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Achieving sustainable development with sustainable packaging: A natural-resource-based view perspective

Cherry C. I. Lau | Christina W. Y. Wong

School of Fashion and Textiles, The Hong Kong Polytechnic University, Hong Kong, China

Correspondence
Cherry C. I. Lau and Christina W. Y. Wong, School of Fashion and Textiles, The Hong Kong Polytechnic University, Hong Kong, China.
Email: cheuk-in-cherry.lau@connect.polyu.hk and christina.wy.wong@polyu.edu.hk

Abstract

Sustainable packaging is a pivotal aspect of sustainable development, involving multi-faceted issues such as stakeholder management and environmental policy compliance. Despite the efforts to find packaging solutions, the extant literature is largely fragmented, featuring a high level of heterogeneity among studies that spread across different disciplines, with the majority examining important packaging issues in isolation. A study that systematically consolidates findings of different important areas of sustainable packaging implementation is lacking. This challenges companies' adoption of research findings in business strategy development. Thus, this paper conducts a systematic literature review combining keyword co-occurrence analysis, thematic analysis and qualitative content analysis to uncover major research domains, consolidate important findings and reveal unsolved research gaps, which are crucial to advancing sustainable packaging management. The findings reveal four major research domains: (1) sustainable packaging materials and properties, (2) management practices of sustainable packaging, (3) consumer behaviours towards sustainable packaging and (4) packaging waste management. Drawing on the natural-resource-based view (NRBV) theory and the review findings, this study proposes four future research directions: (1) identifying ways to enhance the commercialisation of sustainable packaging technological innovations, (2) uncovering reasons for insufficient social aspect investigation in sustainable packaging research, (3) exploring strategies to enhance stakeholder integration in sustainable packaging management and (4) examining contingency factors of packaging waste management effectiveness. The research agenda is important to provide practical and managerial insights for business strategy development in sustainable packaging to achieve *pollution prevention*, *product stewardship* and *sustainable development* capabilities to gain future growth and competitive advantage.

KEYWORDS
environmental policy, natural-resource-based view theory, stakeholder engagement, sustainability, sustainable development, sustainable packaging

Abbreviations: NRBV, natural-resource-based view theory

1 | INTRODUCTION

The significant amount of packaging waste generated from industrial and retailing activities has been an acute environmental issue (Jestratijevic et al., 2022). Packaging accounts for 36% of 400 million tonnes of plastic waste generated per annum, from which a vast amount of 85% is subject to landfilling or disposal into the ecosystems (United Nations Environment Programme, 2022). Unregulated and ineffective packaging waste management imposes detrimental influences not only on environmental sustainability but also on the safety and well-being of human beings (United Nations Environment Programme, 2022). While single-use, oil-based plastics are less expensive and widely used for packaging (Guillard et al., 2018; Jestratijevic et al., 2022), the adoption of sustainable packaging incurs relatively high costs and operational challenges. Firms face difficulties in balancing between organisational needs (e.g., profitability), consumer preferences and environmental concerns in strategy development related to packaging (Australian Packaging Covenant Organisation, 2020; Kim et al., 2019). Concerning the prevalent unsustainable use and unregulated disposal of packaging, its effective strategic management and prudent governance are important to addressing packaging issues (Chigudu, 2020).

Despite scholarly efforts on sustainable packaging, a lot of puzzles remain unsolved. The existing literature is highly fragmented spanning across various disciplines, ranging from material science, management practices, to consumer research. Previous review papers mostly adopt a single dimension perspective to review sustainable packaging issues, for example, (1) sustainable packaging materials (Amara et al., 2021; Bauer et al., 2021; Kamarudin et al., 2022; Qasim et al., 2021; Zhao et al., 2021), (2) supply chain management (Meherishi et al., 2019) and (3) consumer behaviours (Boz et al., 2020; Nemat et al., 2019). Thus, the extant literature fails to provide systematic consolidations of sustainable packaging practices covering all the social, environmental and financial aspects to facilitate firms' strategy development of sustainable packaging. To advance knowledge, it is important to comprehensively review the extant corpus to understand sustainable packaging research from all three sustainability dimensions. This is essential to identify prominent research domains as well as the unsolved, overlooked areas to guide future research directions in addressing packaging waste issues. To address the research gap, this paper consists of the following research questions:

1. What are the prominent research domains in the extant sustainable packaging literature?
2. Under each identified research domain, what are the investigation areas of sustainable packaging being examined?
3. What are the major findings for each research domain?
4. What are the theoretical and practical implications to guide business strategy development regarding sustainable packaging adoption?
5. What are the future research opportunities and directions of sustainable packaging?

2 | RESEARCH METHODOLOGY

A systematic literature review allows us to consolidate and synthesise the extant literature to identify important research findings to uncover research gaps and suggest future research directions (Briner & Denyer, 2012; Cai & Choi, 2019). This systematic literature review consists of three components: keyword co-occurrence analysis, thematic analysis and qualitative content analysis. Keyword co-occurrence analysis is a bibliometric method that uses computer software to statistically analyse keyword occurrences in the examined corpus to identify prominent research clusters (Chandel & Kaur, 2022; He, 1999; Lis, 2018; Wang et al., 2021). It is used to complement and guide the content analysis of the literature, such that the review process can be conducted thematically under the identified research areas. Thematic analysis featuring a priori-defined coding scheme is used to retrieve relevant data (i.e., author, research area, methodology and results) from the selected publications to identify subthemes (Durach et al., 2017; Tranfield et al., 2003). Qualitative content analysis is used to summarise and synthesise the extant literature to examine research development and consolidate major findings (Hsieh & Shannon, 2005; Sastre et al., 2022). This paper followed previous studies (Denyer & Tranfield, 2009b; Tranfield et al., 2003) to develop a systematic review approach containing three phases: (1) planning the review and selecting relevant literature; (2) conducting keyword co-occurrence analysis; and (3) performing thematic analysis and qualitative content analysis to synthesise literature findings.

2.1 | Phase 1: Planning the review and selecting relevant literature

This study observes the major principles of systematic literature review such as transparency, comprehensiveness, replicability and auditability to ensure its rigour (Denyer & Neely, 2004; Denyer & Tranfield, 2009a; Pittaway, 2007; Tranfield et al., 2003). To ensure that the current review adheres to the aforementioned principles, it follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedures (Page et al., 2021). The PRISMA checklist is an authentic guideline for systematic literature review, consisting of 27 checklist items that elucidate the essential steps to produce a transparent and comprehensive review of high significance (Page et al., 2021).

This study adopts an exhaustive approach in publication selection (Opdenakker & Talmar, 2021). The exhaustive, unbiased inclusion of academic journals and review papers is useful to gain a thorough overview of the extant literature to consolidate major findings in a particular filed of knowledge (Opdenakker & Talmar, 2021). Three databases (i.e., Web of Science, Scopus and ProQuest), which are commonly used for systematic literature review in sustainability research, were utilised for th literature search (Andronie et al., 2021; Ionescu, 2022; Lăzăroiu et al., 2020; Novak et al., 2022). These databases feature a comprehensive, interdisciplinary inclusion of extensive peer-reviewed

research journals, which helps understand the research development of sustainable packaging.

Figure 1 shows the literature search process. The same search string was input into Web of Science, Scopus and ProQuest databases to locate publications about sustainable packaging. The literature search was conducted in September 2022. This paper systematically reviewed journal articles and review papers published prior to this period, and subsequent publications were not included. Three inclusion and exclusion criteria were developed based on previous studies (Afif et al., 2022; Baskoro et al., 2024; Farrukh et al., 2022; Meherishi et al., 2019): (1) only English documents were included to ensure comprehension; (2) title and abstract screening and full-text screening were adopted to exclude publications that are irrelevant to sustainable packaging and the research questions; (3) only peer-reviewed academic journal papers and review articles were selected to ensure publication quality. In addition to empirical and theoretical work, the inclusion of review papers is to provide an overview of the research topic, identify important findings and discover research gaps in the extant literature. Further, limitations of previous review papers can be identified, which guides the current review to address their shortcomings for knowledge advancement. Book chapters, conference papers, proceeding papers, meeting abstracts and news were excluded, such that only academic papers that have undergone a rigorous peer-reviewed process are used for a systematic review, which ensures knowledge reliability as well as aligns with the papers' purpose to identify future research agenda (Afif et al., 2022; Tranfield et al., 2003). To examine research evolvement as well as the recent trends of sustainable packaging research, no restriction on the journal period was set. Table 1 summarises the inclusion and exclusion criteria in the literature research process. After applying these inclusion and exclusion criteria, a total of 190 journals were obtained from Web of Science, 141 from Scopus and 134 from ProQuest. As the same publication might be available in more than one database, removing duplicates is necessary (Preghenella & Battistella, 2021). With the use of

TABLE 1 Inclusion and exclusion criteria for the literature search process adapted from Baskoro et al. (2024).

Title & abstract screening in database interface
Inclusion criteria: • Peer-reviewed empirical and theoretical journal articles, review papers • English articles Exclusion criteria: • Incorrect source types such as book chapters, conference papers, proceeding papers, meeting abstracts and news
Full-text screening
Inclusion criteria: • Content relevant to sustainable packaging (including but not limited to packaging materials, supply chain management, consumer research, waste management) • Content that answers the research questions
Exclusion criteria: • Content irrelevant to sustainable packaging • Content that does not answer the research questions

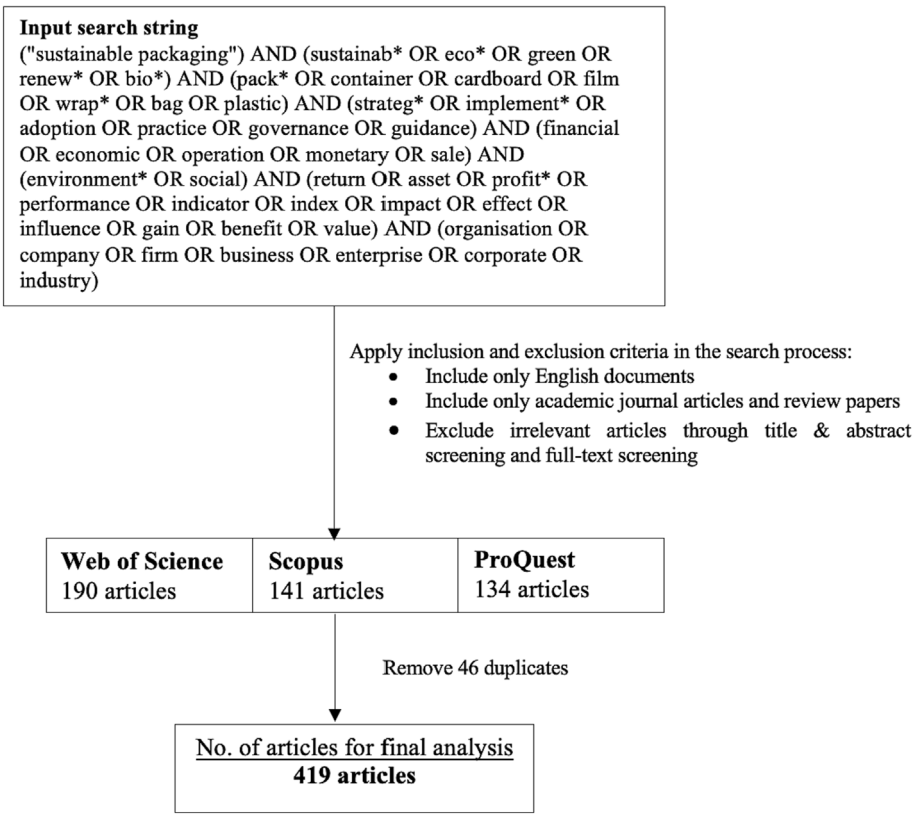

FIGURE 1 Illustration of the database search process.

Endnote (Baskoro et al., 2024), 46 duplicates among the articles were removed. Finally, 419 journal articles were obtained for keyword co-occurrence analysis, thematic analysis and content analysis for a systematic literature review. A full list of all the 419 journal articles is shown in Appendix S1.

To ensure objectivity and minimise bias during the article selection process, this paper adopts the following procedures: (1) before conducting the actual literature search, a structured, transparent and replicable review protocol was developed to guide the process, which significantly enhances the validity of the findings (Cronin et al., 2008; Tranfield et al., 2003). All the steps in the selection process, along with the inclusion and exclusion criteria, are clearly defined and documented to enhance replicability and auditability; (2) the article selection was based on an exhaustive approach, in which more than one databases are utilised to ensure a comprehensive review of relevant literature (Opdenakker & Talmar, 2021; Tranfield et al., 2003); (3) two researchers were involved in the article selection and screening process to minimise bias (Baskoro et al., 2024).

2.2 | Phase 2: Conducting keyword co-occurrence analysis

A bibliometric software, VOSviewer, was adopted for keyword co-occurrence analysis to identify major research domains in the existing sustainable packaging literature. VOSviewer is chosen because of its clear visualisation feature and its embedment of text mining function to statistically identify keyword clusters (Chandel & Kaur, 2022). Bibliographic data including citation information, abstract and author's keywords of all selected publications were imported into VOSviewer for keyword co-occurrence analysis. With the full counting option, the total number of a keyword appearing among the examined articles is analysed (Van Eck & Waltman, 2011). The minimum number of keyword occurrence was set to 20 (Qin et al., 2021), resulting in 37 keywords meeting the threshold. Repetitive and meaningless keywords such as 'article' and 'literature reviews' that are not useful for research cluster identification were manually removed before conducting the analysis (Chen & Xiao, 2016). Finally, 30 highly occurring keywords were subject to keyword co-occurrence analysis, in which prominent research clusters in the extant sustainable packaging literature were identified.

