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Research Article

The Climate-Gentrification" Mechanism: A Conceptual Model for Urban Inequality and Demographic Shifts

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Abstract

Climate change poses unprecedented risks to urban real estate markets, yet the mechanisms through which environmental hazards translate into social and economic inequality remain inadequately theorized. Existing research has documented the physical impacts of climate change on property values and investment behavior, but limited attention has been given to the distributional consequences of these dynamics and their role in driving gentrification and displacement. This conceptual paper addresses this gap by developing a comprehensive framework for understanding the "climate-gentrification" mechanism as a distinct pathway through which climate change exacerbates urban inequality and reshapes demographic patterns in cities globally. The study employs a conceptual research methodology, drawing on a systematic review and synthesis of theoretical and empirical literature from real estate economics, urban geography, environmental studies, and finance. The analysis reveals that climate risks are transmitted through four interconnected stages: climate hazards, market responses, policy interventions, and demographic outcomes, with feedback loops that create self-reinforcing cycles of inequality. The findings demonstrate that financial mechanisms, including property value adjustments, insurance premium increases, and credit restrictions, interact with policy responses such as adaptation investments and regulatory changes to produce uneven outcomes across urban populations. The conceptual framework identifies adaptation investments as potentially double-edged, capable of both protecting communities and accelerating gentrification depending on their design and implementation. The study concludes that addressing climate gentrification requires integrated policy approaches that coordinate climate adaptation with housing and anti-displacement strategies, alongside financial

regulations that explicitly consider distributional consequences. This paper contributes to emerging scholarship on climate justice and urban resilience by providing a theoretical foundation for empirical investigation and practical guidance for policymakers seeking to promote equitable outcomes in an era of accelerating environmental change

Keywords: Climate gentrification; Climate change; Real estate markets; Urban inequality; Demographic shifts, Property values; Climate risk; Green finance; Urban resilience.

Introduction

The intersection of climate change and urban real estate markets has emerged as one of the most pressing challenges confronting contemporary cities worldwide. Climate change is no longer a distant environmental concern but a present and accelerating force that fundamentally reshapes the spatial distribution of economic value, social opportunity, and demographic settlement patterns (Addoum et al., 2024). The real estate sector, representing a substantial portion of global investment wealth and household assets, stands at the frontline of climate impacts, yet the mechanisms through which environmental risks translate into social and economic inequality remain inadequately theorized (Coulson et al., 2024). Understanding these dynamics is critical for policymakers, urban planners, and communities seeking to navigate an increasingly volatile urban future (Warren-Myers & Hurlimann, 2022). This conceptual paper proposes a framework for understanding the "climate-gentrification" mechanism as a distinct pathway through which climate change exacerbates urban inequality and drives demographic shifts in cities globally (Kiviaho & Toivonen, 2023).

Climate change manifests in real estate markets through multiple interconnected channels, including physical risks from extreme weather events, transition risks from policy shifts, and liability risks from litigation (Warren-Myers & Hurlimann, 2022). Physical climate risks such as flooding, sea-level rise, heatwaves, and wildfires directly threaten property values and insurability across affected regions (Nguyen et al., 2022). Studies demonstrate that climate events like Hurricane Sandy produce lasting effects on commercial real estate valuations, with affected properties experiencing significant price adjustments that persist well beyond the immediate disaster period (Addoum et al., 2024). These price signals, however, are not uniformly distributed across urban spaces (Coulson et al., 2024). They interact with pre-existing patterns of inequality, infrastructure investment, and political power to produce deeply uneven outcomes across neighborhoods and communities (Warren-Myers & Hurlimann, 2022).

