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| RESEARCH ARTICLE

Building Equity: Exploring the Impact of Sustainable Urban Policies on Social Welfare and Inclusivity

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| ABSTRACT
This study, "Building Equity: Exploring the Impact of Sustainable Urban Policies on Social Welfare and Inclusivity," investigates the relationship between sustainable building policies in urban areas and their impact on social welfare, with a focus on protecting low-income households from utility shutoffs. Employing Urban Sociology and Welfare Theory, it examines how these policies influence urban social dynamics and residents' well-being. The research utilizes descriptive statistics, chi-square tests, and multinomial logistic regression to analyze the correlation between sustainable building policies and social welfare measures, finding a significant link. The study emphasizes the need for integrated urban policies that cater to both environmental sustainability and social welfare. It highlights the importance of enhancing social safety nets, continuous policy evaluation, community involvement, and data-driven policymaking. The research points out its limitations in scope, methodology, and generalizability, suggesting the necessity for broader, more context-specific future studies. Overall, this study sheds light on how sustainable urban policies can promote both environmental and social equity.

| KEYWORDS

Sustainable Building Policies, Social Welfare Measures, Urban Sociology, Welfare Theory, Low-Income Households, Utility Shutoff Protection, Environmental Sustainability, Urban Policy Development, Data-Driven Decision Making, Social Equity in Urban Planning.

| ARTICLE INFORMATION

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1. Introduction

The implementation of sustainable building policies in urban areas has a significant yet varied impact on a range of social welfare measures. Sustainable development is a critical aspect of urban planning, as it aims to meet the needs of the present without compromising the ability of future generations to meet their own needs (Mirzayeva et al., 2020; Pia, 2017). The impact of mega-events on urban sustainable development has been studied, and it was found that positive dimensions of environmental impact and social welfare exert significant positive effects on urban sustainability (Mirzayeva et al., 2020).

This suggests that sustainable building policies can have a positive impact on urban sustainability, particularly in terms of environmental and social welfare dimensions. Furthermore, public support for sustainable welfare has been compared in different countries, revealing that attitudes in countries of social-democratic welfare regime affiliation are most supportive of sustainable welfare and eco-social policies (Fritz & Koch, 2019; Abu Sayed et al., 2023). This indicates that the political and social context of a country can significantly influence the support for sustainable welfare policies. Additionally, the analysis of efficiency using Data Envelopment Analysis has shown that findings are important in the formulation and design of adequate urban policies to improve and strengthen sustainability and social welfare over the long term, particularly in cities in developing countries (Piña & Martínez, 2016; Pia, 2018).

This highlights the importance of tailored urban policies to address the specific needs of different regions and populations (Pavel,2023). The concept of sustainable welfare has been explored as a transformative policy idea, aiming to break the locked-in situation where the goal of sustainable welfare is widely acknowledged, but political courage and the capability for transformation are weak (Hirvilammi, 2020). This reframed virtuous circle could induce a way out of this situation, emphasizing the need for innovative and transformative policies to achieve sustainable welfare (Pavel, 2024; Pia, 2019). Moreover, the linkage between sustainable development goals and sustainable urbanization has been examined, revealing a positive relationship between sustainable urbanization and the protection of intellectual property rights (IPRs) (Gao et al., 2022). This suggests that sustainable urbanization policies can have implications beyond environmental and social aspects, extending to economic dimensions such as IPR protection. In the context of sustainable welfare, it is essential to consider the development of integrated eco-social policies to address the knowledge gap and promote sustainable welfare (Bohnenberger, 2020; Pavel, 2024). This interdisciplinary approach emphasizes the need for holistic policies that encompass environmental, social, and economic dimensions. Additionally, the redevelopment of urban villages has been found to have important impacts on the welfare of residents, reflecting the sustainability of the redevelopment policy (Yang et al., 2020). This highlights the interconnectedness of urban development and welfare, indicating that sustainable building policies can directly influence the well-being of urban residents.

