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Reflections on crafting a policy toolkit for equitable green infrastructure

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Nature-based solutions are regularly touted as a win-win, allowing cities to simultaneously enhance quality of life and mitigate adverse impacts of environmental change[1]. Frameworks like resilience and complete streets have increasingly shaped the governance of US cities and informed investments in infrastructure, promoting green amenities for cities struggling with congestion, and the impacts of decades of fossil fuel intensive forms of urban development[2]. As cities struggle to adapt to more intense precipitation events that overwhelm storm water systems[3], heat waves that threaten human health[4], and increased demand for parks and trails for public recreation[5] nature-based solutions are receiving additional attention and investment.

At the same time, cities in the United States with renewed commitments to equity are prioritizing nature-based solutions in low-income neighborhoods in an effort to address past inequities in the allocation of environmental benefits and burdens. Any intervention that changes the urban landscape will interact with existing social and economic inequalities stemming from decades of racially discriminatory policies and cycles of uneven infrastructure investment[6]. For example, housing and development policies that excluded nonwhites from specific areas of the city have resulted in enduring urban geographies in which indigenous, low-income, and communities of color are disproportionately proximate to environmental hazards and poorly maintained infrastructures[7]. These patterns of urban segregation and disinvestment result in the uneven distribution of vulnerabilities as well as uneven adaptive capacities to adapt to a changing environment[8].

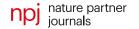## A PARADOX FOR URBAN GREENING INITIATIVES

New and improved green amenities can increase neighborhood appeal to wealthier residents and real estate speculators, while burdening low income residents who can no longer afford rents or taxes[9–11]. This process of green gentrification not only affects local rents and tax burdens, but also threatens to erode feelings of belonging and cultural and historical connections to place[12]. Examples of greening initiatives in US cities that have resulted in increasing property values and residential turnovers include the High Line in New York City and the Beltline in Atlanta, Georgia[13,14]. Recent scholarship has also found that even small greening projects such as park renovations, community gardens, and green building initiatives can increase property assessments and result in functional changes to park usage[15–17].

These examples highlight an urgent paradox in creating climate-resilient, sustainable, and equitable cities: how can we ensure that residents in low-income neighborhoods who have suffered from decades of disinvestment are able to share in the benefits of future green investment?

We focused our review and analysis on the United States for a number of reasons. First, as we detail below, our project is grounded in a co-development model of research design with our community partners, all of which are US-based community organizations. Second, and related, our aim was to identify and summarize policies and actionable organizing approaches informed by and responsive to the specificities of the US context. While there are arguably common and generalizable trends in urbanization, gentrification, and racialized displacement in cities around the globe, taken together the specificities of US urban spatial development have produced particular forms of racial segregation and urban governance structures through government policies and funding mechanisms designed to promote and ensure racial segregation. These policies include racially restrictive covenants and redlining, as well as the specific approaches to taxing, zoning, and urban redevelopment that were responsive to the natural environment, cultural context, and political economy of the United States[18,19]. Thus while it is possible and potentially fruitful to consider global urban trends or conduct comparative analysis across different urban contexts[20], our specific aim of producing an overview of tools that communities were using to address green gentrification that could inform near-term action by local communities merited a focus on the US context in its specificity. Our goal in doing so is not to overlook or eclipse urgent work addressing the intersection of environmental investment and displacement in other parts of the world[21,22] or to provide a comprehensive review green gentrification across scales and context[23].