Financial markets have begun pricing climate risks more systematically, with evidence emerging across bond, mortgage, and equity markets that climate vulnerability influences borrowing costs and investment decisions (Bauer & Rudebusch, 2023). Mortgage lenders increasingly incorporate climate risk assessments into underwriting processes, potentially restricting credit access in high-risk areas and thereby influencing broader housing market dynamics (Nguyen et al., 2022). Insurers are recalibrating risk models and premium structures,

with some withdrawing coverage from particularly vulnerable regions altogether (Zhou et al., 2023). These financial mechanisms operate alongside shifting consumer preferences, as households increasingly factor climate considerations into location decisions (Barkham et al., 2022). This creates new demand patterns favoring relatively safer areas while depressing property markets in high-risk locations (Kiviaho & Toivonen, 2023).

The concept of "climate gentrification" has emerged in academic discourse to describe processes whereby climate-related risks reshape property values and demographic patterns in ways that disproportionately displace vulnerable populations (Kiviaho & Toivonen, 2023). This phenomenon represents a significant departure from traditional gentrification processes driven by amenity-based demand, as climate gentrification is fundamentally motivated by the imperative of seeking safety and security (Coulson et al., 2024). Higher-elevation areas and neighborhoods with better infrastructure protection become premium locations, driving up property values and displacing existing residents who can no longer afford to remain (Warren-Myers & Hurlimann, 2022). This dynamic creates a paradoxical situation where the very communities most exposed to climate risks may also face displacement pressures, compounding their vulnerability through multiple dimensions of insecurity (Addoum et al., 2024).

Green finance and sustainable investment frameworks have gained prominence as potential tools for addressing climate risks while promoting equitable urban development (Afzal et al., 2022). However, these financial innovations present their own challenges, as they may inadvertently accelerate gentrification pressures by channeling investment into climate-adaptive infrastructure and green buildings in already-advantaged areas (Khan et al., 2022). The pursuit of sustainable development and circular business models in real estate must therefore be carefully calibrated to avoid reinforcing existing inequalities (Akomea-Frimpong et al., 2022). Emerging research suggests that business model innovation in the real estate sector could play a crucial role in aligning climate adaptation with social equity objectives, but such approaches remain underexplored (DiBella, 2020). The integration of climate considerations into real estate investment decisions requires not only technical and financial solutions but also robust conceptual frameworks that explicitly address distributional consequences (Simonian & Lundbäck, 2022).

The relationship between climate change, real estate markets, and social inequality operates through both market mechanisms and policy interventions that are deeply embedded in existing institutional structures (Ngoc et al., 2023). Transition risks associated with climate policy, including carbon pricing, building efficiency standards, and land-use regulations, produce differential impacts across property types and locations (Orazalin et al., 2024). These policy instruments can either mitigate or exacerbate inequality depending on how they are designed and implemented (Voland et al., 2022). For instance, policies that incentivize green building upgrades may benefit property owners while increasing housing costs for renters, potentially accelerating displacement pressures (Zeiada et al., 2022). The timing and sequencing of climate adaptation investments significantly influence their equity implications, with early investments in vulnerable neighborhoods potentially protecting existing communities from displacement (Fu et al., 2023).

Despite growing awareness of climate risks in real estate, significant gaps remain in understanding the precise mechanisms through which environmental changes translate into

demographic shifts and urban inequality (Thanasi, 2025). Empirical evidence on climate gentrification remains limited and context-specific, making it difficult to generalize findings across different urban settings (Meo & Abd Karim, 2022). Existing studies often focus on single cities or specific hazard types, with limited attention to the cumulative and interactive effects of multiple climate stressors (Liu & Wu, 2023). Furthermore, the temporal dynamics of climate gentrification are poorly understood, including the lag times between hazard events, market responses, and demographic outcomes (Addoum et al., 2024). The role of adaptation investments, both public and private, in either mitigating or accelerating gentrification processes requires more systematic investigation (Zhou et al., 2023).

