Bibliometric Mapping of Local Knowledge Preservation: Connection to Information Literacy and Open Science

Pemetaan Bibliometrik Pelestarian Pengetahuan Lokal: Integrasi Perspektif Literasi Informasi dan Sains Terbuka

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Abstract

***Problem Statement**: Preserving local knowledge has become a critical effort in this era of globalization to safeguard cultural values and traditions threatened by modernization. In general, local knowledge plays a strategic role in natural resource management, environmental conservation, and sustainable social development. **Purpose**: this research aims to analyze developments in the field of local knowledge preservation, document relevant international publications, and identify research positions on the enhancement of information literacy and open science. **Method**: . A descriptive quantitative approach was used with bibliometric analysis. Data were retrieved from the Scopus database for the period 2014–2024. **Result**: The results showed that research on local knowledge preservation primarily focuses on biodiversity conservation, natural resource management, and community empowerment. However, the explicit connection between local knowledge preservation and information literacy or open science remains underdeveloped. This indicates that local knowledge preservation has significant potential to strengthen information literacy and support open science, but the strategic integration requires further development. **Conclusion**: The results provide an overview of global research trends and show opportunities to incorporate local knowledge into future information systems that are more inclusive and accessible.*

***Keywords:** Bibliometric analysis; Indigenous knowledge; Knowledge preservation; Information literacy; Open science.*

Abstrak

Permasalahan: Di era globalisasi, preservasi pengetahuan lokal menjadi salah satu upaya penting dalam melestarikan nilai- nilai budaya dan tradisi yang terancam oleh modernisasi. Pengetahuan lokal memiliki peran strategis dalam pengelolaan sumber daya alam, konservasi lingkungan, dan pembangunan sosial yang berkelanjutan. **Tujuan**: Penelitian ini bertujuan untuk mengetahui perkembangan riset dalam bidang preservasi pengetahuan lokal, mendokumentasikan studi-studi yang relevan dalam publikasi internasional, serta mengidentifikasi posisi riset terkait penguatan literasi informasi dan open science. **Metode**: Penelitian menggunakan pendekatan kuantitatif deskriptif dengan analisis bibliometric. Data diambil dari basis data Scopus selama periode 2014–2024. **Hasil**: Studi mengenai preservasi pengetahuan lokal banyak berfokus pada tema konservasi keanekaragaman hayati, pengelolaan sumber daya alam, dan pemberdayaan komunitas lokal. Namun, hubungan eksplisit antara preservasi pengetahuan lokal dengan literasi informasi dan open science masih kurang terintegrasi. Dari hasil penelitian ini, preservasi pengetahuan lokal memiliki potensi besar untuk memperkuat literasi informasi dan mendukung sains terbuka, namun integrasi strategisnya masih memerlukan pengembangan lebih lanjut. **Kesimpulan**: Studi ini memberikan gambaran tren penelitian global dan membuka peluang untuk mengintegrasikan pengetahuan lokal ke dalam sistem informasi yang lebih inklusif dan terbuka di masa depan.

Kata kunci: Analisis bibliometrik; Pengetahuan lokal; Preservasi pengetahuan; Literasi informasi; Open science.

I. INTRODUCTION

Background. Knowledge has become a valuable asset in this era of information transparency for strengthening individual capabilities. The development of global

knowledge is inextricably connected to local knowledge held by every sector in society. However, the rapid influx of information, foreign cultures, and technological developments poses challenges to local knowledge preservation in maintaining the cultural values that shape community identity and traditions.

Local knowledge preservation provides significant benefits to cultural heritage by strengthening community identity and ensuring social continuity. This process not only enriches understanding of the historical context but also deepens emotional bonds and a sense of belonging among the population (Chen, 2024). For example, indigenous communities such as Baduy in Indonesia can maintain cultural identity as a form of empowerment in the face of modernization, thereby strengthening social bonds among members (Pratiwi et al., 2024). Moreover, local knowledge preservation contributes to the development of a cultural narrative system that reflects community values and identity. Documenting and celebrating local elements can help maintain authentic cultural narratives and strengthen cultural revitalization, ensuring that future generations have access to rich history and traditions. Preservation not only safeguards cultural heritage but also promotes sustainable social development by integrating local values into current developments.

Knowledge preservation provides various strategic benefits, including strengthening learning processes, fostering increased innovation, facilitating efficient knowledge sharing, and reducing the risk of losing important information. Organized access to pre-existing knowledge enables individuals, groups, or organizations to understand the context, improve skills, and avoid repeating past mistakes. Furthermore, knowledge preservation creates a solid foundation for the development of new ideas, supporting innovation by leveraging existing insights (Agrifoglio, 2015). This is consistent with the concept of information literacy, where an individual ability to access, evaluate, and critically use information is key to processing both traditional and modern knowledge. Through information literacy, preserved knowledge is not only stored as a cultural archive but can also be used to provide innovation to address current challenges.

Effective preservation serves as a bridge between the past, present, and future, ensuring that knowledge accumulated over generations is not lost. These efforts include protecting historical documents, scientific data, and other important records from degradation caused by environmental factors, obsolete technology, or human negligence. By preserving knowledge, community can continue to learn from past experiences, foster innovation, and make better, more informed decisions. Ultimately, knowledge preservation is not only a technical responsibility but also a moral commitment to ensure that intellectual and cultural assets are passed on uninterrupted to future generations.

The availability of open information sources can foster collaboration between various stakeholders. This collaboration strengthens local knowledge and also improves community ability to obtain relevant information. More open access makes it easier for communities to understand, use, preserve, and develop local knowledge.

Aside from using local knowledge for information literacy, preservation also supports the availability of open information (open science). Local knowledge becomes an open resource when digitized and stored in accessible formats, such as databases or digital media. This transformation process facilitates easy sharing and distribution online, increasing accessibility (Chang et al., 2023). Digitized and openly available local knowledge facilitates cultural exchange and also fosters innovation. Local and broader communities can access and use this knowledge, thereby fostering cross-cultural collaboration and the rise of diverse, adaptive solutions to challenges.

Problems. Research on local knowledge preservation has primarily been conducted through anthropological, ethnographic, and cultural research, while bibliometric analyses specifically mapping research developments in this area remain very limited. Existing analyses generally emphasize only publication trends, authors, or productive journals,

without linking to the information literacy and open science frameworks that are crucial for ensuring the accessibility, sustainability, and use of local knowledge.

