

# Consumer behavior in the waste management system: bibliometric analysis

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## Introduction

In the face of escalating waste generation and exacerbated environmental challenges, effective waste management has emerged as a critical imperative in contemporary society. Strategies and methodologies for waste management are pivotal for fostering sustainable development and safeguarding environmental integrity. Central to this discourse is the examination of consumer behavior, given its profound influence on consumption patterns and, consequently, waste generation dynamics. The study of consumer behavior within the waste management framework necessitates meticulous scrutiny and scholarly inquiry. It is imperative to devise robust strategies aimed at enhancing consumer consciousness regarding sustainable consumption practices and waste reduction strategies. A nuanced understanding of consumer motivations, inclinations, and perspectives on waste management is essential for crafting impactful interventions and outreach programs. Bibliometric analysis of scholarly literature pertaining to this domain offers a comprehensive appraisal of existing research paradigms, discerns prevailing trends in academic discourse, and delineates prospective trajectories for further inquiry. This analytical approach serves as a potent instrument for formulating scientific hypotheses, pinpointing knowledge lacunae, and catalyzing scholarly endeavors in the realm of waste management.

The main focus of this study is a bibliometric analysis of literature sources about consumer behavior in the waste management system. Bibliometric analysis is based on quantity analysis of bibliographic documents. It allows to reveal trends and regularities within the researched issue.

## Methodology

The article carries out a bibliometric analysis of Web of Science works for 2000-2023 that are devoted to consumer behavior in the waste management system. Web of Science (2024) and VOSviewer (2024) and were used for the analysis.

Firstly, it was found sample forms based on the scientometric database Web of Science by keywords. Such keywords for this study were "Consumer behavior" and "waste management system". The selection was made by keywords in the topic of scientific works. As a search result, more than 300 publications were found.

Next, the data is filtered by parameters (types of documents, language of documents, year, etc.). Only research and review articles, and proceeding papers were included in the sample. All works were published during 2000-2023. All of them are printed in English. Thus, only 289 of the most relevant publications were included in the sample.

The next step was the analysis of the received sample of works in the VOSviewer (2024) program. The increase in publications and citations of Figure 1 demonstrates a growing interest in the topic. Next, the main directions of scientific research on consumer behavior in the waste management system in 2000-2023 were investigated, and 7 clusters of keywords were selected (Figures 2, 3).