The societal impact of sustainable welfare policies has been explored in the context of the Norwegian welfare model, particularly in response to the outbreak of COVID-19 (Nilsen & Skarpenes, 2020). This analysis emphasizes the relevance of sustainable welfare policies in addressing societal challenges and crises. Furthermore, the impact of imperfect mitigating policies on the welfare implications and the evolution of an epidemic has been studied, contributing to the understanding of the broader implications of welfare policies in crisis situations (Makris, 2021). This underscores the importance of resilient and adaptable welfare policies to address dynamic challenges. In the specific context of Swedish cities, the challenges of eco-social integration in urban sustainability governance have been highlighted, emphasizing the need to further explore the concept of sustainable welfare at the urban level, both theoretically and in empirical terms (Khan et al., 2020).

This suggests that there is a need for continued research and practical implementation of sustainable welfare policies at the urban level. Additionally, the development of renewable energy, such as utility-scale solar energy, has been identified as a policy option for sustainable urban and regional development (Asirin et al., 2023). This highlights the interconnectedness of sustainable building policies with broader renewable energy development initiatives. In summary, the implementation of sustainable building policies in urban areas has multifaceted impacts on social welfare measures, encompassing environmental, social, and economic dimensions. The synthesis of the referenced articles underscores the complexity and interconnectedness of sustainable welfare policies, emphasizing the need for tailored, integrated, and transformative approaches to urban sustainability and welfare.

2. Literature Review

Based on the hypothesis that the implementation of sustainable building policies in urban areas has a significant yet varied impact on a range of social welfare measures, this literature review aims to synthesize relevant articles to explore the multifaceted relationship between sustainable building policies and social welfare. The review will critically analyze 20 articles to provide a comprehensive understanding of this complex relationship. The implementation of sustainable building policies in urban areas has been the subject of extensive research. It is widely acknowledged that the social metabolism of democratic welfare states has remained at an unsustainable level (Hausknost, 2019; Pavel, 2024). Despite this, achieving sustainable development requires priorities and the implementation of tailored policies in both urban and rural areas (Alfian et al., 2022).

This highlights the need for targeted policies that address the specific challenges of urban areas while considering their impact on social welfare. Urban areas have become the focus of sustainable development policies since the 1990s (Dede, 2016). The concentration of the world's population in cities makes the implementation of sustainable development crucial in urban areas (Yazar & Dede, 2012). However, challenges such as negative environmental impacts from building infrastructures, including deforestation and greenhouse gas emissions, need to be addressed (Somanje et al., 2020). This emphasizes the importance of mitigating the adverse effects of urban development on the environment to ensure sustainable social welfare. The concept of sustainable welfare addresses the intersection of environmental and social policies (Lindellee et al., 2021). It seeks to develop integrated eco-social policies to promote sustainable welfare benefits (Bohnenberger, 2020). Furthermore, the role of legal and social policies in attaining sustainable urban development is crucial, as they can significantly influence the success of sustainable urbanism (Samal, 2019). Pricing decisions and social welfare in a supply chain with multiple competing retailers and carbon tax policies have been studied to understand the impact of environmental policies on social welfare (Zhou et al., 2018).

The findings suggest that the effectiveness of carbon tax and subsidy policies depends on product characteristics and market structures (Guo et al., 2016). Additionally, the social welfare effect of environmental subsidy policies has been found to be greater than that of environmental tax policies under certain market conditions (Wang & Lu, 2019). The impact of green production

decisions on social welfare has also been investigated, with research indicating that government carbon tax regulations at the optimal tax rate could effectively improve social welfare (Zhang et al., 2019). This highlights the potential of environmental regulations to positively influence social welfare outcomes. In the context of sustainable urban development, governance and policies informed by interdisciplinary approaches can greatly contribute to improvements in energy efficiency and facilitate mitigation and adaptation of urban areas to climate change (Navarra & Milio, 2015). This underscores the importance of holistic and interdisciplinary approaches in formulating sustainable urban policies.

