

Trends and Challenges in Sustainable Mixed-Income Housing for African Cities: A Bibliometric and Scientometric Review

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Abstract

This article delves into the dynamics of mixed-income housing in African cities, examining its potential to mitigate urban inequality and promote inclusive urban development. The paper explores the viability and efficacy of mixed-income housing models within African urban landscapes, considering the complex socio-economic and spatial contexts. The objectives include understanding the subject area of mixed-income housing, analysing publication trends in the subject area, appreciating its top authors for collaborations, generating main themes, and trending keywords in the last two years. Data mined from the Scopus database were utilized to conduct a bibliometric and scientometric literature review to identify research gaps in the African context. Findings revealed that mixed-income housing, as a social science issue, has a rising impact, with few authors in the African context. In addition, the trending keywords highlight the importance of tailored policies and effective governance structures for mixed-income housing. This article intends to inform policymakers, urban planners, researchers, and practitioners about the opportunities and challenges of implementing mixed-income housing strategies in African contexts. Ultimately, our analysis contributes to

understanding how trending issues in mixed-income housing can contribute to more equitable and resilient urban development in African cities. It also offers insights for designing evidence-based policies and interventions to address housing inequality and foster inclusive urban environments.

Keywords: African development, Bibliometric review, Community integration, Mixed-Income Housing, Urban Planning Strategies.

1. Introduction

Urbanization is rapidly reshaping the African landscape, with cities experiencing unprecedented population growth, economic expansion, and social transformation (Agyemang, Silva, & Poku-Boansi, 2019). According to Isah (2016), African cities are grappling with severe housing affordability crises exacerbated by rapid urbanization and limited economic opportunities. Spatial inequality manifests in the stark divide between well-serviced affluent areas and impoverished informal settlements, leading to uneven access to amenities and infrastructure. In addition, social cohesion is strained as economic disparities fuel segregation and social fragmentation. According to

Tsenkova (2022), implementing a mixed-income housing model can address these challenges by promoting diverse, inclusive communities. It balances affordability, integrates lower-income residents into better-serviced areas, and fosters social interaction across economic classes, thereby reducing spatial inequality and enhancing social cohesion while ensuring a more equitable distribution of resources and opportunities.

Currently, the implementation of mixed-income housing in Africa is limited and faces several gaps, as many initiatives are still in the pilot phase, often hindered by insufficient funding, lack of political will, and regulatory challenges (August 2016; Trillo, 2019). Successful examples are sporadic, primarily concentrated in a few urban centers, and lack scalability. Opportunities for further research include examining best practices from successful mixed-income housing projects globally and adapting them to the African context, understanding the socio-cultural dynamics that influence community acceptance, and exploring innovative financing models to make mixed-income housing more viable. Additionally, investigating the long-term impacts on residents' social and economic mobility could provide valuable insights for policy and practice.

Mixed-income housing refers to residential developments incorporating diverse housing types and price points, catering to residents across various income levels within the same neighbourhood or complex (Simbanegavi, 2019). By integrating affordable, market-rate, and subsidized housing units, mixed-income developments promote social diversity, reduce spatial segregation, and create vibrant, inclusive communities (Levin,

Santiago, & Arthurson, 2022; Read & Sanderford, 2017). This approach stands in contrast to traditional housing models, which often concentrate low-income residents in segregated neighbourhoods, perpetuating cycles of poverty and marginalization.

Across the globe, mixed-income housing initiatives have become a promising strategy for addressing urban inequality and promoting sustainable urban development. According to Tsenkova (2022), cities such as Chicago, New York, and Toronto have implemented mixed-income housing projects with varying degrees of success, demonstrating the potential of this approach to transform urban landscapes and improve residents' quality of life. However, the applicability of mixed-income housing models in the African context remains underexplored despite the pressing need for innovative solutions to address housing challenges in rapidly growing African cities.

Scholars note that the dynamics of mixed-income housing in African cities are shaped by a complex interplay of socio-economic, political, and spatial factors (Onatu, Thwala, & Aigbavboa, 2023). On one hand, rapid urbanization and population growth exert pressure on already strained housing markets, leading to rising demand for affordable housing options. On the other hand, entrenched patterns of spatial segregation, historical inequalities, and weak urban governance pose significant challenges to implementing mixed-income housing initiatives.

