Journal of Law and Bibliometrics Studies
Homepage : https://journal.i-ros.org/index.php/JOLABIS
Email : jolabis@i-ros.org

e-ISSN 3109-3310
Vol. 2, No.1, March 2026

Research Potential of Traditional Buildings from an Ethnographic and Ethnoscience Perspective Through SLR (Systematic Literature Review) in SDGs Studies 2015-2025

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DOI : https://doi.org/10.63230/jolabis.2.1.128

Sections Info

Article history:
Submitted: March 7, 2026
Final Revised: March 17, 2026
Accepted: March 17, 2026
Published: March 31, 2026

Keywords:
Etnographic;
Etnoscience;
SDGs;
SLR;
Traditional Buildings.

ABSTRACT

Objective: *The preparation of a systematic literature review that specifically discusses the ethnoscience perspective is examined in the form of bibliometric analysis findings in the relationship between SDGs and culturalization of culture in the realm of science.* ***Method:*** *Quantitative descriptive research, through bibliometric analysis studies using data from the Scopus database to map trends and focus on SDGs research with culture and ethnophysics in traditional buildings through international literature. A total of 462 documents were analyzed using the PRISMA design to identify research trends and conduct a literature synthesis.* ***Results:*** *Based on publication trend data in the Scopus database for the period 2021–2026, it can be seen that research on traditional buildings from the perspective of sustainable design development studied through ethnographic approaches and ethnoscience values shows an increasing trend. Traditional building architecture has long been seen as a manifestation of the reciprocal relationship among humans, natural conditions, and cultural values passed down from generation to generation.* ***Novelty:*** *Traditional buildings have great potential for study through an ethnographic approach because they reflect cultural values, local knowledge, and the living practices of developing communities. This study contributes to the preservation of cultural heritage and the development of sustainable settlement concepts. This is in accordance with the SDG study point 11 concerning sustainable cities and communities.*

INTRODUCTION

The Sustainable Development Goals (SDGs) are a global development agenda set by the United Nations in 2015 as a framework for sustainable development until 2030. The Sustainable Development Goals consist of 17 goals designed to balance the social, economic, and environmental dimensions of global development. From a sustainable culture perspective, achieving these goals depends not only on economic policies and environmental protection, but also on the values, norms, traditions, and social practices that shape collective behavior. Culture plays a role in determining how society understands, accepts, and implements sustainability principles. This was confirmed by Zheng et al. (2021), who show that cultural considerations have a significant contribution to achieving various SDG targets. Therefore, integrating cultural aspects is an important element of contextual, inclusive, and sustainable development strategies (Suhaeb et al., 2024).

In a cultural perspective on sustainability, achieving the Sustainable Development Goals (SDGs) does not depend solely on modern technological innovation but also on the use of local knowledge that has been ecologically tested (Zheng et al., 2021). Traditional architecture, such as the Javanese house, represents a form of cultural

adaptation to tropical climate conditions through natural ventilation systems and passive thermal control (Muqoffa et al., 2025). In this context, the relevance of this research lies mainly in SDG 11 (Sustainable Cities and Communities), which emphasizes the preservation of cultural heritage as part of sustainable community development (Labadi et al., 2021). In addition, the principles of natural ventilation and thermal efficiency in Joglo architecture also contribute to SDG 13 (Climate Action) through an adaptive, passive design approach that supports reducing dependence on artificial energy (Hefnawy & Ibrahim, 2024). The ethnophysical approach allows the reinterpretation of traditional architectural practices as a manifestation of the application of physical principles in a local cultural context.

The problem is that many people today lack a deep understanding of traditional architecture, as it relates to natural and social knowledge. Previous studies have found that the development of global traditions is marginalizing local wisdom (Pageh et al., 2025). However, understanding traditional culture and architecture within local wisdom is considered crucial and urgent. Culture and the architecture of traditional buildings are closely related because architecture reflects the values, knowledge, and social practices that develop within a society (Velinga et al., 2024). Traditional buildings not only function as physical spaces, but also as representations of cultural identity, social structure, and adaptive responses to the natural environment and local climate (Sanagustín-Fons et al., 2025). In this context, preserving traditional architecture is important not only to safeguard material cultural heritage but also to preserve local knowledge accumulated over generations (Vaz, 2024). The loss of traditional buildings can result in the loss of cultural values, local wisdom, and ecologically proven sustainable design principles. Therefore, efforts to preserve traditional architecture are an integral part of sustainable development that respects cultural, social, and environmental dimensions holistically (Hariram et al., 2023).

