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# *THE CONSTRUCTION OF AFFORDABLE HOUSING IN DEVELOPING COUNTRIES: A SCIENTOMETRIC REVIEW*

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***ABSTRACT***
*The presence of affordable housing in developing countries is a crucial issue in order to fulfill the primary need for housing in a large market segment, especially people whose income is below the average household income. In contrast to developed countries, the development of studies on affordable housing construction (AHC) in developing countries has not been well mapped. This certainly creates many gaps in determining the direction of future developments, especially related to the studies that will be carried out. This study tries to map the development of scientific publications related to AHC in developing countries, from 1983 - 2021. Using scientometric techniques and VosViewers as a data processing tool, 116 publications that meet the given criteria have been identified. The findings of this study reveal a mapping of publications organized by country, organization, research outlet, author, document citation, and main research area. During the observation period, most research focused on developing nations, affordability, sustainable development, the construction industry, and the developing globe. In addition, the results of this study also successfully mapped opportunities for future research focuses related to building materials, affordable housing, low-income populations, decision-making, and structural design. In conclusion, this study highlights the need for further research on affordable housing development in developing countries to guide policy makers and researchers in developing affordable housing solutions that meet the housing needs of low-income households.*
***Keywords****: Affordable Housing Construction, Developing Countries, Science Mapping, Scientometric*

## 1. Introduction

As the global population continues to expand, the demand for housing is expected to increase correspondingly. This means that construction activities will continue to rise in tandem with population growth. In fact, according to recent estimates, the world's population is expected to reach 9.4 billion by the year 2050 (Consip, 2014). However, this surge in population and construction poses a significant challenge for low-income communities, particularly in developing countries where rapid urbanization is already a pressing issue.

Over 70% of people in developing countries now live in substandard informal settlements as a result of the rapid urbanization and growth that has occurred. This situation is particularly acute for low-income groups. High rural-urban migration, shaky mortgage markets, a lack of infrastructure, and poverty are some of the major problems. By making housing more accessible, we may raise living standards, free up household income for other purposes, create assets for wealth creation, encourage expansion of vital sectors, and promote equitable urban development (Keivani & Werna, 2001). In emerging nations that are experiencing fast urbanization, understanding and resolving this issue must be given high attention given the severe housing shortage and the potential socio-economic benefits of appropriate, inexpensive housing (Malpezzi & Mayo, 1987).

In an effort to enhance the living conditions of low-income households, affordable housing has been on the agenda of many governments in an effort to solve this issue (Olagunju et al., 2014) The two main aspects of the affordable housing program are cost and time, as the main objective of the program is the ability to meet the needs of low-income households (Gan et al., 2017). Based on the literature in 2010 there were 980 million urban families living in poor conditions, with little or no housing. Researchers estimate that between 2010 and 2030, more than 600 million urban residents will experience the same issue (Khan & Fang, 2020).

Housing must be recognized as a fundamental human need. The right to adequate housing should not be interpreted narrowly. It is the right to live in a place with security, peace and

dignity (UN HABITAT, 2014). It is anticipated that the provision of habitable housing will meet the rising demand for housing. Nevertheless, the provision of adequate housing has the potential to significantly contribute to the improvement of life quality from a social, environmental, and economic standpoint (Khan & Fang, 2020).

The topic of sustainable affordable housing in developing countries is increasingly important in international debate (Khan & Fang, 2020). In many countries, housing affordability is a term frequently used in scientific and public discourse, although the term has a variety of different meanings ranging from the impact of household budgets or access to decent housing, which is generally through sales to segments of the private rental market as well as social housing and criteria. in preparation for the formulation of housing subsidies (Galster & Lee, 2021). Affordable housing arises because of the need for housing which is one of the primary needs of humans. Affordable housing is aimed at a very large market segment, where the average existing consumer has low purchasing power. Affordable housing refers to housing units that are affordable by the section of society whose income is below the average household income.

Academically, quite a few studies have been conducted on AHC in the context of developing countries, such as the study of building regulations that are barriers to the development of affordable housing in Indian cities (Patel et al., 2018), housing affordability studies from a framing perspective, research and policy synthesis, and future directions (Galster & Lee, 2021), review of construction technology decision support tools for sustainable affordable housing (Atta et al., 2021). However, so far, no publications that map the development of AHC studies in developing countries have been found. A closer publication of this study is the Scientometric Analysis of Affordable Housing 1998–2017 (Adabre et al., 2021), but not specifically the development of AHC studies in developing countries. Therefore, the purpose of this study is to conduct science mapping utilizing scientometric techniques to identify evolutionary paths and evaluate through the visualization of patterns and trends in the literature concerning the major themes of AHC in developing countries.

The findings of this study are critical since, in general, developed and developing countries have quite different approaches to dealing with the need for adequate housing. This study offers a comprehensive view to industry and academic experts by comparing research interests among the top leading countries in studying AHC in developing countries. Where will finally combine the co-occurrence of keywords and document the co-citation analysis to discuss and indicate potential research directions for future studies.

