Trans. Inst. Indian Geographers
ISSN 0970-9851
Indexed in Scopus

Urban planning and environmental injustice- A review

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Abstract

This article presents an overview of the methodologies and execution of various models of urban planning that have emerged in the 20th century and the persistence of environmental injustice in the cities of today. We trace the interconnected changes which have occurred in the urban planning models under the prevailing social philosophy and dissected by neoliberal capitalism. It has resulted in the landscape that now prevails in most of the cities of the world with overt environmental injustice. An extensive and chronological review of urban planning models has been done in this paper to evaluate the growth and changes in various notions of urban planning to assess how explicitly they have addressed the issue of environmental injustice. We contend that a reassessment of the historical trajectory of urban planning models could significantly contribute to rectifying environmental injustice within urban systems and fostering greater equity within the new urbanism movement.

Keywords: *Urban planning, environmental justice, urban planning movements, gentrification, neoliberal capitalism, deep ecology*

Introduction

"Every city is two cities, a city of the many poor and a city of the few rich; and these two cities are always at war." ~Plato

If the 20th century is remembered as the city century, it will also prove memorable as the century of urban planning (Freestone, 2000). The core domain of urban and regional planning activities is concerned with the ways land and the natural environments are valued, used, conserved, developed, or organized using a spatial perspective. The role of planning is associated with plan-making concerning the social, economic, and environmental aspects of particular arrangements (Hall and Jones, 2010). Over time urban planning is considered a tool to improve the health and wellbeing of people while maintaining the sustainability standard which was articulated in the late 20th century.

Planning of the modern city was a historical necessity caused due to haphazard growth of the cities resulting in epidemics and diseases which triggered debate in Britain about public health (Corburn, 2012). Initially, urban planning had to tread through the precarious equilibrium maintained between the capitalists, the politicians, and the working class with more assertive voices emerging from the ecologically sensitive experts, activists, and professionals for the common good of humanity (Peterson, 2009).

The basic economic model of the neoliberal capitalist economy lay at the base of all planning movements (Stein, 2019). Thus every type of urban planning movement starting with certain ecological goals to achieve has ended up with disparity in the environmental quality existing among the rich and the less fortunate working class neighborhoods within the city (Bell, 2015). The disparity in the environmental quality surfaces through zoning, urban renewal, and gentrification (Yenikalayci, 2022; Cocola Gant, 2019) instigated by the inherent inequality-generating mechanism of capitalism (Maanty and Maroko, 2018; Wolch *et al.*, 2014). Environmental injustice has persisted throughout the modern urban planning period in different degrees despite the social equity pursuits gradually adopted by the various planning movements (Ntiwane and Coetzee, 2018).

This study presents a chronological review of the prominent urban planning models to evaluate the extent of inclusion of environmental justice criteria therein. Through a review of relevant literature, this paper proposes some broad principles and projections to mitigate the effect of environmental injustice within the prevailing urban planning models.

Intersection of urban planning and environmental justice issue

The intersection of environmental justice and urban planning occurs on multiple levels and from various perspectives (Liotta *et al.*, 2019). Numerous urban planning initiatives undertaken have had repercussions on the environmental justice issues of cities (Wilson *et al.*, 2008). Historical practices such as creating boulevards, garden cities, and zoning regulations through street demarcation have historically favoured the affluent, cornering disproportionate benefits of these planning initiatives while burdening the working class with the environmental degradation caused by industries. It is now acknowledged that poorly constructed structures in cities can exacerbate various problems (Seidel *et al.*, 2012; Lopez 2012). Hood (2005) contends that fostering inclusive progress can address many of the modern cities' challenges.

Environmental justice within the realm of urban planning is a multifaceted concept that encompasses various dimensions of justice: distributive, procedural, and precautionary (Laurent, 2011). The concern of urban planning with the social, economic, and environmental impacts of defining spatial boundaries and influencing resource distribution pertains to distributive justice. The processes of plan preparation, regulation, and city management are intertwined with the procedural justice. Issues like gentrification, urban renewal, the establishment of urban villages, social exclusion, property speculation, and analysis of policy discourses are pivotal in understanding the mechanisms of environmental injustice within urban planning contexts.

Paper selection criteria: themes

This section describes the criteria for the selection of research papers and the search process adopted. Papers are selected under two themes, (a) environmental perspective in urban planning and (b) engaging with environmental injustice issues in urban planning.