2.3 | Phase 3: Performing thematic analysis and qualitative content analysis to synthesise literature findings

From the keyword co-occurrence analysis conducted in phase 2, the identified research domains were used to guide the thematic analysis and qualitative content analysis to synthesise sustainable packaging literature. Following prior research, a priori-defined coding scheme was adopted to retrieve relevant data (i.e., author, research area, methodology and results) from the 419 selected publications for a thematic analysis (Durach et al., 2017; Tranfield et al., 2003). As shown in Table 2, a total of 22 research subthemes were identified. Literature findings under each subtheme were synthesised. Research gaps were also identified to suggest future research development.

3 | FINDINGS

3.1 | Keyword co-occurrence analysis

A VOSviewer network visualisation map illustrates the results of keyword co-occurrence analysis, in which keywords are represented as

TABLE 2 Thematic analysis: Prominent research domains and research subthemes.

Prominent research domains	Research subthemes
1. Sustainable packaging materials and properties	• Packaging materials, properties and performance • Sustainable packaging material innovations/fabrications/processing techniques • Developments on new/alternative materials for sustainable packaging • Conversion of waste into sustainable packaging materials
2. Management practices of sustainable packaging	• Supply chain management of sustainable packaging • Adoption of green practices and the influences on company's performance • Sustainable business operations and financial performance • Indicators/measurements/selection framework of sustainable business practices • Sustainable development (either in packaging or the macro level); sustainability practices on sustainable performance • Packaging design/packaging quality improvement • Packaging and product quality • Firms' decision-making of packaging issues • Life cycle assessment • Sustainable packaging logistics
3. Consumer behaviours towards sustainable packaging	• Consumer perceptions, attitudes, purchasing intentions and willingness to pay • Marketing practices of sustainable packaging
4. Packaging waste management	• Plastic waste pollution • Recycling • Extended producer responsibility • Circular economy • Sustainable packaging and food waste management • Regulatory measures and legislation

nodes (Van Eck & Waltman, 2014). The bigger the circles of the nodes, the higher the frequency of the keyword occurrence in the examined corpus. The thickness of a line between two keywords denotes the association strength, and a thicker line implies a higher frequency of two keywords being included concurrently in academic studies (Van Eck & Waltman, 2011). A network visualisation map illustrates the interconnection between research keywords to identify prominent research domains.

Figure 2 shows the results of keyword co-occurrence analysis, in which four major research domains with their respective keywords were identified. Referring to Figure 2, four major research clusters in the extant sustainable packaging literature are (1) sustainable packaging materials and properties, (2) management practices of sustainable packaging, (3) consumer behaviours towards sustainable packaging and (4) packaging waste management. Cluster 1 (sustainable packaging materials and properties) focuses on investigating different packaging materials and properties. Cluster 2 (management practices of sustainable packaging) examines packaging design attributes, drivers of sustainable packaging adoption and performance measurement frameworks and models for sustainable packaging. Cluster 3 (consumer behaviours towards sustainable packaging) investigates consumer perceptions, attitudes and behaviours relating to sustainable packaging. Cluster 4 (packaging waste management) focuses on packaging waste treatment tactics. Figure 3 shows a VOSviewer overlay visualisation map that illustrates research trend development of sustainable packaging studies, in which research focus has shifted from supply chain management in 2018, packaging design and waste management in 2019, to sustainable packaging materials in 2021.

3.2 | Thematic analysis and qualitative content analysis of sustainable packaging literature

According to the major research domains identified from keyword co-occurrence analysis, qualitative content analysis was conducted thematically to summarise and synthesise the sustainable packaging literature as discussed below.

3.2.1 | Research domain 1: Sustainable packaging materials and properties

Packaging materials' performance and properties

Biopolymers, bioplastics and bio-based composites are the major areas of scholarly attention (De Léis et al., 2017; Helanto et al., 2019; Reichert et al., 2020; Shlush & Davidovich-Pinhas, 2022; Siracusa & Blanco, 2020; Tan et al., 2021; Turkcu et al., 2022; Varghese et al., 2022), in which their properties, performances, opportunities and challenges in application are investigated. The properties of common bio-based materials including polylactic acid (PLA), polyethylene (PE), poly-hydroxyalkanoate (PHA), cellulose, proteins and waxes for green packaging are examined (Reichert et al., 2020; Shlush & Davidovich-Pinhas, 2022). For instance, PLA features biodegradability and compostability with high transparency; PHA has 100% biodegradability in specific conditions; and cellulosic materials posses exceptional barrier performance (Shlush & Davidovich-Pinhas, 2022). Despite the variety of bio-based packaging materials available in the market, their application still encounters technological challenges and

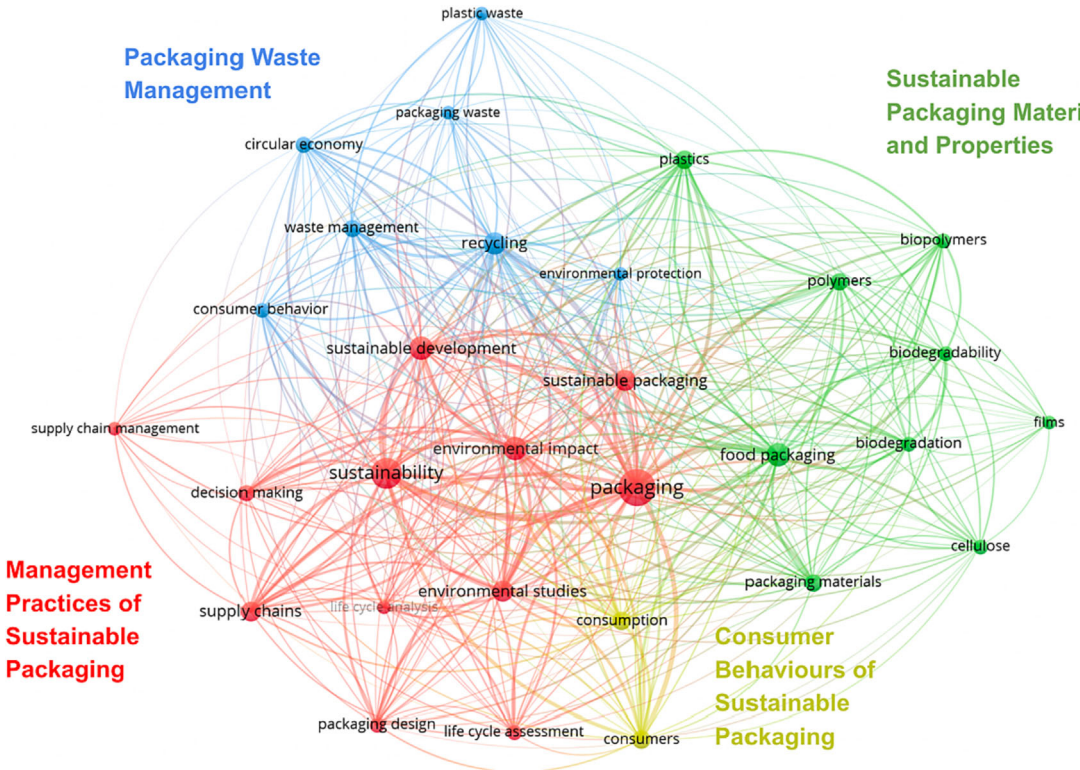

FIGURE 2 Keyword co-occurrence network visualisation map (adapted from VOSviewer).

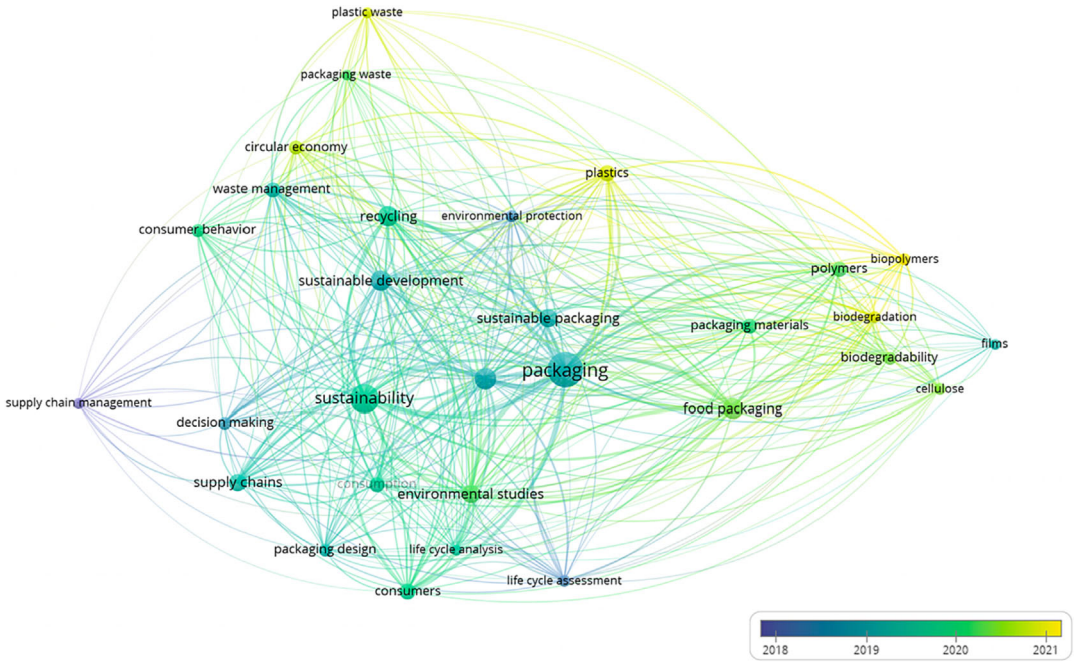

FIGURE 3 Sustainable packaging research trend development (overlay visualisation network from VOSviewer).

performance concerns (Wang et al., 2022). Materials such as protein (i.e., zein and silk fibroin) and polysaccharides (i.e., starch) are brittle (Shlush & Davidovich-Pinhas, 2022), which accounts for a major drawback in packaging applications. Hence, innovations in processing techniques are needed to enhance the functionality and performance of sustainable packaging materials (Higginson et al., 2022; Shlush & Davidovich-Pinhas, 2022).

New processing techniques for sustainable packaging materials

The development of new processing techniques for sustainable packaging materials focuses on physical and mechanical properties enhancement (Farias et al., 2022; Hajirostamloo et al., 2022; Hasan et al., 2021; Prado et al., 2021), including thermal stability (Hasan et al., 2020; Quattrosoldi et al., 2022), barrier properties (Guidotti et al., 2019; Lang et al., 2021; Martins & Martins, 2021; Soares et al., 2022), crystallinity (Zytner et al., 2020), foamability (Ren et al., 2022) and antifungal property (Klinmalai et al., 2021; Salaberria et al., 2017). Processing methods comprise blending different bio-based materials, adding addictives and reinforcing agents and applying coatings to improve packaging material properties. For example, the innovative development of a new biopolymer blend, poly(lactic acid) (PLA)/poly(3-hydroxybutyrate) (PHB) (70/30 wt%), exhibits satisfactory mechanical and thermal characteristics (Farias et al., 2022); hot press drying is found to be an optimal technique to increase tensile strength and water barrier performance of cellulose nanofibril films (Hasan et al., 2021); and hydrolysis treatment can reduce water vapour permeability for starch-based biodegradable films (Martins & Martins, 2021). The use of reinforcing agents and additives is examined for packaging materials' properties enhancement. For instance, cellulose nanocrystals (CNCs) enhances the physicochemical property of flaxseed gum/agar (FG/AG) blends (Prado et al., 2021); and adding Cenostigma nordestinum extracts into chitosan film increases its tensile strength, water barrier properties and antioxidant capacity (Soares et al., 2022). As for coating methods, multilayered alkyd resin/nanocellulose coating (Aulin & Strom, 2013) and palm kernel oil coating (Zeng et al., 2020) can significantly improve paper's hydrophobic properties.

Fabrication of new/alternative materials for sustainable packaging applications

Cellulose is a promising material for sustainable packaging with satisfactory physical and mechanical performance (Fernandes & Madhuranthakam, 2021; Holler et al., 2021; Missio et al., 2018; Mohamed et al., 2019; Petroudy et al., 2019; Wang et al., 2018). For instance, the use of cellulose nanofibrils and condensed tannins for sustainable packaging production leads to water barrier properties enhancement (Missio et al., 2018). Cellulosic materials sourced from meadow hay, cup plant and virginia mallow can enhance paper packaging strength (Holler et al., 2021). Using carboxymethyl cellulose (CMC), gelatin and shellac in sustainable film fabrication can enhance tensile strength, thermal stability and antimicrobial, transparent and elongation characteristics (Mohamed et al., 2019).

The blending of different materials is examined in sustainable packaging fabrication (Narayanan et al., 2017; Oyama et al., 2020; Pesaranhajiabbas et al., 2022; Quilez-Molina et al., 2021). The purpose of combining different materials is to enhance environmental benefits and property performances (e.g., water, oxygen and UV barrier property, elongation at break, transparency, thickness and thermal stability). Examples include the blending of (1) PLA and rosin (Narayanan et al., 2017), (2) low-density PE composite with glassy

carbon (Oyama et al., 2020), (3) polycaprolactone (PCL) and magnesium carbonate (Quilez-Molina et al., 2021) and (4) bio-based polybutylene succinate-co-adipate and polybutylene adipate-co-terephthalate (Pesaranhajiabbas et al., 2022).

