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Sustainable consumption and experimental economics – a bibliometric analysis

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Abstract. *Sustainable consumption represents a crucial research area for modern debates and in addressing globally salient environmental challenges, while experimental economics provides rigorous methods for creating empirically grounded solutions. This study aims to empirically analyze the intersection of the two fields of study, especially in the context of the current climate crisis. The analysis focuses on mapping the dominant research themes, the main actors involved and the collaboration and the influence networks that shape this interdisciplinary area. The article proposes a bibliometric analysis, using VOSviewer software, based on a dataset of 2,596 articles extracted from the Web of Science database. The study includes co-occurrence, co-authorship and co-citation analyses, with the aim of highlighting the intellectual and social structure of the field and the results indicated an exponential growth in publications, especially after 2017. Furthermore, the analysis underscored a geographical shift in scientific productivity, concentrated in Asia, particularly China and India, while the theoretical foundations remain predominantly Western. In addition, collaboration networks highlight the central role of China and the United States as global research hubs. The study provides a comprehensive quantitative mapping of this complex interdisciplinary domain, delineating its intellectual structure, key actors and emerging trends.*

Keywords: sustainable consumption, experimental economics, bibliometric analysis, VOSviewer.

JEL Classification: A1, O1, O3.

1. Introduction

Sustainable consumption is about minimizing negative impacts on the environment in terms of finding ways to optimize the usage of resources so that both current and future generations could still benefit from them (Sargin & Dursun, 2023). Although economic growth can be considered a threat to the environment, it is essential for all business agents to adopt a "to do more and better with less" attitude when it comes to reducing the environmental impact, allocating resources efficiently, using renewable resources, managing waste, and, overall, implementing circular economy processes (UN, 2021). The same attitude should be adopted by individuals, households and governments altogether (Vargas-Merino, et al., 2023).

Experimental economics refers to studying economic questions by applying scientific experimental methods. In order to do that, despite using only historical data and theoretical models, economists observe the ways in which people make economic decisions by creating controlled environments in laboratories or in the field (Eckel, 2014). These controlled experiments in which human behavior is observed when tested against incentives are linked to behavioral economics. This branch of economics investigates consumption patterns based on people's misconceptions, prejudices and social characteristics. Research in this domain gains importance in terms of sustainability due to finding solutions for allocating scarce resources more efficiently, so as to encourage sustainable consumption strategies (Zengi, 2023).

As this topic is well-known nowadays, due to the climate change issues, it is extremely important for researchers to add value to it and to innovate constantly. Thus, this bibliometric analysis has the scope of identifying the current state of knowledge in the field of sustainable consumption and experimental economics, so that researchers interested in this area can assess potential future topics of discussions for finding solutions to the problem of unsustainable overconsumption. Our study consists of the following research questions: (1) What are the main existent academic research topics and subjects on sustainable consumption and experimental economics? (2) What are the subject areas that shape the study around sustainable consumption and experimental economics? (3) Which countries, institutions and authors contribute the most to the research field of sustainable consumption and experimental economics at the moment? (4) Which authors are the most cited in this field of study and what are the current links between organizations and countries? They are explored using the analytics from the chosen database and network landscapes from VOSviewer software in the Results and Discussions section, followed by Conclusions and References.

2. Literature Review

2.1. Sustainable Consumption: Theoretical Foundations

The concept of sustainable consumption is essential in the debates on sustainable development and the ecological crises that have arisen as a result of modern production and

consumption processes. This concept was initiated as a corrective mechanism aimed at diminishing the negative environmental externalities resulting from consumerism (Jackson, 2005). Early strategies focused on this concept were oriented towards efficiency, by supporting recycling or using diminished volume of resources and adopting less harmful products. These initial approaches were structured around environmental impact, making it necessary to expand the ecological perspectives to also include the impact on economic and social dimensions (Lorek and Fuchs, 2013).

The responsible approach to resource consumption was highlighted in the seminal Brundtland Report (WCED, 1987), which defined sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Subsequently, the imperative of adopting sustainable production and consumption models was consolidated at the 1992 Earth Summit in Rio de Janeiro (United Nations, 1992). Modern perspectives have become multidimensional, encompassing the impact of social equity, the economic context and the ecological footprint, highlighting the need to optimize resources use for long-term societal benefits (Agyeman, Bullard and Evans, 2003).

The theoretical framework for sustainable consumption is based on social and environmental psychology and behavioral economics. An influential model developed by Ajzen (1991), the Theory of Planned Behavior, posits that an individual's intention to perform a certain behavior is determined by three factors: the individual's attitude toward the behavior, the perceived social pressure from referent individuals and perceived behavioral control. However, criticism of this model has highlighted its disregard for past habits and the impact of broader contextual factors that can influence behavior independently of intention (Bamberg and Möser, 2007). The Value-Belief-Norm theory, developed by Stern et al. (1999), extended Schwartz (1977) Norm-Activation Model by establishing a causal link: enduring personal values influence environmental worldviews and beliefs, which lead to problem awareness and subsequently trigger personal moral norms for pro-environmental actions. This model links individual values to specific actions, highlighting the deep motivational underpinnings of sustainable consumption behaviors (Stern, 2000).

Furthermore, sustainable consumption is influenced by economic, social, cultural and public policy factors. Cultural norms dictate consumption patterns and the absence of infrastructure facilities, such as public transport or recycling facilities affects individual intention regarding sustainable choices (Evans, 2011). Moreover, socio-economic factors affect access to sustainable options and the content of public policies shapes consumers' final choices (Thoegersen, 2005).