## 2. Literature Review

### 2.1 Affordable Housing Construction (AHC)

AHC refers to the process of building residential units that are affordable for individuals or families with low to moderate incomes. The aim of AHC is to provide safe and decent housing options for those who may otherwise struggle to find suitable accommodation due to financial constraints.

AHC projects typically involve the development of new housing units or the rehabilitation of existing structures. These projects often receive funding from government agencies, non-profit organizations, or private developers who are committed to addressing the issue of affordable housing. The construction process involves various stages, including site selection, design, obtaining permits and approvals, procurement of materials and labor, and actual construction.

To ensure affordability, several strategies may be employed during the construction process. These include cost-effective design and construction methods, such as using standardized floor plans and materials that are readily available and affordable. Additionally, energy-efficient features may be incorporated to reduce utility costs for residents. AHC projects also often prioritize the use of sustainable building practices to minimize environmental impact.

The goal of AHC is not only to provide affordable homes but also to create communities that are inclusive and supportive. Therefore, these projects may include amenities such as community spaces, playgrounds, or access to public transportation. Furthermore, social services and support programs may be offered to residents to enhance their overall well-being.

Affordable housing refers to housing units that are affordable for individuals or families with low to moderate incomes (McDonald, 2015). It is a term commonly used in urban planning and policy discussions to address the issue of housing affordability, particularly in areas where the cost of housing is significantly higher than the average income of the population. The concept of affordable housing aims to ensure that people have access to safe, decent, and affordable homes, regardless of their income level.

AHC in developing countries has been examined from various perspectives in recent studies. The key factors influencing affordable housing provision were discussed (S. K. Singh & A. K. Singh, 2019b). The critical success factors and strategies for affordable housing delivery were reviewed, emphasizing innovations in technology and financing (A. A. Oyedele et al., 2019). The major challenges of affordable housing in developing countries including lack of funding, land constraints, and policy weaknesses were discussed (A. A. Oyedele et al., 2020; S. K. Singh & A. K. Singh, 2019a). The social sustainability of affordable housing relating to access to facilities and services was also examined (A. A. Oyedele et al., 2020). Furthermore, environmental sustainability considerations such as energy efficient designs were reviewed (S. K. Singh & A. K. Singh, 2019b). Overall, the literature indicates affordable housing requires adequate policies, financing, technological innovations, and sustainability considerations to address the pressing challenges in developing countries.

### 2.2 Scientometric Review Approach

Scientometrics is a branch of science that focuses on the measurement and analysis of knowledge and innovation. In the context of affordable housing research in developing countries, scientometric review plays a crucial role in understanding trends, patterns, and contributions of existing scientific works. Scientometrics can be employed to identify collaboration networks among researchers, institutions, and countries, as well as to evaluate the impact of research in specific fields (Mammola et al., 2021). Consequently, through scientometric reviews, researchers can identify gaps or deficiencies in the current literature and gain insights into the direction and focus of future research (Umeokafor et al., 2022). Furthermore, Scientometric review is a crucial tool for examining and evaluating the current literature, tracking research progress, and identifying possible study areas that have not yet been completely investigated in the field of affordable home development in developing nations. Scientometrics refers to the quantitative analysis of scientific literature and patterns of publication within a given field (Hood & Wilson, 2001). It allows for an objective, measurable overview of the amount of research undertaken, key focus areas, influential publications and networks of authors and institutions within a subject area.

The scientometric analysis shows that, despite significant geographic and disciplinary disparities, research on affordable housing in poor nations has gained popularity in the previous ten years. Developing nations must take the information from these studies and use it to create technical and financial capacity, as well as suitable laws and programs, in order to ensure that urban poor and informal populations have substantial access to sufficient housing. The review identifies a number of encouraging approaches, but more South-South learning and comparative research are needed to provide locally relevant and long-lasting solutions.

## 3. Research Methods

This study employs the scientometric method to examine the evolution of AHC literature in developing countries. This method is very effective for visualizing the patterns and trends of the development of existing literature (Darko et al., 2019) The scientometric analysis technique generally consists of the following phases: selection of scientific mapping tools, data collection and analysis, visualization, interpretation, and discussion of results (Börner, 2010).

The analysis was conducted using the science mapping technique and the VOSviewers tool. In general, this study does not provide a comprehensive analysis of the available literature, but a bibliography-based evaluation is regarded as a prudent strategy for gaining a thorough understanding of the research subject (Retno et al., 2020)(Jin et al., 2018a). Quantitatively, this study summarizes the state of the existing literature and trends in the development of literature based on the themes used so that readers can understand systematically the development of

existing publications, sources and types of publications, contributions from countries of origin of publications, development of the number of citations, author contributions, subject areas of existing research, and the most widely used research areas.

