity than control areas, like vacant lots, forest remnants, parks or other green urban habitats. In some cases, however, spider, beetle and bee diversity were higher in urban gardens than in adjacent areas (Burkman & Gardiner, 2015; Gunnarsson & Federsel, 2014; Philpott et al., 2014). A study performed in the German city of Göttingen pointed out that the similarly high bird diversity of allotment gardens and city parks did not decrease from the city edge towards the centre (Korányi et al., 2021). Another research carried out in Leipzig, Germany, found that suburban community gardens can represent important microhabitat features, e.g., ponds, stumps, insect hotels and bird houses, whereas the greener allotments had higher overall species richness, meaning that different urban garden types have rich, but varying biodiversity retaining capacity (Cabral et al., 2017). Allotments in Poznań, Poland, can provide habitat for several threatened plant species; thus, a great role in biodiversity conservation can be attributed to these agricultural sites (Speak et al., 2015). Not only threatened plants but also critically endangered mammals can be present in residential gardens, as Van Helden et al. (2020) found in Australian cities, where ‘wildlife-friendly’ interventions in gardens may be beneficial. These findings confirm the conservation potential of agricultural areas among cities, but most studies were carried out in one country, and each study had varying conditions. Further studies could draw more robust conclusions based on multiple taxa and in a greater geographical range.

LANDSCAPE-SCALE EFFECTS OF URBAN GARDENING ON BIODIVERSITY

The landscape perspective in ecological studies could give a wider insight into how different spatial patterns (compositional or configurational heterogeneity of habitat patches) in natural or artificial habitats and resources modify populations’ growth, persistence and decline (Pearson 2013). Especially when large natural areas are rapidly diminishing, urban areas may provide important habitats for species during the ongoing biodiversity crisis (Rega-Brodsky et al., 2022). Cities can be interpreted as a network of small, fragmented habitat patches (Figure 2.1) where species richness depends on their connectivity and habitat size (Goddard et al., 2010). Urban gardens and other agricultural areas can be viewed as habitat fragments embedded in the often highly sealed urban matrix. Thus, landscape ecological methods could use these patchy structures as model habitats. This can be particularly important given these habitats represent many cities’ single largest green areas. Therefore, the role of urban gardens, such as private residential gardens, in sustaining city biodiversity can be essential (van Heezik et al., 2008), and this phenomenon can be observed globally.

A review based on 72 studies concluded that small fragment size is detrimental for urban birds, as increasing habitat size and connectivity between them could improve avian species richness (Evans et al., 2009). This statement is also true for a range of other taxa inhabiting urbanised areas, e.g., amphibians, mammals and carabids (Magle et al., 2009; Parris 2006; Sadler et al., 2006). Chamberlain and colleagues (2004) showed that garden bird diversity not only depends on garden characteristics solely, but the surrounding landscape could also determine the species’ ability to prosper in urbanised areas. The extent of the surrounding landscape and its type does matter, e.g. large-scale agricultural landscapes provide an entirely different and possibly poorer species pool than a dense deciduous forest-dominated landscape.

When considering the landscape-scale importance of urban green areas, it is crucial to focus on the configurational and compositional heterogeneity of the landscape. The high share of green areas (e.g., parks and allotments as landscape compositional elements) in cities can buffer against the negative effect of urbanisation, ensuring adequate habitat for species, meaning that an already green city with high vegetational cover is relatively resistant to urbanisation effect, at least in the case of birds (Korányi et al., 2021). The configurational nature of gardens or other agricultural areas within urban settings is also important, as gardens adjacent to forest edges might have higher bird diversity (Rodewald 2016). Furthermore, Marín et al. (2020) examined the species richness of floral visitor

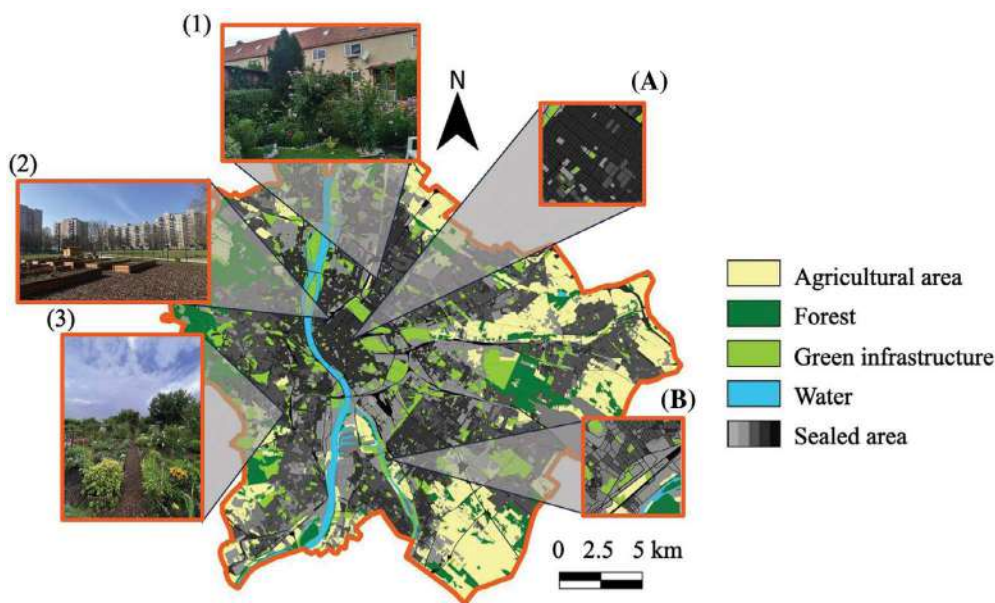


FIGURE 2.1 Schematic representation of land-use types within the City of Budapest, Hungary. Grey colours represent the sealed coverage. Darker shades indicate a higher percentage of impervious surfaces. Green colours indicate the vegetation cover. Figure (A) shows a part of the city where habitat remnants are highly isolated in highly sealed areas, and (B) indicates a well-connected habitat network within a less sealed urban matrix. With numbers, the dominant garden types are represented: (1) private gardens managed by property owners, are situated throughout the city, with more frequent occurrences and more local agricultural practices towards the city edges; (2) another good example of urban gardening are the community gardens often established on vacant lots, which are popular among people living in the dense city centre; (3) allotment gardens, situated mainly in the outskirts, are popular forms of agricultural practices remaining from the communist system.

invertebrates in urban home gardens, comparing different areas within the same city. They found that home gardens are important in maintaining a diverse pollinator community besides natural areas. Gardens function as ecological refuges for these species despite home gardens having different characteristics from natural areas at both local and landscape levels. A study conducted in Paris showed a complementation effect between private gardens and other public green areas. The large, high-vegetation-covered habitats were essential for the common pipistrelle (*Pipistrellus pipistrellus*), but the spatial configuration of private gardens appeared to be especially important for the bat species, as these small natural patches served as stepping stones for improving habitat connectivity (Mimet et al., 2020). Another study from the UK emphasised the role of habitat composition and connectivity on bat communities in urbanised landscapes. Hale and colleagues (2012) revealed that habitat connectivity provided by tree networks is crucial for several *Pipistrellus* species, suggesting that even in highly modified urban landscapes, the connectivity between the remaining habitats could support wildlife.

An important way to study the urban landscape is the gradient approach, which states that graduated spatial environmental patterns determine the structure or function of different ecological systems, whether they are populations, communities or whole ecosystems (McDonnell et al., 1993). Most ecological studies examine urban-rural gradients, extending from densely populated and highly sealed urban cores to the scarcely populated, scattered building-dominated suburban or rural areas. Minor and Urban (2010) studied bird communities in forest patches across a gradient of urbanisation and identified different bird communities. Some species were only present in rural areas, whereas

others preferred urban areas. Neighbourhoods with more gardens in their proximity attracted more urban bird species, and the highest abundance of birds was among the suburban parts of cities, where private gardens are mostly common (Batáry et al., 2018; Pithon et al., 2021). The greater perspective provided by the landscape approach may help to understand the dynamics of urban biodiversity and may be able to help mitigate the approaching biodiversity crisis through targeted landscape design.

WRONG SIDE OF THE GARDENS: BIODIVERSITY THREATENING FACTORS

Beyond urban gardening's positive wildlife sheltering face, some adverse factors are worth mentioning. These are mainly associated with unfavourable management practices (excessive lawn mowing), uncontrolled pesticide usage or planting non-native species that can become invasive. The latter is considered a particularly serious issue, as invasive plant species can damage native ecosystems (Pyšek et al., 2020). They can outcompete native species for available resources, disrupt key ecological processes and alter habitats, leading to local extinctions and reduction of native biodiversity (Pyšek et al., 2012). As a result, they can have an adverse effect on ecosystem services, human well-being and the economy (Kumar Rai & Singh, 2020; Diagne et al., 2021). Urban areas, being hotspots of human activity and associated disturbances in natural ecosystems, are recognised to host a number of exotic plant species (Aronson et al., 2014). This may be influenced by the socioeconomic context, such as the luxury effect being positively associated with both native and non-native plant diversity (Chamberlain et al., 2020). For example, it has been estimated that species of alien origin constitute about 40% of the total floras in central European cities (Lososová et al., 2012). Among urban habitats, gardens can act as primary foci for the introduction of non-native plant species and key sources from which their propagules can escape into adjacent environments (Marco et al., 2010).

Their successful invasion, however, depends on many factors, among which spatial patterns of source habitats, as well as the landscape structure and dynamics in their surroundings, are significant (Basnou et al., 2015). For example, the proximity of linear features, such as roads, rails, rivers or canals, can provide dispersal corridors for invasive plants and allow them to spread across long distances (Säumel & Kowarik, 2010; Threlfall et al., 2016; von der Lippe & Kowarik, 2008). This can also be facilitated by the high level of heterogeneity of urban environments comprising a variety of disturbed habitats (e.g. ruderal sites) that are favourable to non-native plants (Gaertner et al., 2017; Štajerová et al., 2017). However, not only the composition of environments neighbouring the source habitats but also their configuration (e.g. patch size and shape) can play a crucial role in the patterns of invasive plant species distribution (Basnou et al., 2015). For example, Boscutti et al. (2022) showed that the high shape complexity of highly disturbed urban habitats can be an important abiotic driver of plant invasions in heterogeneous landscapes because it increases the exchange area that exotic plants use to spread their propagules to recipient environments. Similarly, Alston and Richardson (2006) suggested that the opportunities for invasive plants to spread from human-modified urban habitats, such as gardens, into adjacent natural and semi-natural ecosystems can be especially enhanced at the interfaces between urban and wildland areas due to the subjection to various edge effects.

Thus, to minimise the risk of introducing and spreading non-native plants, the use of native instead of alien species should be promoted in urban gardening. Establishing the conservation gardening concept, when large-scale planting of already declining native species in urban areas would be in focus, may be a solution (Segar et al., 2022). Moreover, considering the landscape context can provide important insights for preventing the spread of invasive species from gardens and managing invasion processes to sustain urban biodiversity.

CONCLUSIONS

Although large-scale alterations of natural ecosystems are predominant in urban areas, conserving biodiversity in these landscapes is not a lost battle. As the previously synthesised studies showed, the capacity of urban gardens to maintain diverse ecological communities has a stable base. However,

their role in urban nature conservation still needs further research and relevant urban planning to achieve the best outcomes for both society and wildlife.

Focusing on general spatial patterns may be important when considering different urban biodiversity conservation measures. Ample evidence shows that species richness and abundance are highest in peri-urban areas, whereas highly modified areas only harbour impoverished and homogenised communities, among which generalist, exotic and invasive species are dominant. Suburban areas can be the most species-rich parts of cities, indicating that urban biodiversity protection should focus on these areas, and decision-making should promote similar initiatives during urban expansion. The size of gardens, acting as habitats, can play a significant role in wildlife protection, but connectivity between them is also crucial, just like their vegetation structure.

Even though urban gardening provides a novel and remarkable opportunity for biodiversity conservation, the practice still needs time to reach its full potential. The future of urban biodiversity requires effective management of wildlife in urban gardens. Enhancing the quality of these areas and creating a network of green infrastructure with well-connected habitats may result in more biodiverse urban ecosystems (Aronson et al., 2017). To reach this goal, influencing householder attitudes to be more dedicated to native biodiversity is crucial, as they also benefit from healthy ecosystems (van Heezik et al., 2012). The benefits of urban gardening are especially relevant during times of crisis, which will become more frequent as global change accelerates. The nature conservation potential of urban gardens through wildlife gardening practices may be crucial during the ongoing biodiversity crisis. The multiple possibilities, e.g., habitat and shelter creation, offered by urban gardening not only support wildlife but also benefit human inhabitants from the delivered ecosystem services. Therefore, urban gardening can be a sustainable alternative for food production that simultaneously allows the prosperity of urban wildlife and maintains healthy, functional ecosystem services, which can mitigate the severe effects of global crises.

ACKNOWLEDGEMENTS

We thank the support of the Research Excellence Program of the Hungarian National Research, Development and Innovation Office (NKFIH KKP 133839) and the Sustainable Development and Technologies National Programme of the Hungarian Academy of Sciences (FFT NP FTA).

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3 Urban Gardens as a Strategy to Confront the Food Emergency Crisis in Argentina

Analysis Based on Capacities, Barriers and Future Policy Uncertainties

*Francisco Tomatis, Ana María Bonet, Ulises Reno,
Ouiam Fatiha Boukharta and Luis Manuel Navas Gracia*

INTRODUCTION

Historically, urban agriculture initiatives stand out because they can contribute to food security and supply through the cultivation of crop plants, ornamental plants and medicinal plants (Keatinge et al., 2012; Schoen et al., 2021). Despite their historical significance, there is a renaissance of interest in urban food production because these practices can help address more sustainable cities and can confront the socio-environmental impacts of food industrialisation (FAO et al., 2023; Menconi et al., 2020; UN-Hábitat, 2017; Winkler et al., 2019). However, the objectives and challenges of developing urban gardening vary from country to country around the world (Taguchi & Santini, 2019; Wadumestrigie Dona et al., 2021). For example, in European countries, the social and therapeutic potential of urban gardens is emphasised (Ávila Sánchez, 2019), while in southern hemisphere, their contribution to food security is more valued.

Argentina, a southern hemisphere country, has declared a food emergency for 20 consecutive years (2002–2022), facing the challenges of hunger, poverty and food production. These situations are similar in other South American countries (UN, 2022). In response to this circumstance, several initiatives have been launched in Argentina to tackle the food emergency and economic issues by promoting urban (and peri-urban) agriculture. These include national state bodies – for example, the National Institute of Family, Peasant and Indigenous Agriculture (INAFCI) and the National Council of Family Farming (CNAF) – public national programmes – such as the Argentine Plan Against Hunger (PACH), the National Food Assistance Programs and the ProHuerta National Program – or even local programmes like the Urban Agriculture Program (UAP) in the city of Rosario. Particularly, ProHuerta and the UAP, which were initiated during the 2001–2002 economic crisis, are highlighted examples of policies designed, developed and sustained over time that promote urban and family agriculture (Gonzalías, 2015; Lattuca et al., 2014; Liendo et al., 2007). In addition to the official public programmes, *bottom-up* initiatives, such as community canteens, represent social responses that have emerged around the country to cope with periods of food crisis.

In this chapter, urban gardens are considered practices that can contribute to the realisation of the human right to food in its fullest sense, not only by facilitating the satisfaction of nutritional needs but also by responding to food adequacy in its cultural, community and environmental sense (Ávila Sánchez, 2019; Bonet & Belbey, 2023). The concerning socio-economic situation in

Argentina during the last decades has led to the consideration of urban gardens as an alternative to confront the food emergency. For this reason, this chapter highlights the capabilities that urban gardens can offer to cities and citizens of Argentina in times of crisis, recognising outstanding public programmes and considering an uncertain future in the social, economic and political aspects of the country.

URBAN AGRICULTURE IN ARGENTINA: HIGHLIGHTED PROGRAMMES AND CAPACITIES OF URBAN GARDENS TO ADDRESS THE CHALLENGES OF FOOD EMERGENCY

The public programme at the national level that stands out in the promotion of urban agriculture and urban gardens is the ‘ProHuerta,’ which has been in operation for over 30 years. Its objectives are to improve the food distribution situation of the most vulnerable populations through the self-production of fresh food (Gonzálías, 2015; Liendo et al., 2007). ProHuerta promotes agroecological gardens and farms (community and family), especially by facilitating the provision of seeds and inputs, technical assistance, as well as marketing support on local markets (INTA, 2023; García, 2020).

At the local level, the UAP of Rosario – which receives support from ProHuerta – is a policy that stands out for its social impact and for being sustained over time (FAO, 2014). The UAP has mixed participation of governmental, non-governmental and civil society entities and is consolidated in the local Land Use Plan and the local Climate Action Plan (Lattuca et al., 2014; *Municipalidad de la Ciudad de Rosario*, 2020). This initiative has received international recognition, including the 2020–2021 Prize for Cities from the WRI Ross Center for Sustainable Cities.

Although ProHuerta is a national-level programme, while the UAP is local, they are initiatives that have recognition for their promotion of urban agriculture. These experiences show that these policies can serve as strategies for responding to Argentina’s food crisis over time. ProHuerta and UAP reflect characteristics and capacities that urban gardens can provide to food, as well as economic, social, urban and environmental contexts. These capacities are recognised globally, and while their contribution will depend on many factors, those specifically relevant to the case of Argentina are highlighted below (Figure 3.1):

- Food access: ensuring the availability of fresh and healthy food to local communities (Colson-Fearon & Versey, 2022).
- Food sovereignty: reducing dependence on imported and processed foods, improving the quality of dietary food and empowering people to make autonomous and informed dietary choices independently (Colson-Fearon & Versey, 2022; Weiler et al., 2015).
- Agroecology: promoting food production without pesticides and chemical fertilisers while implementing sustainable practices like composting, crop rotation and organic fertilisers (Lattuca et al., 2014; Whittinghill & Sarr, 2021).
- Local food: reducing food production and distribution costs due to inflation, decreasing carbon footprint and pollution (Lattuca et al., 2014; Puigdueta et al., 2021).
- Food diversity: producing fresh, variable and seasonal food. More diverse and nutritious diet (Colson-Fearon & Versey, 2022; Giraud, 2021).
- Local market: establish strong links between producers and consumers, supporting the local economy and markets (Giraud, 2021; Diekmann et al., 2020; Liendo et al., 2007).
- Jobs and occupations: creating opportunities for entrepreneurship, volunteering and community leadership (Diekmann et al., 2020; Giraud, 2021).
- Urban social networks: encouraging engagement, collaboration and the sharing of community knowledge, skills and experiences (Ghose & Pettygrove, 2014).

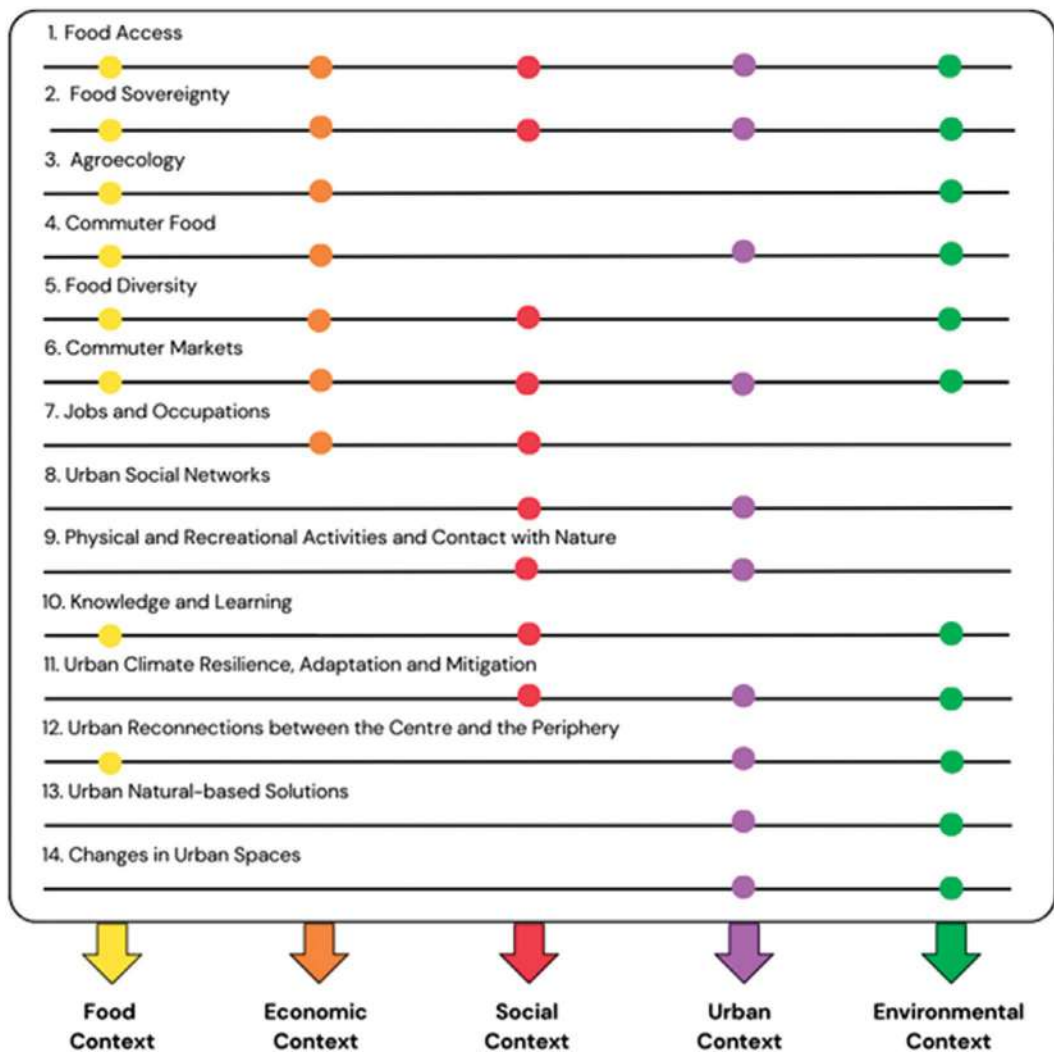


FIGURE 3.1 Capacities that urban gardens can offer in different contexts.

- Recreational and physical activities in contact with nature: promoting physical and mental well-being through activities like walking, visits and recreational pursuits (Lampert et al., 2021).
- Knowledge, learning and awareness: facilitating the exchange of horticultural techniques and experiences from older individuals to young generations, from technicians to novices and between people with rural and urban backgrounds (Giraud, 2021; Menconi et al., 2020).
- Urban climate resilience, adaptation and mitigation: contributing to urban cooling, improving water retention capacity, sequestering carbon and building resilience against natural disasters (Tomatis et al., 2023).
- Urban reconnections linking the centre and the periphery: promoting a more integrated and sustainable urban-rural relationship (Bonet & Belbey, 2023).
- Natural-based solutions: improving and enhancing urban biodiversity, air quality and climate resilience through green and nature-based infrastructure (Menconi et al., 2020; Tomatis et al., 2023).
- Changes in urban spaces: expanding the availability of green, communal and revitalised spaces (Ribeiro et al., 2023).

ARGENTINA'S FOOD EMERGENCY: A MULTIFACETED PERSPECTIVE IN AN UNFAVOURABLE SOCIO-ECONOMIC CONTEXT AND POLITICAL CHANGES

At the beginning of the 21st century, Argentina faced a critical situation with almost half of its population living below the poverty line (Liendo et al., 2007). The years 2001–2002 were difficult due to the crisis, and that was the moment when ProHuerta and UAP emerged. Although the current situation differs from that of 2001–2002, there are still unfavourable food situations that are connected to social, economic, environmental and urban contexts that lead to deficiencies in the population's access to food (INTA, 2019; MAyDS, 2018; MDS, 2019; UCA, 2020).

Considering these circumstances, Argentina has officially declared a food emergency at the national level (Laws 25,724/02 and 27,519/22). These national laws are linked to difficulties in access to food, malnutrition, obesity rates and diseases that especially affect the most vulnerable sectors (Bonet et al., 2019). Various mechanisms, such as the PACH, were implemented with the aim of providing an urgent response to the problem of malnutrition (Bonet et al., 2019).

Argentina has a population of 46,234,830, while the unemployment rate was 7.1% in 2022, and the percentage of households below the poverty line was 27.7% at the end of 2023 (INDEC, 2023a, 2023b). As of the early months of 2024, the country was still grappling with rising inflation, which significantly affects access to food, resulting in lower nutrient consumption and limited healthy diets. (Marichal & Bonet, 2022; Nessier & Bonet, 2021; Oliveros & Vommaro, 2022). In the way of producing food, the Argentine agro-export model has undermined the rural population by losing its self-sufficiency, connection to the land, access to seeds and traditional agricultural practices (Marichal & Bonet, 2021). Local food production, trade and consumption systems are in a vulnerable situation (Bonet et al., 2019; Nessier & Bonet, 2021).

In Argentina, 92% of the population is urban, compared to 56% worldwide (The World Bank, 2021). The historical urban structure is centred on large cities (Jefatura de Gabinete de Ministros, 2017), and two trends coexist: population density is low due to the country's territorial extension, but it has a high rate of urbanisation. The most deprived urban sectors of the population reside in sub-standard housing, or informal urbanisations, where they are more exposed to food insecurities and limited green spaces (Hartinger et al., 2023; Marcos et al., 2018; Rodríguez Tarducci et al., 2021). Peri-urban areas traditionally linked to horticultural belts are nowadays endangered, among other reasons, due to expanding real estate speculation (Marichal & Bonet, 2021). Moreover, Argentine cities and their agricultural model are vulnerable to climate change, threatening food security and production (IPCC, 2023; SAYDS, 2019; SAYDS & MPyT, 2018).

The emergency food situation and the general contexts (especially economic and social issues) described are current challenges for the country. Besides, Argentina is undergoing a new change of government at the national level (starting in December 2023), standing out for following liberal policies, where the social programmes are rethought and redesigned. As a result, the future of food assistance policies (such as PACH and ProHuerta) is uncertain.

POTENTIAL SYNERGIES BETWEEN PACH AND PROHUERTA

The PACH is a national-level mechanism designed to address the population's need for access to food and emerged as part of the extension of the declaration of food emergency after 20 years (Marichal & Bonet, 2021). A specific component of the PACH stands out in this research because it promotes family farming and is linked to ProHuerta: 'Support for food production and marketing.'

This mechanism is subject to criticism as it tends to focus on short-term, targeted and welfare-oriented provisions, such as cash transfers or direct food deliveries and is considered social assistance (Bonet et al., 2019; Marichal & Bonet, 2021). The PACH focuses its implementation (and funding) on emergency measures and with a low level of articulation between components (Marichal & Bonet, 2022). The Alimentar Program is a national government policy that assists and accompanies different vulnerable sectors of society. This Program is implemented by giving money on a card (Tarjeta Alimentar or 'Food Card' in English), where only food and products from the

TABLE 3.1
Potential Articulations PACH-ProHuerta

	Alimentar Program	Benefits for School and Community Canteens	Markets within the Social and Solidarity Economy
Pro-Huerta	The Alimentar Program could be integrated and strengthened to promote the consumption of fresh food at local fairs or markets linked to ProHuerta, including in social and solidarity economy markets.	The creation, maintenance and extension of urban gardens could be promoted in or near school and community canteens, using seeds, seedlings and advice provided by ProHuerta.	Markets of the social and solidarity economy that sell fresh food, exclusively or complementarity and are linked to ProHuerta, could be strengthened.
	Beneficiaries of the Alimentar Program could have preferential access to ProHuerta seeds and seedlings.	Beneficiaries of the Alimentar Program could have preferential access to ProHuerta seeds and seedlings.	ProHuerta’s distribution channels could be consolidated in social economy markets focused on sustainable production and food sovereignty.
	Beneficiaries of the Alimentar Program, who are also linked to ProHuerta, could sell their products in local markets or food fairs, including in social and solidarity economy markets.	ProHuerta staff could provide training to community and school canteen leaders and volunteers in urban agriculture techniques, garden management, food preservation and preparation.	ProHuerta’s technical staff could provide training for popular, social and solidarity economy production units in food preservation and preparation, taking advantage of existing cooperation networks.

basic Argentine family’s basket can be purchased, exclusively basic necessities (Bonet et al., 2019). The Tarjeta Alimentar dominates the implementation of the PACH, consuming nearly 85% of the programme’s budget (Bonet et al., 2019; [Marichal & Bonet, 2022](#)).

The policies advocated by the PACH, such as the Alimentar Program, together with the existence of school and community canteens (explained in [Box 3.1](#)) and markets within the social and solidarity economy, present promising synergies to better coordinate with the ProHuerta Program ([Table 3.1](#)). Through the Alimentar Program, the consumption of fresh food could be promoted at local fairs or markets linked to ProHuerta, including social and solidarity economy markets. Maintaining and increasing these synergies contributes to greater integration and consolidation of urban gardens as public policies. In this way, PACH could modify its social assistance by adopting a more participatory, supportive and community-based approach. However, it is highlighted that financing and effective collaboration between ministries, agencies and institutions are essential for its consolidation over time, in addition to overcoming existing barriers.

BOX 3.1 WHAT ARE THE COMMUNITY CANTEENS?

There are spaces where hunger can be urgently addressed and spaces where forms of collective consumption can be deployed. These are generally located in vulnerable neighbourhoods where the population’s food needs are the most significant. The canteens have been consolidated over time as a territorialised food assistance intervention and are heterogeneous in terms of their organisation, continuity and regularity. There is a high degree of feminisation in their management, and maintenance is registered, and the collaboration of the members to obtain different types of food products is a priority where fresh products are scarce. Even though these feeding troughs will continue to exist if there is a need for food for the population, what remains a question mark is what to feed them, with urgency taking precedence over the question of nutritional content ([De Sena & Dettano, 2022](#)).

BARRIERS IDENTIFIED FOR URBAN GARDENS IN ARGENTINE CITIES

To improve the development and promotion of urban gardens as public policy in the future, it is first necessary to identify limitations, challenges and barriers that must first be identified (Figure 3.2) and then overcome them. Overcoming these limitations involves responsibilities at various levels of government (FAO, 2014; Wadumestrigé Dona et al., 2021), where support at the national level is essential due to its economic capacity. In this section, the main barriers examined by various authors around the world are considered, but especially those that are applicable to the contexts of Argentine cities.

Within social obstacles, the lack of time and interest are constant challenges (Wadumestrigé Dona et al., 2021). Urban lifestyles, linked to work and personal commitments, take time away from leisure time. Waiting for crop development is often not in line with the urgent food needs of part of the Argentine population when people cannot wait to eat.

Horticulture requires continuous maintenance and care work (Palar et al., 2019). The associated physical exertions and wear and tear can be demotivating. Even community work, or sharing, can be a new experience for urban citizens where the anonymity of neighbourhoods is often seen (Świąder et al., 2023). People who benefit from PACH initiatives in a passive role, for example, they may find it more tedious to take an active role in working the land. Another example is that people who are frequently fed by community canteens are not used to eating fresh vegetables, as they have carbohydrate-based eating habits (Bonet et al., 2019). Finally, another social consideration is that the urban garden needs to be monitored most days of the year, so it is essential that its accessibility to the space is guaranteed throughout the year (schools in the summer, for example).

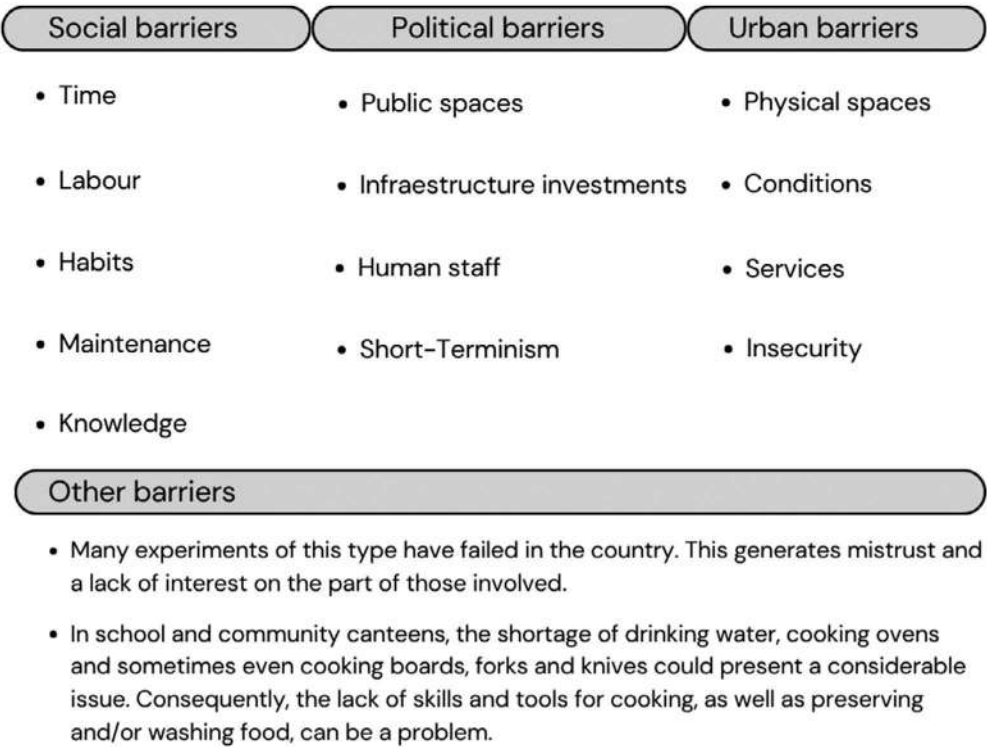


FIGURE 3.2 General barriers identified.

The government has an important role in identifying and establishing specific zones in public spaces for the incorporation of urban horticulture practices. Security of tenure is the most frequently reported challenge (Wadumestrigue Dona et al., 2021). The state must guarantee and ensure the necessary infrastructure, such as access to water, perimeter fences, irrigation, roads, greenhouses, community buildings, toilets and composting areas, among others, that are increasingly necessary for the future (FAO, 2014; Ayling et al., 2021; Wadumestrigue Dona et al., 2021). In addition, measures need to be implemented to combat crimes such as theft and vandalism, which are frequent in many cities in Argentina (Wadumestrigue Dona et al., 2021). It is important that the government promote long-term policies with inclusive urban planning, clear legislation and regulations, financial support, communication and awareness programmes, cooperative networks and monitoring and evaluation plans.

On the other hand, the role of the technical person providing particular advice, monitoring, evaluation, training and education in the gardens is a crucial factor for the correct management and sustainability of these practices (Whittinghill & Sarr, 2021; Hammelman et al., 2022). Leading horticultural technicians are indispensable (Goodfellow & Prahalad, 2022). If ProHuerta technicians get involved, they will need more funding and the input of specialised people and volunteers.

As far as urban barriers are concerned, limited land availability (FAO, 2014; Świąder et al., 2023), small spaces, zoning restrictions and real estate pressure are some constraints. The remunerations obtained by real estate companies are much higher than the remuneration obtained by the production and sale of organic foods in Argentina. Finally, depending on their geographical location, Argentine cities will have diverse and even adverse conditions as urban gardens are subject to climatic conditions (Świąder et al., 2023). Rainfall, urban pollution, soil quality and climate change threaten its development (FAO, 2014; Świąder et al., 2023; Tomatis et al., 2023). According to Świąder et al., in 2023, the most important barriers are infrastructure, investment costs and the knowledge needed to exploit them.

DISCUSSION

Although the main aim of urban gardens is to provide food to the population, it has been demonstrated that they can contribute in many ways to the greater resilience of Argentine society in the crisis context. It would be a mistake to only consider the economic variables of these practices and not the social and environmental variables they provide.

In the current political, social and economic uncertainties that Argentina is experiencing, where government assistance and its public policies at the national level are rethought and redesigned, this chapter seeks to, directly and indirectly, support the maintenance and promotion of better and more urban agriculture, urban garden and family garden practices in Argentina. In this sense, the country must learn from past lessons and the programmes highlighted and look to their future potential.

This document serves as a general diagnosis to evaluate the development of some public policies that promote urban garden practices in Argentina for the future. This is important because public policies at the national level are not clear, and major changes may occur. Subsequent analyses will enable us to identify initiatives that are maintained over time, those that have changed (and how), and those that have been eliminated. In this sense, it is important to differentiate between national strategies such as PACH and ProHuerta, as well as local initiatives such as the UAP in Rosario.

As well as transferring global capabilities and limitations from urban gardens to Argentina, these practices also offer an opportunity for North-South cooperation. Traditional agricultural knowledge, strategies to address different climatic conditions and successful experiences can serve as topics for international collaboration. This is important, especially considering a hypothetical future where national government funding for these initiatives could be cut.

CONCLUSIONS

As the world's population continues to grow, malnutrition, food security and food safety remain major global challenges, especially in South American countries. In this case, Argentina is experiencing unfavourable socio-economic situations manifested by inflation, poverty and food emergencies (at least until early 2024). As a result, the Argentine context is considered a crisis, and in this chapter, the urban gardens are presented as strategies to address this circumstance.

Urban gardens are distinguished precisely by their ability to meet the challenge of food emergencies and crises. Therefore, they can constitute socio-food strategies for Argentina through access to food, agroecology, local food, social networks, urban climate resilience, and others. However, to develop and improve these capabilities in the future, it will be essential to overcome social, political, urban and other barriers that exist in the country. Anyway, a collaboration between institutions and sustained financing over time is crucial. In Argentina, different programmes that promote and demonstrate that such initiatives are possible in the country over time, such as PACH and ProHuerta at the national level and the UAP of Rosario at the local level. In this sense, potential synergies between PACH and ProHuerta are proposed as a possible alternative to consolidate urban garden practices in national policies. But for its development, the national government should support, finance and maintain existing programmes; otherwise, the progress achieved on the topic would be lost.

This chapter can contribute to future studies on the subject and motivate socio-political discussions in Argentina. Furthermore, it is especially important given the political changes that are taking place within the national government, where the future of state policies and programmes that support social and food assistance aid, such as the programmes that stimulate urban gardening practices, is uncertain.

FUNDING

This research was funded by the European Union supporting this work through the FUSILLI project (H2020-FNR-2020-1/CE-FNR-07-2020). Francisco Tomatis has been financed under the call for University of Valladolid 2020 predoctoral contracts, co-financed by Banco Santander.

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Section II

*Case Studies from Around the World
of Crisis Gardening from Various
Socio-Ecological Perspectives*



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4 Growth in Adversity

Exploring Crisis Gardening in African Cities from a Decolonial Perspective

Nicole Paganini

INTRODUCTION: EXPLORING CRISIS GARDENING IN AFRICAN CITIES

From a decolonial perspective, a crisis is understood as a manifestation of the ongoing impacts of colonialism and its enduring legacies (Farrell, 2023; Gray & Sheikh, 2021). A decolonial lens applied to crises offers a perspective that extends beyond immediate, visible events, highlighting the structural and systemic issues that result from the historical processes of colonisation. A crisis, in this context, exposes the deep-seated inequalities, power imbalances and injustices that continue to affect marginalised communities and regions due to colonial histories (Sultana, 2022).

In times of crisis, such as natural disasters, pandemics and economic downturns, a notable trend has emerged: individuals turn to gardening as a means of coping. Often, during these times, disruptions in food supply chains in cities lead to scarcity and rising prices (Cohen & Garrett, 2010). By cultivating vegetables in gardens, individuals attempt to mitigate the impact of these circumstances on their food security (McClintock, 2014). The fruits, vegetables, herbs and livestock produced contribute to communities' food baskets and add nutrition to diets, though space restrictions in urban areas limit staple production (Giseke & Abdelaziz, 2011).

Women, as primary caregivers, often bear the responsibility of ensuring adequate nutrition for their families and gardening allows them to cultivate diverse crops, contributing to a more varied and nutritious diet (Syhre & Brückner, 2018). Indeed, women's involvement in gardening and farming is crucial to household and community nutrition in urban areas affected by food insecurity. In the context of chronic food insecurity crises in African cities, it is not surprising that women predominate in the urban agriculture sector, responding to a combination of historical legacies, economic necessities and cultural norms (Anderson et al., 2021). Community-based initiatives, such as shared gardens and cooperative farming, are often driven by women who leverage these networks for mutual support and resource-sharing (Kanosvamaha, 2021).

