

# HOUSEHOLD WASTE MANAGEMENT A BIBLIOMETRIC ANALYSIS



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## Introduction

Environmental risks include soil, water, air, and odor creation result from increased waste production, a lack of sustainable waste management strategies, and the inability to put them into practice. Disposal at landfills leads in littering and the production of greenhouse gases, affecting the environment and human health. Municipal solid trash is increasing in emerging countries as a result of rural inhabitants migrating to urban areas . Humans can significantly impact the problem of solid waste through personal habits, which can either improve or worsen our living environment.

Between 2001 and 2028, it is estimated that India's population will increase by 42%, from 1029 million to 1400 million, with 325 million living in cities and 852 million in rural areas. In the last 50–60 years, urbanization increased from 26.5% to 38%, and by 2026, it is expected to have reached by 44%. The number of metro cities has also increased from 23 to 35 in last five years . From the above statement, it is clear that day-by-day the population of India is increasing as a result, the consumption of resources for survival is rising.

The policy of '4 R's' Refuse, Reuse, Recycle, Reduce - helps minimize waste by eliminating unnecessary products, encouraging women to reuse household materials, and transforming waste into valuable resources like old glass bottles. Recycling materials like metal, plastic, paper, glass, and tin can be done by sending garbage collectors. Reducing waste at home through composting can return nutrients to the environment. Promoting recycling is crucial for conserving natural resources and transitioning towards a circular economy.

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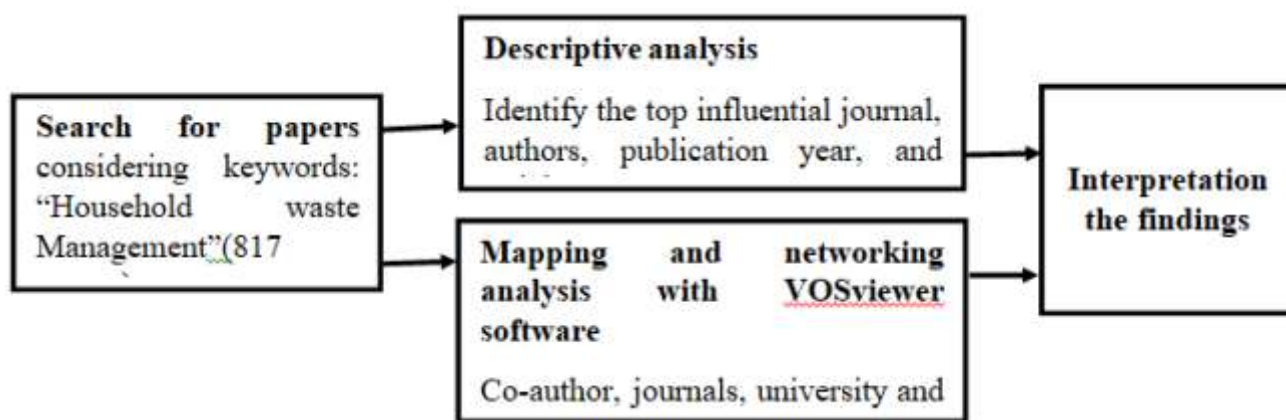
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In order to get a better grasp of the academic environment and the flow of information in the subject, this project will conduct a thorough bibliometric study of household trash management. By analyzing a vast array of scientific literature, the study aims to identify key research trends, influential publications, collaborations, and emerging themes, providing insights into the scholarly landscape and knowledge dissemination. By providing a comprehensive review of studies on home waste management, this analysis adds to the body of knowledge, helps with decision-making, and points the way for further study in this area.

### Methodology

This study aims to explore household waste management using bibliometric analysis. Keywords like "Household Waste Management" were searched and the Web of Science was used to filter publications. Descriptive analysis was used to analyze scientific production growth. Top contributors were identified in terms of author, publication, document types, journal, affiliations, funding agencies, research area, nations, and language. Network extraction techniques included co-citation, co-author, co-word, and bibliographic coupling. VOS viewer software was used for visualization features.