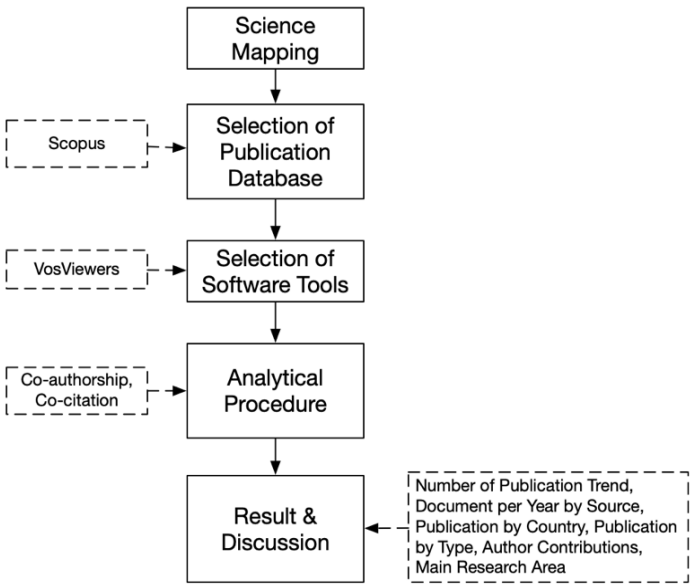


Fig. 1. Study Flowchart

The study's flowchart can be observed in **Fig. 1.** Beginning with the selection of the publication database (Scopus), followed by the selection of the analytical tools (VOSviewers), then the analytical methods (Co-authorship and Co-citation), and finally the presentation of the results, discussion, and drawing of conclusions.

### 3.1 Source of data

Scopus is the source of the bibliographic data used. This choice was based on a greater publication coverage than Web of Science, Google Schoolar, and Researchgate (Zhao et al., 2019). Another factor to consider is that Scopus has a pretty rapid indexing system, which increases the likelihood of getting more recent papers (Meho & Rogers, 2008). Changes in the quantity of scientific knowledge can be immediately reflected in the number of publications (Du et al., 2019a). For this review, the Scopus database was utilized to search for relevant literature using a combination of keywords including "affordable housing", "low-cost housing", "developing countries", and "urban housing".

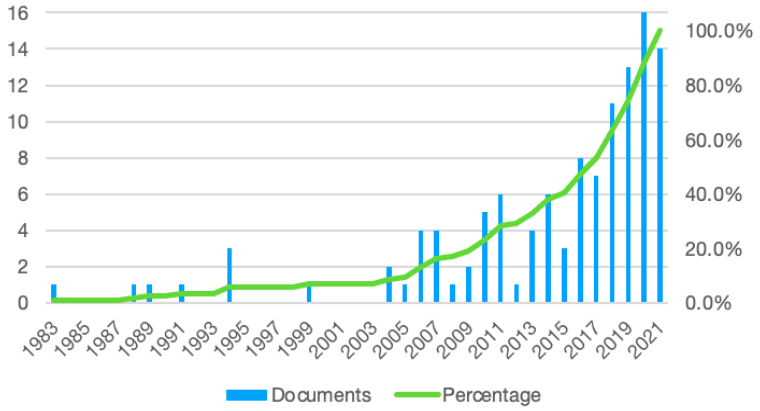


Fig. 2. Publication Growth

**Fig. 2** demonstrates that publications on the topic of AHC (AHC) in developing nations first appeared in 1983, and by 2021, 116 articles were published on this topic. There are 78 articles, 30 conference papers, 4 reviews, 3 book chapters, and 1 book among the 116 publications. The development of the number of existing publications shows that from 1983 to 2003 the AHC theme in developing countries tends to be very low. However, it can be observed

that from 2004 to 2021, publications with this topic are consistently present, with the number of publications increasing year after year.

### 3.2 Mapping Method

This study utilizes quantitative scientific mapping methodologies. One can map patterns and networks within a broader bibliometric data set utilizing this quantitative technique (Retno et al., 2021; Wuni et al., 2019; Zabidin et al., 2020). VOSviewers are used to help with science mapping. This method was chosen because of its ability to represent interpersonal relationships and the interrelationships between disciplines, disciplines, author's personal data and scientific research (Adabre et al., 2021). This bibliometric study uses a mathematical and statistical method to assess and discover research strengths and limitations, as well as investigate the relationship between academic journal citations (Du et al., 2019b). Through network modeling and visualization, scientometric research can analyze the intellectual landscape of the knowledge domain and to understand the questions that researchers are trying to answer, as well as the methods that researchers use and develop to achieve their goals (Retno et al., 2021)(Chen, 2006).