A pervasive challenge is "greenwashing", a practice often encountered in the promotion of false image of ecological responsibility by companies in order to attract consumers (Delmas and Burbano, 2011). In addition, another challenge is represented by issues of equity in the discourse on sustainable consumption, as responsibility can be disproportionately shifted onto individuals, ignoring the crucial role that corporations and

governments have in the environmental burdens that unequally affect marginalized communities (Agyeman, Bullard and Evans, 2003; Shove, 2010).

Recent perspectives challenge the growth-oriented paradigm. The "degrowth" movement argues in favor of planned reduction of production and consumption in wealthy countries, in favor of equity and sustainability (Kallis, Demaria and D'Alisa, 2015). Moreover, the circular economy proposes a model opposite to the linear one, aiming to eliminate waste and keep material in use for an extended time (Ellen MacArthur Foundation, 2016). Likewise, the idea of "consumption corridors" calls for establishing minimum and maximum consumption limits, with the aim of guaranteeing general well-being without affecting ecological stability (Fuchs et al., 2021).

2.2. Experimental Economics: A Methodological Framework

Experimental economics represents an innovative methodological approach for the study of decision-making processes, making a paradigm shift that captures the transition from exclusively theoretical models and observational data to one that uses controlled empirical methods to test hypotheses (Kagel and Roth, 1995). The pioneer of using laboratory experiments in economics was Vernon Smith, who demonstrated how market dynamics can be replicated and studied under laboratory conditions through incentive-compatible mechanisms aligned with participants' preferences (Smith, 1962). Furthermore, Daniel Kahneman and Amos Tversky highlighted deviations from classical economic rationality through the use of experiments and their Prospect Theory (Kahneman and Tversky, 1979) underscored the role of experimental methods in identifying the "anomalies" of human behavior.

To achieve scientific legitimacy and analytical rigor, experimental economics is based on a set of fundamental principles (Smith, 2003). The ability to control variables of interest while holding other conditions constant (ceteris paribus) defines the essence of this methodology, which allows for the establishment of clear causal inferences. Additionally, the randomization procedure ensures that observed discrepancies between groups cannot be attributed to pre-existing factors but rather to the experimental intervention, thus ensuring that experimental decisions are both relevant and reflective of real preferences (Hertwig and Ortmann, 2001). Robustness and validity are achieved through replicability, by reproducing the experimental protocol to obtain similar results.

Behavioral economics has capitalized on this methodological diversification, using experiments to validate numerous cognitive biases, such as loss aversion or the anchoring effect, to demonstrate systematic deviations from perfect rationality (Camerer and Loewenstein, 2004). Moreover, the significant impact of framing effects, where the presentation of information influences the decision, has been demonstrated (Tversky and Kahneman, 1981). Additionally, the concept of the "nudge", developed by Thaler and Sunstein (2008), utilizes choice architecture to guide people towards better decisions without limiting their available options. Field experiments have highlighted the relationship between economics and public policy, particularly through "plumber" approaches

(plumber economics), where institutional details are adjusted by the experimenter to improve the function of policies (Duflo, 2017).

However, the most evident limitation attributed to this methodology relates to its reduced external validity, as results obtained in controlled environments with small groups of participants cannot be readily generalized to the diverse social behaviors of the real world (Levitt and List, 2007). Furthermore, complex experimental studies are difficult to replicate and the robustness of their conclusions is diminished (Camerer et al., 2016). Recent critiques emphasize the need to integrate the institutional and systematic dimensions that condition economic decisions in order to deepen the analysis of individual behaviors (Guala, 2005).

Despite these limitations, experimental economics remains an extremely valuable methodological framework. Through its ability to capture how individuals react to incentives, norms and institutional arrangements, it offers useful tools for analyzing behaviors related to common resources (Ostrom, 1990), cooperation and public policies. Moreover, recent research explores the application of experimental economics to ecological transitions and sustainable consumption (Allcott and Rogers, 2014; Nyborg et al., 2016). The criticisms aimed at experimental economics do not diminish its relevance; they merely highlight the need for methodological transparency to allow for the evolution from laboratory simulations to an interdisciplinary framework with direct applications to current global challenges.

2.3. The Intersection of Sustainable Consumption and Experimental Economics

The intersection of experimental economics and sustainable consumption captures a fundamental methodological evolution, making the transition from purely theoretical model to those oriented towards the identification of rigorous causal inferences. The theoretical framework in section 2.1. outlines the possible factors that can determine sustainable behaviors, while section 2.2. establishes the analytical toolkit. At this confluence, the specialized literature has highlighted several major directions of research, which collectively illustrate how experimental methods contribute to a more sophisticated knowledge of the dynamics of sustainable consumption.

2.3.1. Choice Architecture and Behavioral Interventions (Nudges)

A prolific area of research focused on applying choice architecture to design “nudges” (Thaler and Sunstein, 2008), more specifically, subtle adjustments to the decision-making context to encourage individuals towards sustainable options, but without limiting their choices. Experiments represent the primary methods for the causal validation of the effectiveness of these interventions. One canonic example is the manipulation of social norms, using large-scale field experiments, it has been demonstrated that providing households with comparative information about their energy consumption relative to their neighbors leads to significant and durable reductions (Schultz et al., 2007; Allcott, 2011). Likewise, changing classical electricity contracts to a “green” tariff leads to substantial increases in the adoption rate of renewable energy (Pichert and Katsikopoulos, 2008).