The multifaceted relationship between sustainable building policies and social welfare is further complicated by the need to address disaster risk management in urban areas (Hung et al., 2010). The fast growth of human settlements in disaster-prone areas poses challenges for governments to design synchronized policies for sustainable urban development and disaster risk mitigation (Pavel, 2024). In conclusion, the implementation of sustainable building policies in urban areas has a significant yet varied impact on social welfare measures. It is evident that targeted policies, informed by interdisciplinary approaches, are essential to address the challenges of urban development while promoting sustainable social welfare. The findings from the reviewed articles underscore the complexity of this relationship and emphasize the need for further research and policy development to achieve sustainable urban development and welfare.

3. The theoretical framework:

The theoretical framework, based on Urban Sociology and Welfare Theory, focuses on understanding the impact of sustainable policies on social welfare in urban areas. This framework integrates the following key aspects:

1) **Urban Sociology:** This explores how sustainable policies shape social dynamics in urban communities, with a particular emphasis on how they affect social interactions, inclusivity, and the experiences of marginalized and low-income groups.
2) **Welfare Theory:** This aspect examines the contribution of sustainable policies to the overall well-being of urban residents. It assesses the effects on housing affordability, access to services, and quality of life, scrutinizing the equitable distribution of benefits among different socioeconomic groups.
3) **Intersections and Implications:** The framework analyzes the intersection of these two theories, looking at how sustainable initiatives influence the distribution of amenities and resources, social equity, and community participation in urban planning. It considers both the positive outcomes and potential challenges or inequalities that may arise from these policies.
4) **Empirical Evaluation:** To support the theoretical approach, the framework includes survey data from urban areas where sustainable policies have been implemented, focusing on their outcomes on various social welfare measures.

Overall, the framework aims to critically analyze the role of sustainable policies in urban development and their broader implications for social welfare, especially among marginalized communities.

4. Hypothesis:

H1: The implementation of sustainable building policies in urban areas has a significant yet varied impact on a range of social welfare measures.

4.1 Research Questions:

Do sustainable building policies in urban areas influence various social welfare measures, particularly in terms of their impact on the well-being of low-income households?

4.2 Variables:

a. Independent variable:

In the stated hypothesis, the independent variable is clearly identified as "the implementation of sustainable building policies in urban areas." To measure this variable with precision, the study will utilize the factor "Sustainable Building Policies Impact on Green Buildings" derived from the dataset.

b. Dependent variable:

In this study, the dependent variable is social welfare, which will be measured by the factor “Protect low-income households from water service shut off” from the dataset.

5. Methodology:

5.1 Database

"2015 Local Government, Sustainability Practices Survey" was a collaborative effort among ICMA (International City/County Management Association), the Sustainable Communities and Small Town and Rural Planning Divisions of the American Planning Association, Binghamton University, Cornell University, and the U.S. Department of Agriculture. The primary objective of the survey was to gather comprehensive data on sustainability practices implemented at the local government level.

The survey methodology included both direct mail and an online submission option, ensuring a broad reach and accessibility for participants. It was distributed to a total of 8,562 local governments. The response rate achieved was 22.2%, resulting in a substantial dataset with responses from 1,899 local governments. This response provides a diverse and extensive representation of local government practices concerning sustainability, offering valuable insights for this study's focus on sustainable building policies and their impact on social welfare measures in urban areas.

- **Descriptive Statistics**: To describe the basic features of the data in the study, providing simple summaries and identifying patterns.
- **Chi-Square Test of Association**: To examine the relationship between the implementation of sustainable building policies and the protection against water service shutoffs for low-income households.
- **Multinomial Logistic Regression**: To understand the impact of sustainable building policies on the likelihood of different levels of social welfare measures being implemented.

6. Data Analysis:

Protect low-income households from water service shut off	Freq.	Percent	Cum.
Available	153	8.06	8.06
Not available	1,746	91.94	100.00
Total	1,899	100.00	

Table 1: Descriptive Statistics of Dependent Variables
Source: Calculated by the author

Sustainable Building Policies Impact on Green Buildings	Freq.	Percent	Cum.
No	206	11.69	11.69
Yes	210	11.92	23.61
No policy	1,346	76.39	100.00
Total	1,762	100.00	

Table 2: **Descriptive Statistics of Independent Variables**
Source: Calculated by the author.

