UNDERSTANDING THE NEXUS OF CLIMATE CHANGE AND URBAN POVERTY: DOMINANT DISCOURSES IN ACADEMIC PUBLICATIONS

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ABSTRACT

The purpose of this study is to examine recurring themes in publications on the relationship between urban poverty and climate change. CiteSpace and RStudio software are utilised in this study's bibliometric analysis to retrieve articles from the Scopus database on the relationship between urban poverty and climate change. CiteSpace and RStudio tools were utilised to analyse the data and create visualisations, examining research patterns and topic developments in the areas of urban poverty and climate change governance. The research results identified 13 clusters, with the largest cluster being "informal urban settlements" which had 73 members and a silhouette value of 0.824. This settlement is labeled as an informal urban settlement by LLR, a case study by LSI, and discipline (3.73) by MI. Although they contribute the least to greenhouse gas emissions, people experiencing poverty are the group that is most affected, according to Campbell-Lendrum, the author of the mentioned article. Due to the rapid economic growth and concurrent urbanisation of developing nations, cities in these regions will be more susceptible to the health risks associated with climate change while also contributing to a growing number of issues. Scholars have not focused on the relationship between the impact of climate change and urban poverty because the keywords linking the two issues are not addressed in this study, which makes it intriguing.

Keyword: climate change; urban poverty; urban area

BACKGROUND

Cities are both the cause and sufferers of the most significant impacts of unprecedented climate change (Rusnaedy et al., 2021). Cities act as engines of change that transform and exploit ecosystems and natural resources outside their territory (Boyd & Juhola, 2015). The increase in greenhouse gases is one of the triggers for climate change in urban areas (Barnett & Webber, 2010). This is interesting because climate change has the potential for negative impacts on various sectors of life, including poverty (Friend & Moench, 2013; Jahan et al., 2012). Losses and damage are felt most by developing countries, and poor communities suffer most from the impacts of climate change (Leichenko & Silva, 2014; Warner & Van Der Geest, 2013).

Poor communities usually have the lowest resilience when facing climate disasters, even on a small scale. They suffer sequentially and have little time to recover (Dokken, 2014). They are the first to experience a decline in assets, trapped in a cycle of poverty, and face obstacles to adaptation (Hossain & Hossain, 2014; Sarma & Pais, 2008). Climate variability and climate change are widely acknowledged as factors that can exacerbate poverty, particularly in less economically developed nations and regions. However, they have never

been considered the sole cause of poverty. (Eriksen et al., 2015; Leichenko & Silva, 2014; Schipper, 2020).

Living and working in hazardous conditions, combined with external factors such as inadequate infrastructure and governance, makes impoverished communities in developing nations more vulnerable to climate extremes. (Adelekan, 2010; Chatterjee, 2010; Leichenko & Silva, 2014). Research indicates that the interplay of poverty, vulnerability, and climate consequences is particularly intricate, multifaceted, and context specific. Some communities exhibit remarkable resilience to climate change despite impoverished groups being more susceptible to climate shocks and pressures and having fewer means to adapt (Leichenko & Silva, 2014).

Although previous researchers have researched climate change, there still needs to be more understanding of how this research affects urban poverty. Therefore, this study aims to examine the dominant impact discourse of climate change research on urban poverty. Thus, the purpose of this study is to quantify the impact of climate change research on urban poverty. We employed CiteSpace and RStudio, two programs that facilitate the analysis of research effects through citation analysis, to achieve this purpose. Examining the connection between poverty and climate change can help us better understand how research on climate change affects the factors that lead to poverty in cities. By mapping pertinent material using keywords, this study will help practitioners and policymakers create methods and policies that prevent or lessen urban poverty in the face of climate change. Because it advances our knowledge of how climate change research affects the urban poor, this study is, therefore, extremely urgent.