In the context of traditional Javanese architecture, several studies specifically highlight the role of geometry, such as in traditional buildings, in supporting vertical air movement (Muqoffa et al., 2025). From a cultural perspective, the spatial layout and structural hierarchy of traditional buildings are often associated with a cosmological view of society that emphasizes harmony between humans and nature as a fundamental principle (Muqoffa et al., 2024). However, most research still relies on a qualitative approach. It has not systematically linked these cultural values to building physics principles, such as heat transfer and fluid mechanics, which implicitly underpin the construction system (Hens, 2023). Traditional houses are not only understood as physical structures, but also as representations of tribal cosmology that shape spatial planning, hierarchy, and human relations with the environment (Wardhana et al., 2024). However, the integration of these cultural dimensions with the physical analysis of buildings, especially within an ethnophysical framework, remains relatively limited. Many studies treat symbolic and technical aspects as distinct domains.

Based on the literature review, several research gaps remain. Most studies separate the cultural and symbolic dimensions from the technical analysis of building physics,

thereby failing to comprehensively integrate the relationship between cosmology, spatial planning, and scientific mechanisms (Gaffara et al., 2021; Sumanti et al., 2024). Third, variations in methodological approaches are still difficult to compare directly without a structured synthesis framework. In addition, the implications of the findings for the development of contemporary sustainable architecture are rarely discussed explicitly. In particular, this is the link between traditional buildings and maintaining the stability of the SDGs. Many studies stop at the performance evaluation stage of traditional buildings, without linking it to the potential adoption of energy-efficient, comfort-oriented principles in modern building design (Xian et al., 2024).

By addressing these gaps, this research provides a more comprehensive scientific contribution. The novelty of the research lies in the preparation of a systematic literature review that specifically discusses the ethnoscience perspective, examined through bibliometric analysis of the relationship between SDGs and the culturalization of culture in the realm of science. This approach is expected to provide a more comprehensive understanding of how ethnoscience principles in traditional architectural practice are rooted in cultural values and their relationship to the SDGs. Through this systematic literature review, it is hoped that a clear knowledge map will be developed regarding the contribution of traditional building architecture to sustainable design development in harmony with local cultural conditions, through ethnography and its ethnoscientific value.

RESEARCH METHOD

This research uses a quantitative descriptive approach, namely a type of research that systematically and measurably describes or explains a phenomenon using numerical data (Alaimo, 2022). This research focuses on findings and analysis of phenomena based on data. The bibliometric analysis uses data from the Scopus database to map trends and focus on SDG research on culture and ethnophysics in traditional buildings, drawing on international literature (Tsakeni et al., 2026). The search includes sources, document counts, trends, and relationships among keywords that focus on research topics related to the research objectives.

This study uses the SLR (Systematic Literature Review) approach and the PRISMA design to analyze the findings. This research applies bibliometric analysis to analyze, map, and evaluate scientific developments based on scientific publication data, such as journal articles, proceedings, or books. The bibliometric approach focuses on quantitative measurements of bibliographic information, such as the number of publications, citations, author collaborations, keywords, and research topic trends (Chakim et al., 2024). Through bibliometric analysis, researchers can identify directions of development in scientific fields, identify the most influential researchers and journals, and assess future research connections and potential. Thus, bibliometric research not only objectively depicts knowledge maps but also helps determine more targeted and impactful research strategies and scientific policies (Akter et al., 2021).