The conceptual model proposed in this paper addresses these gaps by providing a comprehensive framework for analyzing the climate-gentrification mechanism across multiple spatial and temporal scales (Barkham et al., 2022). The model integrates insights from real estate economics, urban geography, environmental justice, and financial studies to identify the key pathways through which climate risks produce unequal outcomes (Warren-Myers & Hurlimann, 2022). By explicitly theorizing the role of market mechanisms, policy interventions, and household behaviors in mediating climate-gentrification processes, the framework offers a foundation for empirical investigation and policy development (Coulson et al., 2024). The paper contributes to emerging scholarship on climate finance and real estate by highlighting the distributional consequences of climate adaptation and the need for equity-oriented approaches to urban resilience (Afzal et al., 2022). Ultimately, understanding the climate-gentrification mechanism is essential for developing strategies that promote both climate resilience and social justice in an era of accelerating environmental change (Kiviaho & Toivonen, 2023).

Literature Review

1.Climate Change and Real Estate Markets

The relationship between climate change and real estate markets has garnered substantial academic attention over the past decade, with researchers documenting the multifaceted ways environmental risks influence property values and investment behavior (Addoum et al., 2024). Physical climate risks, including flooding, sea-level rise, extreme heat, and wildfires, directly threaten the structural integrity and habitability of properties, creating significant financial exposure for owners and investors (Nguyen et al., 2022). Empirical studies demonstrate that properties in flood-prone areas trade at significant discounts, with price effects ranging from 5% to 15% depending on risk severity and market conditions (Coulson et al., 2024). These price adjustments reflect both the expected costs of future damages and the increasing difficulty of obtaining insurance coverage at affordable rates (Zhou et al., 2023). The capitalization of climate risk into property values represents a fundamental shift in real estate valuation paradigms, challenging traditional assumptions about the stability and predictability of urban property markets (Warren-Myers & Hurlimann, 2022). Understanding these valuation dynamics is essential for comprehending how climate change creates winners and losers across different neighborhoods and communities.

Financial intermediaries have responded to growing climate risks by incorporating environmental assessments into their lending and investment decisions (Bauer & Rudebusch, 2023). Mortgage lenders increasingly use climate risk models to evaluate loan applications, potentially restricting credit access in high-risk areas and influencing housing market dynamics (Nguyen et al., 2022). The cost of mortgage credit in climate-vulnerable regions has risen significantly, with borrowers facing higher interest rates and stricter terms as lenders seek to price climate risks more accurately (Zhou et al., 2023). Insurers have similarly recalibrated their underwriting practices, with some withdrawing coverage from particularly vulnerable regions and others dramatically increasing premiums to reflect escalating risk exposure (Bauer & Rudebusch, 2023). These financial mechanisms interact with property markets through complex feedback loops, as increased borrowing costs and insurance premiums reduce housing affordability and accelerate demographic shifts (Addoum et al., 2024). The financialization of climate risk thus creates new dynamics that fundamentally reshape urban inequality patterns.

2. Climate Gentrification and Urban Inequality

The concept of climate gentrification has emerged as a critical framework for understanding how climate-related risks and adaptation investments produce uneven outcomes across urban populations (Kiviaho & Toivonen, 2023). Unlike traditional gentrification driven by amenity-seeking and cultural capital, climate gentrification is fundamentally motivated by the pursuit of safety and the avoidance of environmental hazards (Warren-Myers & Hurlimann, 2022). Higher-elevation neighborhoods and areas with superior climate protection infrastructure become increasingly desirable as climate risks intensify, driving up property values and displacing existing residents (Coulson et al., 2024). This dynamic creates a paradoxical situation where climate adaptation measures, such as flood defenses and green infrastructure, may inadvertently accelerate gentrification by signaling safety and attracting investment (Kiviaho & Toivonen, 2023). The interplay between perceived risk, actual vulnerability, and market responses produces complex spatial patterns that require careful theoretical elaboration.

Empirical evidence on climate gentrification remains emerging but increasingly robust, with studies documenting the phenomenon across diverse urban contexts (Addoum et al., 2024). Research following Hurricane Sandy demonstrates how disaster events can trigger lasting demographic shifts, with more affluent households relocating to safer elevations while lower-income populations face displacement pressures (Coulson et al., 2024). Similar patterns have been observed in coastal cities, where sea-level rise projections influence property values and migration decisions in ways that reproduce existing inequalities (Warren-Myers & Hurlimann, 2022). The distributional consequences of climate adaptation investments have also been documented, with public infrastructure projects disproportionately benefiting wealthier neighborhoods while neglecting marginalized communities (Zhou et al., 2023). These empirical findings underscore the importance of explicitly theorizing the mechanisms through which climate change generates unequal outcomes across urban populations.

