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NAVIGATING THE FOODSCAPE: A COMPARATIVE POLICY ANALYSIS OF URBAN AGRICULTURE IN SINGAPORE, DETROIT, AND MEDELLÍN AND ITS IMPACT ON GRASSROOTS INITIATIVES

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ABSTRACT

Urban Agriculture (UA) is promoted within Integrated Urban Food Systems (IUFS) for its potential to enhance food security, sustainability, and social cohesion. However, the role of municipal policy in either enabling or constraining UA, particularly grassroots initiatives, is poorly understood. This paper presents a comparative qualitative analysis of how distinct UA policy frameworks in three cities—Singapore (top-down technocratic), Detroit (bottom-up planner-led), and Medellín (hybrid participatory)—shape the emergence, sustainability, and equity outcomes of grassroots food initiatives. Data were collected through 45 semi-structured interviews with policymakers, NGO leaders, and community gardeners, and a systematic review of policy documents from 2015-2023. The analysis reveals that Singapore's "30 by 30" food security goal effectively fosters high-tech commercial ventures but provides limited support for social-oriented community gardens, marginalizing their contributions. Detroit's planner-led approach, emerging from a robust grassroots movement, has successfully created land access mechanisms but struggles with coordination, equitable resource distribution, and mitigating green gentrification. Medellín's participatory "Corredores Verdes" program successfully integrates UA into its social urbanism agenda, fostering community empowerment, though it faces challenges of long-term funding and political co-optation.

Keywords: urban agriculture policy, food sovereignty, governance models, community gardens, equity, comparative analysis, land access socio-economic viability

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INTRODUCTION

The integration of Urban Agriculture (UA) into the fabric of cities is a cornerstone of the emerging paradigm of Integrated Urban Food Systems (IUFS). Proponents argue that UA can enhance food security, promote public health, create green jobs, foster social capital, and contribute to ecological sustainability by closing nutrient loops (Mougeot, 2006; Opitz et al., 2016). In response, there is a growing number of cities Worldwide are developing policies to support UA. However, the design and implementation of these policies vary dramatically, reflecting different political ideologies, historical contexts, and governance structures (Horst et al., 2017).

A critical tension exists in UA policy between top-down, technology-driven approaches aimed primarily at production and economic growth, and bottom-up, community-driven approaches focused on social justice and empowerment (McClintock et al., 2018).

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The former, often seen in "global cities" and authoritarian contexts, may prioritize high-tech Controlled Environment Agriculture (CEA) to achieve quantifiable food security metrics. The latter, often emerging from post-industrial or social movement contexts, tends to focus on land rights, food sovereignty, and community development. Third, hybrid models attempt to bridge this divide through participatory governance.

The impact of these divergent policy models on the grassroots initiatives that form the social backbone of many IUFS is under-researched. Do technocratic policies crowd out or marginalize community gardens? Can planner-led models sustain the momentum of grassroots movements without bureaucratizing them? Do participatory models genuinely empower communities or risk instrumentalizing UA for other political goals? This study addresses these questions through a structured comparison of three emblematic cities: Singapore, Detroit, and Medellín. Our research aims to:

1. Characterize the dominant UA policy models in Singapore, Detroit, and Medellín.

2. Analyze how these models impact the development, sustainability, and social outcomes of grassroots UA initiatives.

3. Derive policy recommendations for designing more equitable and effective IUFS governance frameworks.

MATERIALS AND METHODS

Research Design

This study employed a qualitative multiple-case study design (Yin, 2018), which is ideal for investigating a contemporary phenomenon (UA policy) within its real-world context. The three cities were selected as paradigmatic cases of different policy models:

1. ***Singapore:*** *Represents a strong, top-down, technocratic state with a strategic national food security policy.*
2. ***Detroit:*** *Represents a bottom-up, planner-led model where policy has followed and attempted to structure a massive grassroots UA movement.*
3. ***Medellín:*** *Represents a hybrid, participatory model where UA is explicitly integrated into a broader social urbanism and environmental strategy.*

Data collection occurred over 18 months and involved two primary methods:

1. *Document Analysis: We systematically collected and analyzed 32 policy documents, including urban development plans, food charters, zoning bylaws, city council minutes, and official strategy papers from 2015 to 2023.*
2. *Semi-Structured Interviews: We conducted 45 in-depth, semi-structured interviews (15 per city) with a purposively selected sample of key actors. This included:*

- **Policymakers:** City planners, elected officials, and agency staff involved in food or sustainability policy.
- **Intermediaries:** Leaders of non-profit organizations, food policy councils, and advocacy groups.
- **Practitioners:** Founders and active members of community gardens, urban farms, and other grassroots UA initiatives.

