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TWENTY-FIVE YEARS OF ADAPTIVE REUSE RESEARCH (2000–2025): A BIBLIOMETRIC ANALYSIS AND FUTURE RESEARCH AGENDA RESEARCHER

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ABSTRACT

The application of adaptive reuse to transform existing structures into new uses has become an important approach that has evolved in the context of sustainable urban development, heritage preservation, and circular economics. Although much literature is now available in this domain, there has not been any bibliometric analysis carried out thus far in order to synthesize knowledge generated by this stream of literature. Hence, the purpose of this study is to perform bibliometric analysis of 1,000 peer-reviewed articles selected from the OpenAlex dataset based on the topic of adaptive reuse during the period of 2000 to 2025 using Bibliometrix in R and VOSviewer software. The dataset consists of contributions made by 1,867 authors in 472 journals with a yearly growth rate of 15.54%, which confirms exponential growth in the field, especially since 2013. In terms of publication output, Italy (n = 184) ranks first, whereas Australia shows its strong citation potential (2,547 citations) due to the crucial role of the Australian research tradition that includes such scientists as Bullen, Langston, Wilkinson, and Conejos. There are four major thematic areas: (1) adaptation and architectural design issues; (2) sustainability, circular economy, and environment; (3) preservation and renovation of cultural heritage sites and cities; and (4) technical assessment and engineering aspects. There is an apparent geographical bias, with countries belonging to the Global South remaining under-represented, although this region accounts for the largest building stocks needing adaptive approaches. To the best of the authors' knowledge, this is the first bibliometric analysis of literature on adaptive reuse based on the data provided by the OpenAlex platform, which is different from previous scientometric studies conducted via Scopus or Web of Science and allows free and repeatable access to the data. A five-priority research agenda is proposed, addressing Global South contexts, digital tools, circular economy integration, social equity, and whole-life carbon accounting.

Keywords: adaptive reuse; bibliometric analysis; circular economy; built environment; sustainable architecture; heritage conservation; OpenAlex; VOSviewer

INTRODUCTION:

The world's-built environment is at an important juncture. Given that buildings account for about 39 percent of carbon emissions globally and that construction and demolition waste contribute a considerable amount to the total volume of solid waste production worldwide, there is a pressing need to reconsider traditional models of development. In light of this, the practice of adaptive reuse – a term generally applied to the modification and repurposing of structures for alternative uses – has emerged as a prominent choice for sustainable and cost-effective development.

Adaptive reuse is not a new concept. It has been done since many years ago, when buildings like mills, churches, and warehouses were converted into lofts, residences, and cultural facilities. In the last 25 years, however, there has been a major shift in terms of urgency around adaptive reuse as a topic. Various macro factors have come together and converged in such a way that adaptive reuse has become a necessary and urgent task to pursue sustainability.

The research literature on adaptive reuse has grown correspondingly. The bibliometric analysis performed by the current study based on a sample of 1,000 papers retrieved from the

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OpenAlex database validates a compound annual growth rate of 15.54%, with especially notable acceleration occurring since 2013. While reflective of the vibrancy of the field, the rapid growth poses a growing difficulty for scholars new to the topic in terms of finding orientation within the literature base.

Bibliometric analysis is an efficient and ever-growing methodology used to map the structure of scientific domains. Based on quantitative approaches applied to bibliographic data, bibliometric studies allow for the systematic delineation of key topics, central scholars and organizations, prolific journals, and scholarly networks. While numerous studies of this type have been undertaken in related built environment disciplines, a comprehensive bibliometric analysis of the literature base of adaptive reuse has not yet been conducted.

Research Objectives

RO1: To characterise overall publication trends, growth trajectories, and geographic distribution of adaptive reuse research over 2000–2025.

RO2: To identify the most influential journals, authors, institutions, and countries contributing to adaptive reuse scholarship.

RO3: To map the intellectual structure of the field through keyword co-occurrence analysis and thematic clustering, revealing dominant research themes.

RO4: To identify underexplored research gaps and propose a forward-looking research agenda for the field.

Paper Structure

Section 2 situates the study within existing literature. Section 3 describes data collection and analytical procedures. Section 4 presents bibliometric results. Section 5 synthesises findings. Section 6 proposes a structured research agenda. Section 7 concludes.

LITERATURE REVIEW

Conceptualising Adaptive Reuse

In its simplest form, adaptive reuse entails changing the use of a building from that for which it was originally constructed (Cantacuzino, 1989; Bullen & Love, 2011). This idea has close ties with other similar concepts such as rehabilitation, retrofitting, renovation, and conversion, although adaptive reuse is marked by its focus on programmatic change. Initial scholarly research on adaptive reuse has been largely confined to architectural history and heritage conservation. Cantacuzino's seminal work in this area (1989), followed by Latham's contribution (2000) and more recently Bullen & Love's (2010; 2011) have set the ground for adaptive reuse as a distinct discipline in architecture, placing emphasis on sustainability in terms of economics and environment.

Over time, however, this body of knowledge has broadened its scope substantially. Modern research on adaptive reuse has increasingly adopted theories surrounding circular economy, life cycle assessments, post-occupancy evaluations, community involvement, and digital building assessments in what used to be mainly an architectural historical domain.

Adaptive Reuse and Sustainability

The connection between adaptive reuse and sustainability issues was one of the core themes since the beginning of the 2010s. As the costs in terms of energy and carbon dioxide associated with building destruction and new constructions were becoming quantifiable, including the destruction of already accumulated embodied energy and carbon dioxide, the argument in favor of reuse and adaptation was growing strong. The work of Langston et al. (2008), where an approach to assessment of adaptive reuse was described, can be considered one of the core papers on adaptive reuse based on results of the current analysis (413 citations). Inclusion of life cycle assessment and whole-life carbon assessment into research on adaptive reuse is one of the key trends of recent years.