## Results

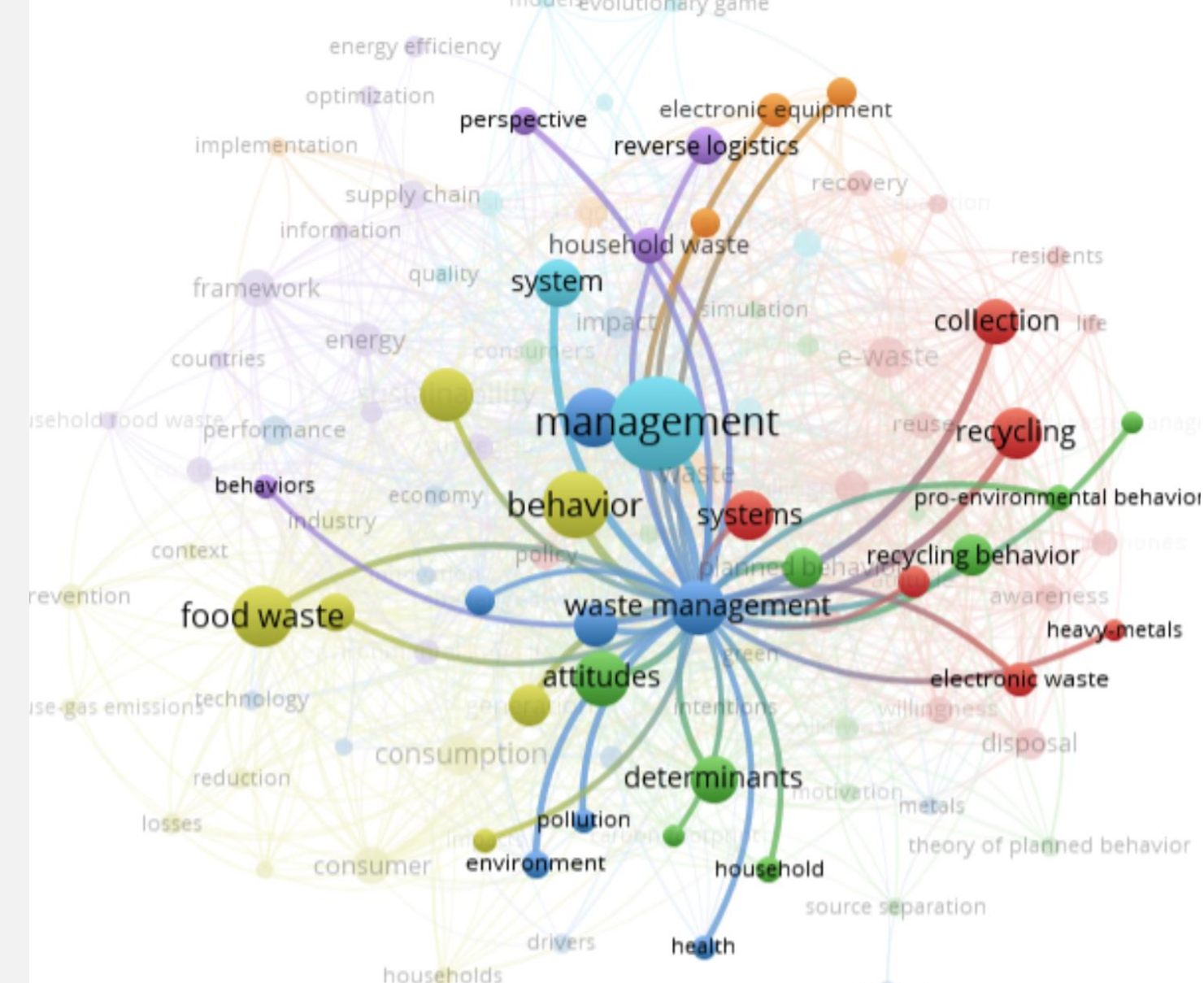


Figure 3. Main directions of scientific research on consumer behavior in the waste management system in 2000-2023. Source: Based on VOSviewer (2024) and Web of Science (2024)