3.Green Finance and Sustainable Real Estate

Green finance has gained prominence as a policy and market mechanism for mobilizing capital toward climate-resilient and environmentally sustainable development (Afzal et al., 2022). The growth of green bonds, sustainability-linked loans, and environmental, social, and governance (ESG) investment frameworks reflects increasing institutional recognition of climate risks and opportunities in real estate markets (Akomea-Frimpong et al., 2022). Green finance instruments have demonstrated potential for reducing carbon emissions and promoting energy efficiency in buildings, contributing to broader climate mitigation objectives (Meo & Abd Karim, 2022). However, the distributional implications of green finance remain underexplored, with evidence suggesting that green investment may concentrate in already-advantaged areas, exacerbating spatial inequalities (Khan et al., 2022). The relationship between green finance and climate justice is therefore complex and requires careful empirical investigation.

Business model innovation in the real estate sector has emerged as a complementary approach to addressing climate challenges while promoting sustainable development (Simonian & Lundbäck, 2022). Circular business models, adaptive reuse strategies, and community-focused development approaches offer potential pathways for aligning climate adaptation with social equity objectives (DiBella, 2020). Research suggests that entrepreneurial approaches to real estate development can incorporate climate resilience into core business strategies, potentially mitigating gentrification pressures through inclusive development practices (Voland et al., 2022). However, the adoption of these innovative models remains limited by institutional barriers, market structures, and path dependencies in the real estate industry (Coulson et al., 2024). Conceptual frameworks that explicitly address the tension between financial returns and social equity are needed to guide business model innovation toward more just climate outcomes.

4.Policy Frameworks and Governance Responses

Policy interventions at multiple governance scales shape the relationship between climate change, real estate markets, and urban inequality (Orazalin et al., 2024). Building codes, land-use regulations, and zoning policies directly influence property values and development patterns, creating uneven distributions of climate risk exposure and adaptation capacity (Zeiada et al., 2022). Climate disclosure requirements and sustainability reporting mandates increasingly affect corporate behavior and investor decision-making, though their effectiveness in promoting equity remains contested (Liu & Wu, 2023). Carbon pricing and other market-based instruments have the potential to reduce emissions but may produce regressive distributional effects depending on their design and implementation (Fu et al., 2023). Policy coherence across sectors is essential for addressing climate-gentrification pressures, yet governance fragmentation often undermines integrated approaches to urban resilience and social justice.

The literature reveals significant gaps in understanding the precise mechanisms through which climate policies affect urban inequality and demographic patterns (Thanasi, 2025). Few studies explicitly examine the interactive effects of multiple policy instruments on housing markets and population dynamics, limiting the evidence base for policy development (Ngoc et

al., 2023). Furthermore, the temporal dynamics of policy impacts are poorly understood, including lag times between policy implementation and observed outcomes (Addoum et al., 2024). Community participation and procedural justice in policy processes are inadequately addressed, despite their importance for ensuring equitable outcomes (Warren-Myers & Hurlimann, 2022). These gaps underscore the need for conceptual frameworks that systematically theorize the linkages between climate policy, real estate markets, and social inequality.