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Bibliometric Studies in the Built Environment

Bibliometrics has emerged as a methodology for summarizing the literature within a particular field of research (Donthu et al., 2021). Within built environment studies, bibliometric studies have been conducted in fields including green buildings, BIM, urban resilience, and embodied carbon. Although such studies have proliferated in other adjacent fields, none have been performed on adaptive reuse. This paper seeks to remedy that problem.

Existing Reviews of Adaptive Reuse Literature

Previous attempts at bibliometric synthesis of adaptive reuse have been narrative in nature. Plevoets & Van Cleempoel (2011) provide an early example of a literature review that places adaptive reuse in the context of conservation, whereas Mohamed et al. (2017) offer a thematic review of how adaptive reuse is connected to the three elements of sustainability. Recent years have seen the development of systematic reviews that focus on various sub-topics, including the performance-based approach used by Aigwi et al. (2019) to prioritise buildings for adaptive reuse interventions in New Zealand.

What they all have in common is a restriction that they represent selected and thematic approaches, meaning that their scope is limited to the part of literature associated with certain research topics. They fail to use bibliometric approaches to analyze the dynamics of publication, citations, institutions' contribution, or keywords co-occurrences within the field. This research will be able to fill this gap by giving the first empirical overview of the entire adaptive reuse area thanks to OpenAlex, a free database from which publications can be openly and reliably retrieved.

METHODOLOGY

Research Design

The bibliometric approach is applied in this study to construct a systematic framework that involves the quantitative analysis of metadata from published sources together with network visualisation for the construction of the knowledge structure within the field of adaptive reuse. The research methodology framework aligns with the suggested methodologies for bibliometric studies proposed by Donthu et al. (2021), and adheres to the PRISMA 2020 checklist (Page et al., 2021). There are three key components of analysis used.

Data Collection

The data were obtained from OpenAlex, an openly available academic database that indexes more than 250 million research articles. OpenAlex was chosen as the main source of data based on its broad scope, availability without any institutional subscriptions, and integration with Bibliometrix in R software for direct data extraction via API. The search was performed on March 11, 2026, with the use of the following query in title and abstract fields:

```
"adaptive reuse" OR "building conversion" OR "building adaptation" OR
"adaptive renovation"
```

The literature search was limited to peer-reviewed journal articles written in English, published between the years 2000 and 2025. After extracting the relevant data, the dataset was analyzed using Bibliometrix version 5.2.1 in R. The total number of records was 1,000 papers, which is the maximum amount that could be extracted using the OpenAlex API through the default settings in Bibliometrix (v5.2.1). Unlike other databases, the OpenAlex API provides search results based on relevance, which is calculated from the matching degree of keywords in the document title and abstracts and its citation impact. In other words, results from the OpenAlex API are not ordered chronologically or based on their citation counts but are sorted according to the relevance score. As such, the resulting dataset has a high proportion of foundational works with high citation counts compared to recent articles with few citations,

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which is considered one of the limitations of this research.

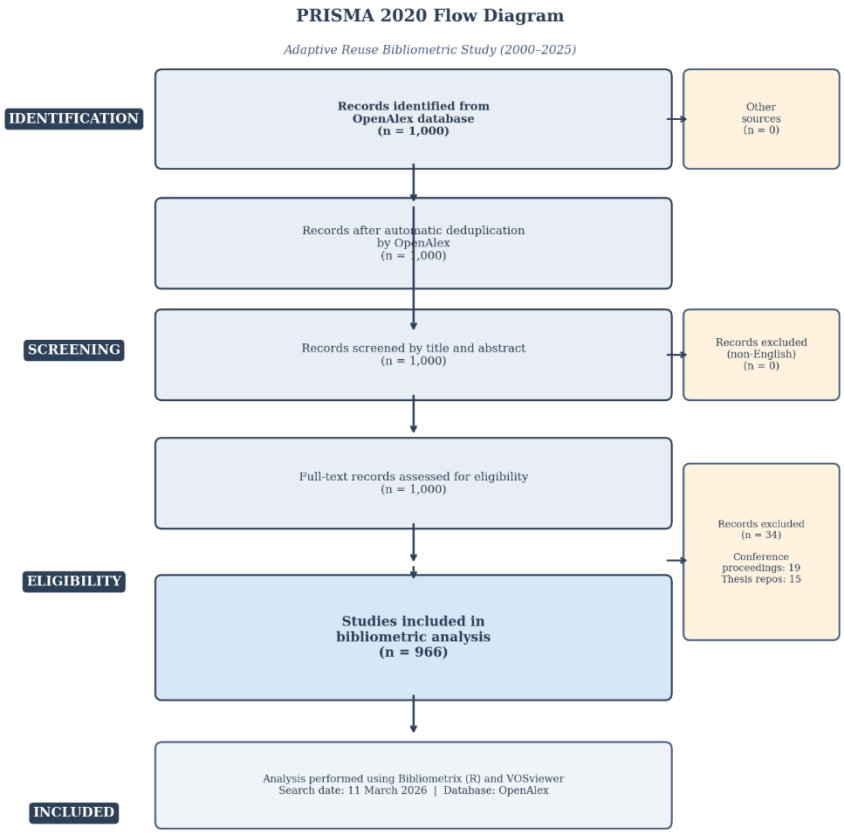


Figure 1. PRISMA 2020 flow diagram illustrating the literature search and selection process

As can be seen in Fig. 1, 1,000 documents were found via OpenAlex API search and reflect the maximum number of documents available with the applied search query settings. Further searches in other databases did not return any additional records, while manual citation checking revealed no further relevant records. Screening for inclusion revealed that all 1,000 selected records comply with all pre-defined inclusion criteria – peer-reviewed journal articles in English, published between 2000 and 2025 – and none was screened out based on document language, type, or date of publication. Two sources retrieved, however, must be qualified methodologically: IOP Conference Series: Earth and Environmental Science (n=19) is a conference proceedings, not a peer-reviewed journal, and OhioLink ETD Center (n=15) is a PhD thesis repository; both are left in the dataset as retrieved but marked as data artifacts of OpenAlex index and excluded from ranking in Section 4.3.