**Figure 1. Methodology Flowchart**

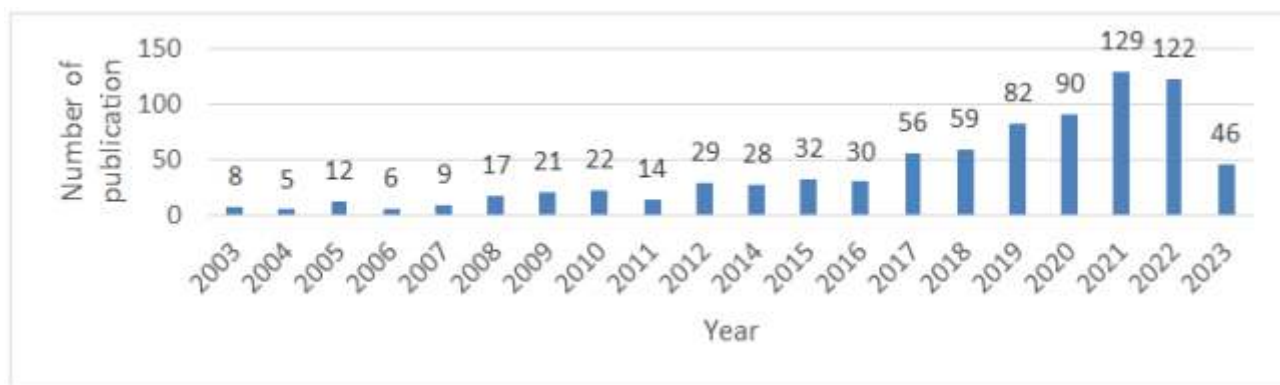
### Results and Discussion

Presented here is an in-depth analysis of the relevant bibliographic networks and the bibliometric inquiry's produce.



**Figure 2: Number of publication authors**

As shown in figure 2, high productivity Authors: Kumar A, Luo Y, Principato L, and Williams ID are the most prolific authors in the field, each having 5 publications. These authors have demonstrated a significant contribution on household waste management.



**Figure 3: Year Performance of the articles**

The bibliometric analysis represented articles published between 2003 and 2023. The highest publication have been listed in 2021 (129). From 2022, the number of publication was reduced by 76.

Sr. No.	Affiliations	Record Count	% of 817
1	N8 Research Partnership	29	3.55
2	University Of London	14	1.71
3	White Rose University Consortium	14	1.71
4	University Of California System	12	1.46
5	Swiss Federal Institutes Of Technology Domain	11	1.34
6	<u>Universiti Kebangsaan</u> Malaysia	10	1.22
7	Indian Institute Of Technology System <u>lit</u> System	9	1.10
8	Shanghai Jiao Tong University	9	1.10
9	<u>Universidade</u> De Sao Paulo	9	1.10
10	<u>Universiti</u> Putra Malaysia	9	1.10

**Table 1: Top 10 Affiliation Universities**

The table 1 above appears to show a list of affiliations along with their respective record counts and percentages out of a total of 817 records. The affiliations are ranked based on the number of records associated with each one. N8 Research Partnership University has the maximum number of paper publication (record count 29, 3.55%), followed by the University of London and White Rose University Consortium (record count 14, 1.71%).

Sr.No.	Country	Documents	Citations	Average citation
1	USA	114	2718	23.84
2	England	95	2636	27.74
3	Peoples R China	89	1799	20.21
4	Malaysia	45	1625	36.11
5	India	55	1514	27.52
6	Italy	36	1467	40.75
7	Canada	26	1309	50.34
8	Australia	47	1115	23.72
9	Brazil	24	860	35.83
10	Sweden	23	835	36.30

**Table 2.** Top 10 Countries citations; Out of 111 authors, 32 meet the threshold of a minimum number of 3 times.

Table 2 shows the number of countries cited, the USA and England have the highest number of documents and total citations (114 documents, 2718 total citations and 95 documents, 2636 total citations). Canada holds the first position in terms of average article citations (50.34 citations per article).

Sr. No.	Author	Documents	Citations	Total Link Strength
1	Jiang, Peng	3	570	9
2	Klemes, Jiri Jaromir	3	570	9
3	Van Fan, Yee	3	570	9
4	Christensen, Thomas H.	4	515	3
5	Principato, Ludovica	5	415	25
6	Secondi, Luca	4	408	23
7	Al-Khatib, Issam A.	3	175	2
8	Rousta, Kamran	3	157	3
9	Rundle-Thiele, Sharyn	4	151	15
10	Kim, Jeawon	3	139	15

**Table 3.** Top 10 authors with the highest citations. Out of 3257 authors, 32 meet the threshold.

From the above table 3, shows that the top three writers Among all persons, Jiang, Peng, Klemes, Jiri Jaromir, Van Fan, and Yee have the greatest overall link strength, the most documents, and the largest number of citations (570). Another writer is Christensen, Thomas H. has (4 documents, 515 citations, 3 link strength). Principato, Ludovica with highest document and total link (5 documents, 415 citations, 25 link strength).