Environmental perspective in urban planning

After the *garden city* movement and by the turn of 20th century modernism became the dominating and influencing factor that brought a paradigm shift in urban planning (Young, 2016). It was heavily influenced by scientific rationalism, based on a mechanistic and reductionist worldview (Benne and Mang, 2015). The major consequence of the modernist project was the planning of cities as a separate entity which is self-reliant in terms of technology and infrastructure. It provided a base for a dualistic perspective of the environment and humans as separate components from each other (Young, 2016). During the 1960s and 70s, the practitioners and scholars of urban planning shifted their focus (Wang *et al.*, 2016) to the ecological approach due to the increasing recognition of environmental issues in planning. In the last few decades, a wide range of theoretical concepts has been put forward which include urban ecology, ecosystem services, landscape ecology, landscape urbanism, biophilic design, resilience planning, and regenerative design (Da Silva *et al.*, 2012). An array of frameworks, assessment systems, and tools has also been adopted to support the application of ecological values into building design, urban planning, and landscape architecture, e.g. the SITES (Sustainable Sites Initiative) for landscape design (Steiner *et al.*, 2014). Nevertheless, such examples of uptake and ecological principles have not been thoroughly adopted in urban planning across the globe (Wang *et al.*, 2016).

Environmental justice

The work of Rachael Carson (1962) during the post-World War set a mark for the idea of environmental injustice. The first National People of Color Environmental Leadership Summit was convened in Washington DC from October 24-27, 1991, where delegates formulated and ratified 17 principles of Environmental Justice (EJ). These principles have since provided the basis for the expanding grassroots movement advocating for EJ (Bullard and Johnson, 2000). There is a broad agreement among scholars as to what constitutes EJ, though there may be some variation on the specifics and in nuances. Broadly EJ encompasses within its fold elements like equity, participation, non-discrimination, transparency, accountability, sustainability, etc. with regard to environmental decision making. According to EPA (1998) EJ is defined as the meaningful and fair movement which includes all people regardless of their colour, race, income, or national origin when it is applied to the implementation, development, regulation, and enforcement of environmental laws, practices, regulations, and policies. Brinkley & Wagner (2024) proposed that EJ aims to address the historical inequities that have unfairly placed a greater burden of environmental hazards on low-income and marginalized communities, particularly those composed of Black, Indigenous, and people of color (BIPOC), resulting in wellbeing disparities. According to Mohai *et al.* (2009), EJ embodies a progressive sustainable strategy that kick starts involvement and restoration within communities, paving the way for their development and revitalization.

Table 1: Key Words and associated Terms

Keyword	Associated Words
Industrial Revolution	Laissez Faire, Overcrowding, Public Health
Ecology	Landscape ecology, Urban Ecology, Nature, Eco-Cities
Infrastructure	Green Infrastructure, Landscape Infrastructure, Green Space,
Environmental Justice	Environmental Justice, Sustainability, Environmental Health
Urban Planning	Urban Development, Sustainable Development, Urban Planning, Landscape Planning, New Urbanism
Sustainability	Sustainable, Sustainable Development, Sustainable Assessment, Brudtland Commission, Urban Poor, Healthy Cities
Smart Growth	Urban Development, IoT, Smart Cities

Table 2: Number of Peer Reviewed Articles and Theme Philosophy

Theme	Philosophy/ Approach	Article containing Theme
Urban Planning	Public Health, Planning History, Ecological/ Environmental Planning, Wellbeing, Planning Theory, Social Wellbeing, Sustainability	14
Industrial Revolution/city	Public Health, Laissez-faire	2
New Urbanism	Zoning, Urban Development, Sustainability	3
Urban Transportation	Sustainability/ Well being	1
Smart Cities	Urban Development, Smart Growth, IoT	7
Global Metropolises	Urban Sustainable Development, Wellbeing	2
Sustainability and Environmental Health	Environmental Sustainability, Global Environmental Health, Urban Poor, Policy/ Planning Perspective, Historical Analysis, Public Health Environmental Justice	8
Environmental Justice	Sustainability, Environmental inequity, Environmental Health	11

EJ was not the central focus of urban planning theories initially, but its significance grew alongside the widespread adoption of key ecological movements and concepts like ecological design, deep ecology, and sustainability. Rosales' (2017) conceptual paper for instance articulates these key ecological movements such as different notions of ecological urbanism as represented through six concepts such as ecological networks, nestedness, cycles, flows, dynamic balance and resilience. Recently, there has been increasing recognition of a strong interconnection between planning theories and societal influences, facilitating an impact on public planning policies (Archibugi, 2004; Alexander, 2005). As claimed by Ntiwane (2018) the incorporation of EJ

into urban planning theories and practices has the potential to mold spatial planning methodologies and theories. With an objective of attainment of minimal well-being of all as stressed by Peeters and others (2015) spatial planning should consistently strive to integrate facilities, amenities, and other aspects within human settlements. EJ anticipates active public involvement in decision-making processes and plan implementation (Miller, 2011; Sikor, 2015).

