

Figure1: Methodology chart

### 3.1 SEARCH QUERY

( TITLE-ABS-KEY ( "masonry structures" ) OR TITLE-ABS-KEY ( "textile" ) AND TITLE-ABS-KEY ( "reinforcement" ) OR TITLE-ABS-KEY ( "geopolymer mortar" ) ) AND PUBYEAR > 2009 AND PUBYEAR < 2024 AND ( LIMIT-TO ( AFFILCOUNTRY , "Italy" ) OR LIMIT-TO ( AFFILCOUNTRY , "China" ) OR LIMIT-TO ( AFFILCOUNTRY , "United States" ) OR LIMIT-TO ( AFFILCOUNTRY , "United Kingdom" ) OR LIMIT-TO ( AFFILCOUNTRY , "Canada" ) OR LIMIT-TO ( AFFILCOUNTRY , "Spain" ) OR LIMIT-TO ( AFFILCOUNTRY , "India" ) OR LIMIT-TO ( AFFILCOUNTRY , "Greece" ) OR LIMIT-TO ( AFFILCOUNTRY , "Undefined" ) OR LIMIT-TO ( AFFILCOUNTRY , "Portugal" ) OR LIMIT-TO ( AFFILCOUNTRY , "Germany" ) OR LIMIT-TO (



there were 62619 authors. This is an increase of 33.11%. The number of author's keywords has also increased over time. In 2010, there were only 4574 author's keywords, but by 2023, there were 27.38 author's keywords. This is an increase of 27.38%. The average number of references per document has also increased over time. In 2010, the average document had only 6.04 references, but by 2023, the average document had 62619 references. This is an increase of 27.38%. The average age of documents has also increased over time. In 2010, the average document was only 1.00 years old, but by 2023, the average document was 6.04 years old. This is an increase of 6.04%

#### 4.2 RESEARCH PRODUCTIVITY.

The below graph depicts the annual count of citations and publications within a specific field from 2010 to 2023, with the "CITATIONS" axis indicating citation numbers and the "PUBLICATIONS" axis reflecting publication figures. Notably, there is a consistent upward trend in publications, starting 41 articles in 2010 and reaching approximately 184 by 2023, indicating a growing interest in the represented field. Similarly, the number of citations shows an increasing trend, though not as pronounced as publications, with 1894 in 2010 rising to about 8972 by 2023, suggesting an expanding impact of the field's published work on other researchers. A positive correlation exists between the number of publications and citations, generally implying that higher publication numbers correlate with increased citation counts. However, it's important to acknowledge that this correlation is not absolute, and certain years may witness a substantial number of publications with a relatively low citation count and vice versa.

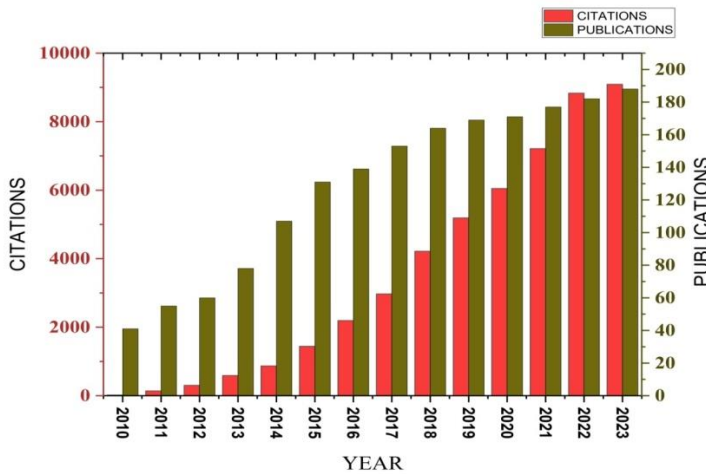


Figure 3: publications and citation trends

### 4.3 SOURCES AND ITS METRICS

The academic journals in the field of composites and structural engineering exhibit varying degrees of impact and citation performance. Notably, "Composites Part B: Engineering" stands out with the highest h-index of 54, a g-index of 92, an m-index of 3.85, total citations (TC) amounting to 8938, and 116 publications. "Construction and Building Materials" follows with an h-index of 38, a g-index of 58, an m-index of 2.53, TC of 4299, and 139 publications. "Composites Part A: Applied Science and Manufacturing" and "Journal of Structural Engineering (United States)" share an h-index of 36 and 28, respectively. On the lower end, "Materials and Structures/Materiaux et Constructions" has the lowest h-index at 16, a g-index of 24, an m-index of 1.06, TC of 1236, and 24 publications. Interestingly, "Journal of Composites for Construction" boasts an h-index of 19, surpassing both "Materials and Design" (h-index 18) and "Materials and Structures/Materiaux et Constructions," but it falls short in total citations, with 1103 compared to "Materials and Design's" 1412. This highlights the nuanced interplay between h-index and total citations in assessing the scholarly impact of these journals.