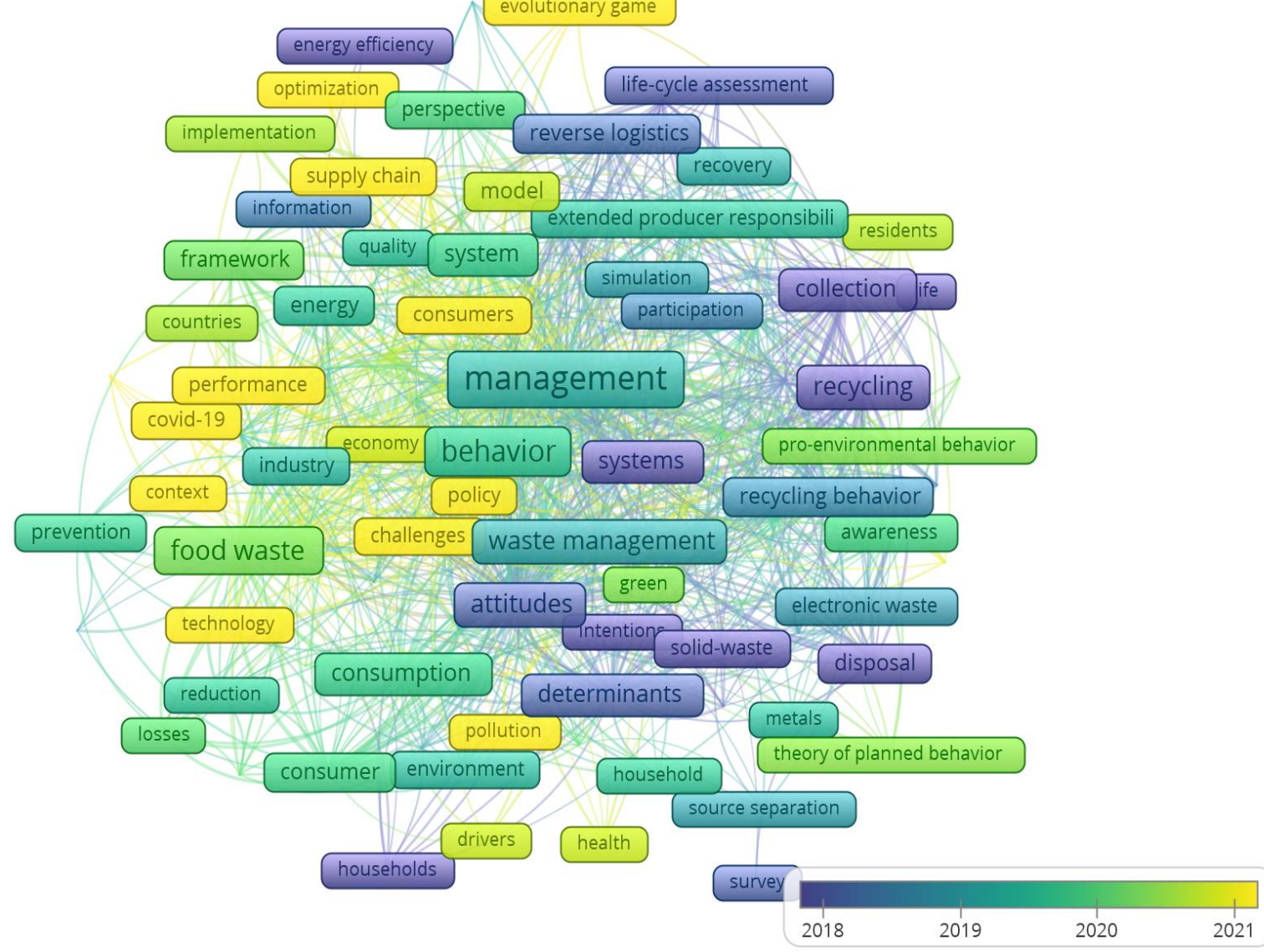


Figure 4. Visualised map of publications on the study of consumer behavior in the waste management system by level of semantic proximity and year of their activation. Source: Based on VOSviewer (2024) and Web of Science (2024)

## Results

The conducted research shows the presence of 7 keywords clusters in the publications of scientists on the topic "Consumer behavior in the waste management system". According to keywords, that were found in each cluster, it started to be possible to give them the following general names: cluster 1 (red) - "Recovery", cluster 2 (green) - "Recycling", cluster 3 (blue) - "Challenges", cluster 4 (light green) - "Consumption", cluster 5 (purple) - "Consumer behavior", cluster 6 (blue) - "Management system", cluster 7 (orange) - "Implementation". As can be seen in Figure 2, two clusters are devoted to behavioral aspects, the other mostly to management and work strategies. Figure 4 presents the Visualized map of publications on the study of consumer behavior in the waste management system by the level of semantic proximity and year of their activation. The most rapid changes were in the years 2018-2021, in this figure the keywords in yellow are the most recent studies, they help to predict future studies. Figures 5 and 6 present countries with over ten publications on consumer behavior in the waste management system and Affiliations with five or more publications on this topic respectively.