Interviews were conducted virtually, recorded, and transcribed, with an average duration of 60 minutes. Interview guides were tailored to each actor type but focused on themes of policy perception, access to resources (land, water, funding), perceived barriers and enablers, and social impacts.

Data Analysis

The analysis followed a two-stage process. First, a deductive content analysis was performed on the policy documents to characterize each city's policy model based on a pre-defined framework including policy goals, instruments, target actors, and stated equity considerations. Second, interview transcripts were analyzed using inductive thematic analysis (Braun & Clarke, 2006) to identify emergent themes related to the lived experience of policy impacts. NVivo software was used to manage and code the qualitative data. Themes were then compared across the three cases to draw cross-city conclusions.

RESULTS

Characterization of Policy Models

The document analysis revealed three distinct policy archetypes, summarized in Table 1.

TABLE 1: TYPOLOGY OF URBAN AGRICULTURE POLICY MODELS IN THREE CASE CITIES (2015-2023)

Policy Dimension	Singapore (Top-Down Technocratic)	Detroit (Bottom-Up Planner-Led)	Medellín (Hybrid Participatory)
Primary Goal	National Food Security ("30 by 30" goal)	Blight Remediation, Community Development	Social Cohesion, Environmental Resilience
Key Policy Instruments	Grants for high-tech farms, R&D funding, land leasing from state.	Land Bank sales, zoning ordinances, non-profit partnerships.	"Corredores Verdes" program, participatory budgeting, public space integration.
Target Actors	Commercial, technology-intensive companies.	Community-based organizations, non-profits, resident groups.	Community councils (*Juntas de Acción Comunal*), mixed community-private partnerships.
Land Access Model	Short-term leases on state-owned land.	Long-term, low-cost purchases from Detroit Land Bank Authority.	Temporary use of public land for community projects; permanent park integration.
Equity Discourse	Implicit (resilience benefits all).	Explicit (racial and food justice).	Explicit (social inclusion of vulnerable populations).

Impact on Grassroots Initiatives

The interview data revealed how this policy models differentially impact grassroots initiatives. The key enablers and barriers perceived by practitioners are summarized in Table 2.

TABLE 2: PERCEIVED ENABLERS AND BARRIERS FOR GRASSROOTS INITIATIVES BY CITY

City	Key Enablers	Key Barriers
Singapore	- High-level political legitimacy for UA. - Potential for funding for tech-savvy projects.	- Policy mismatch: goals focused on calorie production, not social outcomes. - High performance pressure and competition for land. - Lack of support for non-commercial, low-tech gardening.
Detroit	- Secure, affordable land access via Land Bank. - Strong, pre-existing network of grassroots actors. - Policy explicitly values community empowerment.	- Bureaucratic hurdles in dealing with city agencies. - Uneven capacity among groups to navigate systems. - Risk of green gentrification as neighborhoods improve.
Medellín	- Strong integration with social and environmental programs. - Participatory planning fosters community ownership. - Use of UA for post-conflict reconciliation.	- Dependency on political cycles and mayoral priorities. - Risk of co-optation by political agendas. - Challenges in scaling successful pilot projects.

Cross-Cutting Themes
Three powerful themes emerged across all cases:

1. ***The Centrality of Land Tenure:*** *In all three cities, the security and terms of land access were the single most important factor determining the long-term viability of grassroots initiatives. Short-term leases (Singapore) created precarity, while long-term access (Detroit) fostered investment and community building.*
2. ***The Double-Edged Sword of Institutionalization:*** *While policy recognition and support were universally desired, interviewees in Detroit and Medellín expressed concern about the "NGO-ization" or bureaucratization of their work, which could dilute their original mission and community roots.*
3. ***The Gap Between Rhetoric and Resources:*** *In all cities, practitioners reported a significant gap between the stated goals of UA policy and the actual financial and technical resources allocated to achieve them, particularly for initiatives focused on social rather than commercial outcomes.*

