Journal of Civil Engineering, Science and Technology

Volume 14, Issue 1, April 2023, 1 – 5

EDITORIAL SCOPE – WASTE MANAGEMENT AND RECYCLING

Nor Azalina Rosli[1,2*] and Ahmad Beng Hong Kueh[1,2]

[1]Department of Civil Engineering, Faculty of Engineering, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

[2]UNIMAS Water Centre (UWC), Faculty of Engineering, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

Date received: 11/04/2023 **Date revised:** 14/04/2023 **Date accepted:** 17/04/2023 **Date published:** 25/04/2023

*Corresponding author's email: rnazalina@unimas.my

DOI: 10.33736/jcest.5641.2023

Abstract — The present editorial scope of the Journal of Civil Engineering, Science, and Technology (JCEST) emphasizes one of the main disciplines of civil engineering: waste management and recycling. Waste management studies provide insights into new waste management techniques, such as recycling, composting, and waste-to-energy technologies, all of which are essential in reducing the volume of waste in landfills. In this brief editorial paper, information is gathered from the freely-accessible Scopus database to identify common keywords found in published papers related to waste management and recycling in the past decade. Based on the analysis, "waste" is found to be the top keyword in articles published on this topic in JCEST. The primary aim of this exercise is to provide researchers with a brief guide to explore the latest knowledge and advancements in waste management and recycling, in safeguarding the cleanliness and safety of our environment.

2462-1382 / © 2023 The Author(s). Published by UNIMAS Publisher. This is an open access article under the CC BY-NC-SA 4.0 license (http://creativecommons.org/licenses/by-nc-sa/4.0/).

***Keywords*:** waste management, recycling, JCEST, civil engineering, Scopus

1.0 INTRODUCTION

The increase in solid waste generation can be attributed to the growth in population and the rise in living standards, which has led to a boost in the economy and industrial activities. However, due to a lack of financial investment and inadequate waste treatment and disposal facilities, landfills have become the commonly adopted approach for both municipal and industrial wastes [1, 2]. Consequently, landfills are saturated with waste and are among the chief contributors to greenhouse gas (GHG) emissions, which have led to the climate crisis and global warming [3]. Therefore, proper waste management is critical to providing clear direction for the handling and disposal of waste in our community, to minimize adverse environmental impacts. In recent years, there has been a growing trend towards more sustainable waste management and recycling practices, driven by increasing awareness of the negative environmental impact of waste. Sustainable waste management refers to practices and strategies such as waste reduction, reuse and recycling, composting, waste-to-energy, and landfill management [4]. Numerous journals are dedicated to environmental engineering and management, such as Journal of Environmental Engineering, Journal of Environmental Management, Journal of Cleaner Production, Journal of Waste Management, and Journal of Environmental Science and Technology. This paper focuses on the prevalent topics and trends in environmental engineering and management over the last decade, as indicated by statistical data.

2.0 GLOBAL PUBLICATION STATISTICS

Environmental engineering presents a broad range of challenges that require resolution, including air pollution, water pollution, waste management, and sustainable energy. According to the data presented by Google Trends in Figure 1, waste management is the most searched-for keyword worldwide over the past five years, followed by air pollution, water pollution, and sustainable energy [5]. For this reason, waste management will be the focus of this paper. Within waste management, there are several strategies to achieve effective waste management, including recycling, composting, waste-to-energy, and landfill. Once again, Google Trends is used to measure the popularity of these terms. Figure 2 illustrates that recycling has gained more interest in searches compared to the other methods [5]. Looking at the breakdown by region, five countries have a high interest in recycling, with the highest percentage coming from Germany. Germany is also well known as a global leader in recycling, with a recycling rate of more than 60% [6].