Previous Literature Review. Knowledge preservation is a strategic effort to safeguard information, data, and cultural heritage, ensuring availability for future generations. In terms of benefits, preservation saves historical records and also ensures contributions to education, research, data-driven decision-making, and strengthens the cultural identity of communities (Duranti & Franks, 2015). However, despite the benefits, knowledge preservation faces complex technical challenges, specifically those related to limited resources such as funding, expertise, and cutting-edge technology. System interoperability and sustainability are also crucial, as the formats and platforms used must be capable of communicating with one another while ensuring long-term data accessibility. In this context, the use of open source software and standards can be a strategic solution, as the universal and flexible nature, supported by global communities, enhances efficiency and sustainability. It also facilitates the creation of a more inclusive and collaborative knowledge preservation ecosystem (Alaoui et al., 2019).

Local knowledge is the collection of information, beliefs, traditions, practices, institutions, and worldviews developed and passed down by indigenous peoples and local communities through long-term interaction with the environment. This knowledge serves as an adaptive strategy that emphasizes the close association between humans and the ecological, socio-cultural, and spiritual contexts, making it relevant for addressing challenges across sectors, including health, nutrition, education, and environmental conservation, both locally and globally (Vandebroek et al., 2014). In contrast to universal scientific knowledge, the concept is highly contextual, reflecting the uniqueness of environment and culture, while offering practical insights into ecosystems, species, and natural resource management passed down through generations (Sutherland et al., 2014). This position makes local knowledge a valuable complement to conventional science, particularly in understanding biodiversity and ecosystem dynamics in areas less accessible to formal research. It is also a source of adaptive solutions based on direct experience in addressing global challenges such as climate change and natural resource conservation.

The use of local knowledge preservation to improve information literacy is evident across various communities in Indonesia. For example, in Minangkabau in Agam Regency, traditions, practices, and insights passed down through generations have been shown to strengthen literacy skills, such as the ability to search for, understand, and use information effectively when combined with modern information methodologies (Rahmah et al., 2024). This integration not only enriches individuals and community understanding of the social, cultural, and environmental context but also expands information management. Research in Banyumas found that local knowledge preservation plays a crucial role in landslide mitigation. Traditional practices internalized into disaster risk reduction policies reportedly increased community resilience and information literacy related to environmental hazards (Suwarno et al., 2022). This implies that local knowledge can provide valuable insights for decision-making and preparedness. When integrated with science-based approaches, it produces adaptive and sustainable solutions that strengthen community responsiveness to modernization and environmental threats.

Local knowledge preservation is closely associated with information literacy and the principles of open science, as both factors emphasize the importance of accessibility and dissemination of knowledge. Information literacy equips individuals to critically assess, use, and share local knowledge, facilitating the preservation of cultural values across generations (Wu, 2023). Open science fosters transparency and collaboration in research while opening up space for the integration of local knowledge into the scientific realm. By creating an ecosystem that recognizes and values local expertise, information literacy, and open science, together contributes to the development of a more inclusive approach to

knowledge creation and preservation. Ultimately, this approach is expected to broaden global understanding of cultural diversity and social practices.

Although bibliometric analysis has developed rapidly and is widely used across various scientific fields, the application to local knowledge preservation, information literacy, and the relationship to open science remains very limited. Most previous research has focused on conceptual investigations, case studies, or qualitative approaches. Publication data-based scientific mapping has also rarely been used to examine research dynamics in this area. Meanwhile, bibliometric analysis has proven capable of providing insights into the evolution of knowledge, identifying trends, and uncovering underexplored research gaps (Donthu et al., 2021; Tupan et al., 2018). Therefore, this research aims to use bibliometric analysis for mapping the development of publications on local knowledge preservation in relation to information literacy and open science principles. The results will provide methodological contributions while strengthening the theoretical foundations in this field.

State of The Art. This research integrated bibliometric analysis of local knowledge preservation into the information literacy and open science framework, resulting in a cross-disciplinary perspective not widely explored in previous research. The approach not only provides a mapping of scientific trends and collaborations but also positions local knowledge as part of open science.

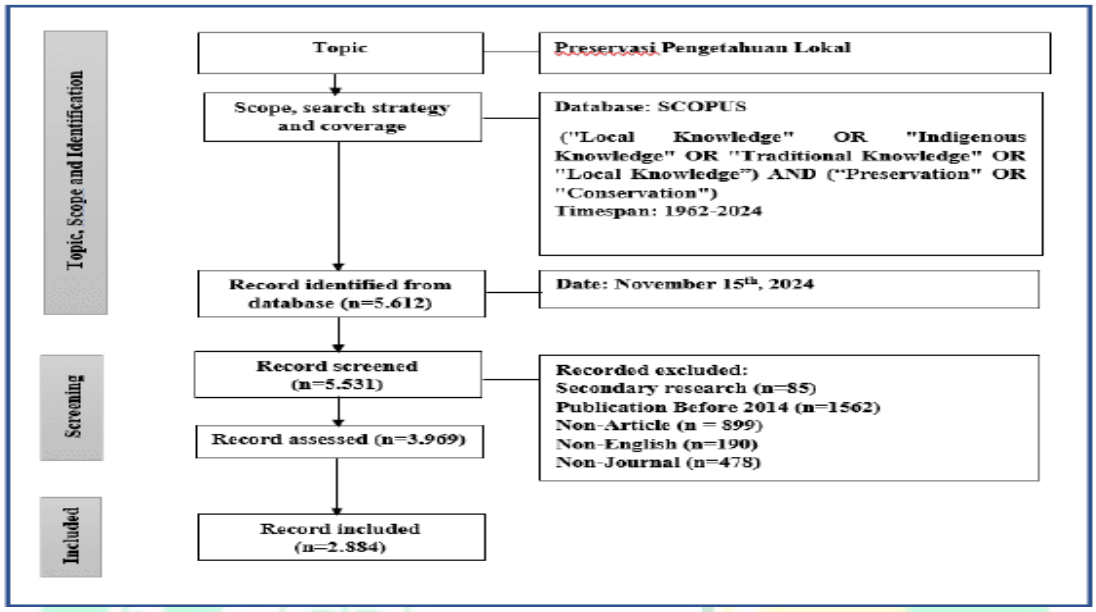
Purpose. Based on the literature review, this research focuses on local knowledge preservation in relation to strengthening information literacy and open science, using a bibliometric analysis to identify trending topics. The objective is to map the development of research on local knowledge preservation documented in international publications and examine the relevance to supporting information literacy and open science. The novelty of this research is grounded in the integration of bibliometric mapping results with information literacy and open science frameworks. It offers a new perspective on the role of preservation in the openness, sustainability, and accessibility of knowledge at the global level.