Moreover, cultural norms, land tenure systems, and regulatory frameworks further influence the feasibility and effectiveness of mixed-income housing projects in African contexts. While some African cities have experimented with

mixed-income developments, such as South Africa's post-apartheid housing policies or Nigeria's public-private partnerships (Onatu, 2010), there remains a lack of comprehensive understanding of the dynamics, challenges, and opportunities associated with mixed-income housing in African cities.

Against this backdrop, this article aims to explore the dynamics of mixed-income housing in African cities, examining the potential of this approach to address housing inequality, foster social inclusion, and promote sustainable urban development. By synthesizing existing literature, analyzing case studies, and identifying critical research gaps, the study seeks to contribute to a deeper understanding of the role of mixed-income housing in shaping the future of African cities. Through this exploration, the study hopes to inform policymakers, urban planners, researchers, and practitioners about the opportunities and challenges of implementing mixed-income housing initiatives in Africa, ultimately paving the way for more equitable and resilient urban futures.

2. Materials and Methods

This section outlines the materials and methods utilized in this analysis, encompassing the document selection and screening, with the justification for the final inclusion. It also delineates the analytical tools employed and options for the data presentation. These details are crucial for ensuring accurate reliability and validity of Africa's consequent framework for sustainable mixed-income housing.

2.1 Database

The Scopus database was used to find relevant materials for this study. The Scopus database was chosen based on its pool of high-quality sources with a broader range of disciplines (Ghaleb, Alhajlah, Abdullah, Kassem, & Al-Sharaf, 2022; Tanko & Mbugua, 2021). Furthermore, the Scopus database permits the export of 2,000 articles for scientometric analysis at a time using the "visualization of similarities viewer" (VOSviewer) software (Aule, Majid, Peter, & Anifowose, 2024).

2.2 Data Identification

The study employed the systematic review method, adhering to the criteria of the "Preferred Reporting Items for Systematic Reviews and Meta-analyses" (PRISMA), as propagated by Page et al. (2021) for data identification, screening, and inclusion. PRISMA is a comprehensive set of guidelines designed to improve the transparency and quality of reporting in systematic reviews and meta-analyses. Accordingly, adherence to PRISMA guidelines ensures high standards of evidence synthesis, ultimately contributing to the body of evidence in a reliable and replicable manner. This study's materials identification was limited to the Scopus database to avoid the complexity of combining data from different sources with the current version of the VOSviewer tool. As shown in Figure 1, precisely 268 materials were initially found when the Boolean operation "mixed-income" OR "mixed-income" AND "Housing" were initially utilized as keywords for the data mining. While the subject area appears in some materials as "mixed-income", with a hyphenated connection between the two keywords, other publications keep the keywords open as "mixed income". With the advanced search criteria, any publication

The data analysis in this study follows the bibliographic data mined in the Scopus database and the scientometric analysis using the VOSviewer. Bibliometric analysis, integrated into a systematic review, quantitatively evaluates research literature to assess the impact, trends, and evolution within a field (Oguntona, Aigbavboa, & Dywili, 2022). Furthermore, it examines citation patterns, authorship, journal impact, and collaboration networks, offering insights into the influence and dissemination of research. This analysis identifies key contributors, influential papers, and emerging research topics, enhancing the systematic review's comprehensiveness and depth. By highlighting significant studies and mapping out research trends, bibliometric analysis aids in understanding the development and current state of knowledge, informing future research directions and policy-making. This quantitative approach complements the qualitative synthesis in systematic reviews.