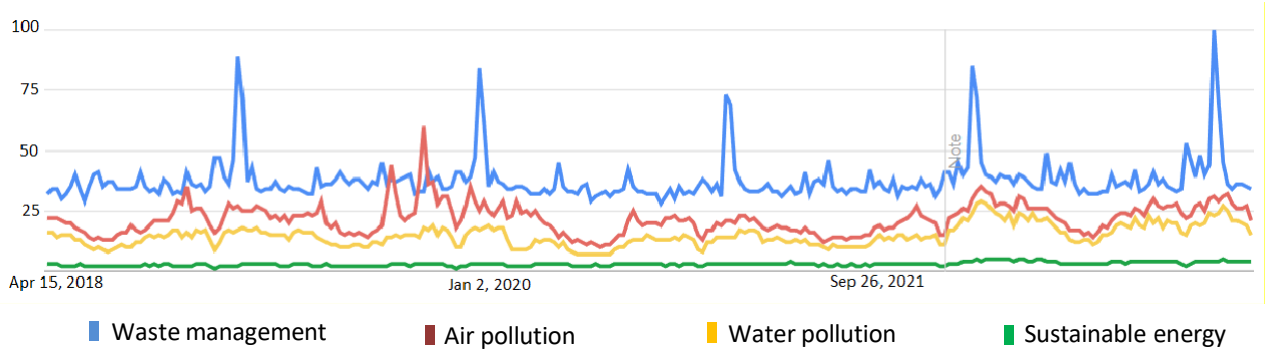

Figure 1 Google trends of environmental engineering [5]

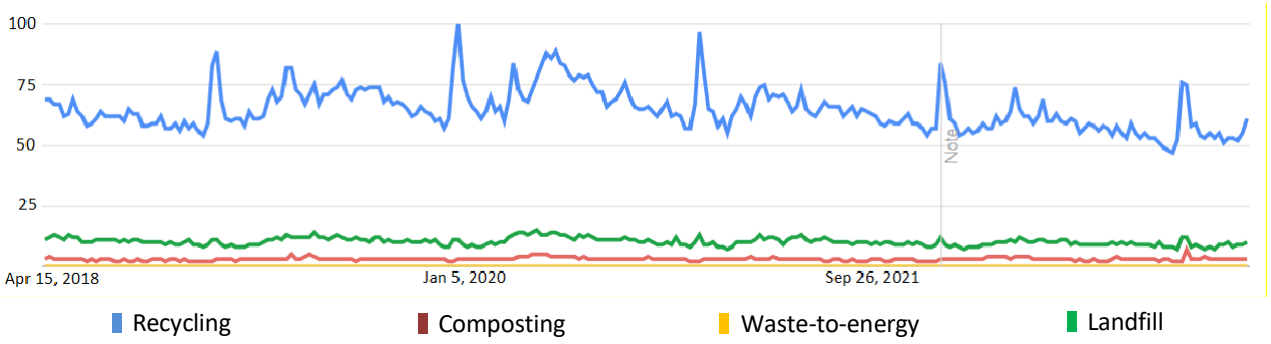

Figure 2 Google trends of waste management [5]

According to the Scopus database, based on a keyword search for "civil" AND "waste" AND "management" OR "recycling", a total of 685 documents have been published from 1970 to 2023. The average number of documents published per year ranges from 1 to 78, as shown in Figure 3(a) [7]. In the last 10 years, the number of documents curated on the platform has fluctuated, with the two highest peaks of published documents being in 2012 with 45 documents, and in 2020 with 41 documents (Figure 3(b)).

