

20. New directions in urban environmental/green gentrification research

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20.1 INTRODUCTION

In cities around the world, residents, activists, and government officials call for urban environmental improvements, such as brownfield redevelopment, additional green space, and expanded bike infrastructure, as part of the transition to a more sustainable, livable city. A mainstream perception is that such changes provide benefits to all residents across the city, and further, that they will address environmental justice concerns by benefiting those who have suffered the greatest environmental burdens. However, residents, activists, and scholars have started to question the motivations, processes, and impacts of such 'improvements' that tend to raise property values and attract wealthier and whiter residents. Low-income residents, homeless residents, tenants in informal housing, and people of color, have found themselves excluded from the benefits of these new environmental amenities and vulnerable to unintended, yet negative, consequences, such as residential, commercial, or industrial displacement.

This chapter reviews gentrification processes that accompany the types of urban environmental changes that are often featured as key parts of urban sustainability plans and discusses how communities and residents are addressing this dilemma in urban greening and sustainability. Although gentrification processes are not confined to cities, environmental gentrification scholarship has focused on urban contexts, possibly as a reflection of the current emphasis on making cities more sustainable. Additionally, the majority of research is based in North American and European cities, with some research situated in the 'Global East'.

20.2 CONCEPTUALIZING ENVIRONMENTAL GENTRIFICATION

Greening and economic development have become increasingly coupled as more and more cities have embraced sustainability and sustainable development as a key component of economic growth plans (Pearsall and Pierce, 2010; Pearsall et al., 2012). In some contexts, greening efforts may serve as one of, or one component of, many structural drivers of gentrification, such as municipal subsidies to large real estate developers, subsidies for housing renovations, or aggressive mortgage financiers, that contribute to the uneven development of cities (Hamnett, 1973; O'Loughlin and Munski, 1979; Smith, 1979a; Wyly and Hammel, 1999). In other contexts, greening efforts may appear at the behest of a new gentrifying class that wants to live in an urban setting that has access to an array of green amenities. These new residents may use their wealth, political

connections, or other means to demand environmental improvements and realize their ideal green aesthetic.

The emergence of the term 'environmental gentrification' is often linked to a study by Sieg et al. (2004) finding increases in prices in neighborhoods with notable improvements in air quality based on their study in Southern California from 1990–1995. Their findings were reinforced by economists Banzhaf and Walsh's (2008) study of how changes in pollution levels impact population and demographic composition and Banzhaf and McCormick's (2006) study of gentrification processes associated with the remediation and redevelopment of locally unwanted land uses (LULUs). Concurrently, the National Environmental Justice Advisory Council (NEJAC) published a report detailing the 'unintended' impacts of urban environmental policies, particularly the remediation and reuse of brownfields redevelopment, in five communities in the United States (NEJAC, 2006). They highlighted gentrification concerns and included a series of recommendations to reduce negative impacts for vulnerable populations, such as displacement or exclusion from the cleanup planning process.

Perspectives on the relationship between urban greening and gentrification have expanded since these initial empirical studies of pollution remediation in the 2000s. New terms such as 'ecological gentrification' or 'eco-gentrification' and 'green gentrification' have emerged, offered by scholars from fields such as geography, planning and sociology, to convey different aspects of the gentrification processes that precede, accompany, or follow sustainability planning or urban greening efforts. There has been little discussion of the differences in these terms, and to some extent it appears that they have emerged from different scholars, in different fields, to describe similar processes. A brief comparison of terms and usage follows and is summarized in Table 20.1.

Many quantitative studies of American cities adopt Banzhaf and Walsh's (2008, pp. 24–5) definition of environmental gentrification as 'in a world where households sort in response to changes in environmental quality, the bulk of the benefits of a policy that successfully cleans up dirtier neighborhoods where the poor live may actually be captured by rich households'. This definition emphasizes the distributional and outcome-oriented aspects of greening, suggests a market-led process, and focuses on the class-based dimensions of gentrification impacts. This definition implies a rather unpoliticized process that unintentionally accrues benefits to the rich while displacing the poor. Subsequent studies drawing on qualitative approaches or other disciplinary perspectives have highlighted additional aspects of gentrification processes, including: (1) acknowledgement that environmental gentrification is racialized, (2) recognition of multiple negative impacts, in addition to residential displacement, and (3) description of the political processes that enable or create environmental gentrification (Table 20.1). For instance, Gould and Lewis (2012), who described the process as 'green gentrification', also included in their definition that such environmental improvements exacerbate racial inequalities, in addition to economic ones, based on a study of a public park renovation in Brooklyn, New York. In a similar vein, Anguelovski's (2015) study of food gentrification in Jamaica Plain, Boston (MA) noted the white privilege of the alternative food movement that supported a healthy food store (Whole Foods) over a Latino market. Secondly, Dooling (2009), through her study of how the creation of new green spaces in Seattle impacted homeless populations, recognized that physical displacement, though a critical negative impact of gentrification, is not the only one and was also accompanied by exclusion from the green spaces and the