METHOD

This study analyses 61 articles from various sources to assess the literature using the Scopus database. It locates documents via API calls Title: TITLE-ABS-KEY ("climate change" AND urban AND poverty) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")). Social network and trend analysis, along with tools designed for scientific mapping, are utilised in the emerging discipline of visualising scientific information. In-depth research is used in this study to clarify and comprehend how poverty is affected by climate change, as indexed by Scopus. The Scopus database search results are evaluated in this study utilising analytical techniques, and CiteSpace and RStudio are used for analysis (Chen, 2016; Chen & Song, 2019).

A well-known and top Java-based program called CiteSpace is used to generate colour maps from bibliographic data, show them, and derive their educational value. (Chen, 2017, 2020). This study analyzed co-citation research documents on climate change and poverty. Essential keywords in papers, subjects, and concepts that tend to cross regional research boundaries can be identified through co-citation analysis. (Liu et al., 2013). Additionally, keyword-based burst detection analysis was used to identify research

limitations among recent publications, how this research was done, how the data was analyzed, and so on.

**Figure 1.** Database Sorting Flow Diagram
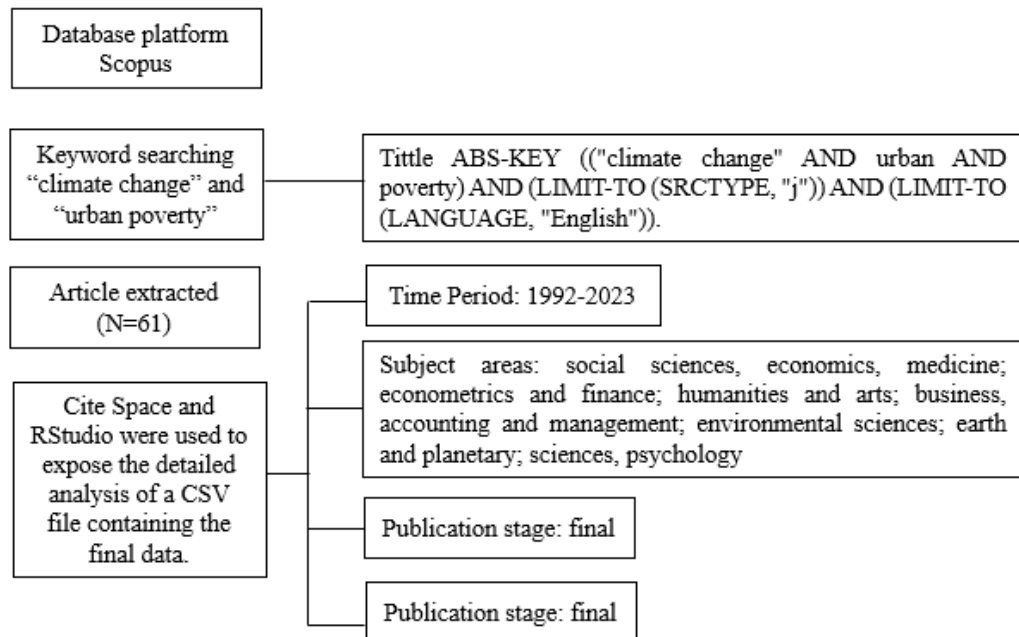
RESULT AND DISCUSSION
Thematic Cluster

This research found that the number of papers on climate change related to urban poverty has not shown a positive trend since it was first published in 1992, but in 2008, there was an increase, although not yet significant. Research on climate change and urban poverty has experienced an unprecedented increase, with 31 documents published in 2021. This research trend is increasingly attractive, considering that climate conditions are the centre of attention of researchers.