Scientometric is the systematic method of analyzing the effect of research publications, authors, journals, institutions, and nations in a particular knowledge domain and their connections (Ghaleb et al., 2022). The scientometric analysis in this study employed the "visualization of similarities viewer" (VOSviewer), a text-mining software tool developed by van Eck and Waltman (2010, 2014, 2022). This freely available tool facilitates the visualization of similarities among articles from databases, encompassing various dimensions such as journals, citations, authors, organizations, countries, keywords, and other bibliometric data. VOSviewer is instrumental in revealing patterns and connections within scholarly literature, aiding researchers in exploring scientific knowledge landscapes. Graphically, the program creates a distance-based network, overlay, and

density map representations using a range of node sizes, line link strengths, and colour-coded themes (Oraee, Hosseini, Papadonikolaki, Palliyaguru, & Arashpour, 2017). With several benefits over other bibliometric tools, Zakka et al. (2021) emphasize that VOSviewer's utility as a data mining tool is particularly advantageous for understandably displaying large maps. Therefore, the software was the principal instrument for this scientometric investigation in this study.

Bibliometric and scientometric analyses, both used in systematic reviews, differ primarily in scope and focus. Bibliometric analysis quantitatively assesses research literature, focusing on citation patterns, authorship, journal impact, and collaboration networks to evaluate the influence and dissemination of research (Adegoriola, Lai, Chan, & Amos, 2021; Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). Scientometric analysis, while encompassing bibliometrics, extends further to analyze the broader scientific and technological progress, including research productivity, innovation trends, and the impact of scientific policies (Anthony, Abdul Majid, & Tukiman, 2023; Oladinrin, Gomis, Jayantha, Obi, & Rana, 2021). In addition, scientometrics involves studying the dynamics of scientific research and its socio-economic implications, providing a more comprehensive view of the scientific landscape compared to the more literature-centric focus of bibliometrics.

3. Results and Discussions

The results of this scientometric review were analyzed partly using bibliometric data taken from the Scopus database and the scientometric network maps made by the VOSviewer software. Therefore, the results were analyzed based on document type, document years, source titles, authors and affiliations, and central themes, leading

to the emerging trends in sustainable mixed-method housing in Africa.

3.1 Documents by Subject Area

The 262 mined documents, comprising journal articles, reviews, book sections, and published conference proceedings, were exported as CSV (comma-separated values) Microsoft Excel files, analysed, and presented as percentages in Figure 2. The table summarises published documents across various subject areas, providing insights into the academic landscape surrounding mixed-income housing research. Social Sciences, with the highest number of publications at 224 (56.6%), encompasses a considerable portion of research on mixed-income housing, focusing on societal dynamics, policy frameworks, and community impacts. Environmental Science and Engineering follow, with 63 (15.9%) and 28 (7.1%) publications respectively; indicating attention to sustainability, infrastructure, and construction aspects of mixed-income housing projects.

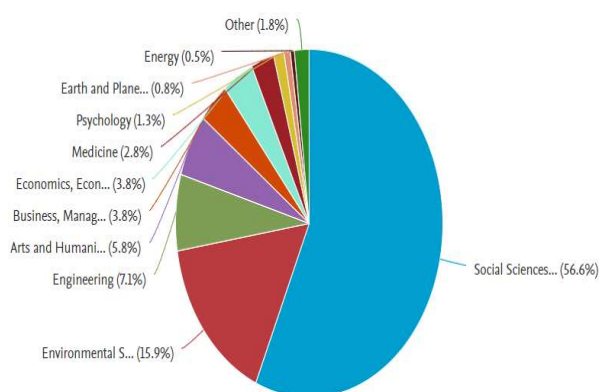


Figure 2: Distribution of Mined Materials of Mixed-Income Housing by Subject Area.

It could be seen that the prevailing literature in social sciences also affirms the importance of housing as a fundamental human need (Aule, Abdul Majid, ' 'Moh'd Jusan, & Ayoosu, 2022; Turkoglu, 2015). Moreover, disciplines such as Economics, Business, and Medicine, with relatively fewer publications in the context of mixed-income housing, present opportunities for further exploration. Additionally, the absence of specific disciplines like Architecture, Urban Planning, and Development within the table underscores a potential gap in interdisciplinary collaboration necessary for comprehensive mixed-income housing research. Furthermore, there is limited representation from fields such as Psychology and Health Professions, which could offer valuable insights into the socio-psychological and health-related aspects of mixed-income communities.

