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CULTIVATING SOCIAL CAPITAL OR GREEN EXCLUSION? A MIXED-METHODS STUDY OF THE EQUITY OF ACCESS AND OUTCOMES OF COMMUNITY GARDENS IN BERLIN, GERMANY

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ABSTRACT

Community gardens are celebrated within Integrated Urban Food Systems (IUFS) for their contributions to food production, environmental education, and social cohesion. However, critical scholarship raises concerns that they may inadvertently reinforce socio-spatial inequalities through processes of green gentrification or by primarily serving privileged groups. This mixed-methods study investigates the equity of access and the differential social outcomes of community gardens in Berlin, Germany. We employed a sequential explanatory design, beginning with a GIS analysis of the spatial distribution and characteristics of 150 gardens relative to socio-economic and demographic census data. This was followed by in-depth ethnographic case studies of four gardens in neighborhoods of varying income levels and ethnic composition, using participant observation and 30 semi-structured interviews with gardeners. The GIS analysis revealed that while gardens are relatively evenly distributed spatially, significant disparities exist in land tenure security, infrastructure quality, and municipal support, with gardens in lower-income neighborhoods being more vulnerable. Qualitatively, all gardens fostered strong bonding social capital, but gardens in wealthier areas demonstrated greater capacity for generating bridging capital, linking them to political and financial resources. Furthermore, implicit cultural norms and governance structures in some gardens created barriers to participation for immigrant and working-class residents. The study concludes that for community gardens to be a truly equitable pillar of the IUFS, municipal support must proactively target resources and secure land tenure in disadvantaged neighborhoods, and garden groups must consciously adopt inclusive practices and governance structures. Without such intentional equity-focused interventions, community gardens risk reproducing existing urban inequalities.

Keywords: social equity, community gardens, green gentrification, social capital, food justice, mixed-methods, GIS, participatory governance.

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INTRODUCTION

The integration of urban agriculture, particularly community gardens, into the vision of sustainable and resilient cities has gained significant traction over the past two decades. Proponents highlight their multifunctionality: they provide fresh produce, create green spaces, facilitate environmental learning, and build community (Firth et al., 2011). Within the framework of Integrated Urban Food Systems (IUFS), community gardens are often positioned as grassroots solutions that enhance local food sovereignty and social-ecological resilience (Tornaghi, 2014). However, a growing body of critical literature questions the universally positive narrative of community gardening.

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Scholars have documented cases where urban greening projects, including gardens, act as catalysts for green gentrification—a process where environmental improvements lead to rising property values and the displacement of low-income residents (Anguelovski et al., 2018). Beyond displacement, questions of access and inclusion within gardens persist. Research suggests that participants are often disproportionately white, middle-class, and highly educated, raising concerns about who benefits from these urban amenities (Pudup, 2008). Barriers can include cultural norms, language, time commitments, and governance models that are not welcoming to diverse populations. This study addresses the critical gap between the potential and the practice of community gardens

Using Berlin—a city with a rich history of community gardening and stark socio-economic divisions—as a case study, we ask:

1. How equitable is the spatial distribution and resource allocation of community gardens across neighborhoods of differing socio-economic status?
2. What are the differential social outcomes (e.g., social capital, empowerment, well-being) for participants in gardens located in different socio-economic contexts?
3. What are the specific mechanisms—both formal and informal—that foster inclusion or create exclusion within community garden spaces?

By answering these questions, this research aims to provide evidence-based recommendations for ensuring that the urban agriculture movement contributes to food justice rather than perpetuating urban inequality.

MATERIALS AND METHODS

Research Design

This study employed a sequential mixed-methods design (Creswell & Plano Clark, 2017). The initial quantitative phase involved a city-wide spatial and statistical analysis to map the landscape of community gardening in Berlin. The subsequent qualitative phase used ethnographic case studies to explain and elaborate on the patterns identified in the first phase.

Phase 1: Quantitative Spatial Analysis

1. Garden Inventory: We compiled a comprehensive database of 150 community gardens in Berlin through existing networks (e.g., anstiftung.org), city directories, and field verification.
2. GIS Mapping and Analysis: Each garden was geocoded. Using QGIS software, we mapped the gardens against census tract data on key variables: median income, unemployment rate, percentage of residents with a migration background, and residential density.
3. Garden Characteristics Survey: A short, structured survey was sent to all identified gardens to collect data on land tenure (owned, leased, temporary use), year of establishment, size, infrastructure (water access, tool sheds), and primary funding sources.

Phase 2: Qualitative Case Studies

Based on the Phase 1 analysis, we selected four gardens for in-depth case studies to represent a spectrum of socio-economic contexts (Table 1).