In network visualization, items are represented by labels and by default also by circles. The weight of an object determines the size of the item's label and circle. The label and circle of an object will grow in size as the weight of the item increases. For some items, the label may not be displayed. This is done to avoid overlapping labels. The color of an item is determined by the cluster it belongs to (Eck & Waltman, 2020). Keyword co-occurrence analysis, keyword citation burst analysis, keyword cluster analysis, country co-citation analysis, institution co-citation analysis, and document co-citation analysis are only a few examples of scientometric analysis (Chen, 2016).

## 4. Results and Discussions

### 4.1 Collaboration Between Countries

Scientific collaboration networks between countries aid in recognizing countries that are engaged in related sectors of study. **Fig. 3** depicts international research network collaboration. From a total of 41 countries, 11 countries with four clusters are obtained by establishing a minimum publication threshold of 5 documents. Australia, China, Tanzania, and the United Kingdom are all members of Cluster 1. India, Malaysia, and the United States are all members of Cluster 2. Egypt and Nigeria make up Cluster Three. The Netherlands and South Africa are part of Cluster 4.

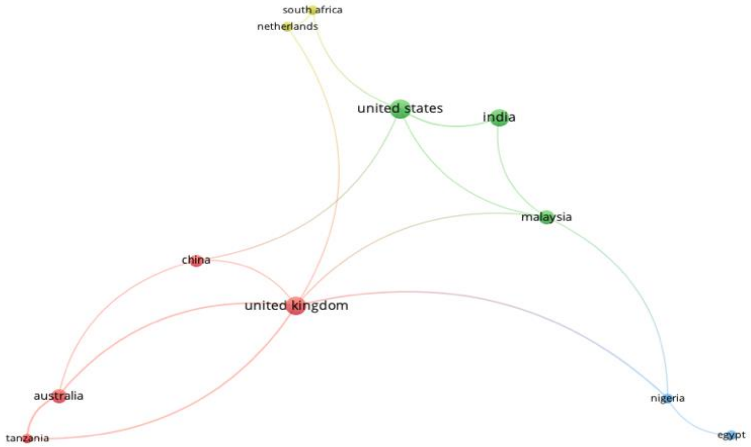


Fig. 3. Collaboration Between Countries

The top 10 countries with the most contributions to publications are listed in **Table 1**. The United States has 20 documents (205 citations), the United Kingdom has 18 publications (156 citations), India has 16 publications (23 citations), Australia has 11 publications (180 citations), Malaysia has 11 publications (11 citations), China has 8 publications (116 citations), Egypt has five publications (16 citations), the Netherlands has 5 publications (44 citations),

Nigeria has 5 publications (16 citations), South Africa has five publications (36 citations), and Tanzania has 5 publications (61 citations).

Table 1 - Most Productive Countries

| Country | Documents | Citations | Average Citation | Total Link Strength |
|---|---|---|---|---|
| United States | 20 | 205 | 10 | 5 |
| United Kingdom | 18 | 156 | 9 | 9 |
| India | 16 | 23 | 1 | 3 |
| Australia | 11 | 180 | 16 | 6 |
| Malaysia | 11 | 11 | 1 | 4 |
| China | 8 | 116 | 15 | 3 |
| Egypt | 5 | 16 | 3 | 1 |
| Netherlands | 5 | 44 | 9 | 2 |
| Nigeria | 5 | 16 | 3 | 4 |
| South Africa | 5 | 36 | 7 | 2 |

### 4.2 Institutional Networks Collaboration

There are 65 organizations of the 219 found in VOSviewers that meet the minimum requirements of 1 paper and 10 citations. The network collaboration between existing organizations is depicted in **Fig. 4**. Where, among the sixty-five organizations, ten have a substantial level of link. The organizations are Awonto Konsolts (Abuja, Nigeria), the Center for Global Learning, Education and Attainment at Coventry University cv1 5fb (United Kingdom), the Department of Mechanical Engineering at Ahmadu Bello University (Zaria, Nigeria), the Institute of Engineering Sciences at De Montfort University (Leicester, le1 9bh, United Kingdom), the Institute of Energy and Sustainable Development at De Montfort University (Leicester, le1 9b (cv23 0wr, United Kingdom).