Extensive studies have provided scientific findings on sustainable packaging material innovations. Despite the variety of sustainable materials developed, their industrial applicability lacks adequate investigation (Guillard et al., 2018). Future studies should examine ways to overcome the barriers to technology commercialisation to facilitate firms' adoption of sustainable packaging (Wright & Nyberg, 2017).

Valorisation of waste into sustainable packaging materials

The waste materials used to fabricate sustainable packaging include agro-industrial waste (Andrade et al., 2022; De Carvalho et al., 2021; Jayasekara et al., 2022; Leceta et al., 2015; Masilamani et al., 2017; Soleimanian et al., 2022; Yaradoddi et al., 2020), waste paper (Nwabor et al., 2021), artificial marble waste (Zhu et al., 2022) and food waste such as red onion skin (Boccalon et al., 2022), mango peels (Marcal & Pintado, 2021), tea waste (Liu et al., 2020), grape pomace (Gorrasi et al., 2022) and potato peel (Miller et al., 2022). Waste valorisation turns waste into useful packaging materials, which helps reduce waste and raw material extraction (Jayasekara et al., 2022; Zhu et al., 2022). It is a promising technique for sustainable packaging production with satisfactory functional performance and cost-effectiveness (Gorrasi et al., 2022; Yaradoddi et al., 2020).

3.2.2 | Research domain 2: Management practices of sustainable packaging

Drivers of sustainable packaging adoption

Firms' adoption of sustainable packaging is motivated by different driving forces. One major internal driver is top management support as it relates to the formulation of a company's sustainability strategies and operational guidelines (Abdul-Rashid et al., 2017; Aboelmaged, 2018; Banik et al., 2022; Gardas et al., 2019; Hailemariam & Erdiaw-Kwasie, 2023). Corporate competitiveness (e.g., resource availability and technological capability for sustainable packaging), company culture regarding its attitude towards sustainable practices (Abdul-Rashid et al., 2017) and employees' participation (Aboelmaged, 2018) are important internal drivers. For external factors, government subsidies and regulations (Banik et al., 2022; Sun & Li, 2021), consumer attitudes and perceptions (Abdul-Rashid et al., 2017) and environmental pressure exerted by external stakeholders and the public (Aboelmaged, 2018) can motivate corporate's adoption of sustainable packaging.

Packaging attributes and strategies

The effectiveness of sustainable packaging implementation can be enhanced with best packaging design practices (García-Arca et al., 2019; Steenis et al., 2018; Vernuccio et al., 2010; White, Wang, et al., 2015), which include the consideration of packaging attributes and strategies such as packaging visual design, the use of sustainable material, functional design for recycling and information communication to positively influence consumers' adoption of sustainable packaging (Elkhattat & Medhat, 2022; Magnier & Schoormans, 2015; Nemat et al., 2019).

Packaging attributes (i.e., visual attributes and quality attributes) can evoke desirable consumers' sustainable behaviours (Elkhattat & Medhat, 2022; Magnier & Schoormans, 2015; Nemat et al., 2019). Visual attributes include labels, texts, pictures and colours; and quality attributes refer to packaging functionality such as resealability and recyclability (Nemat et al., 2019). When consumers are motivated by visual designs and are well-informed about packaging sustainability information (e.g., directions on how to return or recycle the packaging), the effectiveness of sustainable packaging adoption can be enhanced (Nemat et al., 2019). Eco-packaging design information can be categorised into three aspects: (1) *structural cues* (e.g., packaging reusability, material biodegradability, eco refills and packaging size reduction), (2) *graphic cues* (e.g., colours, photographs and logos) and (3) *informational cues* (e.g., environmental claims) (Magnier & Crié, 2015, p. 357). When devising sustainable packaging strategies, other important factors such as customer needs and requirements (Lavuri et al., 2023), packaging regulations and operational feasibility (e.g., material cost) should be taken into consideration (White, Wang, et al., 2015).

Performance measurement frameworks and models of sustainable packaging

Performance measurement frameworks and models related to sustainable packaging contain two levels, namely, the micro and macro level. The micro level focuses on sustainable packaging material selection (Almeida et al., 2017; Gulsun & Mic, 2020; Singh & Pandey, 2018); while the macro level examines sustainable supplier selection (Jia et al., 2015; Roy et al., 2020), green purchasing (Yee et al., 2021) and sustainable supply chain (Kumar et al., 2017; Maceno et al., 2018; Nidhi & Pillai, 2019; Scavarda et al., 2019), in which sustainable packaging is one of the aspects in sustainable supply chain performance measurement (Jia et al., 2015; Kumar et al., 2017; Maceno et al., 2018; Roy et al., 2020).

To select sustainable packaging materials, various criteria apart from the material itself are evaluated, including environmental impacts, functionality, costs, logistics, marketing appearance, customer requirements and regulatory measures (Gulsun & Mic, 2020). Prior research has proposed several guidelines on sustainable packaging material selection, including material recyclability and recovery; fulfilment of packaging functionality; longevity of packaging material; resource optimisation in energy, water and material consumption; reduction of environmental costs in raw material extraction; waste management; and minimisation of hazards to both humans and the environment (Lewis et al., 2010; Singh et al., 2018).

Lack of social aspect evaluations in sustainable packaging performance measurement

Synthesising the literature on sustainable packaging management practices shows that most performance measurement frameworks

and models focus mainly on environmental and financial aspects, in which the social dimension is being inadequately addressed (Meherishi et al., 2019). Social dimensions of sustainable packaging include consumer perceptions and attitudes, needs and preferences, as well as factors of purchase intentions (Nordin & Selke, 2010; Sharma et al., 2023). Althougha few studies have examined the problems of sustainable packaging from a social perspective (Foschi & Bonoli, 2019), for instance, the asymmetrical communication mechanisms between firms and consumers (Baskoro et al., 2024), as well as the failures to fulfil market needs due to inadequate collaboration between different stakeholders along the supply chain (Farrukh & Sajjad, 2023; Guillard et al., 2018), these studies fail to address the attitude-behavioural gap to elevate the performance of sustainable packaging management practices (Testa et al., 2020). Further, the existing consumer research mostly examines generic consumer behaviours such as purchase intentions and willingness to pay for sustainable packaging (Jurconi et al., 2022; Liem et al., 2022; Schuermann & Woo, 2022); other pivotal aspects (e.g., consumer involvement in packaging design and stakeholder integration) lack empirical investigations. The inadequacy of social dimension measurement in sustainable packaging performance is due to its difficulty to be measured and quantified (Foschi & Bonoli, 2019). As the pursuit of sustainability requires consideration of all social, environmental and financial aspects (Bansal, 2005; Boz et al., 2020; Elkington & Rowlands, 1999; Hart & Dowell, 2011; Soderstrom & Weber, 2020), it is important for future research to explore ways in measuring social aspects of sustainable packaging to advance knowledge and offer practical implications in business strategy development.

3.2.3 | Research domain 3: Consumer behaviours towards sustainable packaging

Factors underlying consumers' sustainable packaging adoption

Consumer attitudes and purchasing intentions of sustainable packaging are studied, covering predominantly food products (Bech-Larsen, 1996; Jurconi et al., 2022; Liem et al., 2022; Morgana Weber et al., 2021; Nguyen et al., 2020; Popovic et al., 2019; Santos et al., 2021; Schuermann & Woo, 2022), along with other product categories such as bottled water (De Marchi et al., 2020; Galati et al., 2022), apparel (Rausch et al., 2021) and personal care (Besier, 2015). Literature findings reveal that consumers' perceptions and behaviours towards sustainable packaging are influenced by both intrinsic and external factors. Intrinsic factors include customers' sustainable lifestyle (Su et al., 2021), green knowledge and awareness (Hamza et al., 2018; Mehraj & Qureshi, 2022; Pawaskar et al., 2018) and environmental attitudes (Ahmed et al., 2023; Moorthy et al., 2021; Popovic et al., 2020; Prakash & Pathak, 2017; Wahab et al., 2021; Yarimoglu & Binboga, 2019), while external factors comprise packaging visual design cues (Liem et al., 2022; Lisboa et al., 2022; Magnier & Schoormans, 2015; Steenis et al., 2017) and retailers' sustainable marketing strategies such as price and promotion (Ahmed et al., 2023).

Price is the most influential factor that drives purchasing intentions towards sustainable packaging (Galati et al., 2022; Koch et al., 2022; Lago et al., 2020; Oloyede & Lignou, 2021; Olsmats et al., 2015; Popovic et al., 2020). When the cost incurred is low, consumers are more likely to adopt sustainable packaging (Siracusa & Blanco, 2020; Testa et al., 2019). As compared to price (Orzan et al., 2018; Zeng, 2022), convenience (Besier, 2015), and functionality (Bech-Larsen, 1996; Zeng, 2022; Zeng & Durif, 2019), sustainable packaging is still not a preceding factor in consumers' purchase intentions. To encourage consumers' adoption of sustainable packaging, tactics such as tax implementation (Martinho et al., 2017), the use of visual design cues (Liem et al., 2022; Lisboa et al., 2022; Magnier & Schoormans, 2015; Steenis et al., 2017) and the launch of educational programmes (Cammarelle et al., 2021) can be implemented.

3.2.4 | Research domain 4: Packaging waste management

Packaging waste treatment solutions

Solutions for packaging waste management have been investigated (Ajwani-Ramchandani et al., 2021; Asadollahi et al., 2022; Friedrich, 2020; Hawkins, 2012; Müller et al., 2014; Tencati et al., 2016; Wang et al., 2019). Packaging waste management tactics include material reduction from source (Asadollahi et al., 2022), end-of-life solutions (Müller et al., 2014), reverse logistics (Fidlerová et al., 2021) and packaging waste valorisation (Idrees et al., 2018). Minimising waste from source can help reduce carcinogen emissions to protect human well-being and safety, preserve natural resources and combat climate change (Asadollahi et al., 2022). The adoption of packaging recycling practices can achieve environmental and social benefits such as preventing pollution and reducing non-carcinogenic substance emissions to protect human health; however, its high operational cost constitutes a major limitation (Asadollahi et al., 2022). Despite the variety of waste management tactics, there might be no single perfect solution, which necessitates the integration of different methods to tackle packaging waste issues (Asadollahi et al., 2022; Williams & Rangel-Buitrago, 2022). Future research can investigate the effectiveness of integrating different waste treatment tactics (e.g., source reduction, reverse logistics and waste valorisation), as well as examine the contingency factors affecting packaging waste management performance to advance knowledge in academia and provide practical recommendations (Wright & Nyberg, 2017).

Drivers of packaging waste management

Drivers of packaging waste management are examined in the extant sustainable packaging literature (Do Valle et al., 2004; Palmer et al., 2021; Satapathy, 2017). Different stakeholders are motivated by different driving forces to participate in packaging waste reduction. To manage packaging waste, different stakeholders' roles should be taken into consideration, for instance, consumers' participation in post-consumption recycling (Do Valle et al., 2004), corporate's operational management (Palmer et al., 2021; Satapathy, 2017; White,

Sarpong, & Ndrecaj, 2015) and governments' regulations (Bell & Todoran, 2022; Friedrich, 2020; Gutberlet, 2008; Martinho et al., 2017; Pazienza & De Lucia, 2020; Tencati et al., 2016). From the consumers' viewpoint, recycling convenience and the proximity of recycling facilities significantly affect recycling participation (Do Valle et al., 2004). From an industrial perspective, operational cost of packaging waste management is an important concern (Palmer et al., 2021; Satapathy, 2017; White, Sarpong, & Ndrecaj, 2015).

Providing incentives is crucial to drive packaging waste reduction. The introduction of plastic bag tax reduces 74% of plastic bag consumption among consumers (Martinho et al., 2017). Tax credit offers monetary incentives for companies to adopt packaging waste management practices (Pazienza & De Lucia, 2020). As packaging waste management requires coordination among consumers, industries and the governments (Shrivastava, 1995), future research needs to address different stakeholders' concerns in devising business strategies for packaging waste management.

4 | LIMITATIONS AND FUTURE RESEARCH AGENDA

Although this review adopts an exhaustive approach to article selection, there are still chances that some potential publications are not included due to the constraint of publication availability in the selected database (Baskoro et al., 2024). To address this limitation, the literature search was performed on three databases (i.e., Web of Science, Scopus and ProQuest), which are commonly used for systematic literature review in sustainability research (Andronie et al., 2021; Ionescu, 2022; Lăzăroiu et al., 2020; Novak et al., 2022). In addition, as sustainable packaging is a multi-faceted and evolving issue that involves the interplay of different actors, some nuanced areas might not be covered in the selected literature. However, this review adopts keyword co-occurrence analysis to thematically identify prominent research domains, which not only helps guide future research directions but also provides an overview of the major aspects of sustainable packaging to assist practitioners in business strategy development.

Further, as this review only synthesises findings from existing literature to develop the conceptual framework, future empirical testing is needed to validate its applicability. Another limitation is that, due to the nature of a systematic literature review, this paper only identifies prominent research domains, consolidates major findings and proposes future research directions. Future research is thus important to solve the identified research gaps (e.g., inadequate social dimension investigation and lack of packaging innovation commercialisation) to advance business strategy development of sustainable packaging.

This study draws upon the natural-resource-based view (NRBV) theory to identify future research agenda based on the research gaps in the four research domains (i.e., sustainable packaging materials and properties, management practices of sustainable packaging, consumer behaviours towards sustainable packaging and packaging waste management). This theory is appropriate to provide a theoretical ground for future research direction development as it addresses how a company can achieve sustainable competitive advantage as well as environmental and financial benefits through sustainable operations (Hart, 1995; Hart & Dowell, 2011), which comprise the use of sustainable packaging materials and packaging waste management practices.