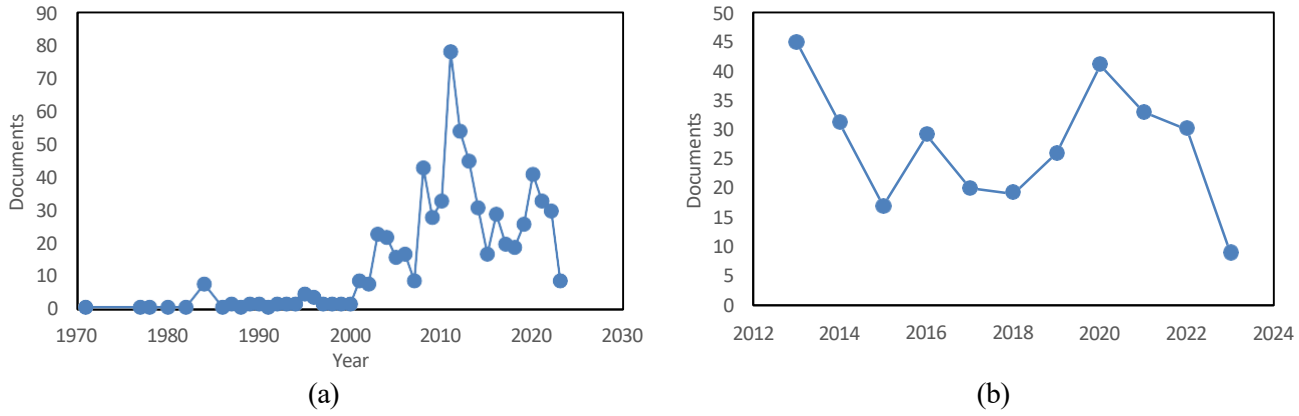

Figure 3 Number of published documents by year: (a) Overall and (b) recent 10 years (keyword: "civil" AND "waste" AND "management" OR "recycling") [7]

The breakdown of disciplines related to civil, waste management, and recycling shows that engineering is the most dominant field, accounting for one-third of the contribution, followed by science areas as presented in Figure 4. Others cover a combination of multidisciplinary areas, including biochemistry, mathematics, health professions, nursing, arts and humanities, dentistry, pharmacology, toxicology, and pharmaceutics, where the contribution is

less than 10%. Based on the civil, waste management, and recycling field, the top 10-ranked keywords in descending order of document contribution number are civil engineering, waste management, recycling, waste disposal, sustainable development, construction industry, aggregates, human, and civil defense, and environmental impact [7].

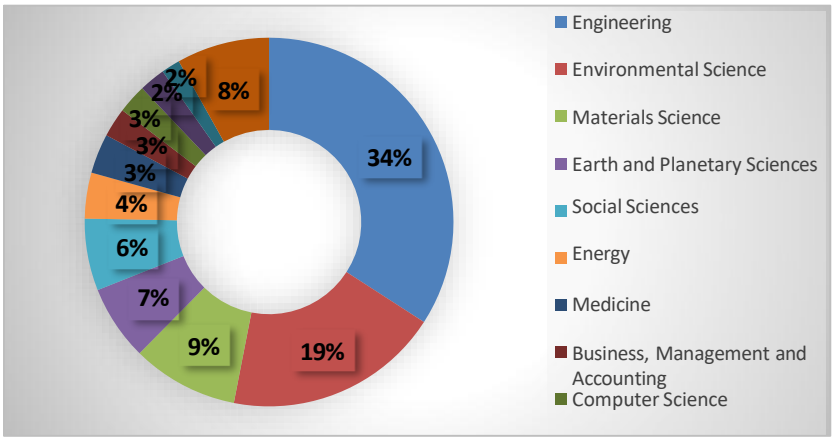

Figure 4 Document percentage by topic (keyword: civil AND waste management OR recycling) [7]

3.0 JCEST PUBLICATION TREND

Researchers spend a significant amount of time using keywords to search for articles, as these terms direct search engines to locate the desired information. Accurately selecting relevant keywords can enhance article visibility and increase citations. In this editorial note, the prominent keywords in the field of waste management and recycling, as determined from the JCEST publication trend, were extracted. However, no detailed analysis or simulation was conducted. Upon examining the key elements of waste management and recycling articles published in JCEST, several common keywords were identified, including **waste**, **ash**, **cement**, **materials**, **study**, **marble**, **replacement,** and **strength** as shown in Figure 5 [8]. The font size in the keyword cloud chart reflects the popularity of each keyword in the field of waste management and recycling. The normalized influence indicates the frequency of a particular keyword appearing in the titles, abstracts, and keywords. It is noteworthy that "**waste**" is the most frequently used term in JCEST papers on waste management and recycling, as illustrated in Figure 6. These terms dominate the vast majority of JCEST papers over the past five years.