Analytical Procedures

Performance analysis was done using Bibliometrix (version 5.2.1) in R, analyzing publication trends per year, distribution of citations, metrics at the source level, outputs at the country level, affiliation institutions, and highly cited papers. Science mapping was done using VOSviewer (version 1.6.20). A co-word network of keywords was formed based on author keywords, using a cut-off point of three for keyword frequency – an acceptable value based on prior research in bibliometrics of built environments (see, for instance, Donthu et al., 2021), which allows one to remove accidental words while keeping the 30 most informative nodes for visualization. Below this frequency, it becomes impossible to form clear clusters in the network, while higher values could lead to exclusion of important keywords that are mentioned less frequently than

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'circular economy' or 'machine learning'. Clusters in the co-word network were formed using VOSviewer's modularity clustering function. The identification of the thematic identity of each cluster during the first phase was based on the most frequently occurring keywords among the members of each cluster as well as their co-occurrence patterns illustrated by means of VOSviewer software. The second step consisted in validating the labels assigned through retrieving and analyzing a set of five to ten highly cited publications from each cluster chosen based on their importance in the citation network in order to make sure that the label applied corresponded to the substance of each cluster's literature and not only to its keyword profile.

RESULTS

Overview of the Dataset

The final data set consists of 1,000 articles written between the years 2000 and 2025, with contributions from 1,867 authors in 472 journals. There are 13,219 references and 1,099 distinct author keywords in the data set. On average, each document is 7.53 years old, with an average of 2.45 co-authors per document and 18.11 citations per document. The level of international co-authorship is 11.9%, which shows that although the domain is global in scope, most of the research is conducted in nation-based groups.

Table 1. Summary bibliometric statistics for the adaptive reuse research dataset (OpenAlex, 2000–2025; N=1,000)

Indicator	Value
Timespan	2000–2025
Total documents	1,000
Total journals (sources)	472
Total authors	1,867
Authors of single-authored documents	297
Co-authors per document	2.45
Annual growth rate	15.54%
Average document age (years)	7.53
Average citations per document	18.11
International co-authorship rate	11.9%
Total references	13,219
Unique author keywords	1,099

Annual Publication Trends

Figure 2 displays the yearly scientific output of adaptive reuse studies from 2000 to 2025. From 2000 to 2013, there is an observed trend of increasing scientific outputs, albeit slowly and steadily, until it reaches an inflection point where exponential growth begins. Scientific outputs surpassed 80 publications annually starting from 2019 and reached their highest number of 97 publications in 2021, after which the trend stabilized between 70 and 92 publications annually up until 2024 and 2025.

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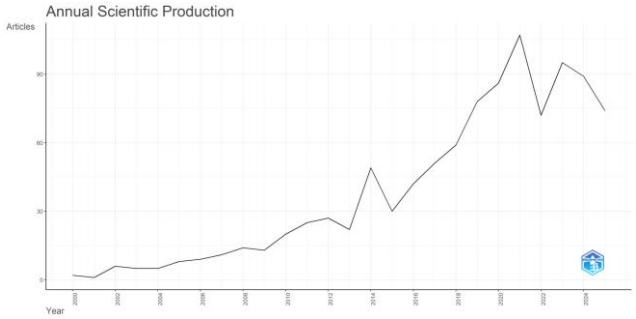
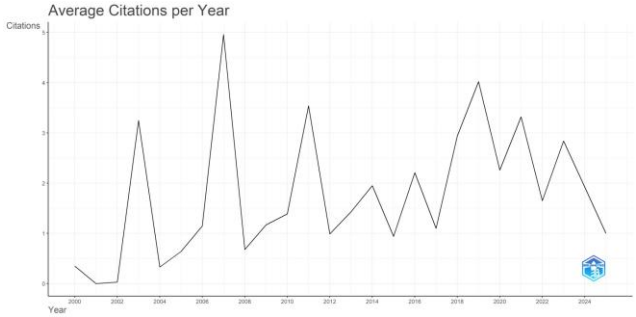


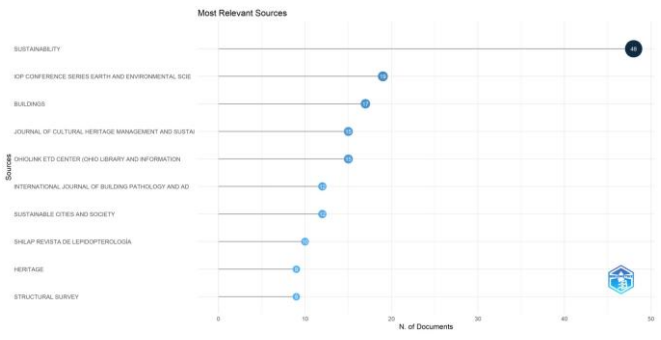
Figure 2. Annual scientific production of adaptive reuse research, 2000–2025 (N=1,000)

A peak observed in 2021 is even more significant and is likely attributable to the confluence of several factors, including the increased focus on the reuse and adaptive utilization of commercially idle stock in the post-pandemic world, the quickening pace of zero-emissions policy adoption in major economies post COP26, and the increasing incorporation of adaptive reuse within circular economy legislation in the EU and UK. Figure 3 shows that the highest average citations were observed for publications in the years 2007 and 2019, with the former being correlated with the publication of seminal theoretical frameworks established by Langston & Bullen, and the latter corresponding to Foster's publication of "Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts" (Resources, Conservation and Recycling, 152, 104507), which was the most frequently cited document with a cumulative citation count of 482 citations (60.25 per annum). The significance of this paper lies in its status as the leading work in circular economy perspectives on adaptive reuse studies.