1. Data Collection: For each garden, we conducted:
   - Participant Observation: Over a 6-month period, researchers engaged in regular gardening activities, attending workdays and social events (~50 hours per garden). Field notes documented interactions, decision-making processes, and informal conversations.
   - Semi-Structured Interviews: We conducted 30 interviews (7-8 per garden) with a diverse range of gardeners, including founders, long-term members, and newer participants. Interviews explored motivations, experiences of inclusion/exclusion, perceived benefits, and involvement in governance.
2. Data Analysis: Interview transcripts and field notes were analyzed using a combination of deductive and inductive thematic analysis. Codes were developed related to social capital, power dynamics, cultural practices, and barriers to participation.

RESULTS

Phase 1: The Uneven Landscape of Urban Gardening

The GIS analysis revealed a complex picture. Community gardens were distributed across the city, with no significant statistical desertification in low-income districts. However, critical differences emerged in the quality and security of these spaces (Figure 1).

TABLE 1: CHARACTERISTICS OF FOUR CASE STUDY GARDEN SITES IN BERLIN

Garden Pseudonym	Neighborhood Income	Land Tenure	Primary Ethnicity of Participants	Key Focus
"Kreuzberg Gemüse"	Low-Mixed	Temporary Use Permit (5-year)	Mixed (Turkish, Arab, German)	Food production, intercultural exchange
"Prenzlauer Permakultur"	High	Long-term Lease from City	Predominantly German	Education, permaculture design
"Neukölln Naschgarten"	Low-Mixed	Squatted, then legalized lease	Mixed (Diverse)	Open community space, activism
"Charlottenburg Parzelle"	Medium-High	Privately owned by member association	Predominantly German	Recreation, socializing

Gardens in wealthier neighborhoods (like those in Prenzlauer Berg and Charlottenburg) were significantly more likely to have secure, long-term land tenure ($p < .01$), permanent infrastructure like sheds and rainwater harvesting systems, and received more external funding from district-level programs. Gardens in lower-income, high-immigration areas (like parts of Neukölln and Kreuzberg) were more reliant on temporary use agreements for vacant lots, making them vulnerable to real estate development.

Phase 2: Lived Experiences of Inclusion and Exclusion
The qualitative data provided a rich understanding of the social dynamics within the gardens.

1. **Bonding vs. Bridging Social Capital:** All gardens were highly effective at creating strong *bonding* social capital—the close ties and mutual support between members. However, gardens in wealthier areas (e.g., "Prenzlauer Permakultur") were adept at generating *bridging* capital—connections to external actors like politicians, universities, and funders. This translated into tangible benefits like grants and political protection. As one interviewee from "Prenzlauer Permakultur" stated, *"We have a member who is an architect and helped us design the grant proposal for our compost toilet. It's about who you know."* This capacity was markedly lower in the other case study gardens.
2. **Implicit Barriers and Cultural Norms:** In the more homogeneously German gardens, implicit cultural norms created subtle barriers. The use of complex German in meetings, a focus on abstract ecological concepts over practical growing, and established cliques made it difficult for newcomers, particularly those with limited German proficiency, to feel fully integrated. At "Kreuzberg Gemüse," which actively fostered intercultural exchange, a Turkish-German gardener noted, *"Here, we share recipes. In other gardens I visited, it felt like I had to pass a test on the 'right' way to garden."*
3. **Governance and Decision-Making:** The formal and informal governance structures significantly influenced equity. "Neukölln Naschgarten" operated on a strict consensus model with open, facilitated meetings, which was inclusive but often slow. "Charlottenburg Parzelle" had a more traditional club structure with a board, which was efficient but concentrated power among long-term members.

TABLE 2: TYPES OF SOCIAL CAPITAL AND REPORTED OUTCOMES BY GARDEN TYPE

Social Capital Type	"Prenzlauer Permakultur" (Wealthy)	"Kreuzberg Gemüse" (Low-Income, Diverse)	"Neukölln Naschgarten" (Activist)	"Charlottenburg Parzelle" (Traditional)
Bonding Capital (Strong ties within group)	High. Strong friendships, shared values.	Very High. Crucial for mutual support in a marginalized neighborhood.	Very High. Sense of shared political struggle.	High. Based on long-term membership.
Bridging Capital (Weak ties to external resources)	Very High. Links to policymakers, funders, media.	Low. Limited connections to formal power structures.	Medium. Strong ties to activist networks, weaker to city government.	Medium. Links to local businesses, but not political.
Primary Benefit Reported	Personal well-being, environmental impact.	Food provision, cultural connection, sense of belonging.	Political empowerment, community resilience.	Recreation, stress relief.