Figure 5 JCEST keyword cloud [8]

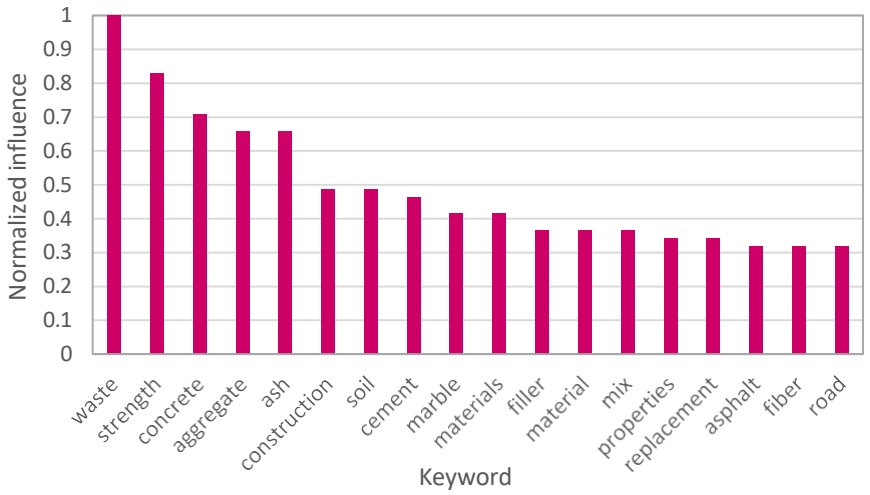

Figure 6 JCEST keyword influence [8]

4.0 CONCLUSION

The latest editorial note in JCEST examines waste management and recycling themes in civil engineering research. It utilizes data from the Scopus database and analyzes publication trends in JCEST to identify popular keywords in both sources. This initiative aims to demonstrate the dominant works in the field of waste management and recycling. By presenting this information, researchers can gain a deeper understanding of the state-of-the-art knowledge applicable to both municipal and industrial waste.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Acknowledgement

The authors thank the Malaysian Ministry of Higher Education (*Kementerian Pendidikan Tinggi Malaysia*, KPT) for the research fund under the Fundamental Research Grant Scheme (Grant number: FRGS/1/2020/TK0/UNIMAS/02/10).

References

[1] Zorpas, A. A. (2020). Strategy development in the framework of waste management. Science of The Total Environment, 716, 137088. https://doi.org/10.1016/j.scitotenv.2020.137088

[2] Yong, Bashir, Ng, Sethupathi, Lim, & Show. (2019). Sustainable Waste-to-Energy Development in Malaysia: Appraisal of Environmental, Financial, and Public Issues Related with Energy Recovery from Municipal Solid Waste. Processes, 7(10), 676. https://doi.org/10.3390/pr7100676

[3] Cheng, K. M., Tan, J. Y., Wong, S. Y., Koo, A. C., & Amir Sharji, E. (2022). A Review of Future Household Waste Management for Sustainable Environment in Malaysian Cities. Sustainability, 14(11), 6517. https://doi.org/10.3390/su14116517

[4] Ghazvinei, P. T., Mir, M. A., Darvishi, H. H., & Ariffin, J. (2017). Solid Waste–Management Framework. In University Campus Solid Waste Management: Combining Life Cycle Assessment and Analytical Hierarchy Process (pp. 81–91). Springer. https://doi.org/10.1007/978-3-319-43228-1_6

[5] Google Trends. (2023). Google Trends.com. Retrieved February 20, 2023, from https://trends.google.com/home

[6] Nelles, M., Grünes, J., & Morscheck, G. (2016). Waste Management in Germany – Development to a Sustainable Circular Economy? Procedia Environmental Sciences, 35, 6–14. https://doi.org/10.1016/j.proenv.2016.07.001

[7] Scopus. (2023). Scopus Database.
[8] Wordclouds. (2023). Wordclouds.com. Retrieved March 27, 2023, from https://www.wordclouds.com/