Furthermore, the framing of information is crucial, as in the case of carbon footprint labels, confirming that the mode of presentation is as important as the information conveyed (Lohmann et al., 2022; Edenbrandt and Nordström, 2023). Thus, large-scale behavioral changes can be achieved with low-cost interventions, if they are well-anchored psychologically.

2.3.2. Pro-Social Behavior and Public Goods Games in Environmental Contexts

Sustainability challenges, such as climate crises or the overexploitation of natural resources, can be defined as collective action dilemmas, having the classical structure of a public goods game. Understanding the mechanisms that promote or inhibit cooperation in such dilemmas is achieved through laboratory experiments. Extending the research of Ostrom (1990), experimental studies have demonstrated that introducing pre-decisional communication channels increases the level of cooperation. Furthermore, the "altruistic punishment" mechanism reveals that individuals are willing to bear a personal cost in order to sanction selfish behavior, thereby strengthening cooperation norms (Fehr and Gächter, 2000). A recent large-scale online experiment with over 18,000 participants from ten countries revealed that differences between cultural contexts varied minimally and cooperation levels remained stable over long periods, emphasizing that individual differences are superior to cultural particularities (Frey, 2019). Furthermore, introducing an option to exploit the common resource in a collective risk experiment substantially diminished the probability of meeting the cooperation threshold, crystallizing the need for climate policies that discourage exploitation (Cloos, Greiff and Kempa, 2025). Thus, these findings represent important benchmarks for institutional design for establishing empirically validated principles in shaping policies for common resource management.

2.3.3. Consumer Preferences and the "Attitude-Behavior Gap"

The "attitude-behavior gap" is a persistent theme in debates on sustainable consumption, owing to the discrepancy between consumers' declared pro-environmental intentions and their actual purchasing behaviors. Experimental methods allow for the rigorous quantification of the real willingness-to-pay (WTP) for sustainable attributes, transcending the limitations of hypothetical survey responses. Studies have shown that while there are consumers willing to pay a price premium for products with eco-labels or a reduced carbon footprint (Teisl, Roe and Hicks, 2002), they often confront barriers such as high prices or a lack of trust in labels, which is eroded by the "greenwashing" phenomenon (Carrington, Neville and Whitwell, 2010; Delmas and Burbano, 2011). To explain why this gap occurs, recent theoretical models, such as SHIFT framework (Social, Influence, Habits, Individual self, Feelings and cognition, Tangibility), explain how psychological and contextual factors determine consumer behavior (White, Habib and Hardisty, 2019). In this context, eco-labels are considered effective marketing tools, yet their effectiveness is contingent upon credibility and regulation (Testa et al., 2015). Therefore, experimental studies play a dual role: they not only measure WTP but also test specific interventions and identify the contextual and psychological factors capable of reducing the "attitude-behavior gap" in sustainable consumption.

To sum up, the literature on sustainable consumption and experimental economics has captured the transition from abstract theoretical models towards the empirical testing of mechanism that determine individual and collective behaviors, "Nudge"-type interventions have highlighted how changes in consumption behavior can generate through subtle adjustments in the decision-making architecture, while studies on public goods and pro-social behaviors have underscored the importance of communication and of creating an institutional design capable of fostering cooperation in the face of environmental dilemmas. Simultaneously, research on the "attitude-behavior gap" has outlined the impact of the psychological context and the importance of consumer behaviors. These directions have created a complex framework, which demonstrates the essential role of experimental methods in supporting the development of public policies aimed at sustainable consumption.

3. Methodology

The research questions mentioned in the beginning of the paper are supported by a bibliometric analysis performed in the VOSviewer software. This type of quantitative research looks into bibliographic data in order to assess the current level of research in the area of sustainable consumption and experimental economics by analyzing keywords and organizations, countries and authors connections.

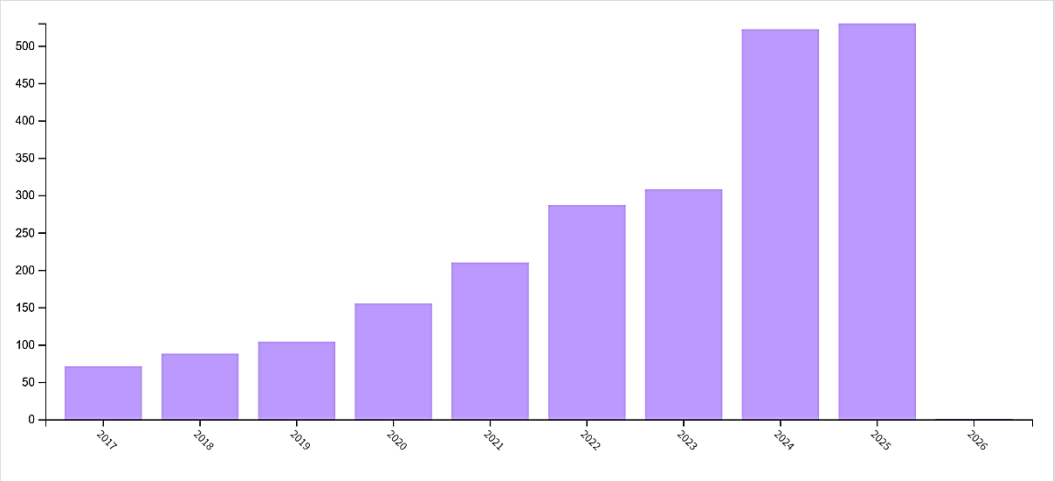
Our data was extracted from the well-known database Web of Science and resulted in 2596 findings (n = 2596) of papers written on the topic of sustainable consumption and experimental economics. Findings from another illustrious database, i.e. Scopus by Elsevier, were checked, but they resulted in only 1127 results, so Web of Science was our final choice for a better understanding of the topic.