The theory proposes three strategic capabilities, namely, *pollution prevention*, *product stewardship* and *sustainable development* (Hart, 1995; Hart & Dowell, 2011). *Pollution prevention* capability concerns a firm's competence to minimise waste and effluents in organisational operations. It can be attained through resource optimisation, reuse and recycling and emission reduction (Schwens & Wagner, 2019). Numerous studies have found that *pollution prevention* capability can enhance a firm's profitability (Graham & McAdam, 2016; Hart, 1995; Hart & Dowell, 2011; King & Lenox, 2002; Klassen & Whybark, 1999; Schwens & Wagner, 2019). *Product stewardship* capability relates to a firm's ability in stakeholder integration, which is to incorporate the viewpoints from both internal stakeholders (e.g., top management and employees) and external stakeholders (e.g., suppliers, shareholders, the public and the government) in designing environmental strategies (Hart, 1995; Hart & Dowell, 2011). With *product stewardship* capability, firms can formulate unique strategies in sustainable product innovations to enhance environmental performance (Hart & Dowell, 2011; Pujari et al., 2003; Sandrin et al., 2018). *Sustainable development* capability is linked with corporate's investments in sustainable practices that consider all the social, environmental and economic aspects (Hart, 1995; Hart & Dowell, 2011). The adoption of *sustainable development* strategy not only intends to achieve environmental and financial objectives but also brings positive influences on social benefits and well-being (Hart & Dowell, 2011).

The NRBV theory suggests important aspects of sustainable packaging, including the use of sustainable materials to reduce economic and environmental costs (i.e., *pollution prevention* capability), the development of sustainable packaging strategies that consider different stakeholders' needs (i.e., *product stewardship* capability) and the corporates' investment in sustainable packaging innovation adoption (i.e., *sustainable development* capability). Referring to the three strategic capabilities of the NRBV theory, this paper suggests the following four future research directions based on how companies might enhance organisational performance through sustainable packaging adoption. A summary of the findings of systematic literature review and future research agenda is illustrated in Tables 3 and 4, respectively.

4.1 | Research agenda 1: Identifying ways to enhance commercialisation of sustainable packaging technological innovations

Research domain 1 (i.e., sustainable packaging materials and properties) shows a diversity of sustainable packaging technological innovations, including sustainable material fabrications, new processing techniques and waste valorisation into sustainable packaging.

TABLE 3 Summary of systematic literature review findings of sustainable packaging research.

	Areas of investigation	Systematic literature review summary	Reference examples
Research domain 1: Sustainable packaging materials and properties	Packaging materials' performance and properties	• Commonly used bio-based materials in sustainable packaging include polylactic acid (PLA), polyethylene (PE), poly-hydroxyalkanoate (PHA), cellulose, proteins and waxes • Examination of the properties, performances, opportunities and challenges of the available sustainable packaging materials	De Léis et al. (2017) Helanto et al. (2019) Reichert et al. (2020) Shlush and Davidovich-Pinhas (2022) Siracusa and Blanco (2020) Tan et al. (2021) Turkcu et al. (2022) Varghese et al. (2022)
	New processing techniques for sustainable packaging materials	• Methods to enhance sustainable packaging materials' properties: 1) blending different bio-based materials 2) using different processing techniques 3) adding addictives/reinforcing agents 4) applying coating techniques • The use of different processing techniques to enhance physical, mechanical, chemical and barrier performance of sustainable packaging materials (e.g., elongation, thermal stability, gas and water barrier properties, crystallinity, foamability and antifungal property)	Farias et al. (2022) Guidotti et al. (2019) Hajirostamloo et al. (2022) Hasan et al. (2021) Klinmalai et al. (2021) Lang et al. (2021) Martins and Martins (2021) Prado et al. (2021) Quattrosoldi et al. (2022) Ren et al. (2022) Salaberria et al. (2017) Soares et al. (2022) Zeng et al. (2020) Zytner et al. (2020)
	Fabrication of new/alternative materials for sustainable packaging applications	• Cellulosic substance as an important source for sustainable packaging material fabrication, with exhibition of satisfactory physical and mechanical performance • Blending different substances for new packaging material fabrication to achieve both environmental benefits and performance enhancement, such as the blending of 1) polylactic acid (PLA) and rosin 2) low-density polyethylene composite and glassy carbon 3) polycaprolactone (PCL) and magnesium carbonate 4) bio-based polybutylene succinate-co-adipate and polybutylene adipate-co-terephthalate	Fernandes and Madhuranthakam (2021) Holler et al. (2021) Missio et al. (2018) Mohamed et al. (2019) Narayanan et al. (2017) Oyama et al. (2020) Pesaranhajiabbas et al. (2022) Petroudy et al. (2019) Quilez-Molina et al. (2021) Wang et al. (2018)
	Valorisation of waste into sustainable packaging materials	• Potential waste materials for valorisation into sustainable packaging: 1) agro-industrial waste 2) waste paper 3) artificial marble waste 4) food waste (e.g., red onion skin, mango peels, tea waste, grape pomace, potato peel) • Waste valorisation is a promising method for sustainable packaging material fabrication that could	Andrade et al. (2022) Boccalon et al. (2022) De Carvalho et al. (2021) Gorrasi et al. (2022) Jayasekara et al. (2022) Leceta et al. (2015) Liu et al. (2020) Marcal and Pintado (2021) Masilamani et al. (2017) Miller et al. (2022) Nwabor et al. (2021) Soleimanian et al. (2022)

(Continues)

TABLE 3 (Continued)

	Areas of investigation	Systematic literature review summary	Reference examples
		satisfy environmental, financial and functional requirements	Yaradoddi et al. (2020) Zhu et al. (2022)
Research domain 2: Management practices of sustainable packaging	Drivers of sustainable packaging adoption	• Drivers of sustainable packaging adoption include top management and employee engagement, environmental partnership with suppliers, government subsidies and regulatory measures	Aboelmaged (2018) Agyabeng-Mensah et al. (2020) Banik et al. (2022) Gardas et al. (2019) Sun and Li (2021) Tran et al. (2021)
	Packaging attributes and strategies	• Major research areas comprise sustainable packaging attributes, best packaging design practices, packaging innovations and sustainable packaging design tools • The use of packaging attributes to elicit desirable consumer sustainable behaviours: 1) visual attributes (e.g., labels, texts, pictures, colours) 2) functional attributes (e.g., resealability, recyclability) 3) effective communication of sustainability information	Accorsi et al. (2020) Dörnyei et al. (2022) Elkhattat and Medhat (2022) García-Arca et al. (2019) Herbes et al. (2018) Jiménez-Guerrero et al. (2015) Magnier and Crié (2015) Magnier and Schoormans (2015) Mugobo and Ntuli (2022) Nemat et al. (2019) Steenis et al. (2018) Svanes et al. (2010) White, Wang, et al. (2015) Yokokawa et al. (2020)
	Performance measurement frameworks and models for sustainable packaging	• Micro-level examination: Selection criteria of sustainable packaging materials (e.g., environmental impacts, costs, marketing appearance, regulatory measures, customer requirements, logistics and functionality) • Macro-level examination, with sustainable packaging being one evaluation area of: 1) sustainable supplier selection 2) green purchasing 3) sustainable supply chain	Almeida et al. (2017) Gulsun and Mic (2020) Jasmi and Fernando (2018) Jia et al. (2015) Kumar et al. (2017) Lewis et al. (2010) Maceno et al. (2018) Nidhi and Pillai (2019) Roy et al. (2020) Scavarda et al. (2019) Singh and Pandey (2018) Singh et al. (2018) Yee et al. (2021)
Research domain 3: Consumer behaviours towards sustainable packaging	Factors underlying consumers' sustainable packaging adoption	• Factors that influence sustainable packaging adoption behaviours: 1) intrinsic factors: green lifestyle, green knowledge, environmental attitudes, educational level 2) external factors: price, convenience, packaging visual design cues • Packaging sustainability is still a comparatively less important factor in purchase intention as compared to price, convenience and functionality	Ahmed et al. (2023) Bech-Larsen (1996) Besier (2015) Galati et al. (2022) Hamza et al. (2018) Koch et al. (2022) Lago et al. (2020) Liem et al. (2022) Lisboa et al. (2022) Magnier and Schoormans (2015) McCarthy and Wang (2022) Moorthy et al. (2021) Oloyede and Lignou (2021) Olsmats et al. (2015) Orzan et al. (2018) Popovic et al. (2020) Prakash and Pathak (2017) Steenis et al. (2017)

TABLE 3 (Continued)

	Areas of investigation	Systematic literature review summary	Reference examples
			Su et al. (2021) Wahab et al. (2021) Zeng (2022) Zeng and Durif (2020)
Research domain 4: Packaging waste management	Packaging waste treatment solutions	• Packaging waste management tactics include: 1) material reduction from source 2) end-of-life solutions 3) reverse logistics 4) packaging waste valorisation • The integration of different tactics is needed for effective packaging waste management	Asadollahi et al. (2022) Fidlerová et al. (2021) Idrees et al. (2018) Müller et al. (2014) Williams and Rangel-Buitrago (2022) Wright and Nyberg (2017)
	Drivers of packaging waste management	• Different stakeholders' perspectives for packaging waste management should be taken into account: Consumers: recycling convenience Industry: operational cost • The provision of incentives (e.g., plastic bag tax and tax credits) from the government can increase the effectiveness of packaging waste management	Bell and Todoran (2022) Do Valle et al. (2004) Friedrich (2020) Gutberlet (2008) Martinho et al. (2017) Palmer et al. (2021) Pazienza and De Lucia (2020) Satapathy (2017) Tencati et al. (2016) White, Sarpong, and Ndrecaj (2015)

However, these innovations require high technological and operational costs (Guillard et al., 2018; Siracusa & Blanco, 2020). The unpredicted risks involved in technology investments deter companies from adopting innovations (Moshood et al., 2022). To enhance companies' *pollution prevention* capability in addressing packaging waste issues, future studies need to investigate factors that hinder the commercialisation of sustainable packaging technological innovations. Ways to overcome the barriers to technology commercialisation should also be examined.

As the commercialisation of technological innovations takes time, to address the constraints of affordability and practicality issues of sustainable packaging adoption imminently, it is impending for future empirical research to examine how different levels of sustainable packaging adoption (e.g., adopting technological innovations vs. commercialised solutions of sustainable packaging) affect financial and environmental performance for firms of different sizes and financial capabilities. This provides valuable insights to guide business strategy development and the decision-making process of sustainable packaging implementation.

Grounded in the NRBV theory, identifying ways to enhance commercialisation of sustainable packaging innovations is important for future research development (Datta et al., 2015). It is crucial for companies to achieve packaging waste minimisaion (i.e., *pollution prevention* capability), life cycle cost reduction through the use of sustainable resource (i.e., *product stewardship* capability) and environmental liabilities minimisation through investments in sustainable packaging practices (i.e., *sustainable development* capability) to gain sustainable growth and competitive advantage (Hart, 1995; Hart & Dowell, 2011; Miller et al., 2007).

4.2 | Research agenda 2: Uncovering reasons of insufficient social aspect investigation in sustainable packaging management research

Sustainable development comprises three important pillars: environmental, financial and social aspects (Bansal, 2005; Boz et al., 2020; Elkington & Rowlands, 1999; Hart & Dowell, 2011; Soderstrom & Weber, 2020). Apart from considering financial and environmental aspects, it is essential to consider the social dimension in sustainable packaging performance measurement (Nordin & Selke, 2010). In research domain 2 (i.e., management practices of sustainable packaging), while environmental and financial aspects are the major areas of investigation (Alfaro & Diaz, 2021; González-Boubeta et al., 2018; Meherishi et al., 2021; Zailani et al., 2012), the social dimension lacks adequate scholarly attention (Bortolini et al., 2018; Sharma & Henriques, 2005). In the extant literature, social dimension investigation mostly focuses on generic consumers behaviours, for example, factors of sustainable packaging adoption, consumers perceptions, attitudes and purchase intentions (Jurconi et al., 2022; Liem et al., 2022; Morgana Weber et al., 2021; Nguyen et al., 2020; Popovic et al., 2019; Santos et al., 2021; Schuermann & Woo, 2022; Wei et al., 2017), in which the attitude-behaviour gap has yet to be addressed. Other important social aspects of packaging

TABLE 4 Future research agenda.

Research gap theme	Potential future research
Sustainable packaging technological innovations	• Identifying ways to enhance commercialisation of sustainable packaging technological innovations • Investigating factors that hinder the commercialisation of sustainable packaging technologcial innovations • Exploring ways to help companies overcome the implementation barriers and promote companies' adoption of sustainable packaging innovations • Examining how different levels of sustainable packaging practice adoption (e.g., innovative vs. commercialised solutions) affect firms' performance
Social dimension of sustainable packaging	• Uncovering reasons of insufficient social aspect investigation in performance measurement frameworks and models of sustainable packaging • Developing performance measurement frameworks and models that dedicate importance not only to environmental and financial aspects but also social dimensions in sustainable packaging performance measurement • Conducting empirical research to address the attitude–behaviour gap of sustainable packaging adoption
Stakeholder integration in sustainable packaging management	• Identifying ways to integrate different perspectives and conerns from both internal and external stakeholders to enhance the effectiveness of sustainable packaging management practices • Devising effective strategies to balance the interests of all parties in managing sustainable packaging adoption
Packaging waste management	• Examining contingency factors of packaging waste management effectiveness

(e.g., consumer involvement in sustainable packaging design and the effective collaboration along the supply chain for sustainable packaging management) lack empirical investigations. Drawing on the NRBV theory, *sustainable development* capability concerns a firm's engagement in sustainable practices that address all social, environmental and financial dimensions (Hart & Dowell, 2011). It is thus important for future studies to include social aspects in performance measurement of sustainable packaging (Boz et al., 2020; Nordin & Selke, 2010), which not only provides companies with clear guidance in developing sustainable business strategies but also a holistic performance evaluation system for continuous improvements.