planning process. Finally, Checker (2011) observed that city officials and developers used the language and aims of environmental justice advocates to promote improving green space access in an underserved neighborhood in Harlem, New York City. Yet, ultimately, this green space served wealthy and white populations. By examining how city officials and the neighborhood redevelopment corporation appropriated language of equity and justice, Checker illuminated the political processes that linked greening and gentrification in this park restoration effort.

20.3 EXPLAINING ENVIRONMENTAL GENTRIFICATION

The majority of studies conceptualize environmental gentrification as supply-side/market-led gentrification, drawing on Smith's (1979b) explanation of a rent gap, or the difference between the actual ground rent and potential ground rent under different types of redevelopment scenarios. In the case of an 'environmental' rent gap, pollution – in air, soil, or water – makes places less attractive to residents and subsequently depresses property values – up to 45% according to Bryson (2013). When the pollution source is removed or site remediated, property values rebound (Hurd, 2002; Dale et al., 1999; Kohlhase, 1991; De Sousa et al., 2009; Roddewig, 1996). A study of site cleanups across the US also supported this remediation-rebound pattern (Gamper-Rabindran et al., 2011). This study further found that property values were not the only thing to change following the remediation of hazardous waste sites; an increase in mean household income and percentages of college-educated residents – two often-employed indicators of gentrification – also accompanied the site cleanups.

Nationwide and citywide quantitative studies of environmental gentrification have suggested that the relationship between cleanups and gentrification is place-specific and complex. For instance, brownfield redevelopment facilitated gentrification only in certain vulnerable neighborhoods in New York City (Pearsall, 2010), primarily those with other gentrifying factors, such as proximity to Manhattan, while brownfield redevelopment in Portland, Oregon, did not create gentrification patterns (Eckerd, 2011). Checker (2014) noted that certain brownfields in Staten Island were more attractive for redevelopment because of their waterfront locations, versus brownfields located inland near other toxic facilities. Finally, Abel and White (2011) attributed gentrification patterns in Seattle (WA) to broader trends in deindustrialization, rather than as a direct result of improvements in air quality and gentrification. Additional studies find that supply-side/market-led perspectives may not provide an adequate explanation of gentrification, particularly when gentrification may precede greening activities.

Demand-side/gentrifier-led environmental gentrification, after Ley (1994) and other consumption theorists, occurs when gentrifiers identify environmental quality or other green amenities as a priority for their post-industrial and professionalized city and use their wealth and political leverage to advance this agenda. Mir and Sanchez (2009) provided an excellent example of this process in Chicago, Illinois, where there were significantly more complaints and inspections of car repair shops in gentrified neighborhoods, even though enforcement remained consistent across all (i.e. gentrified and ungentrified) neighborhoods. Other studies have uncovered how wealthy residents use environmental quality or sustainability goals to justify gentrification. Bavisar (2003) coined the term 'bourgeois

Table 20.1 *Key terms and definitions commonly used in environmental gentrification research*

Name of process	Source of definition	Definition	Key Aspects
Environmental Gentrification	Sieg et al. 2004	'significant price increases in communities with large improvements in air quality and price decreases in communities with small air quality improvements. Distributional effects of environmental policies seem to be pronounced with opportunities for the lowest income households to lose because the induced increases in their housing prices are not fully offset by the air quality improvements they can afford to enjoy' (1074–1075)	<ul style="list-style-type: none"> • Distributional impacts • Class • Market-led perspective
Banzhaf and Walsh 2006		'in a world where households sort in response to changes in environmental quality, the bulk of the benefits of a policy that successfully cleans up dirtier neighborhoods where the poor live may actually be captured by rich households' (24–25)	<ul style="list-style-type: none"> • Distributional impacts • Class • Market-led perspective
Checker 2011		'environmental gentrification builds on the material and discursive successes of the urban environmental justice movement and appropriates them to serve high-end redevelopment that displaces low income residents' (210)	<ul style="list-style-type: none"> • Distributional and procedural impacts • Class • Market-led and gentrifier-led perspectives
Ecological Gentrification	Dooling 2009	'the implementation of an environmental planning agenda related to public green spaces that leads to the displacement or exclusion of the most economically vulnerable human population while espousing an environmental ethic' (621)	<ul style="list-style-type: none"> • Distributional and procedural impacts • Class • Primarily market-led perspective
Green Gentrification	Gould and Lewis 2012	'without clearly focused public policy intervention, in situ environmental improvements will tend to increase racial and class inequality, and decrease environmental' (114)	<ul style="list-style-type: none"> • Distributional and procedural impacts • Class and race • Market-led perspective