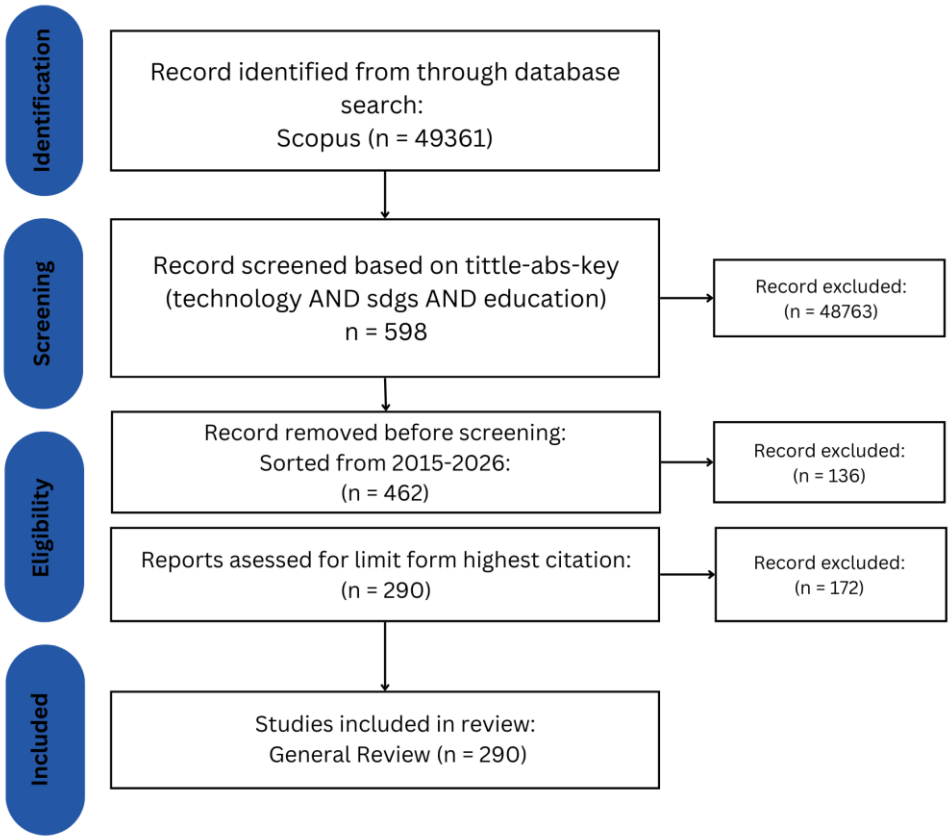

Figure 1. PRISMA design

Keywords were obtained from data collection using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) design carried out on the Scopus database. Using the keywords "Ethnography OR Ethnoscience AND SDGs OR Architecture," source data were obtained (n = 49361). The initial data set was 598; 2015-2026, there were 462 documents, 290 of which were cited.

The PRISMA synthesis findings were examined in more depth through bibliometric analysis. Bibliometric data were analyzed and visualized using VOSviewer, a research tool. VOSviewer was used to map co-authorship networks, keyword co-occurrences, and thematic clusters, enabling the identification of research trends and relationships among research topics in the SDGs and their interrelationships with culture and ethnophysics in traditional buildings (Nuryadin et al., 2024). The main objective of this bibliometric analysis, apart from mapping the distribution of research, is also to analyze the contents of several literatures globally.

RESULTS AND DISCUSSION

Bibliometric Results

Based on publication trend data in the Scopus database for the 2015–2026 period, it can be seen that research on traditional buildings from the perspective of sustainable design development, studied through ethnographic approaches and ethnoscience values , shows an increasing trend.

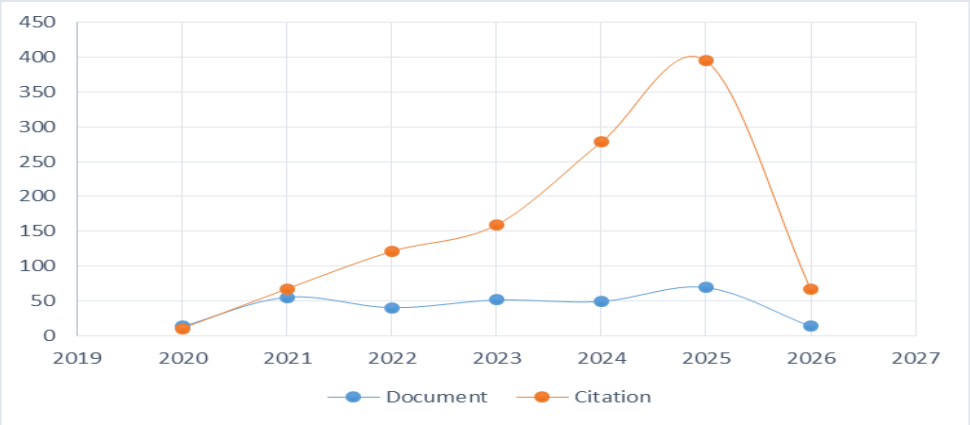

Figure 2. Citation overview in document scopus

In 2021, the number of publications began to grow, with around 60 documents and more than 70 citations, indicating increasing academic attention to the use of local knowledge in architectural and sustainability studies. This trend continues in 2022 and 2023, with the number of documents remaining relatively stable at 50–60 publications, while the number of citations continues to increase, reaching more than 150. A more significant increase is seen in the period 2024 to 2025, where the number of citations increases sharply to around 280 in 2024 and reaches a peak of almost 400 in 2025, while the number of documents also increases to around 80 publications.

The number of documents shows a relatively fluctuating but slowly increasing pattern. In 2020, the number of documents was still very low, but then it increased significantly in 2021. After that, there was a slight decline in 2022, followed by an increase again in 2023. In 2024, the number of documents was relatively stable, then reached a peak in 2025. In contrast to documents, the number of citations showed a much sharper and more consistent upward trend from 2020 to 2025. Citations increased gradually from a very low value in 2020, then rose significantly in 2022–2024, and reached a peak in 2025 with a number much higher than in previous years. In general, citation growth increased faster than the number of documents. This indicates that although the number of publications does not increase drastically each year, the scientific impact and academic attention to these publications are increasing. Furthermore, the peaks in documents and citations both occur in 2025, indicating that this period marks the highest research productivity and influence.