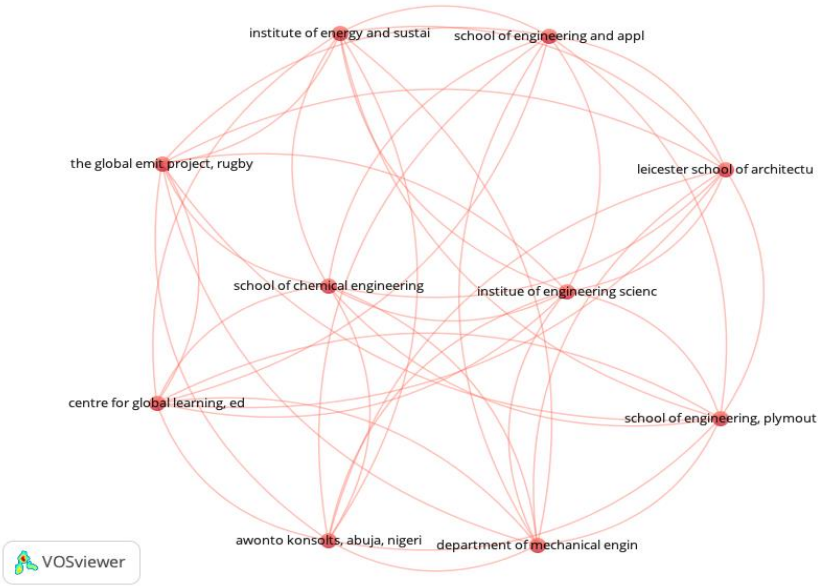


Fig. 4. Collaboration Amongst Institutional Networks

**Table 2** shows the five organizations that have made significant contributions to AHC publications in developing countries: School of Natural and Built Environments, University of South Australia, Adelaide, Australia dengan 4 publications (54 citations), School of Architecture, Construction Economics and Management (sacem), Ardhi University, Dar es Salaam, Tanzania dengan 2 publications (27 citations), Architectural Engineering Department, The British University in Egypt, Cairo, Egypt dengan 1 publications (13 citations), Awonto

Konsolts, Abuja, Nigeria dengan 1 publications (13 citations), and Building and Real Estate Department, Hongkong Polytechnic University, Hongkong dengan 1 publications (26 citations).

Table 2 - Most Productive Organization

| Organization | Documents | Citations | Average Citations | Total Link Strength |
|---|---|---|---|---|
| school of natural and built environments, university of south australia, adelaide, australia | 4 | 54 | 14 | 4 |
| school of architecture, construction economics and management (sacem), ardhi university, dar es salaam, tanzania | 2 | 27 | 14 | 3 |
| architectural engineering department, the british university in egypt, cairo, egypt | 1 | 13 | 13 | 1 |
| awonto konsolts, abuja, nigeria | 1 | 13 | 13 | 9 |
| building and real estate department, hong kong polytechnic university, hong kong | 1 | 26 | 26 | 3 |
| cambiamo \| changing mobility, c/ duque de fernán núñez 2, 1°, madrid, 28012, spain | 1 | 13 | 13 | 1 |
| centre for global learning, education and attainment, coventry universitycv1 5fb, united kingdom | 1 | 13 | 13 | 9 |
| cept university, kasturbhai lalbhai campus, university road, navrangpura, ahmedabad, gujarat 380009, india | 1 | 10 | 10 | 2 |
| college of public administration, huazhong agricultural university, wuhan, 430070, china | 1 | 14 | 14 | 1 |
| cooperative research centre for low carbon living, unsw australia, sydney, 2052, australia | 1 | 22 | 22 | 1 |

### 4.3 Research Outlet

Based on the findings of the analysis, 67 sources or research outlets that publish papers on AHC subjects for developing countries were identified. **Table 3** lists the 10 primary research outlets. The following are the top five research sources: Sustainability Switzerland (6 publications), Habitat International and IOP Conference Series Material Science and Engineering (4 publications), Construction And Building Materials, and Construction Management and Economics (3 publications).

Table 3 - Research Outlet / Sources Analysis

| Source | Documents | Total Link Strength | Citations | Average Citation |
|---|---|---|---|---|
| Sustainability (Switzerland) | 6 | 1 | 48 | 8 |
| Habitat International | 4 | 3 | 59 | 15 |
| IOP Conference Series: Materials Science and Engineering | 4 | 1 | 6 | 2 |
| Construction and Building Materials | 3 | 0 | 15 | 5 |
| Construction Management and Economics | 3 | 0 | 36 | 12 |
| International Journal of Housing Markets and Analysis | 3 | 0 | 10 | 3 |
| AIP Conference Proceedings | 2 | 0 | 1 | 1 |
| International Journal of civil engineering and technology | 2 | 0 | 6 | 3 |

| | | | | |
|---|---|---|---|---|
| International Journal of Construction Management | 2 | 1 | 24 | 12 |
| International Journal of Urban Sciences | 2 | 1 | 9 | 5 |

**Fig. 5** shows the most extensive set of links from existing research outlets. Three clusters emerge from these networks. The International Journal of Construction, IOP Conference Series: Materials, Science, and Engineering, and Procedia Engineering comprise the first cluster. Habitat International and the International Journal of Urban are part of the second cluster. The Journal of Cleaner Production and Sustainability make up the third cluster (Switzerland).


Fig. 5. Network Visualization Research Outlet

### 4.4 Author's contribution

According to the findings of the analysis, the AHC study in developing countries as a whole involved 312 authors. With a minimum of two publications, ten writers are gathered who can meet these requirements. As for the writers' identities, the number of papers, citations, and overall links generated, see **Fig. 6**. The five authors who have made the most contributions are as follows: Chileshe N. has four publications (54 citations), Adeniyi S.M. has three publications (one citation), Kavishe N. has three publications (51 citations), and Bredenoord J. has two publications (24 citations).