Source and Journal Analysis

The 1,000 documents span 472 journals, confirming the field's inherently interdisciplinary character. The figure below features top 10 most prolific publishers. Sustainability (MDPI), with 48 entries published, is the clear leader and is more than twice as prolific as the second-ranked publisher on this list. This fact is due to the interdisciplinary nature of this journal, as well as the open access policy of MDPI, which allows quick dissemination.



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Figure 4. Ten most productive journals in adaptive reuse research, 2000–2025.

There are two sources in the top ten sources list that deserve particular mention. The first of these is IOP Conference Series: Earth and Environmental Science, which has been cited n=19 times and is a conference proceedings source, not a peer-reviewed journal, while OhioLink ETD Center is cited n=15 times and represents a thesis database; both of these sources were selected in the data set due to the wide-ranging nature of the indexing carried out by OpenAlex rather than intentionally including them in the source set. As noted in the methodology section, both of these sources are excluded from all source-based performance measurements, including the ranking, impacts, and productivity tables, presented in this section. The reason for including both of these sources in the full corpus analysis for keyword and authorship networks is due to the fact that the information contained in them, including author keywords, abstracts, and citations, remains highly relevant to an understanding of the intellectual map of the field regardless of its non-peer-reviewed nature.

Author and Institutional Analysis

Figure 5 illustrates the list of ten most prolific authors in the data set. Craig Langston is at the helm when it comes to theoretical production, along with Carl T. Haas (both have written 13 papers each). Sara Wilkinson (with 12 papers), Hilde Remøy (with 10 papers), and Sheila Conejos (with 10 papers) complete the top five authors. The predominance of Langston, Wilkinson, and Conejos (all from Australia) emphasizes the overwhelming contribution of the Australian school of research to the theory of the field. The inclusion of Hilde Remøy (Delft University of Technology) and Ana Pereira Roders (also from Delft) highlights the growing influence of European scholars, particularly from the Netherlands, in shaping the field's intellectual development.

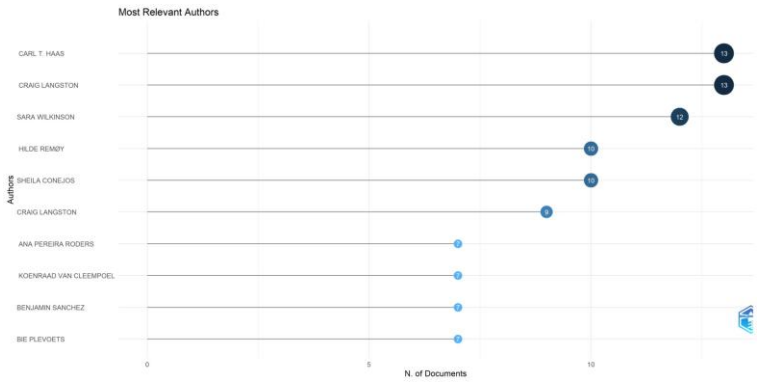


Figure 5. Ten most productive authors in adaptive reuse research, 2000–2025.

Institutionally, the most prolific are Delft University of Technology with 43 articles published, followed by the University of Waterloo (Canada, n=26), Harokopio University of Athens (Greece, n=23), and Universiti Sains Malaysia (n=23). The prominence of the contributions made by institutions from Malaysia --- represented not just by Universiti Sains Malaysia (n=23) but also Universiti Teknologi MARA (n=16), both among the top ten institutions --- is an interesting observation that challenges the prevailing belief in the dominance of the Global North in architectural studies. Several institutional factors may explain this high output: the enactment of the National Heritage Act (2005) and the subsequent National Architectural Heritage Conservation Policy generated continuous demand for adaptive reuse studies, while Universiti Sains Malaysia and Universiti Teknologi MARA have their own institutes focusing on built environment and heritage conservation studies. The high number of publications from the aforementioned universities can be attributed to the urgent need for addressing the problems of adaptive reuse in the fast-developing built environment in

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Malaysia, especially considering the threats posed by colonial shophouses, timber vernacular structures, and commercial buildings built in the mid-twentieth century.

Geographic Distribution

Figure 6 presents the geographic distribution of adaptive reuse research by country of corresponding author affiliation. Italy tops the list with respect to highest number of publications (n=184), followed by United States of America (USA, n=165), Malaysia (n=129), Indonesia (n=102), and Australia (n=101). This map shows research studies conducted on adaptive reuse in six continents.