This shows that research on the potential of traditional buildings as a source of local knowledge for sustainable design is increasingly receiving attention in the global scientific literature. Meanwhile, in 2026, the number of documents and citations will decrease. However, it should be noted that the data were collected in March 2026, so the indexing of publications for the current year has not yet been fully completed. Therefore, the number of publications and citations in that year still has the potential to increase as more articles are indexed throughout the year.

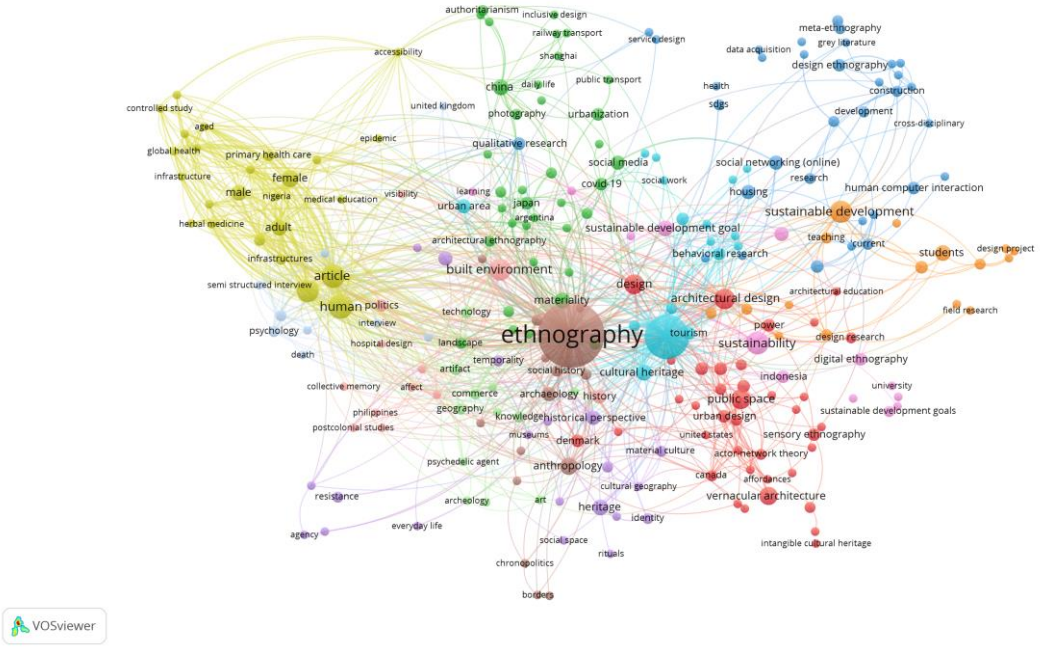

Figure 3. Network visualization

The bibliometric map visualization in the image above was generated using VOSviewer, which maps co-occurrence relationships among keywords in publications indexed in the Scopus database (Li et al., 2024; Lintangesukmanjaya et al., 2025). The map shows the structure of a research network centered on the main keyword ethnography, which appears as the largest node and connects various other research themes. This shows that the ethnographic approach plays an important role in studying social and cultural phenomena and the built environment, including traditional buildings and architectural practices grounded in local wisdom.

Visually, this network is divided into several clusters, each marked with a different color, representing groups of interrelated research themes. The red cluster, for example, is mostly related to architecture, architectural design, cultural heritage, and vernacular architecture, indicating the research focus on the relationship among ethnography, cultural heritage, and traditional architectural design. The blue cluster shows connections to the themes of design process, data analysis, and human–computer interaction, indicating the development of methodological approaches in ethnographically informed design research. Meanwhile, the green cluster shows connections to the themes of urbanization, mobility, and infrastructure, illustrating the link between ethnographic studies and the context of development and the urban environment. Apart from that, other clusters also show connections to sustainability and sustainable development issues, indicating that ethnographic studies are increasingly used to understand local cultural practices that support sustainable development.

The density and connectivity of nodes on the map show that ethnographic research is multidisciplinary and serves as a link between various fields, such as architecture,

design, cultural studies, and sustainable development. In the context of this research, these bibliometric findings show that ethnographic approaches and ethnoscience values are increasingly used to explore the potential of traditional buildings as a source of local knowledge in developing sustainable designs in harmony with the cultural context of local communities.