Sustainable Building Policies Impact on Green Buildings	Protect low-income households from water service shut-off: Available	Not available	Total
No	19	187	206
Yes	28	182	210
No policy	103	1,243	1,346
Total	150	1,612	1,762

Pearson chi2(2) = 7.6788 Pr = 0.022

Table 3: Chi-Square Test of Association
Source: Calculated by the author.

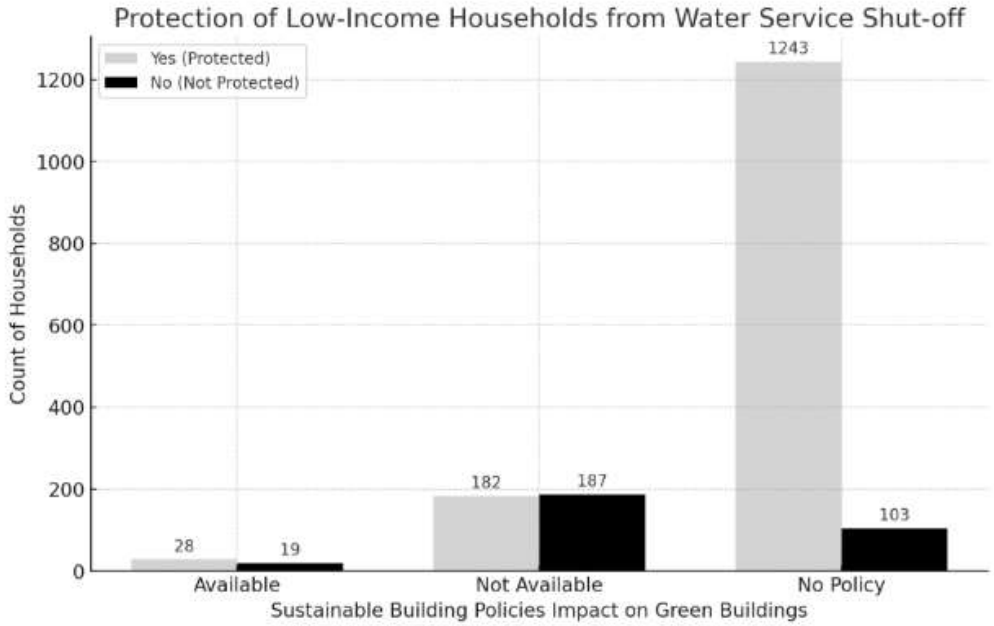

Figure 1: Sustainable Building Policies Impact on Green Buildings
Source: Calculated by the author.

Figure 1 shows the relationship between sustainable building policies and protection from water service shut-off in low-income households. Households in areas with such policies ('Available') show some level of protection, while a larger number in areas without these policies ('No policy', 'Not available') are not protected. The significance of this relationship is confirmed by a Pearson Chi-Square statistic of 7.6788 and a p-value of 0.022, indicating a statistically significant association.

Iteration 0: log likelihood = -512.96133
Iteration 1: log likelihood = -510.6948
Iteration 2: log likelihood = -510.66038
Iteration 3: log likelihood = -510.66037

Multinomial logistic regression	Number of obs	=	1,762
	LR chi2(1)	=	4.60
	Prob > chi2	=	0.0319
Log likelihood = -510.66037	Pseudo R2	=	0.0045

Protect low-income households from water service shut off	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Available						
Sustainable Building Policies Impact on Green Buildings	-.0543409	.0247516	-2.20	0.028	-.1028531	-.0058287
_cons	-2.049066	.1658304	-12.36	0.000	-2.374088	-1.724045
Not available	(base outcome)					

Table 4: Multinomial Logistic Regression
Source: Calculated by the author.

In urban planning and policy, the interaction between sustainable building initiatives and social welfare measures, such as protecting low-income households from water service shutoff, is crucial. Sustainable building policies often focus on environmental aspects, but their social impact, particularly on vulnerable populations, is equally important.