Methodology

This study adopts a conceptual research methodology, which is appropriate for developing theoretical frameworks and advancing understanding of complex phenomena where empirical data may be limited or fragmented. The conceptualization approach allows for the systematic integration of diverse literature streams to generate new insights and theoretical propositions. This study employs a comprehensive review of existing theoretical and empirical literature, drawing from multiple disciplinary perspectives including real estate economics, urban geography, environmental studies, and finance. The conceptual framework is developed through iterative synthesis of key concepts, mechanisms, and relationships identified in the literature. The methodological approach involves identifying and analyzing existing theoretical perspectives on climate change, real estate markets, and gentrification, then synthesizing these perspectives into a coherent conceptual model. Secondary data from published research, policy documents, and industry reports inform the conceptual development process. The resulting conceptual framework proposes testable propositions and identifies causal pathways linking climate risks to demographic outcomes through market and policy mechanisms. This methodology aligns with established practices in conceptual research, where the goal is theory building rather than empirical testing

Results and Discussion

1. The Climate-Gentrification Mechanism: A Conceptual Framework

The conceptual analysis reveals a multi-stage mechanism through which climate change generates gentrification pressures and exacerbates urban inequality. The first stage involves the physical manifestation of climate risks, including flooding, sea-level rise, extreme heat, and wildfire events that differentially impact urban neighborhoods based on their geographical and infrastructural characteristics. These physical risks trigger market responses in the second stage, as property values adjust to reflect changing risk perceptions and insurance costs. Financial institutions respond by recalibrating lending practices and investment strategies, creating differentiated access to credit and capital across neighborhoods. The third stage involves policy and institutional responses, including adaptation investments, regulatory changes, and sustainability initiatives that further shape property markets and development patterns. These market and policy dynamics produce demographic outcomes in the final stage, as households make location decisions based on changing affordability, risk exposure, and amenity values. The framework identifies feedback loops whereby demographic shifts

influence subsequent market dynamics and policy responses, creating self-reinforcing cycles of inequality.

