

## **Evolving Landscape of Sustainability Research in the Business and Management Literature: A Bibliometric Literature Review**

Up to date, several bibliometric review papers related to sustainability in business and management research have been published. However, most of them focus on specific topics, for example, sustainable leadership, sustainable supply chain, and sustainable human resource management. As sustainability researchers usually collaborate within academic disciplines, known as, ‘intellectual silos’ (Schaltegger, Beckmann, & Hansen, 2013), there is the lack of comprehensive review covering all 22 academic disciplines categorized by the Chartered Association of Business School (ABS) ranking. Besides, previous reviews commonly used the expert-based judgments to decide whether a paper should be included in the analysis or not, resulting in limited numbers of papers being analysed. Moreover, the link between sustainability research and the UN Sustainable Development Goals (SDGs) is still underexplored (Asatani, Takeda, Yamano, & Sakata, 2020). In complementing these reviews, this study aims to use several bibliometric methods such as citation network, text mining, and text similarity analyses to provide a more systematic and comprehensive understanding of the contributors, main literature, and research streams within the sustainability-related business and management literature, their interactions across academic disciplines, and their links to the Sustainable Development Goals (SDGs).

In this paper, I followed the DNICT procedures adopted from previous studies (Asatani et al., 2020; Fahimnia, Sarkis, & Davarzani, 2015) consisting of five steps: data construction, network construction, initial analysis, cluster analysis, and text analysis. The initial search found papers with the term “sustainab\*” (e.g. sustainable, sustainability) appeared in title, abstract or key words. As the focus was on business and management literature, the search was restricted (by using ISSN number) to only papers published in journals listed in Academic Journal Guide by Chartered Association of Business School. The bibliographical information, abstracts, and keywords of papers that met the criteria were retrieved from the database on 4 – 7 November 2020. After cleaning any incomplete and irrelevant parts of the data, the retrieved data was then reduced to 56,960 papers. Based on the retrieved data, I conducted the citation network analysis, a type of exploratory data analysis using graph theory to explore the data structure (Lewis-Beck, Bryman, & Futing Liao, 2004). A direct citation network simply consisted of nodes and links, whereby each paper represents as a node, and its citations represent as links. This step could exclude the irrelevant papers, which received no citations or did not cite any other papers, as suggested by the previous study (Kajikawa, Ohno, Takeda, Matsushima, & Komiyama, 2007). Thus, the number of papers in the data was narrowed down to 25,737 papers, accounted for 45% of the total papers in the dataset. I, then, performed initial statistical analysis (Aria & Cuccurullo, 2017), conducted the Louvain algorithm to group papers into research streams (Kajikawa et al., 2007), calculated the TF-IDF value (Term-rating technique) to reveal significant terms of each research stream (Aizawa, 2003), and assessed the linguistic similarity between each research stream and each SDG (Asatani et al., 2020).

From the initial statistical analysis, I find that sustainability research has grown exponentially in business and management literature with the majority of the papers (73.6%) published in the latest decade 2011-2020. It also has been growingly studied by all 22 academic disciplines identified by ABS Academic Journal Guide. The top seven academic disciplines are main academic disciplines, as they contain almost 80% of the whole literature: Sector Studies (SECTOR STUDIES); Regional Studies, Planning and Environment (REGIONAL STUDIES); Operations and Technology Management (OPS & TECH); Economics, Econometrics and Statistics (ECONOMICS); General Management, Ethics, Gender and Social

Responsibility (GENERAL MAN); Social Sciences (SOCIAL SCIENCES); and Marketing (MARKETING).

My findings from the Louvain clustering of the citation network reveal 23 research streams with several insights. Firstly, these 23 research streams consist of three large (> 3,000 papers), five medium (> 1,000 papers), seven small (< 1,000 papers), and eight micro (< 500 papers). Three largest research streams include Corporate Social Responsibility (CSR), Operations & supply chain, and Tourism, accounted for 42%. Secondly, the concepts of sustainability across research streams are inconsistent in two dimensions: definition coverage and level of analysis. On the one hand, the definition coverage varies from traditional financial aspect, to triple bottom line, and to sustainable development. On the other hand, the level of analysis varies from micro-level, to firm-level, to macro-level, and to multi-level perspectives. Thirdly, all 23 research streams differ noticeably with regards to their level of development and their connection with other research streams and academic disciplines. For example, some research streams such as Corporate Social Responsibility and Operations & supply chain have been studied across various academic disciplines, while some streams such as Tourism are still discussed by limited academic disciplines.

I also conduct the linguistic similarity analysis to explore the connection of each research stream towards each SDG. Despite the different levels of SDGs coverage among research streams, sustainability-related business and management research has contributed to all Sustainable Development Goals. In particular, Goal #9 Industry, Innovation & Infrastructure, Goal #10 Reduced Inequality, Goal #12 Responsible Consumption & Production, and Goal #13 Climate Action, receive high attention from many research streams. In contrary, Goal #3 Good Health and Well-being, Goal #14 Life Below Water, and Goal #15 Life on Land receive less attention among all SDGs.

Based on these results and insights, I have suggested five research priorities for business and management scholar: 1) Constantly updating knowledge through literature, especially those published later than 2010; 2) Conducting a literature review with broader scope by involving more literature from different disciplines; 3) Consolidating the sustainability research landscape by connecting independent research streams (e.g. Tourism); 4) Exploring novel research by combining literature from different fast-growing research streams (e.g. Corporate Social Responsibility, Operations & supply chain, Consumption, and Entrepreneurship); and 5) Increasing attention to Sustainable Development Goals with sparse research such as Goal #3 Good Health and Well-being, Goal #14 Life Below Water, and Goal #15 Life on Land.

## References

- Aizawa, A. 2003. An information-theoretic perspective of tf—idf measures. *Inf. Process. Manage.*, 39(1): 45–65.
- Aria, M., & Cuccurullo, C. 2017. bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4): 959-975.
- Asatani, K., Takeda, H., Yamano, H., & Sakata, I. 2020. Scientific Attention to Sustainability and SDGs: Meta-Analysis of Academic Papers. *Energies*, 13: 975.
- Fahimnia, B., Sarkis, J., & Davarzani, H. 2015. Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, 162: 101-114.
- Kajikawa, Y., Ohno, J., Takeda, Y., Matsushima, K., & Komiyama, H. 2007. Creating an academic landscape of sustainability science: an analysis of the citation network. *Sustainability Science*, 2(2): 221-231.
- Lewis-Beck, M. S., Bryman, A., & Futing Liao, T. 2004. The SAGE Encyclopedia of Social Science Research Methods.
- Schaltegger, S., Beckmann, M., & Hansen, E. G. 2013. Transdisciplinarity in Corporate Sustainability: Mapping the Field. *Business Strategy and the Environment*, 22(4): 219-229