II. METHODS

This research adopted a descriptive, quantitative approach, using secondary data to examine trends in local, traditional, and indigenous knowledge preservation. The SCOPUS database was used as the primary source due to the high credibility, search engine flexibility, and extensive citation index coverage (Baas et al., 2020). The search was limited to the period of 2014 to 2024, resulting in a total of 2,884 records relevant to the topic. After data acquisition, a data cleaning process was performed using OpenRefine. This tool was used to remove duplicate keywords, correct inconsistencies, and improve the quality of the raw data, ensuring the analyzed data were accurate and representative. Subsequently, bibliometric analysis was conducted using Bibliometrix-Biblioshiny software, which enabled the identification of publication trends, author distributions, institutions, and collaboration patterns.

The analysis included an evaluation of key metrics, such as the number of citations and the most frequently used keywords in the literature. The results were visualized using VOSviewer to create a network map showing relationships among terms, researcher collaborations, distribution patterns by geography, and institutions. The search and data-cleaning processes are presented in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram.

Figure 1.
PRISMA Diagram



Source: VOS Viewer Data Processing (2024)

III. RESULTS AND DISCUSSION

Figure 2.
Main Information

Source: VOS Viewer Data Processing (2024)

Research on local knowledge preservation has experienced significant progress from 2014–2024. In the 10 years, 2,884 documents were published from 905 different sources, demonstrating the diversity of journals and publications. The annual growth rate of 9.13% indicates that this topic is gaining interest in scientific communities, with research contributions increasing every year. This growth reflects the relevance and potential significant impact of the research field on global science development. Furthermore, the increasing publication trend reflects the global urgency of achieving Sustainable Development Goals (SDGs), particularly those related to sustainable cities and communities (SDG 11), climate action (SDG 13), and terrestrial ecosystems (SDG 15). The average participation of nearly five authors per document and the relatively high citation rate (14.07 per document) confirm that local knowledge is increasingly recognized as a crucial resource for adaptation strategies, conservation, and sustainability innovation. This high level of global collaboration demonstrates that local wisdom is not only contextually valuable but also has universal significance for sustainable development.

The results showed over 11,394 authors, with an average of 4.81 per document. This underscores the importance of collaboration in modern scientific research, where diverse teams produce many documents. International collaboration is also a major strength, with

34.22% of the documents comprising authors from various countries. The data shows that the research is not only local but has a broad global scope. The 9,252 unique keywords used by the authors indicate that the research covers a rich range of topics and approaches, reflecting a diversity of perspectives in solving complex problems.

The impact of this research is evident in the average 14.07 citations per document, indicating that these publications are widely cited by other researchers, thereby strengthening credibility and influence in scientific communities. These documents were also supported by 159,356 references, indicating a strong theoretical foundation. The average age of the documents is 3.98 years, suggesting that the field remains relevant, with relatively recent and cutting-edge publications. Overall, these data reflect a positive dynamic and growth in research on local knowledge preservation, supported by extensive collaboration, innovation, and a significant impact on the development of global knowledge.

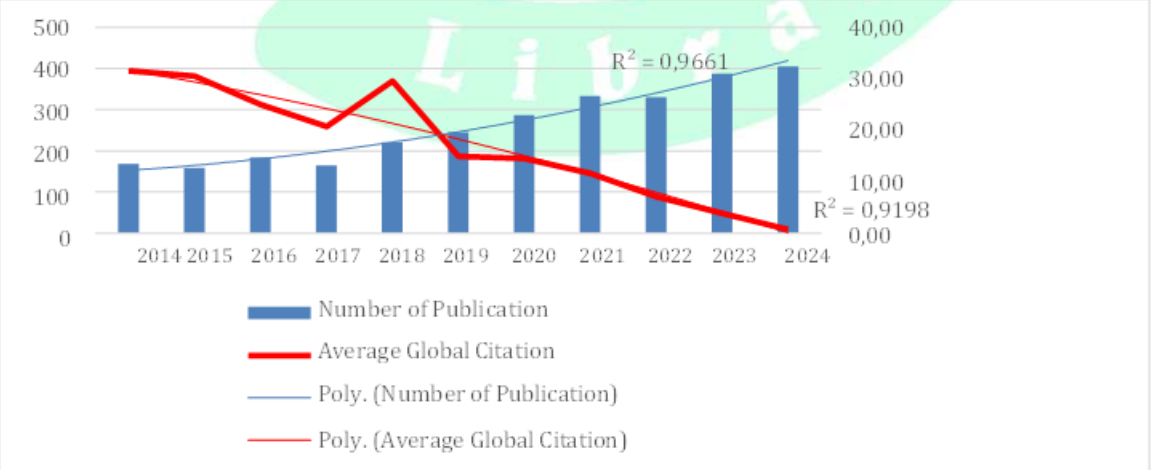
Performance Analysis in Current Research Developments, Publication Trends, and Annual Citations. Figure 2 shows the trend in publications and citations for the topic "Local Knowledge Preservation in Strengthening Information Literacy and the Availability of Open Information Sources". Based on the results, the highest number of documents was published in 2024, reflecting the continued increase in research activity during the 2014–2024 analysis period, with consistent year-over-year growth. This positive trend indicates that the topic is gaining popularity and attracting widespread attention among scholars. The increase in publications in recent years may reflect growing interest in specific issues or new developments in the field, spurring more research contributions.

The higher research activity is reflected in the growing number of researchers engaged in various projects, both individually and collaboratively. Cross-institutional and international collaborations are a major driver of the rising number of documents, reflecting a joint effort to deepen understanding of the topic. Furthermore, the diversity of themes and approaches contributes to the high volume of publications, making this topic a productive area of academia.

The citation trend for this research topic shows a decline in the average citation per document from 2014 to 2024. At the beginning of the period, published documents had a relatively high average citation rate, reflecting the large impact of the initial publications on scientific communities. However, over time, the average citation rate gradually decreased, even though the number of publications continued to increase significantly. This decrease in the average citation rate could be due to several factors. One significant factor is the increase in the number of published documents, which widens citation distribution across more publications, reducing the average citation rate per document.