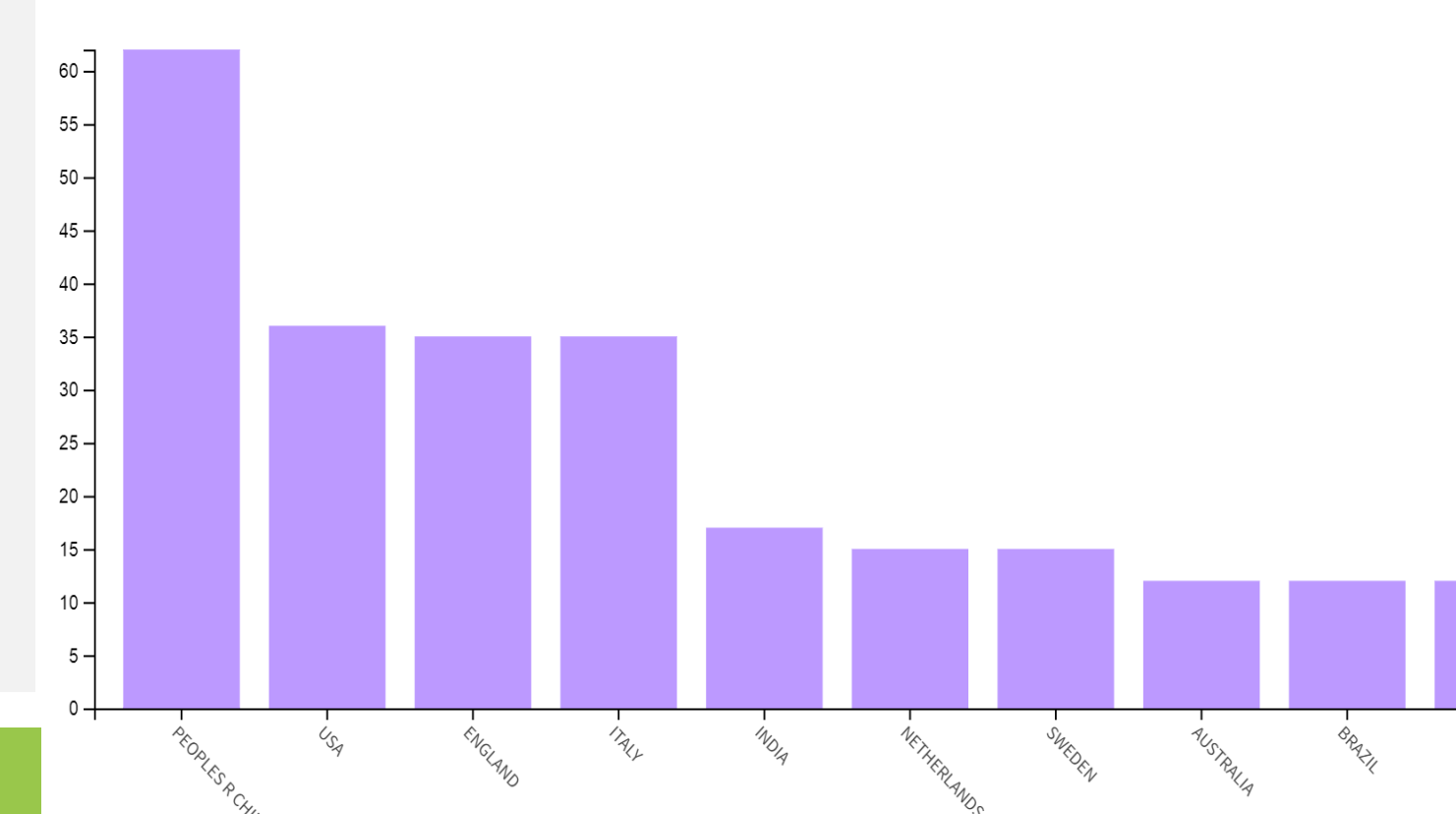


Figure 5. Countries with over ten publications on consumer behavior in the waste management system