3.2 Documents by Year of Publication

Figure 3 provides a longitudinal view of published documents related to mixed-income housing, showcasing fluctuating trends over time. While specific subject areas are not delineated, the figure encompasses research from diverse disciplines such as social sciences, economics, urban planning, and architecture, all pertinent to studying mixed-income housing. The various publications across the years suggest shifts in scholarly interest and activity, reflecting changing priorities, emerging challenges, and evolving methodologies within the field.

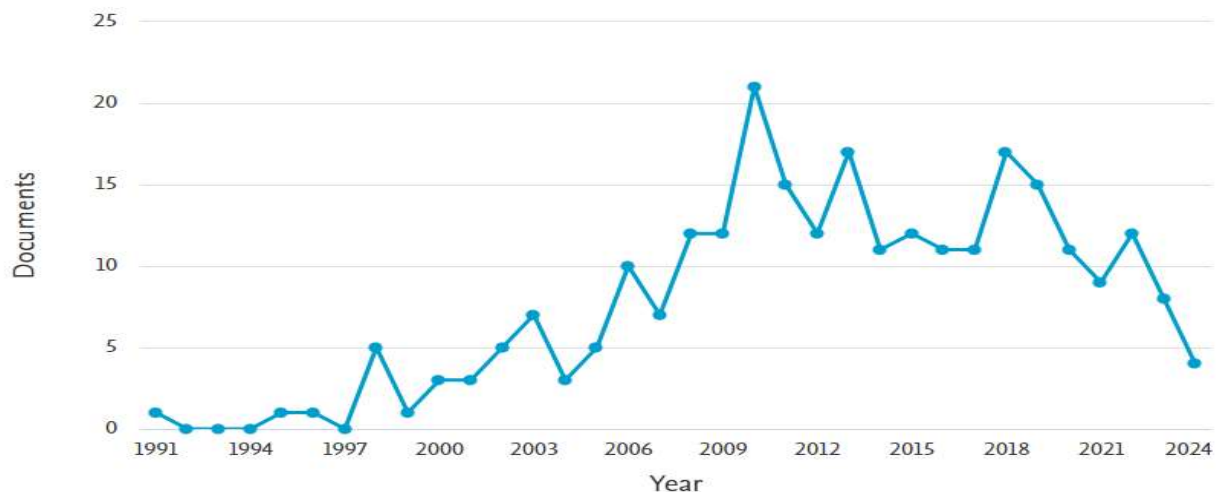


Figure 3: Documents by year on Mixed-Income Housing

Analysing this data provides valuable insights into the trajectory of mixed-income housing research, highlighting periods of heightened attention and potential areas of focus. For instance, peaks in publication numbers might coincide with significant policy changes, economic trends, or housing crises, prompting increased academic inquiry. Conversely, troughs in publication numbers indicate periods of relative stability or reduced funding for research in this area

3.3 Top Authors of Mixed-Income Housing

Table 1 presents the publication output of top authors in mixed-income housing research with at least four publications, reflecting their contributions to the field over time. The authors, along with their disciplines, study contexts, number of documents in the search query, and most cited articles in the research areas, will identify study gaps that will also give direction for followership and collaboration. According to Czischke (2018), knowing the leading writers in a study frequently stimulates further research, encourages transdisciplinary

collaboration, and improves productivity through efficient networking. From the table, Joseph, M. L. and Chaskin, R. J. emerge as the most prolific authors, contributing significantly to community development and social service aspects of mixed-income housing. However, a notable gap is the absence of African authors, which suggests a lack of representation and engagement from scholars in this region. This gap underscores the need for greater involvement of African researchers in shaping the discourse on mixed-income housing, considering the continent's unique socio-economic and urban development challenges. Examining author disciplines reveals a predominance of fields such as community development, social service, and housing policy, indicating a focus on the social and policy dimensions of mixed-income housing. While valuable, this concentration overlooks the interdisciplinary nature of the subject, neglecting contributions from disciplines like urban planning, architecture, economics, and sociology. These disciplines in the built environment play crucial roles in understanding the spatial, economic, and cultural dynamics of mixed-income housing, highlighting a

gap in the diversity of author disciplines represented in the table (Chantzaras, 2019; Jutraz & Zupancic, 2014).