S.NO	SOURCES	h-index	g-index	m-index	TC	NP
1	Composites part B: Engineering	54	92	3.85	8938	116
2	Construction and building materials	38	58	2.53	4299	139
3	Composites part a: applied science and manufacturing	36	55	2.4	3420	87
4	Composites science and technology	29	48	1.93	2729	48
5	Composite structures	28	50	1.86	2858	87
6	Journal of structural engineering (united states)	28	42	2.15	2292	87
7	Engineering structures	23	36	1.53	1407	59
8	Journal of composites for construction	19	32	1.35	1103	32
9	Materials and design	18	25	1.2	1412	25
10	Materials and structures/materiaux et constructions	16	24	1.06	1236	24

Table 1: sources, metrics and citations

#### 4.4 ANALYSIS OF THREE FIELD PLOT

The below figure illustrates the interconnections between sources, countries, and keywords in the Scientometric study of masonry structures using geopolymer mortar and textile reinforcement. The primary five topics, namely mechanical properties, masonry, textiles, strengthening, and composites, were predominantly linked to three sources: construction and building materials, composite structures, and composite part b- engineering. Moreover, these topics were closely associated with the three leading countries in terms of productivity: China, Italy, and Germany.

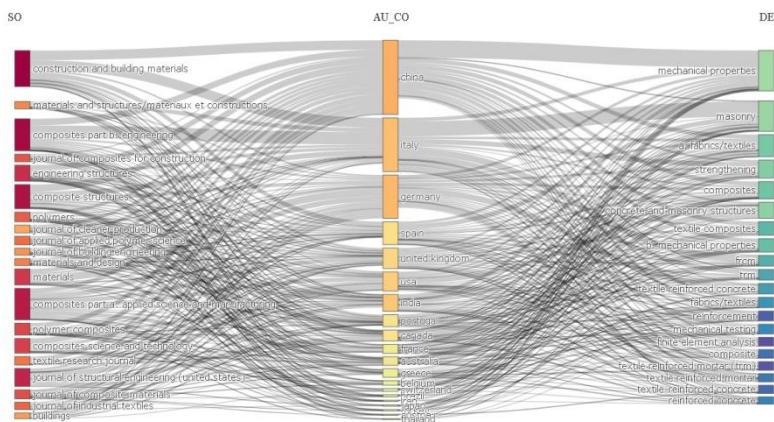


Figure 4: Three-factor analysis of the relationship among Sources (**left**), Countries (**center**), and keywords (**right**).

#### 4.5 THEMATIC MAP OF KEYWORDS

The thematic map, as illustrated in the preceding figure, serves as a visual representation that categorizes themes based on their density and centrality. This insightful map employs a coordinate system, where the X-axis signifies theme importance, and the Y-axis denotes the development stage of these themes. The themes are systematically organized into four distinct quadrants to facilitate a nuanced analysis.

In Quadrant (Q1), motor themes emerge with notable characteristics of high density and centrality. Keywords such as reinforcement, textiles, and reinforced concrete dominate this quadrant, showcasing their significance and suitability for in-depth studies. These keywords have undergone extensive research, rendering them pivotal for further exploration and comprehensive understanding.

In Quadrant (Q2) is characterized by basic themes that exhibit high centrality but relatively low density. However, this quadrant lacks specific



keywords, posing an interesting area for potential research exploration. The absence of keywords highlights a need for deeper investigation into the foundational aspects of these themes.

In Quadrant (Q3) encompasses emerging and disappearing themes that are novel and underdeveloped. Keywords associated with Q3 include textile fibers, tensile strength, and fibers. The presence of such terms suggests a fertile ground for future research, indicating areas where exploration and expansion can contribute to the advancement of knowledge.