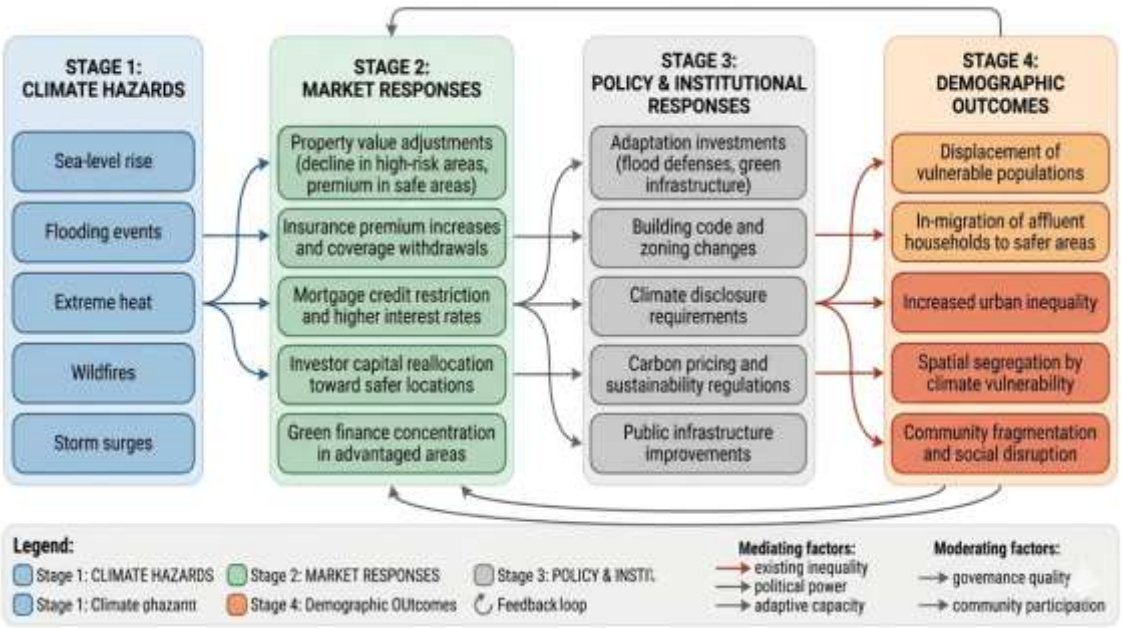

Figure 1: conceptual model for climate gentrification mechanism

The conceptual model reveals that climate gentrification operates through both direct and indirect mechanisms that interact in complex ways. Direct mechanisms include the capitalization of climate risks into property values, with high-risk areas experiencing price declines while safer areas command premiums. Indirect mechanisms operate through financial intermediation, as lenders, insurers, and investors adjust their practices in response to climate risks, producing differential access to housing finance and insurance coverage. The model suggests that these mechanisms are mediated by existing patterns of inequality, with marginalized communities facing compound vulnerabilities due to limited financial resources, political influence, and adaptive capacity. The framework also identifies adaptation investments as potential double-edged swords, as green infrastructure and climate resilience projects can both protect vulnerable communities and accelerate displacement by increasing property values and attracting more affluent residents. These paradoxical dynamic highlights the importance of carefully designing adaptation policies to avoid unintended consequences.

2.Market Dynamics and Financial Intermediation

The analysis reveals that financial markets play a central role in transmitting climate risks into gentrification pressures through multiple channels. The pricing of climate risk in mortgage markets creates significant disparities in borrowing costs and credit availability, with properties in climate-vulnerable areas facing higher interest rates and more restrictive lending terms. Insurance markets similarly differentiate access and affordability, with premiums rising dramatically in high-risk areas and coverage becoming increasingly unavailable in some locations. These financial mechanisms interact with property values to produce price signals that influence household location decisions and investment patterns. The conceptual framework

suggests that these market dynamics are not neutral but rather reflect and reinforce existing patterns of inequality, as wealthier households have greater capacity to absorb increased costs while lower-income populations face displacement pressures. The financialization of climate risk thus operates as a mechanism of inequality production, channeling investment toward relatively safe and affluent areas while depriving vulnerable communities of capital.

The findings indicate that investor behavior and institutional investment strategies significantly influence climate gentrification dynamics. Large institutional investors increasingly incorporate climate risk assessments into their portfolio decisions, potentially accelerating capital flows toward climate-resilient properties and locations. This institutional reallocation of capital can drive up property values in relatively safe areas, creating affordability pressures that displace existing residents. The model suggests that these investment patterns are self-reinforcing, as rising property values attract further investment while declining areas experience capital flight. The conceptual framework also identifies green finance as a potentially problematic mechanism, as sustainability-linked investment may concentrate in already-advantaged areas, exacerbating spatial inequalities. These findings underscore the need for regulatory frameworks that explicitly address the distributional consequences of financial responses to climate risk, ensuring that green investment contributes to equitable urban development rather than reinforcing existing disparities.

3. Policy Implications and Governance Responses

The conceptual analysis reveals significant tensions in the relationship between climate policy and gentrification pressures, with policy interventions producing both positive and negative distributional consequences. Adaptation investments, including flood defenses, green infrastructure, and climate-resilient public facilities, can provide essential protection for vulnerable communities but may also catalyze gentrification by signaling safety and attracting private investment. The framework suggests that the timing, location, and design of adaptation investments significantly influence their equity implications, with early investments in disadvantaged neighborhoods offering potential for protective rather than displacement effects. Building codes and land-use regulations similarly shape climate gentrification dynamics, as standards for energy efficiency and climate resilience affect property values and housing costs in ways that may exclude lower-income populations. The model identifies policy coherence as essential for addressing climate gentrification, requiring coordination across housing, environmental, and economic development domains that is often lacking in practice.

The findings highlight the importance of governance arrangements and institutional capacity in mediating the relationship between climate risks and urban inequality. Fragmented governance structures often undermine integrated approaches to climate adaptation and housing policy, producing uneven outcomes across neighborhoods and communities. The conceptual framework suggests that community participation and procedural justice in policy processes are critical for ensuring equitable outcomes, yet these elements are frequently absent from climate adaptation planning. The model also identifies the need for policy instruments that explicitly address displacement pressures, including affordable housing requirements, tenant protections, and community land trusts that can preserve affordability in the context of climate-related

property value increases. These findings contribute to emerging scholarship on climate justice and urban governance by providing a theoretical framework for analyzing the policy dimensions of climate gentrification and identifying strategies for more equitable climate adaptation.