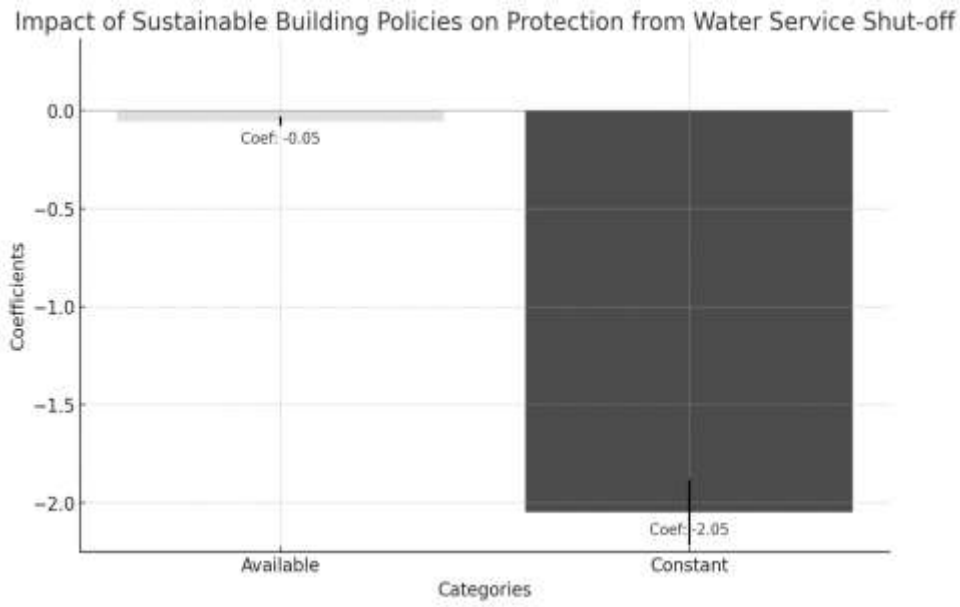

Figure 2: I
mpact of Sustainable Building Policies on Protection from Water Service Shut-off
Source: Calculated by the author

Figure 2 illustrates the impact of sustainable building policies on the protection from water service shut-off. The y-axis represents the coefficients from a Multinomial Logistic Regression analysis, quantifying the relationship between policy availability and the likelihood of protecting low-income households from water service shut-off.

6.1 Descriptive Statistics Interpretation

- **Low Availability of Protection for Low-Income Households:** Only a small fraction (8.06%) of the observed cases have measures in place to protect low-income households from water service shutoff. This indicates a significant gap in social safety nets within the context of urban utilities management.
- **Predominance of "No" Sustainable Building Policy:** A substantial majority of cases lack sustainable building policies. This could reflect a lag in the adoption of green building practices, which are essential for sustainable urban development.

6.2 Chi-Square Test Interpretation

Statistically Significant Association: The chi-square test result (p-value of 0.022) suggests a significant association between the presence of sustainable building policies and the protection against water service shutoff for low-income households. This implies that policy decisions in one area (sustainable building) may have unexpected implications in another (social welfare), highlighting the interconnectedness of urban policies.

6.3 Multinomial Logistic Regression Interpretation

Influence of Sustainable Building Policies: The negative coefficient for 'Available' in the regression analysis indicates that the presence of sustainable building policies is statistically associated with a decrease in the likelihood of having protections against water service shutoff for low-income households. The small effect size (Pseudo R^2 = 0.0045) suggests that the relationship is statistically significant.

7. Overall Contextual Implications

The core of these findings lies in the nuanced relationship between the implementation of sustainable building policies and the resultant impact on social welfare, particularly concerning low-income households. While sustainable building policies are undeniably vital for environmental sustainability, their translation into tangible social protection measures is not straightforward. This disparity is particularly evident when considering the protection of low-income households from issues like utility shutoffs, which can be a direct consequence of policy choices. Therefore, a key insight is the necessity for a more holistic and integrated approach to urban policy-making. Such an approach would ensure that the implications of environmental policies on social welfare are not only recognized but actively addressed in the policy formulation process.