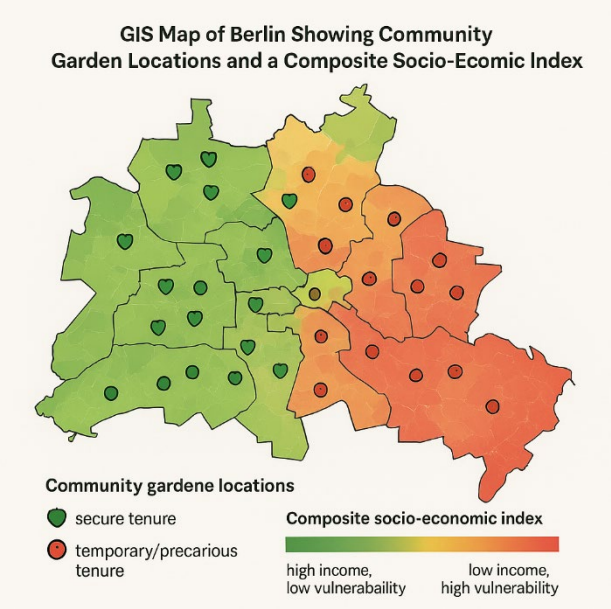

Figure 1: GIS Map of Berlin Showing Community Garden Locations and a Composite Socio-Economic Index (A map of Berlin's boroughs. The socio-economic index is represented by a color gradient from green (high income, low vulnerability) to red (low income, high vulnerability). Dots representing gardens are overlaid. A higher density *of dots in green areas have a "shield" icon denoting secure tenure. A higher density of dots in red areas have a "clock" icon denoting temporary/precarious tenure.)*

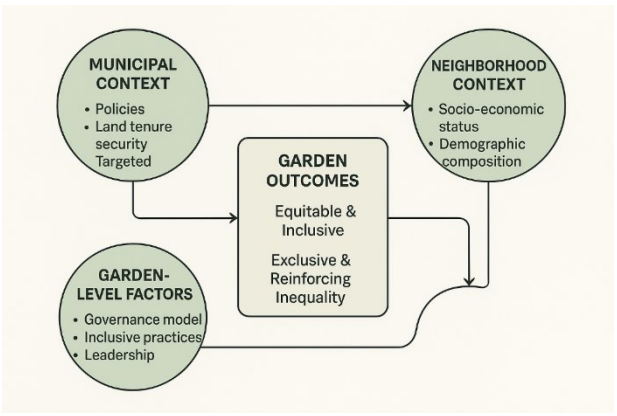

Figure 2: Conceptual Framework of Factors Influencing Garden Equity and Outcomes (A systems diagram with three interconnected circles:

- **Municipal Context:** Policies, land tenure security, targeted support. *

- **Garden-Level Factors:** Governance model, inclusive practices, leadership.*
- **Neighborhood Context:** Socio-economic status, demographic composition.*

These three circles all feed into a central box: "Garden Outcomes," which is split into "Equitable & Inclusive" vs. "Exclusive & Reinforcing Inequality." Feedback arrows show how outcomes can influence the municipal and neighborhood contexts over time, e.g., through gentrification.)

DISCUSSION

The findings challenge the assumption that the mere presence of community gardens guarantees equitable benefits. While Berlin has a vibrant gardening culture, its landscape is characterized by a "two-tier" system. Gardens in affluent areas enjoy stability and resource access, amplifying their benefits and political influence. In contrast, gardens in disadvantaged areas, while often more vital for food provision and social support, operate under a cloud of precarity and resource scarcity, limiting their long-term impact and resilience (Anguelovski, 2015).

The differential capacity for generating bridging social capital is a critical mechanism of inequality reproduction. The ability of wealthier, well-connected gardens to leverage external resources creates a Matthew Effect ("the rich get richer"), further entrenching their advantage. This highlights that social capital is not a monolithic good; its type and utility vary significantly by context (Daly, 2017).

The identification of implicit cultural barriers is crucial for promoting food justice. It moves the focus from intentional discrimination to the often-unexamined norms and practices that can make garden spaces unwelcoming to non-dominant groups. This calls for a move from passive openness to active inclusion, such as multilingual signage, diverse leadership, and programming that resonates with the cultural practices of the surrounding community (Reynolds, 2015).

CONCLUSION

For community gardens to fulfill their promise as pillars of an equitable IUFS, intentionality is paramount. Based on our findings, we recommend:

1. Proactive Municipal Policy: Cities should implement equity-focused UA policies that prioritize secure land tenure for gardens in vulnerable neighborhoods and create targeted grant programs for infrastructure and capacity-building.
2. Institutionalization of Support: Create city-funded coordinator positions to provide technical assistance (e.g., legal, financial) to grassroots gardens, reducing the reliance on privileged social networks.
3. Critical Self-Reflection for Garden Groups: Gardens should engage in regular audits of their membership and practices, actively seeking to diversify leadership and create explicit inclusion statements and strategies.
4. Facilitated Networking: Municipal or non-profit bodies should create structured networking opportunities that deliberately build bridging capital for gardens in marginalized areas, connecting them to resources and power.

Future research should explore the long-term impact of such equity-focused interventions and investigate the relationship between specific garden governance models and their ability to foster genuine inclusion across lines of class, ethnicity, and ability.

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