4.3 | Research agenda 3: Exploring strategies to enhance stakeholder integration in sustainable packaging management

In research domain 3 (i.e., consumer behaviours towards sustainable packaging), previous studies have examined consumers' attitudes, perceptions and purchasing intentions of sustainable packaging. While consumers value affordability and functionality of sustainable packaging, operational cost constitutes a firm's primary concerns (Palmer et al., 2021; Satapathy, 2017; White, Sarpong, & Ndrecaj, 2015). This shows that different stakeholders have different concerns towards sustainable packaging adoption; however, the extant literature has not been able to address each stakeholder's needs adequately in sustainable packaging management. Based on the NRBV theory, stakeholder integration is important to achieve *product stewardship* capability to enhance the effectiveness of environmental practice implementation (Hart, 1995; Hart & Dowell, 2011). Future studies need to investigate ways to integrate different viewpoints from both internal and external stakeholders regarding sustainable packaging adoption (Heras-Saizarbitoria et al., 2020). This is important to assit managers in business strategy development and decision-making process, facilitating the effective implementation of sustainable packaging practices that balance the interests of all stakeholders along the supply chain.

4.4 | Research agenda 4: Examining different contingency factors of packaging waste management effectiveness

In research domain 4 (i.e., packaging waste management), different solutions to address packaging waste have been examined, including material reduction from source, end-of-life management (e.g., recycling), reverse logistics and waste valorisation. Based on the NRBV theory, the effective management of packaging waste is important as it helps companies build the three sustainable strategic capabilities, namely, *pollution prevention* capability through packaging waste minimisation; *product stewardship* capability through innovations in packaging waste management; and *sustainable development* capability through the considerations of all social, environmental and financial aspects in addressing packaging waste issues (Hart, 1995; Hart & Dowell, 2011). Waste management is an important aspect in sustainable business strategy development that not only helps companies reduce total operation cost (Yadav et al., 2023) but also fulfil corporate social responsibility in achieving a circular economy. However, the literature has mixed findings towards the implementation of different packaging waste management tactics, rendering it difficult for managers in decision-making and strategy development in tackling

packaging waste issues. As the effectiveness of environmental practice adoption is contingent on different factors (Wright & Nyberg, 2017), future studies need to conduct empirical investigations on the contingency factors that affect the effectiveness of different packaging waste management tactics. This provides practical recommendations to improve the process of developing effective waste management strategies.

5 | IMPLICATIONS

5.1 | Theoretical implications

To extend the NRBV theory, a conceptual framework has been developed, as shown in Table 5, to explicate the linkage between sustainable packaging adoption and the three NRBV strategic

TABLE 5 Conceptual framework linking sustainable packaging adoption and NRBV strategic capabilities.

Areas of sustainable packaging research	Achievement of NRBV strategic capabilities	Firms' competitive advantages
Sustainable packaging materials and properties • Development of new sustainable packaging materials to improve performance • Innovations in processing techniques to enhance packaging material properties	• ***Pollution prevention* capability:** Minimisation of packaging waste and environmental impacts • ***Product stewardship* capability:** Reduction of life cycle cost due to better natural resource optimisation • ***Sustainable development* capability:** Minimisation of environmental liabilities due to greater companies' commitment and investment in sustainable packaging practices	• Reductions in operational costs and environmental liabilities due to sustainable packaging innovations • Achieving brand differentiation and distinctiveness in offering packaging that suits market demands to pre-empt competitors • Long-term growth and future position due to sustainability practice compliance and continuous innovations • Enhancement of corporate social responsibility image by taking accountability in packaging waste management
Management practices of sustainable packaging • Effective adoption of packaging practices and strategies (e.g., driving forces for companies' adoption and the use of effective packaging attributes such as visual and functional attributes) • Development of measurement framework/models to evaluate sustainable packaging performance	• ***Pollution prevention* capability:** Using measurement frameworks to continuously imporve and evaluate sustainable packaging adoption considering all three sustainability aspects (i.e., social, environmental, financial) • ***Product stewardship* capability:** Higher level of stakeholder integration along the supply chain, with better considerations of the social dimension (e.g. consumer involvement in packaging design) • ***Sustainable development* capability:** Formulation of a more holistic, shared vision towards sustainable packaging along the supply chain through the devise of sustainability frameworks that dedicate importance to all social, environmental, and financial aspects	
Consumer behaviours towards sustainable packaging • Examination of factors underlying consumers' intents for sustainable packaging adoption	• ***Pollution prevention* capability:** Higher level of consumers' sustainable packaging behavioural adoption to alleviate packaging waste problems • ***Product stewardship* capability:** Integration of different stakeholders' concerns including consumers' needs and preferneces in sustainable packaging implementation • ***Sustainable development* capability:** Developing a shared vision of sustainable operations among different stakeholders (e.g., consumers, managers, suppliers, and investors)	
Packaging waste management • Development of effective packaging waste management tactics	• ***Pollution prevention* capability:** Taking accountabilty to reduce packaging waste • ***Product stewardship* capability:** Lower life cycle cost due to better packaging waste management • ***Sustainable development* capability:** Continuous commitment and investment in packaging waste management	

capabilities, namely, *pollution prevention*, *product stewardship* and *sustainable development*. The development of the conceptual framework is based on the systematic literature review findings as summarised in Table 3. The framework details how gaining strategic capabilities through sustainable packaging adoption leads to long-term competitive advantages in four areas: (1) reductions in operational costs and environmental liabilities due to sustainable packaging innovations (Bataineh et al., 2024; Jacomossi et al., 2021; Jiménez-Guerrero et al., 2015; Moshood et al., 2022; Tian et al., 2023); (2) brand differentiation through meeting market needs of eco-packaging to pre-empt competitors (Korhonen et al., 2020; Yokokawa et al., 2021); (3) long-term growth and future position through continuous innovations in packaging (Erzurumlu et al., 2023; Long et al. 2023; Xie et al., 2019); and (4) enhancement of corporate social responsibility image through taking accountability in packaging waste management (Long et al. 2023; Mukonza & Swarts, 2020; Nickerson et al., 2022). This conceptual framework explicates important sustainable packaging research areas and their implications for strategy development within an NRBV perspective, which not only adds theoretical value by enriching the theory but also provides insights for future empirical testing (Ketchen & Craighead, 2023).

5.2 | Practical implications

Synthesising findings from each prominent research domain provides practical implications for business strategy development in sustainable packaging. Firstly, findings on packaging materials' performance and properties, packaging material processing techniques and technology innovations offer companies a useful guide for packaging material selection and development. The consolidation of waste treatment solutions also assists firms in developing appropriate strategies for tackling packaging waste. Considering the high technological and operational barriers to packaging innovations, different strategies can be adopted by firms of different financial capabilities. For companies with greater financial resources, investment in those technologies is worthwhile to gain sustainable competitive advantage in the long run (Hart, 1995; Hart & Dowell, 2011). Meanwhile, for companies with less financial and technological capability, it is prudent to choose commercialised packaging solutions.

The review also summarises findings from the management perspective, illustrating various packaging strategies, performance measurement frameworks and driving forces for sustainable packaging adoption, which assist companies in implementing and evaluating packaging strategies that suit their respective business needs. Further, the overview of factors underlying consumers' adoption of sustainable packaging offers practical insights into devising marketing campaigns and improving packaging design. The findings suggest that balancing between consumers' concerns and the companies' operational costs is key to developing effective sustainable packaging strategies.

6 | CONCLUSION

This study combines keyword co-occurrence analysis, thematic analysis and qualitative content analysis to synthesise the extant literature on sustainable packaging. There are four major research domains in the literature: (1) sustainable packaging materials and properties, (2) management practices of sustainable packaging, (3) consumer behaviours towards sustainable packaging and (4) packaging waste management. A diversity of new sustainable packaging materials and processing technologies have been developed; while in the business management realm, management practices of sustainable packaging, consumer perceptions and behaviours and packaging waste management solutions are investigated.

The NRBV theory, which posits that firms can attain competitive advantage through the adoption of sustainable operational practices, was used to suggest future research agenda based on three strategic capabilities, namely, *pollution prevention*, *product stewardship*, and *sustainable development*. To capitalise on sustainable packaging technological innovations, it is important for upcoming research to examine the factors that hinder the commercialisation of the developed technologies and explore ways to facilitate companies' effective adoption. In the development of sustainable packaging performance measurement frameworks, future studies need to identify reasons attributing to the lack of social dimension measurement and investigate ways to include social dimension evaluation. In addition, it is crucial for future research to explore strategies to enhance stakeholder integration in sustainable packaging management, in which the perspectives of different internal and external stakeholders are taken into consideration. To tackle packaging waste, future studies need to conduct empirical investigations to examine the contingency factors that affect the effectiveness of different packaging waste management tactics to provide practical recommendations. These proposed research directions aim to enhance the effectiveness of business strategy development for sustainable packaging to achieve competitive advantage and future growth.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare that are relevant to the content of this article.

ORCID

Cherry C. I. Lau https://orcid.org/0000-0002-5634-1758
Christina W. Y. Wong https://orcid.org/0000-0002-6130-9613

REFERENCES

Abdul-Rashid, S. H., Sakundarini, N., Ariffin, R., & Ramayah, T. (2017). Drivers for the adoption of sustainable manufacturing practices: A Malaysia perspective. *International Journal of Precision Engineering and Manufacturing*, *18*(11), 1619–1631. https://doi.org/10.1007/s12541-017-0191-4

Aboelmaged, M. (2018). The drivers of sustainable manufacturing practices in Egyptian SMEs and their impact on competitive capabilities: A PLS-SEM model. *Journal of Cleaner Production*, *175*, 207–221. https://doi.org/10.1016/j.jclepro.2017.12.053

Accorsi, R., Baruffaldi, G., & Manzini, R. (2020). A closed-loop packaging network design model to foster infinitely reusable and recyclable containers in food industry. *Sustainable Production and Consumption*, *24*, 48–61. https://doi.org/10.1016/j.spc.2020.06.014

Afif, K., Rebolledo, C., & Roy, J. (2022). Drivers, barriers and performance outcomes of sustainable packaging: A systematic literature review. *British Food Journal*, *124*(3), 915–935.

Agyabeng-Mensah, Y., Ahenkorah, E., Afum, E., Agyemang, A. N., Agnikpe, C., & Rogers, F. (2020). Examining the influence of internal green supply chain practices, green human resource management and supply chain environmental cooperation on firm performance. *Supply Chain Management-an International Journal*, *25*(5), 585–599. https://doi.org/10.1108/SCM-11-2019-0405

Ahmed, R. R., Streimikiene, D., Qadir, H., & Streimikis, J. (2023). Effect of green marketing mix, green customer value, and attitude on green purchase intention: Evidence from the USA. *Environmental Science and Pollution Research International*, *30*(5), 11473–11495. https://doi.org/10.1007/s11356-022-22944-7

Ajwani-Ramchandani, R., Figueira, S., de Oliveira, R. T., Jha, S., Ramchandani, A., & Schuricht, L. (2021). Towards a circular economy for packaging waste by using new technologies: The case of large multinationals in emerging economies. *Journal of Cleaner Production*, *281*, 125139.

Alfaro, M. T. B., & Diaz, R. A. (2021). Impact of green initiatives on the financial performance of small and medium enterprises: The case of manufacturing firm in Central Luzon. *WPOM-Working Papers on Operations Management*, *12*(1), 28–41. https://doi.org/10.4995/wpom.v12i1.14517

Almeida, C., Rodrigues, A., Agostinho, F., & Giannetti, B. (2017). Material selection for environmental responsibility: The case of soft drinks packaging in Brazil. *Journal of Cleaner Production*, *142*, 173–179.

Amara, C., El Mahdi, A., Medimagh, R., & Khwaldia, K. (2021). Nanocellulose-based composites for packaging apppplications. *Current Opinion in Green and Sustainable Chemistry*, *31*, 100512. https://doi.org/10.1016/j.cogsc.2021.100512

Andrade, M. S., Ishikawa, O. H., Costa, R. S., Seixas, M. V. S., Rodrigues, R., & Moura, E. A. B. (2022). Development of sustainable food packaging material based on biodegradable polymer reinforced with cellulose nanocrystals. *Food Packaging and Shelf Life*, *31*, 100807. https://doi.org/10.1016/j.fpsl.2021.100807

Andronie, M., Lăzăroiu, G., Ștefănescu, R., Uță, C., & Dijmărescu, I. (2021). Sustainable, smart, and sensing technologies for cyber-physical manufacturing systems: A systematic literature review. *Sustainability*, *13*(10), 5495.

Asadollahi, A., Tohidi, H., & Shoja, A. (2022). Sustainable waste management scenarios for food packaging materials using SimaPro and WARM. *International Journal of Environmental Science and Technology*, *19*(10), 9479–9494. https://doi.org/10.1007/s13762-022-04327-0

Aulin, C., & Strom, G. (2013). Multilayered alkyd resin/nanocellulose coatings for use in renewable packaging solutions with a high level of moisture resistance. *Industrial & Engineering Chemistry Research*, *52*(7), 2,582–2,589. https://doi.org/10.1021/ie301785a

Australian Packaging Covenant Organisation. (2020). Sustainable packaging guidelines SPGs. Retrieved Sep 1, 2022 from https://documents.packagingcovenant.org.au/public-documents/Sustainable%20Packaging%20Guidelines%20(SPGs).