The search was performed in August 2025 and contained the keyword mix and Boolean operator "AND" such as: "sustainable consumption" AND "experimental" AND "study", while keeping the "Article title, Abstract, Keywords" option regardless of the time range. The findings were exported in a Plain Text File so as to be further exported to VOSviewer for the bibliometric analysis. The processing of data with this software led to graphical networks using bibliographic and text data and revealed the current state of research on this topic.

4. Results and Discussions

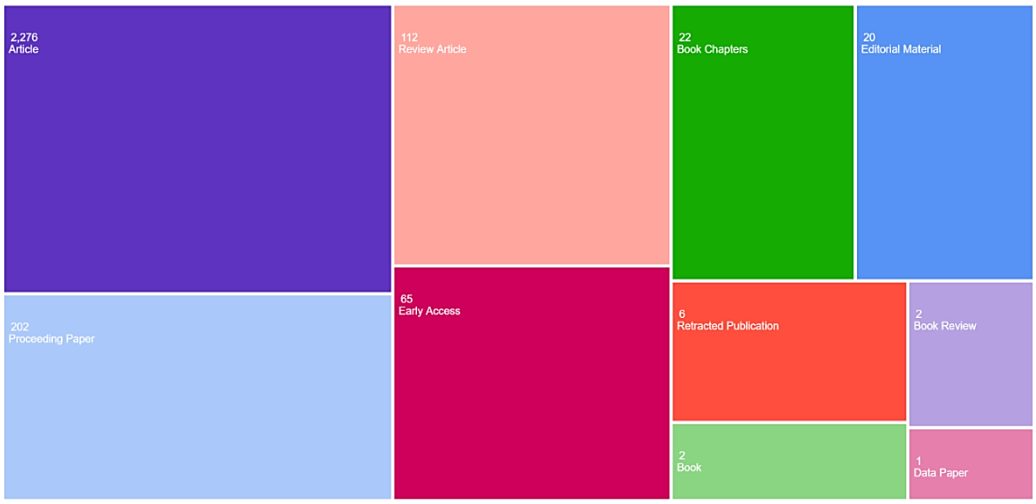
As we mentioned in the Methodology section, we wanted to discover what the actual level of research on this topic is as a starting point for fellow academics who will engage in a related subject in their future research. As the extracted data shows in *Figure 1*, the topic of sustainable consumption and experimental economics started to gain importance in 2017 with a number of 71 papers dedicated to it and the number of papers has been growing ever since, with a high peak this year in 2025 (530 papers).

Figure 1. *No. of publications per year*



Source: Authors' own research.

Figure 2. *Type of documents*

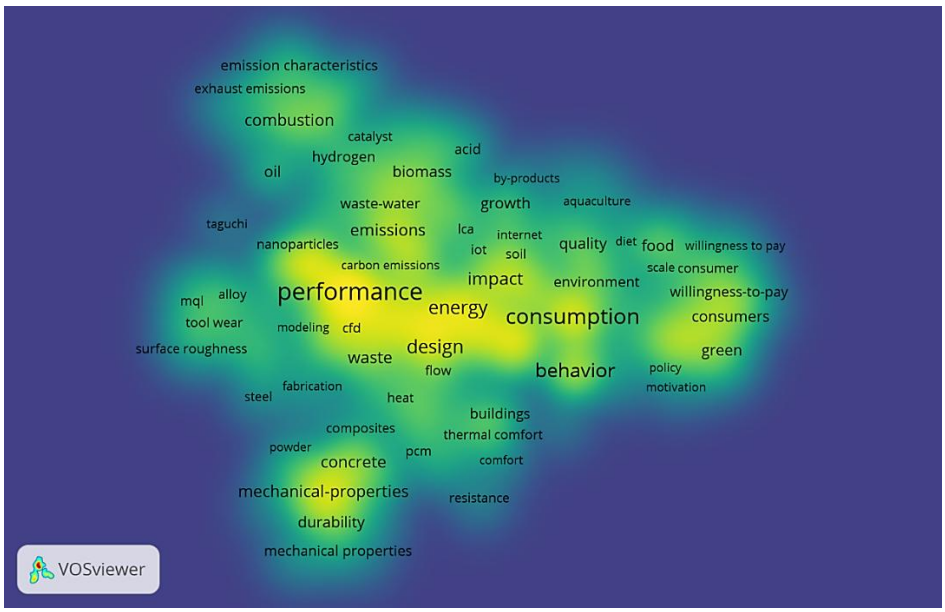


Source: Authors' own research.

The majority of papers (87.67%) is represented by scientific articles, followed by proceeding papers (7.78%), review articles (4.31%), early access papers (2.5%) and book chapters (0.84%), as per *Figure 2.* For the first and second research questions, i.e. *"RQ1: What are the main existent academic research topics and subjects on sustainable consumption and experimental economics?"* and *"RQ2: What are the subject areas that shape the study around sustainable consumption and experimental economics?"*, we have looked into data both in VOSviewer and WoS database. Until now, several themes were touched in the existent academic research, and, by introducing the data to VOSviewer, we

looked into the keywords occurrence to discover some of those main themes. The keyword occurrence can also predict future potential topics to write about for other researchers. Thus, for our topic, the following keywords stand out: "energy consumption", "performance", "optimization", "circular economy", "sustainable consumption", "willingness to pay", "performance evaluation", "performance evaluation", "quality", "management", "planned behavior", "motivation", "climate change", "growth", "recovery", "emission characteristics". *Figure 3* discloses the words with the strongest total links.