Search process

The electronic database was explored to find significant studies including Title/Abstract/Keywords search from Science Direct, ISI Web of Knowledge, and Google Scholar (Table 1). Initially, the search terms were the Title/Abstract/Keywords to identify the related work on selected urban planning movements. These are garden cities, modernist cities, smart growth and smart cities, and sustainable cities. This step returned more than 100 papers, after eliminating replication. The abstracts of these papers were studied thoroughly to define their appropriateness for inclusion in the present study. Studies that were not relevant to the questions of this review paper were excluded during this stage. Furthermore, the relevant studies cited in the bibliography segment of these included papers were further added to the review database. More than 600 studies were initially found relevant to the study. However, keeping in mind the requirement of the present study only those papers were considered which fulfilled the criteria as given in Table 2. Finally, a total of 41 papers were Included. These papers were reviewed and relevant data was extracted. In the next section, we discuss the importance of planning movements in the light of EJ and their success in achieving the goals of EJ.

Early phase of modern urban planning

The early 20th-century influential works of urban planning (Howard 1898; Perry 1929; Jacob, 1961; Lee Corbusier and Frank Lloyd, 1932) are included under this phase to trace the history of the urban planning movement and inclusion of EJ.

Garden city movement

Ebenezer Howard first conceived the idea of *Garden City*. He became a pioneer in this field and a number of scholars followed his idea of Garden city such as Lewis Mumford, Clarence Stein, Henry Wright, and Patrick Geddes, etc. Later on, under the inspiration of this movement other movements like neighborhood unit and modernism emerged and became influential themselves (Domhardt, 2012). Howard (1902) proposed a garden city as a solution to the challenge of urban overcrowding resulting after the Industrial Revolution. His vision of planning was to model neighborhoods surrounded by a greenbelt, combining the best features of the city and the countryside with the constellation of interconnected satellite communities a few miles from London. Howard's plan was practical, especially for England, but it took years to implement his ideas of a garden city in reality. Despite Howard's best intentions but hindered initiatives, the blue-collar workers could not afford to live in the garden city due to the soaring home prices. These cities are most affordable for the skilled middle-class worker populations.

Another innovative concept of planned communities was introduced by Clarence Perry who proposed a neighborhood unit as an instrumental unit for enhancing the physical environment as well as for improving social problems, especially child fatality due to nascent automobile traffic. Clarence Perry's neighborhood unit went a long way in pushing forward the evolution of urban planning. Perry described that it would be a well-designed neighborhood having housing, employment, and day-to-day services within walking distance of the residence (Perry, 1929). Perry proposed his plan keeping in mind that this would enhance the feeling of community in residents and provide the opportunity for interaction for face-to-face contact. Perry's idea of neighborhood units however promoted rigid zoning. Ironically, however, there is growing evidence to suggest that zoning policies and building codes went against the urban poor (Tannerfeldt and Ljung, 2006). As Jacob (1961) conclusively demonstrated, Perry's neighborhood units in fact reduced walkability, encouraged social exclusion and increased care dependency among the residents.

Modernist city

Modernist projects had their main focus on the simplicity of design. Minimalism and the application of basic geometries were the hallmarks of urban design. Much technological development and material science innovation ushered the phase of construction of taller and lighter and more durable structures which mainly used glass, steel, and concrete. The main idea was to liberate humans from congested urban areas and to reduce the burden of disease by aesthetically and practically designing the urban space (Wilk, 2006). Le Corbusier and Frank Lloyd were the most influential key figures of this era. Le Corbusier proposed the concept of *the modernist city* in the 1920s in France. He presented the idea of an ideal city that was organized with a series of large skyscrapers expanse in large open spaces and without any slums. With a modern transit network, the city would be divided into functional zones (Watson, 2009). Wright (1938) proposed another radical theory to inhabit cities with very low-density settlements in dispersed forms in the US that had given rise to suburban development. According to him, cheap energy and availability of land, and extensive networks of highways with car ownership could be utilized to build large cities.

With the widespread market penetration of automobiles and rapidly increasing population, a new pattern formed in the cities known as urban sprawl or suburban sprawl (Dannenberg *et al.*, 2011). Over time, the pattern of suburbs began to change from grid to dendritic, where houses were clustered around cul-de-sac streets and it was thought this pattern would reduce traffic exposure for most people and, would be better for small children and pedestrians (Lopez, 2012). With the rise in income, suburban living reached a high, and zoning codes became more restrictive.