Graph 1. Trends in Climate Change and Urban Poverty Research Results
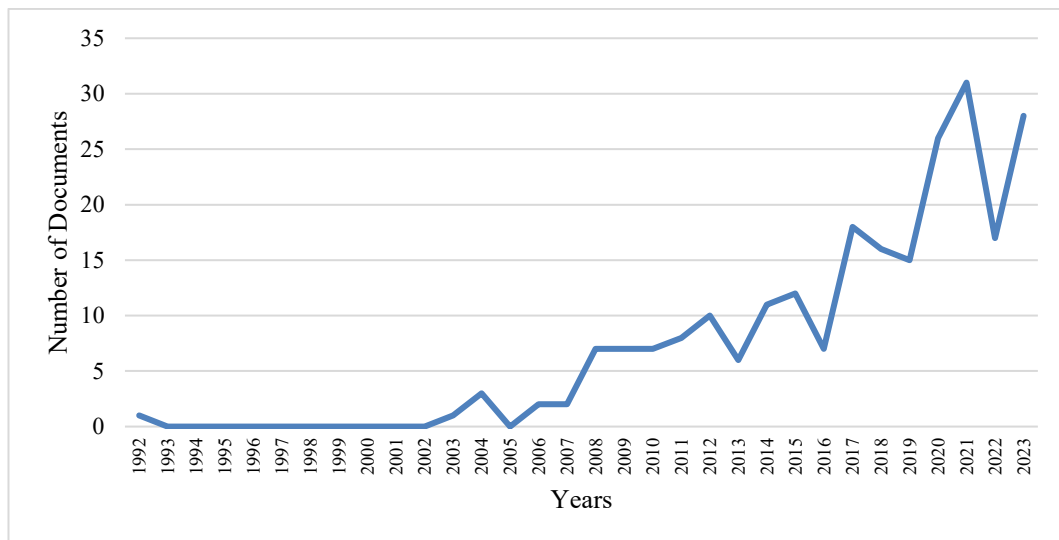
As seen in Figure 1, the research identified twelve groups based on CiteSpace analysis results that characterize the primary subjects of studies on urban poverty and climate change. These results offer a thorough understanding of research patterns related to urban poverty and climate change. To improve comprehension of the conceptual framework employed in this study, relevant subjects were found and grouped using cluster analysis. By identifying the most frequently co-cited papers, the co-citation analysis provides further details on popular subjects.. However, we only show the top 8 clusters as in graph 1.

Figure 1. Findings from our literature-citation-based cluster analysis
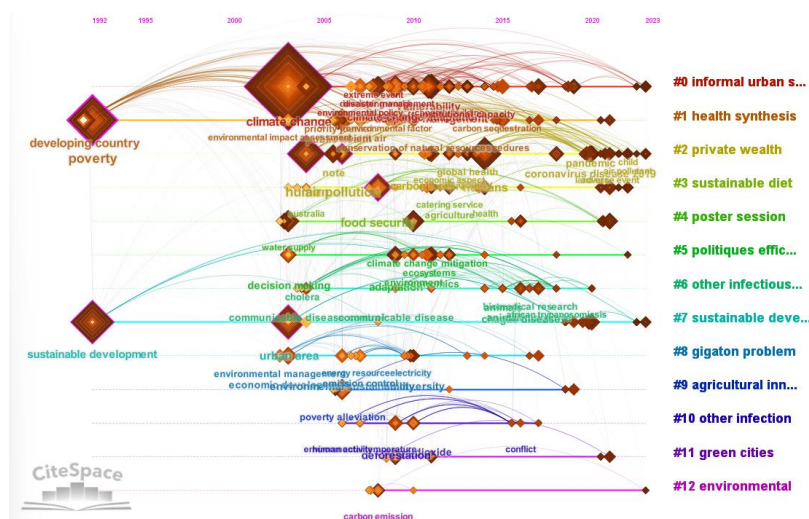
With 73 individuals and a silhouette value of 0.824, the largest informal urban settlement cluster is depicted in Figure 1 above. LLR refers to it as an informal urban

settlement, LSI calls it a case study, and MI refers to it as a discipline (3.73) Campbell-Lendrum & Corvalán (2007), the cluster's primary citing article emphasises that while making the most minor contribution to greenhouse gas emissions, those living in poverty bear the brunt of the effects.