environmentalism' to describe the ways in which the rise of environmentalism embraced by the growing middle class in India has been used to justify the removal of slums or other activities (e.g. defecation in parks) portrayed as dirty or unnatural (see Lees, Shin and López-Morales, 2016, on bourgeois environmentalism as gentrification). She notes that 'upper-class concerns around aesthetics, leisure, safety, and health have come significantly to shape the disposition of urban spaces' (ibid., p.90). While these studies show either consumption-side or production-side perspectives, Curran and Hamilton (2013) also reiterate that a thorough explanation of environmental gentrification may draw on both production-side and consumption-side theories, as supported by other gentrification research (e.g. Lees et al., 2008; Hamnett, 1991; Clark, 2005).

Other scholars have employed explanatory frameworks that draw on theories of urban development and sustainability from various fields (e.g. critical sustainability studies, planning). Perhaps most notably, several scholars (e.g. Rosol, 2013; Goodling et al., 2015; Long, 2016; Tretter, 2013a) have applied White et al.'s (2004) concept of an 'urban sustainability fix', inspired by Harvey's concept of a 'spatial fix', to explain how capitalism interacts with sustainable development goals in post-industrial North American cities such as Austin, Texas; Vancouver, British Columbia; and Portland, Oregon. Other studies (e.g. Abel and White, 2011; Dale and Newman, 2009), have embraced a planning frame by drawing on Campbell's (1996) 'sustainability triangle' that describes conflicts among three dimensions of sustainability (ecology, economy, and equity) by focusing on tensions that emerge as cities try to achieve economic development and social justice (titled 'the development conflict') and environmental protection and social justice (titled 'the property conflict'). Finally, Schuetze and Chelleri (2015) propose the concept of the 'sustainability fallacy' to describe the challenges faced by the extensive and ambitious plan to redevelop downtown Seoul, Korea, into a green smart city, though they use this term in a descriptive rather than explanatory way.

20.4 WHAT SPARKS ENVIRONMENTAL GENTRIFICATION?

While brownfield redevelopment, the addition of new parks, or new transit-oriented developments do not necessarily create gentrification, they can catalyze gentrification or be used by certain actors to justify or accelerate processes that displace and marginalize certain residents. Subsequently, in some cases, such as the park renovation project in Harlem, New York City (Checker, 2011) or the remediation of the industrial Gowanus Canal in Brooklyn, New York City (Miller, 2016), residents vulnerable to gentrification opposed efforts to improve environmental quality and access to environmental amenities. Paradoxically, these vulnerable populations tend to be subjected to the most extreme environmental justice concerns. At first glance, opposition to urban environmental projects may seem confusing or contradictory, thus environmental gentrification research has helpfully uncovered the unintended and negative consequences of greening and how they unfold in different cities (Table 20.2). This research serves as a critical step towards finding a solution to Wolch et al.'s (2014) 'urban greening paradox', where the addition of green space in underserved neighborhoods leads to increases in the cost of living that can ultimately displace or exclude the longtime residents it was intended to serve. As Table 20.2 highlights, research has identified an array of catalysts to environmental

Table 20.2 Gentrification catalysts

EG catalyst	Actors	City	References
Bike infrastructure	Bike advocacy groups	Chicago, Los Angeles, Portland, Milwaukee, San Francisco, Chicago, Seattle	Lubitow, Zinschlag and Rochester 2015; Lugo 2015; Stehlin 2015; Hoffman 2016
Brownfield redevelopment	Developers, city government	New York City, Portland	Checker 2014; Curran and Hamilton 2012; Hamilton and Curran 2013; Pearsall 2010, 2012, 2013
Park creation/restoration	City government, park advocacy groups	New York City, Malmö (Sweden)	Checker 2011; Gould and Lewis 2012; Litke, Locke and Hass 2015; Millington 2015; Sandberg 2014
Waterfront redevelopment	City government, private developers, residents	Ahmedabad, Delhi, Chennai, New York City, North Carolina, Seoul, Toronto	Bunce 2009; Checker 2014; Follman 2015; Lim et al. 2013; Sharan 2015; Youth et al. 2015
Smart growth/ecodensity	City government, developers, environmental interest groups	Austin, Vancouver, Seoul	Quastel 2009; Rosol 2013; Schuetze and Chelleri 2015; Tretter 2013
Community-oriented greening	City government, urban farmers, residents, non-profits	Baltimore, New York City	Battaglia 2014; Reynolds 2015

gentrification, ranging from private to public, top-down to bottom-up, and site-specific to city-wide, as well as the specific aspects that create unjust processes and unintended and adverse impacts.