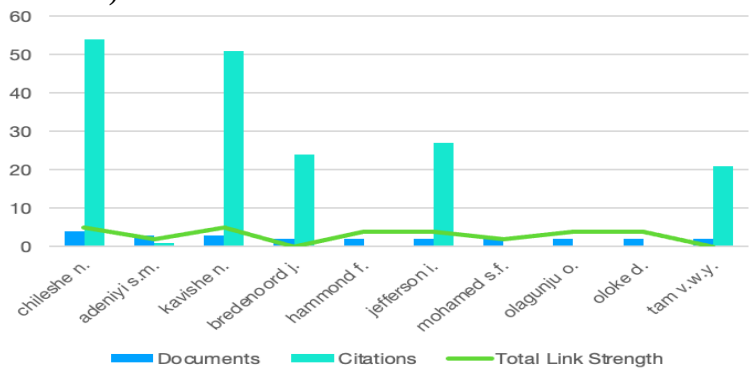


Fig. 6. Author Contribution

Based on the network visualization map generated by VOSviewers of these authors, it was found that 3 authors had the highest degree of association in the network (**Fig.** 7). The three authors were Chilese N. (total link strength 5), Jefferson I. (total link strength 5), and Kavishe N. (total link strength 4).

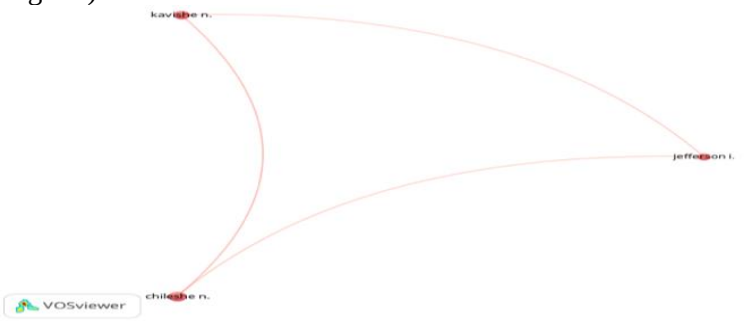


Fig. 7. Collaborative Networking Among Authors

### 4.5 Document Citation

Using a minimal criteria of 10 citations per document, an assessment of 116 documents produced 26 documents that met this threshold. **Table 4** shows the ten documents with the most citations. According to the table, materials research received a high number of citations (Mostafa & Uddin, 2016; Tykkä et al., 2010), as well as stakeholder and policy studies (Gan et al., 2017; Monkkonen, 2013; Mukhija, 2004), economy and efficiency (Zami & Lee, 2010), and studies on barriers and success factors in the implementation of affordable housing(Adabre et al., 2020; Kavishe & Chileshe, 2019).

Table 4 - The Most Cited Documents

| Title | Citations | Links |
|---|---|---|
| Experimental analysis of Compressed Earth Block (CEB) with banana fibres resisting flexural and compression forces (Mostafa & Uddin, 2016) | 55 | 0 |
| The contradictions in enabling private developers of affordable housing: A cautionary case from Ahmedabad, India (Mukhija, 2004) | 53 | 2 |
| Development of timber framed firms in the construction sector - Is EU policy one source of their innovation? (Tykkä et al., 2010) | 45 | 0 |
| How affordable housing becomes more sustainable? A stakeholder study (Gan et al., 2017) | 45 | 2 |
| Economic benefits of contemporary earth construction in low-cost urban housing - State-of-the-art review (Zami & Lee, 2010) | 32 | 1 |
| Urban land-use regulations and housing markets in developing countries: Evidence from Indonesia on the importance of enforcement (Monkkonen, 2013) | 32 | 1 |
| Attitudes towards earth building for Zambian housing provision (Hadjri et al., 2007) | 26 | 1 |
| Critical barriers to sustainability attainment in affordable housing: International construction professionals' perspectivev (Adabre et al., 2020) | 26 | 2 |
| Critical success factors in public-private partnerships (PPPs) on affordable housing schemes delivery in Tanzania: A qualitative study (Kavishe & Chileshe, 2019) | 24 | 0 |
| The informal construction sector and the inefficiency of low cost housing markets (Lizarralde & Root, 2008) | 23 | 0 |

**Fig. 8** shows a network representation of the largest set of links, which consists of four objects divided into two clusters. The first cluster contains (Mukhija, 2004) and (Siddiqui & Khan, 1994), while the second contains (Monkkonen, 2013) and (Patel et al., 2018).