Due to the rapid economic growth and concurrent urbanisation of developing nations, cities in these regions will be more susceptible to the health risks associated with climate change while also contributing to a growing number of issues. Generally speaking, vulnerability factors include proximity to the coast, exposure to the urban heat island effect, high levels of indoor and outdoor air pollution, dense populations, and inadequate sanitation (Campbell-Lendrum & Corvalán, 2007).

With 54 members and a silhouette value of 0.7, Health Synthesis is the second-largest cluster. LLR calls it health synthesis, LSI calls it millennium ecosystem, while MI calls it MENA area (0.46). Brattberg (2004) is the cluster's primary referencing article. With 54 members and a silhouette value of 0.764, private wealth is the third largest cluster. LLR and LSI classify it as private wealth, but MI classifies it as a discipline (0.27) United Nation (2020), emphasises that access to water and sanitation remains a serious health issue, serving as the cluster's main referencing article. According to him, 2.2 billion people still live without safe drinking water. Reducing land use and mitigating climate change are inextricably linked to ending world poverty and addressing food and water shortages. However, as shown in the SDGs report, the world is off track to achieve its goal of environmental sustainability (United Nation, 2020).

The fourth largest cluster is sustainable diet, with 41 members and a silhouette value of 0.895. It is labelled as a sustainable diet by LLR, LSI ecological sustainability, and MI traditional firewood (0.1). The major citing article of the cluster is Johnston (2006) provides numerous examples of how human activities' effects on our biosphere are becoming increasingly detrimental to human health, including overfishing, the depletion of numerous natural resources, extensive degradation of productive land, damage to the stratospheric ozone layer, and the depletion of clean water supplies. 45% of the world's population is currently in danger of developing malaria due to exposure to Anopheles mosquitoes, according to modelling of human-caused global climate change. A 3°C increase in global temperature will lead to the expansion of the Anopheles mosquito's range, putting up to 60% more people at risk globally (Johnston, 2006).

With 37 individuals and a silhouette value of 0.872, the poster session ranks as the seventh largest cluster. Both LLR and LSI refer to it as a poster session and MI's motivating factor (0.09). The cluster's primary citing article is identical to that of the second cluster. With 32 members and a silhouette value of 0.89, it is the sixth most effective cluster policy. LLR and LSI classify it as political effectiveness, while MI classifies it as urban vulnerability (0.1). Using an integrated approach that includes wetland modelling based on water quality parameters to understand ecosystem dynamics, followed by the estimation of economic benefits for various stakeholders and the investigation of incentive-based mechanisms and

their contribution to poverty reduction, is the cluster's primary citing article (Verma & Negandhi, 2011).

With 31 members and a silhouette value of 0.974, various infectious diseases are the seventh largest cluster. It is classified as a vector-borne disease (0.02) by MI, various infectious diseases by LLR, and a research gap analysis by LSI is (Weiss & McMichael, 2004), who the cluster's main referencing article, explain that several changes in human ecology, including the movement from villages to cities that led to urban settlements, are responsible for the emergence of these diseases and the resurgence of ancient diseases like cholera and tuberculosis. Slums in densely populated suburbs, rising mobility and long-distance trade, social unrest brought on by war and conflict, behavioural shifts in individuals, and the fact that human activity is causing more and more global changes, such as extensive forest destruction and climate change (Weiss & McMichael, 2004).

The eighth largest cluster is Sustainable Development Goal, with 26 members and a silhouette value of 0.874. It is labelled a sustainable development goal by both LLR and LSI and a discipline (0.47) by MI. The primary cited article of the cluster is (Bhutta et al., 2019), explaining that there is a striking global gap, which can be seen in the context of poverty, poor living conditions, refugees, and population problems. In his research, it is explained that the problems of food insecurity and malnutrition are related to almost 45% of child deaths seven and are closely related to issues of gender discrimination, climate change, water resources and conflict, which are problems within the Sustainable Development Goal (Bhutta et al., 2019).