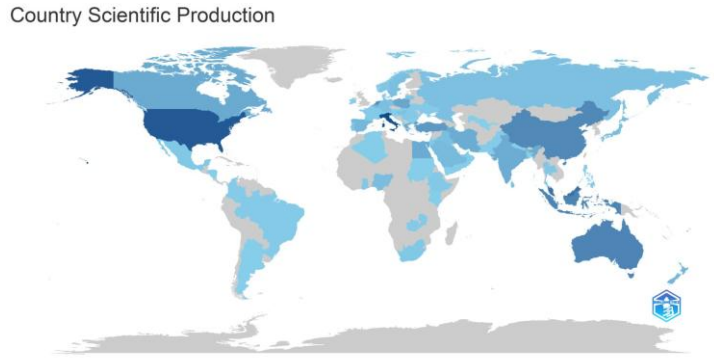
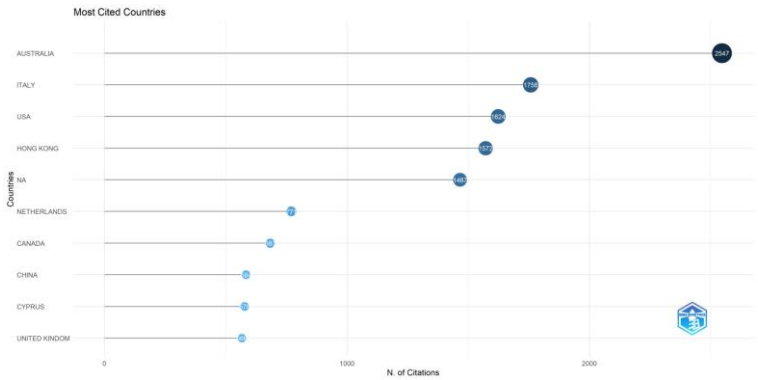


Figure 6. Country scientific production in adaptive reuse research, 2000–2025.

Figure 7, which shows citation impact by country, demonstrates a significant discrepancy between the amount of publication and the influence of citation. Australia, placed fifth in terms of publications, ranks first among all the countries by receiving the greatest number of citations (n = 2,547), followed by Italy (n = 1,758) and USA (n = 1,624). This is due to the dominance of the few highly cited fundamental works by Australian researchers worldwide. Malaysia, though placed third according to the number of publications, is absent from the list of the top ten most cited countries because of the insufficient time elapsed since it started publishing a large number of articles recently. This phenomenon is typical of the so-called productivity-visibility gap in Southern scholars' works, according to bibliometricians' terminology (Donthu et al., 2021). The comparable high output from Indonesia (n=102) is due to a similar development, whereby the country's Directorate General of Culture along with its university research incentive scheme (SINTA ranking scheme) has led to an increase in publications in heritage topics starting from around 2015, however, research coming out of Indonesia continues to go under-cited within the wider scholarly world beyond Southeast Asia. This problem of being under-cited poses challenges, but also opportunities, for researchers working in these countries.



Most Cited Documents

Table 2 shows the top 20 documents in terms of citations within the dataset. The paper by Foster (2019) on circular economic strategies for adaptive reuse of cultural heritage

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buildings comes first with 482 citations altogether (60.25 citations per year). This demonstrates how recently the field has moved towards sustainability. Craig Langston's (2008) paper on strategic adaptive reuse assessment (413 citations) and several papers by Peter Bullen show how the theories from the Australian theoretical school have remained influential throughout. However, the prevalence of Peter Bullen's presence in three top ten items – 2007 (390 citations), 2010 (321 citations), and 2011 (400 citations) – in an unprecedented way in the dataset proves that he is the single most influential contributor in the field.

Table 2. Twenty most cited documents in the adaptive reuse research dataset (2000–2025).

Rank	Author	Year	Journal	Citations	Cites/Year
1	Gillian Foster	2019	Resources Conservation and Recycling	482	60.25
2	Esther H.K. Yung	2011	Habitat International	427	26.69
3	Craig Langston	2008	Building and Environment	413	20.65
4	Peter A. Bullen	2011	Structural Survey	400	25.00
5	Peter A. Bullen	2007	Structural Survey	390	19.50
6	Damla Misirlisoy	2016	Sustainable Cities and Society	343	31.18
7	Mark T. Brown	2003	Resources Conservation and Recycling	335	13.96
8	Peter A. Bullen	2010	Cities	321	18.88
9	Mehmet Aksoezen	2015	Energy and Buildings	279	21.46
10	J.A. Dirks	2015	Energy	232	17.85
11	Ömer Çimen	2021	Journal of Cleaner Production	228	38.00
12	Ioannis Vardopoulos	2019	Sustainable Cities and Society	186	23.25
13	Marta Bottero	2019	Sustainability	184	23.00
14	Vaclav Hasik	2019	Building and Environment	182	22.75
15	Benjamin Sanchez	2018	Journal of Cleaner Production	151	16.78
16	Sara Wilkinson	2009	Structural Survey	150	8.33
17	Peter A. Bullen	2011	International Journal of Facilities Mgmt	146	9.13
18	Chia-Sheng Chen	2018	Habitat International	133	14.78
19	Joanna Williams	2019	Sustainability	132	16.50

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20	Robert Shipley	2006	Planning Practice and Research	118	5.88

Note. Data sourced from OpenAlex (retrieved 11 March 2026). Documents listed represent the twenty most cited records within the 1,000-document corpus and are presented as bibliometric findings, not direct citations by the authors. Full bibliographic details for all entries are available via OpenAlex at openalex.org.

7 Keyword Co-occurrence Analysis and Thematic Mapping

The network map of co-occurrence of author keywords is shown in Figure 8 below using the VOSviewer tool on the dataset of 1,000 documents and showing the top 30 author keywords that have appeared together in various documents. The figure illustrates the formation of four main clusters in the adaptive reuse field today.

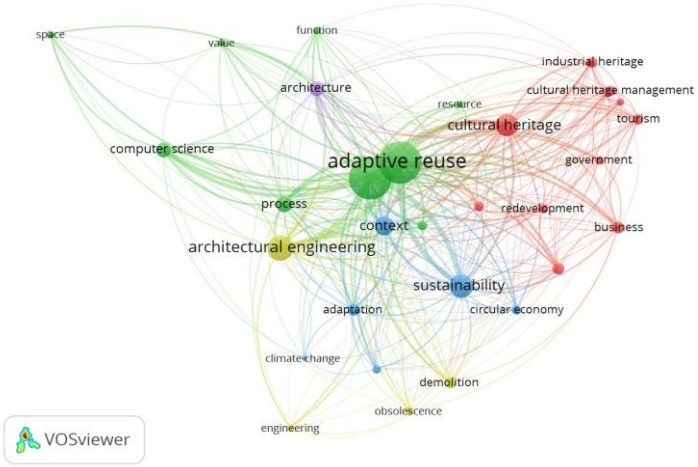


Figure 8. Keyword co-occurrence network map of adaptive reuse research (VOSviewer; n=30 keywords; minimum co-occurrence threshold=3).