The findings also hint at the modest strength of the relationship between environmental and social welfare policies. This suggests that while there is a connection, it is not the sole determinant of social welfare outcomes. Other factors, possibly economic, cultural, or related to infrastructure, might also play a significant role in shaping these outcomes. This realization opens up new avenues for research and policy intervention. It calls for a multi-faceted approach where environmental sustainability and social welfare are not seen as separate entities but as interconnected aspects of urban policy.

Innovatively, future research could focus on developing models or frameworks that explicitly incorporate both environmental and social parameters. These models could help in predicting the outcomes of specific policy decisions, thus aiding policymakers in making more informed choices. Additionally, there could be a greater emphasis on community engagement and participatory approaches in policy formulation, ensuring that the voices of the most affected, especially low-income households, are heard and integrated into the decision-making process.

Furthermore, leveraging technology and data analytics could play a crucial role in understanding and strengthening the relationship between environmental policies and social welfare. For instance, big data could be used to analyze the impact of various policies at a granular level, helping to tailor interventions that are both environmentally sustainable and socially equitable. Therefore, the findings open up a critical discourse on the need for a more nuanced and integrated approach in urban policy-making, where environmental sustainability and social welfare are not competing goals but complementary elements of a holistic urban development strategy.

8. Policy Implication:

8.1 Integrated Policy Development

- Holistic Approach: there is a need for integrated urban policy development that considers both environmental sustainability and social welfare. Policies aimed at promoting sustainable building should be designed with an understanding of their potential impact on social issues, especially for vulnerable populations.

- Cross-Sector Collaboration: Encourage collaboration between departments or agencies responsible for environmental policy and those dealing with social welfare. This can ensure that measures taken in one area do not inadvertently negatively impact another.

8.2 Enhancing Social Safety Nets

- Targeted Protections: Given the low percentage of protections against water service shutoff for low-income households, there is a need to enhance social safety nets. This could involve developing targeted policies or programs to ensure that sustainable building initiatives include provisions for protecting vulnerable populations.
- Utility Assistance Programs: Implement or expand utility assistance programs specifically designed for low-income households. These could include subsidies, payment assistance, or restructuring of utility bills based on income levels.

8.3 Policy Evaluation and Monitoring

- Ongoing Evaluation: Regularly evaluate the impact of sustainable building policies on various social parameters, including utility services for low-income households. This helps in identifying unintended consequences and making necessary adjustments.
- Data-Driven Decision Making: Use data and evidence-based approaches to guide policy decisions. Regular collection and analysis of relevant data can provide insights into the effectiveness of policies and help in making informed adjustments.

8.4 Community Engagement and Advocacy

- Stakeholder Involvement: Engage with communities, especially those most affected, in the policy-making process. This ensures that their needs and concerns are considered and addressed.
- Awareness and Advocacy: Raise awareness about the importance of integrating social welfare considerations into environmental policies. Advocacy can play a crucial role in bringing attention to the interconnectedness of these issues.

8.5 Research and Best Practices

- Further Research: Encourage research into the interplay between environmental sustainability and social welfare policies. This can provide a deeper understanding of the dynamics and inform better policy-making.
- Learning from Best Practices: Look to other cities or countries that have successfully integrated environmental and social policies for insights and best practices that can be adapted and implemented.

9. Future Research Direction:

9.1 Broader Scope of Policy Impact Studies

- Comparative Analysis Across Different Regions: Examine how the relationship between sustainable building policies and social welfare varies across different geographical and socio-economic contexts. This could provide insights into how local conditions influence policy effectiveness.
- Longitudinal Studies: Conduct long-term studies to observe the changes over time in the relationship between sustainable building policies and the protection of low-income households, capturing the evolution and long-term impacts of these policies.

9.2 In-Depth Analysis of Policy Mechanisms

- Understanding Causal Pathways: Investigate the specific mechanisms through which sustainable building policies impact social welfare measures. This would involve exploring the causal pathways and identifying mediating or moderating factors.
- Policy Implementation and Enforcement: Study the role of policy implementation and enforcement in shaping the outcomes of sustainable building initiatives, especially how they affect low-income households.