We sought to better understand and document how communities, municipalities, and regulatory agencies in the United States attempt to address potential inequities that urban greening can introduce. In particular, we identified a need to review and synthesize potential policy tools designed to address and mitigate the harmful effects of green gentrification. Given the limited treatment of this topic in the academic literature, we expanded our review to include policy documentation, listening sessions, and informal interviews with community-based partners, advocacy organizations, and their constituents. We reviewed hundreds of scholarly articles on gentrification, green infrastructure, urban planning, and housing ownership models, including scholarship from urban studies, economics, environmental design and planning, sociology, and geography. We also considered local and regional case studies from jurisdictions across the United States where various anti-displacement policies have been implemented, analyzing policy briefs, local governance language, and legislative text. We consulted environmental non-profit leaders, affordable housing experts, environmental justice organizers, and an array of public sector planning, housing, and

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sustainability staff. Via a prolonged process of co-development with these external partners, we revised and co-created a product that was both grounded in empirical research and scholarship, as well as responsive to the concerns and needs of on-the-ground partners.

As noted above, the academic literature on green gentrification is largely conceptual. A handful of empirical case studies documented property value changes but stopped short of proposing potential solutions. A larger literature exists on anti-displacement strategies associated with investments in transportation and other forms of gray infrastructure[24]. However, it was unclear how these strategies translated to impacts of greening specifically. Overall, we found little guidance in this literature on strategies communities could advocate for as they tried to navigate dual and sometimes conflicting goals of environmental health, access to safe recreation, and concerns of gentrification. We did find, however, that communities are using creative approaches and experimenting with policy tools that hold some promise to disrupt business-as-usual in urban development and urban sustainability and can promote green investment without displacement.

SHARING IN THE BENEFITS OF A GREENING CITY

We compiled our findings as a toolkit called "Sharing in the Benefits of a Greening City". It is designed to equip communities, policymakers, urban planners, environmental philanthropies, and housing nonprofits to better understand the intersection of green investment and displacement and take action accordingly. In particular, the toolkit: (1) synthesizes green gentrification and anti-displacement research; (2) establishes shared language and understanding of core concepts; (3) highlights existing anti-displacement policy tools and new policy possibilities in the context of greening cities; and (4) promotes collaboration across environmental and housing sectors.

The policy tools included in the toolkit provide a comprehensive survey of existing anti-displacement strategies categorized across five typologies: community capacity-building (e.g., tenants' unions, job training), regulatory strategies (e.g., rent control, renter's bill of rights), market-based interventions (e.g., inclusionary zoning, community benefits agreements), public investments (e.g., public housing, land banks), and collective ownership models (e.g., community land trusts, limited-equity cooperatives). The toolkit aims to bridge the gap between environmental and housing policy making and implementation by highlighting approaches at the intersection of these two sectors. Examples include using tenants unions to empower renters to advocate for improved green amenities, leveraging land bank powers to redistribute land to cooperative ownership structures, and applying job training strategies to build wealth through the ownership and maintenance of green environments.

In addition to identifying relevant policy tools, the process of compiling the toolkit through extensive consultation and collaboration with agencies, municipalities, and communities revealed three insights into the problem space of community engaged urban sustainability initiatives that share the goal of ensuring investment without displacement that are relevant for scholars and others interested in doing this work:

1. Many policymakers and practitioners want to ensure everyone shares in the benefits of a greening city, but they often don't know where to start or what to do.

   Early discussions about the toolkit and the goal of investment without displacement were largely met with enthusiasm from partners in nonprofits, government agencies, and philanthropic entities. These conversations often followed a familiar pattern: organizations said they want to center equity in their work and acknowledged that current practices, metrics, and funding streams do not address displacement as a possible outcome. However, organizations echoed a common set of roadblocks: (1) fear and potential confrontation when bringing new equity imperatives to leadership; (2) introducing new frameworks into the day-to-day workings of individual organizations is challenging, particularly for those with no public policy-setting power; (3) there are persistent obstacles to reorganizing large bureaucratic structures; and (4) even when higher-ups were on board, the organizations did not know where to start, had no clear roadmap to advocate for change, and lacked the appropriate language to talk to their colleagues, craft employee trainings, or communicate to their leadership[25].