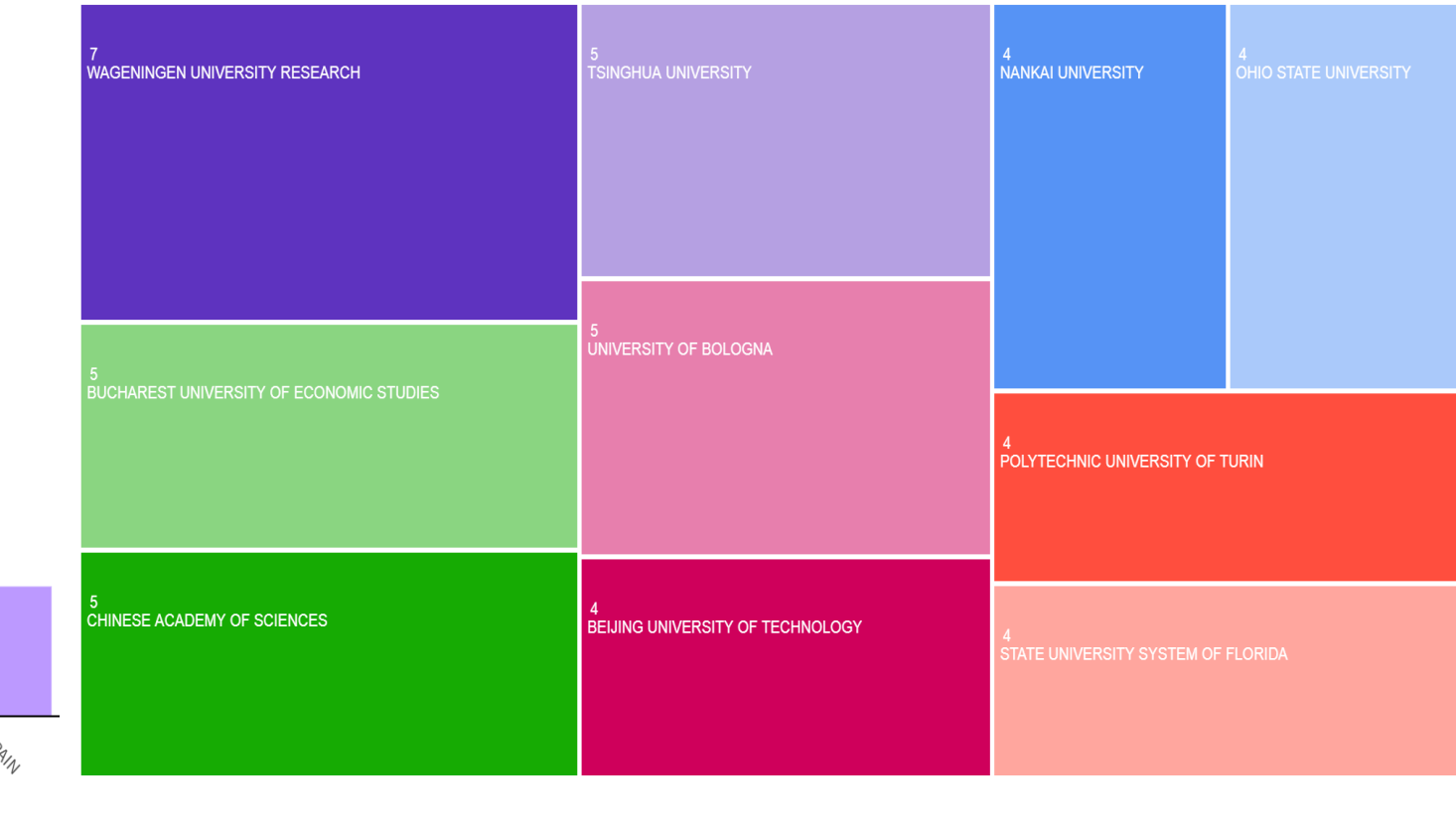


Figure 6. Affiliations with five or more publications on consumer behavior in the waste management system

## Main conclusions

Based on the conducted research, it can be concluded that consumer behavior issues in waste management systems are becoming increasingly relevant within a narrow circle of scientists each year. The evolution of keyword queries highlights promising keywords and combinations, such as consumers, behavior, theory of planned behavior, challenges, evolutionary game, optimization, performance, technology, context, economy, policy, model, health, and drivers. Considering these keywords, directions for further scientific research on consumer behavior in waste management systems can be identified, for example:

- **Consumers:** Exploring consumer preferences and attitudes towards waste management programs.
- **Behavior:** Studying consumer responses to different waste management strategies and their decision-making in this context.
- **Theory of Planned Behavior:** Analyzing consumers' intentions regarding waste management decision-making.
- **Challenges:** Identifying key challenges faced by consumers in waste management systems.
- **Evolutionary Game:** Utilizing evolutionary game concepts to model consumer strategies in waste management.
- **Optimization:** Developing optimal waste management strategies based on consumer behavior models.
- **Performance:** Evaluating the effectiveness of different waste management approaches from a consumer perspective.
- **Technology:** Examining the role of technology in improving consumer behavior in waste management.
- **Context:** Studying the influence of context (social, cultural, economic) on consumer decisions related to waste management.
- **Economy, Policy, Model:** Analyzing the interaction of economic and policy factors on consumer behavior in waste management.
- **Drivers:** Identifying key motivators that shape consumer behavior in waste management systems.