This chapter uses gardening as a metaphor to achieve two things: to scrutinise the crisis of land for gardening as a root cause of the colonial legacy and to highlight the beauty of cultivating food as an act of solidarity. This chapter explores crisis gardening in four African cities from a decolonial perspective: post-apartheid Cape Town, South Africa; post-war Maputo, Mozambique; post-COVID-19 Nairobi, Kenya; and mid-domestic migration and civil war Ouagadougou, Burkina Faso. Observations from these four case studies suggest that crises often foster a spirit of solidarity and community resilience, serving as a catalyst for social cohesion as individuals come together to share knowledge, resources and harvests. Within these interactions, they find solace, sustenance and a renewed sense of agency amidst the uncertainties brought about by crises (Paganini & Lemke, 2020). Community gardens and collective gardening initiatives promote social interactions, strengthen social bonds and create a sense of belonging (Morkel et al., 2023).

THEORETICAL FRAMEWORK: UNPACKING CRISES AND GARDENING THROUGH CRITICAL PERSPECTIVES

CRISIS

Critical theorists and thinkers, such as [Fanon \(1961\)](#), [Mbembe \(2017\)](#) and [Wynter \(2015\)](#), call for an understanding of crises within the broader context of postcolonialism and power, as well as social, economic and political systems. They examine how crises reveal underlying power imbalances, inequalities and contradictions inherent in capitalist societies, encouraging us to view crises as moments that prompt social critique, resistance and societal transformation. In particular, [Wynter \(2015\)](#) challenges gender inequalities embedded within political, economic and social systems, highlighting the need for transformative change to address the root causes of crises. [Mbembe \(2017\)](#) highlights women's and communities' resilience, agency and resistance in times of crisis and draws attention to the strategies, knowledge and community-based initiatives that women employ to navigate and mitigate the impact of crises by shedding light on the remnants of colonial legacies affecting land access (and the lack thereof). [Fanon \(1961\)](#) contends that land is a pivotal aspect in the fight for decolonisation and the freedom of colonised populations. He underscores the interconnectedness of land, identity and liberty. For Fanon, reclaiming control over land transcends mere economic or political concerns; it holds profound psychological significance. Land symbolises a concrete link to history, culture and a sense of belonging.

Expanding this lens to a gendered perspective reveals that women, particularly in many global contexts, are disproportionately affected by unequal land distribution. A gendered view highlights how women often face additional barriers to land ownership, limiting their economic agency and reinforcing traditional gender roles. In the realm of agriculture, understanding women's roles in farming requires acknowledging the unequal access to and control over land ([Tsikata, 2009](#)).

[Butler \(2004\)](#) is a philosopher and gender theorist whose work focuses primarily on issues of gender and sexuality, as well as broader social and political implications. She has analysed how crises impact marginalised communities and how the political dimensions of vulnerability and resistance come into play in times of crisis. Her focus sheds light on how colonial norms are established and reinforced within oppressive systems and how challenging these variables is a necessary precursor to dismantling colonial structures. Indeed, feminist scholars play a critical role in examining patriarchal power structures and social norms that contribute to and exacerbate crises. In the following section, I use gardening as a lens to better understand its role during a crisis.

CRISIS GARDENING

In times of crisis, individuals often experience a heightened desire for connection with nature ([Artmann, 2023](#)). Gardening provides a direct means of engaging with the natural world, offering solace and a sense of harmony amidst chaos ([Farrell, 2023](#)).

Gardening during times of crisis gives people a sense of control over their immediate environment and circumstances, allowing them to take proactive steps to acquire transferable skills and provide diverse foods for themselves and their families throughout the crisis and in preparation for future challenges ([Artmann, 2023](#)). This empowerment can counteract the feelings of helplessness and uncertainty that often accompany crises, provide a sense of security and preparedness, build resilience and adaptability and firmly root family and cultural traditions ([Paganini et al., 2020](#)). As people mobilise to create community gardens, share resources and support one another through crises, gardening serves as a platform to foster a sense of community and social cohesion ([Kanosvambhira, 2021](#)). These are among the reasons that proponents of urban agriculture advocate for the integration of urban farming in cities.

For example, the World Economic Forum (2020) reiterated how the COVID-19 pandemic highlighted the threat of food shortages due to disruptions in supply chains and labour shortages and

listed the benefits of home-growing vegetables as extending to citizens' physical and mental health, reduction of air pollution and overall sustainability. They propose urban farming as a means to sustain the public interest in gardening, enhance resilience in fresh produce supply, improve community and ecosystem health and promote sustainable lifestyles through community gardens, rooftop gardens and gardens in other urban spaces.

Carstens et al. (2021) also delve into the role of home gardens in addressing food insecurity within the context of South Africa's economic challenges, particularly as exacerbated by the COVID-19 pandemic. Despite being a net exporter, the nation contends with substantial food insufficiency, affecting 20% of its population. Home gardens emerge as a promising strategy, offering a means to augment diets that are predominantly reliant on industrially produced staples and to provide surplus produce for selling or sharing. The study underscores the significance of community engagement, Indigenous knowledge integration and self-selection of crops in driving the success of home garden projects. Conversely, projects that falter often suffer from inadequate skills, poor communication and premature withdrawal of institutional support.

A paper by Drescher (2001) investigates the potential applicability of the German urban allotment garden model to address urban poverty and food security crises in southern Africa. Emerging post-World War II in response to the poverty crisis during industrialisation, the 200–400 square metre plots with sheds served as buffers for food security. Their success hinged upon small-scale gardener associations, which may have served as platforms for social cohesion and learning. While the German model could be adaptable in principle, the paper rightly suggests substantial adaptations to consider cultural diversity, governance, water management, animal husbandry, waste recycling and housing regulations and involve well-trained extension services that target women-headed households. Yet, the text neglects the need to rethink local farming practices and organisations in favour of introducing Northern concepts.

Despite the hope exuded by these proponents of urban agriculture, their optimism is not echoed by other authors who dispel urban agriculture as the silver bullet solution to more vibrant, resilient and secure communities. Many claim that when urban agriculture is introduced to communities through development programmes (such as the one proposed by Drescher), it has consistently failed to deliver on expectations (Orsini et al., 2013). Often, this failure results from deeply rooted injustices upheld by colonial legacies, racism and fragile land tenure systems. Through critical discourse and reconciliation with these issues, we can fundamentally change how people garden in cities to maximise the benefits of urban agriculture (Paganini & Lemke, 2020). In the next section, I will explore how four urban communities in Africa were disproportionately affected by crises as a result of the continued legacy of colonialism in their countries and how they all devised unique local solutions to sustain their food and nutrition security in the face of crises and, in the process, discovered solidarity, resilience and empowerment.

CASE STUDIES: CRISIS GARDENING IN FOUR AFRICAN CITIES

In this section, I shed light on the crises occurring within distinct urban locales and the colonial underpinnings of the crises. The observations presented here are derived from an array of on-site visits to Cape Town, Maputo, Nairobi and Ouagadougou conducted from 2016 to 2023 across various projects and research engagements. The foundation of my arguments is constructed upon field observations as well as personal interactions and dialogues with urban farmers, activists and participants in social movements centred around urban agriculture. My interpretations are supported by collaborative, participatory co-research methodologies undertaken alongside urban farmers who, in addition to co-planning and implementing research activities, also contextualised and triangulated my findings and interpretations. These methodologies prove indispensable in apprehending urban agriculture in dimensions that transcend its mere production facet, thereby serving as a conduit for deliberating upon the fundamental underpinnings of food injustices (Paganini & Stöber, 2021).

The four case study cities are post-colonial societies. A core feature of these societies is the disparity in land access, a situation that often fuels conflicts and perpetuates social and economic inequities (Greenberg, 2015). Typically, efforts to address these issues involve reconciling historical injustices, recognising Indigenous land rights and implementing land reforms to provide fair access to marginalised communities (Hendriks, 2008). The challenge lies in undoing centuries of colonial imprint while fostering inclusive land governance that respects diverse cultural and historical connections to the land (Chanock, 1991).

In my own observation, the practice of gardening, particularly within urban settings, often supplies a 'hook' for inciting discourse and dialogue surrounding issues of these social inequities and the brokenness of food systems (Kesselman, 2023). Across all the examined cities, the historical tapestry of gardening remains intricately interwoven with the legacy of colonialism, a heritage that is appropriated by local governments and development agencies in strategies aimed at ameliorating poverty. However, key challenges of urban production are access to land and local and traditional seeds, as well as soil degradation resulting from industrial land management and climate change. Non-native plants, such as Swiss chard and lettuce, thrive, while indigenous and local foods have been neglected in both cultivation and consumption. This is imbued with a sense of elation and a link to ancestral lineage, indigenous traditions, dietary patterns and a reservoir of sagacious insights.

Further, the four examples – Cape Town, Maputo, Nairobi and Ouagadougou – span perspectives from different African regions with different colonial histories and highlight one particular strong challenge common to all areas: the role of access to land for gardening.

COLONIAL DIARIES: NAVIGATING CAPE TOWN'S LAND CHALLENGES

Cape Town's colonial legacy is deeply intertwined with its historical significance as a strategic port along European trade routes (Mellet, 2020). Founded by the Dutch East India Company in the 17th century, the city bore witness to successive waves of colonial influence, including Dutch, British and Indigenous Khoisan interactions (Mellet, 2020). The colonial imprint is visible in the city's architecture, social hierarchies and cultural dynamics. Colonialism's enduring presence in Cape Town's culture is evident in its architecture, language, land disparities and culinary traditions. Historic buildings reflect Dutch and British colonial influences, while English and Afrikaans remain the dominant languages. Land ownership imbalances, rooted in colonial-era dispossession, persist, impacting housing, agricultural land and resources (Greenberg, 2015). Colonial-era land dispossession and apartheid policies still affect land ownership patterns in Cape Town (Malinga, TD, 2020), leaving many historically disadvantaged communities without land rights and adequate housing. The city's apartheid planning legacy and a deeply rooted racist view of humanity seeded the cities' challenges and upheld the nation's understanding of race today (Durrheim et al., 2011).

This legacy is epitomised by the iconic Company's Garden, established by the Dutch East India Company in 1652 as a refreshment station for passing ships, complete with cultivated European flora growing in harsh juxtaposition with the indigenous landscape. Over time, the Company's Garden evolved into a symbol of power, control and dominion over the land, shaping both the urban fabric and colonial relationships within Cape Town (Cole, 1987). Plans for a sacred heritage piece of land – namely the Liesbeek Park – at the time of writing (2023) include the construction of a 15 ha regional headquarters for Amazon, commonly lauded as a symbol of capitalism, despite the outcries of indigenous Khoisan communities who view these lands as their sacred cultural and historical ancestral lands upon which their 100,000-year heritage and lineage was built (Thomson Reuters Foundation, 2021). The land problem remains a contentious issue that highlights the broader challenge of balancing economic development with the preservation of indigenous cultural and historical sites in South Africa.

In South Africa, historical injustices in land distribution are rooted in apartheid-era policies, which concentrated arable land in the hands of the white minority while relegating the Black majority to less fertile areas (Mellet, 2020). Land reform efforts in South Africa have been a contentious



FIGURE 4.1 A community garden in the low-income area of Khayelitsha in Cape Town, cultivated by a group of women. The land is leased from a school. Land tenure is one of the main challenges for urban farmers in Cape Town. (Author photography, 2016.)

and debated issue. There have been calls for more radical land redistribution policies to address historical imbalances. Till today, many non-White South Africans live and farm in marginalised and low-income communities (Paganini & Lemke, 2020).

Land access and ownership affect the some hundreds of urban farmers who cultivate in community gardens or home gardens in the Cape Flats, a low-income peri-urban community on the outskirts of Cape Town (Paganini & Lemke, 2020). Here, urban farmers face difficulties accessing suitable land for cultivation. Many employ creativity in growing crops on school grounds or abandoned lands, in containers, on rooftops and in backyards due to the limited availability of land (see Figure 4.1). Land tenure is often precarious for urban farmers, leading to uncertainty and an unwillingness to invest in long-term infrastructure or crops with longer maturation periods, such as trees (Hauser et al., 2022a).

AFTER CONFLICT CRUMBLES: UNRAVELLING MAPUTO'S POST-WAR HUNGER CHALLENGE

Maputo's green belt is a designated agricultural area that surrounds the city of Maputo, the capital of Mozambique, that was established as a part of the broader urban planning and agricultural policies implemented by the Portuguese colonial authorities (Engel et al., 2019). Conceived as an agricultural zone to service demands for fresh produce from the city's growing population, its primary aim was food security for colonial settlers and, secondly, agricultural revenue generation for the colonial administration (see Figure 4.2). However, in order to establish the green belt, local communities were forcibly displaced from their homes and their traditional land holdings were expropriated and dispossessed (De Sousa, 2007). This disruption of traditional livelihoods and agricultural practices



FIGURE 4.2 The green belt of Maputo is home to many farmers' associations, primarily engaged in cultivating leafy vegetables. However, urbanisation and the increasing demand for housing and industry have been steadily diminishing the available production area over the years. (Author photography, 2017.)

caused long-lasting, intergenerational social and economic upheaval among affected communities. Efforts at reconciliation and addressing historical injustices related to land ownership and use have been ongoing in Mozambique, but progress has been slow, and challenges remain. The government, non-governmental organisations and international agencies have been involved in initiatives aimed at resolving land disputes, clarifying land tenure rights and ensuring fair compensation for affected families (Engel et al., 2019).

Land for production in Maputo is mainly found in the green zones, backyards and public fallow land across the city. The green zones comprise 1,300 hectares of farmland, originally established during the civil war. However, urbanisation, housing disputes, salinisation and unclear food system planning are putting pressure on existing farmland. Many coastal areas have been converted into construction sites for malls, hotels and upscale housing. Most producers use their own land, organised into 'canteiros' (single beds), which range from 2–4 sq. meters and are cultivated within associations. Government land in the peri-urban area remains undeveloped and unclassified as agricultural land, offering potential for agricultural expansion (Engel et al., 2019).

The Mozambican Civil War, from 1977 to 1992, resulted in the significant displacement of the rural population, as well as the massive disruption of agricultural activities and infrastructure in rural areas, leading to food shortages and economic hardships (de Sousa, 2007). The signing of a peace agreement between the Mozambique Liberation Front (FRELIMO) and the Mozambican National Resistance (RENAMO) in Rome was a significant turning point in Mozambique's history and allowed for infrastructure construction, economic development and social reconciliation. Following the war, a notable influx of people into urban areas occurred as displaced rural dwellers sought economic opportunities, basic services and a new start in their lives. Maputo attracted a significant portion of these migrants, but its urban environment was unsuitable for traditional agriculture due to limited arable land availability and competing land use interests of urban developers.

Though some new immigrants established small-scale gardens, food security initiatives for the new urban poor were limited to a handful of urban agriculture initiatives and dozens of farmers' associations (Engel et al., 2019).

PANDEMIC PARADOX: NAIROBI'S STRUGGLE IN THE FACE OF COVID-19

Nairobi's colonial legacy started with a simple railway depot. British colonial rule in Kenya in the late 19th century envisioned the city's wealth and growth as linked to the Uganda Railway: Nairobi was the ideal link between the coast and the Ugandan hinterlands (Hendriks, 2008). The expansion of the rail line resulted in the city's rapid expansion with profound implications for agriculture and land use in the region. Urban agriculture in Nairobi faces obstacles due to a scarcity of suitable land, precarious land tenure and competition for urban space as the city rapidly expands (Hendriks, 2008). Rising demand for housing has forced marginalised urban communities into less habitable areas, such as riverbanks, roadsides and power line reserves, offering limited space for farming (Hendriks, 2010). These informal settlements often lack secure land ownership, with nearly 500,000 households experiencing landlessness. This restricts the involvement of the urban poor, who make up over 60% of the city's population, in urban agriculture. In contrast, the middle class, with better land access, benefits more from this practice despite the greater need among the poor (Hauser et al., 2022b).

Not unlike Maputo's green belt, Nairobi's 'White Highlands' were unceded fertile ancestral lands expropriated from local communities for the benefit of colonialists. The White Highlands were allocated primarily to European settlers for commercial farming, thereby displacing locals, disrupting traditional agricultural practices and causing significant socio-economic upheaval (Hauser et al., 2022b). The colonial authorities promoted European-style farming methods and crops, often at the expense of indigenous agricultural practices (Kinuthia et al., 2021). The introduction of cash crops, such as coffee, tea and flowers, fuelled European settlers' and British-owned companies' massive financial gains but required large plantations (which were easily expropriated at a whim). This legacy continues to influence the city's agricultural dynamics today, as cash crops and European cropping systems, unequal access to resources, the continued imposition of foreign agricultural practices and land dispossession remain central to Kenya's economy through its agricultural sector development.

In the aftermath of Kenya's independence, two formal mechanisms facilitated land access. In the late 1960s, squatter communities formed cooperatives to purchase occupied land, but the initiative was short-lived due to speculation by wealthy individuals. In 1970, the Kenyan government adopted a sites-and-services project approach, providing partly subsidised land to low-income beneficiaries for cost recovery (Kimani, 1972). This attracted the working class, limiting access to poorer households. Currently, land allocation in Kenya, especially in Nairobi, is predominantly driven by the private market, leading to monotonous, multi-storey districts (Hendriks, 2008).

Informal mechanisms also prevail, ranging from squatting to illegal land subdivisions. Land grabbing, the illegal privatisation of public land, is rampant, generating 200,000 titles since independence (Kieyah & Mbae-Njoroge, 2010). Class dimensions and ethnicisation by the political elite exacerbate land disputes. Nairobi's poorer citizens face threats of dispossession from those acquiring land through irregular means, which impacts even middle-class property developers, as land grabbing and speculation increase land values and create artificial shortages (Paganini & Weigelt, 2023).

It should come as no surprise, then, that COVID-19 and the control measures imposed by the government affected certain groups differently as well. Major disparities existed in outcomes for the wealthy who live in peri-urban areas with established gardens and landless renters, as well as homeowners locked down in informal settlements (Paganini & Weigelt, 2023).

The pandemic caused significant economic disruptions in Nairobi as a result of lockdowns, restrictions on movements and business closures, which often hit slum residents hardest. The majority of this demographic relies on daily wages (as opposed to salaried wages) for their work as street



FIGURE 4.3 A group of farmers began experimenting with greenhouse production during COVID-19. Urban farming became a source of income generation during the pandemic years. Greenhouse production is currently being tested in some informal settlements. (Author photography, 2022.)

vendors, casual labourers, minibus drivers and other roles in the informal economy (Hauser et al., 2022b). For them, business closures and lockdowns translated into job losses or reduced hours and income reductions. Poverty levels and food insecurity soared as access to essential goods and services dwindled.

Urban agriculture played a strong role in Nairobi's informal settlements during the first few months into the pandemic (Paganini & Weigelt, 2023). For example, in an informal settlement called Mukuru, urban gardeners provided access to fresh and nutritious food, enhancing food security and generating income for residents. Given the limited availability of formal employment opportunities, urban agriculture offers a means of livelihood and economic empowerment to its residents. Mukuru faces several challenges for urban agriculture, including limited access to land, poor soil quality, lack of water resources and insecure land tenure. However, innovative solutions have emerged, such as vertical gardening, sack farming (using sacks filled with soil for planting) and container gardening, which allows for cultivation in small spaces and removes production challenges associated with contaminated soils in informal settlements (see Figure 4.3). The impact that urban areas face due to climate change, such as water shortages, was addressed through a demo unit for a greenhouse at Reuben Centre (Paganini & Weigelt, 2023).

URBAN DREAMS AND DILEMMAS: NAVIGATING DOMESTIC MIGRATION AND CRISIS IN OUAGADOUGOU

The agricultural endeavours of French missionaries in Ouagadougou, Burkina Faso, came alongside the colonial context of European expansion in Africa during the late 19th and early 20th centuries. Driven by a blend of religious, economic and colonial motivations, missionaries sought to



FIGURE 4.4 Ouagadougou, the capital, faces high domestic migration. Many newcomers to the city start farming on vacant land. However, heat and a lack of resources pose significant constraints. (Author photography, 2021.)

establish self-sufficient mission stations, introduce European farming techniques and exert economic and political influence in the region (Ouédraogo et al., 2019). This initiative set the stage for broader changes in Burkina Faso's food system, marked by the promotion of cash crops aligned with European markets, the displacement of local communities from their lands and a shift toward export-oriented agriculture (Semde et al., 2020).

Access to land and water are significant barriers to the development of urban and peri-urban agriculture in Ouagadougou (see Figure 4.4). Most urban farmers, whether owners or tenants live in fear of losing their land to the municipality (Paganini & Weigelt, 2023). Only a minority have secure property rights, while the majority have temporary acquisition rights through renting or loans. Additionally, water scarcity is a pressing issue, particularly during dry months when dams dry up. Many farmers resort to using wastewater for irrigation, which improves soil fertility but poses health risks. Skin issues and diseases are reported among those in prolonged contact with wastewater (Paganini & Weigelt, 2023).

Burkina Faso has seen a sharp increase in attacks by extremist groups targeting security forces, civilians and infrastructure. These attacks included bombings, ambushes and raids on villages. The insecurity had led to a humanitarian crisis, with a significant number of people internally displaced and in need of humanitarian assistance. Access to basic services and livelihoods had been severely disrupted (Paganini & Weigelt, 2023).

Ouagadougou has experienced rapid urbanisation in recent years, with a significant influx of people from rural areas seeking better economic opportunities and access to services, education and improved living standards (Zoma, 2022). The city offers a range of job opportunities in various sectors in greater abundance than in rural areas, for example, commerce, services, industry and government. Domestic urban migration to Burkina Faso's capital and economic hub contributes to its population growth and urban development as migrants come to the city (Ouédraogo et al., 2019).

CONCLUSION: CONSIDERATIONS AND REALITIES OF CRISIS GARDENING

Crisis gardening, while undoubtedly offering a range of benefits, requires a nuanced assessment when positioned as a panacea for crisis mitigation. Although it can provide supplementary income and food resources to urban households, its transformative impact on livelihoods may be constrained by scale and context.

1. From a decolonial standpoint, crises are not mere ad hoc occurrences but rather deeply embedded in historical legacies. This is evident in the challenges faced by crisis gardeners, especially concerning urban farming and land tenure struggles.
2. Although crisis gardening serves as a coping mechanism during challenging periods, the obstacles confronted by these individuals trace back to systemic inequalities that persist.
3. Looking at crisis gardening through a social lens reveals its potential to cultivate solidarity, foster networks and facilitate exchanges among communities.

The limited expanse of available urban cultivation plots and the prevailing informal, subsistence nature of urban farming can curtail its potential for substantial income augmentation and comprehensive livelihood enhancement. The southern regions of the globe account for 80% of global urban farming land; nonetheless, the potential for self-sustaining cities is diminishing, leading to a reduction in available land for food cultivation (Engel-di Mauro & Martin, 2022). Due to limited available land, urban agriculture has the capacity to sustain only a relatively modest segment of urban dietary needs. Urban farming frequently operates within a legal ambiguity, existing in a grey area of regulations (Engel-di Mauro & Martin, 2022). This is particularly pertinent when considering its often tenuous land tenure arrangements, which render it susceptible to conflicts and displacement. Ambiguities in regulatory frameworks exacerbate this vulnerability, inhibiting the cultivation of sustainable practices and constraining its role as a dependable livelihood avenue.

Recognition of urban agriculture's constraints, however, should not overshadow its ancillary benefits, which, despite the described crises in Cape Town, Maputo, Nairobi and Ouagadougou, became apparent when understanding the role of social capital among those engaged in crisis gardening. Solidarity in gardening refers to the powerful effort that goes beyond the act of planting; it embodies shared values, mutual support and a commitment to sustainability. Solidarity in gardening promotes knowledge exchange, intergenerational connections and the pooling of resources for common goals. Through this shared endeavour in cultivating plants, they also cultivate relationships, empathy and a shared responsibility for the environment. Gardening becomes a tangible expression of unity, reflecting the potential for positive change when communities unite.

The significance of gardening as a human and environmentally crucial commitment, questioning its relationship to politics and historical consequences. This perspective heralds an emancipatory shift from Eurocentric aesthetics and norms, advocating for the enrichment of plant varieties and landscaping approaches in alignment with indigenous ecologies and cultural preferences. Gardening shows the spiritual rapport that local communities and many indigenous cultures share with land and reestablishes profound interconnectedness between humanity, flora and the ecosystem at large.

This reclamation is intrinsically linked to the imperative of challenging historical land exploitation and empowering local communities to wield autonomy over land and food systems, fostering self-reliant trajectories.

ACKNOWLEDGEMENT

My heartfelt thanks go to Carmen Aspinall for the copy editing of the chapter. I further thank the colleagues in the research projects at the Centre for Rural Development (SLE) at Humboldt-Universität zu Berlin, BMEL-funded project UFISAMO (2016–2019), COVID-COPING (2020), Agency in South Africa's Food System (2020), and since 2021 the BMZ-funded Urban Food Futures programme at TMG Research. The different roles in the project allowed significant time

in the cities. Most importantly, I would acknowledge all conversations, meetings, workshops, farm visits and critical thoughts from the many farmers, gardeners and activities I was allowed to meet and learn from during the course of my research.

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5 The Langa Agri-Food Hub in Cape Town, South Africa

Strengthening Farmers' Networks and Transforming Food Systems in Crisis

Natalia Urrego Díaz, Astrid Ley, Kurt Ackermann and Leonie K. Fischer

INTRODUCTION

Urban agriculture has been promoted in sub-Saharan Africa as a grassroots solution to food insecurity, poverty and waste management. In South Africa, it is widely endorsed by national and local governments (Cilliers et al., 2020; Olivier & Heinecken, 2017). Research on urban agriculture has predominantly focused on household food and nutrition security, as well as income generation. Studies reveal a series of challenges that urban farmers face, including limited access to land, land tenure insecurity and marketing constraints (Kanosvamhira & Tevera, 2021). Paganini and Weigelt (2023) use the term 'crisis' to encompass the challenges faced by urban farmers, including increasing food prices, inadequate public services, unemployment and threats to personal safety. They also highlight 'global megatrends' like urbanisation, migration, climate change, population growth, biodiversity loss and the COVID-19 pandemic, which hinder urban farmers' ability to cope with crises, particularly for those living in poverty. As farmers in poverty allocate most of their income to food, policy interventions prioritise production over social benefits, utilising rural approaches to enhance food availability (Battersby & Marshak, 2013; Cohen & Garrett, 2010). Although food is physically available through small-scale vendors, supermarkets and the informal market, it is often unaffordable, indicating that the main issue lies in food distribution, purchase and the broader urban food environment (Battersby, 2017).

Urban agriculture is promoted as a policy in South Africa to aid the poor in ensuring their food security. However, this approach assumes that people have free time, access to land and resources required to engage in such activities. This contradicts the reality of poverty: individuals typically have routine jobs with limited free time, no land tenure and insufficient resources for agricultural tools (Haysom & Battersby, 2016b). While the State and NGOs can facilitate resource access in some cases, many residents lack the networks to benefit from them (Davies et al., 2021). In low-income urban communities, like those in Cape Flats, residents struggle to make significant contributions to their food security through urban agriculture, given the multiscale crisis and broader megatrends (Kanosvamhira & Tevera, 2021). This aligns with studies indicating a lack of peer-reviewed research supporting the role of urban agriculture in enhancing food security (Korth et al., 2014).

In the South African context, urban agriculture was promoted as a means of empowerment for individuals expected to grow their harvests independently and lift themselves out of poverty (Haysom & Battersby, 2016b; Slather, 2001). While urban agriculture directly provides food and nutrition for many households, its greater impact lies in creating social capital, enhancing livelihood strategies, fostering interpersonal relationships and consolidating networks (Olivier, 2015).

For instance, the value of networks and the social benefits of urban agriculture were highlighted for urban food resilience, describing its capacity to cope with food availability stress factors (Kanosvambhira & Tevera, 2021).

This chapter contributes to knowledge by examining urban farmer networks and their impact on community development and urban food systems in the context of crisis. It focuses on the community of farmers in Langa, Cape Town, and their involvement in an Agri-Food Hub project promoted by local NGOs. During the COVID-19 pandemic, urban agriculture witnessed widespread adoption. Langa evidenced that it is a strategy to spend time purposefully, cope with personal crises, cope with multiscale crises and cope with global megatrends (Paganini & Weigelt, 2023). Urban dwellers in Langa gradually embraced farming and established small-scale farms despite facing numerous barriers, notably in agricultural inputs, tools, farming knowledge and market access. Through this growing farming practice, farmers formed various communities. Here, the South African Urban Food & Farming Trust collaborates with the Masakhe Foundation on establishing a pilot project for an Agri-Food Hub (Figure 5.1), aiming to support existing and new small-scale farmers and farms with infrastructure, inputs, tools and training programmes. Their goal is to link

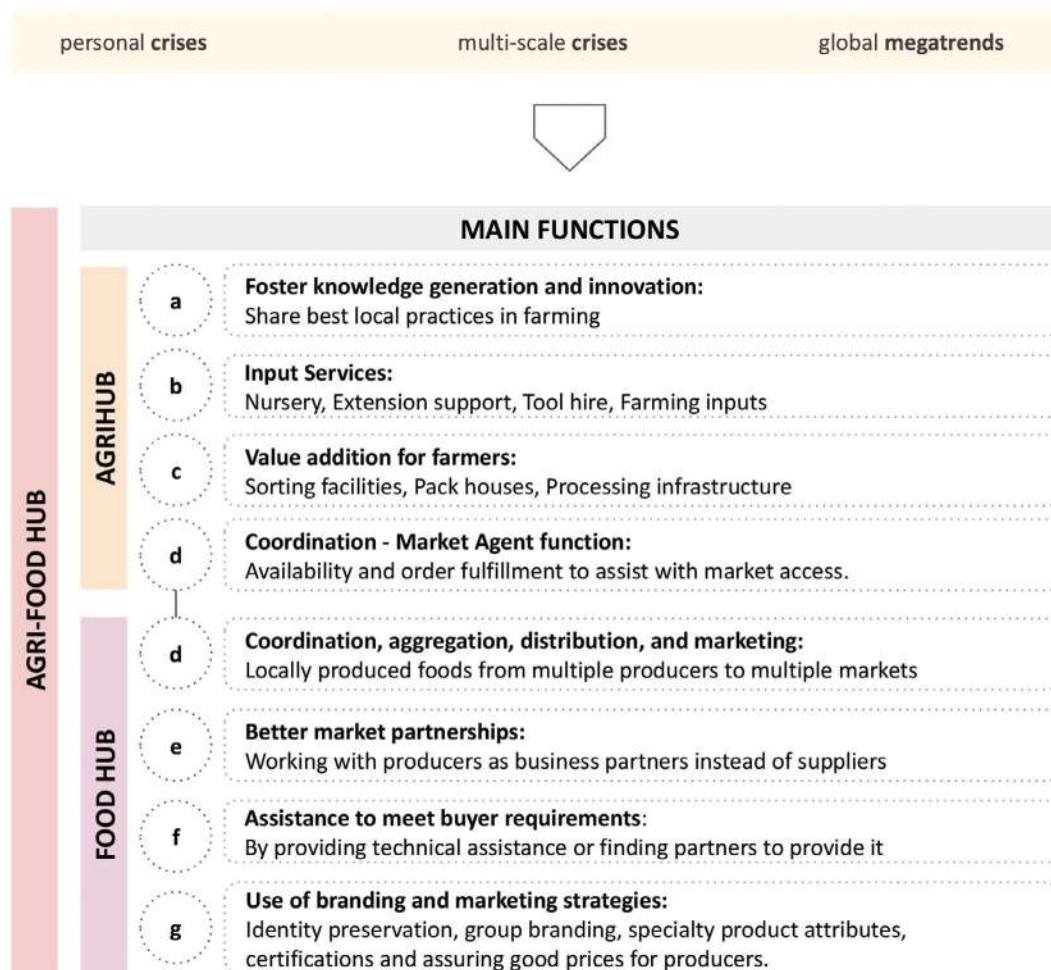


FIGURE 5.1 Agri-Food Hub: The combination of an agrihub and a food hub as a response to crises, based on Southern Africa food labs workshop report, workshop report, 'Designing a smallholder farmer-focused Agri-Hub' (2017).

local and city markets with their produce, potentially increasing the availability of locally grown products, expanding opportunities for commercial farming, enhancing household nutrition and food resilience in Langa and fostering social cohesion.

For this context, we aim to demonstrate the value of active participation and co-creation as important means of innovation and sustainability. Thus, we addressed the following questions to study how food crises, the value of networks in urban agriculture and the role of NGOs in the transformation of the food system in Cape Town connect:

1. What types of farmers' communities exist in Langa, and what is their role?
2. How do they interact with the Agri-Food Hub project's key stakeholders?
3. How can the Langa Agri-Food Hub support these communities in the process of participating in a more sustainable and resilient food system?

METHODS

FIELD WORK AND DATA COLLECTION

An ethnographic research approach was used to collect primary data between March and October 2022. Through a mixed methods design, it was possible to analyse the early phase of the implementation of the Agri-Food Hub in Langa, led by the South African Food and Farming Trust. The research was divided into three phases: literature review, fieldwork from March to June 2022 as part of an agreed voluntary engagement in the daily activities of the Trust, and validation-analysis of results. During the fieldwork, data collection methods were participant observation, operation workshops, farm visits, interviews and semi-structured interviews. To avoid the research fatigue that some of the dwellers of the Cape Flat experience, *participant observations* of the daily activities planned by the Trust team were the main source of data for this research. This contributed to building trust and created the space for having casual conversations about personal experiences with the Trust members, farmers and residents of Langa. From March to June, the Trust ran three 'operations workshops' to periodically connect with farmers and start conversations around the Agri-Food Hub. The first workshop, attended by eight farmers, aimed to explain the Hub's purpose and its benefits for Langa, to identify interested farmers who would participate and to understand their motivations for farming and future goals. The second workshop, attended by three farmers, touched on the topic of decision-making, particularly concerning input donations. The core topics of this workshop were transport, fair distribution and a possible fee to start building collective capital. Farmers were encouraged to spread the word and come to future meetings. The third workshop, which was attended by more than 20 farmers, enhanced the connection between farmers and between farmers and the Trust and focused on collective production and access to the market. These workshops were the starting point for developing an Agri-Food Hub environment. In addition to the workshops, periodic farm visits were an insightful tool to see the state of 23 active farms, run by different communities that counted on a basic approach to farming and could sustain any type of support provided. These visits helped to map the constellation of farms in Langa, measure their physical distance to the Agri-Food Hub and understand their conditions and needs. The main issues looked at were the water access and irrigation system, how active/inactive was the crop growth, the type of planted crops, the quality of the soil and the farm layout. Photos and notes helped keep a record of the important aspects, and semi-structured interviews with the farmers provided input concerning their strengths, struggles, needs and goals. Lastly, three interviews with the Project Manager, a Facilitator and the Executive Director of the Trust were conducted in May and June 2022. The core questions looked at their role within the NGO, their considerations about NGO-supported urban agriculture in Cape Town, their reflections on the Agri-Food Hub project and their future vision of it. On average, the interviews lasted around one hour and were recorded with the prior authorisation of the interviewees.

OUTCOMES OF THE RESEARCH AND DISCUSSION

FARMERS COPING WITH CRISES GROW STRONGER WITH A COMMUNITY

The strong isolation measures and the increase in the levels of uncertainty caused by the COVID-19 pandemic encouraged some dwellers of Langa to develop an interest in farming activities. Community gardens were supported by state initiatives, and NGOs increased their participation as intermediaries in such action, which, in turn, promoted the participation of farmers in schools and other institutions. Some of them started farming at home with limited resources, while others decided to seek further support from state projects like community kitchens and schools, where they ended up having a leading role or participating as active members.

Aware of this increase in farming practices in Langa, and with the background of different multistakeholder strategies and programmes they were part of, The South African Urban Food and Farming Trust saw the potential to make the Agri-Food Hub a real project. According to its members, engaging with the community before building physical infrastructure was essential because knowing their motivations for farming and aspirations for the future was key to the project's sustainability. During fieldwork, conversations and the 'operations workshops' showed that farmers had a diverse list of motivations to farm: spending time outside purposefully, learning something new, distracting themselves from the daily stress, farming because someone else suggested it and trying to generate additional income through selling vegetables to neighbours or having a potential business. Farming to ensure food on their table was not a frequent answer for farmers, but having a more nutritious diet and consuming more vegetables was a common remark among them. This reaffirms the positive effects of farming for food diversification over food availability (Kanosvamhira, 2023). Additionally, farmers with a more transcendental motivation wanted to cope with isolation, reconnect with indigenous practices, deepen their understanding of the world of herbal medicine and farm as a stress relief or mental health strategy.

During the 'operations workshops,' sharing information about local challenges like the increase in food prices on the one hand and general issues like the COVID-19 pandemic and climate change on the other allowed farmers to know other farmers' motivations and goals in terms of farming. Also, it encouraged them to connect more closely with farmers with common interests, with successful production, or simply with trustable neighbours. The discussed challenges, as described by Paganini and Weigelt (2023), are multiscale crises and global megatrends and are aggravating issues on the existing challenges farmers go through in Langa. For the South African Urban Food and Farming Trust, this exchange was insightful since it allowed them to better plan how to address their support and the functions of the Agri-Food Hub. Thus, until June 2022, 23 farms with the potential to be supported were identified by the Trust, and the existence of communities of farmers taking care of them became evident (Figure 5.2). They can be classified as neighbourhood farms, school-based farms, non-profit organisations or government-supported initiatives, institutional farms (e.g., police offices, clinics, AIDS care facilities, compost facilities) and small gardens at early childhood development centres.

The communities behind these farms have exclusive and flexible farmers who work on multiple farms; the latter usually enrich the local farming scene by exchanging practices, experiences, knowledge and resources with other farmers and key actors, such as the Trust (Figure 5.3). Some of these communities are bigger, more active and more connected than others, which is reflected in their organisation, flow of resources and the status of the farms.

Until here, a key finding of this research is that there is no isolated farmer in Langa; there is always a network to which they are connected. Even if independent home-based farmers own and lead their production in their backyards, networks are beneficial to their operation. It may happen that some farmers are not periodically part of a community garden; however, they are linked to someone who does and shares tips, know-how, techniques, inputs and tools. Farmers who are linked to larger farms with larger communities find a reason to connect, and a common goal or interest keeps them together. Despite the challenges they face and the factors they aim to cope with, farming

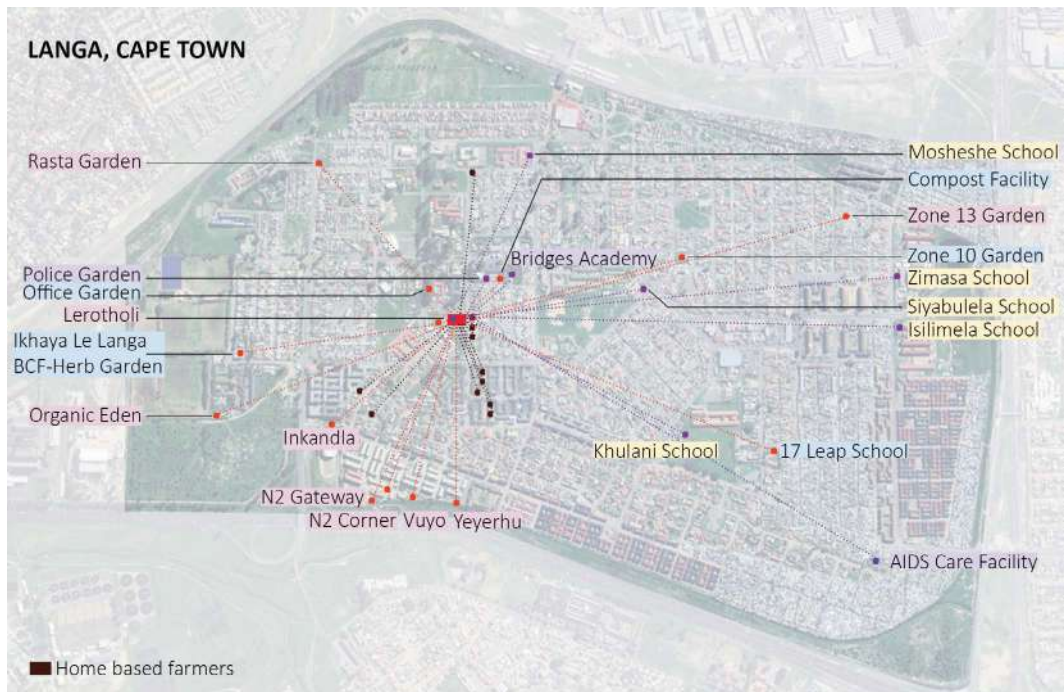


FIGURE 5.2 Location of the farms linked to the Agri-Food Hub in Langa. The shading of the names corresponds to the categories of farms in Langa, as shown in [Figure 5.3](#).

together makes them stronger as a group and as individuals when they obtain high-quality harvests and exemplary outcomes. The engagement of the Trust with the farmers before the full development of the Agri-Food Hub was important to detect the importance of the social benefits of farming, to connect farmers with farmers and with external stakeholders that assist them from an early stage (e.g., to provide training services by NGOs), to implement beginner training workshops and to plan better for future support.