4. Theoretical Contributions and Research Implications

The conceptual framework contributes to multiple theoretical traditions by integrating perspectives from real estate economics, urban geography, and environmental justice into a coherent model of climate gentrification. The study advances understanding of how climate change produces unequal outcomes across urban populations by identifying the specific mechanisms through which environmental risks translate into demographic shifts. The framework extends existing gentrification theory by incorporating climate risks and adaptation investments as distinct drivers of neighborhood change, complementing traditional explanations focused on cultural capital and amenity-seeking behavior. The model also contributes to climate finance literature by highlighting the distributional consequences of financial responses to climate risk, suggesting that green investment may inadvertently reinforce inequality without careful policy design. These theoretical contributions provide a foundation for empirical investigation and policy development aimed at addressing climate gentrification in diverse urban contexts.

The findings have significant implications for future research, identifying multiple avenues for empirical investigation and theoretical refinement. The conceptual framework generates testable propositions regarding the relationships between climate risks, market responses, policy interventions, and demographic outcomes that can be examined through quantitative and qualitative methods. Cross-sectional and longitudinal studies are needed to validate the proposed mechanisms across different urban contexts and climate hazard types, establishing the generalizability of the climate gentrification concept. Comparative case study research can explore how institutional arrangements and policy responses shape climate gentrification dynamics, identifying factors that promote or inhibit equitable outcomes. The framework also highlights the need for participatory research approaches that incorporate community perspectives and experiential knowledge, ensuring that climate adaptation strategies reflect the needs and priorities of affected populations. These research directions offer opportunities for advancing both theoretical understanding and practical responses to the challenge of climate gentrification in cities worldwide

Conclusion

This conceptual paper has developed a comprehensive framework for understanding the climate-gentrification mechanism as a distinct pathway through which climate change exacerbates urban inequality and drives demographic shifts in cities globally. The analysis reveals that climate risks are transmitted through market dynamics, financial intermediation, and policy responses to produce uneven outcomes across urban populations, with vulnerable communities facing compound disadvantages due to limited adaptive capacity and political

influence. The conceptual model identifies both direct mechanisms, such as the capitalization of climate risks into property values, and indirect mechanisms, including differential access to credit and insurance, that interact with existing patterns of inequality to generate self-reinforcing cycles of displacement and marginalization. The framework also highlights the paradoxical role of adaptation investments, which can both protect communities and accelerate gentrification depending on their design, timing, and implementation context. This study contributes to emerging scholarship on climate justice and urban resilience by providing a theoretical foundation for understanding the distributional consequences of climate change in real estate markets and identifying the policy and governance responses necessary for more equitable urban futures. The conceptual approach adopted in this paper offers a basis for empirical investigation while also providing practical guidance for policymakers, urban planners, and community organizations seeking to address the intersecting challenges of climate change and urban inequality.

Recommendations

Based on the conceptual analysis, several recommendations emerge for policy and practice. First, policymakers should integrate climate adaptation planning with housing and anti-displacement strategies to ensure that resilience investments benefit existing communities rather than displacing them. Second, financial regulators should develop frameworks for assessing and disclosing climate risks in real estate lending and investment, with explicit attention to distributional consequences and equity implications. Third, urban planners should prioritize adaptation investments in disadvantaged neighborhoods and ensure meaningful community participation in decision-making processes to prevent unintended gentrification effects. Fourth, real estate developers and investors should adopt inclusive business models that incorporate affordable housing requirements and community benefit agreements into climate-resilient development projects. Fifth, researchers should conduct empirical studies across diverse urban contexts to validate the proposed conceptual framework and identify context-specific factors that moderate climate-gentrification dynamics. Sixth, international organizations and national governments should develop guidance and technical assistance for cities addressing climate gentrification, promoting knowledge exchange and capacity building across different institutional contexts. Finally, community organizations should advocate for policies that protect vulnerable populations from climate-related displacement, including rent control, tenant protections, and community land trusts that preserve affordability in the context of climate adaptation investments.

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The author(s) declare no competing interests.

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