These research directions will contribute to a better understanding and optimization of waste management with consideration of consumer preferences and behavior.

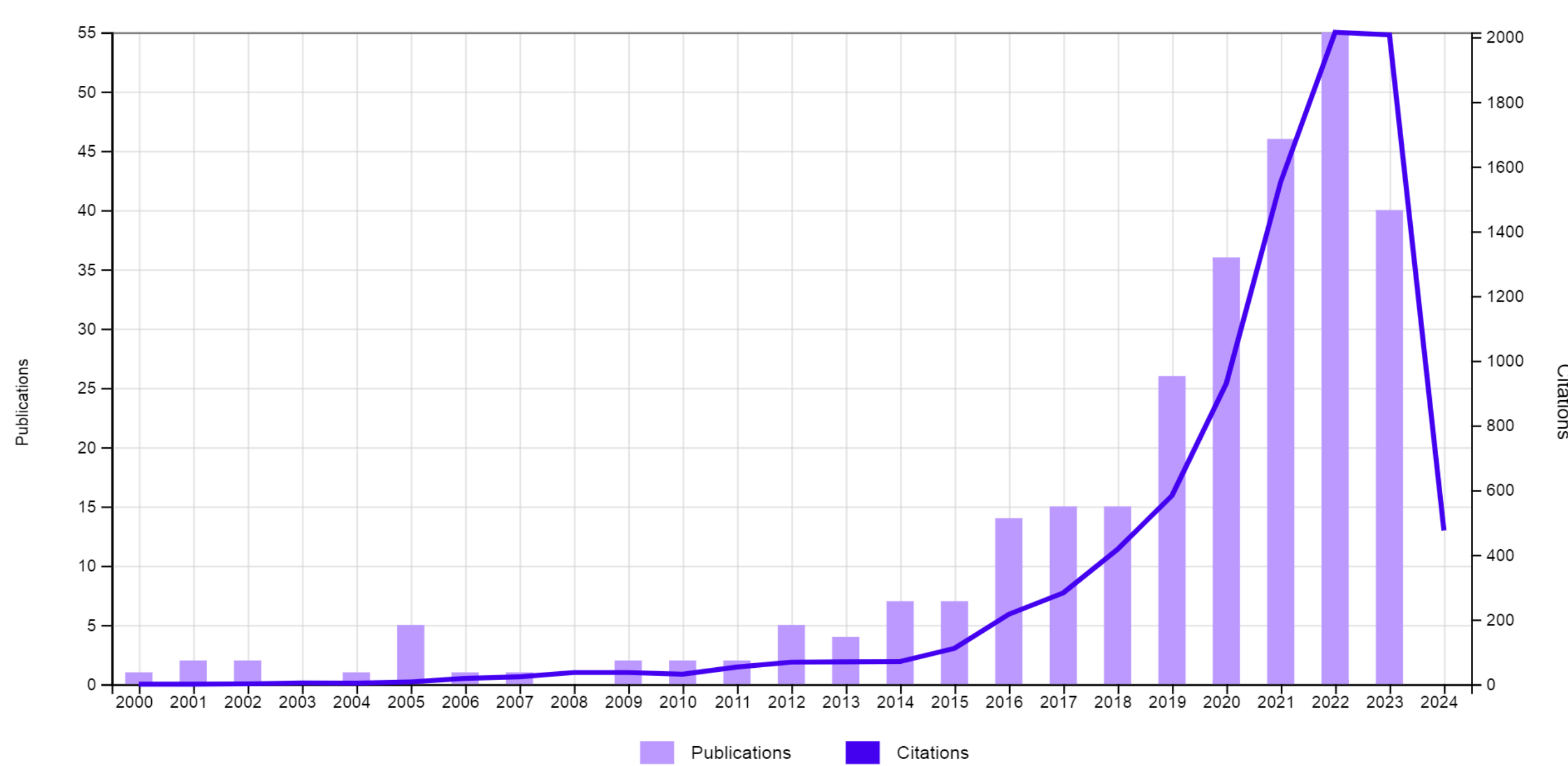


Figure 1. Times cited and publications over time. Source: Based on Web of Science (2024)