By participating in the Agri-Food Hub's dynamics – both as individuals and communities – farmers in Langa become communicators of an active local network, turn into creators of opportunities and promote agriculture, innovation and healthier nutrition choices locally. Besides, they strengthen their skills and recognise the power they gain when working hands-on on a project that benefits them and their communities. This means that the individual reasons that motivated them to start farming gain a deeper meaning and relevance after sharing and networking within the farmers' communities.

Our research shows that farming is a means to many ends but is mainly a coping strategy with social benefits as a valuable outcome. In the words of [Paganini and Weigelt \(2023\)](#), 'Communities use social capital to develop and apply coping mechanisms' (p. 78).

CAPACITY-BUILDING SUPPORTS URBAN AGRICULTURE AS A RESPONSE TO CRISIS

From the expert interviews and observations at farms, we learned that the Langa Agri-Food Hub will technically become an agricultural facility in the future, but practically, its envisioned functions will go beyond that. It is expected to be a resource centre where different social activities and events take place (e.g., workshops, training courses), and services are provided (e.g., use of tools, use of cold rooms, harvest storage, harvest processing, cooking/kitchen). The social exchange that is expected to happen there is key to its success. During its first year of implementation, teaching



FIGURE 5.3 Categorisation of farms in Langa. Five main categories respond to the spatial conditions, the communities that attend the farms and the outcomes of that attendance.

through training workshops and capacity-building was a priority to support farmers and strengthen the local food system in the long term. This comes by improving agricultural practices and connecting the produce of Langa to Cape Town's food market.

The Agri-Food Hub will continue to support locals who show a committed interest in practising agriculture and want to deepen their level of expertise in the field. The level of expertise required of farmers is not necessarily high or technical; it is only expected to be improved. The South African Urban Food and Farming Trust has been emphatic on the importance of supporting farmers by training them and developing their capacities so that in the future, they can keep reproducing the lessons learned and take the lead of the Hub without depending on any organisation or external stakeholder. Although the Trust members initially teach directly to farmers at gardens and workshops in different places in Langa, most of the workshops and training programmes are not imparted by them but brought from the connection with other organisations. Thus, networks to stakeholders that support capacity-building are important for strengthening farming practices in Langa as they provide valuable experience-based knowledge, like SEED,¹ where hundreds of interested people with different backgrounds and motivations have been trained.

The Agri-Food Hub aims to strengthen the training on five main themes: (1) training to establish a local, organic and cooperative agricultural practice; (2) training to properly and rationally use tools with a long-term vision; (3) training to be able to transfer the knowledge to children, new batches of interested farmers and farmers from other interested communities of the Cape Flats; (4) training in vegetable processing at a post-harvest level, so harvests meet commercial standards and can be sold in different markets of the city; and (5) training in processing to create innovative and resourceful products that offer alternative uses of vegetables and extend their life span. The training and acquired capacities of farmers have proven to be a decisive factor in the successful production at farms, and it is perceived as an added value of the Agri-Food Hub project in its aim of creating local change.

From the fieldwork, we conclude that to be a successful centre of resources, the Langa Agri-Food Hub would benefit if it were progressively developed with the stakeholders involved in the project from the management, networks and funding perspective. That is, a co-creation process of local farmers, the South African Urban Food and Farming Trust and the Masakhe Foundation (and their connected networks) is needed before it is completely and sustainably managed by farmers. Yet, as facilitators and supporters, the Trust and the Masakhe Foundation face the challenge of identifying farmers over a longer period who are willing to participate and ensure that they will have a safe environment to communicate, exchange ideas and make decisions: a space for governance and leadership like a farmers' cooperative that centralises collective concerns in the long term (see [Figure 5.4](#)).

In this sense, urban agriculture-focused NGOs in Cape Town are key intermediaries between farmers, the government and, to some extent, the market. As underlined also by [Haysom and Battersby \(2016a\)](#), [Kanosvumhira and Tevera \(2021\)](#) and [Paganini and Weigelt \(2023\)](#), capacity-building and training are strongly connected to social networks and confirm once more that urban agriculture can only have a substantial impact on urban farmers once its looked at, supported by and encouraged with a social perspective.

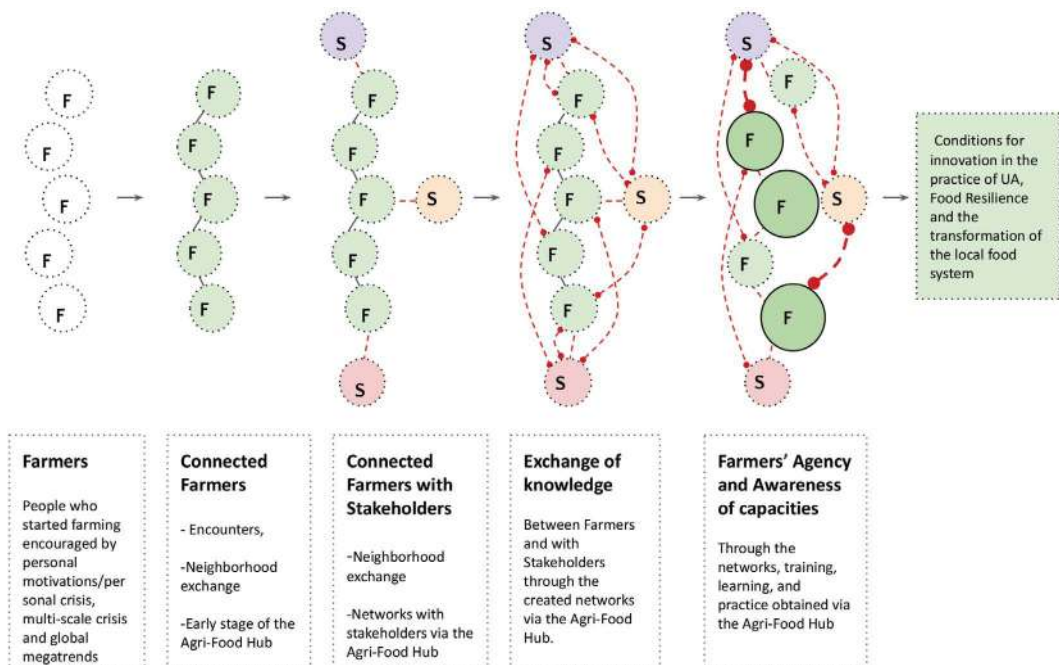


FIGURE 5.4 From individual action to a connected and resilient community of farmers.

SUPPORT METHODS STRENGTHEN FARMING PRACTICES, CREDIBILITY AND ALIGNMENT OF ACTORS

From the field observations, we learned that by practising urban agriculture, farmers in Langa are automatically involved with Cape Town's agri-food system. The exchange of knowledge between farmers, the South African Urban Food and Farming Trust, the Masakhe Foundation and linked networks brings awareness about the weaknesses of the city's food system and encourages farmers to grow local, organic, perennial and indigenous crops; and increase the intake of more varied and nutritious food based on their produce. These choices, as individuals and as communities, promote local agriculture, which can produce vegetables more efficiently, demand less maintenance, assure the next planting season more effectively and contain less or zero chemicals. From site visitations, the most commonly found waste was processed food packaging, which points out some of the most consumed foods locally. In turn, urban farming in Langa does not only impact agricultural improvements but is also an opportunity to impact the food system at a local scale regarding lower food packaging and consumption of processed foods.

From fieldwork, we can summarise that awareness and education concerning how to obtain better harvests (considering the season, daylight and interactions with other species) were groundbreaking for farmers. From the farm visits, operations workshops and exchanges with farmers and members of the South African Urban Food and Farming Trust, we conclude that learning on-site and from experienced trainers increased farmers' trust and curiosity, and sometimes, it encouraged them to make plans for potential businesses. Also, trying homemade products made with local ingredients gave farmers a glimpse of the range of opportunities that emerge when growing good quality local fruits, vegetables and herbs and reaffirmed the power of food. This proves that strengthening farmers' agricultural practices has a direct impact on the production of their farms, but more importantly, it draws attention to the quality of the interactions and the methods used by trainers and facilitators. Field observations showed that the more empathetic and friendly interactions were, the more they fostered curiosity and the bigger the willingness to learn and improve. This also strengthened the alignment of actors.

We affirm that the role of the Agri-Food Hub as an agricultural facility, resource centre and supportive platform goes beyond strengthening agricultural practices to improve harvest quality. The 'human component' of the support given by the members of the Trust and connected stakeholders is powerful because the quality of the networks is as important, perhaps more so, as the quantity. This issue, also raised by [Kanosvamhira \(2019\)](#), reaffirms how crucial it is that NGOs and communities of farmers are aligned towards a common goal, which is determinant for the transition towards better and innovative food production in Langa and, potentially, in Cape Town.

SUPPORT TO INCLUDE FARMERS OF LANGA IN CAPE TOWN'S MARKET

One of the biggest contributions of NGOs to farmer communities in Cape Town is to connect them to markets through capacity-building, networks and infrastructure (Estefan Channel, 2021). The South African Urban Food and Farming Trust aims to reach this, first, with the mentioned training programmes; second, by facilitating several connections among local and external stakeholders; and third, by providing an adequate infrastructure facility that supports them with storage, post-harvest processing, product development, packaging and healthy cooking for their local consumption.

From a sales perspective, while connecting the production of farmers in Langa with niche markets, the South African Urban Food and Farming Trust has prioritised encouraging local sales, strengthening commercial links with initiatives like the Philippi Economic Development Initiative (PEDI) and opening opportunities to install pop-up stores. This means that supplying big supermarkets is not one of their goals. In terms of market education, the Trust is focusing on encouraging farmers to have seasonal produce as a community and according to commercial standards. This is important because farming as a synchronised community helps avoid mono-crops, which minimises oversupply, keeps prices stable, reduces the chances of spoilage and increases the variety of

produced food and potential customers. Also, because farm sizes vary across Langa, and to guarantee a functional farming plan to follow, consistency is needed. This consistency allows them to meet deadlines at a sustainable rhythm and avoid failure in delivering to customers.

During the fieldwork, besides all positive reactions, we identified barriers to farming. Some female farmers pointed out that farming was an activity they enjoyed but that it was challenging. Others said that it did not compensate for all the efforts made and that they had been questioned by other family members on why they were getting dirty pursuing such a ‘manly’ hard activity. Most of the farmers of Langa, however, were women who enjoyed farming and sustaining their farms. [Cilliers et al. \(2020\)](#) touch upon this significant issue and describe this as a stigmatisation of the practice of urban agriculture due to a low contribution to subsistence farming. In a practical sense, the lack of retribution for hard work can be explained by poor practices but more by a poor connection of demands and needs and, thus, poor sales connections. We claim here that although the strengthening of market networks is crucial for the Agri-Food Hub to be successful, it is equally important to work with the farmers on the benefits and value of their role in the food system, as a community but also as valuable individuals because in the end, market connections are a consequence of initial motivations and crisis and phenomena they are coping with (see [Figure 5.5](#)).

In sum, the Agri-Food Hub is the supporting bridge through which farmers become critical agents of the local food system in Cape Town by starting to farm, among others, as a strategy to cope with crises, assuming the active role they have when developing community decisions on

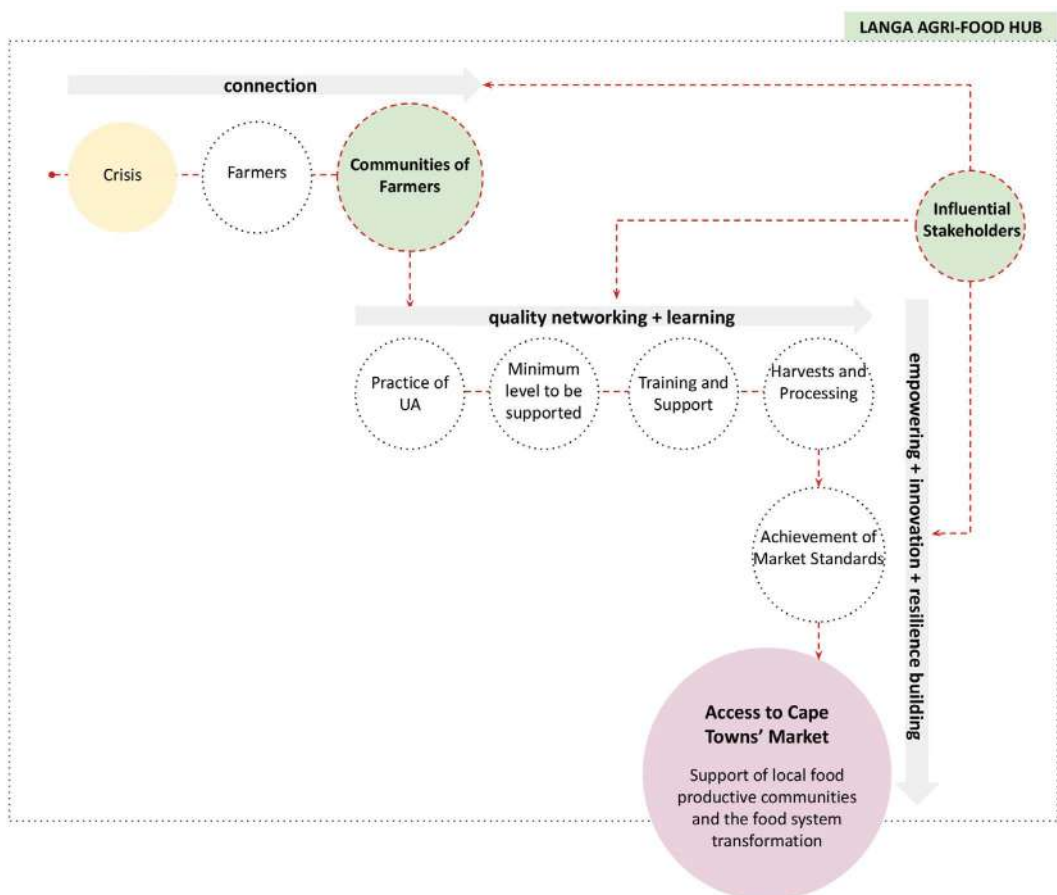


FIGURE 5.5 From crises to connected farmers with increased participation in Cape Town’s food system.

cooperative production, and continuously working on their relationship with the market network in the food scene of Cape Town to strengthen the local and urban food system.

CONCLUSION

The current state of Cape Town's food system is the consequence of urban food programmes and urban agriculture policies mainly conceived with a household food security approach. The dominance of supermarkets, together with a thriving informal food market, highlights the complexity of the food landscape. The local food system requires a reoriented urban agriculture approach, focused on community networks and marketing, and potentialising the strong contribution of NGOs that play a crucial role in supporting sustainable initiatives. The emergence of Agri-Hubs was driven by initiatives like the Nourish to Flourish Strategy and Cape Town's Food System Program, which address food security, resilience and nutrition through collaborative efforts involving various stakeholders. The Southern Africa Food Lab's smallholder Agri-Hub project exemplifies a model for replicable solutions, connecting smallholder producers to local markets and fostering economic growth. The Langa Agri-Food Hub, led by the South African Urban Food and Farming Trust, is an ongoing project that connects diverse stakeholders to strengthen farmer communities in Langa and slowly transform Cape Town's food system into a more sustainable and equitable one.

This research showed that there are active urban agriculture projects in Cape Town that emerged because of urban food system policies and the potential upgrades they could have by using a community approach. Understanding the key role of farmer communities and NGOs in these projects reveals opportunities to better address stakeholders' knowledge, put it into practice and ultimately create systemic change. The study also highlighted that the types of farmers' communities matter. Whereas previous research indicates the importance of individual farmers interacting and forming communities to have a greater voice, this chapter highlights that farmers' communities themselves need to be differentiated based on their institutional and physical settings. This helps to differentiate their diverse interests in governing urban agriculture and shows different ways of addressing crises.

The Langa Case indicates that farmers' communities previously interacted only sporadically and primarily on an individual basis; the Agri-Food Hub is continuously creating a platform to drive more systematic interaction for knowledge management and exchange, helping them to cope with crises. The Agri-Food Hub in Langa has an important role in closing important gaps regarding awareness, capacity-building and market access for farmer communities that emerged from crises and have struggled to scale their production to a higher commercial level.

In terms of the policy environment of the city of Cape Town, important accomplishments in terms of strategies and programmes are visible. However, their implementation in the case of multistakeholder initiatives like the Agri-Food Hub still needs time for an evaluation of impacts in the long term. In addition, targeting urban agriculture projects as a solution for food insecurity is certainly a missed opportunity, specifically in the case of Langa, where strengthening the connections between farmers, NGOs, local initiatives and key stakeholders seems to strengthen local practices. Certainly, a community approach and the connection with niche and local markets appear as cornerstones in the Hub development, yet the quality of the created links stands out. This chapter confirms that in under-resourced contexts where societal and economic challenges and related food crises are often found, networked-based support is uplifting and impactful for individuals.

NOTE

- 1 SEED is an organization focused on providing training skills on permaculture training. For further details see: <https://seed.org.za/>

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6 From Crisis to Opportunity

Exploring Urban Food Growing in the UK during and beyond the COVID-19 Pandemic

*Chris Blythe, Silvio Caputo, Michael Hardman,
Paul Milbourne, Mina Samangooei and Victoria Schoen*

INTRODUCTION

The relationship between urban food growing and crisis has a long but largely undocumented history in the UK, other than research around the response to the food shortages during the two world wars (Buchan, 2014; Foley, 2014; Schoen et al., 2021). In this chapter, we explore the relationship between urban food growing and military, social and economic crises, discussing key moments that have been influential in shaping the development of urban food growing in the UK. We then explore how the COVID-19 pandemic represents one of the latest forms of crisis to shape urban food growing in the UK. We do this by reviewing the limited published academic work on urban food growing during the pandemic, exploring the responses of third sector organisations to the crisis and considering how various forms of media portrayed urban food growing during the COVID-19 pandemic period. Lessons from the experiences of the latest pandemic can inform food planning during non-crisis periods as well as providing direction for the sector when the next crisis hits.

Although urban food growing encompasses a wide variety of forms in urban areas (Blythe et al., 2023), our interest in this chapter is mainly concerned with allotments, community gardens and domestic gardens in towns and cities. As will be seen, it is these forms of urban food growing that have contributed significantly during different crises over the decades. This contribution is largely due to the common and accessible nature of these forms of urban food growing.

CRISIS AND URBAN FOOD GROWING IN THE UK: A HISTORICAL PERSPECTIVE

The development of urban food growing has often resulted from crises of varying types and magnitudes, as suggested by numerous studies (e.g., Kingsley et al., 2023; Mok et al., 2014; Schoen et al., 2021). Perhaps the earliest point of crisis underpinning the development of urban food growing in the UK occurred with the enclosure of common land from the middle of the seventeenth century, leading to the provision of food growing gardens or allotments for the rural poor (Foley, 2014; Niala, 2021). As Thorpe (1970, p. 4) writes:

The strength of economic motive that underlay early provision has meant that in the past, allotments have always flourished and been fully tenanted during periods of war and want.

By the nineteenth century, the Industrial Revolution had produced a mass exodus of labourers from the countryside to work in factories in the rapidly growing industrial towns and cities (Burchart, 2002). Low wages and precarious living and working conditions meant that the urban poor ‘could literally starve for lack of food or land on which to grow their own food’

(National Allotment Society, 2023). This situation created fears within the government of civil revolt (Hallett et al., 2017), and it is reported that food riots occurred in several towns in northern England (Booth, 1977; Hindle, 2008). The first legislation providing for allotments was passed in parliament in 1885 (Thorpe, 1969) and was an important policy response to this potential crisis of social production, setting aside parcels of land – known as allotments – that could be used by the labouring poor to grow food for their own consumption at little or no cost. Some cities had allotment provision much earlier, largely providing social enhancements rather than as a response to crisis (Acton, 2015).

Several authors have described the relationship between urban food growing and military crises in the UK (Buchan, 2014; Ginn, 2012; Smith, 2011; Willes, 2014), demonstrating that the growth of both the allotment and other urban food growing movements have often been down to government-driven campaigns in times of war. The First World War provided a significant crisis for food supplies in the UK. The German navy's blockade of British shipping dramatically reduced the volume of food entering the country and raised the prospect of mass starvation (Olson, 1963). As a means of feeding the nation, the wartime government introduced radical land reform measures to expand the provision of allotments. Discussing this national state intervention, Willes (2014, p. 273) comments that 'it is likely that... [it will be] mentioned in years to come as marking the start of a movement of turning the urban classes of the community on to the vacant lands for raising food.'

A few decades later, the UK found itself at war again, facing another national crisis of food supply. The government's response to this crisis was, perhaps, more significant than that during the previous world war. The 'Dig for Victory' campaign dramatically reshaped the urban food production landscape (Ginn, 2012). Half a million more allotments were created (Ginn, 2012; Smith, 2011), householders were encouraged to convert their gardens into food growing and much of public urban space was turned over to the production of food (Buchan, 2014). In addition to fruit and vegetables being grown in public spaces, livestock became a familiar feature of the new urban foodscape, with almost 7,000 pig clubs in existence and domestic hen keepers producing about one-quarter of the country's fresh eggs (Willes, 2014). While there exists some debate about the effectiveness of the 'Dig for Victory' campaign in feeding the nation during wartime (Buchan, 2014), there is little doubt that it reshaped public attitudes towards food growing in urban places as well as collective forms of gardening in the city.

The immediate post-war period saw the dismantling of many of these public growing spaces and the closure of many of the allotment sites developed under the 'Dig for Victory' campaign (Foley, 2014; Hallett et al., 2017; Thorpe, 1969). Urban policy turned to focusing on the repair of bomb-damaged sites and the further development of industry and housing in towns and cities. Demand for urban allotments also fell dramatically during this period as inner-city slum clearances and social housing building programmes meant that many more householders now had access to domestic gardens (Crouch & Ward, 2023).

By the 1970s, urban food growing had begun to rise up the political agenda in the UK (Hallett et al., 2017). In 1976, the City Farms Advisory Service was founded with the support of the Department of the Environment (Wardle, 1983). By 1980, the National Federation of City Farms was established, as grassroots organisations highlighted the limited provision of public green space, the dilapidated state of the local environment in inner-city areas and the planning and dereliction challenges these areas faced (K. Fennell, personal communication, June 3, 2020). In addition to these grassroots initiatives to develop public growing spaces in the inner city, gardening became part of the central government's policy response to the inner-city riots that took place in several cities in 1981 (Unsworth, 1982). A national Garden Festival scheme was introduced, which involved the development of public gardens on deindustrialised sites every couple of years between 1984 and 1992. This initiative aimed to use these spectacular gardening projects to transform derelict urban spaces into green sites that would be attractive to developers and address the crisis of urban decay in the UK at the time. As pointed out by Wetherall (2021), these events demonstrated how the environment, the economy and the social order of British cities were reimagined in the 1980s and 1990s.

Perhaps related to the ongoing crises of urban living, albeit outside of a specific crisis, the 1990s witnessed significant growth in the number of urban grassroots gardening projects (Milbourne, 2012). These were commonly referred to as community gardens in the UK and appeared largely as a response to the neglected state of the local environment in many inner-city neighbourhoods. Supported by the Federation of City Farms and Community Gardens and the Royal Horticultural Society through its Britain in Bloom campaigns (Royal Horticultural Society, 2015), community gardening in these places was concerned with growing plants to improve local environments. It was also about local communities taking back control of their neighbourhoods (Cumbers et al., 2018; Chalmin-Pui et al., 2023).

Much of the gardening activity in the projects above encompassed what Hodgkinson (2005) describes as ‘anarchy in action.’ Another form of horticultural ‘anarchy in action’ that also became more visible during this period was guerrilla gardening (McKay, 2011; Reynolds, 2008). This involves spontaneous acts of establishing and cultivating plants in neglected urban spaces, often without permission from landowners. Guerrilla gardening was associated with a recognition of citizens’ common responsibilities and rights towards the urban environment (Hardman & Larkham, 2014b). In discussing his own motivations for undertaking guerrilla gardening, Reynolds comments, ‘I do not just tend existing gardens but create them from neglected space...Vacant lots flourish as urban oases, roadside verges dazzle with flowers and crops are harvested from land that was assumed to be fruitless’ (Reynolds, 2008, pp. 16–17).

More recently, austerity has emerged as another critical moment for the future of urban food growing in the UK (Jenkins et al., 2021). As a response to the global fiscal crisis of 2007–2008, recent UK governments have sought to shrink the size and scope of the state and dramatically cut public spending (McBride & Evans, 2017). A key target of budgetary cuts has been local government (Gray & Barford, 2018; Rex & Campbell, 2022). With their budgets reduced, many city councils have been forced to reduce their costs and increase their revenue. One way they have achieved this has been by intensifying the sale of public land to the private sector, with many allotment and community gardening sites destroyed and replaced by new housing developments (Wright & Fraser-Young, 2019). At the same time, austerity has opened up new opportunities to develop urban food growing initiatives as city governments have sought to transfer the management of some of their green public spaces to third sector organisations and community groups in an effort to reduce costs (Milbourne, 2021; Smith et al., 2023).

Urban food growing has also come to feature in a growing number of food strategies that have been initiated by towns and cities in the UK in the last 15 years (Hardman & Larkham, 2014a; Milbourne, 2024). Urban food strategies are a response to the growing crises of the urban environment. These include rising levels of malnutrition, obesity and hunger, particularly in the most disadvantaged urban neighbourhoods, as well as the climate crisis (Westman et al., 2022). These place-based food initiatives have sought to establish a more progressive local food agenda. This usually involves the promotion of food health, food sustainability and food equity (Mattioni et al., 2022). In doing this, attention has been given to the development of more locally based food systems and reconnecting locally produced food with everyday urban living. Within many of these urban food strategies, references are made to the contributions of allotments, community gardens, small-scale peri-urban farms and other, more technological forms of urban food growing to the development of more sustainable, inclusive and just local food systems.

URBAN FOOD GROWING IN THE UK DURING THE COVID-19 PANDEMIC

We now turn to explore how the COVID-19 pandemic created crisis conditions for the UK’s urban food growing sector during 2020–2021, as well as the ways in which urban food growing organisations responded to these challenges. We review academic publications on urban food growing in the UK during the pandemic. We follow this by exploring the approaches taken by third sector (charity) organisations in response to the crisis. Finally, we consider some of the ways in which urban food

growing was portrayed in the media and how this demonstrates ways in which the pandemic influenced urban food growing in the UK.

The COVID-19 pandemic differed from previous crises in that it was both unprecedented and unexpected, soon becoming an existential crisis. Gardening practices emerged as a largely self-organised psychosocial solution (Kingsley et al., 2023) to improve people's mental well-being conditions and provide those in need with healthy food. Since the pandemic began, there have been relatively few peer-reviewed studies of its impact on, and relationship with, urban food growing in the UK. This could be a result of a number of factors, including the short time period that has elapsed since the pandemic, as well as research funding being directed towards other areas of research importance in relation to the pandemic.

Reviewing existing academic outputs on urban food growing and the pandemic reveals several important findings. Bulgari et al. (2021), for example, report that there was a fivefold rise in queries about gardening on the Royal Horticultural Society's website during the lockdown period.

Work by Hardman et al. (2022) highlights an increase in food production among some urban food producers, including one using vertical farming, to address the failures of conventional food supply chains.

Other research reveals how some urban farms and community gardens had increased their food production levels because of growing demand from households and food aid organisations (Schoen et al., 2021). This aligns with other international studies on COVID-19 and urban food growing (e.g., Kingsley et al., 2023; Niala, 2021) which suggest that allotments represent a form of food growing at a household level that can circumvent issues of social distancing. As a form of urban food growing in the COVID-19 crisis, many, e.g., Edmondson (2024), refer to the growth in demand for allotments during and after the pandemic.

Perhaps one of the most interesting strands of research is the one focusing on home gardening as a type of urban food growing that can yield benefits in terms of food security and health (Niala, 2021). Home gardening can be practised at a small scale in any interstitial home space, from balconies to terraces to private gardens, hence reaching a large population, as identified in Kingsley et al. (2024).

Academic Research Councils in the UK simplified and accelerated the application process for projects that directly tackled many aspects of the pandemic (UKRI, 2024).

In many cases, the charity or 'third sector' provided a strong part of the response to the pandemic in the UK, and not without challenges to their operations and existence (e.g., OSCR, 2019). A large amount of relatively short-term, one to two-year funding was made available to organisations involved in urban food growing, often from COVID-19 response funds designed to help them continue their operations (National Lottery, 2024).

In some cases, organisations were able to generate higher levels of grant income during the pandemic than in normal years (Schoen & Blythe, 2020). Although evidence from the wider charity sector (Clifford et al., 2023) suggests that the financial impact of COVID-19 on charities was negative. It is yet to be demonstrated whether this short-term, large-scale rise in funding opportunities will have an impact on longer-term funding opportunities in the sector in the UK; since the pandemic, many of the larger funders have changed their approach to funding or scaled it back in some way.

In terms of reactions to the pandemic, the third sector delivered the fastest and most supportive response, particularly in terms of on-the-ground delivery. Unlike other crises, in which the response was generally centrally coordinated, the contribution of urban food growing to mitigate the effects of COVID-19 was largely generated from the bottom up without any consolidated government support.

Those in the charity or third sector were fast in ascertaining the impact of the pandemic on urban food growing. Many organisations carried out surveys related to urban food growing through the pandemic. A report by the third sector organisation, Sustain – the UK-based Alliance for Food and Farming – draws on findings from a survey of food growing projects in the UK conducted in

April 2020. It finds that 39% of member organisations (mostly in London) had closed their gardens at that stage for an unspecified amount of time, while 70% predicted they would grow more produce than usual during the pandemic, possibly because of a combination of higher demand from charities and/or households (e.g., vegetable boxes) (Sustain, 2020). Sustain's research also revealed how urban food growing had expanded in the UK during the COVID-19 crisis, leading to more impacts on communities, from enhancing local green spaces to increasing food provision, upskilling of participants and beyond.

A second report from the Food Standards Agency (2021), based on an online poll of 10,069 UK adults, highlighted that nearly one-fifth (18%) of respondents had grown more of their own food during the pandemic, compared with 16% who had grown less. Social Farms & Gardens launched a COVID-19 impact study to capture the experiences of its membership during the pandemic (author data). This revealed how many sites were placed under increased financial pressure, with the charity establishing a series of support materials to help the spaces navigate the crisis. Other organisations also produced reports on the impact of the pandemic on their area of focus, many of which demonstrated similar results and impacts.

This includes material on production, such as Scaletta's (2024) recent study, which highlights the scaling up of private cultivation in gardens in the UK. As highlighted previously, the rise in grey literature has helped support the scaling up of policy post-COVID to support the development of urban food growing. The Manchester Food Board's Growing Manchester initiative led to the Manchester City Council committing to fund and support urban food growing and to develop new and existing successful food growing projects in their 2023–2028 food strategy (Hall et al., 2023).

Such organisations have also provided insights into the impact of urban food growing during and immediately after the pandemic. This ranges from Sustain's work highlighting the power of local food growing during COVID-19 to the Brighton & Hove Food Partnership's work, which reveals the transformational nature of projects during the crisis (Brighton & Hove Food Partnership, 2020; Levidow, 2021; Levidow et al., n.d.). Sustain's research also revealed how urban food growing had expanded in the UK during the COVID-19 crisis, leading to more impacts on communities, from enhancing local green spaces to increasing food provision, upskilling of participants and beyond. On a more radical level, organisations such as Farm Urban highlighted the impact of urban food growing beyond the community level, in this case, showcasing how high-tech solutions have impacted populations significantly during the pandemic (Farm Urban, 2023).

At a meta-level across the UK, Sustainable Food Places (a programme to network food partnerships) was instrumental in capturing much of the impact of the crisis on the urban food growing sector (Sustainable Food Places, 2023). Their analysis highlighted good practice and the growing interest in the concept, from the importance of local partnerships to help expand and sustain activities to the increase in a range of local, regional and national tools to support urban food growing (Jones et al., 2022). Similarly, the Sustainable Food Trust has lobbied for more focus on urban food growing to tackle food access issues, which have been heightened due to the pandemic. In this case, their work argues that such spaces can play a crucial role in enabling more communities to have access to fresh produce, particularly within food deserts (Sustainable Food Trust, n.d.).

At a more local level, the pandemic revealed how many urban food growing spaces were able to step up activities in times of crisis (Sustain, 2020; Wheeler, 2020). This ranged from scaling up production to courses designed to enable others to grow at home. Many local community-based charities sourced funding to enable them to support their local community with growing packs (see, for example, Social Farms & Gardens, 2020), increasing the number of people able to grow at home. The provision of supplies to food banks and surplus organisations also became an increasing area of focus within communities. With the latter, there is a nascent evidence base to suggest that the COVID-19 crisis acted as a catalyst for enabling a more explicit connection between UA and food banks, with such spaces allowing locally grown produce to be stocked in their outlets (Salvation Army, 2023). While in some countries this has been commonplace, in the UK there have been barriers to this relationship, with food banks often preferring canned goods over fresh produce. Social

Farms & Gardens (2020) and many other third sector organisations highlight the immense impact of UA both during and post-pandemic, with spaces acting as critical hubs for communities and providing emergency food provision for communities in need.

The response of the urban food growing sector to the pandemic was overall one of support to others and their local communities, and clearly, this activity went a long way to opening up new opportunities and collaborations across the sector (Evans & Davies, 2020). One of the strongest examples of this is in the relationships with food banks or food surplus projects, where, for many years, community-based food growing projects had found it challenging to provide surplus fresh food to such enterprises. The demands and opportunities created by the pandemic and the subsequent growth in the focus on food justice meant that many food banks and surplus organisations had a greater appetite for accepting fresh food and surplus from local food growing projects and allotments (Social Farms & Gardens, 2020; Sustain, 2022). Anecdotal evidence from Birmingham and Glasgow would suggest that this relationship has continued, with local fresh produce being sought to supplement the supplies of many food surplus projects.

The COVID-19 pandemic occurred at a time when online social media provided both instant access to news and views (Cho et al., 2023). Various news articles and organisation websites highlighted the importance of building policies and frameworks for strengthening urban food networks (Eskandari et al., 2022). In addition to the numerous health benefits for people and the planet, it was shown how food networks can give resilience during crises by increasing food security (see, for example, Sanderson-Bellamy et al., 2021; Sonnino, 2023).

Many media outlets reported that urban food growing increased during the COVID-19 pandemic. Online news sites such as The Guardian and Wales On Line demonstrated this in terms of urban food growing in both community (Busby, 2020) and private settings (Gibbons, 2021). The Independent highlighted how fruit and vegetable seed sales increased and allotment waiting lists became longer (McCarthy, 2020). Reports often focussed on how more people in the UK bought locally grown food and grew their own food (Lasko-Skinner & Sweetland, 2021). In other countries, urban food growing has also been positively portrayed in the media, with a focus on health and well-being benefits (Mind, 2022; Ossola, 2022). Hashtags related to 'growing your own food' were noticeably high during the pandemic (Christensen, 2021). In the media, urban food growing in the UK was seen as being able to alleviate food security, increase access to healthy, nutrient-rich food and create opportunities for building trust, engagement and community cohesion (Payne, 2020).

Linking urban food growing activities helped strengthen local food networks during the pandemic (Payne, 2020). This needs to be underpinned and resourced with a Food Plan and cross-sector food partnerships (businesses, community organisations and public agencies) (Parente, 2023). The UK National Planning Policy Framework, which manages policies for national development, can help protect land for local food growing to build resilient food systems during crises (Parente, 2023).

People who grew more food during the pandemic believe that they will continue to do so (Lasko-Skinner & Sweetland, 2021), indicating that people see the benefits of growing their own food outside of a pandemic. Seed sales have been seen to continue to thrive post-pandemic due to an increase in the cost of living (Luymes, 2023). Community gardens were shown to increase food shortage resilience during the pandemic (Parente, 2023). The knowledge and connections existing urban growers have of their local community became invaluable in order to reach the most vulnerable and now also for the cost-of-living crisis (Parente, 2023). This includes being linked with vulnerable populations in a community, knowing how they access food and what type of food they need.

The benefits of gardening during crisis have informed changes in policy since the pandemic to increase opportunities for urban food growing; for example, Hounslow Council in London, UK, have implemented 'Grow for the Future' looking at community food growing on unused land owned by the council (London Borough of Hounslow, 2022). Support for local food growing from local authorities is important due to competition for land for other uses, such as housing (Parente, 2023). Over 27 acres of land have been identified for local people to grow food, aiming to alleviate

access to fresh food due to the cost-of-living crisis, as well as providing education about where food comes from and nutrition. Access to land on which to grow, however, still remains a massive barrier to many urban communities, and a lack of information on ownership and how to access or get permission all create ongoing challenges to those wishing to participate in urban food growing (Crombie et al., 2024). The ongoing ‘Right to Grow’ campaign led by Incredible Edible (Incredible Edible, 2023) has developed since the pandemic as one means by which the movement might be strengthened.

The COVID-19 pandemic in the UK caused a surge in interest and participation in urban food growing and gardening, as demonstrated by the press, social media and wider responses. This ranged from formal to informal interventions, such as the aforementioned guerrilla gardening, given the appetite of citizens to scale up activities and enable growing schemes as quickly as possible. Others highlight the growth in allotment use and applications, although anecdotal evidence suggests that when the subsequent ‘rent period’ became due, in some cities, this interest waned (B. Wilson, personal communication, January 2022).

In the UK, the pandemic demonstrated the value of urban food growing and gardening to many people: as in other countries, it was seen as a means of escape and supported self-provisioning. This movement transcends the UK context and has witnessed rapid growth of late, particularly post-pandemic, with urban residents often keen to connect more with nature and not wait for permissions to be given for formal projects (Crombie et al., 2024).

CONCLUSIONS

While urban food growing would never be able to provide a comprehensive solution to all of the problems deriving from the COVID-19 pandemic, evidence suggests that it certainly had a positive role to play in mitigating some of its impacts. It is clear that urban food growing provides a short-term means of support, which can be ‘picked up’ or ‘put down’ to fit a wide range of circumstances. The danger of this is that it is never recognised to its full potential as a long-term solution, supporting many of the key agendas of the government, such as health and well-being, community cohesion, climate change/net-zero and food security, both during and beyond moments of crisis.

As pointed out by Sanderson-Bellamy et al. (2021, p. 791), in relation to food systems as a whole and their resilience in response to the COVID-19 pandemic, ‘solutions developed as emergency responses used opportunities shaped by crisis to shape innovations and demonstrate potential pathways for food systems transformation.’ COVID-19 has not gone away; perhaps it is too early to say, but the impression is that without the immediate urgency of the pandemic, the focus of much research – let alone policy – has moved to other priorities. Perhaps this is a repeat of past occasions when urban food growing has been a key response to a crisis, but then when the crisis passes, the focus moves on. A continued focus on support for urban food growing by national and local governments in the UK would ensure that the sector is better able to respond to future crises.