   We also heard from community partners that they were overburdened by simultaneously trying to understand and address potential changes in their neighborhoods, raise concerns about potential risks to gentrification, and come up with an advocate for solutions. Communities felt stuck between wanting to advocate for green amenities, while also having to advocate against their own displacement[26]. A goal for the toolkit was to ease some of the burden on community organizations trying to educate, advocate, and propose solutions to green gentrification. For example, the toolkit includes a series of definitions for key terms like environmental justice, affordable housing, and gentrification and provides audience-specific worksheets to help urban planners, public officials, and non-profit advocates elucidate how their positioning illuminates areas of expertize and space for collaboration. We saw part of our role as leveling the playing field between low-wealth communities and neighborhood organizers and the developers, municipalities, and other organizations with the resources to hire consultants to develop conceptual designs, market assessments, and advocacy campaigns.

2. Co-development of research questions ensures an audience for the research product

   Co-development of research that includes non-academic partners upends traditional research processes that are driven by disciplinary literatures and frameworks, and requires relationship building *before* the research topic is defined, allowing partners substantial influence over the nature and purpose of the research. Our experience suggests that this approach not only results in more robust networks for circulating findings[27], but also enables researchers to identify novel research topics that disciplinary debates might otherwise overlook. A co-development approach proved particularly important for the toolkit because of its implementation-oriented intent.

   By bringing community partners and agencies into the process at the beginning, we were able to identify the key gaps in understanding that serve as roadblocks for implementation of equity principles in greening initiatives. Whereas community groups that we collaborated with identified displacement and gentrification as urgent concerns, some partners in environmental agencies indicated that they did not understand exactly what was meant by concepts like gentrification, and others expressed skepticism that greening could contribute to negative outcomes. Bringing partners with such divergent understandings of the problem from the outset shaped our understanding of the type of research and product that would be most effective.

   As we developed the toolkit we distributed drafts of the policy tools and fact-sheets to partners and they often

responded with requests to expand the review to additional tools and concepts. The scope of the toolkit was therefore constantly responding to the needs of our intended audience—from neighborhood organizers to municipal leaders and state agencies.

3. Challenging boundaries around organizational mandate can promote collaboration across housing and environmental sectors

Siloing, or the tendency for sectors of government and activism to not interact, is a common challenge in urban governance[28]. This is arguably especially pronounced in the housing and environmental sectors in US cities, and we heard from housing and environmental professionals and activists that they struggled to elevate the crucial intersections of the two in their respective work. The collaboration necessary to respond to green gentrification may be stifled by institutional mandate, siloed funding streams, or bureaucratic obstacles.

One key emphasis of the toolkit is the importance of uplifting existing resources and connecting institutions that are able to provide technical assistance to one another. Environmental nonprofits, reliant on donor funding and often strapped for capacity, cannot suddenly transform into joint environmental and housing-minded entities, for example. They can, however, consider housing concerns in their work, whether by co-applying for grant funding, implementing new language in project requirements, and bringing in consultation from housing coalition partners. There is further possibility to formalize housing-environmental partnerships, such as through municipal governance protocols to jointly consider how affordable housing funding and parks funding are allocated.

As regional green initiatives and climate resiliency efforts continue to multiply, there is an urgent need to frame these strategies with historic legacies in mind. The enduring impact of redlining, housing discrimination, and other practices that have contributed to racial segregation and environmental injustice are crucial considerations that must inform future greening efforts[29]. That greening can contribute to inequality does not negate the importance of access to green investment as a potentially life-saving climate adaptation measure. This much was repeatedly reiterated by our community-based partners as the toolkit took shape. In fact, most of the community-based organizations we worked with were already taking action to mitigate environmental change with equity and neighborhood stabilization as core values.

As our engagement with municipal and regional stakeholders has revealed, there is a real desire to deliver on *both* climate and social equity goals through concerted policy efforts. Our work illustrates that the pursuit of both simultaneously is possible. The toolkit operates from this same mode of possibility: re-tooling anti-displacement measures to adapt to a greening context is just as doable as it is necessary.

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COMPETING INTERESTS

The authors declare no competing interests.

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