Figure 3.

Trends for Number of Publications and Citations



Source: VOS Viewer Data Processing (2024)

The decreasing pattern in the linear polynomials for both parameters, publications and citations, indicates that although this topic has attracted considerable attention and generated a significant volume of publications, saturation may be present in some subtopics or methodologies. Therefore, it is important to continue analyzing the trend and exploring new areas in the topic to ensure continued growth and relevance. Continued research activity and a focus on quality and innovation are key to maintaining long-term relevance.

Table 1.
Top-10 Countries Based on Individual Authors

Country/Territory	Documents	Percentage out of Total
United States	439	15.08%
India	344	11.82%
United Kingdom	251	8.62%
Canada	211	7.25%
Brazil	210	7.21%
China	182	6.25%
Australia	178	6.11%
Indonesia	158	5.43%
South Africa	150	5.15%
Ethiopia	133	4.57%

Source: Study's Data, 2025

As shown in Table 1, the United States had the largest number of documents on local knowledge preservation research, with 439 documents, accounting for 15.08% of total publications. This position reflects the United States dominant role in global research, supported by abundant resources and highly active scientific communities.

Conversely, Ethiopia had the fewest documents, with 133, or 4.57% of total publications. Although the contribution is relatively small compared to other countries, this figure still demonstrates Ethiopia significant participation in global research, specifically considering the country potential limitations in resources.

Indonesia ranked eighth with 158 documents, accounting for 5.43% of total publications. The number demonstrates Indonesia significant role in the global context, as one of the few developing countries making substantial contributions. This may reflect the increasing attention to research and development in Indonesia, which possesses a rich diversity of local knowledge in indigenous communities. To further enhance contribution, the country can focus on improving research quality, cross-border collaboration, and developing stronger resources.

Most Active Journals. To assess the quality of research published in a particular field, the particular journal can be an important indicator. Table 2 shows a list of the top ten journals publishing research on this topic.

Table 2.
Top-10 Highest Journals

Rank	Journal	Docu-ments	Percentage out of Total	SJR	Quartile
1	Journal Of Ethnobiology and Ethnomedicine	185	6,41%	0,69	Q1
2	Ethnobotany Research and Applications	111	3,85%	0,32	Q1

3	Sustainability (Switzerland)	96	3,33%	0,67	Q1
4	Biodiversitas	56	1,94%	0,35	Q2
5	Journal of Ethnopharmacology	55	1,91%	0,94	Q1
6	Ecology and Society	42	1,46%	1,07	Q1
7	Indian Journal of Traditional Knowledge	41	1,42%	0,32	Q2
8	Plos One	39	1,35%	0,84	Q1
9	Ambio	33	1,25%	1,79	Q1
10	Environmental Management	33	1,14%	0,83	Q1

Source: Source: Study's Data, 2025

Table 2 shows information on the top 10 journals in local knowledge preservation research, including the number of documents published, percentage contribution to total publications, and journal quality, measured by Scimago Journal Rank (SJR) and quartile. Based on the number of documents published, the Journal of Ethnobiology and Ethnomedicine ranked first with 185, contributing 6.41% of total publications. This journal also ranked in Q1, indicating very high quality and esteemed respect in the academic world. Furthermore, Ethnobotany Research and Applications and Sustainability (Switzerland) also contributed significant numbers, accounting for 3.85% and 3.33% of total publications, respectively, and both ranked in Q1, indicating strong reputations in this field.

Other journals with fewer documents demonstrated excellent quality. Biodiversitas, with 56 documents or 1.94% of the total publications, and the Indian Journal of Traditional Knowledge, with 41 documents (1.42%), are in Q2. Biodiversitas and Indian Journal of Traditional Knowledge have SJRs of 0.35 and 0.32, respectively, indicating lower influence than Q1 journals, but still quite significant in the context of more focused research.

In terms of SJR, Ambio achieved the highest score of 1.79, indicating significant global impact and strong influence in scientific communities. SJR also reflects Ambio Q1 position, making it one of the most influential journals in the topic. Other journals, such as Ecology and Society (SJR 1.07) and Plos One (SJR 0.84), demonstrated significantly high SJR scores, despite having slightly lower document counts. This indicates that journal quality does not depend solely on the number of documents, but also on the journal influence and relevance in global scientific communities.

The trend of publications in the health and environmental fields indicates that indigenous community information literacy also plays a crucial role in public health, traditional medicine, and environmental conservation. Good information literacy can bridge local knowledge with open science principles, enabling the resulting information to be accessed, used, and developed more widely for the benefit of global health and environmental sustainability.

Table 3.
Top 10 Journal Impact for Number of Publications

Rank	h_index	h_index	h_index	TC	NP	PY_start
Journal Of Ethnobiology And Ethnomedicine	40	61	3.636	5046	185	2014
Journal of Ethnopharmacology	30	49	2.727	2520	55	2014
Ecology And Society	20	31	1.818	990	42	2014

Sustainability (Switzerland)	20	31	1.818	1189	96	2014
Plos One	19	33	1.727	1097	39	2014
Ambio	18	27	1.636	770	36	2014
Marine Policy	16	24	1.455	627	31	2014
Biodiversitas	14	20	1.4	539	56	2015
Ethnobotany Research and Applications	14	22	1.273	740	111	2014
Ocean and Coastal Management	14	19	1.273	423	33	2014

Source: Source: Study's Data, 2025

Table 3 shows a list of the top 10 journals based on the most impactful publications, presenting the number of publications (NP), h-index (h_index), g-index (g_index), m-index (m_index), total citations (TC), and publication start year (PY_start) of each journal. The Journal of Ethnobiology and Ethnomedicine has the highest h-index (40) and the highest number of publications (185) with a total of 5,046 citations since 2014. The Journal of Ethnopharmacology is ranked second in terms of productivity, with h-indexes of 30 and 55 publications, but a lower total number of citations, at 2,520. Other journals, such as Sustainability (Swiss), PLoS One, as well as Ecology and Society, show comparable h-indexes (20 or more), although the numbers of publications and total citations vary. More specialized journals such as Biodiversitas and Ethnobotany Research and Applications have relatively high numbers of publications (56 and 111, respectively), though with lower h-indices.