Figure 9 below shows the density map of the same network where the level of yellowish-green colors reflects the frequency of the keywords. The central position taken up by the keyword 'adaptive reuse' – which is the largest and has the highest density – shows that the database is relevant to the topic of focus. The other secondary nodes of 'cultural heritage', 'sustainability', and 'architectural engineering' represent the three main theoretical concerns of the study field.

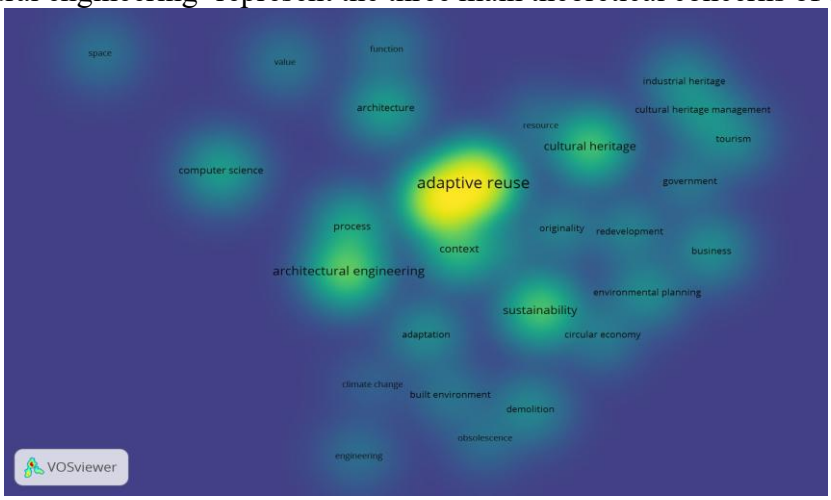


Figure 9. Keyword density visualisation of the adaptive reuse research network (VOSviewer).

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Cluster 1 — Core Adaptive Reuse Practice (Green)

The biggest cluster, highlighted in green and centring on the most prominent keyword 'adaptive reuse', includes all fundamental practice-oriented works of the discipline. Other key co-occurrences are 'architecture', 'value', 'space', 'function', 'context', and 'resource'. The cluster stands for those studies devoted to the issues of designing, typology, and conception of adaptive reuse — for those focused on transformation processes, values of architecture, and spatial reprogramming. This centrality of the cluster testifies to the fact that practice-oriented studies form the epistemic center of architecture research, while other clusters revolve around it.

Cluster 2 — Sustainability and Circular Economy (Blue)

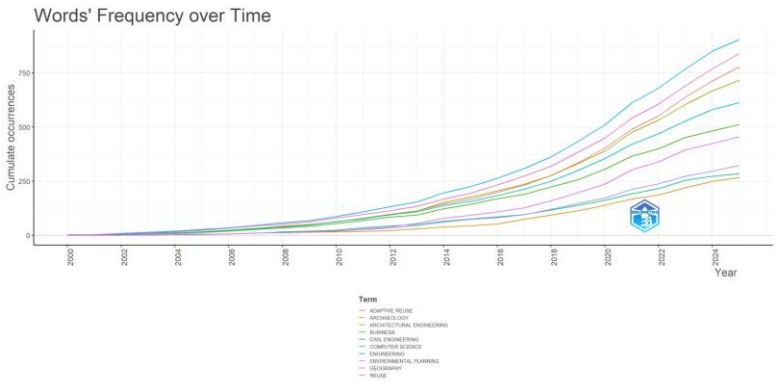
The second cluster, represented in blue and centered around the node ‘sustainability’, comprises studies on the link between adaptive reuse and environmental performance. Some of the keywords that commonly occur together include ‘circular economy’, ‘adaptation’, ‘built environment’, ‘climate change’, ‘demolition’, and ‘obsolescence’. This cluster has witnessed the fastest increase in any theme within the field, as indicated by the Words’ Frequency over Time graph (Figure 10). It is thus the leading edge of growth in the field. The occurrence of ‘circular economy’ with sustainability-related keywords demonstrates the increasingly prominent incorporation of material flow theory into adaptive reuse discourse, which carries profound implications for the theorisation of building adaptation within urban metabolism frameworks.

Cluster 3 — Cultural Heritage and Urban Regeneration (Red)

The third cluster is color-coded in red and includes the terms related to cultural heritage, which represents the literature relating to the field’s focus on heritage conservation and urban development. Among the prominent keywords co-occurrence terms found within this cluster include industrial heritage, cultural heritage management, tourism, redevelopment, business, and government. These keywords represent the origins of this field and the evolution of research in the field to the extent that it deals with issues of policy and governance in relation to adapting historic buildings to fit new roles in cities. The presence of 'china' as a keyword within this cluster reflects a growing body of Chinese scholarship on adaptive reuse of historic urban districts, consistent with national policies on historic district preservation.

Cluster 4 — Technical Assessment and Engineering (Yellow)

The final group of co-occurrences, which is indicated by the yellow colour in relation to the term 'architectural engineering', is concerned with the technical literature relating to adaptive reuse assessments. Some of the important co-occurring terms in this group include 'process', 'computer science', 'engineering', 'obsolescence', and 'environmental planning'. The relationship of this group to computer science terminologies relates to the relatively new and emerging link between adaptive reuse and the use of computational methods.