The study contexts provided predominantly feature locations in the United States and Canada. This geographical bias limits the generalizability of findings and overlooks the diverse contexts and challenges

African countries face in implementing mixed-income housing initiatives. The absence of African study contexts underscores the need for more research within African urban environments, where mixed-income housing projects are increasingly relevant in addressing housing affordability, social integration, and sustainable urban development.

Table 1: Bibliometric Information of Top Authors in Mixed-Income Housing

S/N	Author	Author Discipline	Document Number	Study Context	Most-Cited Material	Citations
1	Joseph, M. L.	Community Development	17	Cleveland, US	Joseph, Chaskin, & Webber, 2007	229
2	Chaskin, R. J.	Social Service	11	Chicago, US	Chaskin et al., 2007	229
3	Vale, L.J.	Urban Planning	8	Massachusetts, US	Vale & Shamsuddin, 2017	31
4	Tsenkova, S.	Planning	4	Calgary, Canada	Tsenkova, 2019	4
5	Shamsuddin, S.	Housing Policy	4	Tufts, Boston, US	Vale & Shamsuddin, 2017	31
6	Levy, D.K.	Housing and Urban Development	4	Scarsdale, New York, US	Popkin, Buron, Levy, & Cunningham, 2000	124
7	Kleit, R.G.	Housing Policy	4	Ohio, US	Manzo, Kleit, & Couch, 2008	183
8	Khare, A.T.	Urban Planning	4	Cleveland, US	Chaskin, Khare, & Joseph, 2012	76

3.4 Themes in Mixed-Income Housing

This section presents the main themes associated with mixed-income housing throughout its research and development. Typically, scholars have categorized researchable issues into five groups: people, things, records, ideas/thoughts, and dynamics/energy (Leedy & Ormrod, 2010; Ilesanmi, 2016). Nonetheless, Ilesanmi (2016) emphasizes that pursuing concrete answers to research questions in contemporary times often transcends the conventional categories, particularly in the context of the Sustainable Development Goals (SDGs), spanning

economic, environmental, and social domains.

Overall, the co-occurrence result reflects a comprehensive examination of various aspects of housing, urban development, and social issues, with specific keywords emerging as focal points based on their frequency of occurrence and total link strength. Selecting a minimum of five keywords, five clusters resulted in themes comprising Urban Planning and Design (red), Community and Social Dynamics (green), Policy and Governance (yellow), Economic Vitality and Financial Models (purple), as well as that of Methodological, Evaluation and

Impact Assessment (blue), as presented in Figure 4.

Besides aggregating the main themes based on a colour variation of the result, several keywords stand out with high numbers. "Public housing" and "neighbourhood" appear prominently, with 60 and 52 occurrences, respectively, indicating a significant

focus on these topics within the dataset. Other frequently occurring keywords include "policy" (34 occurrences), "housing policy" (34 occurrences), "United States" (62 occurrences), and "urban housing" (35 occurrences), suggesting a broad exploration of policy frameworks, geographical contexts, and housing-related issues.