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7 Combatting the Crisis of Social Isolation and Loneliness through Gardening

Troy D. Glover and Sina Kuzuoglu

Social isolation and loneliness pervade across the globe as significant public health crises. In a recent survey of adults in 142 countries, [Gallup \(2023\)](#) found that 24% of the global population felt ‘very’ or ‘fairly lonely,’ with 6% feeling they had no connection to anyone whatsoever. While 6% may seem low, it translates into approximately 287 million people across the globe, a shocking number of individuals who lack meaningful connections. The seriousness of this crisis has led the United Nations to recently form a commission to foster social connection ([WHO, 2023](#)). The ubiquitous nature of isolation and loneliness across the globe – particularly among older adults and youth ([WHO, 2022](#)) – has led many governments and international organisations to address the issue at a macro policy level ([WHO, 2023](#)). However, everyday, scalable answers that can be integrated at the community level deserve necessary exploration, too.

No matter what the response, feeling connected to others matters tremendously for our health and well-being. In the longest scientific study of happiness ever conducted, [Waldinger and Schulz \(2023\)](#) identified warm relationships of all kinds as the best source of health and happiness. In this chapter, we argue that the activity of gardening, by enabling people – familiar or otherwise – to engage in social interaction, contributes to social connectedness, ‘the sense of belonging and subjective psychological bond that people feel in relation to individuals and groups of others’ ([Haslam et al., 2015](#), p. 1).

When people socialise, their interactions, no matter how brief or trivial, create the potential to build and strengthen their relationships ([Klinenberg, 2018](#)), particularly if these interactions are marked by positive emotions ([Fredrickson, 2013](#)). The connections built through such interactions – even when not developed into strong relationships – open up possible access to needed emotional, informational and instrumental support networks (e.g., [Bourdieu, 1986](#); [Cacioppo et al., 2015](#); [McPherson et al., 2001](#)). This possibility matters because social connectedness makes us more resilient in the face of stressful life events ([Aldrich, 2009](#)) and contributes to our everyday quality of life ([Waldinger & Schulz, 2023](#)).

Utilising a conceptual approach, this chapter employs [Hall’s \(1963, 1966\)](#) proxemic differentiation of intimate, social and public spaces with [Hunter’s \(1985\)](#) continuum of private-public social orders to suggest how gardening in various contexts has the potential to address adverse states of being, particularly intimate, relational and collective loneliness ([Cacioppo et al., 2015](#); [Motta, 2021](#)). The chapter begins by offering an overview of the health-related and social consequences of social isolation and loneliness and the benefits of social connectedness to explain why the contemporary trends in social isolation and loneliness amount to a crisis. Next, it explores the types and significance of connections that can be developed and nurtured through the activity of gardening and how these connections can address the crisis of loneliness.

THE CONSEQUENCES OF SOCIAL ISOLATION AND LONELINESS

[Holt-Lunstad and Steptoe \(2022, p. 232\)](#) refer to social isolation as the ‘relatively objective indicator of being alone, having few or infrequent social contacts or roles, and little involvement in clubs or organization.’ They described loneliness, by contrast, as ‘a subjective distressing feeling of isolation

or the discrepancy between one's desired and actual level of social connection' (p. 232). In other words, whereas social isolation denotes the *objective* absence of meaningful connections in one's life, loneliness refers to the *subjective* absence of them. Both separately and combined, then, social isolation and loneliness are associated with a myriad of increased physical and mental health issues.

Generally speaking, loneliness manifests itself in three ways: intimately, relationally and collectively (Cacioppo et al., 2015). *Intimate loneliness* refers to 'the perceived absence of a significant someone (e.g., a spouse) ... [who] one can rely on for emotional support during crises ... and who affirms one's value as a person' (Cacioppo et al., 2015, p. 4). People who experience intimate loneliness may still find meaningful connections with others as important sources of social support. Where these others remain absent from people's lives, however, individuals may experience *relational loneliness*: 'a lack of perceived connections with the 'sympathy group' within one's relational space' (Motta, 2021, pp. 76–77) or a peer group (Maes et al., 2017). Finally, *collective loneliness* pertains to the experience of feeling disconnected from a shared understanding, purpose or community within a broader social or cultural context (Cacioppo et al., 2015). Hence, it represents the absence of 'imagined' connections with others who conceivably belong to the same social, cultural or communal group. These three forms of loneliness effectively address the varied facets of social connectedness.

A burgeoning literature unequivocally establishes deficiency in social connection as an independent risk factor for mortality from various causes, including immune response, cardiovascular diseases, diabetics and dementia (e.g., Cohen, 2021; Duffner et al., 2022; Harding et al., 2022; Holt-Lunstad, 2022; Holt-Lunstad et al., 2017; Howick et al., 2019; Valtorta et al., 2016), thereby supporting earlier research on the relationship between social connectedness and mortality (e.g., Berkman & Syme, 1979). Being socially connected not only encourages individuals to engage in more health-promoting and preventive behaviours (Kim et al., 2014), but also offers them a support network to more effectively manage their health conditions (Smith et al., 2021; Song et al., 2017). Correspondingly, evidence shows a strong relationship between being socially connected and living a longer life (NASEM, 2020).

Furthermore, feelings of loneliness represent a root cause of suicide, self-harm and suicidal ideation (Shaw et al., 2021). Being isolated or in poor-quality relationships amplifies the probability of perceiving life challenges as stressful, likely because of the heightened stress resulting from having access to limited support and fewer resources to mitigate the impacts of such challenges (Southwick et al., 2016). In this context, expectedly, social connectedness contributes significantly to well-being and happiness (Brown et al., 2012; Siebert et al., 1999; Waldinger & Schulz, 2023) and leads to a variety of social benefits, including intimacy, a sense of sharing and stronger group attraction (Ijsselstein et al., 2003), and emotional intelligence (Lo et al., 2022).

The various positive health and well-being outcomes associated with social connectedness should come as no surprise, for people are inherently social beings. Far more than a trivial desire, social connection represents a fundamental human need. Indeed, Tomova et al. (2020) even demonstrated how people *crave* social contact when they are isolated. While temporary periods of social isolation and feelings of loneliness can be positive – for example, to (re)evaluate existing relationships and seek new ones (Samuel, 2022b) – a major concern arises when feelings of loneliness become persistent, and individuals lose their motivation to seek out social connection, therein compounding the potential negative health impacts (Cacioppo & Patrick, 2008).

Given the clear benefits of social connection in our lives, the pervasiveness of social isolation and loneliness in contemporary society constitutes a disturbing and growing crisis. The outcomes of this crisis extend beyond individual needs and desires to create a societal problem insofar as loneliness can drive individuals to identify with groups outside the mainstream (Vergani et al., 2020) to foster a sense of belonging (Samuel, 2022a) and even become violent with members of other groups (Doosje et al., 2016). Guided by these individual- and societal-level problems, identifying different ways to foster social connectedness is imperative to support the national and international agendas combating the epidemic (or pandemic) of social isolation and loneliness. In line with this chapter's

focus on the relationship between gardening and social connectedness, then, we explore gardens as attentional spaces in which different forms of social relationships may be cultivated.

GARDENS AS ATTENTIONAL SPACES

Hall (1963, 1966) sensitised scholars to the varying degrees of interpersonal proximity and engagement that individuals maintain in space by distinguishing among types of *attentional* spaces, including intimate, social and public spaces. Space, here, embodies a social construction inasmuch as it represents different levels of social closeness and interaction. The different forms of gardening with which one may engage (e.g., as a hobby or duty; individually, with family members, in small social groups or communally) and the different types of gardens (e.g., private residences, community gardens, public domain) encourage one to consider how this variability reflects on engagement with attentional spaces that would potentially address intimate, relational and collective loneliness (Cacioppo et al., 2015). To be sure, previous investigations established the possibility of generating a greater sense of social connectedness through the activity of gardening (Kingsley & Townsend, 2006; Kingsley et al., 2019). Recalling Fredrickson's (2013) broaden-and-build theory, in states of enhanced positive emotions, people tend to be more sociable and open to investing in social connections. Therefore, for those who derive pleasure from gardening, gardens provide spaces in which relationships can potentially grow, not just flower.

The proxemics framework developed by Hall (1963, 1966) share certain similarities with the private-public realm continuum outlined by Hunter (1985), who suggested affective engagement and mutual knowledge of others decline as one moves from private to public. The people with whom we would engage with gardening in our homes compared to a community garden would expectedly be different, both in terms of our proximity and affective engagement, thereby signifying the parameters of the relationality within them. In other words, the strength – as well as the weakness or the absence – of the relationship between individuals contains a spatial reflection. As Koay and Dillon (2020) suggested, gardening may take place as an experiential and/or a social conduct – as exemplified by the difference between no-gardening, home gardening and community gardening. The combination of these factors determines the psychosocial outcomes of the gardening practice, such as stress, well-being and resilience.

The presence of individuals in the same attentional space situates them in the same position on the private-public continuum, as both require behavioural and emotional patterns that are mutually agreed upon by those engaging in social interaction. Attention plays a key role in understanding loneliness because it involves the interpretation of social cues or information that reinforces feelings of connection or isolation, which, in turn, influences the perceived rights and duties of individuals in particular instances (Hunter, 1985). For example, a lonely person may be more inclined to notice instances of exclusion or rejection within a garden while overlooking positive social cues, which ultimately influence their willingness to enter and/or engage with the space and the social entity contained therein (e.g., Kanai et al., 2012). Using Hall's framework, the content that follows focuses on gardens as intimate, social and public spaces to tease out the kinds of social ties potentially strengthened by engaging in gardening as an activity aimed at building greater social connectedness and combatting the loneliness crisis.

GARDENS AS INTIMATE SPACES

Hall (1963, 1966) conceived of intimate spaces as those closest and most personal in which social interactions may unfold. These spaces remain reserved for close relationships and deep emotional connection, most often with intimate partners and close friends. If an individual experiences a lack of close, personal connections within their intimate spaces, they may feel intimate loneliness, characterised by a sense of emotional isolation (Cacioppo et al., 2015). While gardens provide intimate spaces in which individuals can garden alone, thereby enabling gardeners to enjoy solitude or

possibly feel lonely, they also offer spaces in which gardeners can strengthen their strong ties – that is, romantic relationships, loving family ties and close friendships – by working closely and meaningfully together.

Evidence shows individuals strengthen their close relationships through the joint act of gardening. [Smith-Carrier et al. \(2021\)](#), in their research on therapeutic gardening, revealed gardens to be spaces where intimate relationships develop meaningfully. Accordingly, it is not unusual for intimate partners to bond through the activity of gardening. Research on the contribution of ‘couple leisure’ to marital satisfaction, for example, shows how regular participation in joint activities, including gardening, contributes to overall marital satisfaction ([Johnson et al., 2006](#)). [Cano et al. \(2018\)](#), meanwhile, shared research findings from a couple who identified gardening as a shared hobby in which they could spend meaningful time together and address their relationship distress. In short, gardens provide potential spaces for couples to nurture their relationships.

Gardens also cultivate familial relationships. In demonstrating the social aspects of gardening, an activity often characterised as individualised, [Bhatti’s \(2014\)](#) research depicted domestic gardens as places that often involve a shared experience among family members. The nature of this sharing, he observed, includes routines, rituals and traditions that build and support intimate relationships. During the Covid-19 pandemic, a time when people were forced to isolate themselves, thereby exacerbating an already pervasive loneliness crisis, [Shannon \(2023\)](#) listed gardening among the common activities in which families engaged to cope with public health restrictions and physical distancing. Families, it seems, gain interpersonally from gardening together.

Close friendships can grow in gardens, too. [Smith-Carrier et al. \(2021\)](#) found that participants who gardened together experienced camaraderie that gave them a greater sense of connectedness. Gardening, as a leisure activity, supports friendships by providing a ‘sphere of sociability’ in which friends can (re)invest in and nurture their relationships ([Glover & Parry, 2008](#)). Even in gardens shared by others, gardening can provide an intimate space in which close relationships form. For example, [Kim et al. \(2014\)](#) observed improved trust and levels of friendship among elementary school students who participated in a school gardening programme. [Glover, Parry, and Shinenew \(2005\)](#), meanwhile, profiled community garden participants who spoke glowingly about their garden as a space in which they forged close friendships. Though considered by participants as a by-product of their garden participation, friendships emerged through their interactions when gardening.

In all of these cases, gardening functioned to strengthen strong ties – the kinds of connections that provide reliable sources of emotional support upon which people can draw to cope with their life situations ([Lin, 2001](#)). As these examples suggest, even though home gardening may be misconstrued as a private activity in an intimate space, it can develop characteristics that temporarily transform it into a social space.

GARDENS AS SOCIAL SPACES

[Hall \(1963, 1966\)](#) described social spaces as those in which people interact comfortably with friends and family but also with people with whom our relationships are weaker, albeit still sociable. As the name suggests, the level of engagement in social spaces tends to be more communal and shared – i.e., social space indicates the presence of a larger peer group ([Maes et al., 2017](#)). In this sense, one may argue that the perceived absence of meaningful relationships in the social space aligns more with relational loneliness insofar as this space may support the development of closer relationships with those in it.

While strong ties can be strengthened within intimate and social spaces, gardens as social spaces have the unique potential to develop weak ties – that is, friendly relations or acquaintances defined as ‘the contacts whom individuals know on a first name basis ... such that they would have a friendly chat if they were to meet randomly’ ([DiPrete et al., 2011](#), p. 1242). Weak ties lack a sense of uniqueness and intimacy and entail less personal disclosure and less intimate knowledge, which means they establish weaker obligations ([Sprecher, 2022](#)) mutually agreed upon ([Hunter, 1985](#)). In

the context of gardening, these weak ties may include neighbours, programme participants, service providers, co-workers, volunteers and others – basically, anyone with whom we are friendly but not close. Community gardens, for example, serve as social spaces in which weak ties, such as garden leaders and volunteers, develop relationships, either in parallel activity or in the joint maintenance of their gardens (Glover, Shinew, and Parry, 2005). Front yard gardens, by contrast, offer social spaces in which neighbours can engage in the act of neighbouring, the active engagement in authentic social interactions with neighbours as they pass by (see Glover, 2021). Either way, the garden becomes a focal point for connection.

In contrast to strong ties, weak ties involve less voluntary (or affective) interaction but more formal role interaction (e.g., Manzini, 2015). That is, we recognize weak ties by and through the roles we both play (e.g., leader/volunteer, neighbour). With a balanced mixture of strong and weak ties in the social space, one is closer to a parochial realm where individuals have a heightened sense of safety by virtue of their perceived common attributes with others with whom they share the social space (Hunter, 1985; Lofland, 1989) without the space becoming too exclusive for outsiders to join (Manzini, 2015). Neo and Chua (2017), in their research in Singapore, viewed the processes of inclusion and exclusion as intricately connected to the diverse responsibilities assigned to individuals in the proper functioning of community gardens. However, these formal roles do not mean we cannot have a casual chat with our neighbour or a fellow community gardener who we do not know when engaged in these respective social spaces. But neighbours with whom we chat briefly every so often would not expect us to host a party for them, or vice versa, for example.

Under this premise, we may assume that weak ties are less important than strong ties, but acquaintances serve important functions. Broadening our social networks to include weak ties with acquaintances enhances our capacity to confront challenging circumstances (Kim & Fernandez, 2023). By engaging in small talk with our neighbours in our gardens, we may not host a party for them, but we may develop a meaningful (albeit not necessarily close) relationship upon which we can each draw should we need support, from borrowing their lawn mowers to shovelling our driveways should they fall sick. The simple act of gathering together does not necessarily mean that people will like each other or enjoy each other's company and develop a strong, meaningful relationship (Field, 2003); even so, weak ties do provide an important source of social connectedness that expands beyond our immediate family and inner social circle to enlarge our sense of connection and belonging.

In addition, acquaintances can provide a bridge to information and opportunities beyond those available through our inner circles (Granovetter, 1973). We hear the latest gossip within the neighbourhood by chatting with our neighbours. In this sense, weak ties in the social space give individuals access to resources that help advance their social position and 'get ahead.' These resources are otherwise unavailable from our stronger ties (Lin, 2001). Gardening, as a shared identity marker (McPherson et al., 2001) among an otherwise diverse group of individuals, thereby becomes a powerful instrument to shape the information received, the behavioural patterns cultivated and the social relationships and interactions. In this context, by facilitating diverse relationalities – through a potential combination of strong and weak ties – the activity of gardening in different types of social spaces contributes to addressing the relational aspect of the loneliness crisis.

GARDENS AS PUBLIC SPACES

Hall (1963, 1966) regarded what he deemed public space as representing a more distant and anonymous area in which we interact with others. If individuals feel a disconnection from a shared understanding or purpose in the more public aspects of their social environment, they may experience collective loneliness and a sense of isolation from a broader societal or existential framework (Cacioppo et al., 2015). Beyond strong and weak ties, then, gardens as public spaces play a meaningful role in exposing us to invisible ties – that is, familiar strangers or so-called 'nodding relationships' that are 'recognized from regular activities, but with whom one does not interact or

communicate’ (Jackson et al., 2017, p. 9). Put differently, invisible ties remain anonymous, albeit recognisable social connections that ‘become known over time and are no longer interchangeable’ (Felder, 2020, pp. 7–8).

For example, while gardening, we may spot a passer-by on the sidewalk next to our property whom we recognise as someone who routinely walks within our neighbourhood and with whom we may exchange nothing more than a nod or a smile (see Glover et al., 2023). While the brief exchange may seem inconsequential, that person, over time, becomes a familiar feature of our local environment and, therefore, adds to our public familiarity, predictability and sense of security (Leyden, 2003). Greater familiarity generates what Horgan (2012, p. 619) referred to as ‘soft solidarity,’ a form of mutuality recognised and sustained by apparent strangers without a requirement for explicit recognition. Accordingly, activities such as gardening in public spaces, which Glover (2022) described as leisure-in-public, can expand our imagined geographies by facilitating ‘spontaneous ‘bumping into’’ people, which ‘can help to encourage a sense of trust and a sense of connection between people and the places they live’ (Leyden, 2003, p. 1546). In harsher terms, Sennett (1971) referred to this type of interaction as *social friction*, which he described as the little inefficiencies that force people to interact with strangers, which may culminate in a mutually acknowledged familiarity. Whatever its name, facilitating positive social interaction among strangers through gardening matters as an important step toward promoting prosocial behaviour and building social connectedness for those experiencing collective loneliness.

CONCLUSION: GARDENING AS A REMEDY FOR THE LONELINESS CRISIS

Social isolation and loneliness pervade disturbingly across the globe and show no sign of abating. While macro policy initiatives to combat loneliness at the national level are welcome and necessary ways to address this growing problem, small-scale, local activities that encourage people to connect at the micro level warrant serious consideration as potential, everyday solutions, too. Garden spaces and the act of gardening, as argued in this chapter, offer us opportunities for authentic and meaningful connection and contain the very real potential to strengthen our social ties. No matter the strength of the tie we develop – whether those ties are strong, weak or invisible – it establishes for us a meaningful connection that can have positive implications for our health and well-being. Viewing gardens as intimate, social and public spaces may enable us to reconceptualise gardening as an activity that can assist us in building meaningful connections with others. With this in mind, governments and communities ought to consider ways to incorporate gardening into their policy frameworks and interventions. Moreover, social prescribing, the medical referral of activities to patients deemed in need of greater social interaction for their health, offers an intriguing way to link activities with therapeutic social benefits, such as gardening, to traditional clinical practice. Ultimately, gardening ought to be viewed as a genuine solution to the crises of social isolation and loneliness.

We must acknowledge, however, that social interactions within garden spaces do not always guarantee the development of quality relationships to solve loneliness. We, as gardeners, can come together, but it doesn’t mean we will like each other or enjoy time in each other’s company. Moreover, gardening and garden spaces do not necessarily give rise to relationships with diverse others either. We tend to associate and bond with those similar to ourselves, a tendency referred to as *homophily*. Public forms of gardening facilitate opportunities for us to get to know each other because they bring people together who share the same interests (i.e., other gardeners) or the same identity markers (e.g., neighbours from the same neighbourhood). In other words, similarity naturally breeds association. In doing so, homophily can restrict our social circles in a manner that significantly influences the information to which we are exposed, the attitudes we develop and the interactions we encounter (McPherson et al., 2001). To diversify our networks, we must be willing to bridge to different groups in ways that transcend our own identity markers.

Ultimately, for us to encounter others and welcome the opportunity to get acquainted, we must first notice each other. Fortunately, as an outdoor activity, gardening brings us out of our private homes into neighbourhood or community spaces, thereby facilitating organic opportunities to interact with those who occupy the same space, voluntarily or not. We know nature activities within a community context, such as spending time in community gardens or in front yard garden spaces, effectively increase social interactions in communities to strengthen social cohesion (Oh et al., 2022). In this sense, gardens represent important social infrastructure (Klinenberg, 2018). As such, gardens exert spatial separations, boundaries and practices that influence how we, as individuals and groups, relate to one another and how we relate to ourselves. Gardening researchers must critically explore how and why individuals and groups are granted or denied access to garden spaces, thereby resulting in social connection or disconnection. Doing so exposes exclusive isolating practices within garden spaces that privilege certain groups over others.

The content contained in this chapter offers direction for future research on crisis gardening as a means of confronting the epidemic of social isolation and loneliness. The associations outlined above provide the theoretical foundation for empirical and interpretive inquiries focused on the relationship between garden spaces and social connectedness. Given the severe crises of social isolation and loneliness that pervade across the globe, the ability of gardening to address these crises merits further investigation. Doing so will presumably work to further underscore the benefits of crisis gardening as a meaningful activity for social connection.

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8 Meaningful Activities during the COVID-19 Public Health Crisis

Benefits and Challenges of Home Food Gardening in Santiago, Chile

*Constanza Cerda-Gosselin, Solène Guenat,
Monika Egerer and Leonie K. Fischer*

INTRODUCTION

Home food gardening is a traditional part of food production in cities (Taylor & Lovell, 2014), besides other types of food production such as that happening in community gardens (Guitart et al., 2012) or in agricultural farms (Mok et al., 2014; Orsini et al., 2013). Home food gardening is practised in many cultural and geographic contexts (Azunre et al., 2019) – especially during times of crisis. The role of producing food at home aligns with the concept of crisis gardens, which has been adopted by some researchers to refer to food gardens developed in contexts of hardship and collective crisis, specifically (Čepić & Tomićević-Dubljević, 2017; Katz, 2020; Schupp & Sharp, 2012). Studying the role of home food gardening during crises is crucial due to its significance for individuals and communities alike: Beyond its practical implications in ensuring a more secure food supply, home food gardening takes on a broader significance as a source of hope and resilience during uncertain times. In the face of crises, cultivating one's food at home also becomes a symbol of self-sufficiency and empowerment.

Iconic examples of these crisis gardens are those developed during World War I and II. 'War gardens' were a nationwide strategy in the United States to encourage citizens to cultivate food as part of their patriotic duty, transforming times of food shortages into abundance (Herrmann, 2015; Schupp & Sharp, 2012). During the same war periods, food gardens were created throughout Europe mainly as 'allotment gardens' (Čepić & Tomićević-Dubljević, 2017; Vávra et al., 2018). In countries such as Romania, Albania and the Soviet Union, food gardens had an essential role as food resources in those uncertain times (Vávra et al., 2018). The Great Depression, i.e., the economic crisis taking place between the two World Wars, also led to the creation of new home gardens. Those, called 'Relief gardens,' were developed, increasing the number of home food gardens in the U.S. by 17% (Mullins et al., 2021). Posterior surges in home food gardening were a reaction to the 1970s oil crises in the U.S. (Čepić & Tomićević-Dubljević, 2017), the political instability in Cuba in the 1980s (Galhena et al., 2013) and the dissolution of the Soviet Union in the 1990s (Galhena et al., 2013; Vávra et al., 2018). The Great Recession in 2008 marked a more recent economic crisis that boosted the development of home food gardens in Greece, Spain, Portugal and Cyprus (Čepić & Tomićević-Dubljević, 2017; Mullins et al., 2021). During the last years, home food gardens have been implemented to cope with humanitarian crises, such as the refugee camps in the Middle East (Katz, 2020), the under-nutrition situation in slum areas of the Peruvian capital of Lima (Galhena et al., 2013) and the rising obesity rates in the U.S. (Herrmann, 2015).

In the recent context of the COVID-19 health crisis, different motivations for home food gardening were identified all around the world. While producing their own food, people tried to handle local food shortages, minimised the frequency of shopping trips to avoid contagion and used gardening to cope with the stress experienced because of the global pandemic (Montefrio, 2020; Nicola et al., 2020). Gardening also turned out to be a family activity, relevant for parents to entertain their children, to connect to neighbours or simply as a new hobby to reduce boredom as people spent more time at home (Chenarides et al., 2020; Kingsley et al., 2022; Mullins et al., 2021; Sunga & Advincula, 2021). In this context, it is opportune to delve into and acknowledge the significance that home food gardening has held for individuals amidst the COVID-19 health crisis. Consequently, the primary objective of this chapter is to scrutinise the implications of home food gardening during the COVID-19 health crisis for those actively engaged in gardening. To achieve this goal, we specifically examined the benefits and challenges identified by gardeners during this time. We based our investigation on Santiago de Chile (henceforth ‘Santiago’) as a case study of a large metropolis. Santiago is the capital and the most populated city in this South American country, with 5,250,565 inhabitants (INE, 2017). It is located in a central valley between the Andes and the coastal mountain range. The climate is originally Mediterranean semi-arid, but the city has experienced a critical decrease in rainfall in recent years, leading to a more arid climate and water scarcity (Alvarez-Garreton et al., 2022). Lately, the cultivation of food plants at home has gained popularity in Santiago, particularly due to the creation of community gardens by local stakeholders, including non-governmental organisations, artists, neighbourhoods and university groups (Contesse et al., 2018). Some public initiatives now support gardening activities, focusing mainly on community gardens (Contesse et al., 2018). In more private settings, home food gardens (Figure 8.1) are locally abundant and together account for one-third of food gardens in Santiago (Casanova, 2016), opening the possibility that food gardening is a relevant practice here.

As the city experienced several citywide lockdowns, the impact of the COVID-19 health crisis was strongly felt in Santiago, with severe social consequences (Anigstein et al., 2021). The strictest measures prevented individuals from leaving their homes unless they had a special permit, even for essential activities such as grocery shopping or taking a walk (Aguilera et al., 2022). Measures also included highly restricted access to public green spaces, for example, large-scale parks, local green areas and community gardens. Therefore, people had limited opportunities to visit green spaces and were confined to experiencing nature mainly within their private spaces.

METHODS

STUDY DESIGN

We developed an online survey on the topic of home food gardening and its benefits and challenges during the COVID-19 health crisis and distributed it between 22 March and 25 April 2021, during the second wave of the COVID-19 pandemic in Chile. The survey targeted people growing food at home during this health crisis in Santiago, including people who started gardening before or during the pandemic. Our previous study (Cerdeira et al., 2022) focused on quantitative data obtained in the questionnaire. This study conducts a qualitative analysis that focuses on respondents’ subjective experiences, thus contributing to a more complete picture of home food gardening in Santiago. Thus, this chapter delves into exploring how home food gardening became a meaningful activity during the COVID-19 health crisis and the benefits and challenges gardeners considered relevant for them.

QUESTIONNAIRE DEVELOPMENT

Our study is based on the gardening experiences of gardeners from a qualitative perspective that was assessed in a section of a questionnaire in which respondents were asked to answer the optional



FIGURE 8.1 Pictures of home food gardens across Santiago during the COVID-19 health crisis provided by survey respondents.

open-ended question: *Is there anything I would like to share regarding my experience in practising home food gardening during the pandemic?* Answers given needed to be brief, i.e., not exceeding 100 characters. Even though the question was phrased as an open-ended question, and people were not especially encouraged to comment on a specific topic, the responses often expressed the role home food gardening played for them and addressed some of the benefits and challenges they faced during the pandemic. Consequently, we acknowledge the most relevant issues and gain a deeper insight into the experience of people who gardened during the COVID-19 health crisis based on their own words and interests.

The questionnaire included a general introduction at the beginning that explained how the questionnaire was structured and in which context it was developed. Ethical review and approval were not required for the study on human participants in accordance with the local legislation and institutional requirements. The questionnaire, however, featured a disclaimer stating that all replies were treated anonymously and that respondents had to be older than 18 years to participate. Participants could leave the survey at any time. The survey was distributed through snowball sampling, which began with initial ‘direct’ messages to 360 followers of a related Instagram account (Cerdeira et al., 2022).

DATA PREPARATION AND ANALYSIS

In total, 130 respondents out of 305 answered the open-ended question used as a database for this chapter. With this sub-sample, we made a content analysis (Krippendorff, 2004). That is, the 130 responses were carefully read, and minor spelling errors were corrected. Subsequently, through a qualitative analysis, patterns and emerging themes were identified in the extracted quotes. This involved grouping similar responses to pinpoint key themes related to home food gardening, such as motivations, challenges, perceived benefits and changes in behaviour during the health crises. These general themes were defined based on a literature review of similar home food gardening studies in terms of topics and methods during the COVID-19 health crisis (Katz, 2020; Montefrio, 2020; Sunga & Advincula, 2021). Afterwards, data was coded by assigning descriptive labels to specific segments of the quotes. These codes reflect central concepts or ideas present in participants' responses, facilitating the organisation and subsequent analysis of the data. The topics were then organised as representing benefits (4 topics) or challenges (4 topics).

A comparative analysis was conducted between responses from different participants to highlight similarities and contrasts. This helped identify recurring patterns and provided a better understanding of the diversity of experiences surrounding home food gardening during crises. Finally, a comprehensive narrative was constructed, integrating key findings. This step involved synthesising the collected information to provide a holistic and contextualised view of how individuals experienced and attributed meaning to home food gardening during times of crisis.

SAMPLE DESCRIPTION

Respondents who provided qualitative answers were predominantly women (77%), with their ages equally distributed under 65, but with an underrepresentation among those over 65 years old (1%). Almost half of the respondents (45%) began home food gardening at the start of the COVID-19 health crisis. The majority (77%) had their food gardens within their houses, 21% in apartments and 2% in other locations, such as sidewalks or tree pits (Figure 8.1). In the following sections, example quotes are linked to an indication of whether a respondent was a 'crisis gardener,' that is, the person started home food gardening during the COVID-19 health crisis, or an 'established gardener,' that is, the person started home food gardening before the COVID-19 health crisis.

STUDY LIMITATIONS

The present study is based on a specific case study and focuses on the immediate effects of the COVID-19 health crisis; therefore, results might not capture the long-term impact of home food gardening on participants' ecological consciousness, food habits and emotional well-being beyond the crisis period during which they were participating in our survey. Yet, future studies could help further validate and expand upon these initial findings by assessing whether effects manifest in times outside the crisis and how people perceive home food gardening when food supply is more stable.

RESULTS AND DISCUSSION

PERCEIVED BENEFITS

The qualitative data highlights that people perceived benefits from home food gardening. In particular, four themes were identified that described the respondents' understanding of gardening, namely how the practice supported (1) Relationships with nature and ecological consciousness, (2) Family and social bonding, (3) Emotional well-being and (4) Food supply. Generally, people were restricted in their contact with urban nature, such as in public green spaces, and their answers in our survey expressed that relationships with nature were improved by home food gardening. They mentioned

that gardening allowed extended periods of nature observation and that they could witness the complete life cycles of plants and gain a deeper understanding of the intricate ecosystem processes. A respondent mentioned:

By being more at home, you can see in more detail the growth of the plants (female, crisis gardener).

The interviewed gardeners expressed that the act of nurturing plants and witnessing their growth instilled a deep sense of connection with nature in them. As one respondent stated:

I have become more conscious about caring for the environment. Interest in composting (female, established gardener).

Thus, a profound connection with nature also sparked a heightened sense of environmental consciousness, opening avenues for ecological awareness and sustainable practices. Urban environments usually present additional challenges in terms of allowing connection with nature due to high population density, physical and cultural disconnection from agricultural practices, and a general scarcity of green spaces (Katz, 2020). The allocation of more time at home due to the COVID-19 pandemic has already been identified as a key factor in increasing time spent in food gardens (Chenarides et al., 2020; Garre-Olmo et al., 2021). Home food gardening heavily depends on the availability of time and the presence of free manual labour within households (Darly et al., 2021), and both of those increased during the health crisis period, allowing people to spend more time tending plants at home (Pérez-Urrestarazu et al., 2021).

The results also suggest an enhanced environmental awareness during the moment of health crisis that has led to an exploration of sustainable waste management practices. We, therefore, assume that individual practices such as home food gardening can be gateways to other relevant, sustainable practices. Incorporating composting, vermicomposting or other waste management practices into home food gardening presents an opportunity to recycle soil nutrients within urban areas, thus establishing a potential for a sustainable urban metabolism (Lake et al., 2012).

In parallel, many respondents expressed how the presence of a home food garden during the pandemic played a vital role in fostering unity and connection among close family members in times of high social isolation. From their answers, we draw that engaging in gardening provided a unique opportunity to come together and strengthen bonds during challenging times. Respondents expressed how:

[Gardening] has been an excellent activity and entertainment for the whole family, especially the children (female, established gardener), or

It has been the best during this pandemic, allowing us to unite as a family (female, crisis gardener).

From these quotes, we learned that the shared experience of tending the garden created a sense of togetherness and became a valuable source of joy and connection. The family garden became a platform for the children's exploration, where they played, learned and discovered nature. Responses also expressed how such connections did not only happen with the family but exemplify how respondents perceived gardening to facilitate connections with neighbours as well:

Bartering, in my case by sharing plants or tomatoes, generates a pleasant atmosphere among neighbours (male, established gardener).

The connection-building aspect of crisis gardening highlighted here aligns with previous studies before and during the COVID-19 pandemic, identifying motivations to get involved in home gardening to include the desire to educate children about food origins, establish a connection with nature,

cultivate an interest in gardening and self-sustainable food production (Conway, 2016; Kingsley et al., 2022). Cultivating a (family) garden can thus serve as a bridge to build relationships within the neighbourhood, thereby fostering a sense of community, goodwill and mutual assistance, and contributes to creating social capital (Machida, 2019; Van Lier et al., 2017). Even during the COVID-19 health crisis, gardeners emphasised the significance of engaging with neighbours and the community for resources and advice (Katz, 2020). By bringing people together, gardens became catalysts for forming new bonds, strengthening family ties and exchanging experiences and knowledge.

We also learned that engaging in home food gardening during the pandemic played a profound role in improving individual's emotional well-being, with respondents identifying home food gardening a good way for coping with stress; e.g. a respondent stated how:

[Gardening] is a good way to release stress and to have a space for oneself (female, crisis gardener).

Our data indicated that the meditative and therapeutic benefits of gardening, finding solace in a meaningful and captivating hobby during a period characterised by uncertainty, were key here, though varied. Levels of help ranged from extremely therapeutic, with one respondent describing how:

Gardening got me out of depression (female, crisis gardener)

to significantly increasing the subjective well-being, with a respondent exclaiming:

Cultivation in this pandemic has brought happiness and *tranquility* to my life. I am happy! (female, crisis gardener)

These statements illustrate the multi-faceted well-being benefits that home food gardeners perceive from the practice (Figure 8.2). Further statements exemplified how gardening provided not only a relief to work-related stresses but also had a larger contribution to overall mental health. Others found that stress relief was already the primary driving force behind starting a home garden in Chile pre-pandemic (Home & Vieli, 2020). During the long confinement periods, people were forced to adapt their lives by incorporating work, homeschooling and childcare into daily life at home, along with the uncertainty of the unexpected outcomes of the COVID-19 pandemic. Consequences for people's mental health and well-being included stress, loneliness and depression (Buckner et al., 2021; Kasar & Karaman, 2021; Lades et al., 2020; Pouso et al., 2021), while a generalised increase in sedentary lifestyles compromised people's physical health (Cheval et al., 2020). Yet individuals who practised home food gardening during the COVID-19 pandemic experienced notably higher emotional well-being, mental health and sleep quality, as well as physical health (Corley et al., 2021). Joy and fulfilment were expressed by gardeners as they engaged with their gardens, transforming them from mere sources of food or entertainment into meaningful endeavours. Growing one's own food also brought a sense of distraction and enjoyment of the ability to create delicious meals using their own harvests.

Respondents also described the importance their home gardens had in providing food security during the lockdown periods. As one respondent mentioned:

I have always had my garden, the best thing during the pandemic is not needing a permit to buy vegetables (female, established gardener).

Furthermore, the garden offered the opportunity to grow specific food that may have been difficult to obtain during the quarantine. As another respondent noted:

It has allowed me to have herbs that I wouldn't have had access to because they aren't available near me (female, established gardener).



FIGURE 8.2 Illustrations reflecting the benefits of home food gardening during the COVID-19 health crisis, according to the quotations from respondents' open answers. Benefits related to (A) the gardener's relationship with nature and ecological consciousness, (B) family and social bonding activities, (C) emotional well-being and (D) food supply. (Illustrations by C. Cerda.)

Thus, a home garden granted individuals a source of fresh food, reducing their dependence on stores and supermarkets, which was particularly critical and likely emphasised during restrictions on going outside and the low availability of fresh food supplies. Such limitations also led to changes in behaviours, with respondents stating how:

Gardening turned from a hobby to a necessity (male, established gardener).

Consequently, the garden provided a source of stability when access to external resources was limited. Historically, such changes in behaviours and motivations to garden are common in times of crisis, with gardens often becoming a subsistence activity (Schupp & Sharp, 2012). A willingness to optimise food production, space and time to achieve self-sufficiency and self-preservation has thus been described as critical for gardeners during the pandemic elsewhere (Montefrio, 2020). In

our case, the harvest of food from the garden was also perceived as being particularly healthy, with respondents describing:

I have not saved because I have invested in the garden, but I eat clean and that is priceless (female, crisis gardener).

Such a quote highlights the recognition that people feel that health should not be compromised, even in times of financial constraints. Among gardeners, the perception that their homegrown food surpassed store-bought products in terms of quality emerged. We anticipate that gardens thus provide security not only in terms of food quantity but also in terms of quality.

PERCEIVED CHALLENGES

Respondents, albeit to a lesser extent, expressed challenges they faced during this period. From their comments, we identified four major topics that include specifically the (1) Lack of knowledge; (2) Need to be supported and encourage food gardening; (3) Costs and access to resources (seeds, fertilisers, etc.); and (4) Lack of space (Figure 8.3).

Overall, we draw the conclusion that especially the lack of education and knowledge regarding gardening techniques posed significant challenges for individuals during the pandemic. This related to different fields of knowledge; as for example, one respondent shared:

I have not yet achieved a yield that allows me to sustain myself, perhaps due to a lack of knowledge (female, crisis gardener).

Such statements identify the pre-existing disconnect with growing food in urban areas. Crisis gardeners, who started their food production as a response to the health crisis, felt that they lacked the necessary knowledge to be as efficient in their gardening practices as they wished or know how to deal with pests. This was perceived by respondents as a source of stress and frustration, expressed as follows:

It has been stressful and somewhat frustrating not knowing how to handle pests (male, crisis gardener).

Respondents thus understood the handling of pests and fungi in their home gardens as a real challenge, limiting not only their food production but also the well-being benefits derived from the activity. However, cultivation was also understood by the respondents as a continuous learning process requiring adaptation, extensive reading and experimentation. The practice was thus perceived as both suffering from a lack of knowledge and providing an opportunity to increase this knowledge base. Participants commented that not every attempt at gardening would be successful, as underlined by a respondent noting how:

[Gardening] has been a constant learning process, with plenty of adaptation, reading, trial and error, and sometimes things don't work out (male, crisis gardener).

This learning by error was more prevalent in crisis gardeners who could not build on their previous experiences. Its acceptance, however, reflects that the opportunity to further connect with nature and learn from it, identified here as one of the key benefits, outbalance the short-term frustrations caused by a lack of knowledge base. Similarly, other gardening studies revealed that people lacked intuitive understanding and were unable to seek guidance from friends or family members (Chenarides et al., 2020; Katz, 2020).