Figure 3. *Keyword co-occurrence in density visualization*



Source: Authors' own research.

Besides the keywords analysis, it is also of great importance to look into the prevalent research areas on this topic. As demonstrated by *Figure 4,* 1003 papers are engineering-related, followed by environmental sciences ecology (564 papers), science technology (554 papers), energy fuels (436), materials science (243), construction building technology (199), chemistry (193), thermodynamics (157), business economics (155), agriculture (132) and computer science (123).

We have also looked into the publishers and Elsevier turned out to be the first in the ranking with 1026 papers, followed by MDPI with 396 papers, Springer Nature with 244 papers, Wiley with 124 papers, IEE with 68 papers, and Taylor & Francis with 67 papers.

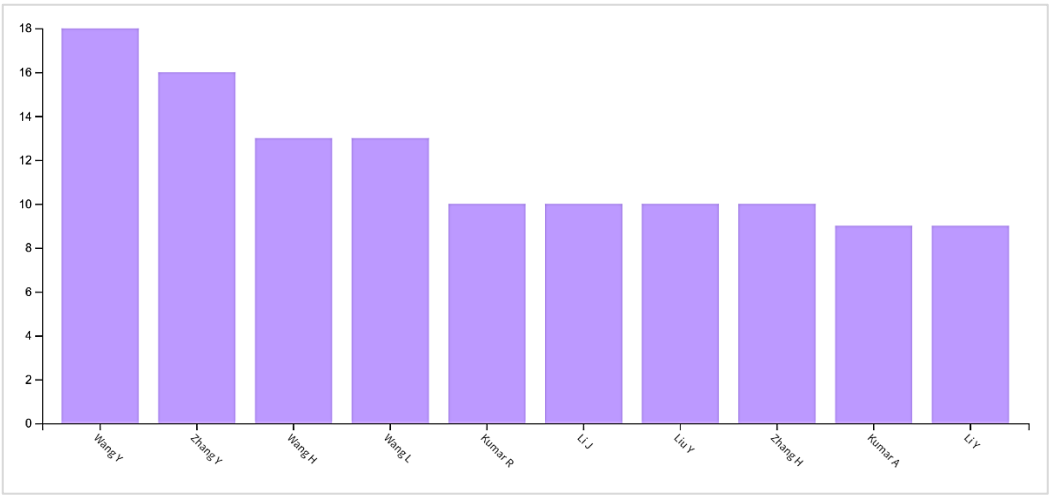
For the last two research questions, i.e. *"RQ3: Which countries, institutions and authors contribute the most to the research field of sustainable consumption and experimental economics at the moment?"* and *"RQ4: Which authors are the most cited in this field of study and what are the current links between organizations and countries?",* the below results reflect upon them.

Y. Wang is the most productive author *(Figure 5*) with a number of 18 papers written on this topic, followed by Y. Zhang with 16 papers, H. Wang with 13 papers, L. Wang with 13 papers, and R. Kumar with 10 papers. With regards to the countries which contributed the most, results show that China is on top with 623 papers, then comes India with 314 papers, United States with 234 papers, Italy with 176 papers, United Kingdom with 133 papers, Spain with 121 papers, Germany with 98 papers, Australia with 97, and France with 94 papers.

Figure 4. *Research Areas*



Figure 5. *Most productive authors*



Source: Authors' own research.

In order to look into the citation frequency of authors, there as a minimum of 5 papers per author set in VOSviewer and a minimum of 10 citations per authors, and the results showed

that the most cited ones are M. Jamil with 8 papers and 328 citations, N. He with 6 papers and 295 citations, A.M. Khan with 5 papers and 287 citations, S. Jia with 6 papers and 173 citations, F. Septianto with 5 papers and 149 papers. *Figure 6* shows the most cited authors and *Figure 7* depicts a cluster of the 3 authors that cited each other the most.