Table 4.
Highly Cited Document

No	Title	Author	Year	Total Citation	DOI
1	The use of focus group discussion methodology: Insights from two decades of application in conservation	Tobias O.Nyumba, Kerrie Wilson, Christina J. Derrick, Nibedita Mukherjee	2018	1286	10.1111/2041210X.12860
2	Ten golden rules for reforestation to optimize carbon sequestration, biodiversity recovery, and livelihood benefits	Alice Di Sacco, Kate A. Hardwick	2021	364	10.1111/gcb.15498
3	The Potential Role of Neglected and Underutilised rop Species as Future Crops under Water-Scarce Conditions in Sub-Saharan Africa	Pauline Chivenge, Tafadzwanase Mabhaudhi, Albert T. Modi	2015	315	10.3390/ijerph120605685
4	Citizen science: a new approach to advance ecology, education, and conservation	Hiromi K obori, Janis L. Dickinson,	2016	276	10.1007/s11284-015-1314-y

		A. J. Miller-Rushing			
5	From science to action: Principles for undertaking environmental research that enables knowledge exchange and evidence-based decision-making	C. Cvitanovic, J. McDonald, A.J. Hobday	2016	249	10.1016/j.jenvman.2016.09.038
6	Global trends of local ecological knowledge and future implications	Shankar Aswani, Anne Lemahieu Warwick H. H. Sauer	2018	238	10.1371/journal.pone.0195440
7	A new approach to modeling the sediment retention service (InVEST 3.0): Case study of the Cape Fear catchment, North Carolina, USA	Perrine Hamel, Rebecca Chaplin-Kramer, Sarah Sim, Carina Mueller	2015	236	10.1016/j.scitotenv.2015.04.027
8	Climate change adaptation: Linking indigenous knowledge with Western science for effective adaptation	Cuthbert Casey Makondo, David S.G. Thomas	2018	235	10.1016/j.envsci.2018.06.014
9	Ethnobotanical survey of medicinal plant species used by communities around Mabira Central Forest Reserve, Uganda	Patience Tugume, Esezah K. Kakudidi, Mukadasi Buyinza, Justine Namaalwa, Kalema	2016	214	10.1186/s13002-015-0077-4
10	A Rosetta Stone for Nature's Benefits to People	Sandra Diaz, Sebsebe Demissew, Carlos Joly	2015	196	10.1371/journal.pbio.1002040

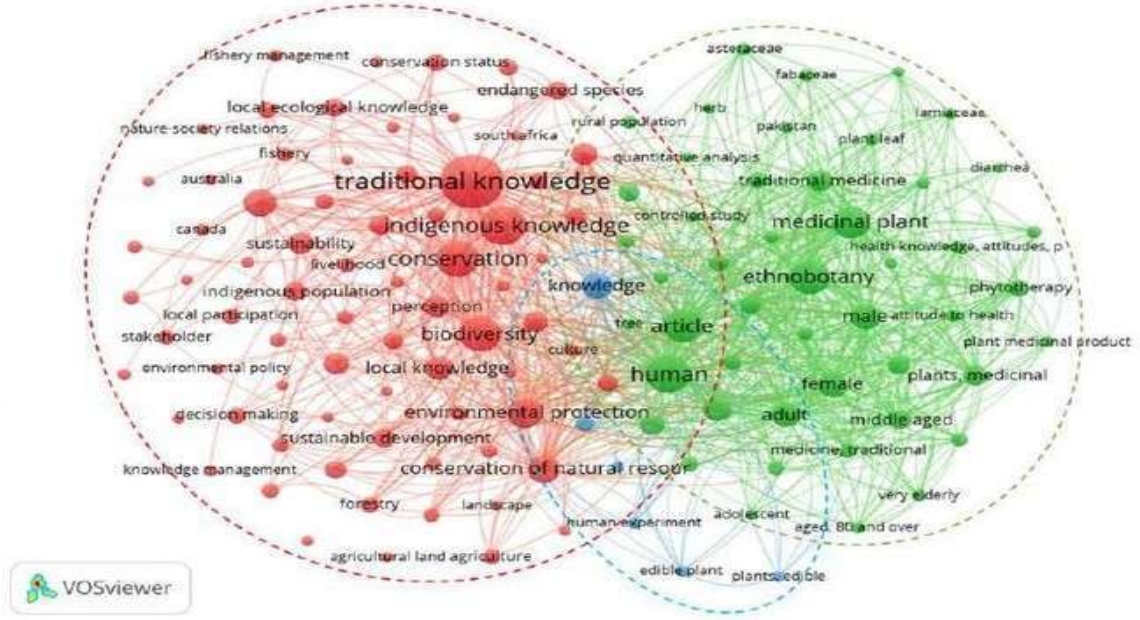
Source: Study's Data, 2025

Table 4 shows the 10 most cited documents for the period 2014-2024. The document with the most citations is "The use of focus group discussion methodology" by Tobias O. Nyumba et al. (2018), with 1,286 citations. The second and third-most-cited documents are "Ten golden rules for reforestation" by Alice Di Sacco et al. (2021) and "The Potential Role of Neglected and Underutilized Crop Species" by Pauline Chivenge et al. (2015), with 364 and 315 citations, respectively. Newer documents tend to have fewer citations due to the limited time to gain attention, but the impact can increase over time. The results reflect the diversity of research focuses and the influence in the field of local knowledge preservation.

Research Trends and Publication Mapping. When analyzing research trends on a particular topic, cluster formation in a diagram is crucial for understanding emerging thematic patterns. Each cluster represents a collection of interrelated terms or concepts. By analyzing these clusters, researchers can identify key themes and relevant trends, helping in the understanding of the interrelationships between concepts and the exploration of new

research directions. This approach enables the identification of patterns that might not be immediately apparent, helping in focusing on the most relevant and impactful topics (Mazov et al., 2020b). In network visualizations, keywords are depicted with circle labels, where the size and circle reflects the weight of each keyword. Keywords with higher weights have larger labels and circles. Furthermore, the distance between keywords in the diagram indicates closeness in the document context. The closer the distance, the more closely related the keywords. This approach helps researchers understand the patterns of interaction and relationships between themes in the research context (Waltman & Jan Van Eck, 2014).