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Figure 10. Cumulative keyword frequency over time, showing growth trajectories of dominant research terms (2000–2025).

Figure 10 clearly demonstrates that all the key thematic categories have increased significantly after 2013. Moreover, the growth of the categories 'engineering,' 'reuse,' and 'adaptive reuse' has been very sharp compared to other categories. The fact that all themes have developed in parallel, instead of one replacing another over time, indicates that the discipline has expanded broadly rather than changing its scope.

DISCUSSION

The Intellectual Evolution of Adaptive Reuse Research

The bibliometric profile that emerges from the present study reflects an academic discipline that has seen remarkable intellectual development during the last 25 years. Whereas the early corpus was based on historical architecture, heritage conservation, and empirical practice accounts, it is evident that the current literature has evolved into a richer analytical field, with the application of rigorous research methods, performance measurement using quantitative indicators, and the incorporation of sustainability at the macro-level forming notable hallmarks of the current corpus. The growth rate of 15.54% per year is considerably higher than the overall built environment literature, indicating that adaptive reuse is a thriving research domain.

In the case of the four cluster model based on keyword co-occurrence, we can see productive disciplinary pluralism – the existence of both heritage and design history approaches, in addition to engineering and sustainability science and urban policy approaches. Such intellectual diversity is the unique advantage of adaptive reuse as a field; it uses several disciplines and generates knowledge that is valuable for designers, engineers, historians of heritage, urbanists, and policymakers at once. The danger here, according to the rather low level of inter-cluster connectivity in the keyword network, is that these disciplines function separately from each other.

The Australian Paradox

One of the most surprising results of this study is the significant citation power of Australian research. Although Australia ranks fifth overall in terms of the number of publications (n = 101), it tops all nations in the number of citations received (n = 2,547). The so-called "Australian paradox" is a consequence of the influential role of a small number of scholars, namely Bullen, Langston, Wilkinson, and Conejos, whose theoretical approaches, which have been published mainly during the period from 2007 to 2013, including the initial models developed by Langston and Bullen (2007–2011) and the later AdaptSTAR approach developed by Conejos et al. (2013), are considered reference points for the international academic community. Peter Bullen's appearance in three of the most cited papers in the entire dataset, making him the most cited individual scholar.

Consequences of this discovery are far-reaching for those scholars attempting to make the most of their citations. Theorization and methodology have proven to yield many more citations in the long term than empirical case studies, regardless of whether the institution publishing the material is known around the world.

Three related reasons explain why theoretical and methodological publications on adaptive reuse, such as those of Langston et al. (2008) and Bullen & Love (2010; 2011), earn such an unusual number of citations. In the first place, they provide replicable instruments, in which an instrument that is used once in relation to a building stock in Malaysia, Greece, or Italy needs only a single citation no matter how many times it is cited in practice, resulting in a multiplier effect on citations that case studies, as purely descriptive researches, are unable to

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reproduce. In the second place, they come up early in any literature review, being made a must for any researcher in their field to refer to passively as time goes by and more researchers enter the field, especially as this process goes even faster owing to the field's 15.54% yearly increase in publications. In the third place, they deal with transferable issues, such as how buildings are to be assessed in relation to reuse, rather than specific situations. For scholars starting out their career in the area of adaptive reuse, this trend implies a certain strategy. One research paper that proposes a new framework for assessing, a tool for decision support, or theoretical synthesis, even if based on just one case study, will almost always receive more citations in five to ten years' time than several well-done case studies in the same journals. This is not to say that empirical research is not important – on the contrary, empirical research provides the factual basis for any theory. It does imply that scholars who not only conduct high-quality empirical research but also explicitly propose a theoretical or methodological framework based on their case study results will be far more likely to receive recognition than researchers who conduct case studies for their own sake.

Geographic Imbalances

The geographic concentration of the literature of research on adaptive reuse is related to its concentration in few countries regardless of the global dispersion of publications. Indeed, the presence of such countries as Malaysia and Indonesia in the list of those countries with a high number of publications, along with the lack of their presence among the top cited countries indicates that there exists a tendency under which research conducted in developing countries is written but is never cited in the English-speaking world. Thus, it may lead to an undesirable situation in which the theories formulated in Australia, Europe, and North America are used worldwide without proper adaptation to local conditions.

Emerging Themes

Keywords like "circular economy," "machine learning," and "building information modeling" seen in the map are fairly new additions to the adaptive reuse body of knowledge, their trajectory indicating potential for considerable development in the future. Adaptive reuse in combination with circular economy's material flow models is particularly an area which has considerable potential for theory building and application in practice: the concept of treating buildings as stockpiles of material resources, to be conserved to the maximum extent possible, holds considerable potential for extending the theoretical scope of the subject matter.

Limitations

Several limitations warrant acknowledgement related to this study. The first limitation lies in the fact that the dataset only included publications written in English, thus introducing language bias into this work. This becomes especially relevant because the data revealed three countries having the largest scientific production regarding the topics mentioned in the introduction. Publications made in Italy about adaptive reuse are not included in the dataset as they were mostly written in Italian journals about architecture and conservation. In the same way, there are fewer publications made in Chinese about preservation of historic districts and adaptive reuse and also South American contribution about heritage conservation due to the fact that many publications made in these countries are made in languages other than English.

Secondly, the collection of data is restricted by the retrieval limit of the OpenAlex API, which can only retrieve 1,000 publications when the relevance-ranked filter is selected. Hence, the publications with lesser citation frequency are not included, especially for the recent period of 2023-2025. Therefore, it would be safe to conclude that the corpus is representative of high impact articles of the subject.