Banik, A., Taqi, H. M. M., Ali, S. M., Ahmed, S., Garshasbi, M., & Kabir, G. (2022). Critical success factors for implementing green supply chain management in the electronics industry: An emerging economy case. *International Journal of Logistics Research and Applications*, *25*(4–5), 493–520. https://doi.org/10.1080/13675567.2020.1839029

Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal*, *26*(3), 197–218.

Baskoro, M. L., Tjahjono, B., Beltran, M., Bogush, A., & Wang, Y. (2024). The imperative of communication signals in boosting business strategies of the bioplastic packaging industry. *Business Strategy and the Environment*, *33*(2), 307–334. https://doi.org/10.1002/bse.3490

Bataineh, M. J., Sánchez-Sellero, P., & Ayad, F. (2024). Green is the new black: How research and development and green innovation provide businesses a competitive edge. *Business Strategy and the Environment*, *33*(2), 1004-1023. https://doi.org/10.1002/bse.3533

Bauer, A.-S., Tacker, M., Uysal-Unalan, I., Cruz, R. M., Varzakas, T., & Krauter, V. (2021). Recyclability and redesign challenges in multilayer flexible food packaging—A review. *Food*, *10*(11), 2,702.

Bech-Larsen, T. (1996). Danish consumers' attitudes to the functional and environmental characteristics of food packaging. *Journal of Consumer Policy*, *19*(3), 339–363. https://doi.org/10.1007/BF00411413

Bell, L., & Todoran, G. S. (2022). Plastic bag legislation in the United States: Influential factors on its creation. *Journal of Environmental Studies and Sciences*, *12*(2), 260–271.

Besier, S. (2015). Generational perceptions of pro-environmental packaging advantages: UWF. *UmweltWirtschaftsForum*, *23*(4), 315–322. https://doi.org/10.1007/s00550-015-0375-2

Boccalon, E., Viscusi, G., Lamberti, E., Fancello, F., Zara, S., Sassi, P., Marinozzi, M., Nocchetti, M., & Gorrasi, G. (2022). Composite films containing red onion skin extract as intelligent pH indicators for food packaging. *Applied Surface Science*, *593*, 153319. https://doi.org/10.1016/j.apsusc.2022.153319

Bortolini, M., Galizia, F. G., Mora, C., Botti, L., & Rosano, M. (2018). Bi-objective design of fresh food supply chain networks with reusable and disposable packaging containers. *Journal of Cleaner Production*, *184*, 375–388. https://doi.org/10.1016/j.jclepro.2018.02.231

Boz, Z., Korhonen, V., & Koelsch Sand, C. (2020). Consumer considerations for the implementation of sustainable packaging: A review. *Sustainability*, *12*(6), 2192.

Briner, R. B., & Denyer, D. (2012). Systematic review and evidence synthesis as a practice and scholarship tool. In D. M. Rousseau (Ed.), *The Oxford handbook of evidence-based management* (pp. 112–129). Oxford: Oxford University Press.

Cai, Y.-J., & Choi, T.-M. (2019). Extended producer responsibility: A systematic review and innovative proposals for improving sustainability. *IEEE Transactions on Engineering Management*, *68*(1), 272–288.

Cammarelle, A., Viscecchia, R., & Bimbo, F. (2021). Intention to purchase milk packaged in biodegradable packaging: Evidence from Italian consumers. *Food*, *10*(9), 2068. https://doi.org/10.3390/foods10092068

Chandel, A., & Kaur, T. (2022). Demystifying neuromarketing: A bibliometric analysis using VOSviewer. In J. Kaur, P. Jindal, & A. Singh (Eds.), *Developing relationships, personalization, and data herald in marketing 5.0* (pp. 256–283). IGI Global.

Chen, G., & Xiao, L. (2016). Selecting publication keywords for domain analysis in bibliometrics: A comparison of three methods. *Journal of Informetrics*, *10*(1), 212–223.

Chigudu, D. (2020). Public sector corporate governance: Zimbabwe's challenges of strategic management in the wake of sustainable development. *Academy of Strategic Management Journal*, *19*(1), 1–13.

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: A step-by-step approach. *British Journal of Nursing*, *17*(1), 38–43. https://doi.org/10.12968/bjon.2008.17.1.28059

Datta, A., Mukherjee, D., & Jessup, L. (2015). Understanding commercialization of technological innovation: Taking stock and moving forward. *R&D Management*, *45*(3), 215–249.

de Carvalho, G. R., Marques, G. S., Jorge, L. M. D., & Jorge, R. M. M. (2021). Effect of the addition of cassava fibers on the properties of cassava starch composite films. *Brazilian Journal of Chemical Engineering*, *38*(2), 341–349. https://doi.org/10.1007/s43153-021-00093-7

de Léis, C. M., Nogueira, A. R., Kulay, L., & Tadini, C. C. (2017). Environmental and energy analysis of biopolymer film based on cassava starch

in Brazil. *Journal of Cleaner Production*, *143*, 76–89. https://doi.org/10.1016/j.jclepro.2016.12.147

de Marchi, E., Pigliafreddo, S., Banterle, A., Parolini, M., & Cavaliere, A. (2020). Plastic packaging goes sustainable: An analysis of consumer preferences for plastic water bottles. *Environmental Science and Policy*, *114*, 305–311. https://doi.org/10.1016/j.envsci.2020.08.014

Denyer, D., & Neely, A. (2004). Introduction to special issue: Innovation and productivity performance in the UK. *International Journal of Management Reviews*, *5*(3–4), 131–135.

Denyer, D., & Tranfield, D. (2009a). Producing a systematic review. In D. Buchanan & A. Bryman (Eds.), *The Sage handbook of organizational research methods* (pp. 671–689). Sage.

Denyer, D., & Tranfield, D. (2009b). The Sage handbook of organizational research methods. In D. Buchanan & A. Bryman (Eds.), *Producing a systematic review* (pp. 671–689). Sage.

do Valle, P. O., Reis, E., Menezes, J., & Rebelo, E. (2004). Behavioral determinants of household recycling participation: The Portuguese case. *Environment and Behavior*, *36*(4), 505–540.

Dörnyei, K. R., Bauer, A.-S., Krauter, V., & Herbes, C. (2022). (not) communicating the environmental friendliness of food packaging to consumers—An attribute- and cue-based concept and its application. *Food*, *11*(9), 1371. https://doi.org/10.3390/foods11091371

Durach, C. F., Kembro, J., & Wieland, A. (2017). A new paradigm for systematic literature reviews in supply chain management. *Journal of Supply Chain Management*, *53*(4), 67–85.

Elkhattat, D., & Medhat, M. (2022). Creativity in packaging design as a competitive promotional tool. *Information Sciences Letters*, *11*(1), 135–148. https://doi.org/10.18576/isl/110115

Elkington, J., & Rowlands, I. H. (1999). Cannibals with forks: The triple bottom line of 21st century business. *Alternatives Journal*, *25*(4), 42.

Erzurumlu, S. S., Deets, S., Nersessian, D., & Rodgers, V. L. (2023). Strategic engagement of business with sustainable development goals: A systems thinking approach. *Business Strategy and the Environment*, *32*(7), 4954–4969. https://doi.org/10.1002/bse.3402

Farias, N. C., Major, I., Devine, D., Brennan Fournet, M., Pezzoli, R., Farshbaf Taghinezhad, S., & Hesabi, M. (2022). Multiple recycling of a PLA/PHB biopolymer blend for sustainable packaging applications: Rheology-morphology, thermal, and mechanical performance analysis. *Polymer Engineering and Science*, *62*(6), 1764–1774. https://doi.org/10.1002/pen.25962

Farrukh, A., Mathrani, S., & Sajjad, A. (2022). A systematic literature review on environmental sustainability issues of flexible packaging: Potential pathways for academic research and managerial practice. *Sustainability*, *14*(8), 4737.

Farrukh, A., & Sajjad, A. (2023). Investigating sustainability tensions and resolution strategies in the plastic food packaging industry—A paradox theory approach. *Business Strategy and the Environment*, 1–22. https://doi.org/10.1002/bse.3637

Fernandes, S. Q., & Madhuranthakam, C. M. R. (2021). Molecular dynamics simulation of a Superhydrophobic cellulose derivative targeted for eco-friendly packaging material. *Macromolecular Theory and Simulations*, *30*(1), 2000056. https://doi.org/10.1002/mats.202000056

Fidlerová, H., Makyšová, H., Sklenárová, L., & Bajdor, P. (2021). Streamlining packaging as part of sustainable reverse logistics processes. *Acta Logistica*, *8*(4), 423–433. https://doi.org/10.22306/al.v8i4.249

Foschi, E., & Bonoli, A. (2019). The commitment of packaging industry in the framework of the European strategy for plastics in a circular economy. *Administrative Sciences*, *9*(1), 1–13. https://doi.org/10.3390/admsci9010018

Friedrich, D. (2020). How regulatory measures towards biobased packaging influence the strategic behaviour of the retail industry: A microempirical study. *Journal of Cleaner Production*, *260*, 121128. https://doi.org/10.1016/j.jclepro.2020.121128

Galati, A., Alaimo, L. S., Ciaccio, T., Vrontis, D., & Fiore, M. (2022). Plastic or not plastic? That's the problem: Analysing the Italian students purchasing behavior of mineral water bottles made with eco-friendly packaging. *Resources, Conservation and Recycling*, *179*, 106060.

García-Arca, J., Trinidad González-Portela, A., & Carlos Prado-Prado, J. (2019). Organizational best practices in packaging design. An analysis in perfumery and cleaning products. *DIRECCION y ORGANIZACION*, *68*, 5–19. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85078528036&partnerID=40&md5=6510e08a628f33ae7025a47d57f15c64

Gardas, B. B., Raut, R. D., & Narkhede, B. (2019). Identifying critical success factors to facilitate reusable plastic packaging towards sustainable supply chain management. *Journal of Environmental Management*, *236*, 81–92. https://doi.org/10.1016/j.jenvman.2019.01.113

González-Boubeta, I., Vázquez, M. F., Caamaño, P. D., & Prado, J. C. P. (2018). Economic and environmental packaging sustainability: A case study. *Journal of Industrial Engineering and Management*, *11*(2), 229–238.

Gorrasi, G., Viscusi, G., Gerardi, C., Lamberti, E., & Giovinazzo, G. (2022). Physicochemical and antioxidant properties of White (Fiano cv) and red (Negroamaro cv) grape pomace skin based films. *Journal of Polymers and the Environment*, *30*(9), 3,609–3,621. https://doi.org/10.1007/s10924-022-02463-9

Graham, S., & McAdam, R. (2016). The effects of pollution prevention on performance. *International Journal of Operations & Production Management*, *36*(10), 1333–1358.

Guidotti, G., Soccio, M., Lotti, N., Siracusa, V., Gazzano, M., & Munari, A. (2019). New multi-block copolyester of 2,5-furandicarboxylic acid containing PEG-like sequences to form flexible and degradable films for sustainable packaging. *Polymer Degradation and Stability*, *169*, 108963. https://doi.org/10.1016/j.polymdegradstab.2019.108963

Guillard, V., Gaucel, S., Fornaciari, C., Angellier-Coussy, H., Buche, P., & Gontard, N. (2018). The next generation of sustainable food packaging to preserve our environment in a circular economy context. *Frontiers in Nutrition*, *5*, 121.

Gulsun, B., & Mic, P. (2020). An integrated fuzzy multi criteria decision making method for sustainable (green) packaging materials selection: An application in Turkey. *Fresenius Environmental Bulletin*, *29*(4A), 2653–2661.

Gutberlet, J. (2008). Empowering collective recycling initiatives: Video documentation and action research with a recycling co-op in Brazil. *Resources, Conservation and Recycling*, *52*(4), 659–670.

Hailemariam, A., & Erdiaw-Kwasie, M. O. (2023). Towards a circular economy: Implications for emission reduction and environmental sustainability. *Business Strategy and the Environment*, *32*(4), 1951–1965.

Hajirostamloo, B., Mortazavi, S. A., Molaveisi, M., & Dehnad, D. (2022). Improvement of soy protein isolate-Alyssum homolocarpum seed gum blend film through intermolecular bonds induced by the mixture of plant extracts. *Journal of Food Measurement and Characterization*, *16*(4), 2639–2648. https://doi.org/10.1007/s11694-022-01359-5

Hamza, K. M., De Abreu Sofiatti Dalmarco, D., & Veloso, A. R. (2018). Knowledge and understanding of sustainability labels in Brazil. *International Journal of Sustainable Development*, *21*(1–4), 131–149. https://doi.org/10.1504/IJSD.2018.100828

Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, *20*(4), 986–1014.

Hart, S. L., & Dowell, G. (2011). Invited editorial: A natural-resource-based view of the firm: Fifteen years after. *Journal of Management*, *37*(5), 1464–1479.

Hasan, I., Wang, J. W., & Tajvidi, M. (2021). Tuning physical, mechanical and barrier properties of cellulose nanofibril films through film drying techniques coupled with thermal compression. *Cellulose*, *28*(18), 11345–11366. https://doi.org/10.1007/s10570-021-04269-9

Hasan, M., Gopakumar, D. A., Olaiya, N. G., Zarlaida, F., Alfian, A., Aprinasari, C., Alfatah, T., Rizal, S., & Khalil, H. (2020). Evaluation of the thermomechanical properties and biodegradation of brown rice starch-based chitosan biodegradable composite films. *International*

Journal of Biological Macromolecules, *156*, 896–905. https://doi.org/10.1016/j.ijbiomac.2020.04.039

Hawkins, G. (2012). The performativity of food packaging: Market devices, waste crisis and recycling. *The Sociological Review*, *60*, 66–83.