In Quadrant (Q4), niche themes surface with high density and low centrality, similar to Q2, but without specific keywords. This quadrant prompts consideration for further examination, as the absence of keywords necessitates a closer look to uncover potential insights and connections within these specialized themes. Overall, the thematic map provides a comprehensive framework for identifying, categorizing, and prioritizing themes, guiding researchers towards areas ripe for exploration and contributing to the evolution of knowledge in the field.

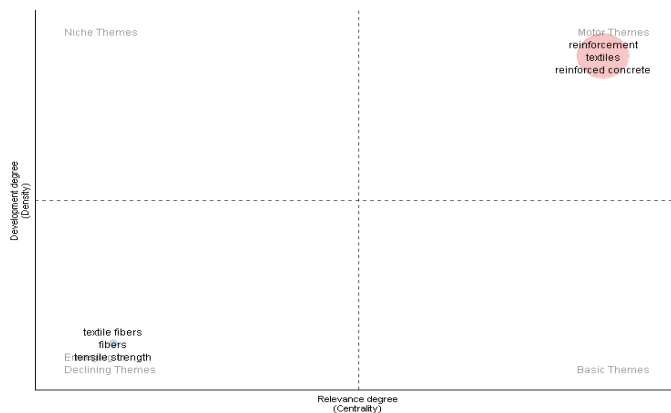


Figure 5: Thematic mapping of keywords

#### 4.6 BIBLIOGRAPHIC COUPLING ANALYSIS OF COUNTIES

The bibliographic coupling analysis conducted using VOSviewer has uncovered intriguing patterns in the relationships between different countries. Out of a total of 80 countries analyzed, 52 of them meet the set thresholds of possessing at least 3 documents and receiving a minimum of 1 citation. This indicates that a significant majority of the countries under study are actively contributing to the body of knowledge and their work is being recognized and cited in the research community. The visualization generated by VOSviewer presents 11 distinct clusters. These

clusters represent groups of countries that share strong bibliographic ties, implying that these countries are working on similar research topics or fields. This could be due to shared research interests, collaborative research projects, or similar regional and global challenges that these countries are trying to address through research.

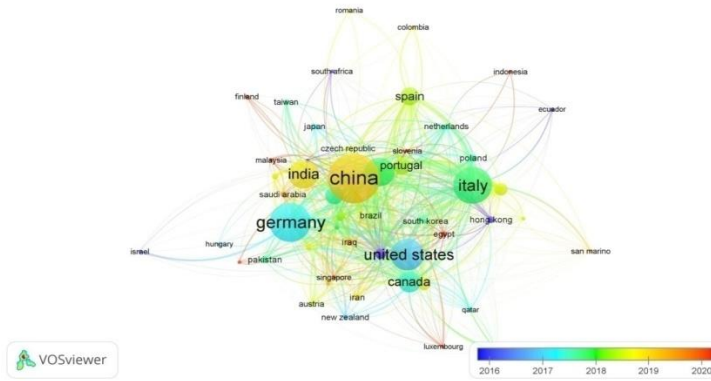


Figure 6: Countries bibliographic coupling analysis

The presence of 680 links in total suggests a high level of interconnectivity between these countries. This could be interpreted as a sign of extensive international collaboration in the scholarly community, with research transcending geographical boundaries. It could also indicate that the research produced by these countries is having a wide-reaching impact, with their work being cited by researchers across different countries. The total link strength of 67370 signifies the overall intensity of these connections. This high link strength is indicative of the depth and significance of these bibliographic ties. It's not just that the countries are interconnected; the strength of these connections suggests that these are not merely superficial or incidental links, but rather meaningful relationships that likely involve substantial intellectual exchange and collaboration.

#### 4.7 CO-OCCURRENCE ANALYSIS OF KEYWORDS

In the co-occurrence analysis conducted using VOSviewer, with the option to consider all keywords and a minimum occurrence threshold of 10 for a keyword, a significant pattern emerges from the data. Out of the total 12457 keywords analyzed, only 544 meet the specified threshold. This suggests that these 544 keywords are the most frequently occurring and potentially represent the core themes or topics in the body of work being analyzed. The analysis further identifies 4 distinct clusters among these keywords. These clusters could represent different themes or topics that are







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