Third, the cluster themes presented in Section 4.7 are not generated through the algorithm but interpretive in nature. Even though a two-step verification technique was conducted through the evaluation of highly cited articles within the cluster (refer Section 3.3), there were other

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possible themes for labelling. It would be noted that the identification of four clusters mentioned here depends on the result obtained from the modularity clustering algorithm of VOSviewer at this particular level of resolution parameters.

Fourth, citation counts are based on the OpenAlex database as at 11 March 2026 and will change as the body of literature evolves. Specifically, articles written in 2024 and 2025 can be considered to have citation counts that underestimate their impact significantly.

Fifth, the data set has several observations that fail to satisfy the peer-reviewed condition mentioned in the search protocol; they include conference proceedings (n = 19) and thesis articles (n = 15) indexed by IOP Conference Series and OhioLink ETD Centre, respectively. As indicated in sections 3.2 and 4.3, these observations have been omitted from the source analysis but kept in the entire data set for purposes of keyword and authorship analysis.

A FORWARD-LOOKING RESEARCH AGENDA

Building on the gaps and emerging themes identified in the preceding analysis, we propose the following five-priority research agenda for the adaptive reuse field over the coming decade.

Global South and Climate-Specific Adaptive Reuse

Original research on adaptive reuse in these underrepresented contexts is urgently needed. However, there have been numerous publications from both Malaysia and Indonesia – countries that feature a rising number of buildings, climate vulnerability, and unique construction culture. Nonetheless, they have not contributed to theoretical advancements in terms of citations. The development of context-specific models for assessing adaptive reuse in tropical regions, desert conditions, and densely populated cities can fill in the mentioned gaps and be highly-cited papers as a result.

AI, Machine Learning, and Digital Assessment Tools

The appearance of terms like ‘computer science’ and ‘machine learning’ among the technical assessment-related keywords points towards an incipient but fast-growing trend to adopt computational methods for adaptive reuse assessment. Research should examine the creation and validation of AI-based solutions for the analysis of adaptive reuse feasibility at both the building and the neighborhood levels, as well as for simulating adaptive reuse through digital twins. At the same time, there is a need to explore the problems of data availability hindering data-driven analysis.

Circular Economy and Material Flow Integration

Though there are many similarities between the two concepts, as evidenced by the co-appearance of both terms within Cluster 2, further research must be done to incorporate the ideas behind material passports, design for disassembly, and building material flows into the field of adaptive reuse. Studies should focus on developing methodologies for assessing the economic value of existing structures and creating an environment conducive to adopting such practices.

Social Equity and Community-Centred Adaptive Reuse

The social aspects of adaptive reuse – such as the potential for displacement, community identity, and addressing inequality when it comes to access to good-quality built spaces – have thus far been inadequately addressed in relation to their practical significance within current literature on the subject matter. This is evident by the low number of references made to ‘gentrification’, ‘affordable housing’, and ‘community participation’ in relation to key themes in existing research into adaptive reuse practices.

Whole-Life Carbon Accounting and Net-Zero Policy Alignment

With the growth in national pledges for net zero emissions leading to greater

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involvement with the carbon performance of existing buildings, there arises an urgent need for studies that consider adaptive reuse within the context of whole-life carbon accounting methodologies. Comparative studies that analyze the whole-life carbon pathway for adaptive reuse compared to demolition and replacement strategies, as well as investigations into the alignment between adaptive reuse decision-making software and national carbon accounting systems, are key areas of study.

CONCLUSION

In this paper, we have carried out the first ever systematic bibliometric review of the research articles related to adaptive reuse published from 2000 to 2025, using 1,000 scientific publications that we collected through the OpenAlex library. As revealed by the bibliometric review, there is an area with outstanding academic dynamics – it is increasing by 15.54% each year – based on four key thematic categories: architecture, sustainability and circular economy, conservation, and engineering.

The main empirical results are the citation impact effect that is highly disproportionate to the number of publications made by Australian research, the growing significance of the Italian, Malaysian, and Indonesian research communities, the position of the Sustainability (MDPI) journal as the leader among other journals by the number of papers published, and the citation impact of a limited number of Australian researchers who developed a theoretical basis for sustainability studies, especially the authors of the assessment models introduced by Bullen and Langston and the AdaptSTAR framework proposed by Conejos et al.

Geographic clustering, lack of inter-cluster connectivity, and inadequate integration of social equity and Global South considerations constitute the biggest structural deficiencies within the discipline. The research agenda proposed in Section 6, focused on Global South cases, use of digital technologies, integration into the circular economy, social equity issues, and whole-life carbon accounting, clearly marks those areas that need to receive original scholarly attention and will be cited for many years to come.

There are several limitations associated with the methodology of this research that need to be discussed. Firstly, the dataset in question is limited in scope by the limit on document acquisition using the OpenAlex API of 1,000 results arranged according to relevance rank. Thus, very recent publications that have not had much time to generate citations are underrepresented compared to their scholarly impact. If one needs comprehensive results for 2023-2025, it is necessary to supplement the current dataset with an appropriately filtered query based on dates. Moreover, the dataset does not account for research articles written in any language except for English since only peer-reviewed journals in this language are included. Lastly, the citation numbers are based on the database status on the date of retrieval – 11 March 2026.

For new researchers coming into this field, the above analysis can serve as both a guide and a direction for future work to be done in the most needed places. For professionals who apply these theories and policies, the above analysis is a systematic summary of existing evidence for using adaptive reuse in sustainable development, as well as the areas where there is least evidence.

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Data Availability

The bibliometric dataset and VOSviewer network files supporting the findings of this

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study are available from the corresponding author upon reasonable request. Data were retrieved from OpenAlex (openalex.org), an open-access bibliographic database.

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