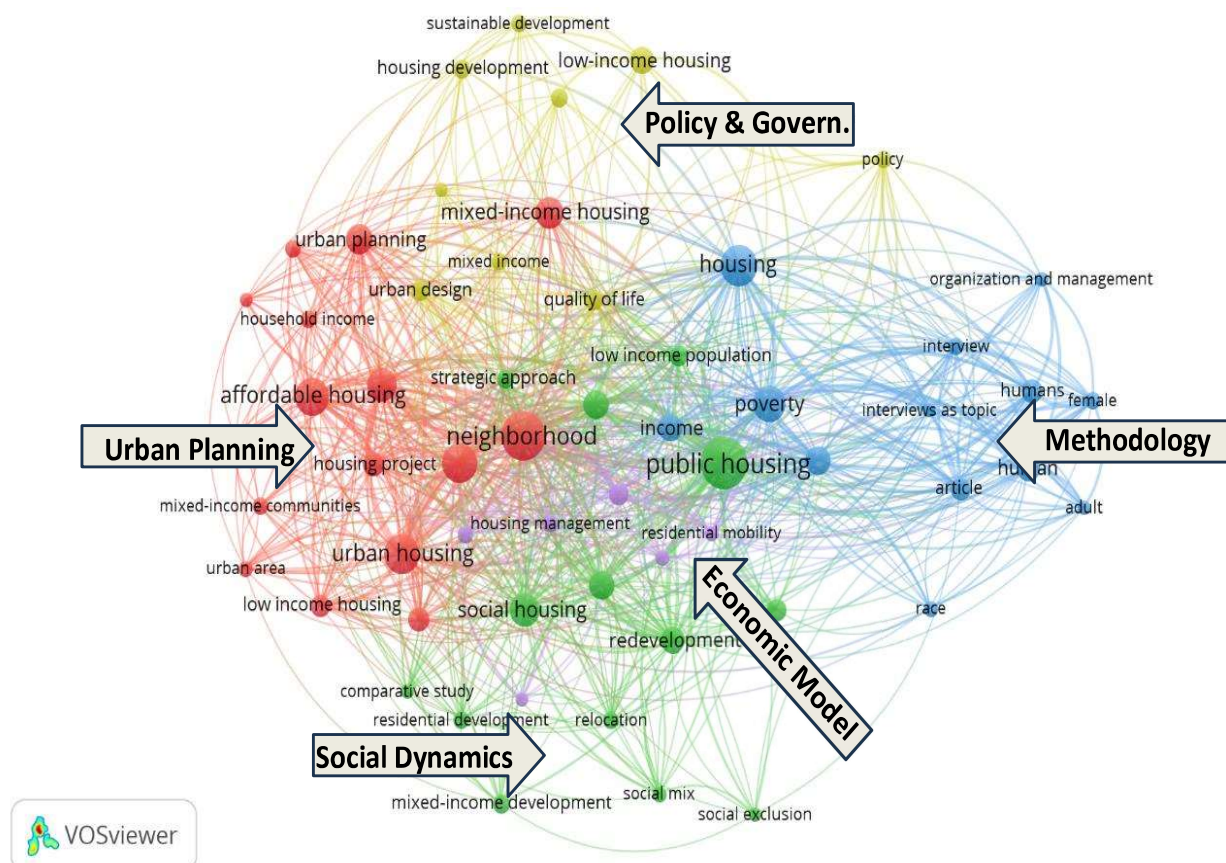


Figure 4: Main Themes in Mixed-Income Housing

On the other hand, the Total Link Strength provides insight into the interconnectedness or importance of each keyword within the dataset. "United States" leads in total link strength with 400, indicating its central role and extensive connections to other keywords. "Urban housing" follows closely with a total link strength of 216, highlighting its significance in urban development discussions. Additionally, keywords like "public housing" (318), "neighbourhood" (325), and "housing

policy" (151) demonstrate substantial linkages and relevance within the dataset.

These themes appear consistent with findings that social, economic, and environmental issues are among the sustainability concerns impacting global housing growth in contemporary times (Aule, Majid, & Jusan, 2022b; Ezennia, 2022; Jaiyeoba & Aklanoglu, 2018; Marchesi & Tweed, 2021). While each central theme comprises various sub-

issues, there are elements of integration between two or more to establish a trending study area. Consequently, new scholars in mixed-income housing research should carefully note the themes to make informed methodological decisions regarding their prospective contribution to sustainable development, especially in Africa.

3.5 Emerging Trends in Mixed-Income Housing

Some emerging keywords were generated using the Overlay Visualisation of the co-occurrence analysis, highlighting the trending variables since 2020 on the timeline in Figure 5.