Figure 4.
The Dynamics of Conceptual Structure's Network



Source: VOS Viewer Data Processing (2025)

Based on data processing using VOSViewer, 3 clusters related to the research topic of local knowledge preservation are presented in Table 5.

Table 5.
Keywords in Clusters

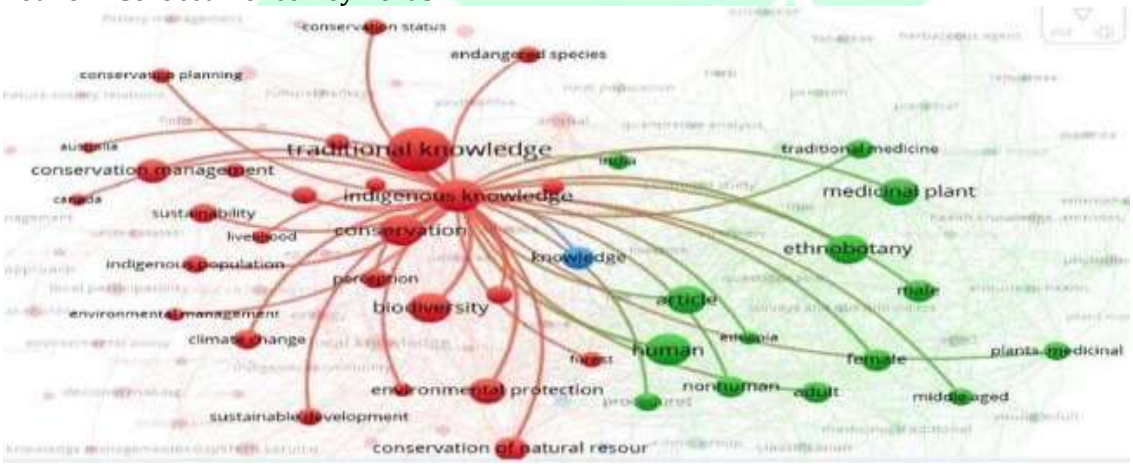
Cluster	Color	Keywords
Cluster 1	Red	Adaptive management; agricultural land; agricultural worker; agriculture; agroforestry; animal; animalia; Australia; biodiversity; biodiversity conservation; brazil; Canada; climate change conservation; conservation management; conservation of natural; conservation planning; conservation status; cultural heritage; culture; decision making; ecology; ecosystem; ecosystem service; ecosystems education; endangered species; environmental manager; environmental monitoring; environmental policy; environmental protection; fish; fishery; fishery management; food security; forest; forest management; forestry governance approach; indigenous; indigenous community; indigenous knowledge; indigenous community; indigenous population; knowledge management; land use; landscape; livelihood; local ecological knowledge; local knowledge; local participation; management practice; natural resource; nature conservation;

		nature-society relations; participatory approach; perception protected area;questionnaire survey; resource management; rural area; social-ecological system; south Africa; spatiotemporal analysis; species conservation;stakeholder; sustainability; sustainable development; traditional ecological knowledge; traditional knowledge; united states; water conservation; water management; wildlife management
Cluster 2	Green	adolescent adult; aged; aged, 80 and over; document; asteraceae; attitude to health; classification; controlled study; diarrhea; Ethiopia; ethnic group; ethnobotany; ethnomedicine; ethnopharmacology; fabaceae; female; fruit; health knowledge, attitudes, practice; herbaceous agent; human; india; interview; lamiaceae|; livestock; male; medicinal plant; medicine, traditional; middle aged; nonhuman; Pakistan; phytotherapy; plant leaf; plant medicinal product; plants, medicinal; procedures; quantitative analysis; questionnaire rural population; semi structured interview; species diversity; surveys and questionnaire; traditional healer; traditional medicine tree; very elderly; young adult
Cluster 3	Blue	China; edible plant; human experiment; knowledge; plants, edible

Source: Study's Data, 2025

- **Red Cluster (Conservation, Indigenous Knowledge)**
  The red cluster emphasizes environmental issues, with keywords primarily related to nature conservation, biodiversity, resource management, and indigenous community local knowledge. The focus is relevant to ecological sustainability and tradition preservation that foster environmental management.
- **Green Cluster (Ethnobotany, Medicinal Plants)**
  The primary focus of the green cluster is health, specifically the use of ethnobotanical knowledge and traditional medicinal plants. Issues arising include the interconnections between traditional health practices, plant-based medicine, and ethnomedicinal research.
- **Blue Cluster (Edible Plants)**
  The blue cluster focuses on food, particularly the potential of edible plants. Keywords such as edible plants open up research opportunities in food security, nutrition, and the development of food products based on local resources.

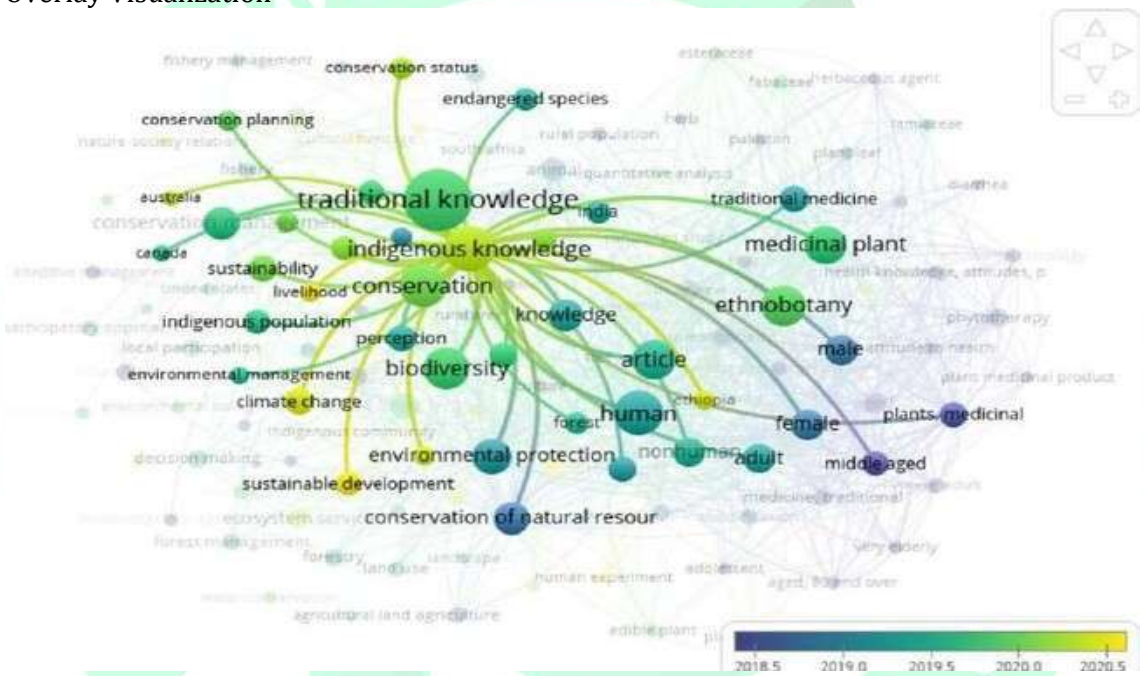
Figure 5.
Network Co-Occurrence Keywords