Consequently, respondents recognised that there was a need to be supported to facilitate and spread the activity of home food gardening. They expressed a desire for assistance from the

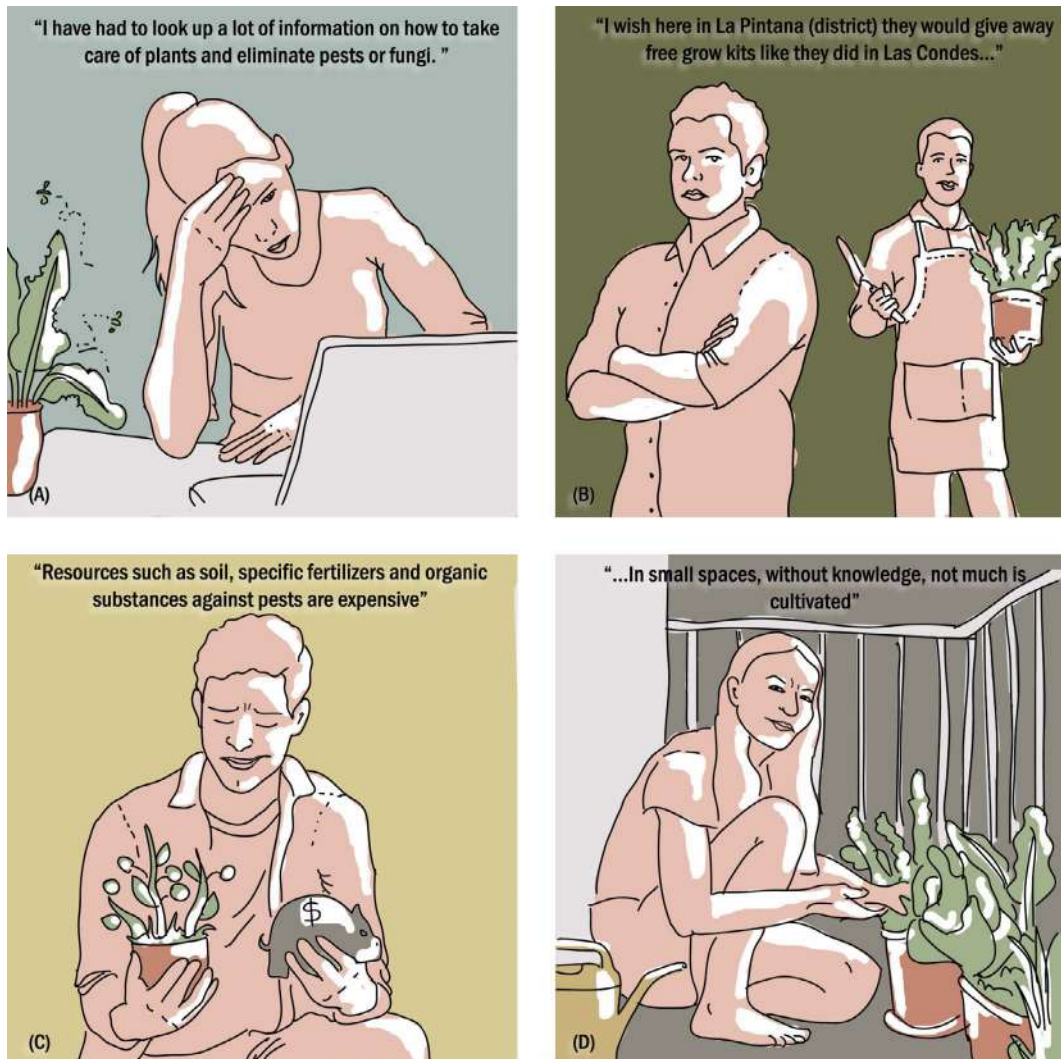


FIGURE 8.3 Illustrations reflecting the challenges of home food gardening according to the quotes from respondents' open answers. Challenges related to (A) Gardeners' Lack of knowledge, (B) the need for support and encouragement of home food gardening, (C) high costs and difficulty in accessing resources and (D) lack of space. (Illustrations by C. Cerda.)

government or institutions in promoting and facilitating home food gardening, revealing a profound need for collective action and support during challenging times. Respondents felt left behind, as respondents expressed:

It would be amazing if the government could assist in cultivating during the pandemic (female, established gardener) and

Hopefully, once the pandemic is over, there will be more gatherings and activities centred around home gardening (female, crisis gardener).

Here, we learn that gardeners may hope for official support that enables individuals to overcome barriers and engage in gardening activities. The desire for further community-building and

post-pandemic initiatives that unite people through a shared love for gardening was expressed on several occasions. This sentiment reflects the recognition that government intervention can play a pivotal role in empowering people to cultivate their own food and derive benefits from the activity. Yet, there was no massive promotion of home food gardening in Chile during the COVID-19 health crisis. Conversely, and as in previous crises in history, some governments and organisations around the world decided to promote home food gardening as a strategy to cope with the generalised food shortages. In Ontario, Canada, profit and non-profit organisations promoted green infrastructures and offered courses on food gardening on green roofs (Nicola et al., 2020). In the Philippines, private and public initiatives emerged, including food growing projects at home and in schools, while government agencies distributed seeds to promote home food gardening (Montefrio, 2020). In the UK, the Royal Horticultural Society saw a fivefold increase in queries for food gardening advice, providing relevant support for gardeners during the first waves of the COVID-19 pandemic (Nicola et al., 2020).

Additionally, the especially high costs of gardening activity and spatial challenges were reported as burdens and constraints in our case study. As one respondent pointed out,

Having horticultural plants is very entertaining; however, the initial and maintenance costs are significant (female, crisis gardener).

Essential items such as soil, fertilisers and organic substances to combat pests were often regarded as costly investments. Respondents admitted that navigating these expenses required significant financial commitment. One respondent, reflecting on the experience, shared,

I have been doing this for a short time, and so far, it has required a significant financial investment. I hope it balances out (female, crisis gardener).

Interestingly, while investments were perceived as a difficulty for respondents, most did not come from the poorer neighbourhoods. This financial strain might thus increase inequalities by hindering access to home food gardening in poorer neighbourhoods. Yet, the lack of resources was also understood as difficulties in accessing resources related to garden maintenance, particularly due to pandemic-related confinements.

Spatial issues were also pointed out as constraints, sometimes surmountable, by some respondents:

Without knowledge, you don't yield much in small spaces (female, crisis gardener), and

Despite not having so much space, I managed and have harvested several foods (female, established gardener).

The reflection on the lack of space was thus also perceived as a characteristic of home food gardening that had to be coped with and, when successful, as a source of pride in being able to grow food despite spatial constraints. Again, such constraints might, however, reinforce the inequalities in terms of access to gardening practices, as it's likely to be more marked in poorer neighbourhoods. For instance, respondents perceived that shared areas in buildings or communal areas should be integrated into gardening concepts. However, they also understood the use of shared places as posing difficulties, for example:

Shared spaces in condominiums are sometimes not respected by neighbours; there is little space (female, established gardener).

Community spaces and condominiums are spaces where many people with different interests interact. Though home food gardening can strengthen the sense of community, it may also increase

conflicts when not all residents perceive it as the best use of shared spaces. We conclude that this gap, both in finances but also in access to resources for gardening and space for gardening, underscores the need for affordable alternatives and support systems. Similar difficulties were common in other countries due to the global interruption of the market chain and an increase in the demand for gardening items (Chenarides et al., 2020; Kingsley et al., 2022; As studies prior to the COVID-19 health crisis also highlighted, ownership of a private garden is a major factor in participating in growing food at home (Darly et al., 2021; McClintock et al., 2016), the need to ensure broader access to gardening plots and practices is crucial. The lack of space could also be defined as a structural barrier related to urban policy and planning agendas (Katz, 2020) and could be addressed to provide access, especially for underprivileged parts of society in a variety of neighbourhoods.

CONCLUSIONS

Our findings regarding the benefits and challenges of home food gardening in the specific context of Santiago highlight the importance of gardening during crisis and its potential for widespread adoption. The qualitative aspects analysed demonstrate how meaningful home food gardening was from the gardeners' perspective. Crisis gardening fostered a profound reconnection with nature: as people faced restricted access to public green spaces, their domestic gardens became sanctuaries of solace and nourishment. Moreover, we discovered that adopting new gardening practices can be a gateway to other sustainable practices in everyday life. In parallel, gardening served as a therapeutic and bonding activity for many, bringing families together and fostering a sense of community with neighbours. Crisis gardening offered respite from stress and uncertainty, instilling joy and fulfilment in the act of cultivating one's own food.

However, we also detected a specific mention of disparities that underscored the significance of promoting home food gardening practices during crises as an essential component of ecological consciousness, food security and community resilience regardless of geographical location or socioeconomic background. Lastly, municipal support would be helpful in building more sustainable neighbourhoods as a whole, underscoring the desire for collaborative efforts and demonstrating that local authorities also promote sustainable practices. Our study, therefore, also highlights the perceived need for proactive support from the government during the COVID-19 pandemic and in shaping a future where home food gardening during crisis is widely supported and accessible to all.

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9 'A Sweet and Quiet Lesson in Motion'

The Pleasures of Pandemic Gardening

Kelly Donati and Nick Rose

That eating may also be a pleasure and that this pleasure is a universal right is an idea that for centuries remained outside the thinking of members of the ruling class, which chose to imagine pleasure as their exclusive privilege.

(Montanari, 2012, p. 75)

INTRODUCTION

The COVID-19 pandemic ushered in a crisis-suffused decade, prompting a global surge in gardening practices (Kingsley et al., 2023). Despite the many practical limitations of quickly starting or scaling up home food production, edible gardening is a well-documented response to social and economic hardship in Australia and globally (Donati & Rose, 2020). Allotment gardens in nineteenth-century Europe, Victory Gardens during World War Two and *organipónicos* in post-Soviet Cuba are all historical examples of crisis gardening (Gaynor, 2006; Keshavarz & Bell, 2016; Viljoen & Bohn, 2012). Recent studies highlight the psychosocial benefits and other positive impacts of gardening for refugees experiencing the trauma, upheaval and uncertainty of armed conflict and humanitarian crises (Tomkins et al., 2019). Food gardening has also arisen in response to political crises that are seemingly less immediate than geopolitical conflict. The 'slow violence' of neoliberalism, characterised by a logic of extraction and exploitation, is manifesting in climate change, environmental degradation and extreme inequality, jeopardising the continuity of social and ecological life worlds (Nixon, 2011, p. 2; Rose, 2021). In urban settings in the Global North, political gardening has emerged as a strategy to address these 'slower' yet no less devastating crises. Food gardening has been mobilised to intentionally cultivate 'innovative relations of care, decision-making and politics of place' in ways that are diverse, complex and at times contradictory (Certomà & Tornaghi, 2015, p. 1123).

Crisis gardening is, therefore, more than an instrumentalist response to the immediate experience of food insecurity (Daněk et al., 2022; Jehlička et al., 2021). Studies on pandemic gardening in Australia and globally document how gardening was therapeutic, offering stress relief, ecological connection, creative expression and social connectedness, despite social distancing mandates (Cerdeja et al., 2022; Egerer et al., 2022; Kingsley et al., 2022; Kingsley et al., 2023). The material and sensory practices of gardening deepen the social, cultural and political significance of food, allowing for the expression of 'creativity, emotional attachments, and prosaic pleasures' (Bhatti et al., 2009, p. 62).

Almost two decades before COVID-19, John Coveney and Robin Bunton observed that pleasure is often overlooked in public health research and policy:

Pleasure appears almost too frivolous a topic to discuss in the face of the earnest struggle against pandemics such as global human suffering. [...] A reluctance to address pleasure may be another

manifestation of medical science's preference for studying the causes of illness rather than health. It may also reflect more deep-seated difficulties with modern western ideas about pleasure and what is considered 'serious' scientific pursuit.

(2003, p. 162)

This may explain why pleasure, the central focus of this chapter, has been only superficially addressed in the crisis gardening literature. Taking seriously the pleasure of gardening during the pandemic, we argue for recognising pleasure in public policy not only for its established health benefits but as a foundation for cultivating a necessary ethic of care in navigating ongoing crises – geopolitical, socioeconomic and ecological – that continue to deepen human and planetary inequity (Friel et al., 2022). In doing so, we draw on a study of pandemic gardening in Australia, delving into qualitative survey data that speaks directly to these pleasures (Donati & Rose, 2020).

The pandemic gardening survey ('the survey') was conducted by Sustain: The Australian Food Network, a health promotion charity we established in 2015. Sustain focuses on supporting the transition to healthier, more sustainable and equitable food systems through research, policy development and community engagement, particularly in urban agriculture. Initiated in June 2020, this national survey aimed to explore the significance of gardening following the first stay-at-home orders in Australia. Comprising 25 questions, the survey delved into what and how much people grew, where and with whom they gardened and the importance of gardening for their health and well-being during the pandemic. Many quantitative questions offered space for additional comment. Because the disruptions to the food system were widely reported during the pandemic, the inclusion of three open-ended questions invited views about the possibilities of the pandemic to contribute to a fairer, more sustainable future, along with perspectives about the importance of urban agriculture and the Australian food system more broadly. The survey attracted over 9,000 respondents; reflecting in part the time people had available to complete the survey, it generated tens of thousands of qualitative comments in the month it was open, forming a unique dataset for exploring the pleasures of crisis gardening, among many other topics.

Our analysis and discussion have a normative orientation. Exploring pandemic gardening through the lens of pleasure, we bring together our work in urban agriculture, farming and food systems governance and integrate conceptual concerns from our respective fields of political ecology, critical public health, the environmental humanities and gastronomy (Donati et al., 2010; Rose, 2021; Rose et al., 2022). Through this productive intersection of our respective disciplinary perspectives, we build on and extend the work of other scholars who point to pleasure as a critically important but overlooked component in public policies for more liveable futures (Coveney & Bunton, 2003; Thompson & Coveney, 2018).

This chapter begins by briefly exploring the tensions and challenges that pleasure presents for public health. Next, we engage with literature relevant to the particularities of pleasure during the pandemic and its relevance to crisis gardening. We then turn to qualitative survey data to explore different modalities of gardening pleasure – gustatory, relational and care-oriented – along with gardeners' perspectives on government policy and action not only during the pandemic but also in the broader context of the systemic inequities and ecological crisis (Donati & Rose, 2020). With gardeners' perspectives in mind, the final section considers the lessons of pandemic gardening as we face current and future crises.

THE PROBLEM OF PLEASURE

Food pleasures encompass both gustatory and deeply social experiences, often expressed through the convivial act of sharing (Montanari, 2012). Pleasure matters, and is made to matter, in often very inequitable ways, influenced by material, temporal, cultural and economic factors (Meah, 2013),

each of which contributes to the broader experience of eating and living well (Dixon et al., 2007). These inequities also encompass how pleasure is subject to moralising discourses in contemporary public health policy discourses (Thompson & Coveney, 2018; Zivkovic et al., 2015).

Food media and corporate food marketers capitalise on the potency of pleasure. Since the early twentieth century, food engineers and food manufacturers have operated within an ‘aesthetic-industrial complex’ designed to produce, measure and operationalise aesthetic responses for profit (Shapin, 2012, p. 10). Multinational soft drink advertisers remind us that ‘life tastes good’ and entreat us to ‘taste the feeling’ (Coca-Cola Company, 2023). Recent KFC advertisements feature the catchy beat and lyrics of a pop hit – ‘I don’t care. I love it!’ – inviting consumers to resist and ‘invert the rationality and asceticism’ of public health exhortations to ‘make healthy choices’ (Phillipov, 2013, p. 386). This digital food landscape, accompanied by the proliferation of fast-food outlets in urban environments and ultra-convenient home delivery services, has been carefully engineered to ‘channel our desires according to forces of the libidinal economy’ (Vodeb, 2017, p. 384).

Given the centrality of pleasure to food cultures and economies, its neglect in public health research and policy is notably peculiar (Coveney & Bunton, 2003). Rather, health promotion initiatives seek to produce ‘self-controlling and self-denying individuals’ (Jallinoja et al., 2010, p. 127). By contrast, the corporate food industry in Australia operates largely unfettered by regulatory constraints in public policy (Lacy-Nichols & Williams, 2021; Slater et al., 2024). In a capitalist marketplace that endlessly manufactures and commodifies the promise of pleasure, the ‘rhetoric of restraint, reason, and rationality are virtually the only tools’ mobilised in public health promotion, prompting calls for new approaches that take pleasure seriously (Thompson & Coveney, 2018, p. 125). Responding to this call, we turn to the ways in which the pandemic created opportunities for pleasure through crisis gardening.

PLEASURE, CRISIS GARDENING AND ‘QUARANTIME’

Pandemic gardening diverged significantly from other periods of crisis gardening. Social isolation mandates heightened anxiety amid social distancing and job losses, but also gave rise to the experience of ‘quarantime’ in which the rhythms of working life were radically disrupted for many (Irons, 2020). The pandemic has also been described as a ‘crisis of pleasure,’ resulting from the constraints on hedonic consumption, such as dining out and travel were prohibited (Soto-Vásquez et al., 2023). Outside the commodified exchanges of the marketplace, the simple pleasures of touch – a caress, hug, kiss or even handshakes – were also denied and fraught with new dangers.

While normal avenues for pleasure dwindled, studies have examined the emergence of new pleasures in everyday life, including widespread experimentation with food practices such as bread-making, baking, fermenting, and, of course, gardening (Harding et al., 2022; Hoolohan et al., 2022; Lindsay et al., 2022). Quarantime may have sharpened appreciation for the joys of gardening or simple pleasures that might go unnoticed in the hurly-burly of everyday life (Klaver & Lambrechts, 2021; Marsh et al., 2021). Other studies explore the immediate yet fleeting hedonic pleasures, as well as the deeper eudemonic pleasures tied to the sense of fulfilment or meaning that gardening and its care practices engender (Brückner et al., 2021; Daněk et al., 2022; Giraud et al., 2021).

However, these pandemic pleasures were not universal. Many women faced intensified domestic burdens, single-person households grappled with loneliness, and essential workers in health-care, education or food processing encountered new stressors and risks (Brückner et al., 2021). The inequitable distribution of pleasure also manifested in pandemic restrictions in Australia. The starkest example was when, at the time our survey was open, vulnerable communities – First Nations families, refugees, migrants and people with disabilities – across nine public housing estates in Melbourne were subject to ‘hard’ lockdowns. Initially banned from leaving their apartments for five days (later deemed a violation of Victorian human rights law), residents’ outdoor

access was then confined to fenced exercise yards under police watch (Kelaita et al., 2023). Under less targeted pandemic restrictions, some local councils shut down community gardens entirely (Maddock, 2020). Even where they remained open, stay-at-home orders limited outdoor exercise to one hour per day, significantly constraining garden activities for those who did not have private space, particularly in Melbourne, which was one of the world's most locked-down cities by late 2021 (Macreadie, 2022).

GARDENING FOR PLEASURE DURING THE PANDEMIC: SURVEY FINDINGS

Within the survey's qualitative data, three interrelated categories of pleasure emerge: gustatory, relational and care-oriented. These categories were defined as:

1. *Gustatory* pleasures are overtly gastronomic, relating to flavour or culinary expression.
2. *Relational* pleasures stem from convivial practices of sharing and connecting with others.
3. The third category concerns *the pleasures of care* within and around the garden, fostering intimacy and togetherness with human and more-than-human communities.

GUSTATORY PLEASURES

Not surprisingly, a significant joy of gardening is the food it produces. Many gardeners appreciated the superior flavour, freshness and diversity of homegrown produce compared to supermarket offerings. Some gardeners observed that children and grandchildren were more likely to eat produce from the garden than from the supermarket. Gardeners expanded their culinary repertoire in both ingredients and practices, which this gardener experienced as a form of love: 'I love learning about native bush foods, growing them myself and adding them to our diet. [...] I want to ferment and preserve even more than I do now...I am so in love' (Gold Coast, 35–44 years old).

Many gardeners also described how the pandemic's slower temporalities not only deepened their appreciation of cooking and eating but also transformed the previously burdensome activity of gardening into a meaningful practice that became 'second nature and the new normal' (Melbourne, 25–34 years old). Meals became something to look forward to, with gardening and cooking punctuating the hours and days, which felt increasingly undifferentiated as the lockdowns wore on.

Gustatory and spiritual fulfilment became deliciously entangled: 'The freshness of tasty herbs are paramount! It is great for mental health and bonding with others. It brings me joy, enormous pleasure and makes the soul sing' (Sydney, 45–54 years old). The meditative tasks of the garden were experienced as nourishing for the body and soul while intensifying the pleasure of anticipating meals to come:

It's good for my soul – and my body. It gives me a moment to 'ground' myself and slow down. Whether it's weeding, pruning, planting or harvesting it's always a manual but thoughtful process that if done well – and with meaning – pays off by providing nourishment...

(Melbourne, 55–64 years old)

These comments suggest that, in crisis, gardening is rarely motivated by purely instrumentalist outcomes, with pleasure often just as much as, if not a more powerful motivator than health and well-being (Chalmin-Pui et al., 2021; Donati et al., 2010). While the hedonic pleasures of gustatory enjoyment may be immediate and fleeting, the decommodified food of the garden provided

gardeners with a sense of not only being well-fed but also deeply nourished. While eating delicious produce is a subjective pleasure experienced by the individual, gardeners also sought to share these pleasures with others. This brings us to the relational pleasures of crisis gardening.

RELATIONAL PLEASURES

Social distancing requirements heightened the appreciation for the garden's convivial possibilities. Gardeners shared knowledge online, swapped produce over fences and left produce on the footpath to share with others. The survey findings also reveal the joy that came from observing others' pleasure:

I love watching my family sneak out into the garden to see what is ripe and devouring fresh produce before it even has a chance to make it inside.... I love seeing the look on my daughter's face when she is trying a food that we would typically buy from the supermarket and seeing her face light up when she is excited by how good it tastes.

(Brisbane, 45–54 years old)

Some gardeners extended their garden to the front yard or median strips. This conscious choice to share the garden's abundance was often rewarded with other convivial pleasures: 'I've experienced some lovely interactions with neighbours due to the new "grow free" cart. Some even leave little notes: heart-warming and joyful' (Melbourne, 55–64 years old). Giving joy to others also brought deeper meaning to the garden:

Passers-by who stop to chat is a source of joy and brings a sense of belonging to a community of gardeners. Passing on this love and appreciation of growing vegetables, fruit and flowers to grandchildren and others feels like a worthwhile thing to do.

(Melbourne, 65–74 years old)

Expanding gardening into public spaces during the pandemic goes beyond the utilitarian aims of maximising personal pleasure or increasing production. Blurring private and public spaces cultivated a sense of community, powerfully demonstrating how the pleasures of crisis gardening were as much in sharing as eating. Importantly, these acts of generosity can be seen as micro-expressions of solidarity that acknowledge and respond to our collective capacity for pleasure in ways that both offer and invite support. This leads us to care-based pleasure.

PLEASURABLE PRACTICES OF CARE

Gardeners also found pleasure in the slow, mindful labour of caring for the garden. One gardener said: 'There is such satisfaction and pleasure in caring for a garden. Planting, growing, harvesting is a very positive way of keeping in touch with the rhythm of life when the future seems so insecure' (regional Victoria, 75+ years old). Some found greater enjoyment in the intellectual labour that gardening demands, experiencing a pleasurable confluence of mental and embodied labour in researching companion planting and how to best care for plants. While gardeners took joy in feeding friends and family, others pointed to how weeding, composting and other tasks were pleasurable because they nourished the creaturely communities of the garden, such as chickens, lizards and even dogs. Observing bees feeding in the garden was a particular source of joy for some: 'Watching all the native bees going crazy over my pineapple sage makes me happier and more content than you could believe' (regional New South Wales, 35–44 years old).

The garden was also a space of enchanting encounters and co-flourishing. An Adelaide gardener (75+ years old) spoke of his garden's reciprocity, which brought him 'pleasure and

sanity' during the pandemic: 'Plants don't talk back but grow and show a great deal of love and affection.' Encounters with lizards and bees were experienced as joyful visitations that alleviated anxiety, while others felt the song of birds brought companionship and reduced loneliness. After the Black Summer of 2019–2020, followed by the loss of her mother in March 2020, this gardener described the slower temporalities of the garden as a pleasurable way to ground herself in the present:

Watching things grow, helping them into the world, has been enormously comforting. In a year where things feel like they've been put on pause, the inexorable growth of our vegetables has been a sweet and quiet lesson in motion. A sense of things carrying on.

(outer Melbourne, 25–34 years old)

Through these slow pleasures, crisis gardening mitigated despair, cultivated hope and engendered health and well-being through a deeper appreciation of the mutual flourishing of a well-cared-for garden.

POLITICAL DIMENSIONS OF CRISIS GARDENING

The survey's open-ended questions elicited extensive commentary about climate change, broader structural inequities in Australia and systemic political failures to take effective action. Some gardeners pointed to local government initiatives (such as the City of Greater Bendigo) to integrate gastronomy as a policy priority but lamented the lack of wider impact:

'Crisis gardening'...builds on [work done] over the past two decades in our community...[While] local governments are developing policies in an irregular manner across the country for food systems, public space, environment and sustainability, climate change and even now gastronomy...[w]hat is missing is coordination of effort for implementation in the community and resources to allow the actions to be implemented on the scale required.

(regional Victoria, 55–64 years old)

There was palpable frustration with the lack of government policy and investment. Many offered stories of encountering obstruction, risk aversion and indifference from their local council.

Gardeners also reflected on the inequitable distribution of the garden's pleasures, with some acknowledging their own privilege in having access to a garden. Housing was a common theme in these comments. This gardener expressed concern for residents in the aforementioned public housing estates: 'If I was locked in a tower [...], I'd likely be insane by now. I'm so sad for those people who can't go outside to breathe, turn the soil, or smell a flower' (regional NSW, 55–64 years old). Others pointed to housing affordability as limiting equitable access to the pleasures and delights of the garden, particularly for young people. Some gardeners shared painful stories about losing their gardens due to evictions or landlords who prohibited growing food outside of pots, underscoring the precarious nature of access to the pleasures derived through gardening facing renters. These and other inequities prompted calls for not only more government support for edible gardening on public land but also better-quality public housing and urban development.

Gardeners' comments often extended beyond edible gardening to broader systemic and structural issues. Some tentatively regarded the pandemic as an opportunity 'to rethink what makes a good life' (regional Victoria, 55–64 years old). Pandemic interventions to protect public health were seen as evidence that radical and immediate change was not only possible but urgently needed beyond the pandemic: 'It is time to reorder society. Forty years of neoliberal ideas and platforms have caused too much inequality' (Melbourne, 75+ years old). Many gardeners called for a profound

re-imagination of Australia's economic and agricultural systems. Thinking beyond national borders, this gardener described the slow violence of capitalist agriculture as a fundamental threat to the webs of life that sustain us, likening it to a psychic crisis on a planetary scale: 'Huge, impersonal and automated farms deny the rights and well-being of every living creature. [...] We have got this gift of eating so very wrong. This is no longer food, but a slow form of suicide' (Melbourne, 65–74 years old). Such perspectives highlight how gardeners' personal experiences during the pandemic promoted broader reflections about the structural factors which shape how they and others eat and live, as well as the possibilities and limitations of edible gardening for social and ecological justice.

DISCUSSION

THE TEMPORALITY OF PLEASURE AND HEALTH

Despite the pandemic's devastating consequences for many, it also acted 'as a rare natural experiment' in how quickly and significantly everyday practices can change with systemic interventions (Lindsay et al., 2022, p. 472). Many gardeners who benefited from increased time during the pandemic reported transformative changes in their cooking and eating habits, many of which were attributed to the pleasures their garden provided for them and their families. Even if these changes do not endure beyond the pandemic, they offer important lessons. If shifts in everyday food practices were as significant as gardeners described in our survey, this suggests the power of pleasure in achieving public health priorities.

Pleasure and health cannot be disentangled from time, as suggested in our study and other literature on pandemic gardening (Brückner et al., 2021; Harding et al., 2022; Hoolohan et al., 2022). The pandemic's slower rhythms 'sweetened' time. People grew, cooked and ate more fresh produce – and *actually enjoyed doing so* – because they had *more time to care* for their gardens, for themselves and for each other. Time is an essential but unspoken ingredient for the *enjoyment* of healthy eating. This suggests that interventions that restructure work in ways to increase 'leisure' time could make a substantive difference to health and well-being under late capitalism (Hoolohan et al., 2022). The relationship between pleasure, time and health warrants further research and recognition in public policy.

THE PLEASURES OF RELATIONAL HEALTH

For many gardeners, growing food engaged the totality of their humanity: what they ate, with whom they interacted and how they experienced the world around them – in some cases, their very sense of self. Gardeners' efforts to find new ways to share the joys of their garden also serve as a reminder that the 'ritual of survival cannot be celebrated by oneself' (Montanari, 2012, p. 124). The garden's abundance invited generosity, strengthened social relations and enabled pleasurable care practices that were material and relational. Through greater attunement to the garden's social and ecological entanglements, the everyday acts of eating and feeding others were experienced as deeply nourishing.

Gardening as a 'transcorporeal practice' nourished gardeners materially and spiritually but also cultivated spaces to nourish others (human and more-than human) through nurturing 'a diverse range of symbiotic relations and interwoven pleasures' (Alaimo, 2016, p. 34). This heightened experience of 'interconnectedness' during the pandemic speaks to what environmental ethicist Paul Thompson calls a 'spirit of raising food and eating as an act of communion with some larger whole' (1995, p. 18–19). The pandemic brought the interdependency of human health to the fore in ways that were both disruptive and frightening. The garden provided a place for interconnectedness to be experienced as pleasurable and nourishing.

GARDENS AS ESSENTIAL CULINARY INFRASTRUCTURE

Food gardening – whether public or private – will not resolve climate change and food insecurity, but the pandemic highlighted the profound health and well-being benefits of *pleasurable* access to decommodified food, especially during crises. Gardeners expressed a desire for greater equity in accessing edible landscapes, seeking out new ways to share the garden's material abundance but also its pleasures. Many recognised pleasure as a shared need rather than a frivolity – even during times of crisis – demonstrating the potency of pleasure in fostering 'collective care for ongoing shared worlds' (Shotwell, 2021, p. 15). The practices of gardeners during the pandemic serve as a form of 'communication by doing' – that is, everyday practices by ordinary people that tell planners and policymakers what they want their community or city to become (Devlin, 2018, p. 581). They offer guidance for how public policy and investment might develop according to a broader set of interests and concerns.

The survey findings suggest a strong appetite for more equitable access to edible landscapes in a post-pandemic future. However, growing housing precarity and inequity in Australia – also noted by gardeners – constrains this vision (Kingsley et al., 2024). A survey of the urban agriculture sector in Victoria, conducted by Sustain a year after the lifting of pandemic restrictions, also suggests that insufficient government investment, a lack of institutional recognition, barriers to accessing land, and volunteer burnout in community organisations hinder equitable access to edible landscapes (Donati & Rose, 2022). Unsupportive regulatory, policy and legal frameworks for urban agriculture are a reality across Australia (Sarker et al., 2019).

Gardeners' calls for political action to expand public infrastructure suggest they view food gardens as essential 'culinary infrastructure' that provide 'social-ecological, nonmarket food sources' and allow governments and communities 'to respond to COVID-19 and future societal shocks' (Elton & Cole, 2022, p. 3). The fact that some local councils in Australia closed community gardens because they were regarded as 'recreational' infrastructure and not an essential service underscores the risk of trivialising pleasure in public policy. Pandemic gardening – and the practices of collective care that it engendered – demonstrate how infrastructures of pleasure can also act as infrastructures of care, with implications beyond the pandemic: 'rethinking the practices of care and the daily means by which we carry out this work is a fundamental act to ensure a dignified life in the face of uncertainties' (Gómez Becerra & Muneri-Wangari, 2021, p. 11). While edible landscapes – both public and private – were important sites for enacting practices of social and ecological care during the pandemic, the question remains how these practices can be sustained and expanded.

CONCLUSION

The pandemic gardening survey was an opportunity for people in Australia to express themselves in the extraordinary moment of radical disruption to everyday life. Thousands of gardeners imagined a future beyond the stunted, commodified horizons of a market economy. They imagined cities and towns in which gardens, verges, parks and orchards were brimming with delicious, fresh produce. They expressed a desire for the pleasures and relations of care engendered by the garden to guide public policy and civic life as a matter of social and ecological justice. Their reflections, only a handful of which are captured in this chapter, expressed a desire to learn from what the pandemic made possible as the foundation for more radical and positive societal and cultural transformation.

Locally and globally, the need for more flourishing ways of living and eating together is no less urgent now than it was during the pandemic. Australia faces social and economic challenges, including a cost-of-living crisis and rising food insecurity, that necessitate significant public policy interventions (IPSOS, 2023). Essential workers whose labour sustained basic services during the pandemic now struggle to afford secure and adequate housing (Azize, 2023). Food gardening is not a panacea, but it can enable a more relational ontology of food that is critical for imagining

new ways of living, growing food and eating in the Anthropocene. We argue that a key lesson of pandemic gardening is to reconceptualise pleasure, not as a frivolous indulgence but as a basic component of social and ecological justice. We challenge Australian policymakers to take pleasure seriously as a central aspect of a life well lived and to recognise growing food as a practice of care that underpins our collective flourishing.

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10 Mitigating a Public Health Crisis

Exploring the Benefits of Gardening for People Living with Dementia through Collaborative Autoethnography

Pauline Marsh, Theresa Scott and Jonathan Kingsley

INTRODUCTION

DEMENTIA AND THE NARRATIVE OF CRISIS

When we hear of dementia in the public realm, it is often in the context of discussions about a looming health and social crisis. These are often prefaced by statements about the growing rates of a life-limiting syndrome amongst an ageing population, for example – a ‘silver tsunami’ of ‘dementia sufferers.’ To be fair, a quick look at the statistics gives credence to a crisis narrative. The [World Health Organisation \(2023\)](#) reports that globally, there are over 55 million people living with dementia, and it is one of the major causes of disability – meaning there are significantly high numbers of care partners also affected. The numbers are rising with each year: 10 million cases annually ([WHO, 2023](#)). In Australia, where we write this chapter, dementia is currently the leading cause of death for women and the second leading cause for all genders. These numbers are expected to double from 400,000 to 800,000 within the next 35 years ([ABS, 2020](#); [AIHW, 2023](#)).

For those living with and experiencing the various types of dementia, the global story is perhaps less of a concern than the personal stories of their own experiences. Dementia is a collection of symptoms caused by neurodegeneration that affects memory, thinking and daily activities ([WHO, 2023](#)). Alzheimer’s is the most common of the diseases, but there is a suite of others that affect mainly older people and, to a lesser extent, people in younger age groups. There is no medical cure, and symptoms worsen over time ([Breijyeh & Karaman, 2020](#)). Symptoms also follow unpredictable trajectories, creating huge challenges for the person living with dementia and their families and care partners ([Thoft & Ward, 2022](#)). Overall, people living with dementia experience varying forms of cognitive disruption (memory disruption, confusion, focus), greater incidence of anxiety and depression, poorer mobility and more chance of falls, apathy, the loss of meaning and purpose in life, and feel more socially isolated than others ([Biggs et al., 2019](#); [Huizenga et al., 2022](#); [Sabat & Warren, 2023](#); [Zhang et al., 2019](#)). People start to experience a ‘shrinking’ and increasingly interior world ([Duggan et al., 2008](#)). As symptoms progress, care-partner stress can increase, and it becomes more difficult to continue living comfortably together at home.

When we dig deeper, there are, as always, nuances to individual situations that complicate any generic ‘crisis’ narrative. In this chapter, we delve into the experiences of our own lives to illuminate these particularities. We approach this investigation as a trio of scholars interested in the health benefits of gardening, who coincidentally share a common bond as adult children of fathers with

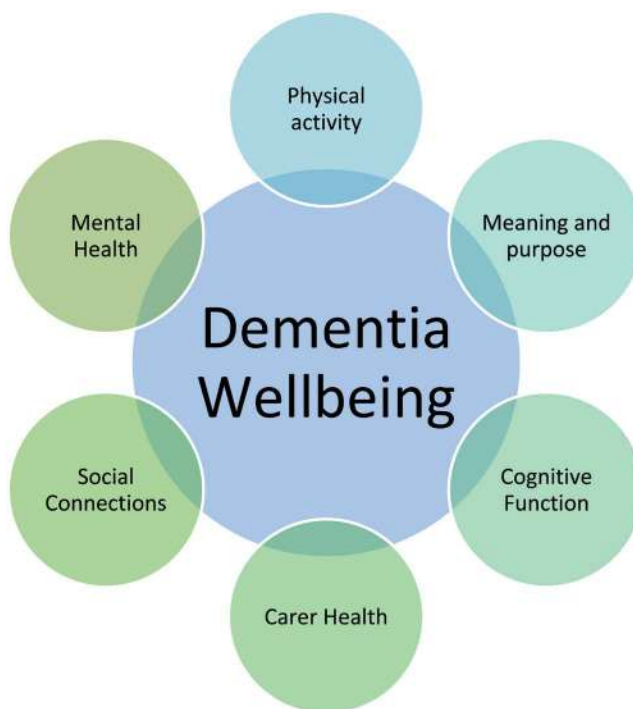


FIGURE 10.1 Domains of dementia well-being..

experiences of dementia. We do not wish to take away from the difficulties that dementia symptoms create. However, our focus slants toward the strong evidence that demonstrates that garden-based psychosocial supports can deliver promising improvements in key areas that impact dementia well-being (see [Figure 10.1](#)).

Drawing on our previous research and the personal experience of our own families, in this chapter, we discuss how and why gardening is a suitable platform for the delivery and uptake of psychosocial supports that can improve dementia well-being. Before we talk about our own fathers, we first provide the theoretical framing for this discussion.

BIOPHILIA, GARDENS AND DEMENTIA

Gardening as a psychosocial enabler – or a form of non-pharmacological intervention – can contribute to alleviating many of the adverse symptoms often linked with dementia, including anxiety, restlessness, depression, and apathy ([Olazarán et al., 2010](#)). Research evidence consistently highlights substantial well-being benefits of being in a garden or involved in gardening activities (such as potting, weeding, watering, sensory engagement, planning garden beds, harvesting fruits, vegetables, herbs, and food preparation) for people living with dementia ([Marsh et al., 2018](#); [Scott et al., 2022](#); [Whear et al., 2014](#)). Gardening research is a sub-set of the greater field of nature connection scholarship, which has strengthened the knowledge and evidence base of the benefits of being and feeling connected to non-human nature ([Richardson, 2023](#)). Gardening offers an accessible and meaningful intervention to promote psychological well-being for individuals experiencing dementia, be it living in their own homes in the community or in aged care facilities. The suite of positive impacts includes those for emotional, social and physical well-being, as well as fostering engagement and a sense of agency.

The importance of designing and maintaining aged care facilities with access to green and outdoor spaces aligns with the broader concept of creating age-friendly environments that support the

well-being and dignity of older people (Hung et al., 2021; WHO, 2007). The emotional and social benefits of gardens in residential aged care settings are complemented by physiological benefits, including fresh air, sunshine, and exercise. The World Health Organisation's Ottawa Charter framework (WHO, 1986) recognises the critical importance of providing opportunities for residents of aged care facilities to connect with nature and the outdoors.

According to the biophilia hypothesis (Wilson, 1984), contact with nature is fundamental to the human psyche. The hypothesis proposes that a bond exists between humans and the natural world that is deeply rooted in our evolutionary past when our ancestors roamed the savannahs. Recent studies have substantiated these claims (Chang et al., 2022). During the course of evolution, verdant landscapes would have provided a safe haven from predators and a place for recuperation. Over millions of years, these repeated experiences in natural environments encoded humans with a behavioural response (i.e. attraction to) and an emotional response (capacity to recover) to natural environments (Wilson, 1993).

The negative impacts of the experience of dementia on health, well-being and quality of life can be profound. Alongside the range of cognitive disruptions, once diagnosed, people with dementia are at increased risk of loneliness and isolation (Victor et al., 2020). A lack of social participation and the experience of being socially disconnected from one's community, in turn, has adverse consequences, leading to an increased risk of anxiety and depression and more rapid cognitive decline (Sun et al., 2021). Conversely, engagement in community gardening offers great benefits for persons with dementia living in the community, as among the social and emotional benefits, they cultivate a feeling of sustained commitment, working towards something of importance and something that leaves a legacy (Scott et al., 2022).