Figure 6. *Citation of authors*

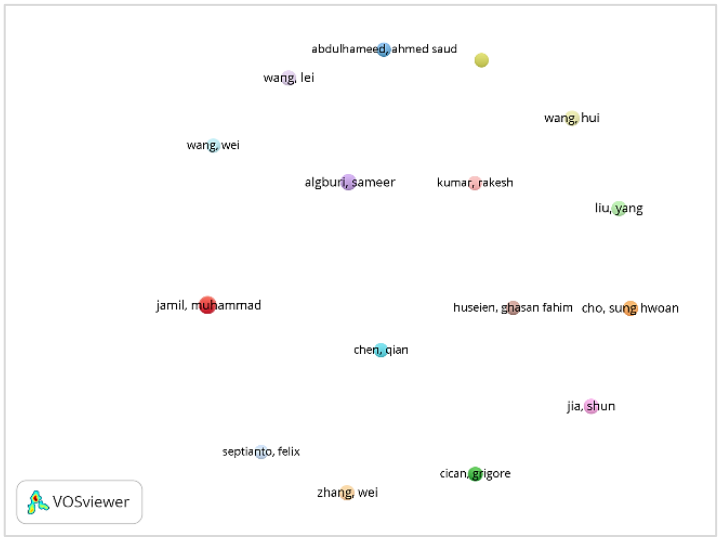
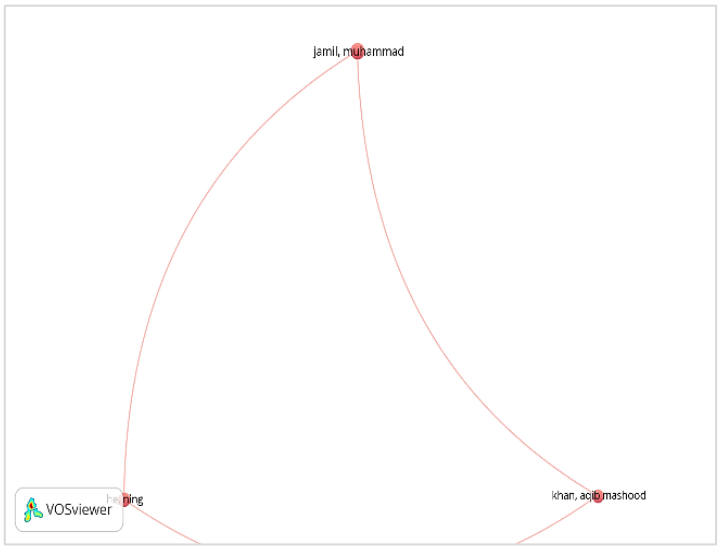


Figure 7. *Citation Links*



Source: Authors' own research.

There are several co-authorship clusters of authors that worked together on a minimum of 5 papers, while there are also isolated clusters of only one author (*Figure 8). Figure 9* delves deeper into the relationships of authors based on how they cite one another's work.

While the co-authorship of authors shows a more fragmented network that the citation one, we can draw a comparison between the two: in the citation map, author M. Jamil is connected to author Z. Liu, which means they are cited by influential authors in a bigger network, and, in the co-authorship map it is seen that M. Jamil only collaborates with author A.M.Khan, which indicates an influence through citations rather than a broader collaboration. Some authors like Z.Liu, Y. Wang, for example, are major citation hubs and collaborate outside smaller groups in the co-authorship network, while pairs of authors like H. Wang and S. Jia publish together quite often but do not have a strong citation impact. Author M. Jamil is part of a small co-author group and linked to high-impact authors via citations.

Figure 8. *Co-authorship of authors*

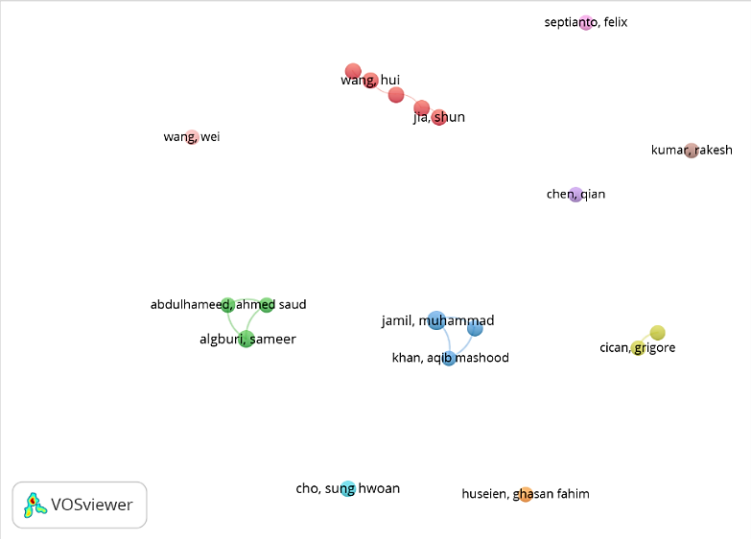
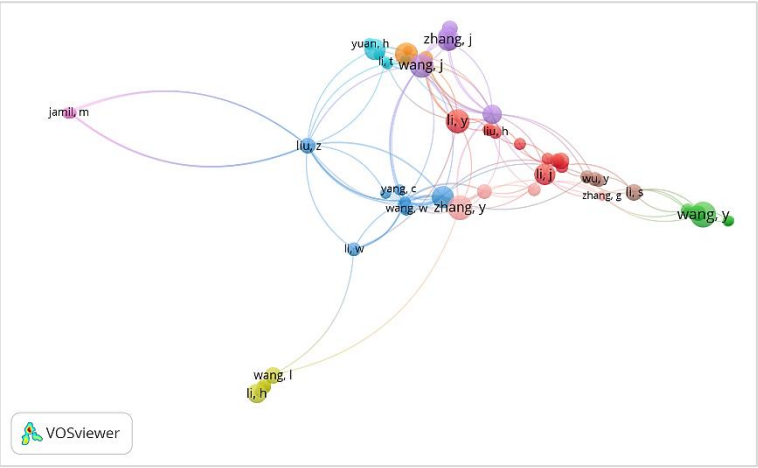