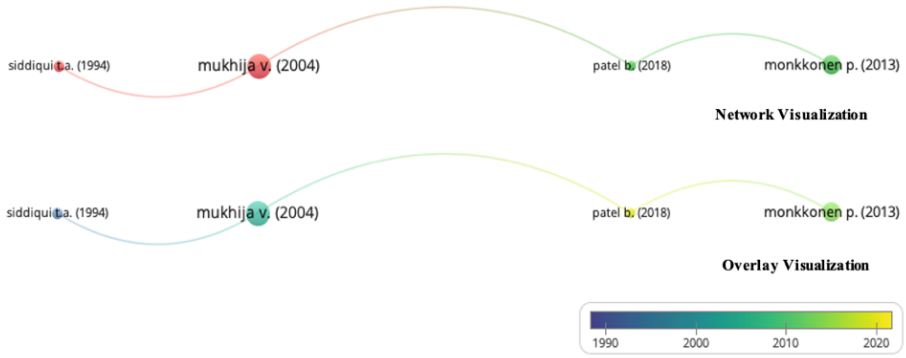


Fig. 8. Network Visualization and Overlay Visualization of Document Citation

### 4.6 Main Research Areas

The main research area is taken based on all keywords (author keywords and index keywords) used in existing publications. These keywords are a network of keywords that appear together in the document and reflect the theme of the research publication (Saka & Chan, 2019) and citation bursts can be used to show the focus/trend of temporary research and appear in the literature related to the main research topic in a certain period (Adabre et al., 2021),(He et al., 2017). In this study, 33 keywords that match these conditions were created using the minimal criterion of three occurrences.

The total link strength that exists shows the relationship between a given keyword and other keywords according to text mining in the literature (Jin et al., 2018b). This is represented in **Fig. 10**, which attempts to demonstrate the relationship between keyword occurrences and total link strength. The novelty of the development of the research area based on these keywords is described in **Fig. 9**.

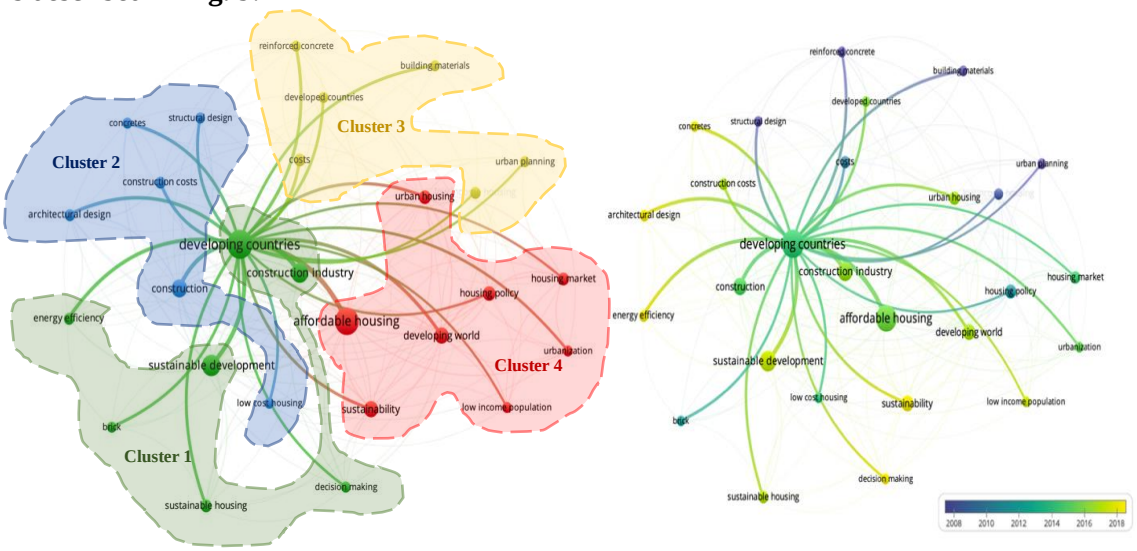


Fig. 9. Network Visualization (Left) and Overlay Visualization (Right)

The keyword co-occurrence network is a static representation of a particular field that does not take into account changes over time in the way the term is used (He et al., 2017). According to **Figure 9**, developments in the AHC study field utilizing the primary keyword developing countries resulted in the formation of various research clusters.The first research cluster consists of developing countries, construction industry, sustainable development, brick, and sustainable housing. The second cluster consists of construction, construction cost, architectural design, construction costs, structural design, and concretes. The third cluster consists of costs, developed contries, building materials, reinforced concrete, urban planning and low-income housing. The fourth cluster consists of affordable housing, sustainability, developing world, low-income population, urbanization, housing policy, housing market and urban housing.

Meanwhile, numerous research areas can be split into several phases based on the novelty of the research. In the first period (1983 – 2011), many research areas ranged from structural design, reinforced concrete, building materials, urban planning and low income housing. The second period (2012 – 2016) the main research areas consist of costs, housing policy, brick, affordable housing, construction, urban housing, developed countries and construction costs. The third period (2017 – 2021) research study areas generally consist of developing world, low income population, sustainable development, sustainable housing, concrete, sustainability, energy efficiency, and architectural design.