Brownfield redevelopment in North American cities has come under particular scrutiny from environmental gentrification scholars, who have highlighted associated demographic changes, power-laden political processes, and vulnerable populations. As reviewed above, early research on environmental gentrification focused on improvements to air quality or the remediation of contaminated land, such as brownfields or hazardous waste sites, primarily in North American cities. Several national and regional studies suggest that gentrification, characterized by the displacement of low-income and minority residents, follows brownfield redevelopment and hazardous site cleanups (Gamber-Rabindran et al., 2011; Gamber-Rabindran and Timmins, 2011; Essoka, 2010). City-specific projects have uncovered some additional aspects of remediation practices and their connections to gentrification. Dale and Newman (2009), for example, found that brownfield redevelopment projects in Victoria and Toronto reduced diversity and equity. Research in New York City highlighted the characteristics of populations vulnerable to displacement, such as low-income and elderly populations, as well as those living in rent

stabilized housing (Pearsall, 2010), and active industries and blue collar workers (Curran and Hamilton, 2012). Kern's (2015) study in Toronto, Ontario, reminds us of important racial components of environmental gentrification, observing that remediation of toxic sites was accompanied by displacement of black bodies in one former industrial neighborhood. Finally, in Spokane, Washington, Bryson (2012) traced the political processes surrounding the remediation and redevelopment of a brownfield site, documenting how civic leaders who heavily promoted and facilitated this private redevelopment failed to acknowledge or consider negative impacts for residents vulnerable to displacement from increases in property values. While this research on environmental remediation has analyzed impacts in the neighborhoods where remediation occurs, it has not considered what remediation in one neighborhood means for environmental conditions and demographic impacts in other neighborhoods. Better engagement with environmental justice scholarship could improve the multi-scalar perspective on environmental remediation.

Activists and scholars have also critically examined the impacts of densification or smart growth planning in an era of neoliberalism (Rérat and Lees, 2011; Quastel et al., 2012). Compact urban form provides locational advantages that gentrifiers value, including reduced travel time and associated costs, and improved mobility. Rérat and Lees (2011) suggest that gentrifiers benefit from 'spatial capital' gained from inhabiting inner city residences in dense, 'sustainable' neighborhoods. Quastel (2009), Quastel et al. (2012) and Rosol (2013) note that Vancouver's municipal EcoDensity plan capitalized on this notion of density as gentrification. They suggest that this plan represented little more than state-sponsored support of developers aiming to market environmental amenities and the concept of 'livability' to wealthy residents interested in living in downtown Vancouver. Quastel (2009) also highlighted the role that green consumerism played in developers' appropriation of environmental discourses without addressing the need for affordable housing. Vancouver is not the only city to fail to deliver on affordable housing promises; Addison et al.'s (2013) review of smart growth planning revealed that affordable housing is often challenging to include in sufficient supply, particularly because smart growth principles reduce the amount of land available for housing (Downs, 2005).

Residents, activists and scholars have also examined the impact of green building policies on neighborhood housing values and characteristics, uncovering multiple ways in which green design can simultaneously create and reflect gentrification. Chegut et al.'s (2013) study of green buildings in London made a clear connection between green buildings and gentrification, finding that these buildings raise nearby property values, although also noting that each addition to the green housing stock decreased the rents and property values of such buildings. Beyond this property value impact, Mehdizadeh and Fischer suggest that national green building policies create symbols of gentrification:

As being green becomes in vogue, and the next way to compete with the 'Joneses', communities will market themselves to the wealthy as 'green'. Conceivably, 'green' may become a code word for safe, rich, professional, and privileged (Mehdizadeh and Fischer, 2013, p. 6).

Boeing et al.'s (2014) study of the neighborhood-scale green building certification (LEED-ND) in a gentrifying neighborhood in Oakland, California, provided further perspectives on this issue, finding that neighborhoods that failed to meet environmental certification criteria often contained longtime residents who viewed their neighborhood

as livable and employed valuation criteria different to those promoted in LEED-ND. Their study indicated that efforts to comply with environmental certification may ignore the needs of current residents and instead redesign neighborhoods to attract a new (and likely wealthier) crowd.