9.3 Economic and Social Cost-Benefit Analyses

- Economic Impact Assessment: Conduct comprehensive cost-benefit analyses to understand the economic implications of integrating social welfare considerations into sustainable building policies.
- Social Impact Evaluation: Evaluate the social impact of these policies, focusing on metrics such as quality of life, health outcomes, and social equity.

9.4 Stakeholder Perspectives and Community Engagement

- Stakeholder Analysis: Research the perspectives of various stakeholders, including policymakers, industry players, and the communities affected, to understand the challenges and opportunities in policy formulation and execution.
- Effectiveness of Community Engagement: Examine how different models of community engagement influence the outcomes

of sustainable building policies, especially in terms of addressing the needs of low-income households.

9.5 Integration of Technology and Innovation

- Role of Technological Innovations: Explore how emerging technologies (like smart building technologies and renewable energy solutions) can be leveraged to align sustainable building practices with social welfare goals.
- Data-Driven Policy Making: Study the impact of data analytics and AI in enhancing policy decision-making, monitoring, and evaluation.

9.6 Policy Synergies and Trade-Offs

- Synergies with Other Policy Areas: Investigate how sustainable building policies can be aligned with other policy areas (like health, education, transportation) for holistic urban development.
- Understanding Trade-offs: Research the potential trade-offs involved in balancing environmental sustainability with social welfare objectives.

10. Limitation of the Study:

10.1 Scope and Generalizability

- **Limited Sample Size and Diversity:** The study may have a limited sample size or may not adequately represent diverse geographical and socio-economic contexts. This limits the generalizability of the findings to broader populations or different settings.
- **Cross-Sectional Design:** If the study employs a cross-sectional design, it captures data at a single point in time, which restricts the ability to infer causality or observe long-term trends and impacts.

10.2 Methodological Constraints

- **Statistical Limitations:** The statistical methods used, such as chi-square tests and logistic regression, have inherent limitations. They may not fully capture the complexities and nuances of the relationships between variables.
- **Measurement and Data Quality:** The accuracy and reliability of the data used in the study are crucial. Any limitations in data collection, measurement errors, or missing data can impact the study's validity.

10.3 Interpretation and Analysis

- **Potential for Confounding Variables:** The study might not account for all potential confounding variables that could influence the relationship between sustainable building policies and social welfare measures.
- **Limited Exploration of Causal Mechanisms:** The study may not delve deeply into the causal mechanisms or the 'why' and 'how' behind the observed relationships, focusing more on statistical associations.

10.4 Policy and Practical Implications

- **Narrow Policy Focus:** The study's focus on specific policy areas (like sustainable building policies) may overlook broader urban planning and policy considerations that could influence outcomes.
- **Practical Implementation Issues:** The study might not address the practical challenges in implementing policies, such as political, economic, or logistical constraints.

10.5 Socio-Economic and Cultural Factors

- **Cultural and Socio-Economic Contexts:** The study may not fully account for the influence of varying cultural, economic, and social contexts, which can significantly impact the effectiveness and reception of policies.

11. Conclusion:

The study reveals a notable link between sustainable building policies in urban areas and the enhancement of social welfare, particularly for low-income households facing utility shutoffs. It emphasizes that while these policies are environmentally centered, they significantly affect social aspects, advocating for an integrated urban policy-making approach that combines environmental sustainability with social welfare. The study underscores the need for collaborative efforts across different sectors to ensure that urban planning effectively balances environmental goals with social welfare needs.

It also highlights the importance of protecting vulnerable populations through robust social safety nets and calls for ongoing policy evaluation and community involvement to ensure policies are effective and responsive to changing urban needs. The research advocates for data-driven decision-making in policy development and adaptation. Ultimately, the study contributes to the sustainable urban development discourse by showing that environmental and social welfare goals are interconnected and essential for a comprehensive urban development strategy. The findings encourage further research to delve deeper into this relationship and optimize sustainable building policies for both environmental and social benefits in urban settings.

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