Figure 2. Thematic evolution of research based on keywords

Thematic Evolution
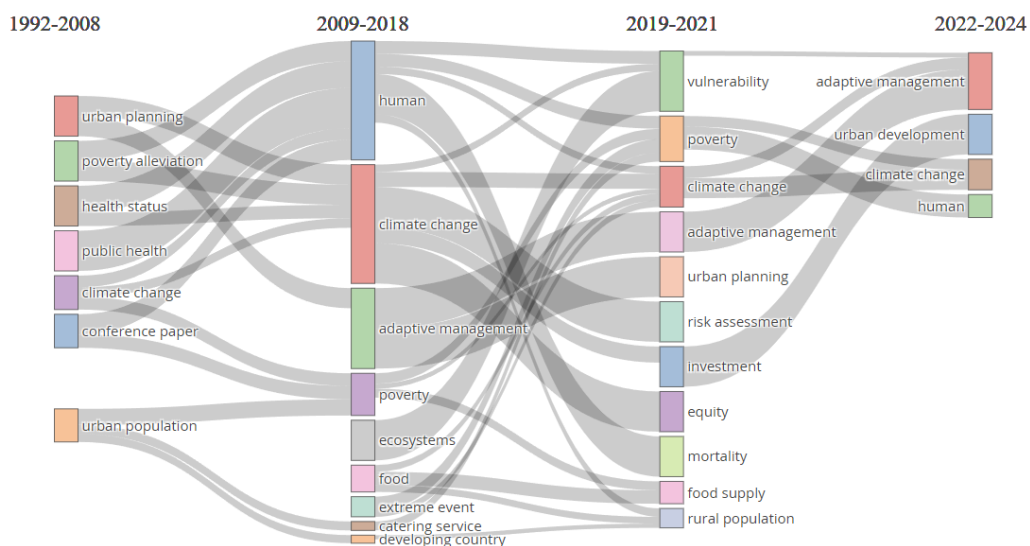
Based on keywords, we utilised R Biblioshiny to examine the evolution of themes related to urban poverty and climate change from 1992 to 2024. The results are shown in

Figure 2 as a Sankey diagram (Aria et al., 2020). We can better grasp the connections and evolution of different topics with the aid of this flow diagram (Aria et al., 2020). The diagram's arrow widths indicate the quantitative proportion of the flow (Subramanyam et al., 2015). The overall time (31 years) has been split into four sub-periods: i) 1992-2008, ii) 2009-2018, iii) 2019-2021, and iv) 2022-2024, based on the publication years of the first (1992) and last (2020) publications found in this study

Fig. 2 shows that during the first sub-period (1992-2008), the focus was on seven themes: urban planning, poverty alleviation, health status, public health, climate change and urban population. In the second period (2009-2018), new themes emerged: humans, adaptive management, food, extreme events, and developing countries. Sub-period 3 raises several new research themes: vulnerability, risk assessment, investment, and equity. In the 2022-2024 period, no new research themes will emerge.

Figure 3. Word cloud climate change and urban poverty

Wordcloud shows that climate change (16%) and poverty (9) are the most highlighted words in the cloud. Human and humans (7%), sustainable development (5%), urban area (4%), urban population (3%), urbanization (2%), and vulnerability (2%) are the following keywords highlighted in the cloud. The word urban poverty has not become a big

keyword, so research on the impact of climate change on urban poverty is a theme that has not attracted the attention of researchers. So, the theme of the impact of climate change on urban poverty is interesting to research in the coming years.

CONCLUSION

The results of this research conclude that climate change impacts poor communities. They are the most minor contributor to greenhouse gas emissions but have the most significant impact. Furthermore, cities in developing nations will be more susceptible to the health risks associated with climate change, which will exacerbate existing issues due to the fast economic growth and urbanisation of impoverished nations. Therefore, measures related to sustainable development, urban population, urbanisation, vulnerability, population growth, and urban planning must be prioritised to mitigate the impact of climate change on the urban poor. We also found that research on the impact of climate change on urban poverty has yet to become mainstream research in climate change governance.

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