In theory, gardening can be easily incorporated into the daily activities of residential care facilities as activities that provide opportunities for relaxation and contemplation (Whear et al., 2014), social interaction (Murrioni et al., 2021) and increased physical activity (Gebhard & Mir, 2021). The activities of gardening may positively improve mood and behaviour (Liao et al., 2020) and cognition (Bourdon & Belmin, 2021) and foster reminiscence through familiarity with plants. Memories of home gardens may be invoked through contact with plants and gardening activities; gardens may provide many residents of aged care facilities with a continuation of 'home,' a connection to their former gardens and to the 'outside world.' Accordingly, the activity of gardening or access to a garden in such settings presents opportunities not just for leisure but also for enhanced psychological and physiological well-being. Conversely, environments devoid of nature or where access to the outdoors is restricted (or disallowed), as is sometimes the case in aged care institutions, can have profound negative effects on the health and well-being of occupants.

To explore these ideas further, we would like to draw on our own personal experiences as adult children of fathers with experiences of dementia. As academics, we employ the methodology and method of autoethnography to achieve this.

AUTOETHNOGRAPHY

Autoethnography is a qualitative research method where a researcher focuses on oneself as the subject/object, recognising that separating oneself from the research process is impossible as one's voice cannot be hidden, being a reflexive and deeply personal of one's own life experiences (Butz & Besio, 2009; Chang, 2016; Lapadat, 2017; Ngunjiri et al., 2010). What this does is simply 'make the human sciences more human,' bringing the topic alive and allowing the reader into the research through the story, emotions and vulnerability that comes from this style of writing (Bochner & Ellis, 2022). Autoethnography has gained significant popularity in recent times because it addresses issues around representation and incorporates the power of storytelling into the academic discipline at a personal level to explore cultural experiences and epiphanies being evocative, engaging and having a plot, thus being therapeutic for the research and reader together (Chang, 2016; Ellis et al., 2011; Lapadat, 2017).

By creating a personal narrative, ‘autoethnographers open their research to a wider audience. In doing so, they shape individual perspectives and influence collective actions’ (Lapadat, 2017, p. 593). This process goes beyond pure storytelling. It involves exploring personal experience in the context of what is occurring in society to help us understand a broader social phenomenon (Chang, 2013; Chang, 2016). In this chapter, the method enables us to critique a narrative of a looming population-level crisis by closely examining how it affects us at the individual level on a daily basis. This personal experience can engage the reader and aid in understanding. Further, we three authors collaborate in order to strengthen, frame, reflect and critically analyse our collective context. This collaborative autoethnography process leads to richer/more trustworthy perspectives and observations because of its multidisciplinary lens and balances diverse perspectives (Chang, 2013; Lapadat, 2017; Ngunjiri et al., 2010). Through this process, as Chang (2013, pp. 111–112) explains, the ‘authors-researchers-participants are encouraged to listen to each other’s voices, examine their own assumptions, and challenge other perspectives.’

In the following section, we tell the stories of our fathers and describe our own experiences as we watched dementia symptoms progress. Acknowledging the unique experience of dementia, the three examples go some way to representing three different stages of a disease trajectory and demonstrate the myriad of individual ways dementia creates personal and social challenges. In each example, we emphasise how the garden space impacts the experiences of dementia for those involved. The first example is of Jonathan’s father, who, at the time of writing, had recently been diagnosed with early-onset dementia. The second is Theresa’s story of her father, who needed care to manage his day-to-day activities, and the final is a reflection from Pauline, whose father died in 2022 with vascular dementia. As you read, we invite you to consider not only the hardships of dementia but also the individual nuances that complicate the global crisis narrative.

OUR STORIES

COMMUNITY GP AND FAMILY DAD: COPING WITH THE GRIEF OF MY FATHERING BEING DIAGNOSED WITH DEMENTIA (JONATHAN KINGSLEY)

Over the last few years, I have tried to write about my dad, but I always hit roadblocks along the way. Shortly after my dad was diagnosed with early onset dementia in 2020, I had this grand idea to write a book about him to try to get down his incredible life journey before he could no longer explain it to me. His early life was difficult with family tragedies, nearly dropping out of medical school, and growing up with a single parent in a religious community. But then he, with the help of my mum, turned that all around by helping others as a community general physician who always had time for his family and patients. I say ‘always’ because, no matter the time, he would be there to see patients with care and compassion (I still remember hearing the phone ringing frequently early in the morning, him quietly answering it and going to see anyone who needed help). Nevertheless, I never remember a time he missed anything I did or we as a family did, no matter how tired he was. And I can only imagine he got very tired – he, to this day, is the hardest working person I have ever met, so there were plenty of stories to get down and to tell about my father’s journey in life. He did this all very quietly, as he wasn’t outspoken or full of meaningless words. If my father were your doctor or you were part of our circle of family or friends, you certainly felt someone who listened deeply to what you were talking about, always, and in return, you would receive wise feedback.

Now, I could blame not getting these stories down on COVID-19 or that I had my own young family, and I just didn’t have time. But the truth is I probably couldn’t bring myself to see this great person start to jumble and mix up his words and ideas, so I held back and made excuses for not writing the book. I thought if I gave it time and we did regular Sunday night walks and dinners and went over enough, we could talk through some of these events, experiences and ideas, and I could piece this together later. But there never was enough time to really go into detail, and as time has passed, my dad’s situation has declined too. He now no longer jumbles the occasional words – you need to

focus hard to understand what my dad is talking about because it doesn't always make much sense. With time, you can always get to an understanding, but the conversations aren't as deep as they once were, and although with his presence, you can still feel his wisdom, he can no longer communicate like he once did. He still feels like the person who always had the answers, but he can no longer do that through words – it is now through silence.

Now, this is not easy for anyone to experience – for my dad, my mum and his kids (my sister, brother and I). And there are many times I want my old father back, but he is still here, and I try my best to make the most of these times; he is present in the moment as our journey is still in its infancy, and he unfortunately will only deteriorate as time passes. For me, the place I have often turned to deal with these thoughts and experiences is to get into the garden and weed, plant, harvest and tidy. This gives me some quiet time to reflect deeply on the experiences I am going through as I observe the slow decline of someone dear to me. This allows my brain to slow down and cry if I need to cry, be nostalgic and reminisce, or get out the anger I feel towards this illness, which is slowly taking my father away.

On the other hand, my dad is happy and healthy, so I don't like to bring these negatives to his incredible story. He is always up for us being around and coming out with me and my kids. We always go to my parents' house (and the kids love it and my dad), and what I have noticed is this man who once was busy in his general practice needs other hobbies. He has found a new joy that I can clearly observe when he is cleaning the garden. His love for this becomes a little obsessive, at times, so much so that my parents' garden is immaculate because it is constantly checked on. The other reason I think he does this is because he likes to be close to the family, but as I have mentioned, he no longer can communicate like he once could. The garden gives him a space to be close to us but not have to be put in situations where he has to find words that are no longer there or act in a certain way that may lead to shame. Specifically, what he does is clean, trim away and tidy the leaves and mess from a self-sufficient garden pretty much while we sit outside, allowing him to dip in and out of the social space without feeling pressure to communicate. This is a safe space for him and a coping mechanism. It is ironic that I have been doing research on the health and well-being benefits of gardening now for the last two decades. I never thought my research would be so relevant to my situation, but right now, it is a place for me to process grief and gain some solace, and in a way, it is the same for my special dad, who is going through a different life journey which I could not even imagine.

MY FATHER WAS NOT A GARDENER (THERESA SCOTT)

In the domain of gardening, my father was far from having a 'green thumb.' He dutifully mowed lawns, passing the chore on to my brothers as they grew big enough to push the motor mower around our arid quarter-acre backyard block. But I know that you need not possess a passion for weeding, raking, or nurturing seedlings to appreciate the aesthetics and innumerable benefits that gardens and nature confer upon us. Since his confinement to a locked ward of a dementia facility, it has become evident to me how the transformative potential of gardens and nature reaches far beyond the act of gardening itself.

Witnessing my father's journey from a decorated policeman with a brilliant detective mind to a man troubled by memory problems and later diagnosed with Alzheimer's disease has been a heart-breaking contrast. Growing up, his presence as a policeman instilled a sense of security in our lives. His cleverness and sharp attention to detail meant that there was no getting away with anything as a child, for Dad had an uncanny ability to see through any of our mischief. It was astounding to witness his remarkable career, which earned him much media attention and numerous humanitarian awards for saving lives and serving his community. Beyond his professional achievements, he embodied a vibrant spirit as a young adult amateur champion sportsman and remained an avid jogger well into his 70s. His charisma extended beyond the realm of policing, too, as he often was invited to take on the role of toastmaster at various events, captivating audiences with his wit and wisdom.

Laughter was, and still is, a constant companion in his presence, and his infectious humour brought joy to those around him. Fathering eight children, he worked tirelessly, holding down two jobs at times to ensure our well-being. He literally had no time for gardening, but he thrived outdoors in nature. In his youth, he loved riding horses, cycling along the bush trails, and swimming in the creek. Later in life, he found joy in leisurely walks, and he relished taking the grandchildren to feed the horses and ducks around the lake area near the retirement village. To see him locked away in a dementia ward, devoid of contact with the outside world and restricted access to nature, feels like an unfair fate for a man who lived his life to the fullest. The confinement of his vibrant spirit within the walls of the ward feels like an unjust reward for a life so well lived. However, during our visits, we take the opportunity to break free from the constraints of the locked ward and savour moments outside the facility together.

It is no lush oasis just outside the facility; there are no flower beds to stroll through, no soothing sounds from water features, nor the soothing symphony of birdsong. Yet, moments that might seem mundane to others, we revel in. We engage in the art of avian observation as we watch the crows forage for food and we contemplate the graceful dance of leaves swaying gently in the breeze. When I observe my father in this space, I witness the undeniable, innate love for nature and the inherent positive response that aligns with the essence of biophilia theory. Stepping outside of the confines of the ward, he is 'liberated'; he is no longer regulated, his every choice restricted. He is free outside, and it is easier for him to rest and restore his sense of being. Upon sighting the majestic poinciana tree, we talk about how the deep red of the blossoms reminds us of Christmas time. He smiles as he always does at this thought.

Witnessing my father confined to the limits of the ward, with its locked doors and the restrictions imposed on his access to the courtyard garden, evokes a poignant realisation of the profound impact this isolation has on him. As a geropsychologist and a person who has always found joy and tranquillity in nature, I can only imagine how this loss of freedom weighs heavily on his spirit. Denied the simple pleasures of feeling the sunshine on his face, the earth beneath his feet, and the gentle breeze, he is, in essence, disconnected from the very essence of life.

LONG TIME GARDENER AND AVID WATERER: WATCHING MY DAD UNLOCK IMPLICIT MEMORIES (PAULINE MARSH)

My Dad died in April 2022 after living with vascular dementia for probably two to three years. He was a gardener for as long as I can remember. Dad grew up in the type of household that grew vegetables not to supplement or experiment but to survive. He was a practical man: strong, active, sporty and talented. He made much of the fact that he had left school at 14 to go and work on a farm. Every house we grew up in had a large vegetable garden. At one point, he had taken over the empty house block behind our house and converted the entire area into a vegetable garden. I remember one evening at the dinner table he took us four kids to task about not helping him with the garden. The next morning, I got up early and went out to help him before breakfast. I remember hanging around him, not knowing what to do. I imagine I did a lot of talking, as was my 5-year-old way, and I wonder now if he had second thoughts about suggesting we join him – it cannot have been as peaceful as usual.

The last home that Dad lived in with my Mum was in a retirement village. The village rules stated no vegetable gardens – they were deemed too unsightly. Professional gardeners came and saw to the shared garden areas that surround each of the small homes; they wielded chainsaws to trim every enormously lush tropical plant down to knee height. This arrangement was never going to work for Dad – he needed an active role in the garden. While Mum tucked in tomato and basil plants amongst the dahlias out the back, Dad's strategy was to make friends with the gardeners and start 'helping' out around the village. Without fences and with many interested onlookers, gardening for the 15 or so years he lived there became a very social affair. Almost every day, Dad would

stand with the hose in the front garden and talk with everyone who wandered past as he watered the lawns and those chainsawed shrubs. Everyone had thoughts to share, opinions about the professional gardeners, the weather, the pests, the flowers, the weeds – Dad included.

When he started to experience some significant cognitive disturbances (memory disruption, confusion) and associated mental health challenges (anxiety, depression), the garden became Dad's key, if not *only*, source of social contact. It also became an outlet for his pent-up frustrations and anger. If inside too long, he would jump up and burst out the door. He would storm his way over to the hose, throw on the tap, and water everything. He watered at any time of the day, rain or shine. While Dad sprayed, soaked and doused, Mum breathed, sighed and took a break. The waterbirds from the neighbouring waterhole loved it and soon moved onto the damp lawns permanently.

Before the final move into residential care, Dad spent weeks in the hospital. Confused, frustrated and trapped indoors. One day, I asked: 'What can I get for you, Dad?' he paused, then said: 'More, more *nature* – really!' At this, my heart cracked open.

We chose a residential care home where each room opened out onto a central green space. A little tired and neglected, but at least it had some trees, a lawn and a breeze that came into the room. He lay on the bed, with fresh air coming in, and had a glimpse of treetops from his pillow. When I took in some indoor plants, potting mix and pots, he looked at me with mild bemusement. But when we sat outside to tend them, his implicit body memory took over what the explicit could not do. He tapped plants out of their pots, shook their roots clear and repotted them, just like he had been doing all his life.

After Dad died, we were gathered at Mum's house, and one of the village gardeners arrived at the door. She held onto my Mum in a long embrace. We all cried, watching a heartfelt moment of shared grief. The gardener loved my Dad for his eclectic and enthusiastic gardening. I loved him for showing me the deep value of human contact with the soil, plants and birds, and how this helps us connect with others. From him, I know implicitly the immense importance of gardening when the rest of the world stops making sense.

CONCLUDING THOUGHTS

There is no doubt that dementia is a slow-moving global health crisis. However, in this chapter, we look at what this means for the individuals living every day experiencing its challenging symptoms. Drawing on our personal experiences, we show how gardening, as a nature connection and a nature-based psychosocial intervention, can mitigate the *daily* crises that people with cognitive decline confront. Our unique but overlapping stories provide nuanced detail to bring something of a nature connection lens to the global population crisis narrative of decline and loss. By telling stories of the role, function and promise of gardening activities of varying kinds in various green space locations, we advocate for its role in supporting health conditions with no cure. We also hope the stories of the impacts and value of gardening resonate with you and provide optimism and comfort for those of you who are also experiencing the daily reality of living with dementia.

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Section III

The Potential of Gardening during Crisis: Scaling up the Lessons from Crisis Gardening to Transform Food Systems, Public Health Systems, Policy and Landscape Planning Processes



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11 Community Gardens as a Source of Social Capital for Earthquake Preparedness

Case Studies from Old Neighbourhoods in Kobe, Japan

Naomi Shimpo

INTRODUCTION

THE NEED FOR COMMUNITY GARDENS IN HIGH-DENSITY RESIDENTIAL AREAS VULNERABLE TO EARTHQUAKES

Earthquakes are a threat that can happen at any time, especially in areas with high seismic risk (Figure 11.1). The Circum-Pacific Belt, or ‘Ring of Fire,’ is particularly prone to earthquakes (Hinga, 2015). Japan is located in this hazardous region, and many large earthquakes have struck the country, including one in the Noto area on New Year’s Day 2024. However, even other areas, such as the Alpine-Himalayan orogenic belt, are not immune to hazards. For example, the Turkish-Syrian earthquake in February 2023 and the Moroccan earthquake in September caused severe damage to cities (Aktuna & Bahar-Özvarış, 2023; Oduoye et al., 2023). Preparation for such an unexpected event is necessary to minimise the damage caused by an earthquake and return to normal life as soon as possible.

Many studies have shown that the higher the social capital of a community, the faster it recovers in the post-disaster recovery process (Aldrich, 2010, 2011; Nakagawa & Shaw, 2004; Panday et al., 2021; Shimada, 2015). Social capital and its components and functions are defined in various ways, ranging from narrow to broad contexts; however, it generally refers to the networking, trust and norms that exist among people, which can be formed within society (Hishida & Shaw, 2014). In the disaster recovery process, social capital facilitates various activities and enhances the performance of social actors, which are essential for disaster recovery (Hishida & Shaw, 2014). Community gardening may enhance social capital by providing opportunities for social interaction and support (Alaimo et al., 2010; Christensen, 2017; Christensen et al., 2019; Kingsley & Townsend, 2006; Kingsley et al., 2020). To prepare for an unexpected earthquake, it is necessary not only to physically improve building structures but also to increase social capital through community gardening in normal times.

Community gardens also play a variety of specific roles in responding to earthquake crises. For example, they become an open space without buildings that allows people to escape or set up tents in the event of a disaster (Liedtke, 2020). They can also provide vegetables and fruits to replenish vitamins and other nutrients during times of evacuation because emergency relief mainly consists of carbohydrates (Sioen et al., 2017). In addition, during discouraging times of recovery, the ability to live life as usual with companions in a garden supports gardeners emotionally by keeping a sense of normality (Shimpo et al., 2019). Community gardens should be considered as part of the foundation for earthquake recovery from various perspectives.

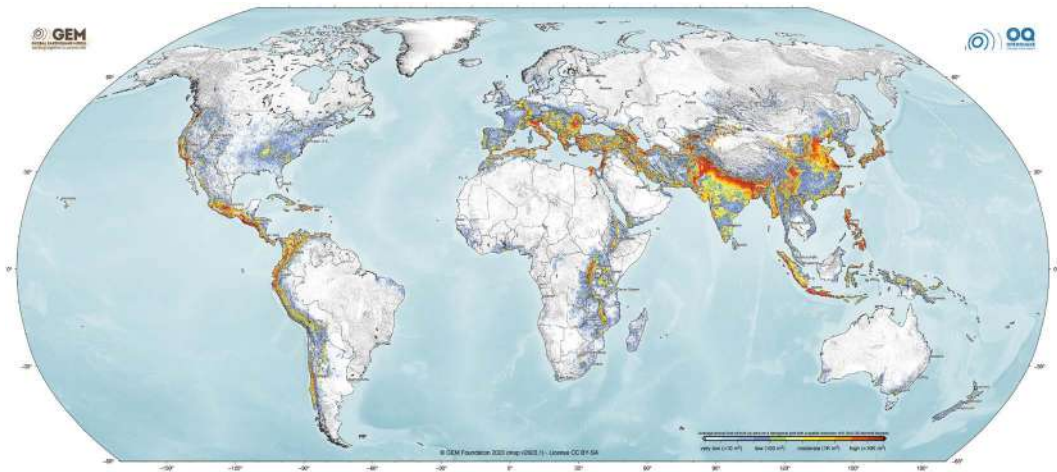


FIGURE 11.1 The global seismic risk map. (Silva et al., 2023.)

KOBE CITY, WHERE ANOTHER MASSIVE EARTHQUAKE COULD STRIKE AND COMMUNITY GARDENS ARE FLOURISHING

Kobe City, located in the western part of Japan, has a population of over 1.5 million people, as well as mountains and fishing ports, making it a city with thriving agriculture and fisheries (Kobe City, n.d.). In 1995, Kobe experienced the Great Hanshin-Awaji Earthquake with a Richter Scale of 7.3, which caused not only the destructive shaking itself but also uncontrollable fires that killed over 6,400 people and destroyed over 100,000 homes (Aldrich, 2011). The victims include people who might have died due to the loss of existing social networks and ties in the disaster recovery process (Aldrich, 2010). Although reconstruction has progressed since then, the risk of further earthquakes remains high. Referring to the National Earthquake Motion Prediction Map 2020, the probability of being hit by a quake of intensity 6 or greater in the 30 years from 2020 is 26% or greater for most coastal areas facing the Pacific Ocean, where the oceanic plate is subducting into the continental plates (Headquarters for Earthquake Research Promotion, 2021). Kobe is included there.

In particular, some old neighbourhoods are lined with densely built wooden houses, and such neighbourhoods are vulnerable to earthquakes (Oki & Osaragi, 2016). In these residential areas, fires can spread easily in the event of a major earthquake, and narrow alleys are inaccessible to fire engines and ambulances. Their unique residential landscape and disaster prevention performance should be balanced as much as possible by grasping the important spatial characteristics of each area and selecting appropriate disaster prevention measures (Yoshihara et al., 2023). From this perspective, Kobe City has also taken measures to set aside a moderate amount of open space called '*Bosai Kuchi*' (open space for disaster prevention) to be used as evacuation sites and parking areas for emergency vehicles in the event of a disaster (Fujino, 2018; Shimizu & Hokugo, 2022). Landowners of *Bosai Kuchi* lend their land to the city free of charge in exchange for exemption from land tax. In normal times, some of *Bosai Kuchi* are used as community gardens. By having these spaces, the neighbourhoods are able to maintain their landscape and increase their disaster preparedness.

On the other hand, there is a policy to support the boom of transforming vacant land into community gardens. Since 2015, under the title of 'Gastropolis Kobe (*Shokuto Kobe*),' measures have been taken to create opportunities for urban residents to become familiar with Kobe's agricultural and fishery products and food culture (Kobe City, n.d.). As part of this policy, since 2020, the 'Urban Farming Project' has been encouraging urban residents to try their hand at farming in rental farms and community gardens, with the goal of changing consumer attitudes through agricultural

experiences (Kobe City, n.d.). Although no statistics are available, community gardens have sprung up in recent years, using vacant lots, underutilised parks and building rooftops.

Although these strategies are ideal from a political point of view, community gardens are usually created through various bottom-up approaches rather than top-down approaches by initiatives by public authorities, which means that local residents usually make a plan to establish their community gardens regardless of with/without informal, professional or political-administrative support (Fox-Kämper et al., 2018). Therefore, from the accumulation of case studies, it is necessary to develop a theory on how to establish a community garden using vacant land in the above-mentioned earthquake-prone areas.

This chapter focuses on two community gardens located in old, densely built residential areas in Kobe and describes how the gardens were established and how they are used. This is based on facts gathered through interviews with the founders of each garden in 2021 and 2022, as well as information from websites and other literature sources. It then discusses the role of gardens and necessary policies will be discussed.

CASE STUDIES

CASE 1: THE ‘MULTICULTURAL GARDEN’ FOR INVOLVING VIETNAMESE RESIDENTS IN COMMUNITY

The first case study is the ‘Multicultural Garden (*Tabunka Kyosei Garden*)’, in Komagabayashi, Nagata Ward, Kobe, which was an old fishing village (Figures 11.2 and 11.3). Many old buildings remain here because they were not burned in the bombing of Kobe during World War II and did not catch fire in the Great Hanshin-Awaji Earthquake (Komagabayashi Community Development Council, 2007; Yoshihara et al., 2023). Many Vietnamese live in this neighbourhood. They originally fled by boat to Japan in the late 1970s due to the Vietnam War. After receiving vocational training at the Hyogo Prefectural Himeji Resettlement Promotion Center, the first such centre in Japan, these ‘boat people’ moved to the east and settled in Kobe, mainly in Nagata Ward, where the Multicultural Garden is located, to find jobs in the chemical industry and other fields (Kobe YMCA, 2018).

In addition, in recent years, Vietnamese have been the most numerous foreigners coming to Japan as technical interns (‘*Gino Jisshusei*’), accounting for 54.3% of all interns by the end of 2022 (Immigration Services Agency, 2023). The technical internship system was established in 1993 to transfer Japanese skills, technology and knowledge to developing regions, thereby contributing to the development of human resources responsible for economic development in those regions. Since around 2015, the number of accepted interns has increased rapidly (Immigration Services Agency, 2023). It decreased during the COVID-19 pandemic but increased again to 324,940 in 2022 (Immigration Services Agency, 2023). Although this system was originally initiated as part of international contribution activities, it has actually been used to supplement Japan’s labour shortage and has also become a social problem, such as the disappearance of interns (Zhang & Zhang, 2020). As of August 2023, there are 8,100 Vietnamese nationals, the third-largest group of foreign residents in Kobe City after South Korean and Chinese nationals (Kobe City, 2023). In this environment, daily rules, such as garbage disposal, can be difficult to understand and may cause friction among residents. It is a challenge to establish a connection between the old local community and the Vietnamese residents.

In addition to this problem, in Komagabayashi, the earthquake damage left many vacant lots unattended, which have become problematic due to overgrown weeds and illegal dumping (Aoyama, 2020; Kobe City, 2022; Komagabayashi Community Development Council, 2007). This has contributed to a decline in population, and the ageing of the population is weakening community ties. To overcome this difficulty, the Komagabayashi Community Development Council, founded by local residents, has been exploring the charm of the neighbourhood through events, workshops and questionnaires since 2005. Based on the opinions collected, they published a neighbourhood

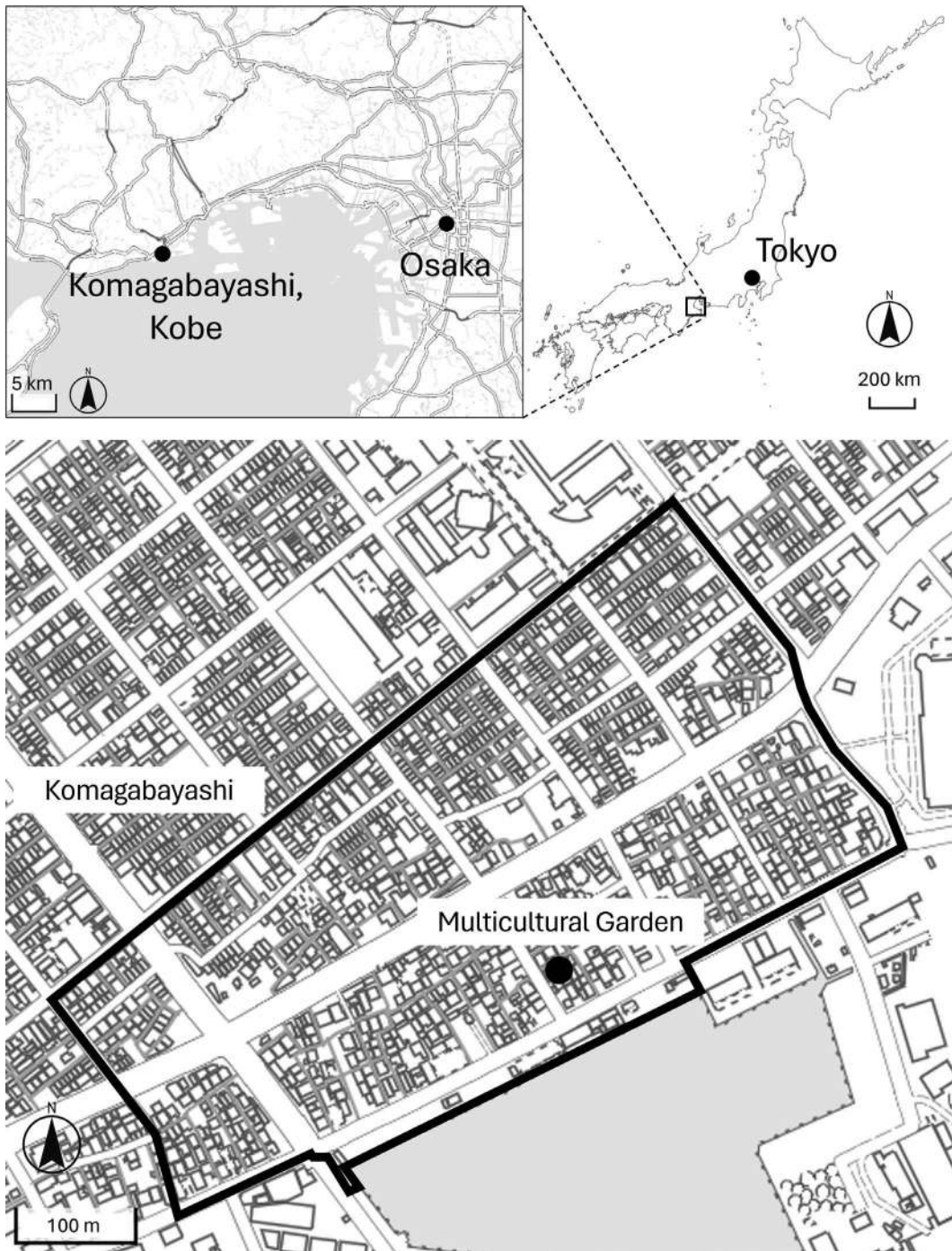


FIGURE 11.2 The location of the multicultural garden. (Made by the author from a Chiriin Map Vector.)



FIGURE 11.3 The multicultural garden with ethnic herbs in a densely built-up area. (Taken by the author.)

development concept in 2007 ([Komagabayashi Community Development Council, 2007](#)). One of the founding members of the Multicultural Garden, an architect working in the neighbourhood, was involved in this movement.

The owner of the land where the Multicultural Garden is now located consulted the architect about the difficulties in maintenance, such as weeding. The owner could not rebuild on the land either due to the inability to meet road access requirements for a new building. At the same time, the architect was asked by another person about the possibility of creating a pak choi garden to build a friendly relationship between Vietnamese and Japanese residents in the area. The architect then helped local residents form a volunteer organisation, the ‘Shin-Nagata Multicultural Garden Friendship Association’ (now the Multicultural Garden Kobe-Nagata Friendship Association), and consulted with the aforementioned landowner about establishing a community garden for Vietnamese residents. In 2020, maintenance began, and workshops were held to create a garden by hand. By communicating with the local community while gardening, the association built relationships with local residents, mostly elderly people, who were not used to interacting with foreigners ([Aoyama, 2020](#); [Kobe City, 2022](#)).

Thus, the Multicultural Garden project was realised through a bottom-up approach, but it was also supported by the city government. The establishment of the garden was supported by the Kobe City Government’s ‘Vacant House and Vacant Land Maintenance Subsidy Program’ and ‘Nagata Ward Community Development Activity Subsidy.’ The former is a programme that subsidises up to 1 million yen in property taxes and other maintenance costs when vacant land is rented free of charge for community activities. The latter is another subsidy programme that mainly supports the launch of community development activities planned by residents of Nagata Ward ([Kobe City, 2022](#)).

Currently, the Multicultural Garden is used as a place to connect local and Vietnamese people by growing pak choi and other vegetables. Vietnamese food has sometimes been cooked and eaten together for lunch. Gardening is a necessary daily community activity that brings residents into frequent contact with one another. It also allows people to learn about and enjoy different cultures by using and eating the harvest. The garden helps break down barriers in people's minds.

CASE STUDY 2: 'ICHIBATAKE' – A COMMUNITY GARDEN BORN OUT OF A GAP OF AN OLD MARKET

At the Nada Central Market in Suidosuji, Nada Ward, Kobe, which has a history of almost 100 years, there is a community garden called 'Ichibatake' (an original coinage from '*ichiba* (market)' and '*hatake*' (field)). (Figure 11.4) Raised beds are arranged in a formerly vacant lot where shops used to be (Figure 11.5). The Nada Central Market has a problem in terms of disaster prevention because of the concentration of old buildings and the possibility of fire spreading (Figure 11.6). However, rebuilding the market is difficult because it requires the consent of many landowners and funds are scarce. As a result, several *Bosai Kuchi* have been set up inside the market as a temporary disaster prevention measure.

The founder of Ichibatake is a Kobe City Hall employee with a background in architecture who was previously in charge of improving structures and living environments in dense urban areas. When he became involved with the Nada Central Market through his work, he was drawn to its attractiveness and potential and rented a house in the market. His desire to engage with the area on a personal level led him to establish Ichibatake. In April 2019, he formed 'Team Cultus' with another city employee who works in agriculture and is local to the area. They decided to use an existing vacant lot in the market through the 'Kobe City Vacant Land Utilization Project.' The vacant land had been shuttered for a long time and was not known to be vacant. Negotiations with the landowner proceeded smoothly because the Ichibatake founder was familiar with the landowner through his work. The team also included a community designer who had been involved in community development in the area. The team members are all young people in their 30s. Ichibatake was created by this team through workshops with local residents.

When Ichibatake was founded, the site was half its current size. In March 2021, the building next door was demolished, and now the site is two lots wide. The initial construction of the existing vacant lot was funded by the 'Kobe City Vacant Land Utilization Project' while the demolition of the adjacent parcel was funded by the *Bosai Kuchi* Project, also funded by Kobe City. Currently, the team pays a rental fee to the landowner of the existing vacant land. On the other hand, the additional land is used free of charge, as it is considered *Bosai Kuchi* and is exempt from property taxes.

At Ichibatake, people can enjoy gardening in raised bed plots and participate in various activities. Those who pay for plots are called 'Challenge Farmers,' and they can rent a small (1.0–1.5 m²) plot for six months (as of April 2023). Continued use is possible if desired. There is another Ichibatake Farmers membership, which allows members to participate in the daily care of plants, learn how to water, select fertilisers, deal with insects and share information with other members to raise awareness of food. This membership cost is less than renting a plot. The fees are used to cover operating costs, including land rental, soil and seed expenses and field maintenance. Community activities are held twice a month, on the first Saturday and third Sunday of each month, and are open to everyone.

Ichibatake functions as a place for intergenerational exchange by connecting the older market vendors and the young gardeners. While the market vendors are ageing, the shape of the raised beds at Ichibatake was designed with children in mind. For example, the raised beds were equipped with a plank for children to walk on so that even small children could reach the full space and take care of plants. Thanks in part to these innovations, young parents and children are often seen in the garden activities, which means that Ichibatake provides an opportunity for young people to go to a traditional market and communicate with the elderly in the market. An example of the

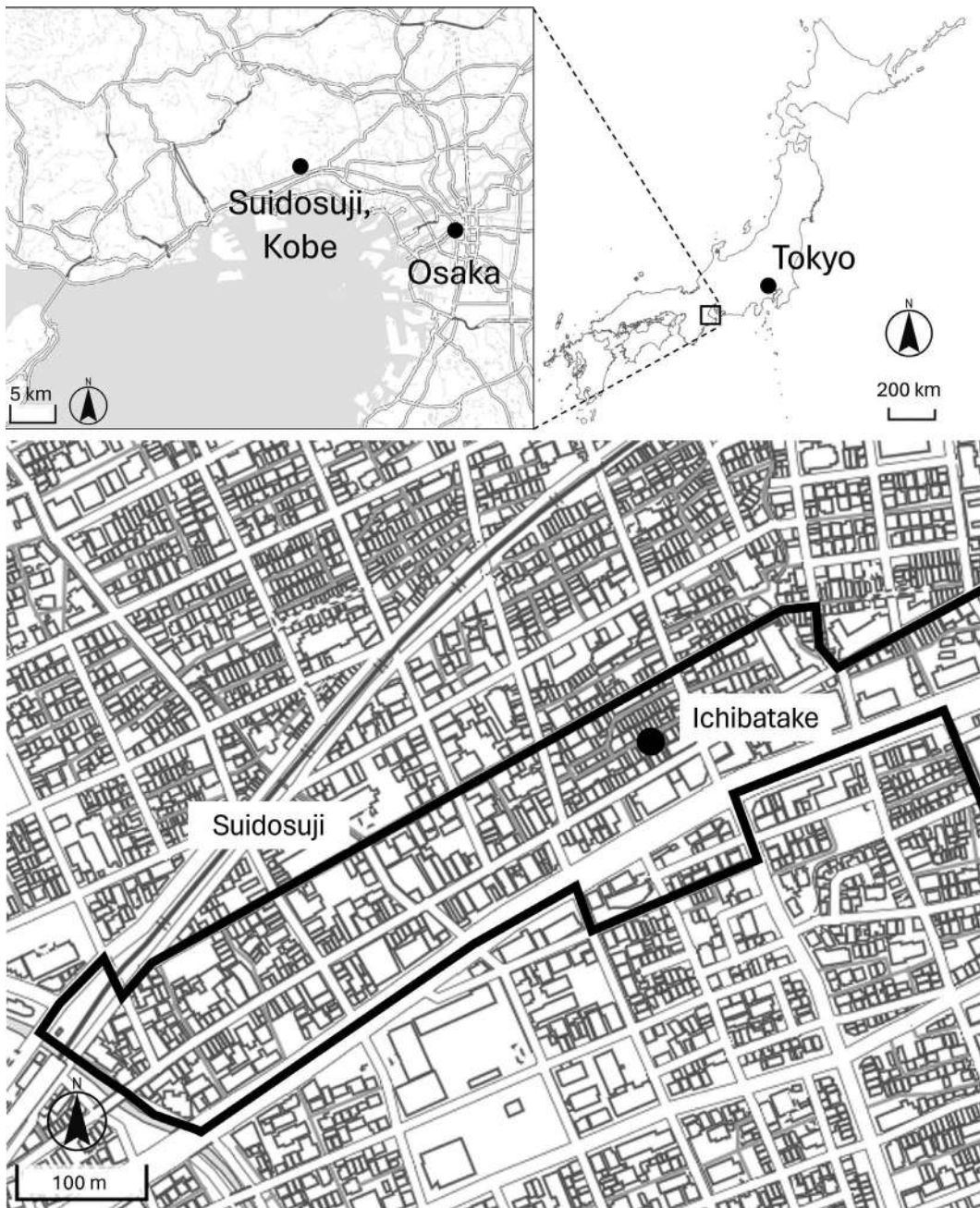


FIGURE 11.4 The location of Ichibatake. (Made by the author from Chiriin Map Vector.)

interaction between the vendors and gardeners is a typical autumn event: baking sweet potatoes. The gardeners roasted and ate different types of sweet potatoes, which were purchased by the owner of a vegetable shop in the market, with his expert explanations. The event also included a fire drill both for children and adults, using water fire extinguishers and targets borrowed from the local fire department. In this way, Ichibatake functions as a place for intergenerational interaction among local residents.



FIGURE 11.5 Ichibatake in the Nada Central market found between shops. (Taken by the author.)



FIGURE 11.6 The Nada Central market in need of reconstruction for disaster preparedness and the entrance of Ichibatake to the right side. (Taken by the author.)

COMMUNITY GARDENS CONNECTING DISASTER VULNERABLE PEOPLE TO THE COMMUNITY

Both the Multicultural Garden and Ichibatake not only provide open space for evacuation and food sources in the event of an earthquake but also foster community as a basis for mutual aid. Because social capital is formed iteratively through collective experiences, actions and activities (Partelow, 2021), it is likely to be formed in these gardens as well. Social capital increases resilience by enabling collective action that leads to the provision of needed aid and services (Partelow, 2021). The first case is likely to have a greater contribution to the community, including foreign residents, and the second case is likely to benefit the elderly.

In previous earthquakes in Japan, difficulties encountered by foreign residents in evacuation have been a problem. At the time of the Great Hanshin-Awaji Earthquake, foreigners with limited Japanese language skills had great difficulty in obtaining information on how to get to evacuation centres, secure water and food and find hospitals where foreign languages were spoken (Sato et al., 2004). Similarly, after the 2011 Great East Japan Earthquake, foreigners faced similar problems (Kawasaki et al., 2018). It is expected that these problems can be solved through mutual assistance if foreigners belong to a local community. Even though some people do not want to build social capital on a daily basis, it is also important to do so with a sense of purpose for disaster preparedness (Uekusa, 2020).

Older people are also vulnerable during disasters. During the Great Hanshin-Awaji Earthquake, the elderly were left alone in shelters and also tended not to disclose their problems to others (Tanida, 1996). Many elderly survivors were also left behind in temporary housing and reluctant to establish new relationships after losing their community (Tanida, 1996). With regard to the Great East Japan Earthquake, the number of deaths in the severely damaged prefectures of Iwate, Miyagi and Fukushima reached 15,821 by 11 March 2015, and of the 15,738 whose ages were known after autopsies, 10,396 (66.1%) were aged 60 years or older (Cabinet Office, 2015). The situation could have been better if the younger generation had daily contact with the elderly so that evacuation could have been faster and care could have been provided in evacuation centres. Japan has the highest percentage of the population aged 65 and older in 2023 at 29.0% (OECD, 2023), making intergenerational support increasingly important in times of crisis. This is true not only in Japan but also in other disaster-prone countries with large immigrant and elderly populations.

If daily interactions in community gardens can be made more aware of their usefulness in building social capital for disaster prevention and mitigation, it is expected that residents, including foreign and elderly residents, will help each other in emergencies. Community gardens should be proactively positioned in policies as a place for disaster preparedness.