Waterfront redevelopment has also been tied to greening or cleaning efforts. Unsurprisingly, many studies find that these state-sponsored projects lead to displacement of residents. Cities with slums or informal settlements have witnessed extensive displacement patterns associated with a newfound interest in waterfront property. In Delhi, India, the Yamuna River was cleared of slums to make way for two large mega-projects, in hopes of creating a 'world class' riverfront (Follmann, 2015; Sharan, 2015). A similar process unfolded along the Sabarmati River in Ahmedabad under the pretense of 'inclusive' redevelopment (Desai, 2012), and in Chennai, where an estimated 18,000 families were displaced from the Cooum River as a result of development and environmental restoration efforts (Coelho and Raman, 2010).

Research in post-industrial cities in the United States and Seoul, South Korea, has also highlighted how redevelopment that leverages the waterfront as amenity, displaces industries and working waterfronts. Curran (2004, 2007) observed industrial displacement along the waterfront in the rapidly gentrifying Williamsburg in Brooklyn, New York City, in the early 2000s. Subsequent research also linked the installation of park space or other green waterfront amenities to the loss of industrial space. In Seoul, South Korea, Lim et al. (2013) found that the Cheonggye Restoration Project led to the displacement of industrial uses in the historic business district and that land use changes associated with the river restoration project were aimed at wealthier users. This pattern also emerges in smaller cities in North America. Coastal fishing communities across the USA have become gentrification hot spots, threatening long-time marine-based economies and their workers: Colburn and Jepson's (2012) study of close to 3,000 fishing communities argued that both resource-dependent residents and their culture, developed over decades of a fishing economy, were displaced by in-migration of higher-income populations who were often retired and seeking the amenities afforded by waterfront access. In Toronto, Ontario, Bunce (2009) found that even public waterfronts are subject to gentrification in the neoliberal city, where city officials provide developers with access to pursue private projects for large-scale urban revitalization.

In other cities, too, public space has become a sort of gentrification battleground. In response to environmental justice concerns about the inequitable distribution of parks across cities, many sustainability plans call for improving green space access in underserved neighborhoods by creating new parks or renovating existing ones. Despite the appearance of good intentions, activists and residents have critiqued the outcomes, such as 'richening' and 'whitening' observed by Gould and Lewis (2012), as well as planning processes that exclude longtime residents (Checker, 2011). In Seattle, Washington, Dooling (2009) noted that the addition of city-maintained public green spaces ultimately served to displace homeless people who lived in them, and excluded these populations from discussions concerning creating new parks in the future.

The creation of the High Line in New York City, an elevated linear park constructed on a defunct railway, points towards the heightened gentrification impacts associated with private-public partnerships. Though the High Line is part of the municipal park system in New York City, its development and maintenance is led by a 'friends' group

that act as non-profit caretakers of the park and raise 98% of the annual budget (Friends of the High Line, 2016). Several studies reveal large-scale displacement of residential and commercial occupants following the creation of this internationally renowned park space that serves as a global attraction in New York City's post-industrial Meatpacking District (Littke et al., 2015; Patrick, 2014; Millington, 2015). As Littke et al. (2015, p. 367) observed, 'great landscaping does not make great places', pointing to the damaging effects of such dramatic gentrification (which has been celebrated by the city's administration as economic development). From a different perspective, Patrick (2014) also noted how plants, labeled as invasive, have been displaced by the creation of the park. His 'more than human' relational analysis shows the irony of one plant surviving the challenging industrial and post-industrial growing conditions being designated as undesirable, and systematically removed: 'it hardly seems ethical that *A. altissima* should bear the weight of being demonized as invasive when the very conditions for its survival are intertwined with the forms and structures of urbanization in late capitalism' (ibid., p. 936). Patrick's study reminds us that the impacts of gentrification go beyond human populations and that we should continually question so-called environmental improvements and whose interests they serve.

Another type of green public amenity that is linked to gentrification is bike infrastructure, often presented as a sustainable transit option, alongside public transportation, to reduce car congestion and CO₂ emissions. Rather than focusing on the impact of bike lanes on property values, as with many of the studies of brownfield redevelopment or green space creation or renovation, research conducted primarily in US cities, has revealed how bike planning has become both racialized and failed to accommodate the needs of communities that intersect the bike lanes. Hoffman's (2016) book *Bike Lanes are White Lanes* describes how bike advocates have, perhaps unintentionally, created a white community of advocacy in Portland (Oregon), Milwaukee (Wisconsin) and Minneapolis (Minnesota). Lugo's (2015, p. 308) research in Seattle reinforces this sentiment, in that she found that some communities viewed bike lanes as a way to help people to pass through their neighborhoods: 'In Seattle the entrenchment of sustainable development as city policy made bicycle infrastructure seem like yet another benefit that would accrue to white environmentalists'. Not all research concluded that bike infrastructure is part of (or a symbol of) gentrification, and this will be addressed below in a section on responses to environmental gentrification.