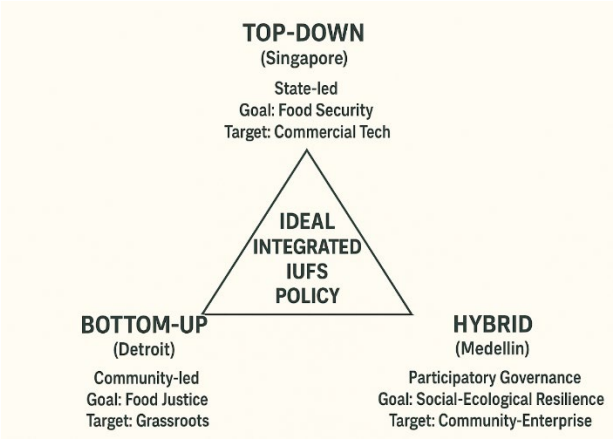

Figure 1: Conceptual Model of Urban Agriculture Governance Approaches
(A triangle diagram. At the top vertex: "Top-Down (Singapore)" with descriptors: "State-led", "Goal: Food Security", "Target: Commercial Tech". At the bottom left vertex: "Bottom-Up (Detroit)" with descriptors: "Community-led", "Goal: Food Justice", "Target: Grassroots". At the bottom right vertex: "Hybrid (Medellín)" with descriptors: "Participatory Governance", "Goal: Social-Ecological Resilience", "Target: Community-Enterprise". An arrow points to the center of the triangle, labeled "Ideal Integrated IUFS Policy".)

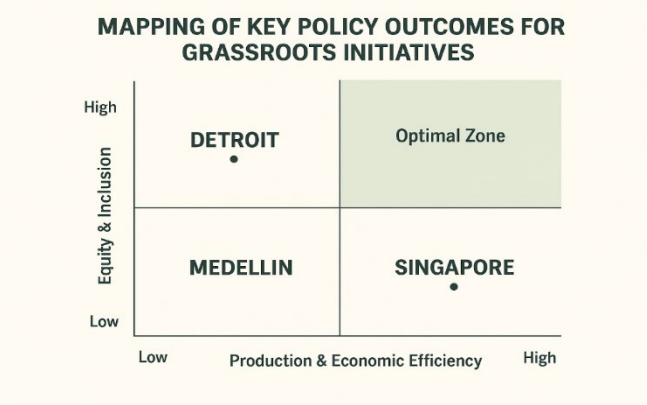

Figure 2: Mapping of Key Policy Outcomes for Grassroots Initiatives
(A 2x2 matrix. The Y-axis is "Social Equity & Inclusion" (Low to High). The X-axis is "Production & Economic Efficiency" (Low to High).

- *Detroit is plotted in the top-left quadrant (High Social Equity, Medium-Low Economic Efficiency).*
- *Singapore is plotted in the bottom-right quadrant (Low Social Equity, High Economic Efficiency).*
- *Medellín is plotted in the center-top (High Social Equity, Medium Economic Efficiency).*
- *An "Optimal Zone" is shaded in the top-right quadrant, indicating the target space for policy that balances both goals.)*

DISCUSSION

The findings demonstrate that there is no one-size-fits-all model for UA policy, and each approach carries inherent trade-offs. Singapore's technocratic model is highly effective at driving private investment and technological innovation towards a narrow definition of food security. However, it systematically sidelines the social and community-building functions of UA, potentially creating a two-tiered food system where high-tech produce is for the affluent and community gardens struggle for legitimacy (Yee, 2021). This aligns with critiques of "smart city" approaches that prioritize technological solutions over social ones.
Detroit's planner-led model showcases the potential for municipal government to respond to and empower a vibrant grassroots movement. The creation of the Detroit Land Bank Authority was a monumental achievement. However, our findings confirm concerns that institutionalization can create new barriers (White, 2018). The complexity of navigating city systems can disadvantage smaller, less-resourced groups, potentially exacerbating inequalities within the movement itself. The emerging threat of green

Gentrification also highlights the need for policies that not only support UA but also protect vulnerable residents from its potential displacement effects.

Medellín's hybrid model offers a promising pathway for integrating UA into broader urban development goals. By embedding UA within the "Corredores Verdes" and social urbanism framework, the city has successfully linked food production to environmental education, public space quality, and social cohesion. The participatory nature of the policy fosters a strong sense of community ownership. The primary risk here is sustainability beyond political cycles; the program's success is heavily reliant on continued political will and funding, making it vulnerable to change.

CONCLUSION

For Urban Agriculture to fulfill its potential within Integrated Urban Food Systems, policy must be consciously designed to be both effective and equitable. This research suggests that the most resilient and just approach is a hybrid one that combines the strategic direction and resource capacity of the state with the deep community knowledge and social legitimacy of grassroots movements. Specifically, we recommend:

1. Diversify Policy Goals: Move beyond a singular focus on food production metrics to explicitly include social, health, and ecological indicators of success.
2. Secure Community Land Access: Establish community land trusts or long-term lease agreements to protect urban farms from market pressures and displacement.
3. Create Multi-Stakeholder Governance Platforms: Formalize the role of grassroots practitioners in policy co-creation and implementation, ensuring their voices are heard in decision-making.
4. Tailor Support Mechanisms: Provide differentiated support for commercial,
5. technological UA and social, community-oriented UA, recognizing their distinct contributions and needs.

Future research should longitudinally track the evolution of these policy models and their long-term impacts on community well-being and food sovereignty.

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