COMMUNITY GARDENS ESTABLISHED THROUGH BOTTOM-UP APPROACHES WITH GOVERNMENT SUPPORT

In terms of the establishment process, both the cases presented in this chapter had in common that they started with a bottom-up approach supported by the local government's programmes. It is difficult for the government to promote the use of privately owned vacant land in a top-down manner. In densely populated residential areas and markets where there are many landowners, it is impossible to widen roads or demolish buildings all at once, and there is also the possibility of losing the local landscape and identity that has been cultivated over time.

Under these circumstances, Kobe City has decided that securing vacant land for the time being is an improvement in disaster prevention and mitigation. It established support programmes, mainly in the area of finance. However, in addition to this kind of financial support, there must also be a programme to support a bottom-up approach, such as assistance in finding landowners or introducing community designers to help with workshops and launching a community garden. Otherwise, those who have ideas for creating community gardens on a vacant lot may not know with whom and how to proceed with negotiations.

CONCLUSION

Through the case studies of Kobe City, which has a high seismic risk, this chapter examined how community gardens using vacant land can contribute to disaster preparedness in densely built-up residential areas. In addition to reducing the risk of building collapse and fire spread and providing open space for evacuation and parking of emergency vehicles, community gardens are expected to foster social capital across nationalities and generations through daily activities. It is highly important to build communities that are inclusive of foreign residents and the elderly, who are likely to become vulnerable to disasters. Although the local government now provides financial support for the use of vacant land, more support is needed for the establishment and management of gardens.

Areas of high building density and seismic risk can be found in other countries as well. Cities in developing countries are particularly vulnerable to disasters, including earthquakes, due to not only geographical reasons (Alcántara-Ayala, 2002) but also unplanned urbanisation and increased construction that does not meet standards (Ahmed, 2014; Rahman et al., 2015). Areas with many older, dilapidated structures are also at high risk of suffering significant damage from collapses (Armaş, 2012). In such areas, the establishment of community gardens is seen as crucial for securing unbuilt areas and strengthening social capital in preparation for a major earthquake. It is hoped that this idea itself will be widely publicised and that municipal support will be prepared.

ACKNOWLEDGEMENT

I would like to thank the interviewees who established the Multicultural Garden and Ichibatake for their cooperation with this study. This work was supported by JSPS KAKENHI Grant Number 21K14870 and 23H01575.

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12 Homegardens in the Crises of Climate Change, Biodiversity Conservation and Gender Equity

Perspectives from Bangladesh

Tarit Kumar Baul and Tapan Kumar Nath

INTRODUCTION

Population growth, land use changes, land degradation and climate change all strain food and nutritional security, particularly in developing countries (Molotoks et al., 2021; Moore et al., 2012). For example, between 2010 and 2050, dietary changes brought on by climate change are expected to result in more than 500,000 additional deaths worldwide due to decreased consumption of food, as well as fruits and vegetables (Springmann et al., 2016). Land use change and deforestation cause an increase in the atmospheric concentration of CO₂, affecting the global carbon cycle on the one hand (Raihan et al., 2022) and, on the other hand, making rural livelihoods vulnerable in low-lying and drought-prone countries (Paudel et al., 2021). Amongst such crises, local agroecological practices such as those within homegardens can play a significant role in climate change mitigation (Nair et al., 2021) and biodiversity conservation (Kumar, 2023), but also in food and nutritional security (Turnšek et al., 2022) and women empowerment (Patalagsa et al., 2015) for resource-poor farmers.

In this chapter, we focus on Bangladesh as our case study to elucidate such potential benefits amidst interacting crises. In Bangladesh, the total forest coverage accounts for approximately 17% of the country's total land area, with a per capita forestland of 0.016 ha, which is far below the global standard of around 0.05 ha (FRA [Forest Resource Assessment], 2014; FAO, 2020). Furthermore, the country's forest cover is unevenly distributed, with only 12 out of 64 districts having a forest cover of more than 10% and 24 districts having officially no forestland at all (FD, 2017). This guides people to rely more on homegardens. In addition to the adverse impacts of climate change on agriculture and forests, people in rural Bangladesh are more vulnerable to unpredictable and torrential rainfall, frequent flooding, cyclones, riverbank erosion and drought due to their fragile livelihoods (Alam et al., 2017). Homegardens can have a significant role in rural development, conservation of forests and biodiversity, as well as mitigation and adaptation to climate change through supplying diverse products and ecosystem services (Baul et al., 2021c, d). In this chapter, we describe the roles that homegardens in Bangladesh can play in climate change mitigation and adaptation, biodiversity conservation as well as women empowerment. We also address the challenges that homegardens face and the policy implications towards the sustainability of these resources.

THE ROLE OF HOMEGARDENS IN CLIMATE CHANGE MITIGATION

At least 20 million households in Bangladesh maintain their homegardens (Kabir & Webb, 2008a, 2009), which cover about 0.27 million hectares of land area occupying 2% and 10% of the country's total land and forest cover, respectively (Mukul et al., 2014). In mitigating climate change, homegardens play a paramount role in several ways, such as capturing and storing carbon in the ecosystem (tree biomass, litter and soil) (Kumar & Kunhamu, 2021) and harvesting wood products. Besides, these supply energy biomass (fuelwood, twigs, leaves, branches) that have substitution potential for avoiding fossil carbon emissions. The carbon-storing potential in the ecosystem varies with location, elevation, landholding and tree species of homegardens, as well as the quality of litterfall (Birhane et al., 2020; Chakravarty et al., 2019a; Kumar, 2011). In the following sections, we discuss how homegardens in Bangladesh can contribute to climate change mitigation. We base this on our research over 20 years across the country (Table 12.1).

TREE BIOMASS CARBON

Homegardens of Bangladesh have a large but underestimated the potential for storing carbon. This estimation of carbon stock becomes more important when natural hills and Sal forests are heavily degraded due to illicit felling, shifting cultivation and other forms of land use. Across the country, in the northern, northeastern, southeastern and southwestern regions, homegardens in plain, hilly and coastal areas have a significant carbon sequestration potential (Table 12.1). The potential of carbon, both in biomass and soil, is affected by species diversity and stand structure. Carbon stocks in homegardens with higher species diversity and tree density are higher in those with relatively lower species diversity and tree density (Baul et al., 2021a, b; Jaman et al., 2016; Kumar, 2023; Nair et al., 2009; Nath et al., 2015). This also depends on tree diameter at breast height (DBH) and basal area (BA); higher tree DBH and BA can contribute to higher carbon stocks. Farmers tend to decrease tree size in terms of height and density in their small fields, with the intention of accommodating other agricultural crops, leading to lower BA, which results in lower biomass carbon. In Asia, including Sri Lanka, India, Indonesia and Africa, the positive relationships between biomass carbon and species diversity, tree density and BAs also exist (Day et al., 2014; Mattsson et al., 2015; Poorter et al., 2015; Rahman et al., 2015; Shen et al., 2016). Tree species such as *Mangifera indica*, *Samanea saman*, *Artocarpus heterophyllus* and *Dipterocarpus turbinatus* store a higher amount of biomass carbon in hill and inland homegardens due to their higher frequency compared to those on the beachside (Baul et al., 2021a).

TABLE 12.1

Carbon Stocks in Homegardens in Different Regions of Bangladesh

Studies in Bangladesh	Carbon Stocks (Mg ha ⁻¹)	References
Coastal homegardens, Maheshkhali	96 (tree biomass + litter +soil)	Baul et al. (2021a)
Hill homegardens, Bandarbars	89 (tree biomass + litter +soil)	Baul et al. (2021b)
Homestead forests of Fatikchhari	4.57 (tree biomass)	Yeasmin et al. (2021)
Homegardens of southwestern region	129.47 (tree biomass + soil)	Rahman et al. (2021)
Homegardens in Rangpur District	53.53 (tree biomass)	Jaman et al. (2016)
Ecologically Critical Area of Cox's Bazar–Teknaf Peninsula	117.73 (tree above ground biomass)	Nath et al. (2015)
Palm tree in the homegardens of Sylhet City	20.29 (tree above ground biomass)	Day et al. (2014)
Mean of total	72.94	

LITTER AND SOIL CARBON

The contribution of litterfall carbon stocks in homegardens is relatively low (about 0.1 to 1%), which may be due to the regular collection of litterfall for use as fuels instead of leaving them on the floor, opposite to the natural forests (Baul et al., 2021a, b). Carbon stocks of homegardens vary with management, elevation and topography of the site. For example, the litterfall carbon stock was found to be 22–28% higher in low altitudes compared to high and mid altitudes due to litter deposition on the sloping ground caused by gravity, thereby enhancing soil carbon (Baul et al., 2021b). Moreover, litter in the form of pruned materials has a deliberate function to be used as mulch in low altitude homegardens for reducing soil erosion and adding carbon to the soil. The share of soil carbon is the highest (52–60%) in the total ecosystem carbon in the homegardens of Bangladesh (Baul et al., 2021a, b). On the other hand, well-managed homegardens generate fuels in the form of branches, leading to a diminished carbon stock in litterfall. The removal of pruned materials decreases nutrients in the soil, causing reduced growth of trees, which may decrease carbon sequestration potential and litter input in the soil (Baul et al., 2022).

In the coastal homegardens, the hillside with abundant *Acacia* and *Mahogany* species and a larger amount of litterfalls stores more carbon in litter and surface soil compared to the beachside and inland. However, the total carbon stock in the soil is also affected by the types of species and litter, stand density and the decomposition rates of litter and humus, depending on environmental circumstances and underground processes. For instance, leaflets of *Acacia* and *Mahogany* species are small and unpalatable, thereby not considered as good fuel or fodder. Therefore, leaving them on the floor contributes to soil carbon stock (Barua & Haque, 2013; Danquah et al., 2012). In India, the slower decomposition of the litter of these species in homegardens and agroforestry, the more organic carbon in the soil in comparison with *Mangifera indica*, *Artocarpus heterophyllus* and *Anacardium occidentale* (Isaac & Nair, 2005; Jamaludheen & Kumar, 1999).

CARBON IN HARVESTED WOOD AND AVOIDED FOSSIL FUEL EMISSIONS

Through thinning and final felling of biomass, carbon moves from the ecosystem to the technosystem. The carbon is retained in the harvested wood in the form of sawn timber, beams, poles and other wood products, including construction materials and furniture. In Bangladesh, home gardens supply 80–90% of the total requirement for timber and fuelwood (FD, 2017), meeting the demand for construction materials, furniture and energy fuels sustainably while alleviating human pressure on state-owned forests. Therefore, the wood harvested from homegardens is a valuable pool, keeping the carbon intact in the wood while preventing the release of carbon into the atmosphere, depending on the lifespans of the products. Furthermore, the use of harvested wood and biomass fuels avoids fossil carbon emissions by replacing the use of fossil fuel-intensive materials and fossil fuels. However, these climate change mitigation benefits of using wood and biomass fuels are completely ignored and have not been accounted for yet. There is a need for the assessment of carbon stocks in wood and the substitution benefits of using wood products and biomass fuels to realise the full climate change mitigation potential of homegardens considering the ecosystem-technosystem-atmosphere continuum. Homegardens' climate-regulating role could be a potential component of Nationally Determined Contributions (NDCs) for Bangladesh to meet its responsibility in lowering carbon emissions in key sectors, which, however, is not included in the NDCs despite its rich coverage.

ADAPTATION TO CLIMATE CHANGE THROUGH ECOSYSTEM SERVICES OF HOMEGARDENS

Over 77% of Bangladesh's population lives in rural areas, and most of them are poor and experiencing a shortage of income, food, fuel and land resources (BBS, 2020). This scarcity grows when

they are in crises like famine, natural disasters and adverse climate impacts. The impacts of climate change, such as severe floods, tidal surges, cyclones, drought, landslides and salinity, are acute in Bangladesh, and these impacts are found to be intensive and affect lives, properties and livelihoods in riverine and coastal areas (Alam, 2016; Alam et al., 2017). Bangladesh is expected to account for 13.3 million internal climate migrants, thus making roughly 27% of all South Asian climate migrants by 2050 as a result of climate-related hazards on agricultural productivity, water scarcity and sea level rise, with a greater impact on women (Kanta Kumari et al., 2018; Viviane et al., 2021). According to the World Bank Report 2018, seven of the ten top hotspot districts are in the Chittagong Division, with Cox's Bazar, Bandarban and Chittagong districts predicted to experience the largest negative effects due to changes in average weather (Mani et al., 2018).

In this circumstance, homegardens, like other ecosystems, provide a variety of ecosystem services such as provisioning (food consumption), cultural (traditional and ritual activities), sustaining (biodiversity conservation) and regulating (carbon sink, soil conservation), and these help locals adapt to the adverse impacts of climate change under extreme conditions.

PROVISIONING SERVICES AND POVERTY ALLEVIATION

Homegardens supply provisioning services such as fruit, timber, fuelwood, fodder, medicinal, non-timber forest products (NTFPs) (bamboo, cane, murta), vegetables and spices including both perennial and seasonal plants, depending on the geographical location (Barua et al., 2020; Yeasmin et al., 2021). The services derived from homegardens are sources for households' consumption and earning revenue from the sale of the products. Dominant tree species, including *Albizia procera*, *Mangifera indica*, *Artocarpus heterophyllus*, *Acacia auriculiformis*, *Acacia mangium*, *Samanea saman*, *Cocos nucifera*, *Swietenia mahagoni*, provide multiple values and provisioning services. For example, in the hill and coastal homegardens, about 37% and 40–44%, respectively, of the total tree species were found to be multipurpose tree species (MPTS) (Baul et al., 2021c, d). Another study by Henry et al. (2021) revealed that homegardens supply about 70% of the total timber, bamboo, fuelwood and leaves and about 50% of the fruit. About 45–53% of the households use bamboo as construction materials, handicrafts making, fodder and fuel, and 40% use *Clinogynae dichotoma* (murta) for making handicrafts, mats and baskets in the southern region (Baul et al., 2021c; Foysal et al., 2013).

Fruits (e.g., Mango, jackfruit, Chinese date, coconut, wood apple, elephant apple and guava), timber, fuelwood and bamboo are major homegarden products that are largely consumed and sold by households. After meeting households' own needs, biomass fuels, timber and fruits accounted for 36%, 29–40% and 10–46%, respectively, in earning their total sale revenues in the southern and coastal regions (Baul et al., 2021c; Foysal et al., 2013), and thus contribute 31–52% of their total income (Nath et al., 2015). As the number of trees and bamboo individuals per household, tree density, species diversity, size of landholding and homegardens increase, the production, consumption, utilisation values and sale revenues of fruits and tree biomass fuels from homegardens increase, thus help increasing revenue from harvests and household income (Baul et al., 2021d; Motiur et al., 2006; Rahman et al., 2005). Income from homegarden output varies with the farm size of the households. The amount of annual production and selling of homestead timber increased from marginal to large farm size categories (Alam, 2012). These positive associations indicated that households were able to avoid the costs of purchasing these products from marketplaces by utilising resources from their gardens. However, Alam (2011) found that households in rural Bangladesh typically use almost all of the fuelwood they gather, with very little being sold in the market due to the country's energy crisis.

Diverse plant species grown in homegardens provide not only food for sustenance but also vitamin- and mineral-rich multiple fruits and vegetables as a source of nutrition (Daulagala et al., 2012). In addition to ensuring livelihoods and nutritional and financial security (Ruba & Talucder, 2023), during adverse conditions like floods, storms and drought, homegardens act as a buffer alternative to agriculture by supplying food, fruits, fodder, medicine, shelter and cash (Baul et al., 2022). The immediate sale of timber from fast-growing species like *Acacia*, *Gmelina arborea* and *Albizia*

species generates emergency cash for households during extreme events (Baul et al., 2021d), providing a security net for households' potential economic benefits (Mattsson et al., 2015; Muhammed et al., 2013; Paembonan et al., 2018). However, people in the Middle Hills of Nepal adopt different management strategies and farming techniques, such as diversified cropping and shifting to vegetable farming in their agricultural fields and homegardens, to make them resilient to a changing climate (Baul and Morag, 2014). It has also been discovered that homegardens in Sri Lanka, India, Ethiopia and Benin offer protection from the negative effects of climate change while promoting adaptation to it (Abdula, 2021; Daulagala et al., 2012; Gbedomon et al. 2017). Besides, NTFPs like bamboo growing in homegardens are a common practice, generating quick returns from the sale of whole bamboo culms or NTFP-based products in local markets, as also evident in northeast India (Talukder et al., 2021). This adaptation to climate change through homegardening depends on the size of homegardens, people's experience, wisdom, years of living, level of education, resources around them and commercial exposure (Daulagala et al., 2012; Muhammed et al., 2013).

REGULATING SERVICES

In addition to supplying services, homegarden trees provide a variety of regulating functions, including soil conservation and fertility, moisture conservation, coastal protection and insect control. In the coastal homegardens, about 31–37%, 31–46%, 31–39% and 37–42% of species are identified as shade, coastal protection, soil improvement and soil conservation services, respectively (Baul et al., 2021c). People perceived that *Acacia* and *Samanea saman* provide regulating services, such as the conservation and reclamation of soil through erosion control and fertility improvement, as well as moisture conservation and nitrogen fixation from the atmosphere. Bamboo, *Cocos nucifera* and *Area catechu* are the most common components in coastal homegardens, and they have a protective role against cyclones and storms (Nath et al., 2015). Conversely, earlier studies documented other services that included heat mitigation and protection against natural disasters like landslides caused by heavy rain in hilly Bandrabans (Baul et al., 2022) and improving soil fertility, recharging groundwater, air cooling effect in summer, recreation and beautification in homegardens in India (Chakravarty et al., 2019b). The ecosystem services that tropical agroforestry systems provide are especially crucial for the welfare of smallholder farmers in the tropics, given their vulnerability to climate change-induced disasters (Hashini Galhena et al., 2013).

People's local knowledge of the selection of species and their planting techniques are important as people prefer light canopy fruit species near the houses and larger canopy taller trees as boundary trees, which play both productive and protective roles. Boundary trees operate as a windbreak, shielding trees and structures downwind. They prefer *Acacia*, Mahogany, *Casuarina equisetifolia* and *Samanea saman* because these species have strong and spreading root systems that can endure cyclones and strong wind (Nath et al., 2015). Thus, homegardens form a natural barrier around homesteads, giving residents the impression that they are self-protected from natural disasters (Masiero et al., 2019). People's education, age and gender also had an impact on how positively they perceived the services, with educated, older and male people having greater awareness of the environmental advantages of having homegardens (Baul et al., 2021c; 2022). Although Barua et al. (2020) and Yeasmin et al. (2021) estimated the valuation of ecosystem services in homegardens, there remains a dearth of rigorous studies related to valuing ecosystem services that enable mitigation and adaptation to climate change impacts across the country.

BIODIVERSITY CONSERVATION

LOSS OF BIODIVERSITY

In the last decades in Bangladesh, some changes have taken place in the structure and function of homegardens. One of the major causes of this change is the fragmentation of landholdings

due to increased population (Motiur et al., 2006). The separation of large into small households causes the fragmentation of corresponding landholdings into several smaller units. This reduces the efficient utilisation of land and accommodation of the number of tree individuals per unit area, diminishing biodiversity (Islam et al., 2018). Within a smaller unit of land, accommodating many fruit trees may not be possible, as they require sufficient spacing for their growth. Besides, fruit trees like mango and jackfruit spread their canopy when grown, which causes a conflict for shading effect with the neighbourhood, restricting them from planting as many plant species and individuals as they want because homestead area is scarce and fragmented (Akther et al., 2010). Kandyan homestead forests in Sri Lanka are rich in biodiversity; however, it has been observed that when trees are cut down, seasonal crops take their place (Haan et al., 2020).

In Bangladesh, due to overpopulation, forest lands are increasingly being converted to settlement, agriculture, commercial and other land uses, resulting in the loss of state-owned forest areas and thus erosion of biodiversity (Islam et al., 2017). Moreover, forest degradation and deforestation through illicit logging and encroachment are shrinking forest areas and consequently reducing species diversity and tree populations (Reza & Hasan, 2019). The livelihoods of millions of people who rely on forests for their livelihoods are becoming incredibly fragile at the present deforestation pace of 2600 hectares per year (FRA, 2014). In addition, the influx of Rohingya refugees in southern Bangladesh has contributed to deforestation, with a loss of 50% of core hill forests between 1989 and 2017 (Hassan et al., 2023), resulting in the degradation of the local environment.

Climate change is expected to have adverse impacts on different ecosystems, including homegardens, in several ways. For example, the yield of the homegarden crops may decrease due to severe drought in the northern region and may be at risk in the coastal region due to flooding and catastrophic events. When soils are dry, microbial activity and decomposition are reduced, which lowers the amount of carbon that is added to the soil. For soil biota, favourable environments are provided by soil moisture and precipitation. Soil biota biomass is positively linked with increased precipitation (Watts et al., 2023). For regulating soil carbon cycles, there is a need for continuous input from aboveground biomass and microorganisms (Davidson & Janssens, 2006), which may therefore destabilise soil carbon cycles in homegardens under changing climate scenarios due to minimal effects of trees on soil carbon under warmer and drought conditions. Soil nutrient cycles could also be susceptible to destabilisation under warmer and drier conditions, as soil C (carbon), N (nitrogen) and P (potassium) are positively interlinked in homegarden systems (Baul et al., 2022; Delgado-Baquerizo et al., 2013). In addition, the appearance of new diseases and pests in the trees may accelerate the damage to the forest resources such as trees, crops and livestock. This overdependence on homegardens is higher for small and marginal households which own a very small piece of homegardens because the dependency of households with farming for forest income is higher than those with non-farming households (Motiur et al., 2006).

BIODIVERSITY CONSERVATION THROUGH HOMEGARDENING

Bangladesh is one of the biodiversity-rich countries in the world since it is a downstream country of major rivers including Padma, Meghna, Jamuna, Brahmaputra, etc. and has a huge flat plain with excellent soil that is good for plant growth. Homegardens are the most widely used agroforestry system in Bangladesh, and they are considered a managed land use system with the capacity to conserve floral biodiversity in the country. Previous studies have documented a wide range of floral biodiversity, comprising mainly tree species, as well as herbs, shrubs and climbers, in homegardens (Table 12.2). These homegardens appear to be more important to biodiversity conservation in Bangladesh than in most other parts of Asia and maybe the entire tropical region (Bardhan et al., 2012). Homegardens are considered a great reservoir of native

TABLE 12.2

Studies on Homegardens in Bangladesh Showing Number of Plant Species

Studies in Bangladesh	Number of Tree Species	References
Coastal homegardens, Maheshkhali	52 (tree), 4 (bamboo species)	Baul et al. (2021a)
Ecologically Critical Area of Cox's Bazar–Teknaf Peninsula	73	Nath et al. (2015)
Coastal homesteads of southern Bangladesh	69	Islam et al. (2013)
Hill homegardens, Bandarban	71	Baul et al. (2021b)
Homestead forests of Fatikchari	26	Yeasmin et al. (2021)
	34	Foysal et al., (2013)
Gopalpur upazila in Tangail district	75 trees	Haque et al. (2018)
Gazipur Sadar Upazila in central region	57	Rahman et al. (2005)
Naogaon district	56	Alam & Sarker (2011)
Meherpur district	73 (42 tree, 13 shrubs, 18 herb species)	Hosain & Rakkibu (2017)
Rangpur District	32	Jaman et al. (2016)
Northwestern region	37	Baul et al. (2015)
Northeastern	30	Islam et al. (2015)
Northern region	62	Roy et al. (2013)
Southwestern homegardens	416 (146 tree, 67 shrubs, 150 herbs and 56 climbers species)	Kabir & Webb (2008b)
	142 (76 tree, 25 shrubs, 41 herb species)	Alam & Masum (2005)
	62	Uddin et al. (2002)
Four different agroecosystems	83 (25 tree, 5 shrubs and 53 herb species)	Shajaat Ali (2005)
The southwestern, northwestern, eastern and central northern regions	92	Millat-e-Mustafa et al. (1996)

flora. [Kabir and Webb \(2008b\)](#) documented that 59% of 419 plant species are native. They also support the conservation of rare species which are lost in the wild. For example, IUCN red-listed species, *Mangifera sylvatica* and *rographis paniculata* and *Calamus guruba*, were planted in homegardens for their protection from extinction ([Baul et al., 2015](#); [Kabir & Webb, 2008b](#)). The complex structure of homegardens is dominated by trees and other plants in several strata that are inhabited by wildlife.

Homegarden comprises trees, shrubs, herbs, lianas, livestock, poultry and aquaculture. Usually, farmers plant them, and, in some cases, they are naturally grown. For example, [Hosain and Rakkibu \(2017\)](#) documented a total of 73 species (42 trees, 13 shrubs and 18 herbs) belonging to 39 plant families. These species comprised 38 native and 35 exotic, as well as 68 planted and 5 naturally occurring, in the southwestern region of the country. In relation to the planting of tree species, farmers' preferences for fruit and food, medicines, fuel, timber and aesthetic and beautification purposes depend on their needs and the size of their homesteads. For instance, [Roy et al. \(2013\)](#) identified 45% fruit and food-producing, 39% medical plants, 32% firewood, 29% timber, 16% ornamentation and spiritual species and 11% species as both fodder and fence and 5% spices and vegetables in the northern region.

However, tree species diversity varies widely between locations because of the differences in environmental conditions (e.g., rainfall, temperature and soil fertility). In the northwestern region, limited rainfall, intense heat and low soil fertility limit the species diversity, resulting in the lowest species richness. On the other hand, higher numbers of species exist in the southwestern region, where agricultural land is submerged for the majority of the year; this makes farmers maintain a homestead-based subsistence system for raising important species.

THE SOCIAL INEQUALITY CRISIS AND WOMEN EMPOWERMENT

MALE-DOMINATED SOCIETY

Rural Bangladesh can be described as a male-dominated society, which can have negative impacts on the lives of women. Women feel obliged to let their spouses make household decisions due to their relatively lower decision-making power (Abbink et al., 2020). Patriarchal norms still designate men as the primary decision-makers and breadwinners in Bangladesh (UNDP Bangladesh, 2023). In daily life, males are usually busy with non-homegarden activities such as agriculture, off-farm activities, service, labour and small-scale business, while females are busy with in-house activities such as preparing food, taking care of family members, gardening and rearing domestic animals, which are possible to perform without going outside the home (Kabir & Webb, 2009).

EMPOWERMENT THROUGH HOMEGARDEN ACTIVITIES

Homegardens have a high potential to empower women. From species selection and sowing to planting and harvesting, as well as the processing and marketing of products, females play a significant role in homegarden farming, as the homestead is often within their activity space. In near-landless and smallholder households, women and children perform three-fourths of their farming tasks compared to the other categories of households (Shajaat Ali, 2005). Through active participation in home gardening activities, women can contribute to the household income by reducing production costs while also becoming employed. This helps in the reduction of gender discrimination while improving their benefit shares with males in the family. In Bangladesh, 97% of home gardeners are female, compared to over 80% of men in Sri Lanka and India (Marambe et al., 2012). Homegardens need a regular but small amount of labour to monitor and raise plants and animals, which easily fits the schedule of females and children who spend a major portion of time at their homegardens, reducing the chance for male members not to shift from non-homegarden activities. Families with homegardening provide 75.7% of the labour needed, with the remaining 24.3% coming from outside sources. Approximately half of the labour requirements are filled by female workers, which is crucial because they often lack access to alternative employment options (Motiur et al., 2006).

Females, as the most disadvantaged segment of society, are now considered as the potential producers of homegarden products in Bangladesh using their traditional knowledge. A study conducted by Kabir and Webb (2009) in southwestern Bangladesh found that homegardening could give both male and female family members work opportunities, boosting family income and improving living conditions. There is still a great deal of room for the improvement of the homestead production system. Technical knowledge and skills for actively utilising these in the production system of homegardens could be provided to women. A study conducted by Kabir and Webb (2009) in southwestern Bangladesh found that homegardening could give both male and female family members work opportunities, boosting family income and improving living conditions.

CONCLUSIONS: CHALLENGES AND POLICY IMPLICATIONS

In Bangladesh, forest degradation and deforestation, land use change, land fragmentation and poverty are among the major threats against socioeconomic development, including vulnerable livelihood, social inequalities and environmental degradation (increasing carbon emissions, climate change impacts and loss of biodiversity). In such circumstances, homegardens, a well-established land use system managed by a majority of rural communities, are a way to support their livelihoods in crises to make them resilient to climate change while enabling gender equality, biodiversity conservation and carbon emission reductions.

However, homegardens have experienced fragmentation, overutilisation and conversion into other land uses due to overpopulation. Conversion of homegardens into other land uses lessens

the populations of some species like *Phoenix dactylifera* and *Borassus flabellifer*, which used to appear frequently in the recent past. Furthermore, insufficient spaces in homesteads restrict farmers from raising livestock and poultry, resulting in a shortage of organic manure to fertilise the homestead plants. This, in turn, diminishes the components of the tree, crop and livestock in the homegarden system, leading to a loss of diversity. Intensive cultivation of homegardens by small-holder households to meet the demands of their high populations may also decrease soil fertility and productivity. Moreover, the adverse impact of climate change is likely to diminish the productivity of homegardens.

The lack of adequate national interests in forest policy and Bangladesh Forestry Master 2016 may hinder the strategic development of homegardens and associated benefits to local people. Furthermore, ignorance about the understanding of the socioeconomic factors of homegarden practitioners and rural areas is one of the drivers of fragmentation and degradation of homegardens. Although several studies have concentrated on floristic compositions, stand structure, biodiversity and the role of homegardens in the socioeconomic development of rural households, there is a dearth of studies on ecosystem services, carbon stocks and the valuation of the ecological benefits that homegardens provide. Despite its extensive coverage and great potential for livelihood opportunities through carbon financing and climate change mitigation, homegarden agroforestry has not been included as a significant component of NDCs due to this knowledge gap.

In sum, homegardens are unique agroecological systems in the Global South with diverse trees, shrubs, undergrowth and even animals. Home gardening in the Global North is practised mainly for food and health benefits. However, these homegardens play a significant role in climate change mitigation and adaptation in developing nations, along with other ecosystem services. In order to unlock the potential benefits of homegardens, they deserve greater attention from policymakers nationally and globally.

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13 Towards Urban Resilience

Urban Gardening in Post-Earthquake Christchurch, New Zealand

Andreas Wesener and Matt Morris

INTRODUCTION

Christchurch (New Zealand) is known as the ‘Garden City’ thanks to its plenitude of public parks and gardens, historically low suburban residential densities, as well as an early twentieth-century connection with the English ‘Garden City’ movement (Morris, 2006). Before European settlement, Aotearoa (New Zealand) had a long tradition of communal gardening by Indigenous Māori. The first European settlers who arrived in the first part of the nineteenth century documented these practices. However, traditional Māori gardening came under threat during the nineteenth century as a result of warfare, confiscation, resettlement and economic decline (Morris, 2020). Across New Zealand, traditional food-gathering areas were repurposed for urban development, and through ‘the creation of self-sufficient settler spaces, Māori were effectively excluded from economic activity’ (Morris, 2020, p. 50). On the other hand, generous residential subdivisions allowed European settlers to grow fruits and vegetables in their private backyards (Trotman & Spinola, 1994) – an expected practice to support people’s food supplies (Dawson, 2010).

In this chapter, urban gardening is defined as ‘a practice of urban agriculture’ (Tomatis et al., 2023, p. 1). Urban agriculture has been broadly defined as ‘the cultivation, processing and distribution of agricultural products in urban and suburban areas,’ inclusive of organisational and spatial variations such as ‘community gardens, rooftop farms, hydroponic, aeroponic, and aquaponic facilities, and vertical production’ (USDA, 2023).

The chapter is divided into four sections. The introduction highlights the historical worldwide significance of urban gardening in situations of crisis and associated contributions to disaster, community and food resilience. The chapter continues with case studies of urban gardening projects in Christchurch, followed by a discussion on urban policy and strategic plans, community networks and events against the backdrop of past and future natural/anthropogenic disasters. The chapter concludes with a discussion of the present and future roles of urban gardening within the conceptual context of urban resilience.

URBAN GARDENING AS A GLOBAL RESPONSE TO CRISIS

Throughout history, urban gardening has played a significant role in the survival of urban communities worldwide (Fox-Kämper, 2016). In the nineteenth century, urban allotment gardens emerged in response to food shortages during the Industrial Revolution (Barthel et al., 2015). In the first part of the twentieth century, food was produced in urban backyards and allotment gardens to supplement short supplies during the two World Wars (Barthel & Isendahl, 2013; Crawford et al., 1954). In the second part of the twentieth century, urban gardening grew in response to political and economic predicaments such as the 1973 oil crisis (Keshavarz & Bell, 2016) or following

the collapse of socialist economies throughout the 1990s (Altieri et al., 1999; Visser et al., 2019). In the twenty-first century, urban gardening, e.g., in urban community gardens, has supported socially deprived neighbourhoods (e.g., Audate et al., 2021; Kingsley et al., 2021). The literature has discussed urban gardening initiatives in the context of the economic crisis in the Global North (e.g., Anthopoulou et al., 2017; Camps-Calvet et al., 2015), the Global South (e.g., Kutiwa et al., 2010) and former socialist countries (e.g., Matijevic, 2022). Most recently, the benefits of urban gardening have been discussed with regard to the COVID-19 pandemic (e.g., Kingsley et al., 2023; Lal, 2020). When people have to leave their homes, urban gardening is often ‘a survival strategy for displaced people to obtain food on a temporary basis, but also a valuable livelihood strategy for those who settle permanently, and for those who eventually return to their home cities’ (Adam-Bradford & van Veenhuizen, 2015, p. 407).

Urban community gardens have been considered particularly beneficial in the context of natural disasters. They have helped alleviate food supply chain interruptions, for example, following earthquakes (Sioen et al., 2017) or hurricanes (Sims-Muhammad, 2012). They have been considered safe ‘multi-purpose community refuges which hosted meaningful and restorative greening practices’ (Chan et al., 2015, p. 625), providing opportunities for social interaction to reduce stress and anxiety and to increase ‘psychosocial resilience after a disaster’ (Okvat & Zautra, 2014, p. 85). They have helped community members cope with negative feelings by engaging in positive experiences (Okvat & Zautra, 2014) and supported deprived communities through collaboration and networking (Kato et al., 2014).

URBAN GARDENING IN THE CONTEXT OF DISASTER AND COMMUNITY RESILIENCE

Disaster resilience has been defined as the capability of individuals and social collectives to mitigate disasters, limit their effects and recover from them without larger social disruptions (Marasco et al., 2022). In the context of disasters, community resilience has been related to community action with regard to ‘the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures’ (UN/ISDR, 2004). As a concept, community resilience combines collaborative community action, the procurement and utilisation of shared resources and collaboration with government and other stakeholders to empower communities and help them thrive in difficult and unstable times (Daly et al., 2009; Magis, 2010). Community gardens have been able to strengthen disaster and community resilience ‘by providing the structure and practices to support social–ecological diversity, learning, and community support networks to better respond to future disturbances’ (Chan et al., 2015, p. 633).

Disaster and community resilience are, to some extent, based on building social capital (Aldrich, 2012). Social Capital Theory (Putnam, 2000), with its focus on social networks and corresponding bonding, bridging and linking social capitals, has been considered a key factor for post-disaster recovery (Aldrich & Meyer, 2015; Wilson, 2012). For example, the Fitzgerald Ave temporary community garden project in post-earthquake Christchurch encouraged social interaction between different user groups through urban gardening. Community members developed new relationships and networks between different community groups, encouraging inclusive team building and respectively developing bonding and bridging social capitals (Montgomery et al., 2016).

However, urban gardening is not commonly included in disaster prevention or recovery plans. For example, while urban gardening in Vancouver has been recognised as a contributor to food resilience, its role in earthquake preparedness and recovery has not been adequately acknowledged (Slater & Birchall, 2022). Despite calls to include urban gardening in climate change strategies (Dubbeling et al., 2019), it is rarely included in climate change adaptation plans (Clarke et al., 2019).

URBAN GARDENING PROJECTS IN POST-EARTHQUAKE CHRISTCHURCH

CRISIS CONTEXT

In 2010 and 2011, the Canterbury region was struck by two major earthquakes and a series of devastating aftershocks. It was one of the most destructive natural disasters in New Zealand, with 185 casualties and about 7,000 people injured. About 90% of residential properties were damaged, leading to the demolition of around 8000 households. Eight out of ten buildings in Christchurch's city centre were badly damaged, and demolition work dominated the urban experience for years (Brand et al., 2019). Shortly after the experiences of the 2010–2011 Canterbury earthquakes, various bottom-up urban gardening initiatives sprung up (e.g., Montgomery et al., 2016; Wesener, 2015). New policy frameworks such as the 'Food Resilience Policy' (Christchurch City Council, 2014a) and network organisations such as the Food Resilience Network and the related 'Edible Canterbury' web portal¹ were created.

TEMPORARY URBAN GARDENING PROJECTS AS A POST-CRISIS RESPONSE

The damage in Christchurch's city centre following the earthquakes was extensive. Large parts of the built environment were destroyed or damaged to the extent that they had to be demolished successively (Brand et al., 2019). Christchurch's city centre became a kind of dystopian landscape of rubble and vacant spaces (Figure 13.1). Following the disaster, community groups such as 'Greening the Rubble' and 'Gapfiller' developed projects for the temporary use of vacant urban



FIGURE 13.1 Christchurch city centre, June 2013. Following the earthquakes, Christchurch's city centre became a dystopian landscape of rubble and vacant spaces. (Photo: A. Wesener.)

spaces across the destroyed city centre, with the aim of reactivating the area until permanent development occurred ([Wesener, 2015](#)). Temporary uses included urban gardening projects in the central city. For example, a temporary urban community garden was constructed on a vacant central city site in 2012, designed by the local community, facilitated by Greening the Rubble and supported by local businesses, schools and community groups ([Montgomery et al., 2016](#)). The garden was only recently closed for permanent redevelopment. ‘Agropolis’ was a temporary ‘scalable transitional urban farm’ ([LIVS, 2015](#)) and collaborative community initiative that opened in 2013 ([Figure 13.2](#)). The project continued for about three years, featuring regular working bees, workshops and community events. It became an inspiration and incubator for other urban gardening projects such as a vertical pop-up garden ([LIVS, 2016](#); [Figure 13.3](#)) and ‘Cultivate Christchurch,’ an urban farm that started on a vacant central city site in 2014 and extended to a network of urban farms combining urban food production with social work around youth development and community engagement. Cultivate merged with a larger commercial organic farm in 2021, considering that the ‘small scale model of urban farming is not robust enough for supporting our youth programme over the long term, nor a viable business in the competitive Canterbury organic veggie market’ ([Cultivate Christchurch, 2021](#)).

ESTABLISHED COMMUNITY GARDENS AND THEIR ROLE IN CRISES AND DISASTERS

Community gardens, as we now understand them, are documented in Aotearoa New Zealand, from the late 1920s in the form of ‘worker’s gardens’ formed during the Great Depression to support the families of working men struck by economic crisis (e.g., ‘Community Garden. Thames Unemployed,’ 1933). During World War II, more community gardens appeared around the country,



FIGURE 13.2 Community gathering at Agropolis urban farm, October 2013. (Photo: A. Wesener.)



FIGURE 13.3 A vertical pop-up garden (in the back), November 2015. A temporary urban gardening initiative on a vacant site in Christchurch's post-earthquake city centre. (Photo: A. Wesener.)

with some particularly used by women whose husbands were now caught up in the conflict (Morris, 2020). Since the 1970s, community gardens have continued to develop across urban centres. Potential triggers include 'alternative lifestyle' drivers of the 1970s, economic hardships resulting from neoliberal economic restructuring in the 1980s and increased subdivision densities in the 1990s. In the twenty-first century, triggers have tended to be an increased need to strengthen community networks (2000s) and a general revival of urban food production, especially since the Global Financial Crisis (Morris, 2020). While the post-war development of community gardens started to flourish in the early 1980s, most gardens were established in the early 2000s.