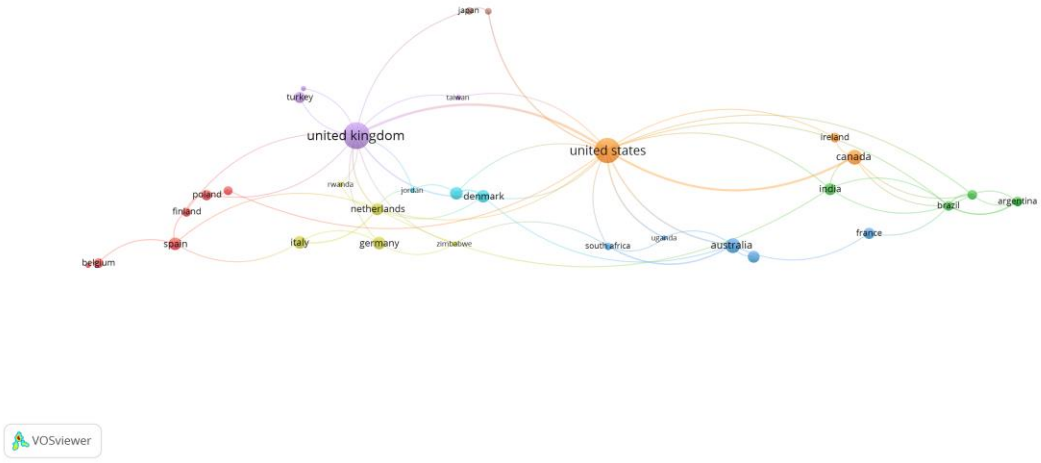

Figure 4. Distribution country

Visualization of country collaboration networks in images generated with VOSviewer software from publication data in Scopus reveals patterns of international collaboration in research on ethnography and built environmental studies. Visualization of country collaboration networks using VOSviewer aims to map and analyze research collaboration patterns between countries based on co-authorship relationships in scientific publications, thereby identifying the level of contribution, strength of collaborative relationships, and structure of research networks within a field of study. (Li et al., 2024; Lintangesukmanjaya et al., 2025). In this map, the United States and the United Kingdom are the centers of the collaboration network, with the greatest number of connections to various other countries, such as Canada, Australia, India, Brazil, and France. Apart from that, several European countries, such as the Netherlands, Germany, Italy, and Spain, have also formed quite active collaboration networks, showing the strong involvement of the European region in the development of ethnographic-based research. Meanwhile, connections with countries in Asia, Africa, and South America such as Japan, South Africa, and Argentina show that this research topic is global and interdisciplinary. Overall, the network pattern indicates that research on ethnography, including in the context of the study of traditional buildings and the development of sustainable design based on local culture, is developing through quite extensive international collaboration with developed countries as the main connecting centers in the global research network.