Activists have also observed how small-scale, community-oriented greening activities conducted by residents themselves can reflect the green interests of gentrifiers, as well as acting as a symbol or catalyst for accelerating gentrification. It is, perhaps, in this area of research that the embedded processes of market-led and gentrifier-led gentrification are best illuminated, as it is difficult to disentangle these two aspects of environmental gentrification at this fine scale. Certainly, Bavisar's (2002) discussion of bourgeois environmentalism in Delhi, and its impact on environmental regulations and urban space, showed how the aesthetic interests of the middle class can guide development of city-wide environmental regulations that displace vulnerable populations. As an indication of how residents have become sensitive to symbols of gentrification, residents in Baltimore opposed street tree planting in certain neighborhoods (Battaglia et al., 2014). In New York City, Reynolds (2015) observed that urban agriculture, despite its association with socially just practices, did little to challenge structural racism in the neighborhood. However, in a counter example

in Liverpool, England, Thompson (2015) notes that grassroots greening, in the form of guerilla gardening led by residents who remained in the increasingly abandoned Granby neighborhood, set the stage for an effective Community Land Trust that rehabilitates houses, as opposed to demolishing them and serving to further devalue the neighborhood.

20.5 INCLUDING SOCIAL JUSTICE AND EQUITY AS PART OF URBAN ENVIRONMENTAL CHANGES

Efforts such as the Community Land Trust described above, hold promise for preventing displacement, although McKendry and Janos (2015) suggest that even deliberate efforts to elevate the social equity and justice components of greening projects face considerable challenges in overcoming the logic of neoliberal urbanism and technocratic sustainable development approaches. Despite this, residents, community groups, and activists have drawn on a variety of strategies to oppose environmental gentrification processes. Some strategies employed are similar to those used by environmental justice activists, such as collective neighborhood action, community organizing, and direct tactics, while others are different approaches afforded by specific urban environmental conditions, such as environmental policies and regulations. Pearsall and Anguelovski (2016) provide a review and analysis of responses to environmental gentrification processes, and this section complements their analysis by discussing the ways in which efforts at resistance gain traction in different contexts.

20.5.1 Is it Up to the Individual?

Arguably, the scale at which responses or resistance strategies occur has become increasingly scrutinized and relevant in neoliberal cities that silence community protests, sponsor urban renewal and gentrification, and roll back social services providing safeguards for those living in gentrifying neighborhoods. Pearsall's (2012) study of resistance to gentrification in New York City points out how strategies implemented at the individual scale, such as owning a home, became the most effective way of safeguarding vulnerable residents from displacement, as other community or city-wide support systems, such as rent stabilization, were eroded. This shift – placing burden on the individual to be resilient to neighborhood change – marginalizes already vulnerable residents (e.g. renters). Further, research in Chicago (Hoffman, 2016; Lubitow et al., 2015), Delhi (Bavisar, 2011), New York (Checker, 2011, 2014), and Seoul (Schuetz and Chelleri, 2015) suggests that the voices of these vulnerable individuals are not always heard. For instance, residents who participated in planning meetings to discuss the restoration of Morningside and Marcus Garvey Parks in New York City, expressed frustration at the restoration effort being co-opted by a new gentrifying population: 'Residents were encouraged to accommodate a technocratic compromise that shunned politics as unseemly and counter-productive, and that sought instead only to engage "community" at the level of governance' (Checker, 2011, p. 225). While the formal planning process seemingly promised 'meaningful involvement' from all residents, ultimately contributions from specific residents – those who were whiter and wealthier – were adopted by the planners. Lubitow et al. (2015) make similar observations regarding bike lane infrastructure in Chicago, Illinois. Although certain

residents raised concerns about adding new bike lanes to their neighborhoods, these concerns went unheeded in the 'community' planning process that bike advocates oversaw. Bike advocates—similar to the park restoration advocates in New York—made problematic assumptions about what was best for neighborhoods, leading community members and scholars to urge advocates to rethink the role of biking: 'Bicycles have great potential to revolutionise how people use and interact with public space, but a truly just and socially sustainable bike infrastructure must incorporate community concerns and avoid strictly technological, universalised assumptions about the use and value of bicycles' (ibid., p. 2650). Thus, given the power dynamic embedded in a 'community' planning process that is led by those with more power, it seems likely that the residents most vulnerable to the changes proposed by the process will be only superficially involved.