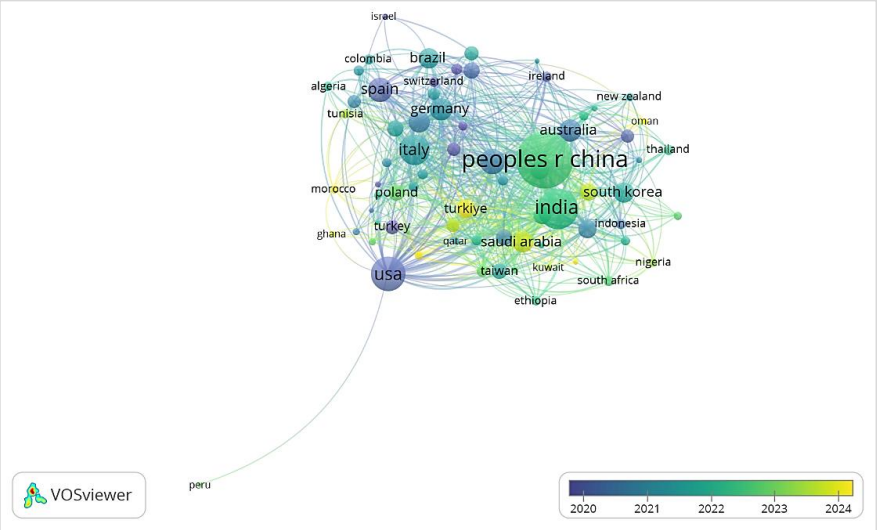
Figure 9. *Citation authors*



Source: Authors' own research.

The co-authorship network among countries illustrates the frequency of authors from different countries collaborating on publishing papers. As *Figure 10* shows, the largest nodes are represented by countries such as China, US and India, which means that they have collaborated on more papers with other countries, and China and US are strongly interconnected with other countries, as well, during 2020-2021 and around 2022, based on the colors blue and green from the scale. This means that authors from countries like Saudi Arabia, Oman and Qatar have worked together more recently. While clusters highlight strong interlinked groups of countries like China, India, Saudi Arabia, South Korea and Spain, Italy, Germany, Brazil, there is also one country, Peru, positioned in a far away point on the network map because it has fewer collaborations, mainly with US.

Figure 10. *Co-authorship of countries*

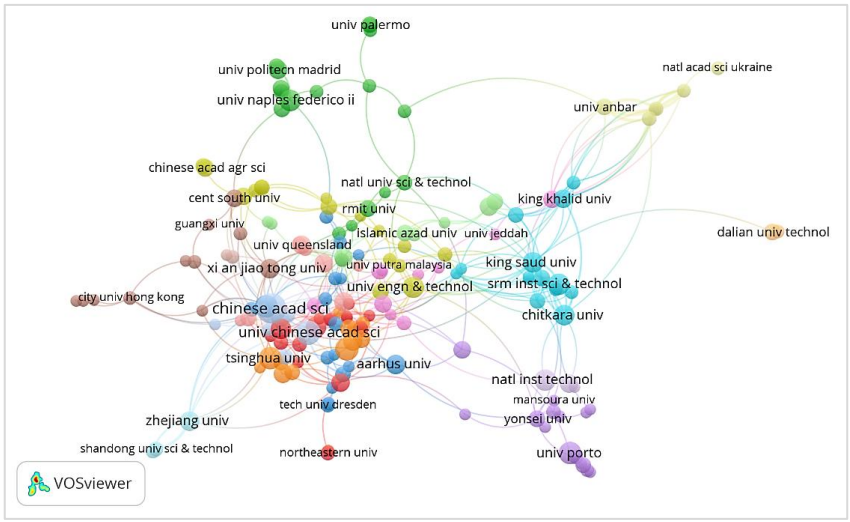


Source: Authors' own research.

When it comes to co-authorship relationships between organizations, based on the very large nodes in the network visualization, Chinese Academy of Sciences, University of Chinese Academy of Sciences, and Tsinghua University display high publication volume. The first two mentioned organizations have strong connections with institutions like Tsinghua University and Zhejiang University. The colored clusters show collaborations between groups of institutions, thus the red cluster in *Figure 11* is dominated by research institutions from China, the green cluster highlights University Politecnica de Madrid, University Naples Federico II, and University Palermo, the blue cluster shows universities from the Middle East and South Asia such as King Saud University, King Khalid University, and SRM Institute of Science and Technology, and, lastly, the purple cluster illustrates University of Porto, Yonsei University, and Mansoura University. The organizations that are closer to each other collaborate more often. Central hubs, like the Chinese Academy of Sciences) are connected to several different clusters and act like bridges between regions, while peripheral nodes indicate isolated collaborations, such the one shown by Dalian University of Technology. This network visualization outlines

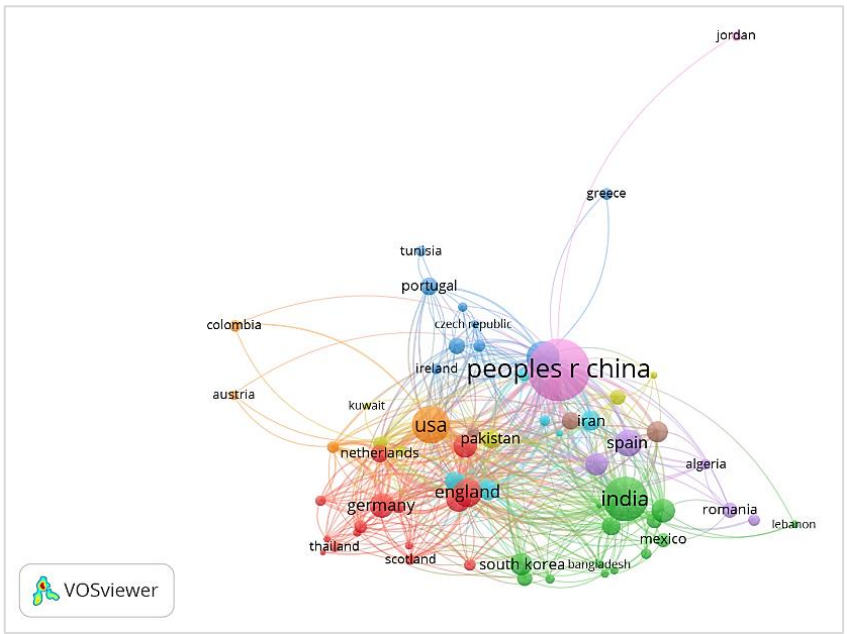
institutions from Chian as central hubs in global collaborations, universities from Europe have tight sub-networks and links between each other and with Asian partners, while Middle Eastern institutions have collaborations with China and other regional partners on the rise.