Source: VOS Viewer Data Processing (2025)

Based on the Co-occurrence visualization in VOSviewer, Figure 5 shows a close relationship between the keywords indigenous knowledge and conservation, which are in the red cluster, indicating a strong connection. Indigenous knowledge is connected to themes such as traditional knowledge, indigenous populations, local knowledge, and environmental issues, including climate change, sustainability, and environmental protection. This demonstrates the role of traditional knowledge in addressing global challenges. Meanwhile, conservation is related to terms such as biodiversity, conservation management, and sustainable development, indicating a focus on biodiversity conservation and environmental management. The relationship between these two keywords shows that indigenous knowledge plays a crucial role in supporting preservation efforts, including in natural resource management, ecosystem preservation, and local community-based adaptation strategies.

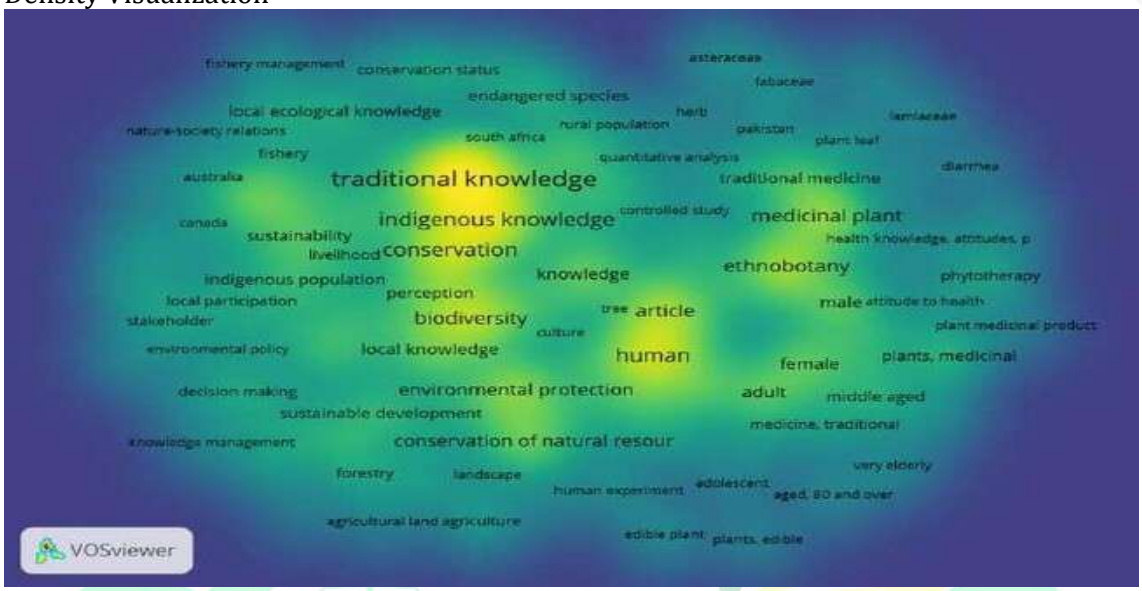
Figure 6.
Overlay Visualization



Source: VOS Viewer Data Processing (2025)

Figure 6 shows an overlay visualization illustrating the development of research-related terms over time, with colors indicating the time period during which each keyword was used. Green to blue colors indicate newer terms (around 2019-2020 and later), while yellow to green colors reflect older terms. Traditional and indigenous knowledge are at the center of the network, indicating the two terms position as a primary focus of research and the close relation to conservation, biodiversity, and environmental protection. Climate change, sustainability, and the indigenous population, colored green, indicate that these terms were already widely used before 2020, reflecting the early growth of research on the issues. On the other hand, terms such as medicinal plant, ethnobotany, and medicinal plants, colored blue, indicate that research on medicinal plants and ethnobotany has grown significantly in recent years

Figure 7.
Density Visualization



Source: VOS Viewer Data Processing (2024)

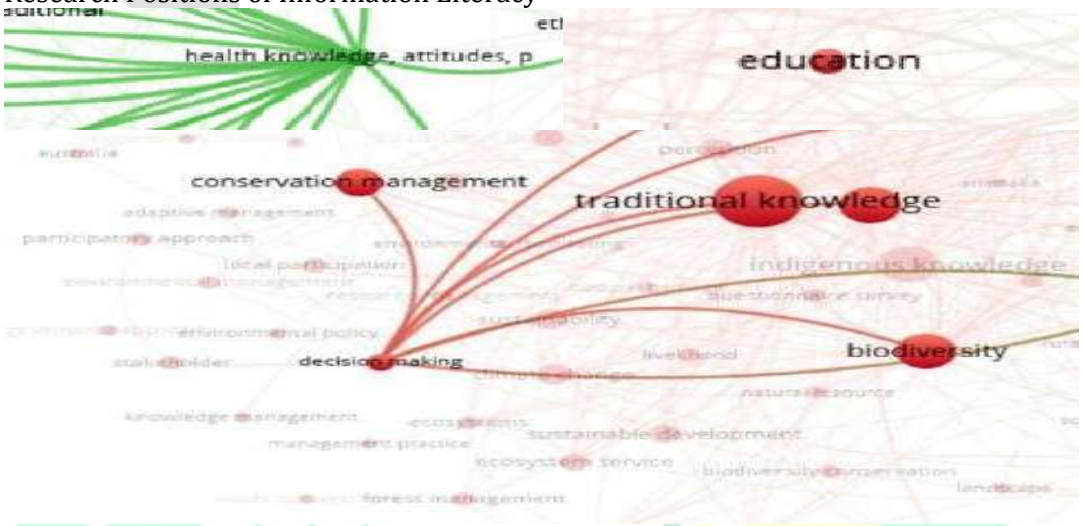
Figure 7, illustrating a density visualization, shows the distribution of keywords or terms that frequently appear in the research topic, visualized using VOSviewer software. Lighter colors (yellow) indicate areas with high term density, where certain keywords appear more regularly and are closely related to others nearby. Darker colors (blue or dark green) indicate lower term density. Terms such as "traditional knowledge," "indigenous knowledge," "biodiversity," and "conservation" have higher densities, indicating centrality to the topic being discussed. In addition, other terms such as "medicinal plant," "environmental protection," and "ethnobotany" also have significant densities, indicating a close relationship with the research topic.