Lugo's (2015) comparison of bike advocacy in Seattle and Los Angeles reminds us that cultural sensitivity and inclusion can improve the social justice dimension of bike infrastructure expansion efforts in cities. In Seattle, she found that residents questioned the imposition of bike infrastructure in their neighborhoods, noting that such infrastructure was not intended to serve the neighborhoods that it crossed. Lugo contrasted this example with the bicycling communities in Los Angeles, where biking was found to be part of a network of social movements, thus placing social justice and equity as part of the bike discussion. She observed:

Too often, urban planners, designers, and developers fail to engage ethnographically with the spaces they wish to improve, ignoring the cultural distinctions that imbue public spaces with meaning... When bike advocates focus on changing infrastructure rather than building networks among existing residents, urban neighborhoods become design products rather than lived places (ibid., p. 307).

Lugo found that the presence and inclusion of people in discussions and planning helped prevent gentrification. This act of including opinions and concerns from residents as a meaningful part of planning processes has gained traction in other contexts too. In East Baltimore, Maryland, where residents indicated that they did not want street trees because of perceptions of gentrification, city officials recognized that community involvement was important for realizing their urban tree canopy cover (UTC) goal (Battaglia et al., 2014). Having this feedback from residents from East Baltimore helped tree planting advocates reframe their approach to defining 'Possible' UTC and to incorporate residents' attitudes towards trees.

20.5.2 Far-reaching Impacts of Community Activism

Hackworth and Smith (2001) suggested that large-scale protests, such as the Tompkins Square Park protests in the early 1990s (Smith, 1996), became less common in the neoliberal context, yet scholars have documented important community-led activism/protests against environmental gentrification processes. These studies reveal mixed results, though in some cases the efforts have succeeded in stopping or slowing particular developments or initiatives. For instance, threats to demolish urban gardens in New York City's Lower East Side, to make way for affordable and market rate housing, was met with highly visible protests by the gardeners, and ultimately the involvement of the state, as well as celebrity Bette Midler's non-profit, the New York Restoration Project (Schmelzkopf, 2002). In

Austin, Texas, environmental justice activists from 'People Organized in Defense of Earth and Her Resources' (PODER) challenged a municipal smart growth plan for its inattention to racial inequalities and gentrification potential across the city. Tretter (2013b) observed that PODER had to reframe this perceived social problem (of racial inequality) into environmental terms in order to get the attention of the city's environmentalists and advocates of the SMART growth plan. Ultimately, the plan was not approved, though largely due to economic reasons. Additionally, even though some smart growth principles were subsequently adopted into other city policies, affordability was incorporated into these plans.

Other studies have also observed how community activism has influenced perceptions of environmental plans and changes, even if they have not stopped them. For instance, Quastel (2009) and Rosol (2013) examined how social justice advocates critiqued superficial efforts to incorporate affordability and livability in Vancouver's sustainability plan. Rosol (2013, p. 2251) argues that even though an ecodensity bill was approved by city council, it 'failed as a hegemonic project', as critics questioned the project for its lack of affordable and livable plans. In Jamaica Plain, Boston (MA), a coalition of Latino residents, college students, and older residents came together to oppose 'food gentrification' via the opening of Whole Foods (Anguelowski, 2015). One particular concern was that 'Whole Foods', an expensive 'healthy' food store, would replace the local 'Hi-Lo' supermarket that served the local community and was known as one of the best Latino markets in the state. The 'Whose Food/Whose Community?' coalition leveraged a highly visible campaign through protests, comments in newspaper and online forums to protest the opening of Whole Foods, which they saw as a sign of gentrification to come and the loss of the neighborhood's Latino identity. While such activism is important, Checker's (2014) study of state-sponsored gentrification in Staten Island's North Shore found that such participation in formal planning processes, even if meaningful, requires considerable attention, time, and resources from activists.

20.5.3 'Just Green Enough' as a New Approach to Resisting Environmental Gentrification

The examples above describe activist efforts to oppose a particular development, plan or initiative, and Miller (2016, p. 293) suggests that some residents have used pollution 'as a protective barrier against the ill effects of green gentrification'. However, Curran and Hamilton (2012) discovered that activists and residents have avoided gentrification without compromising environmental quality or environmental improvements. Based on work in Brooklyn, Hamilton and Curran (2013) observed what they call 'gentrifier-enhanced environmental activism', highlighting how longtime residents worked with gentrifiers to redevelop brownfields along Newtown Creek, a contaminated industrial waterway. They positioned this term as different and complementary to local environmental justice efforts, where 'successes were won by countering gentrifiers' voices rather than cultivating cross-class alliances' (ibid., p. 1561, citing Keil and Boudreau (2006) and Checker (2011)), with it enacting a focus on strategic alliances that can keep the interests of longtime residents at the center of discussions. They found that this arrangement facilitated the redevelopment of contaminated and underutilized properties in Greenpoint in a way that was consistent with the needs of longtime residents and maintained the industrial fabric of the neighborhood. In Curran and Hamilton (2012), they coin the term 'just green enough' to

describe a process where redevelopment initiatives remediate and redevelop land without catalyzing gentrification processes or displacing residents. Their case study in Greenpoint provided an exciting solution to Wolch et al's (2014) green space paradox, and it suggests an approach for centering social justice and equity in greening processes.