He, Q. (1999). Knowledge discovery through co-word analysis. *Library Trends*, *48*, 133–159.

Helanto, K., Matikainen, L., Talj, R., & Rojas, O. J. (2019). Bio-based polymers for sustainable packaging and biobarriers: A critical review. *BioResources*, *14*(2), 4,902–4,951. https://doi.org/10.15376/biores.14.2.Helanto

Heras-Saizarbitoria, I., Boiral, O., Allur, E., & García, M. (2020). Communicating environmental management certification: Signaling without signals? *Business Strategy and the Environment*, *29*(2), 422–431.

Herbes, C., Beuthner, C., & Ramme, I. (2018). Consumer attitudes towards biobased packaging—A cross-cultural comparative study. *Journal of Cleaner Production*, *194*, 203–218. https://doi.org/10.1016/j.jclepro.2018.05.106

Higginson, J. L., Rezaei Kolahchi, A., & Behzadfar, E. (2022). Evaluation of layer adhesion and uniformity in poly(lactic acid) and thermoplastic starch multilayered films. *Industrial & Engineering Chemistry Research*, *61*(23), 7996–8004. https://doi.org/10.1021/acs.iecr.2c00898

Holler, M., Lunze, A., Wever, C., Deutschle, A. L., Stucker, A., Frase, N., Pestsova, E., Spiess, A. C., Westhoff, P., & Pude, R. (2021). Meadow hay, *Sida hermaphrodita* (L.) Rusby and *Silphium perfoliatum* L. as potential non-wood raw materials for the pulp and paper industry. *Industrial Crops and Products*, *167*, 113548. https://doi.org/10.1016/j.indcrop.2021.113548

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288.

Idrees, M., Rangari, V., & Jeelani, S. (2018). Sustainable packaging waste-derived activated carbon for carbon dioxide capture. *Journal of CO2 Utilization*, *26*, 380–387. https://doi.org/10.1016/j.jcou.2018.05.016

Ionescu, L. (2022). Urban greenhouse gas accounting for net-zero carbon cities: Sustainable development, renewable energy, and climate change. *Geopolitics, History, and International Relations*, *14*(1), 155–171.

Jacomossi, R. R., Feldmann, P. R., Barrichello, A., & Morano, R. S. (2021). Does ecological sustainability really matter? Evaluation of its mediating role in the relationship between innovation and competitiveness. *BAR - Brazilian Administration Review*, *18*(3), e200126. https://doi.org/10.1590/1807-7692BAR2021200126

Jasmi, M. F. A., & Fernando, Y. (2018). Drivers of maritime green supply chain management. *Sustainable Cities and Society*, *43*, 366–383. https://doi.org/10.1016/j.scs.2018.09.001

Jayasekara, S., Dissanayake, L., & Jayakody, L. N. (2022). Opportunities in the microbial valorization of sugar industrial organic waste to biodegradable smart food packaging materials. *International Journal of Food Microbiology*, *377*, 109785. https://doi.org/10.1016/j.ijfoodmicro.2022.109785

Jestratijevic, I., Maystorovich, I., & Vrabič-Brodnjak, U. (2022). The 7 Rs sustainable packaging framework: Systematic review of sustainable packaging solutions in the apparel and footwear industry. *Sustainable Production and Consumption*, *30*, 331–340.

Jia, P., Govindan, K., & Kannan, D. (2015). Identification and evaluation of influential criteria for the selection of an environmental shipping carrier using DEMATEL: A case from India. *International Journal of Shipping and Transport Logistics*, *7*(6), 719–741.

Jiménez-Guerrero, J. F., Gázquez-Abad, J. C., & Ceballos-Santamaría, G. (2015). Innovation in eco-packaging in private labels. *Innovations*, *17*(1), 81–90.

Jurconi, A., Popescu, I. M., Manea, D.-I., Mihai, M., & Pamfilie, R. (2022). The impact of the "green transition" in the field of food packaging on the behavior of ROMANIAN consumers. *Amfiteatru Economic*, *24*(60), 395–409. https://doi.org/10.24818/EA/2022/60/395

Kamarudin, S. H., Rayung, M., Abu, F., Ahmad, S. b., Fadil, F., Karim, A. A., Norizan, M. N., Sarifuddin, N., Mat Desa, M. S. Z., & Mohd Basri, M. S. (2022). A review on antimicrobial packaging from biodegradable polymer composites. *Polymers*, *14*(1), 174.

Ketchen, D. J. Jr., & Craighead, C. W. (2023). What constitutes an excellent literature review? Summarize, synthesize, conceptualize, and energize. *Journal of Business Logistics*, *44*(2), 164–169. https://doi.org/10.1111/jbl.12339

Kim, A., Bansal, P., & Haugh, H. (2019). No time like the present: How a present time perspective can foster sustainable development. *Academy of Management Journal*, *62*(2), 607–634.

King, A., & Lenox, M. (2002). Exploring the locus of profitable pollution reduction. *Management Science*, *48*(2), 289–299.

Klassen, R. D., & Whybark, D. C. (1999). The impact of environmental technologies on manufacturing performance. *Academy of Management Journal*, *42*(6), 599–615.

Klinmalai, P., Srisa, A., Laorenza, Y., Katekhong, W., & Harnkarnsujarit, N. (2021). Antifungal and plasticization effects of carvacrol in biodegradable poly (lactic acid) and poly (butylene adipate terephthalate) blend films for bakery packaging. *LWT-Food Science and Technology*, *152*, 112356. https://doi.org/10.1016/j.lwt.2021.112356

Koch, J., Frommeyer, B., & Schewe, G. (2022). Managing the transition to eco-friendly packaging—An investigation of consumers' motives in online retail. *Journal of Cleaner Production*, *351*, 131504. https://doi.org/10.1016/j.jclepro.2022.131504

Korhonen, J., Koskivaara, A., & Toppinen, A. (2020). Riding a Trojan horse? Future pathways of the fiber-based packaging industry in the bioeconomy. *Forest Policy and Economics*, *110*, 101799. https://doi.org/10.1016/j.forpol.2018.08.010

Kumar, P., Singh, R. K., & Vaish, A. (2017). Suppliers' green performance evaluation using fuzzy extended ELECTRE approach. *Clean Technologies and Environmental Policy*, *19*(3), 809–821. https://doi.org/10.1007/s10098-016-1268-y

Lago, N. C., Marcon, A., Ribeiro, J. L. D., de Medeiros, J. F., Brião, V. B., & Antoni, V. L. (2020). Determinant attributes and the compensatory judgement rules applied by young consumers to purchase environmentally sustainable food products. *Sustainable Production and Consumption*, *23*, 256–273. https://doi.org/10.1016/j.spc.2020.06.003

Lang, C. R. V., Wang, T. R., & Zhao, Y. Y. (2021). Investigation of eco-friendly chemical treatments of apple pomace for producing high quality molded pulp biocomposite. *Journal of Applied Polymer Science*, *138*(46), e51363. https://doi.org/10.1002/app.51363

Lavuri, R., Akram, U., & Akram, Z. (2023). Exploring the sustainable consumption behavior in emerging countries: The role of pro-environmental self-identity, attitude, and environmental protection emotion. *Business Strategy and the Environment*, *32*(8), 5174–5186. https://doi.org/10.1002/bse.3411

Lăzăroiu, G., Ionescu, L., Andronie, M., & Dijmărescu, I. (2020). Sustainability management and performance in the urban corporate economy: A systematic literature review. *Sustainability*, *12*(18), 7705.

Leceta, I., Uranga, J., Arana, P., Cabezudo, S., de la Caba, K., & Guerrero, P. (2015). Valorisation of fishery industry wastes to manufacture sustainable packaging films: Modelling moisture-sorption behaviour. *Journal of Cleaner Production*, *91*, 36–42. https://doi.org/10.1016/j.jclepro.2014.12.009

Lewis, H., Verghese, K., & Fitzpatrick, L. (2010). Evaluating the sustainability impacts of packaging: The plastic carry bag dilemma. *Packaging Technology and Science: an International Journal*, *23*(3), 145.

Liem, D. G., In't Groen, A., & van Kleef, E. (2022). Dutch consumers' perception of sustainable packaging for milk products, a qualitative and quantitative study. *Food Quality and Preference*, *102*, 104658. https://doi.org/10.1016/j.foodqual.2022.104658

Lis, A. (2018). Keywords co-occurrence analysis of research on sustainable enterprise and sustainable organisation. *Journal of Corporate Responsibility and Leadership*, *5*(2), 47–66.

Lisboa, A., Vitorino, L., & Antunes, R. (2022). Gen Zers' intention to purchase products with sustainable packaging: An alternative perspective to the attitude-behaviour gap. *Journal of Marketing Management*, *38*(9–10), 967–992. https://doi.org/10.1080/0267257X.2022.2083214

Liu, M., Arshadi, M., Javi, F., Lawrence, P., Davachi, S. M., & Abbaspourrad, A. (2020). Green and facile preparation of hydrophobic bioplastics from tea waste. *Journal of Cleaner Production*, *276*, 123353. https://doi.org/10.1016/j.jclepro.2020.123353

Long, H., Feng, G.-F., Gong, Q., & Chang, C.-P. (2023). ESG performance and green innovation: An investigation based on quantile regression. *Business Strategy and the Environment*, *32*(7), 5102–5118. https://doi.org/10.1002/bse.3410

Maceno, M. M. C., Pawlowsky, U., Machado, K. S., & Seleme, R. (2018). Environmental performance evaluation a proposed analytical tool for an industrial process application. *Journal of Cleaner Production*, *172*, 1452–1464. https://doi.org/10.1016/j.jclepro.2017.10.289

Magnier, L., & Crié, D. (2015). Communicating packaging eco-friendliness. *International Journal of Retail & Distribution Management*, *43*(4/5), 350–366. https://doi.org/10.1108/IJRDM-04-2014-0048

Magnier, L., & Schoormans, J. (2015). Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern. *Journal of Environmental Psychology*, *44*, 53–62. https://doi.org/10.1016/j.jenvp.2015.09.005

Marcal, S., & Pintado, M. (2021). Mango peels as food ingredient/additive: Nutritional value, processing, safety and applications. *Trends in Food Science & Technology*, *114*, 472–489. https://doi.org/10.1016/j.tifs.2021.06.012

Martinho, G., Balaia, N., & Pires, A. (2017). The Portuguese plastic carrier bag tax: The effects on consumers' behavior. *Waste Management*, *61*, 3–12. https://doi.org/10.1016/j.wasman.2017.01.023

Martins, P. C., & Martins, V. G. (2021). Effect of Rice starch hydrolysis and esterification processes on the physicochemical properties of biodegradable films. *Starch-Stärke*, *73*(9–10), 2100022. https://doi.org/10.1002/star.202100022

Masilamani, D., Srinivasan, V., Ramachandran, R. K., Gopinath, A., Madhan, B., & Saravanan, P. (2017). Sustainable packaging materials from tannery trimming solid waste: A new paradigm in wealth from waste approaches. *Journal of Cleaner Production*, *164*, 885–891. https://doi.org/10.1016/j.jclepro.2017.06.200

McCarthy, B., & Wang, P. J. (2022). Shades of sustainability: Who are the buyers and non-buyers of sustainable packaging? *Journal of Food Products Marketing*, *28*(4), 153–178. https://doi.org/10.1080/10454446.2022.2064202

Meherishi, L., Narayana, S. A., & Ranjani, K. (2019). Sustainable packaging for supply chain management in the circular economy: A review. *Journal of Cleaner Production*, *237*, 117582.

Meherishi, L., Narayana, S. A., & Ranjani, K. S. (2021). Integrated product and packaging decisions with secondary packaging returns and protective packaging management. *European Journal of Operational Research*, *292*(3), 930–952. https://doi.org/10.1016/j.ejor.2020.11.022

Mehraj, D., & Qureshi, I. H. (2022). Does green brand positioning translate into green purchase intention?: A mediation–moderation model. *Business Strategy and the Environment*, *31*(7), 3166–3181.

Miller, D. J., Fern, M. J., & Cardinal, L. B. (2007). The use of knowledge for technological innovation within diversified firms. *Academy of Management Journal*, *50*(2), 307–325.

Miller, K., Reichert, C. L., Schmid, M., & Loeffler, M. (2022). Physical, chemical and biochemical modification approaches of potato (peel) constituents for bio-based food packaging concepts: A review. *Food*, *11*(18), 2927. https://doi.org/10.3390/foods11182927

Missio, A. L., Mattos, B. D., Ferreira, D. D., Magalhaes, W. L. E., Bertuol, D. A., Gatto, D. A., Petutschnigg, A., & Tondi, G. (2018). Nanocellulose-tannin films: From trees to sustainable active packaging. *Journal of Cleaner Production*, *184*, 143–151. https://doi.org/10.1016/j.jclepro.2018.02.205

Mohamed, S. A. A., El-Sakhawy, M., Nashy, E., & Othman, A. M. (2019). Novel natural composite films as packaging materials with enhanced properties. *International Journal of Biological Macromolecules*, *136*, 774–784. https://doi.org/10.1016/j.ijbiomac.2019.06.130

Moorthy, K., Kamarudin, A. A., Xin, L., Hui, L. M., Way, L. T., Fang, P. S., & Carmen, W. (2021). Green packaging purchase behaviour: A study on Malaysian consumers. *Environment, Development and Sustainability*, *23*(10), 15391–15412. https://doi.org/10.1007/s10668-021-01302-6

Morgana Weber, M., Carvalho, R., Luísa Paula, C.-L., & Guiné, R. P. F. (2021). Plastic food packaging: Perceptions and attitudes of Portuguese consumers about environmental impact and recycling. *Sustainability*, *13*(17), 9953. https://doi.org/10.3390/su13179953

Moshood, T. D., Nawanir, G., Mahmud, F., Mohamad, F., Ahmad, M. H., AbdulGhani, A., & Kumar, S. (2022). Green product innovation: A means towards achieving global sustainable product within biodegradable plastic industry. *Journal of Cleaner Production*, *132*, 506.