The Potential of Traditional Buildings in Supporting SDGs

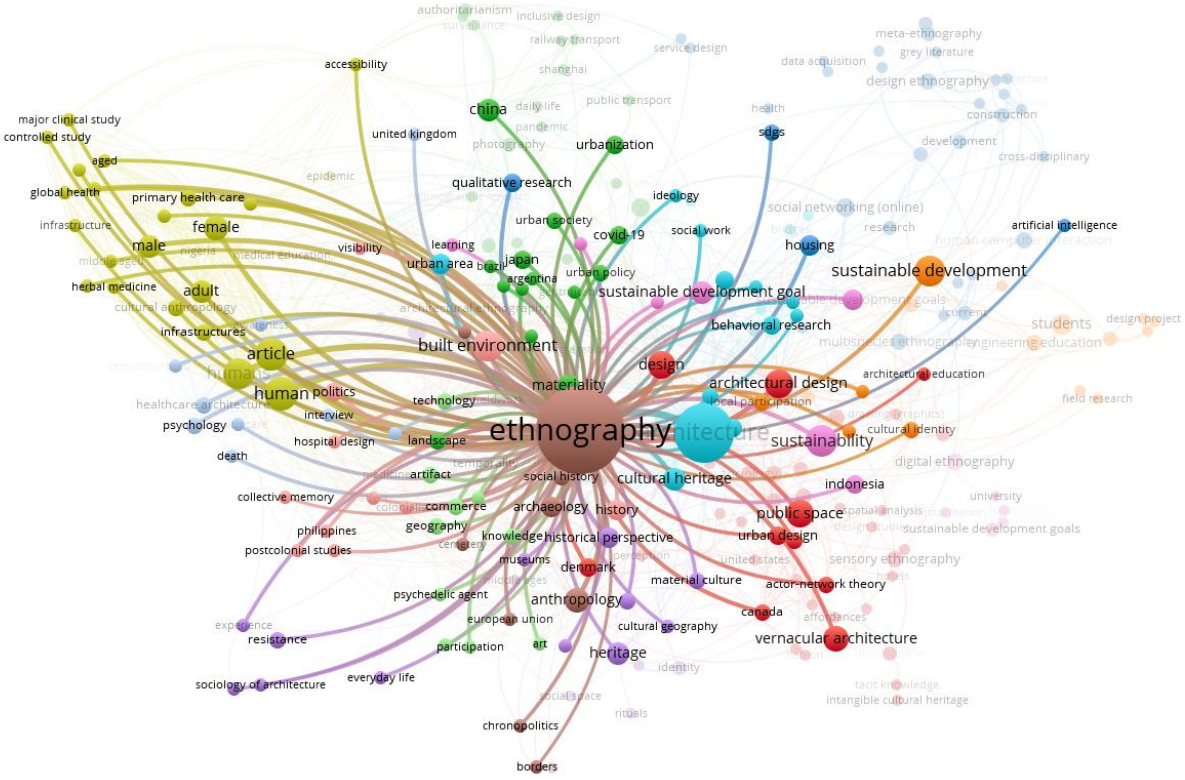

Figure 5. Correlates of ethnography in sustainable development

The keyword ethnography emerged as the most dominant node and became the center of a network that connects various cross-disciplinary research themes. Several main clusters can be identified from the different colors, which depict groups of related topics. The red cluster is mostly related to architectural and cultural themes, such as architecture, architectural design, vernacular architecture, cultural heritage, and sustainability, suggesting that an ethnographic approach is often used to study the relationships among traditional buildings, cultural heritage, and sustainable design. The blue and orange clusters connect to the themes of design, technology, and sustainable development, indicating the integration of an ethnographic approach with contemporary design development and innovation. Meanwhile, the green and yellow clusters relate to the study of the built environment, social behavior, public health, and the dynamics of community life. The network's density and the large number of relationships between keywords indicate that ethnographic-based research has a strong multidisciplinary character (Punziano et al., 2025) and is increasingly used to explore local knowledge and community cultural practices to support contextual and sustainable design development. This is also reinforced by the architectural literature and by research trends.

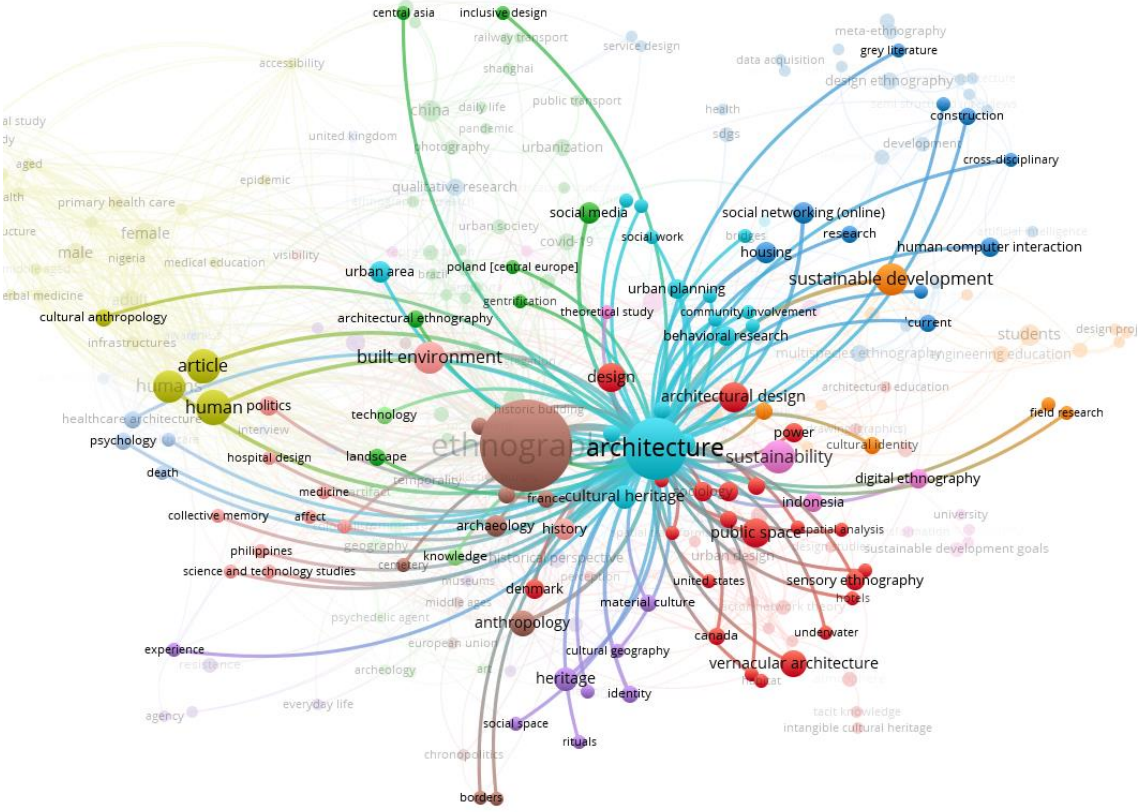

Figure 6. The relationship of architecture in research trends

The Potential of Traditional Buildings Discussed in Ethnographic Studies and SDGs