Sr. No.	Keywords	Occurrences	Total Link Strength
1	Waste Management	78	158
2	Recycling	68	149
3	Food Waste	59	134
4	Sustainability	38	94
5	Circular Economy	34	74
6	Municipal Solid Waste	28	57
7	Solid Waste Management	28	52
8	Household Waste	26	43
9	Waste	21	45
10	Covid-19	18	40

**Table 4.** Top ten Keyword co-occurrences of publication; Out of 2578 keywords, 213 words meet the threshold.

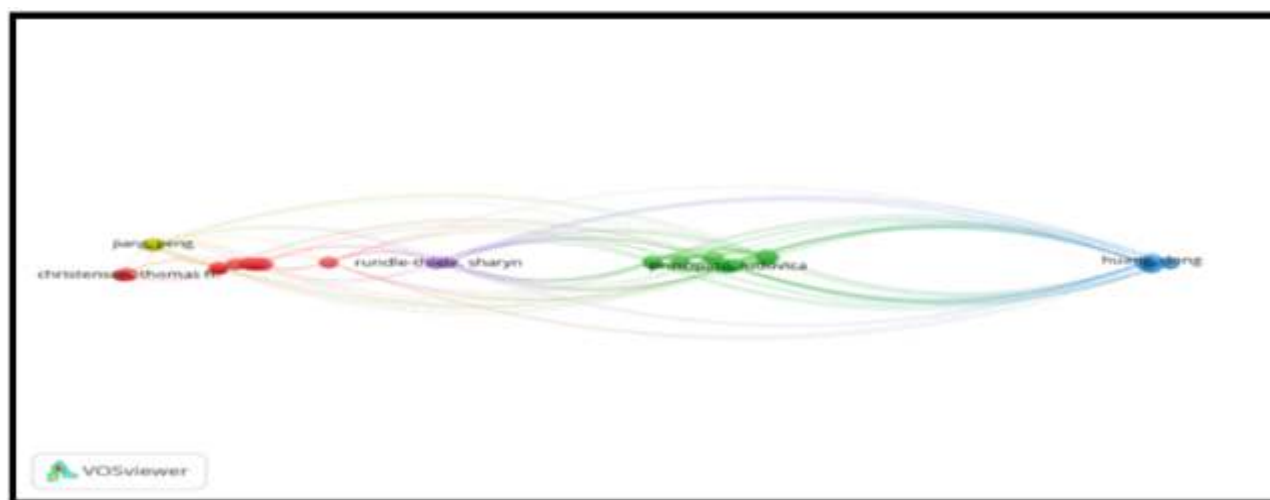
Research trends and the most significant topics within a certain field of study are highlighted by the keywords, which frequently indicate the article's main subject and area of investigation. . When working with keywords, the number of documents that include the keyword is shown with the occurrences attribute. The table represents the top ten keywords, as well as their occurrence and total link strength. About occurrence and link strengths, the maximum significant keywords are “Waste Management” (78 occurrences & 158 link strengths), “recycling” (68 occurrences & 149 link strengths) and “food waste” (59 occurrences & 134 link strengths).

<b>Sr. No.</b>	<b>Authors</b>	<b>Title</b>	<b>Year</b>	<b>Journal</b>	<b>Citations</b>
1	<a href="#">Forouzanfar</a>	NA	2015	NA	1815
2	<a href="#">Klemes</a>	Mitigating The Energy Consumption, Environmental Impact, And Present And Future Plastic Waste Associated With Covid-19	2020	Renewable & Sustainable Energy reviews	437
3	<a href="#">Thyberg</a>	The determinants of food waste and their ramifications for the formulation of sustainable policies	2016	Resources Conservation and Recycling	425
4	Kumar	An Examination of Generation, Collection, Legislation, and Recycling Practices Regarding E-Waste	2017b	Resources Conservation and Recycling	390
5	Parizeau	The household-level dynamics of food waste production in Guelph, Ontario, as well as associated beliefs, attitudes, and behaviors	2015	Waste Management	344
6	Kumar	An examination of waste-to-energy technology alternatives for the efficient administration of municipal solid waste	2017c	Waste Management	327
7	Secondi	Behavior of households regarding food waste in the EU-27: A multilevel analysis	2015	Food Policy	278
8	Laurent	Methodological guidance for improved practices; a second review of lca studies on solid refuse management systems.	2014	Waste Management	274
9	<a href="#">Beigl</a>	A review of modeling municipal solid refuse generation	2008	Waste Management	273
10	<a href="#">Manaf</a>	Management of municipal solid waste in Malaysia: Practices and Obstacles	2009	Waste Management	254
11	<a href="#">Salemdeeb</a>	Impacts of food refuse utilization as animal feed on the environment and human health: A comparative analysis of food waste management alternatives	2017	Journal of Cleaner Production	209

**Table 5.** Top 10 Authors with their highest citations, title and journal; out of the 817 documents, 420 meet the threshold.