New urbanism

Contrary to the idea of Perry and Wright which triggered the trend of gentrification, in her book entitled *Death and Life of Great American Cities*, Jane Jacob (1961) promoted

the idea of mixed land use. Due to gentrification in the second half of the twentieth century, the economically privileged moved to better and less congested suburban areas. Dough Kelbaugh (2019) notes that new urbanism promoted the spatial mixing of land uses, houses, different income groups, age groups, urban designs, and transit. New urbanists believed that functional zoning encouraged more established hierarchies, which are necessary for a thriving community.

Smart growth and smart cities

Smart growth was a reaction to the undesirable growth features of suburbs in the 19th century. Smart growth policies promoted mixed land uses, higher densities, pedestrian-friendly layouts, and revitalized older existing neighborhoods ((Downs, 2007; Dieleman & Wegener 2004). Due to the lack of any particular definition, the term smart is barraged with the new terms of city discourse like smart, digital, intelligent, creative, and at the same time cultural. Komninos (2008) argued that the smart city has a network of infrastructure to increase the efficiency of socio-cultural, political, and urban development. Atzori *et al*., (2010) claim that the term smart is not smart enough, without the use of computational power, algorithmic capabilities, and super-fast internet. This data/information/knowledge system is required to make the city more communicable with the help of these devices and to promote the concept of the Internet of Things (IoT). Numerous variables were employed to define the smartness of city intelligence, but the most commonly used indicators are economics, people, government, mobility, quality of life, and environment. However, to improve outcomes, the smart city programme must involve the public, the government, and non-governmental organisations. In 2013 Schneider & Kitchen observed that large self-designed smart cities failed to incorporate the attributes of culture, politics, policy and governance and that a technological solution alone is not capable of addressing the deep-rooted structural malaise inextricably linked to their social dynamics.

Hollands (2020) in his work cited the examples of many big cities like Ottawa, Singapore, San Diego, and San Paolo to argue that the attributes of smart planning have led to conflict between the rich elite and poor working class by the top-down corporate-driven governance and bottom-up decentralized management. In addition, he claimed that the smart cities led by business-driven skills and gentrification are unconcerned with the issues of social justice, class inequality, inclusion, and polarization. The major source of the critique for these smart city initiatives is the use of ICT to deal with environmental problems with devices/data/technology while ignoring the social aspect of urban life (Albino *et al*., 2015). Mattern (2021) in this context claimed that smart cities exacerbated the entrenched legacies of extractivism, capitalism, colonialism, racial violence, and social and environmental inequalities, because smart cities are constructed on a legacy of exploitation, the unfairness is exacerbated by their dashboards, which have all-seeing and all-knowing capabilities. The structure of smart cities is shaped by a small minority of humans who have excluded others and their potential to heal the wounds provoked by

biased algorithmic representations and bad metaphors that limit our understanding of cities.

Sustainable cities

The World commission on environment and development first coined the term sustainable development in the 1980s. Brundtland Commission (1987) defines sustainable development as development that ensures current needs are met without compromising the ability of future generations to meet their own. The urban sustainability debate has become a prominent feature of the 21st century for urban policy, planning and development decisions. A plethora of literature is available on the various initiatives aimed at fostering sustainability in urban areas, including concepts like eco-city, eco-town, and eco-garden city. Richard Register in his 1987 book, *Ecocity Berkeley: Building Cities for a Healthy Future* first coined the term eco-city. The sustainable city movement also emerged from its contemporary movements like other movements to deal with the challenges created by urbanization, climate change, and resource limitation. However, the provision of a sustainable built environment that is linked with the natural environment is still a challenge for planners and policymakers (Rydin, 2010).