Curran and Hamilton developed the concept of the 'just green enough' approach based on their case study in Greenpoint, Brooklyn, and it is worth asking to what extent or how it could be a viable solution in other locations. Arguably, a particular set of institutional structures helped waterfront redevelopment in Greenpoint become equitable and community-sensitive. Notably, in 2010, Newtown Creek was designated a Superfund site, one of the most contaminated sites in the USA, which provided funding and regulatory oversight, including mechanisms for community involvement, as part of the remediation process. Additionally, Greenpoint had a well-organized and committed group of organizers. Pearsall (2013) observed a similar outcome in the nearby Gowanus Canal in Brooklyn, where many residents advocated for a Superfund designation, willingly accepting the stigma of living near a Superfund site so that they could have more input in the redevelopment process. However, as Miller (2016) observed, private investment had occurred before the full remediation of the Gowanus Canal, complicating the goals of affordability and stability that many longtime residents wanted.

Institutional structures, specifically state or national legislation, have been used in other contexts to improve the social equity outcomes of environmental improvements. Addison et al. (2013) emphasized the importance of legislation to synchronize definitions and expectations of affordability in different cities, particularly given the challenges that smart growth proponents face in incorporating adequate affordable housing. In Malmö, Sweden, Sandberg (2014) discussed the successes of city ecologists in designating a former quarry, used previously as a scenic amenity for nearby condominium owners, as a nature preserve. This designation was enabled by environmental regulations and required the quarry to provide access to the public (rather than exclusively maintaining it as scenery for wealthy condominium owners). Of course, all environmental laws may not be so benevolent to vulnerable communities; Gertner (2010) describes how environmental regulations were used to justify the removal of slums in Delhi in the 1990s.

Finally, additional research points to the importance of context and design for providing a space that is 'just green enough'. While the formalization of space into parks may catalyze gentrification, vacant land or other informal spaces, such as river banks, may provide a unique green space that is sheltered from gentrification (Rupprecht et al., 2015). Foster's (2014, p. 124) research on the 'Petite Ceinture', an abandoned railway in Paris, France, supported this idea, revealing that 'vacant' land provided an important space for ecological and socio-cultural interactions that 'disrupt the dominant logic of urban development'. On the other hand, Bavisar (2011) and Follmann (2015) show how informal waterfront spaces can become attractive to developers, as observed by developments on the Yamuna River in Delhi, resulting in the displacement of extensive slum settlements. From a design perspective, Ngom et al. (2016) noted that the configuration of greenspace can influence gentrification potential. In Quebec City, Canada, they found that linear parks designed for walking or cycling improve social equity outcomes, particularly when compared to parks in Montreal (Canada), which tend to be placed in the densest (and wealthiest) parts of the city. They emphasized the need for attention to accessibility and quality, as opposed to a narrow focus on increasing per capita greenspace.

20.6 CONCLUSION

While the growth of environmental gentrification research over the last decade has built a strong and interdisciplinary foundation for understanding the socio-spatial dimensions of urban sustainability planning and associated environmental improvements, there is much ground for future research to cover. To begin, environmental gentrification research would benefit from connecting theories and methods from currently disconnected literatures in urban geography (e.g. gentrification), human-environment geography (e.g. political ecology), and even ecology (for example Patrick, 2014) to more fully accommodate the human and ecological dimensions of environmental gentrification. Secondly, and related, 'environmental gentrification' research would benefit from moving beyond urban conceptualizations of gentrification to consider rural gentrification, which would also provide new theoretical and methodological insights (e.g. Phillips et al., 2008). Third, as mentioned previously, attention to flows of pollution or environmental burdens across spaces and places would improve the scalar lens of this work; little environmental gentrification research has investigated the consequences of displacing polluting facilities or the pollution itself to other neighborhoods or regions. Fourth, although there is some research from the 'Global East' and other cities around the world, the majority of research is based in North American and European cities. Further examining environmental gentrification in additional locations and in non-Western settings would improve our understanding of greening and gentrification processes and how they unfold in different social, economic, cultural, political, and environmental contexts. Finally, the majority of environmental gentrification resistance research draws on large-scale or major moments of resistance (e.g. protests, opposition to formal projects). Further, a more nuanced approach to understanding how everyday acts of resistance influence the processes and patterns of environmental gentrification in rapidly changing neighborhoods would provide an important perspective on the broader impacts of small-scale actions and how they contribute to the creation of just and equitable green cities.

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