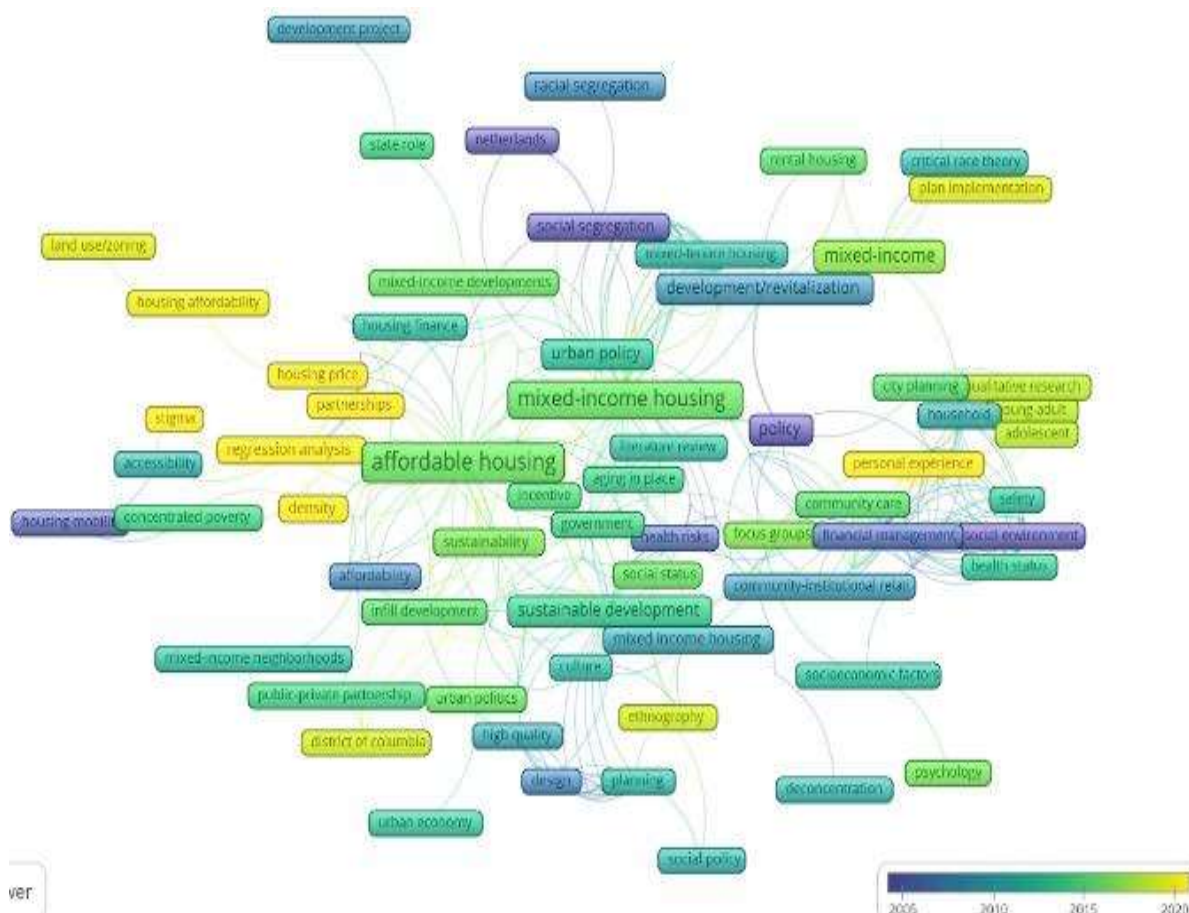


Figure 5: Trending Keywords for Mixed-income Housing in the 2020s

The trending keywords in the Policy and Governance cluster emphasize the importance of tailored policies and effective governance structures to support mixed-income housing initiatives. However, there is a notable gap in the lack of specific policies addressing African realities, highlighting the need for research to analyze existing policies and identify opportunities for improvement. On the other hand, the Community and Social Dynamics cluster underscores the significance of fostering

inclusive communities within mixed-income housing projects. However, there is a dearth of research on how cultural diversity and socio-economic disparities impact community integration in African contexts, suggesting a need for studies to explore community perceptions and social cohesion.

Furthermore, the Economic Viability and Financial Models cluster highlights the necessity of sustainable financing mechanisms for mixed-income housing

developments. However, there is insufficient discussion on financing models tailored to African urban settings, indicating a research gap in exploring innovative financing strategies and assessing their viability. In the Urban Planning and Design cluster, emphasis is placed on the importance of integrating mixed-income housing principles into urban planning frameworks. Nonetheless, there is limited focus on urban planning considerations specific to African cities, calling for research to address land tenure issues and design inclusive urban spaces.