Mapping of Scientific Knowledge Related to Types of Local Knowledge Preservation and Research Position.

1. Utilization of Information Literacy and Open Science
   The list of keywords presented in Table 7, related to local knowledge preservation for Information Literacy and Open Science, includes:
   - Health Knowledge, Attitudes, and Practices is a conceptual framework for understanding the relationships among health knowledge, attitudes toward health, and practices to maintain health.
   - Education is a systematic process for acquiring knowledge, skills, values, and habits. This process comprises teaching, training, discussion, and exploration to develop individuals and communities.
   - Decision-making is the process of selecting the best solution from several alternatives to achieve a specific goal.
   - Knowledge Management is the process of managing knowledge, such as valuable assets, enabling the use to improve work efficiency, foster innovation, and maintain competitive advantage (Bergeron, 2003).
   - Sustainability is the ability to meet current needs without compromising future generations. This concept requires a balance between environmental, social, and economic aspects.

2. Research Positions of Information Literacy and Open Science

Figure 8.
Research Positions of Information Literacy



Source: VOS Viewer Data Processing (2024)

Figure 8 shows that terms such as "Health Knowledge, Attitudes, Practice," "Education," and "Decision Making" are not directly connected to "Conservation" and "Indigenous Knowledge," reflecting the lack of research explicitly integrating local knowledge preservation with information literacy. This presents significant opportunities for research exploring how local knowledge, including indigenous traditions and practices, strengthens information literacy. The research can bridge the gap between local knowledge and modern science, strengthening community participation in decision-making.

Figure 9.
Research Positions of Open Science

Source: VOS Viewer Data Processing (2024)

Figure 9 shows that the keywords "sustainability" and "knowledge management" do not have a strong relationship with "conservation" and "indigenous knowledge." This presents an opportunity to explore how local knowledge preservation can be integrated into an open science framework. Presently, open science is becoming increasingly important as an approach to increase transparency, accessibility, and collaboration in research, enabling broad access to scientific data, methods, and results. Leveraging local knowledge in open science not only bridges the gap between modern science and indigenous traditions but also promotes sustainability through the active participation of local communities in production and management. This effort will

enrich the diversity of perspectives in science, accelerate innovation, and ensure that research has a significant impact on social, cultural, and environmental sustainability.

Discussion of Research Findings. The analysis shows that research on local knowledge preservation experienced significant growth in the 2014–2024 period, with consistent annual growth rates. The increase in publications, the diversity of topics, and the participation of researchers from various countries confirm that this issue is receiving growing attention globally. The extensive research on biodiversity conservation, natural resource management, and community-based practices underscores the strategic role of local knowledge in addressing environmental conservation challenges. These results are consistent with previous literature emphasizing the importance of integrating local knowledge into conservation (Vandebroek et al., 2014; Suwarno et al., 2022).

Despite the positive growth demonstrated, the analysis shows limited links between local knowledge preservation, information literacy, and open science. Although several publications address aspects of education, decision-making, and knowledge management, explicit links to information literacy and open science remain weak. This situation indicates a research gap that needs to be filled to bridge local knowledge traditions with the global agenda of open access and scientific collaboration. The results strengthen the idea that local knowledge preservation has significant potential but has not been fully utilized in a more inclusive information ecosystem.

The relatively high level of international collaboration suggests that research in this field is multidisciplinary and cross-border. However, the contributions of Indonesia and other developing countries remain relatively small compared to those of developed countries. This situation presents an opportunity for developing countries to improve research quality, strengthen global collaboration, and integrate local knowledge into information literacy and open science discourse. The results emphasize the need for more research focused not only on conservation but also on developing strategic models that connect local knowledge with global information needs, thereby contributing to the sustainability of science and cultural preservation.

Research Limitations (Disclaimer). This research has limitations, for example, the data were sourced only from the Scopus database covering 2014–2024. Therefore, the analysis results do not reflect the full range of publications on local knowledge preservation, which may also be found in other databases or non-indexed literature. The bibliometric approach used is descriptive and does not fully show the qualitative dimensions of the socio-cultural context, community practices, or relevance to information literacy and open science

IV. CONCLUTION

In conclusion, research on local knowledge preservation continues to grow annually, with a primary focus on cultural preservation, traditional knowledge, and biodiversity management. Existing research shows how local knowledge can support natural resource management, traditional agricultural practices, and community-based conservation approaches. The results also indicate a steady increase in the number of publications and authors participating each year. Local community plays an active role in the use of traditional knowledge, which supports sustainable conservation strategies. However, there is still a gap in developing practical strategies, including the documentation, digitization, and integration of local knowledge into a global information system that is easily accessible to all parties.

Research positions related to local knowledge preservation were identified to strengthen information literacy and open science. The results show that although information literacy and open science have significant potential to support local knowledge preservation, the topic has received relatively little attention in international scientific

publications. This indicates the need for further research to connect local knowledge preservation with the information literacy and open science agenda, thereby creating opportunities for broader collaboration in supporting information access and cultural sustainability.

Future Work. This research offers opportunities for more development through qualitative analysis that examines methodologies, theoretical approaches, and community practices in local knowledge preservation. Future research could also use altmetrics or academic social networks to gain a more comprehensive understanding of the impacts and patterns of collaboration. Furthermore, cross-country and cross-disciplinary comparative research are needed to examine variations in the application of information literacy and open science. Further investigations are expected to produce a strategic model, supported by robust data, that can be used by institutions, libraries, and policymakers to develop open, inclusive, and sustainable local knowledge preservation strategies.

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