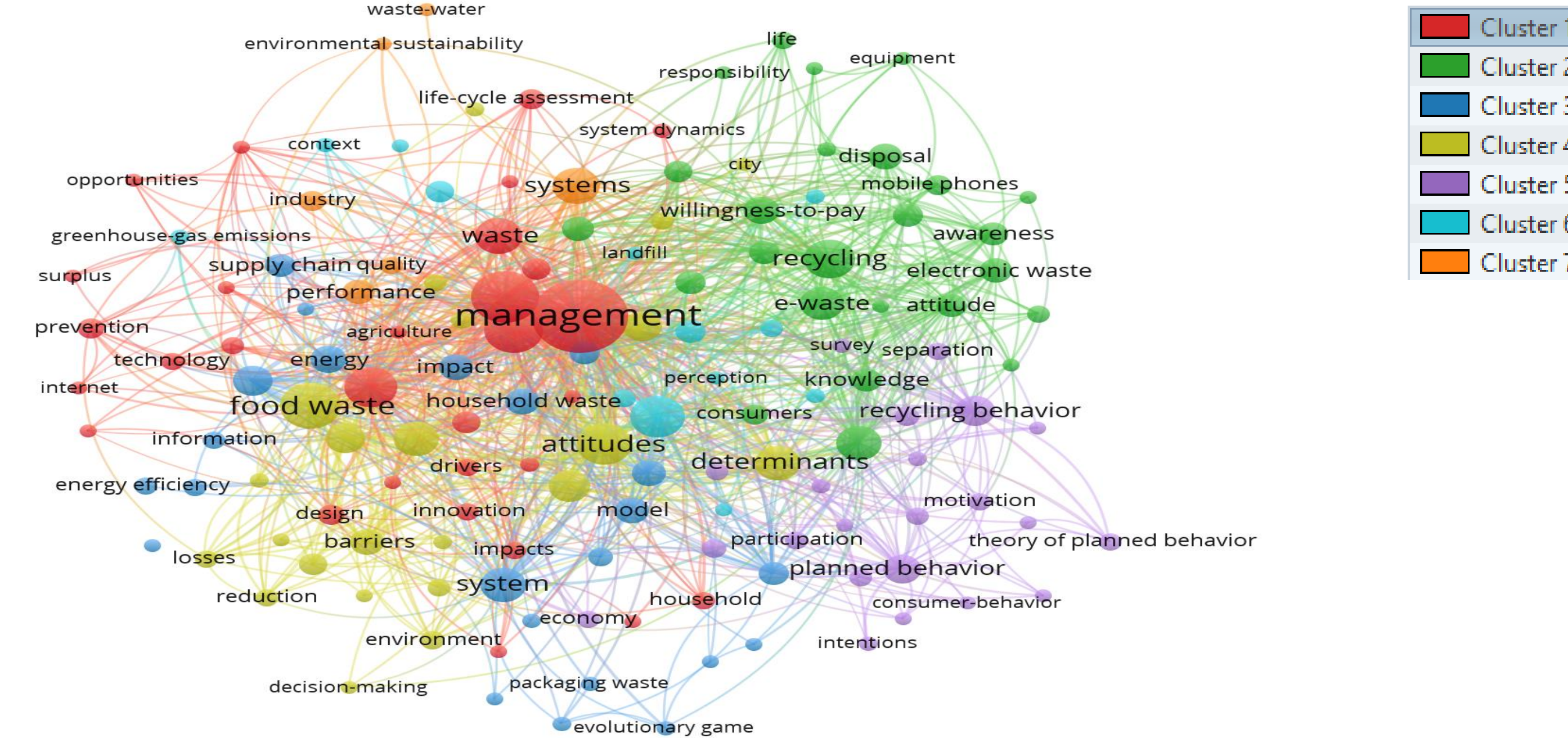


Figure 2. Clusters of scientific research on consumer behavior in the waste management system in 2000-2023. Source: Based on VOSviewer (2024) and Web of Science (2024)