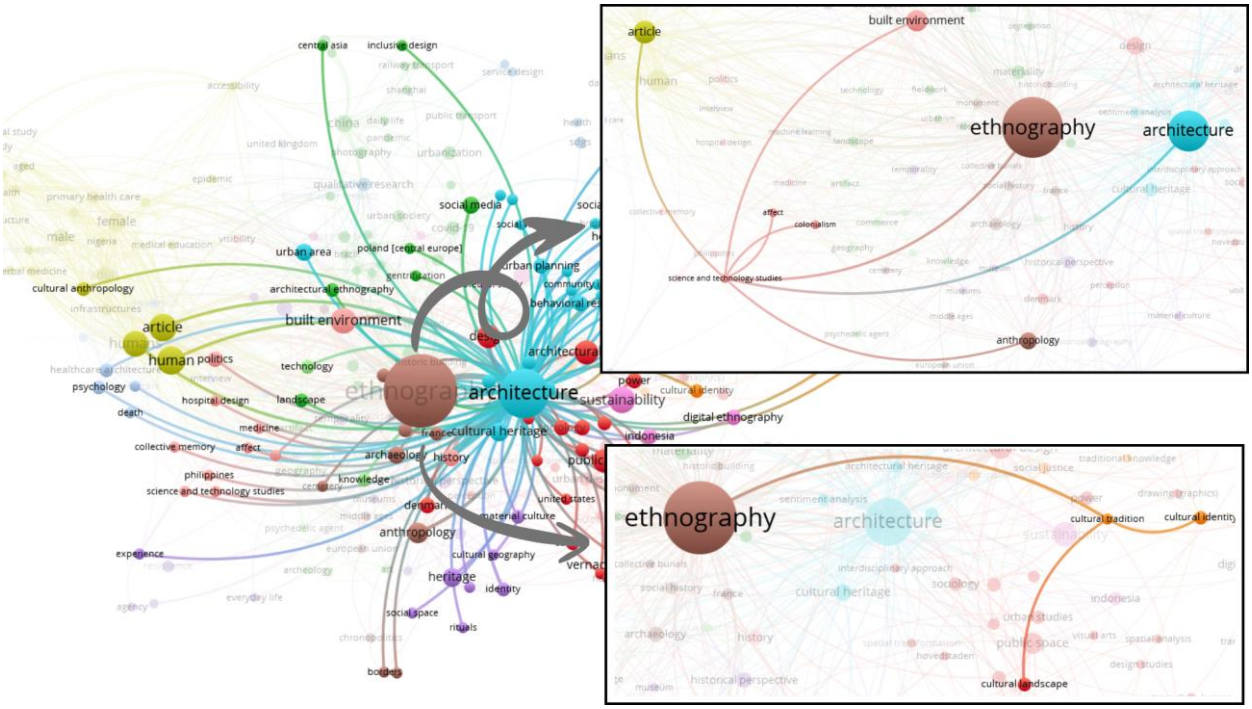

Figure 7. Keyword correlation

Traditional buildings have great potential for ethnographic study because they reflect cultural values, local knowledge, and community living practices that have

developed over generations. Through ethnographic studies, researchers can understand how people design, build, and use traditional buildings based on environmental conditions, the availability of natural resources, and the social and cultural values they adhere to. This local knowledge not only demonstrates community wisdom in creating functional and sustainable housing but also contributes to cultural and environmental preservation efforts (Pratama et al., 2024). In the context of sustainable development, traditional buildings also contribute to the Sustainable Development Goals (SDGs) (Scrucca et al., 2024), especially by supporting the preservation of cultural heritage, the use of environmentally friendly resources, and the strengthening of local communities. Thus, ethnographic studies of traditional buildings not only document cultural practices but also open opportunities to integrate local wisdom values into more sustainable and inclusive development strategies.

Ethnoscientific Values Contained in Traditional Buildings

Traditional building architecture has long been seen as a manifestation of the reciprocal relationship among humans, natural conditions, and cultural values passed down from generation to generation. Various recent studies show that vernacular buildings in tropical regions tend to exhibit more responsive environmental performance than conventional modern buildings, especially in aspects of heat control and natural ventilation, as demonstrated by comparative studies and field measurements (Kariuki et al., 2025; Muqoffa et al., 2025). These studies confirm that the configuration of the building shape, roof height, layout of openings, and the use of local materials are the main factors that determine comfort levels (Jegede & Taki, 2022).