Finally, the Methodological Evaluation and Impact Assessment cluster underscores the need to assess the long-term impacts of mixed-income housing projects. However, research on impact evaluation methodologies in the African context is scarce, suggesting a research gap in conducting longitudinal studies to understand the social, economic, and environmental effects of mixed-income housing initiatives.

In brief, clusters of the trending keywords highlight the importance of tailored policies and effective governance structures for mixed-income housing, identifying research gaps in specific policies for African contexts necessitating research for improvement. The emerging themes in this study concur with researchers that most current housing and built environment research is concerned with humanity and environmental challenges that necessitate social improvements (Aule, Majid, et al., 2022b; Aule, Majid, & Jusan, 2022a; Horgan & Dimitrijević, 2020). Additionally, fostering inclusive communities and understanding their dynamics in mixed-income housing projects is crucial, urging studies on cultural diversity and social cohesion within African settings (Aule, 2023; Trisos et al., 2022). Moreover,

sustainable financing mechanisms and urban planning considerations tailored to African cities are essential, alongside a need for research to assess the long-term impacts and evaluate methodologies for mixed-income housing initiatives. Since the start of the twenty-first century, the Sustainable Development Goals (SDGs) have been an active idea with various objectives to address major global concerns (Aule, 'Moh'd Jusan, & Ayoosu, 2019). Therefore, closing these research gaps can inform evidence-based policies to promote inclusive and sustainable mixed-income housing developments in African cities.

4. Study Limitations

This study has the potential to inform policy development in Africa and rapidly urbanizing regions across Asia and South America. However, there are notable limitations. Firstly, the study exclusively relies on the Scopus database, which may result in the exclusion of significant contributions from other reputable databases such as Web of Science, Dimensions, and PubMed. To ensure a more comprehensive understanding, incorporating a wider range of sources could enrich the research variables. Furthermore, additional investigations should explore the interconnections between mixed-income housing and various emerging keywords within fields such as planning, healthcare, psychology, and other scientific and technological disciplines. Expanding the scope of this study to include more quantitative analysis and meta-analysis would also provide further methodological depth, offering a more detailed exploration of the subject area and enhancing the robustness of the findings.

Areas for future research in mixed-income housing to include comparative studies with other developing regions, longitudinal socio-economic impact analysis, exploration of adequate policy frameworks, community participation's role, interdisciplinary connections, innovative financing models, smart city technology integration, urban policy impact, and detailed case studies of successful projects in African contexts.

5. Summary and Conclusion

In summary, this article has explored the dynamics of mixed-income housing in African cities, investigating its potential to address urban inequality and promote inclusive urban development. Through a thorough review of literature, case studies analysis, and critical research gaps identification, we have highlighted the importance of tailored policies, effective governance structures, and sustainable financing mechanisms to support mixed-income housing initiatives in African contexts. Additionally, we have underscored the significance of fostering inclusive communities, integrating mixed-income principles into urban planning frameworks, and conducting rigorous impact assessments to evaluate the long-term outcomes of such interventions.

Our analysis has revealed the complex interplay of socio-economic, political, and spatial factors that shape the dynamics of mixed-income housing in African cities. While there is growing recognition of the potential benefits of mixed-income housing, there remains a critical need for more research, policy innovation, and collaborative efforts to address the unique challenges and opportunities associated with its implementation in African contexts.

In conclusion, this article contributes to a deeper understanding of the role of

mixed-income housing in shaping more equitable and resilient urban futures in African cities. By synthesizing insights from multidisciplinary perspectives and offering practical recommendations for policymakers, urban planners, researchers, and practitioners, we aim to inform evidence-based policies and interventions that effectively address housing inequality and foster inclusive urban environments in African cities. Finally, our analysis highlights the importance of advancing the agenda of mixed-income housing as a critical strategy for promoting sustainable urban development and enhancing the quality of life for all residents of African cities.

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