The table presents a comprehensive list of research papers on household waste management topics, including authors, titles, publication years, journals, and citation counts.: Klemes (2020): The paper titled "Minimising the Present and Future Plastic Waste, Energy and Environmental Footprints Related to Covid-19" was

published in the journal "Renewable & Sustainable Energy Reviews" in the year 2020. During the COVID-19 outbreak, the need of managing plastic trash has been brought up 437 times. Thyberg (2016): This paper explores the "Drivers of Food Waste and their implications for sustainable policy development." It was published in the journal "Resources Conservation and Recycling" in 2016 and has received 425 citations.

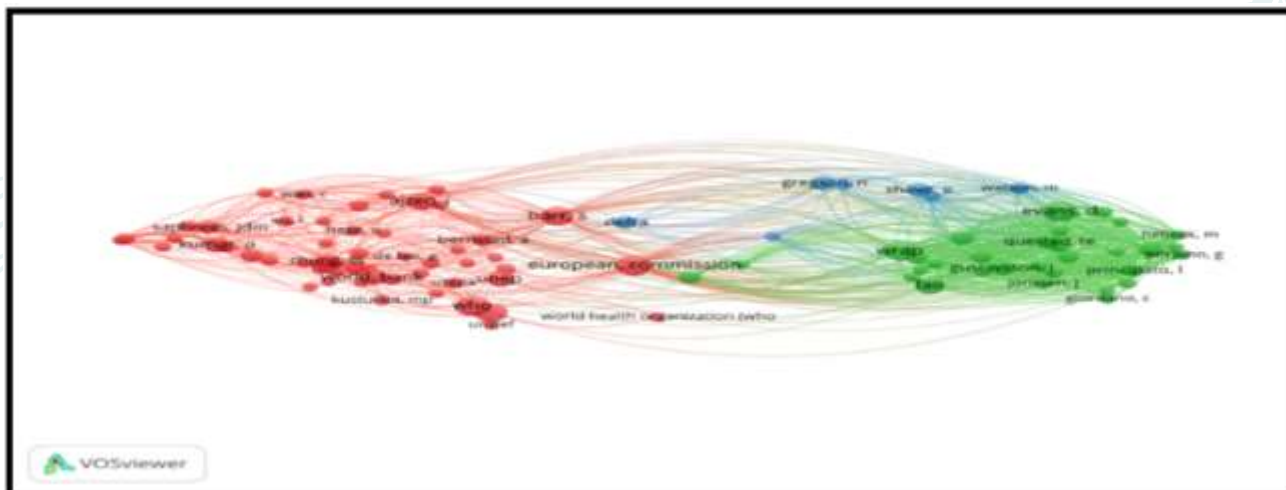


**Figure 4.** The authors' bibliographic coupling comprises 32 authors out of 3257 authors who meet the minimum standard of having at least three documents authored by each author.

Based on a large number of common references, the bibliographic coupling analysis indicates a strong link and research field when authors A and B quote works of author C. Gazzini (2016)

30 authors formed five clusters, according to the author's figure 4 bibliographic coupling. With 12 authors, the red cluster (Cluster I) is the largest; Williams, I, and D. are the most representative. Nine authors comprised Cluster II Green, cluster III blue had 4 authors; cluster IV yellow had 3 authors; and Cluster V purple had 2 authors. Authors huang, dong, lu, yi, and wu are ranked according to overall link strength; laping had a total of 1003 links. Secondi, Luca, and another principato, Ludovica, each have 884 points. Jiang, Peng, Klemes, Jiri Jaromir, and Van Fan are ranked according to the number of citations obtained; all four of them have the same total of 570. Principato Ludovica (415), Thomas H. Christensen (515).





**Figure 5.** Author co-citation network: out of 26444 cited authors, 93 authors have at least 20 citations, meeting the minimal threshold.

Three clusters are displayed in the authors co-citation network figure 5: The European Commission, Barr's, and Ajzen, I. make up the biggest cluster of 55 authors most strongly connected with the color red (93 citations, 552 link strengths), followed by Ajzen, I. (67 citations, 593 link strengths), and Barr's. Of the 31 writers in the green cluster, Evans, D. stands out with 96 citations and a link strength of 1323. Wrap is one of many authors included here; Fao has 67 citations and 667 link strengths, while Wrap itself has 36 citations. There are 7 authors in the blue cluster, the most prominent of whom is Shove, E. (45 citations and link strength 374), followed by Gregson, N. (44 citations and link strength 285).

### Conclusion

This paper concludes with a summary of the key findings from the bibliometric analysis of Household Waste Management. By shedding light on publication trends, authorship patterns, collaboration networks, influential work, and research gaps, this study contributes to an understanding of the current state of research in household waste management. The insights gained from this analysis helps policymakers, researchers, and practitioners in their efforts to develop effective waste management strategies and promote sustainable practices.

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