Community gardens in New Zealand provide many social and health benefits (Earle, 2011). However, official statistics about the number and distribution of community gardens do not exist. A 2019 study estimated that there are about 150 community gardens in New Zealand's three largest cities – Auckland, Wellington and Christchurch (Shimpo et al., 2019) – and a 2021 New Zealand-wide survey established a contact list of 204 gardens across the country. Based on 196 surveyed gardens, more than 60% were established since 2010 (Morris et al., 2020), indicating that the popularity of community gardens has grown over the last decade. In 2019, the Canterbury Community Gardens Association (CCGA) featured about 30 community gardens on their website (Shimpo et al., 2019). The number of gardens grew to 52 by January 2023 (CCGA, 2023), a sign that community gardening – in line with the national trend – has become progressively popular within the Greater Christchurch metropolitan area. The 2016 Christchurch City Council community garden guidelines 'encourage community gardens throughout the city' (Christchurch City Council, 2016, p. 1).

Shimpo et al. (2019, p. 31), who studied the New Brighton community garden in Christchurch and its contribution to earthquake recovery and community resilience, argued that '[w]ell-established community gardens may help secure food supplies and provide essential infrastructural support

following a disaster. However, first and foremost, community gardens help strengthen social interactions, relieve stress and build the social capital that is needed when a disaster strikes.’ [Wesener \(2020\)](#) discussed three commonly experienced benefits of community gardens in post-earthquake Christchurch with regard to notions of urban resilience: First, community gardens were considered safe and accessible sanctuaries for social exchange, where local communities could meet, work, communicate and participate in shared activities to ‘escape from the difficult situation – at least for a few hours’ ([Wesener, 2020](#), p. 82). Second, community gardens helped address food insecurities after the earthquakes. Food donation schemes, organised by community gardeners and local charities, contributed to food supplies for people in need during this period. For example, food supplies were transported by helicopter from a community garden in Kaiapoi to areas in Christchurch that were cut off from the rest of the city when roads and bridges were so badly damaged that they became unusable. Third, local community gardens became educational hubs where community members could learn practical skills around cooking, DIY repairs, saving water and installing composting toilets when regular infrastructure was damaged ([Wesener, 2020](#)). Such findings support the results of other studies that have highlighted the important role of community gardens as learning spaces (e.g., [D’Abundo & Carden, 2008](#); [Gregory et al., 2016](#); [Surls et al., 2014](#); [Wesener et al., 2020](#)).

OTHER POST-EARTHQUAKE URBAN GARDENING INITIATIVES

The Christchurch City Council Community Gardens Guidelines include a list of other types of edible gardens besides urban farms and community gardens, such as community orchards and food forests, institutional and school gardens, food foraging sites and Mahinga kai² sites ([Christchurch City Council, 2016](#)). The Ōtākaro Orchard is an example of a post-earthquake central city urban gardening project that combines a food forest and edible garden with a food information centre, a restaurant, office, event spaces and educational facilities ([Ōtākaro Orchard, 2023](#); [Figure 13.4](#)). Following the Canterbury earthquakes, many suburban areas in Christchurch, particularly the eastern suburbs, experienced soil liquefaction and lateral spreading. Based on the extensive damage to land and properties, it was decided to ‘red zone’ the areas that were deemed unsuitable for the rebuild and to demolish the existing built structures ([CERA, 2016](#)). The residential red zone includes a vast 602-hectare area in the East of Christchurch, the Crown-owned ‘Ōtākaro Avon River Corridor.’ The area is now home to a range of food projects and edible gardens, following the 2019 Ōtākaro Avon River Corridor Regeneration Plan that determines ‘farming and food-based opportunities’ as preferred land uses. These include commercial farming, horticulture, markets and community gardens, food forests and ‘plot to plate’ facilities, including cafes and restaurants ([DPMC, 2023](#), p. 46). The Richmond Community Garden was established in 2015 in the Ōtākaro Avon River Corridor providing various community services such as recycling, composting and olive oil production ([Richmond Community Garden, 2023](#)). The ‘Moon River Flower Farm’ became the first commercial flower nursery in the Ōtākaro Avon River Corridor ([Harvie, 2021](#)). Christchurch City Council features a web-based fruit tree map on their website that encourages food foraging in the Ōtākaro Avon River Corridor by helping people find fruit tree species across Christchurch ([Christchurch City Council, 2023](#)).

FROM FOOD RESILIENCE TO URBAN RESILIENCE

Following the Canterbury earthquakes, people started reflecting on growing and distributing food from a resilience perspective. The Food Resilience Network, founded in 2013 ‘from a range of organisations who all had an interest in food resilience’ ([Edible Canterbury, 2023](#)), developed a ‘Food Resilience Strategy,’ which was adopted by Christchurch City Council in November 2014 to provide ‘healthy, affordable and locally grown food for all people’ ([Christchurch City Council, 2014a](#)). The related ‘Food Resilience Network Action Plan’ seeks to establish a ‘patchwork of food



FIGURE 13.4 Entrance to the Ōtākaro Orchard, January 2023. (Photo: A. Wesener.)

growing at local hotspots, linked together like a ribbon and woven into the fabric of our communities’ ([Christchurch City Council, 2014b](#)). Its goal is to strengthen the local food economy, for example, by growing networks and partnerships, educating people, and developing supportive policy frameworks. In 2015, the ‘Edible Canterbury Charter’ established ‘guiding principles of our collective efforts to create a more food resilient region’ ([Edible Canterbury, 2023](#)). It was signed by high-level organisations, including Christchurch City Council and the Canterbury District Health Board. The related Edible Canterbury web portal went online to provide comprehensive information on local food production and distribution ([Edible Canterbury, 2023](#)).

On their food resilience website, the Council defines food resilience as ‘[p]hysical and economic access, by all people, at all times, to enough food to maintain an active and healthy life’ based on a ‘local food production and distribution system based on ecological sustainability, able to withstand natural and man-made shocks’ referring to both natural and anthropogenic disasters ([Christchurch City Council, 2014a](#)). After the Canterbury earthquakes, community gardens contributed to local food supplies when other supply chains failed ([Wesener, 2020](#)). The experiences have been incorporated by local urban gardening initiatives such as the Ōtākaro Orchard, which ‘realised that supermarkets carry only 3 days’ worth of food and if our supply chains get disrupted, we go hungry’ ([Ōtākaro Orchard, 2023](#)). Edible Canterbury defines food resilience as ‘the ability to prepare for, withstand, and recover from disruptions in the food supply chain in order to make food accessible for all’ ([Edible Canterbury, 2023](#)).

The Food Resilience Network (FRN) was originally conceived as just that: a network of organisations committed to providing better access to food for all citizens ([Morris, 2020](#)). The Network met to provide updates on relevant projects undertaken by those organisations and to identify

common themes emerging and potentially collaborative actions that could address common needs. The Ōtākaro Orchard was one such project, developed out of a collaborative design process that involved 50 organisations ([Ōtākaro Orchard, 2023](#)). Over time, the work of developing the information centre on the site has come to absorb the majority of the Network's energy, but the orchard itself is flourishing with a range of fruit trees and small fruits. More importantly, the orchard has hosted countless community and school groups for education sessions, thereby fulfilling its central mission of being an educational resource for increasing food resilience in Christchurch.

The collaboration that is so important to the mission of the FRN (and enshrined in the principles of the Edible Canterbury Charter) has allowed other initiatives to develop successfully. One impactful example is the series of school gardening hui³ that have been facilitated by the FRN since 2016. These hui grew out of survey work undertaken by the FRN with the support of student interns from the University of Canterbury in 2015 and 2016 ([Akpan, 2015](#); [Morris & Hubbard, 2016](#)). The surveys identified that while 81% of the 54 schools responding had edible gardens (a 25% response rate), and 61% of those used the garden as a teaching resource, only 30% reported having outside help with maintenance. Of the 19% who did not have a garden, 46% wanted help to start one. Furthermore, 82% reported they would be interested in professional development around using the garden for teaching, and 77% wanted to attend hui with like-minded teachers. The hui were, therefore, designed as professional development days and drew on the knowledge of the handful of school gardening educators working in schools (but not members of the teaching staff) in the area. Since they commenced, these hui have led to the creation of a distinct community of practice supporting peer-to-peer, regionally specific learning. In addition, they are fora where practitioners – often passionate but overworked – can be re-energised and encouraged in what can sometimes be lonely work within the school setting.

Collective action for enhanced impact around food resilience remains an important driver for many in Christchurch. In 2023, the University of Canterbury (UC) hosted an inaugural 'Community Feast.' This event sought to reflect the values of the Edible Canterbury Charter, while also explicitly referencing the 2015 United Nations Sustainable Development Goals (SDGs) in its planning. Of the 17 SDGs, the event specifically focused on those pertaining to No Poverty (SDG1), Zero Hunger (SDG2), Good Health and Wellbeing (SDG3) and Partnerships (SDG17). As such, a stakeholder group of organisations working in the food resilience space was convened to help guide the event. Those organisations included community gardens and farms, chefs, academics from UC and Lincoln University and of course the FRN. It also included those working with the most vulnerable in our communities, such as Housing First and the Christchurch City Mission. The guiding vision was of a feast that was open to all and where those most impacted by food security issues could feel comfortable. Organisers also wanted to reflect the spirit of Te Tiriti o Waitangi/The Treaty of Waitangi, considered as New Zealand's founding document (see e.g., [Palmer, 2008](#)). They worked with mana whenua⁴ to provide a traditional hāngi (earth oven) meal as part of the overall feast. Registrations for the event included people from over 60 organisations, with around 300 people attending.

Of particular note was the attendance of approximately 40 people from the kaewa community. Kaewa is a Māori word that literally means to wander or roam. In this context it refers to people who are on a journey, and specifically to the homeless. The feast was designed to stimulate conversation and connections related to food resilience, and it was considered essential to include this demographic. Feedback from kaewa was generally positive, and to be listened to by others was an unexpected experience. Jimi, for example, felt it was 'an honour to be invited.' The discussion of food issues, he thought, felt like 'bringing back old values from our grandparents' time.' He, and others, remarked that if the event happened again kaewa would like to be more directly involved in the organisation. Another kaewa, Connor, hoped that the event would become a nationwide experience ([UC Sustainability Office, 2023](#)). Community gardens featured prominently at the Community Feast; 31% of respondents to a post-event survey said they came from community gardens, while the CCGA made an impressive visual impact with a large display of autumn

produce. Around 57% reported they felt they had made valuable connections for themselves or their organisation, and 92% said they would attend if the Community Feast were to be run again. Perhaps most indicative of the worthiness of such networking events as this, and the desire to collaborate, 32% said that their organisation could be interested in co-hosting the event if it were to be run again. In addition, 61% said they would like to volunteer at the event in the future (UC Sustainability Office, 2023).

CONCLUSIONS

The above discussion shows an intrinsic conjunction between urban gardening, disaster resilience, community resilience and food resilience. In Christchurch, the local production and distribution of food is contextually interwoven with the disaster history of a region that went through a major earthquake over a decade ago. However, recent networking events like the 'Community Feast' indicate that discussions around food resilience have broadened and become inclusive of a range of environmental, socio-economic and cultural processes and challenges. Urban gardens in Christchurch have become part of a wider resilience narrative with regard to strengthening 'the resilience of urban social-ecological systems' (Chan et al., 2015, p. 632), sometimes subsumed under the overarching, however, contested notion of urban resilience (Amin, 2014; Leitner et al., 2018; Wilson & Jonas, 2018). Urban resilience concepts are based on diverse systems that work 'constantly in the silent background' and that can be quickly activated when needed, for example, when a disaster strikes (Amin, 2014, p. 311). Community gardens can be considered a form of such a system (Wesener, 2020).

While the Canterbury earthquakes were an incubator for community action around urban gardening, concepts of disaster resilience do not only relate to sudden events such as earthquakes but also to slow-onset disasters like climate change. Like many low-lying coastal cities in the world, Christchurch is prone to floods, extreme weather events and sea-level rise. Such events do often affect urban populations that suffer already from socio-economic deprivation. This raises questions about how urban gardens could respond to a variety of crisis scenarios and how their role as silent systems in the background could be extended. With regard to climate change mitigation, urban gardens can potentially help reduce and sequester carbon emissions (Okvat & Zautra, 2011; Richter et al., 2020) and reduce carbon footprints (Edmondson et al., 2020). With regard to climate change adaptation, urban gardens can provide benefits for urban socio-ecological systems that are vulnerable to the adverse effects of climate change (Demuzere et al., 2014; e.g., Gill et al., 2007), including urban temperature reduction (Rost et al., 2020), environmental education (Bendt et al., 2013) and stormwater storage and filtration (Pauleit & Duhme, 2000). For example, urban gardening could become part of 'strategically located green stormwater infrastructure networks for adaptive flood mitigation' (Muangsri et al., 2022) that help alleviate the impacts of extreme rain weather events and stormwater surges.

It is time to include urban gardening in more holistic urban resilience policy frameworks, including natural, environmental and socio-economic disasters and the effects of climate change. This would change the role and reputation of urban gardens and open up new opportunities for public funding and investment into urban gardening, research and strategic urban interventions. It would increase the many benefits of urban gardens and farms beyond food resilience narratives. Our case study shows that discussions around resilience and urban gardens have broadened since the Canterbury earthquakes. Now, it is the time for policymakers and communities to embrace the manifold potentials of urban gardening and give urban gardens the attention and resources they deserve in order to address the serious challenges we face in the twenty-first century!

NOTES

1 <https://ediblecanterbury.org.nz/>

2 Te Reo Māori expression referring to natural resources and habit supporting people's livelihoods (see also <https://www.ecan.govt.nz/your-region/your-environment/our-natural-environment/mahinga-kai/>)

- 3 Te Reo Māori expression for gathering or meeting.
- 4 Te Reo Māori expression referring to (indigenous; ancestral) territorial rights including power from and authority over the land.

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14 Response Options Related to Health Benefits of Gardening in Times of Crisis

*Agnes E. van den Berg, Victoria Bugni,
Shureen Faris and Ranaivo Rasolofoson*

RESPONSE OPTIONS RELATED TO ACCESS TO AND OWNERSHIP OF GARDEN SPACES

An important precondition for individuals to reap the health benefits of gardens in acute and chronic crisis situations is that they have access to garden spaces (Goodall & Kingsley, 2024). Access is defined as the ‘ability to derive benefits from things’ (Ribot & Peluso, 2003). In both high- and low-income countries, there are social disparities in ownership of private gardens (Delshad, 2022; Kingsley et al., 2024). However, in high-income countries, the lack of a private garden is to some extent compensated by the availability of community and allotment gardens that are accessible for recreation and growing one’s own food (Ponizy et al., 2021). In many low-income countries, such publicly accessible garden spaces are scarce, which can exacerbate existing social disparities in access to gardens (Drescher, 2002).

This section first introduces property rights as a key factor that shapes people’s access to garden health benefits. It is then followed by a discussion of temporary and more structural inequities in access to garden health benefits and the pathways that may lead to these inequities. It closes with an overview of solutions and recommendations on how to enhance the health benefits of gardens in acute and chronic crisis situations through access improvement.

PROPERTY RIGHTS

During acute crises and in perpetually vulnerable communities in low-income countries, secure property rights (also known as land tenure or ownership) play a pivotal role in enabling individuals to access health-related garden products (Payne, 2004). These products encompass nutritious foods, medicinal plants, and other resources essential for personal consumption or local market sales. Broadly speaking, property rights can be categorised into categories of legal and perceived forms of tenure. Legal forms of tenure are achieved through the provision of legal documentation of ownership and right of access (Uwayezu & De Vries, 2019). Perceived land tenure refers to the perception and experience of local groups of having access to a particular land and the confidence that they will continue to accrue benefits from it without the threat of eviction. Due to intense competition for urban land in low-income countries, gardeners struggle to access and legally obtain adequate land for cultivation (Magidimisha et al., 2013).

Formalising perceived land tenure is a cumbersome process with significant bureaucratic hurdles and legal complexities. A natural experiment in a poor suburban area of Buenos Aires showed that passing land from original owners to poor citizens who squatted the properties substantially increased the housing investment of the occupants, reduced household size, and enhanced the education of their children. However, the process of formalisation took a long time and only indirectly affected occupants’ health by strengthening their physical and human capital (Galiani &

[Schargrodsky, 2010](#)). A study in South Africa suggests that perceived and de facto tenure present equally crucial forms of tenure which could be supported by state actors to promote urban agriculture ([Kanosvamhira & Tevera, 2023](#)). As such, land tenure security should not only rely on a simplified process of the formalisation of the land but also effectively build on other forms of land tenure security options utilised by community gardeners within their various contexts.

SOCIAL INEQUITY IN ACCESS TO GARDENS

In Britain, an estimated one in eight households had no access to a private or shared garden during the coronavirus (COVID-19) lockdown, according to data from Natural England's Monitor for Engagement in the Natural Environment (MENE) survey ([MENE, 2020](#)). This number has risen to more than one in five households in the densely populated urban area of London.

Allotment gardens, constituting small, rented plots of land in designated areas farther away from one's home, can compensate for the lack of a private garden ([Genter et al., 2015](#)). Having such a plot of land has been shown to have important health benefits, especially for older people ([Van den Berg et al., 2010](#)). In most countries, however, these 'private gardens away from home' are almost constantly under threat of being displaced or bulldozed to make way for new development projects, jeopardising the vital green oases they provide for local residents ([Anthopoulou et al., 2017](#)).

More than 26 million people are estimated to currently be living away from home in refugee camps or host communities, according to the United Nations High Commissioner for Refugees (UNHCR, 2023). For these refugees, property rights are not even an issue. They are living in places they do not own or have any legal or informal access to. Let alone that they have the right to have a garden. Yet, people living in refugee camps often turn to nature as a means to make life bearable in these often barren and hostile environments ([Hughes, 2018](#)). Due to limited space, unavailability of fertilisers, and scarce access to water, the possibilities for growing a garden are limited. However, as documented by NGOs such as Concern Worldwide, people in refugee camps are creative in using diverse techniques to create slope, multilayered and vertical gardens ([Concern World Wide, 2022](#)). While the focus of these gardens is on growing foods, these gardens also bring solace as a means to cope with being so far away from home and living under difficult circumstances.

PATHWAYS

Social inequity in the distribution of access to garden health benefits operates through several interlinked pathways. First, without adequate access and ownership rights, people will not be able to directly benefit from garden products of direct relevance to human health (e.g., nutritious garden food, medicinal plants). For example, some garden products cannot be extracted without the use of tools, and without knowledge and education on the nutritional or medical virtues of garden products, the health benefits of gardens will be left unused ([Kupets, 2019](#)). Second, other garden products (e.g., honey, seeds and seedlings, tourist products made with craft materials) need to be worked on or enhanced to yield health benefits. For example, for bee hiving to produce honey, people need equipment and markets to generate income that can be used for health care. Vulnerable people who do not possess the capitals to achieve such translation will not be able to derive health benefits from these garden products ([Horst et al., 2017](#)). Third, wealthier and better-educated community members tend to be more likely to participate in garden activities in private and public gardens that serve mainly for recreational purposes, enjoying mental health and resilience benefits that are out of scope for less wealthy and educated gardeners who are mainly struggling to survive.

SOLUTIONS AND RECOMMENDATIONS

As elaborated upon in this section, the mere accessibility of gardens is of paramount importance in harnessing their health benefits. Policies, regulations, legislation, and interventions aimed at

improving access to the health benefits of both private and public gardens must take into account property rights and the equitable distribution of these rights (Kingsley et al., 2023). In densely populated urban environments, the pressure to repurpose public gardens for other uses, such as commercial or residential development, can be considerable. To safeguard the accessibility and health benefits these green spaces provide in both normalcy and times of crisis, it is imperative to establish and enforce regulations that prioritise the preservation of existing public gardens (Dam et al., 2023).

Additionally, when building new houses or residential developments, there is an opportunity to embed gardens and other private outdoor spaces, such as rooftop gardens and balconies that are large enough for growing plants as essential and integrated components of the design (De Sousa, 2017). Urban planning and housing policies should avoid the development of residential projects with limited or no access to private outdoor spaces, with a particular emphasis on social housing initiatives targeted at residents facing high levels of stress. By ensuring that new housing developments incorporate private garden spaces, authorities can address the challenge of unequal access to green spaces, particularly for those living in urban environments where public gardens are limited.

When local communities, particularly those in crisis and other difficult circumstances, have a more significant say in the control and management of their garden resources, they gain empowerment and are more inclined to engage in collective action. This, in turn, paves the way for the achievement of more equitable health and health-related outcomes. By fostering a sense of ownership and stewardship over communal green spaces, governments not only support the physical and mental health of residents but also contribute to their overall well-being. The promotion of access rights can stimulate a sense of community cohesion and collaboration, enabling residents to collectively address a myriad of health challenges they face, ultimately leading to more equitable and healthier societies. Thus, a holistic approach to garden access is not only about improving socio-economic conditions but also about fostering community empowerment (Eng & Khun, 2022).

In summary, comprehensive and forward-thinking policies should address not only the preservation of existing public gardens and allotments but also the integration of private gardens and public green spaces into housing developments and the ownership of local communities over communal green spaces. This multifaceted approach will contribute to the equitable distribution of garden access rights and support the well-being of urban communities, ultimately resulting in healthier and more vibrant cities that exhibit resilience in the face of crisis situations.

RESPONSE OPTIONS RELATED TO THE DESIGN OF GARDENS FOR RESTORATION AND STRESS RELIEF

Gardens serve as restorative spaces that provide relief from stress, which is especially helpful when people are confronted with a personal or societal crisis (Egerer et al., 2022; Gerlach-Spriggs et al., 1998). Regular visits to gardens can also help build biological, social and psychological resilience to cope with stressful events as a nature-based health intervention (White et al., 2023). It is of paramount importance that gardens are thoughtfully designed with a focus on the users' needs for stress relief and other mental health benefits. This is particularly pertinent to more intensively managed and designed public recreational gardens in urban areas and healing gardens situated near hospitals, nursing homes, and other healthcare facilities frequented by vulnerable populations. Nevertheless, owners and users of private and community gardens may also take advantage of design guidelines for optimising the restorative value of their gardens.

This section discusses design principles of gardens that can support and promote restoration from stress, along with an overview of solutions and recommendations on how to implement these principles. This section mostly focuses on urbanised areas in high-income countries where residents often contend with elevated levels of stress due to the fast-paced, demanding character of urban living.

DESIGN ASPECTS THAT SUPPORT AND PROMOTE RESTORATION FROM STRESS

As a very broad classification, gardens can be divided into predominantly natural gardens, rich in trees, plants, grass, flowers, water and other natural elements, versus predominantly tiled or paved gardens. It probably does not come as a surprise that the first type of garden is more restorative for stress relief. Indeed, numerous studies have consistently demonstrated that the perceived restorative benefits of gardens and green spaces are positively correlated with their degree of naturalness (Carrus et al., 2013). Regrettably, many private garden owners frequently opt for paved designs to reduce maintenance efforts, only to realise, often belatedly, that such a transformation has rendered their garden less conducive to meeting their needs for restoration and stress relief.

Natural gardens encompass a spectrum that can be categorised into two primary types: formal and informal gardens (Turner, 2005). These design approaches diverge significantly in terms of structure and layout. Formal gardens are characterised by their neat and manicured look, straight lines, and the regular rhythm of repeated plantings. Some well-known historical examples are the medieval cloister gardens and the French Renaissance gardens. In contrast, informal gardens are designed in a less rigid way, leaving more space for nature to grow spontaneously, or, as some might call it, 'to become overgrown.' Some typical historical examples are the 18th-century English landscape parks, which featured flowing curves, irregularly shaped lakes and seemingly wild, undulating terrain designed to mimic the appearance of untouched nature.

Empirical studies on contemporary garden preferences indicate important individual differences in preferences for formal and informal garden styles (Van den Berg & Van Winsum-Westra, 2010). Some people like gardens that look neat and well-maintained, while others like more wild and naturally grown-looking gardens. These differences reflect the influence of two fundamental human needs that shape the way people perceive and evaluate natural environments: the need for security, which finds a more fulfilling expression in formal gardens, and the need for exploration, which is better satisfied in informal garden settings (Appleton, 1975; Kaplan, 1995). In general, garden designs that balance needs for security and exploration, such as romantic and lush rose gardens, tend to enjoy broad popularity among all users. Nevertheless, designs that are meticulously tailored to align closely with specific user needs offer the greatest potential for restoration. This becomes especially vital during times of crisis when user preferences often shift towards heightened requirements for security (Koole & Van den Berg, 2005).

The Perceived Sensory Dimensions model, developed by landscape architects and therapists in Sweden, provides concrete design guidelines for healing gardens (Stoltz & Grahn, 2021). The model distinguishes eight key qualities that support people's needs for restoration across four axes: a Natural – Cultural axis, a Cohesive – Diverse axis, a Sheltered – Open axis, and a Serene – Social axis. These axes and the corresponding qualities are graphically represented in Figure 14.1, with key words for each dimension derived from ongoing research at care farms conducted by the first author (see <https://resonate-horizon.eu/>).

Research suggests that especially the physical qualities of nature, serene and shelter, contributes significantly to the perceived restorative potential of urban green spaces (Stigsdotter et al., 2017). In general, however, the contributions of the design qualities appear to vary with the individual characteristics of users in different contexts with different needs (An et al., 2022). These findings underline the importance of 'designing with people in mind' (Kaplan et al., 1998).

People with disabilities, as a special needs group, often have limited access to gardens and other natural areas. The idea of universal design strives to make gardens accessible for all users, including those with a physical disability. An analysis of 20 projects and studies in Britain revealed that disabled respondents emphasised the need for detailed information about access to nature and facilities, preferably supported with photographs so that they can choose appropriate areas and plan their visit (Morris et al., 2011). A survey on the preferences for features of nature trails of people in wheelchairs from three European countries showed that, across the different countries, people with disabilities attributed the highest usefulness to asphalt surfaces, concrete surfaces or surfaces made

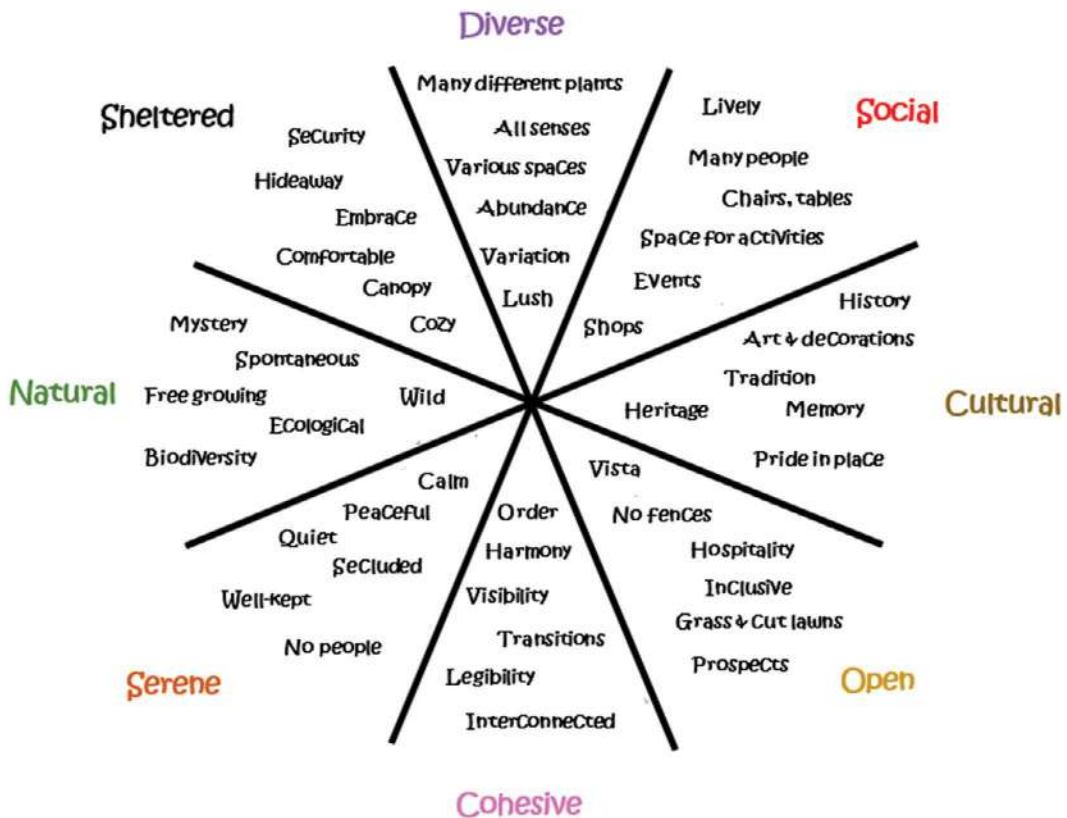


FIGURE 14.1 The Perceived Sensory Dimensions model, with keywords that represent design principles for each quality. (Created by the author, released into the public domain.)

of cobblestones. Paving materials from wood is generally considered to be avoided due to paths being slippery during the rainy season (Janeczko et al., 2016).

SOLUTIONS AND RECOMMENDATIONS

From a design perspective, an essential recommendation is the explicit inclusion of health as a primary guiding principle in master plans and the more detailed designs of public garden areas. Currently, many garden plans tend to prioritise recreational and aesthetic values when addressing user needs. While these aspects contribute to the overall well-being of garden visitors, a dedicated focus on health-specific design principles is vital for realising the full potential of gardens as facilitators of physical and mental health. Models such as the Perceived Sensory Dimensions model can serve as valuable tools to guide designers and landscape architects in incorporating health-specific principles into their work. This shift in perspective acknowledges the profound role that green spaces can play in enhancing the health and well-being of the communities they serve, particularly in preparing for future crises like COVID-19, which have a significant impact on mental health.

A critical challenge in the health-oriented design of gardens lies in creating universal designs that cater to the diverse and often complex needs of all users. This entails a careful balance between addressing the distinct psychological requirements for both safety and stimulation among various individuals and user groups. Furthermore, it necessitates the provision of suitable infrastructure that accommodates the needs of every visitor, irrespective of their physical abilities or disabilities. Achieving this level of inclusivity and accessibility in garden design requires the collaborative

efforts of multidisciplinary project teams composed of experts from fields such as landscape architecture, psychology, and geography. These teams can provide well-informed and consensual guidelines to ensure that gardens are thoughtfully designed to address the diverse health and well-being requirements of the communities they serve. Embedding health-oriented principles into garden design will enhance the potential of these spaces as valuable contributors to the physical and mental health of the population.

RESPONSE OPTIONS RELATED TO GOVERNANCE AND HEALTHCARE

Human health benefits of gardens often do not feature strongly, nor explicitly, in governance and healthcare. As far as the health benefits of nature are addressed, these are mostly related to more large-scale natural environments, such as forests and parks. At the global level, for example, a report from the Worldwide Fund for Nature (WWF) highlighted the vital role of forests for human health (Beatty et al., 2022). In Canada, national parks encourage doctors to prescribe visits to their parks by supplying free Parks Canada Discovery Passes to patients (James et al., 2019; Kondo et al., 2020; PaRx, 2022). Nevertheless, from a health promotion perspective, gardens are invaluable natural assets that are more easily available and accessible than natural landscapes such as forests, parks and beaches farther away.

The section gives an overview of dimensions of government arrangements relevant to the health benefits of gardens. Possible solutions for implementing these benefits in governance and healthcare are presented.

GOVERNANCE ARRANGEMENT

Governance arrangements involve the dimensions of discourses or narratives, actors and the alliances they can form, resources that are mobilised by actors in decision-making, and the rules of the game in terms of the ways in which decision-making is structured (Arnouts et al., 2012). These arrangements are complex, as they involve a wide range of discourses, often at the intersection between different policy and governance sectors.

Regarding discourses, policies and programmes at different scales mostly fail to include the essential contributions of gardens to health. If gardens are included, this mostly pertains to municipal gardens and their contribution to community building. For example, the EU-funded GenerACTOR programme aims to promote community gardens in urban areas in Columbia for good governance, active citizenship and participation (GeneActor, 2023). This focus on public rather than private gardens is understandable, given that these communal spaces have a more significant impact on social equity and community health and well-being, as they are accessible to a wider range of residents and serve as shared resources for all. However, private gardens, although not as accessible, still play a crucial role in fostering individual health and well-being, especially during periods of lockdowns, such as those imposed in many countries during the COVID-19 pandemic (Kingsley et al., 2023). Private gardens, therefore, deserve more attention in the current discourses on the health benefits of nature.

The need for more collaboration and coordination between different governance actors is another key issue. Most importantly, there is still a lack of involvement of key actors from the healthcare sector (Van den Berg, 2017). The limited engagement of the health sector in promoting the health benefits of gardens and other types of nature can be attributed to the prevailing paradigms within modern medicine (Wagenaar, 2005). These paradigms often cast nature-based treatments as unconventional or even fringe practices, perpetuating the perception of them as ‘quackery.’ Despite growing recognition of nature’s role in holistic well-being, a significant shift in medical perspectives and practices is still needed to fully embrace and incorporate these approaches into mainstream healthcare. In general, healthcare professionals are pivotal figures in promoting the health benefits of gardens because, in contrast to policymakers and nature managers, their primary focus is the

well-being of their patients. Their involvement is motivated by a genuine commitment to improving the health and quality of life of individuals under their care rather than being concerned with broader environmental or societal considerations.

A wide range of government resources needs to be mobilised for the optimisation of garden health benefits, from mainly raising awareness about the health benefits of gardens to dedicated policy plans and funding streams, legislations and regulations, and management plans and strategies. When it comes to raising awareness, government agencies are obviously key actors, but not-for-profits can also play an important role. For example, the King's Fund in the UK, an independent charity working on improving health and care in England, commissioned the publication of a comprehensive report on the health benefits of gardens (Buck, 2016). This report includes a 'menu' of recommendations that aims to encourage government departments, national bodies, local government, health and well-being boards, and clinical commissioning groups to collaborate in prioritising the diverse health benefits of gardens and gardening.

A final relevant dimension of governance relates to the rules of the game, i.e., the ways in which governance is structured and organised. Currently, initiatives to promote the health benefits of gardens and gardening are often organised sectorally, with branch organisations of plant growers and horticulturalists taking the lead in the promotion of private gardens and municipalities and other local authorities taking the lead in the promotion of public gardens. For more impact in society, a more cross-sectoral approach will be needed. This implies bringing in actors from other sectors, such as the healthcare and educational profession, in decision-making, also to foster new alliances and collaborations.

SOLUTIONS AND RECOMMENDATIONS

From a governance perspective, it needs to be ensured that the health benefits of gardens are being more explicitly considered in times of crisis and peace. As discussed in the previous section, tackling this issue requires changes in many layers of governance arrangements, including the discourse on the health benefits of nature, collaboration and new alliances between governments, markets and civil society actors, mobilisation of resources and rules of the game. Opportunities do exist, for example, linking the health aspects of gardens to the discourses that highlight the important role of gardens in climate change action, biodiversity conservation, and poverty alleviation (Goddard et al., 2010).

Good governance and inclusion of the health benefits of gardens in healthcare requires full integration of these benefits in all relevant strategies, policies, and assessments. To support such integration, there is a need for more evidence on the benefits of private gardens, which are thus far poorly documented due to a lack of public funding to support such research. Moreover, dedicated initiatives are needed that focus on health aspects, inspired by some of the examples provided in this section. Clearly, the positive mental health effects of gardens should be emphasised, rather than the negative environmental effects of garden loss, particularly in light of making communities across the world more resilient in dealing with potential future pandemics and other crises. Strategies, policies and assessments need to be inclusive and address the interests and stakes of local communities.

CONCLUSIONS

This chapter has given an overview of the response options available for putting into action the evidence for the health benefits of gardens and gardening in times of crisis, as described in the previous chapters. Three areas for action are distinguished, related to the management of access, design, and governance and healthcare. Across these areas, some common solutions and recommendations emerged. Perhaps the most crucial of these is the recommendation to explicitly include and acknowledge human health as an important value (or ecosystem service) in the development of visions, plans and other strategic policy documents pertaining to public garden spaces. As noted in

the section on design, the benefits of gardens for human well-being are still mostly considered in terms of recreation and aesthetic values. However, health constitutes a distinct value that cannot be fully optimised by promoting recreational and aesthetic values.

Once the health benefits of gardens are recognised in strategic plans, the next question becomes what can be done to reduce inequity in access to and ownership of gardens. This requires a system change in policies and governance, with more openness to collaboration and the formation of new alliances. A major challenge. But as with all major challenges, the way to proceed is by taking it step-by-step. Even small initiatives can have a significant impact and set in motion a chain of positive actions. Successful local examples can inspire similar initiatives in other regions and countries.

While taking steps towards a new, more health-focused approach to gardens, three important and recurrent lessons from this chapter need to be taken into mind. First, response options for optimising the positive impacts of gardens on human health should always be taken into account and adequately address issues of access and ownership. Second, there may be trade-offs between user needs for safety and control over their own environment and other needs for challenge and exploration. Third, it is important to get health professionals on board to optimise the impact of strategies and policies. However, in the end, people and gardens are mostly in synch when it comes to their health. With climate change and urbanisation as the major threats. As such, ‘one-health’ solutions that benefit human health as well as the health of gardens are available and should be given priority (Zinsstag et al., 2011).

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Conclusion

Finding Hope and Symbolism within Gardens in Times of Crises

Jonathan Kingsley and Monika Egerer

In times of crisis, one tries to grasp onto hope. Climate-related crises, escalations in war and conflicts and increased socio-economic inequalities are all current crises. This book offers but one solution to addressing crises through the act of gardening or the benefits of the garden space itself. Although this book can only provide a snapshot of select countries' ability to address public and ecological crises through gardens and gardening, it still highlights the potential of this activity and setting to alleviate stressors during challenging times. A more representative global analysis on this topic will come with time as crisis research becomes more robust in various contexts.

The idea of gardens as a sanctuary in hard times is not new. It may also not be surprising that one of the most enduring symbols of peace, the olive branch, can be found in many garden spaces around the world. The olive branch has evolved as this symbol over the centuries, as evident in Greek and Roman traditions. The strength of the symbol can be found in the olive wreath given to Olympic winners over 2,500 years ago and on Greek coins of that period, where leaders held an olive branch signifying power and strength. In Roman History, the Goddess of Peace is frequently depicted with an olive branch in her hands. The olive branch is also found across texts in both Christian, Jewish and Muslim religions. Sometimes, this is depicted by a dove holding an olive branch, evident in the story of Noah. When Noah received the olive branch as a gift, the flooding stopped, which symbolised forgiveness and new beginnings.

Today, the character of two olive branches is used in the UN flag to symbolise the organisation's mandate to build peace. Because of the widespread and long-standing use of the olive branch as a representation of peace, the meaning of this garden object has evolved over time. The olive branch is now associated with ideas like power, morality, victory, reconciliation, forgiveness and more, which connect to the idea of peace. In gardens today, planting an olive tree is meant to provide an air of serenity and inner peace – especially important in times of crisis.

So, may we end this book by thinking of the olive branch in the garden and even the act of gardening during times of crisis as a symbol of hope and possibility in uncertain times. May this book and the various stories within it be a starting point in considering gardens as a viable activity from the beginning of any crises for ecology, public health and economic benefit. Gardening, however, should not only be seen as an afterthought or when we are at breaking point but also as a place to look for some optimism. This will require, as has been shown throughout this book, a diversity of communities, sectors and academic disciplines working and coming together to implement gardening activities in times of crisis.

Monika Egerer and I initially started discussing this book topic at the start of 2022, as the peak of the COVID-19 pandemic had passed. Little did we know that we would be faced with several other major crises around the world at the time of writing this book, including the war in Ukraine as well as in the Middle East. Although we knew that the pandemic would be the frequently applied contemporary example in this book, we now recognise the diversity of challenges that gardening addresses. Such examples herein make this book even more relevant than

when we started this journey. Insights from this book can provide tools for these challenges. We hope this book can be used as an advocacy tool for policymakers and practitioners in the areas of health, agroecology, conservation and social welfare to pay more respect to gardens to alleviate some of the challenges we all face during these times. To move beyond ideas of purely an olive branch as a symbol of hope in the past and to move to the present to a place where we view the whole garden as a space that one can use as a sanctuary for optimism in the challenging times of the future.

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