From a sustainability perspective, vernacular architecture is often considered to have adaptive capabilities to the environment because its design is based on the empirical experience of local communities in responding to local climate characteristics (Zong et al., 2025). Conceptually, these characteristics are believed to enhance thermal comfort while optimizing natural ventilation, especially in humid tropical climates (Jia et al., 2021). Several previous studies have examined the ethnoscience of vernacular buildings in tropical regions by highlighting the relationships among architectural form, spatial layout, constituent materials, and local climate characteristics (Hermawan & Švjlenka, 2021; Costa et al., 2021). The approaches used vary, ranging from direct field measurements to numerical simulations to comparative studies between traditional and modern buildings (Hailu et al., 2021; Milal, 2025; Samalavičius & Traškinaitė, 2021). The results of this study show that passive design strategies that have developed over generations, such as high roofs, rooms without ceilings, and layered opening systems, make a real contribution to reducing indoor air temperature and increasing air circulation (Kolani et al., 2023; Muqoffa et al., 2025). Strategies such as cross-ventilation, large openings, and significant roof elevations have been shown to increase occupant thermal comfort without relying on mechanical cooling systems (Gao et al., 2024; Hu et al., 2023).

Traditional buildings are not only understood as cultural architectural heritage, but also as representations of local knowledge that can be studied through an ethnoscience perspective. In ethnoscience studies, traditional buildings are seen as a form of application of scientific concepts that develop from people's experiences in interacting with their natural environment. Previous research shows that traditional communities have indirectly applied scientific principles in building design, such as regulating air circulation, using local environmentally friendly materials, and adapting building structures to climatic and geographical conditions. The use and design of urban development systems that are conducive and relevant to science have the potential to improve the quality of sustainable settlements as per SDG point 11 (Chen et al., 2024). Through an ethnoscience approach, these practices can be identified as forms of scientific knowledge that are integrated with the cultural values of society.

This study has become popular in educational and anthropological research because it connects local wisdom with modern scientific concepts, so that traditional buildings are seen not only as cultural artifacts but also as contextual learning sources relevant to the development of science- and culture-based education. Traditional buildings reflect architecture that is adaptive to local climate, cultural, and environmental conditions. This study contributes to the preservation of cultural heritage and the development of sustainable settlement concepts. This is in accordance with SDG 11, which concerns sustainable cities and communities. This study's limitations lie in the focus of its bibliometric analysis. However, despite its limitations, it yields numerous findings. These findings are relevant to future research plans that focus on empirical studies of traditional buildings through ethnography, ethnoscience, and even cultural values in society.

CONCLUSION

Fundamental Finding: Based on publication trend data in the Scopus database for the period 2021–2026, it can be seen that research on traditional buildings from the perspective of sustainable design development, studied through ethnographic approaches and ethnoscience values , shows an increasing trend. Traditional building architecture has long been seen as a manifestation of the reciprocal relationship among humans, natural conditions, and cultural values passed down from generation to generation. **Implication:** Traditional buildings have great potential for ethnographic study because they reflect cultural values, local knowledge, and the living practices of developing communities. This study contributes to the preservation of cultural heritage and the development of sustainable settlement concepts. This is in accordance with the SDG study point 11 concerning sustainable cities and communities. **Limitation:** This research examines it only from a literature review perspective and has not empirically demonstrated that traditional buildings are relevant to SDG values. **Future Research:** Future research can focus on empirical studies of traditional buildings in terms of ethnographic, ethnoscience and even cultural values in society.

AUTHOR CONTRIBUTIONS

Rahmatta Thoriq Lintangesukmanjaya contributed to the conceptual framework, research design, and validation process; **Oktamia Ramadhani** was involved in methodology development, data analysis, sourcing references, and drafting the manuscript; **Hanandita Veda Saphira** handled data management, project coordination, and manuscript drafting. All listed authors have reviewed and approved the final version of this submission.

CONFLICT OF INTEREST STATEMENT

The authors confirm that there are no conflicts of interest, either financial or personal, that may have influenced the content or outcome of this study.

ETHICAL COMPLIANCE STATEMENT

This manuscript complies with research and publication ethics. The authors affirm that the work is original, conducted with academic integrity, and free from any unethical practices, including plagiarism.

STATEMENT ON THE USE OF AI OR DIGITAL TOOLS IN WRITING

The authors acknowledge the use of digital tools, including AI-based technologies, as support in the research and writing stages of this article. Specifically, Grammerly was employed for helps improve good writing, grammar and verbs. All outputs generated with digital assistance were critically evaluated and revised to ensure academic rigor and ethical standards were upheld. The final responsibility for the manuscript rests entirely with the authors.

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