Figure 11. *Co-authorship of organizations*



Source: Authors' own research.

Figure 12. *Citation countries*

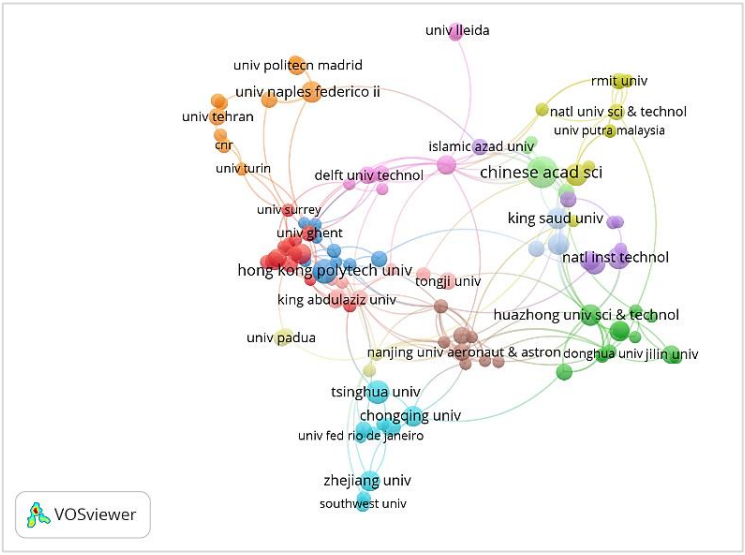


Source: Authors' own research.

By looking at the network of countries based on citation patterns (*Figure 12*), the map reveals that dominant research hubs are composed of China, US, United Kingdom and India. These countries are central to the global research landscape, because of the high volume of publications and citations. There are strong citation relationships among countries like US, United Kingdom, Germany, Netherlands, Thailand, Scotland and Austria. The green cluster indicates another important group of countries like India and South Korea, which have connections to Mexico and Bangladesh. There are also strong ties between countries from Europe, such as Ireland, Czech Republic, and Portugal, as seen in the blue cluster. Due to the high number of lines connecting different colored clusters, it can be seen that international collaboration and knowledge sharing play a significant role. The thick lines between China, US and UK indicate a strong flow of citations among them.

On the other hand, by looking at the network citation of organizations (*Figure 13*), the prominent institutions are Chinese Academy of Sciences, Hong Kong Polytechnic University, King Saud University, Islamic Azad University, along with a cluster of universities from the UK such as University of Surrey and University of Ghent. The purple cluster being centered around "Islamic Azad University" and "King Saud University" suggests an important research network in the Middle East, while the green cluster represents a strong domestic research network inside China. The blue cluster showcases collaborations between European and Chinese universities, and the yellow cluster looks into the relationships among organizations from Australia and the Southeastern Asia. These maps give a visual representation of the collaborative structures and highlight the fact that there is a multi-polar world of research, with hubs in North America, Europe, and Asia, and US and China being the "central players". Even though the clusters of organizations tend to reflect geographical proximity, there exists significant evidence of international from different clusters.

Figure 13. *Citation organizations*



Source: Authors' own research.

5. Conclusion

The bibliometric analysis in this article provided a quantitative perspective on the intersection of sustainable consumption and experimental economics, highlighting several relevant structural characteristics. The results confirmed a recent and exponential growth in the volume of publications after 2017, outlining the relevance and importance of knowledge in this field. One of the central findings is the thematic duality, with the field being structured along two directions: on one hand, a foundational literature, with a theoretical orientation focused on a socio-behavioral mechanisms, and on the other hand, a quantitatively dominant corpus with a technical orientation. The study also crystallized significant geographical particularities, revealing a dichotomy between the predominantly Western theoretical foundations and the centers of scientific productivity located mainly in China and India. Collaboration networks are robust, with China and the United Stated acting as central global hubs.

The article's contribution lies in expanding the understanding of this interdisciplinary field. The bibliometric analysis empirically validated the exponential growth of the scientific literature, most importantly, revealed a possible disconnect between technical and socio-behavioral research. The results highlighted that scientific productivity is predominantly focused on creating a techno-economic agenda, while the most foundational studies are deeply influenced by behavioral science.

Future research directions should focus on bridging this gap. A first direction could consist of a more detailed analysis of how insights from behavioral economics can be integrated to enhance the effectiveness of technical solutions. Furthermore, extending the bibliometric analysis by including other databases, such as Scopus, would allow for more robust comparisons. Finally, a qualitative meta-analysis of the research originating from the highly productive Asian hubs would provide a deeper understanding of their research agendas, facilitating more targeted international collaborations.

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