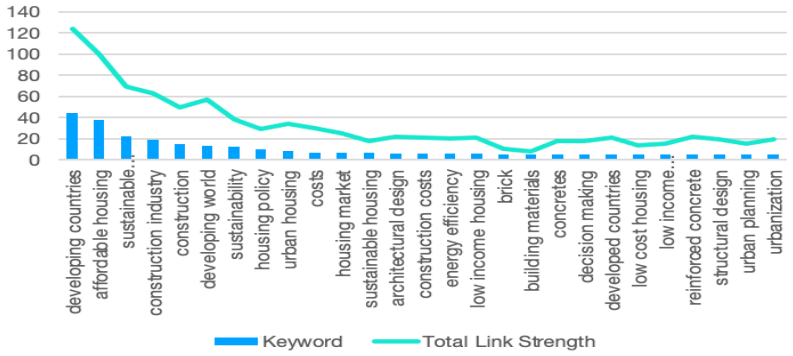


Fig. 10. MainA Research Areas

**Fig. 10** provides information on the relationship between the main research areas and the resulting total link strength. The top 5 based on occurrences are developing countries (44 occurrences and 124 total link strength), affordable housing (38 occurrences and 100 total link strength), sustainable development (22 occurrences and 59 total link strength), construction industry (19 occurrences and 63 occurrences). total link strength) and developing world (13 occurrences and 57 total link strength). There are also research areas with a number of studies that still seem lacking, including building materials, low cost housing, low income population, decision making, and structural design.

## 5. Conclusion

This study uses scientometric analysis with the VOSviewers tool to provide a quantitative review of the existing AHC literature in developing countries. Based on Scopus publishing bibliographic data released between 1983 and 2021.

The country network study reveals that the following pairs have a high level of cooperation: the United Kingdom and Australia, the United States and India, the Netherlands and South Africa, and Egypt and Nigeria. India, South Africa, Nigeria, and Egypt are the network's developing countries. Case studies and cross comparative studies are two factors that enable cooperation between countries and organizations/institutions in developed and developing countries. Australia, Tanzania, Egypt, Nigeria, Hong Kong, Spain, England, India, China, and Zambia are among the countries represented by the institutions involved. Based on an analysis of research outlets and authors, it shows that Sustainability Switzerland, Habitat International and the IOP Conferene Series Material Science and Engineering are the main research outlets that contain many publications on the theme of AHC during the period of observation. Meanwhile, the writers that have made the most significant contributions to this study are Lima Chilesahe N., Adeniyi S.M., and Kavishe N. During the observation period of 1983 to 2021, it was discovered that the paper with the most citations or references was "Experimental analysis of Compressed Earth Block (CEB) with banana fibres resisting flexural and compression forces" (Mostafa & Uddin, 2016), "The contradictions in enabling private developers of affordable housing: A cautionary case from Ahmedabad, India" (Mukhija, 2004), and "Development of timber framed firms in the construction sector - Is EU policy one source of their innovation?" (Tykkä et al., 2010).

"Developing countries" and "affordable housing" are interrelated and are the primary topics in AHC in developing countries, particularly for people with lower and middle incomes. The study's findings show that building materials, along with low-cost housing, urban planning, low-income populations, and decision-making on affordable housing development that will be implemented, are areas that require further research. Furthermore, research and development strategies at the macro and micro levels for scientific communication and cooperation are critical for both developed and developing countries and their institutions. Such policies can help to facilitate technology transfer and knowledge sharing in order to implement effective sustainable housing strategies.

This study provides a comprehensive knowledge development study that is relevant to the advancement of AHC investigations in developing countries. The findings are likely to expand knowledge, and future researchers will be able to identify and address gaps in the research area

where additional research is judged necessary to supplement the existing research literature. Although testing and analysis have been completed, this study has certain limitations. Among these are the limitations of discussion depth due to space and the usage of data sources that exclusively employ Scopus. This study does not map papers from other sources that are related to the discussed themes.

The analysis highlights several areas for future research focus including alternative building materials, low-cost housing, decision-making models, and structural design to address gaps; the research networks between developed and developing countries present opportunities for cross-country collaborative studies and knowledge sharing which researchers should leverage; the findings suggest a need for multi-objective and cross-disciplinary policy approaches by governments to balance affordability, sustainability and scale, and facilitate academia-industry linkages and technology transfer; for practitioners, the knowledge hubs and topic areas provide insights to inform projects around sustainability, while key technologies can be piloted to improve affordability along with implementation tools and strategies to overcome barriers that are identified; overall, the study provides a foundation to guide research avenues, partnerships, policies and practical solutions for various AHC stakeholders to enhance outcomes and address this challenge, especially in developing country contexts through building on the scientometric findings in a focused manner.

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