A sustainable city is in no way different from the previous movements except that it incorporates green technologies like a smart grid, water treatment system, solid waste management system, net-zero energy buildings, e-working, etc. The most dominant feature of the eco-urban movement is its focus on low-carbon cities. This is a significant improvement as compared to the previous movements. One more important thing regarding the eco-city movement is its toolkit assessment to measure the validity of the performance. There is however a disproportionate reliance on physical design and technological solutions which underrates the role that can be played by the public (Joss and Molella, 2013). Most eco-friendly cities like Copenhagen, Stockholm, Singapore, Vancouver, etc. have eco-certified restaurants, recycling of waste to a tune of up to 70 percent, green spaces/parks around 40-50 percent of the total jurisdiction of the city, use of the renewable source of energy, urban gardening, zero-emission vehicles, biofuel from the sewer, green department/sustainability department in the resource-based company, etc. Without incorporating residents' will to uptake a friendly environment; the rebound effects may offset the benefits of the development. Eco urbanism movement, which intended to bring change by achieving social equity, has not been completely addressed i.e., Hamley's (1991) on Canada; Liu *et al*., (1987) on Hawai; Hyma and Wells (1979) on India; Pizam *et al*., (1994) on Fiji are few case studies subject to development tourism. Aunguelovski *et al*., (2019) claim that the greening projects populated by the vulnerable residents aiming at large-scale urban development and higher-end real estate investment, mostly replaced by rich people create climate gentrification conditions. Anguelovski and colleagues (2021) contend in their book that green adaptation strategies aimed at fostering social equity in urban environments often diminish in importance at a rapid pace because urban greening is

frequently portrayed as a politically charged effort, often embedded in technocratic language and promotional reassurances that it will lead to fairer and more prosperous cities.

Mitigation of environmental injustice: way ahead

Based on the lessons learned from 20th-century urbanization, there is a strong agreement amongst urban experts and planners that the cities need to be more inclusive. Cities should be socially cohesive and diverse (Hoover *et al.*, 2021, Barret *et al.*, 2016). To achieve the viable goal of EJ with sustainability there is a need for incremental short-term but radical long-term changes in the urban planning approach. The objective of planning should be to synchronize concrete steps with the overarching shift towards a deep ecological paradigm, aimed at addressing injustice. Houghton (1999) aptly highlights five interconnected equity principles that acquire prominence in a discourse to theoretically integrate environmental justice with the concept of sustainable development. Success can be envisaged through the establishment of an agonistic mechanism to reconcile value conflicts among stakeholders (McAuliffe and Rogers, 2019). Conceptualizing how to address and implement EJ during the planning process should be the reference point for urban planning (Arnold, 2007). Justice must be the first evaluative criterion used in the actual development phase. In an effort to curb the gentrification of revitalized urban areas, inclusionary zoning is suggested. Inclusionary zoning is a policy tool used by local governments to promote affordable housing within their communities. It requires or incenti*vize*s developers to include a certain percentage of affordable housing units in new residential developments. The goal is to ensure that a diverse range of income levels can access housing within the same neighborhood or development. These incentives may include low-interest financing, density bonuses, subsidies, access to low-cost land, or logistical advantages. Its popularity among developers is increasing for social housing. Grassroots activism also affects the implementation of EJ in the urban planning process improving the lives of people (Bullard and Johnson, 2000; Fainstein, 2014).

The progress towards green capitalism represents a necessary shift from the conventional neoliberal economic model to address urban environmental challenges effectively. Implementing market-based mechanisms such as carbon taxes is essential for this transition, as highlighted by Scales (2017). However, merely adopting such policies may not suffice. We should aim for a profound transformation in urban planning approaches and practices, as proposed by Lehman (2010). Embracing models like self-reliant and fair share urban planning can lead us toward a more sustainable future.

As we advance, it's crucial to integrate the principles of deep ecology and the concept of a green economy, as advocated by Ehresman and Okereke (2015). This approach emphasizes understanding ecosystems' intrinsic value and promoting the rights of all species to exist and thrive. By shifting away from the current neoliberal perspective, which primarily views the environment as a spring of resources and a dumping ground for industrial waste, we can

address issues of equity and sustainability more comprehensively.

Under the prevailing neoliberal framework, marginalized communities often bear the brunt of environmental degradation and pollution, perpetuating social injustices. Transitioning towards a philosophy that prioritizes intergenerational equity, social justice, geographical fairness, and interspecies equality, as discussed by Haughton (1999) and Kopnina (2014), is vital. It's essential to recognize that environmental concerns are entangled with social and economic disparities, and urban planning must reflect a commitment to addressing these concerns within a holistic sustainability framework.

Conclusion

Our review concludes that the economic model of neo-liberal capitalism is creating environmental problems in urban areas faced by every planning model. It reveals that gentrification raises property values, displaces low-income residents, limiting their access to new green spaces, disrupts social networks, and worsens health disparities. The study indicates that until a more just, integrated model of economy and urban planning is adopted, an urban planning movement cannot achieve the goal of environmental justice. Elaboration of this model is beyond the scope of this paper.

The planning movements have achieved little success in improving EJ issues. Though all planning movements have emphasized public participation, and promoting environmental consciousness, the urban poor benefit little and continue to face discrimination. The various plan models like zoning, urban renewal, or redevelopment ironically end up against the very principles of EJ.

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