Mugobo, V. V., & Ntuli, H. (2022). Consumer preference for attributes of single-use and multi-use plastic shopping bags in Cape Town: A choice experiment approach. *Sustainability*, *14*(17), 10887. https://doi.org/10.3390/su141710887

Mukonza, C., & Swarts, I. (2020). The influence of green marketing strategies on business performance and corporate image in the retail sector. *Business Strategy and the Environment*, *29*(3), 838–845.

Müller, G., Hanecker, E., Blasius, K., Seidemann, C., Tempel, L., Sadocco, P., Pozo, B. F., Boulougouris, G., Lozo, B., & Jamnicki, S. (2014). End-of-life solutions for fibre and bio-based packaging materials in Europe. *Packaging Technology and Science*, *27*(1), 1–15.

Narayanan, M., Loganathan, S., Valapa, R. B., Thomas, S., & Varghese, T. O. (2017). UV protective poly (lactic acid)/rosin films for sustainable packaging. *International Journal of Biological Macromolecules*, *99*, 37–45. https://doi.org/10.1016/j.ijbiomac.2017.01.152

Nemat, B., Razzaghi, M., Bolton, K., & Rousta, K. (2019). The role of food packaging design in consumer recycling behavior—A literature review. *Sustainability*, *11*(16), 4350. https://doi.org/10.3390/su11164350

Nguyen, A. T., Parker, L., Brennan, L., & Lockrey, S. (2020). A consumer definition of eco-friendly packaging. *Journal of Cleaner Production*, *252*, 119792. https://doi.org/10.1016/j.jclepro.2019.119792

Nickerson, D., Lowe, M., Pattabhiramaiah, A., & Sorescu, A. (2022). The impact of corporate social responsibility on brand sales: An accountability perspective. *Journal of Marketing*, *86*(2), 5–28.

Nidhi, M., & Pillai, V. M. (2019). Product disposal penalty: Analysing carbon sensitive sustainable supply chains. *Computers & Industrial Engineering*, *128*, 8–23.

Nordin, N., & Selke, S. (2010). Social aspect of sustainable packaging. *Packaging Technology and Science*, *23*(6), 317–326.

Novak, A., Novak Sedlackova, A., Vochozka, M., & Popescu, G. H. (2022). Big data-driven governance of smart sustainable intelligent transportation systems: Autonomous driving behaviors, predictive modeling techniques, and sensing and computing technologies. *Contemporary Readings in Law and Social Justice*, *14*(2), 100–117.

Nwabor, O. F., Singh, S., Ontong, J. C., Vongkamjan, K., & Voravuthikunchai, S. P. (2021). Valorization of wastepaper through antimicrobial functionalization with biogenic silver nanoparticles, a sustainable packaging composite. *Waste and Biomass Valorization*, *12*(6), 3,287–3,301. https://doi.org/10.1007/s12649-020-01237-5

Oloyede, O. O., & Lignou, S. (2021). Sustainable paper-based packaging: A consumer's perspective. *Food*, *10*(5), 1035. https://doi.org/10.3390/foods10051035

Olsmats, C., Nilsson, B., & Pousette, S. (2015). Perceptions of sustainability and functional aspects on liquid carton board packaging materials versus competing materials for juice applications in Sweden. *Beverages*, *1*(3), 194–203. https://doi.org/10.3390/beverages1030194

Opdenakker, R., & Talmar, M. (2021). What to consider in a systematic literature review: Three examples from design science research. In A. P. C. Ermel, D. P. Lacerda, M. I. W. M. Morandi, & L. Gauss (Eds.),

Literature reviews: Modern methods for investigating scientific and technological knowledge (pp. 191–199). Springer.

Orzan, G., Cruceru, A. F., Bălăceanu, C. T., & Raluca-Giorgiana, C. (2018). Consumers' behavior concerning sustainable packaging: An exploratory study on Romanian consumers. *Sustainability*, *10*(6), 1787. https://doi.org/10.3390/su10061787

Oyama, I. C., de Souza, G. P. M., Rezende, M. C., Montagna, L. S., & Passador, F. R. (2020). A new eco-friendly green composite for antistatic packaging: Green low-density polyethylene/glassy carbon. *Polymer Composites*, *41*(7), 2744–2752. https://doi.org/10.1002/pc.25572

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., & Brennan, S. E. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Systematic Reviews*, *10*(1), 1–11.

Palmer, S., Herritt, C., Cunningham-Sabo, L., Stylianou, K. S., & Prescott, M. P. (2021). A systems examination of food packaging and other single-use item waste in school nutrition programs. *Journal of Nutrition Education and Behavior*, *53*(5), 380–388. https://doi.org/10.1016/j.jneb.2021.01.009

Pawaskar, U. S., Raut, R. D., & Gardas, B. B. (2018). Assessment of consumer behavior towards environmental responsibility: A structural equations modeling approach. *Business Strategy and the Environment*, *27*(4), 560–571.

Pazienza, P., & De Lucia, C. (2020). The EU policy for a plastic economy: Reflections on a sectoral implementation strategy. *Business Strategy and the Environment*, *29*(2), 779–788. https://doi.org/10.1002/bse.2445

Pesaranhajiabbas, E., Pal, A. K., Rodriguez-Uribe, A., Mohanty, A. K., & Misra, M. (2022). Biodegradable polymer blends: Studies on performance control through droplet to co-continuous morphology. *ACS Applied Polymer Materials*, *4*(8), 5546–5556.

Petroudy, S. R. D., Rahmani, N., Garmaroody, E. R., Rudi, H., & Ramezani, O. (2019). Comparative study of cellulose and lignocellulose nanopapers prepared from hard wood pulps: Morphological, structural and barrier properties. *International Journal of Biological Macromolecules*, *135*, 512–520. https://doi.org/10.1016/j.ijbiomac.2019.05.212

Pittaway, L. (2007). The Sage dictionary of qualitative management research. In R. Thorpe & R. Holt (Eds.), *Systematic literature reviews*. Sage.

Popovic, I., Bossink, B. A. G., van der Sijde, P. C., & Fong, C. Y. M. (2020). Why are consumers willing to pay more for liquid foods in environmentally friendly packaging? A dual attitudes perspective. *Sustainability*, *12*(7), 2812. https://doi.org/10.3390/su12072812

Popovic, I., Bossink, B. A. G., & Peter, C. v. d. S. (2019). Factors influencing consumers' decision to purchase food in environmentally friendly packaging: What do we know and where do we go from here? *Sustainability*, *11*(24), 7197. https://doi.org/10.3390/su11247197

Prado, N. S., da Silva, I. S. V., Nascimento, J. A. D., Pasquini, D., & Otaguro, H. (2021). Flaxseed gum/agar blends and nanocomposites: Preparation and physical properties. *Iranian Polymer Journal*, *30*(8), 821–830. https://doi.org/10.1007/s13726-021-00933-w

Prakash, G., & Pathak, P. (2017). Intention to buy eco-friendly packaged products among young consumers of India: A study on developing nation. *Journal of Cleaner Production*, *141*, 385–393. https://doi.org/10.1016/j.jclepro.2016.09.116

Preghenella, N., & Battistella, C. (2021). Exploring business models for sustainability: A bibliographic investigation of the literature and future research directions. *Business Strategy and the Environment*, *30*(5), 2505–2522.

Pujari, D., Wright, G., & Peattie, K. (2003). Green and competitive: Influences on environmental new product development performance. *Journal of Business Research*, *56*(8), 657–671.

Qasim, U., Osman, A. I., Al-Muhtaseb, A. a. H., Farrell, C., Al-Abri, M., Ali, M., Vo, D.-V. N., Jamil, F., & Rooney, D. W. (2021). Renewable cellulosic nanocomposites for food packaging to avoid fossil fuel plastic pollution: A review. *Environmental Chemistry Letters*, *19*(1), 613–641.

Qin, D., Hu, Y., & Li, X. (2021). Waste glass utilization in cement-based materials for sustainable construction: A review. *Crystals*, *11*(6), 710.

Quattrosoldi, S., Guidotti, G., Soccio, M., Siracusa, V., & Lotti, N. (2022). Bio-based and one-day compostable poly (diethylene 2,5-furanoate) for sustainable flexible food packaging: Effect of ether-oxygen atom insertion on the final properties. *Chemosphere*, *291*, 132996. https://doi.org/10.1016/j.chemosphere.2021.132996

Quilez-Molina, A. I., Pasquale, L., Debellis, D., Tedeschi, G., Athanassiou, A., & Bayer, I. S. (2021). Responsive bio-composites from magnesium carbonate filled Polycaprolactone and curcumin-functionalized cellulose fibers. *Advanced Sustainable Systems*, *5*(10), 2100128. https://doi.org/10.1002/adsu.202100128

Rausch, T. M., Baier, D., & Wening, S. (2021). Does sustainability really matter to consumers? Assessing the importance of online shop and apparel product attributes. *Journal of Retailing and Consumer Services*, *63*, 102681. https://doi.org/10.1016/j.jretconser.2021.102681

Reichert, C. L., Bugnicourt, E., Maria-Beatrice, C., Cinelli, P., Lazzeri, A., Canesi, I., Braca, F., Belén Monje, M., Alonso, R., Agostinis, L., Verstichel, S., Six, L., De Mets, S., Elena Cantos, G., Ißbrücker, C., Geerinck, R., Nettleton, D. F., Campos, I., Sauter, E., … Schmid, M. (2020). Bio-based packaging: Materials, modifications, industrial applications and sustainability. *Polymers*, *12*(7), 1558. https://doi.org/10.3390/polym12071558

Ren, Q., Wu, M., Wang, L., Zheng, W., Hikima, Y., Semba, T., & Ohshima, M. (2022). Cellulose nanofiber reinforced poly (lactic acid) with enhanced rheology, crystallization and foaming ability. *Carbohydrate Polymers*, *286*, 119320.

Roy, S. A., Ali, S. M., Kabir, G., Enayet, R., Suhi, S. A., Haque, T., & Hasan, R. (2020). A framework for sustainable supplier selection with transportation criteria. *International Journal of Sustainable Engineering*, *13*(2), 77–92. https://doi.org/10.1080/19397038.2019.1625983

Salaberria, A. M., Diaz, R. H., Andrés, M. A., Fernandes, S. C., & Labidi, J. (2017). The antifungal activity of functionalized chitin nanocrystals in poly (Lactid acid) films. *Materials*, *10*(5), 546.

Sandrin, E., Trentin, A., & Forza, C. (2018). Mass Customization and Environmental Sustainability: A Large-Scale Empirical Study. In *Customization 4.0* (pp. 251–264). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-77556-2_16

Santos, V., Gomes, S., & Nogueira, M. (2021). Sustainable packaging: Does eating organic really make a difference on product-packaging interaction? *Journal of Cleaner Production*, *304*, 127066. https://doi.org/10.1016/j.jclepro.2021.127066

Sastre, R. M., de Paula, I. C., & Echeveste, M. E. S. (2022). A systematic literature review on packaging sustainability: Contents, opportunities, and guidelines. *Sustainability*, *14*(11), 6727.

Satapathy, S. (2017). An analysis of barriers for plastic recycling in the Indian plastic industry. *Benchmarking-an International Journal*, *24*(2), 415–430. https://doi.org/10.1108/BIJ-11-2014-0103

Scavarda, A., Dau, G. L., Scavarda, L. F., & Korzenowski, A. L. (2019). A proposed healthcare supply chain management framework in the emerging economies with the sustainable lenses: The theory, the practice, and the policy. *Resources Conservation and Recycling*, *141*, 418–430. https://doi.org/10.1016/j.resconrec.2018.10.027

Schuermann, H., & Woo, J. (2022). Estimating consumers' willingness to pay for reusable food containers when ordering delivery food: A contingent valuation approach. *Journal of Cleaner Production*, *366*, 133012. https://doi.org/10.1016/j.jclepro.2022.133012

Schwens, C., & Wagner, M. (2019). The role of firm-internal corporate environmental standards for organizational performance. *Journal of Business Economics*, *89*, 823–843.

Sharma, K., Aswal, C., & Paul, J. (2023). Factors affecting green purchase behavior: A systematic literature review. *Business Strategy and the Environment*, *32*(4), 2078–2092.

Sharma, S., & Henriques, I. (2005). Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal*, *26*(2), 159–180.

Shlush, E., & Davidovich-Pinhas, M. (2022). Bioplastics for food packaging. *Trends in Food Science & Technology*, *125*, 66–80.

Shrivastava, P. (1995). The role of corporations in achieving ecological sustainability. *Academy of Management Review*, *20*(4), 936–960.

Singh, G., & Pandey, N. (2018). The determinants of green packaging that influence buyers' willingness to pay a price premium. *Australasian Marketing Journal*, *26*(3), 221–230. https://doi.org/10.1016/j.ausmj.2018.06.001

Singh, S., Kumar, J., & Rao, P. (2018). *Environmental impact assessment framework for product packaging*. An International Journal.

Siracusa, V., & Blanco, I. (2020). Bio-polyethylene (bio-PE), bio-polypropylene (bio-PP) and bio-poly (ethylene terephthalate) (bio-PET): Recent developments in bio-based polymers analogous to petroleum-derived ones for packaging and engineering applications. *Polymers*, *12*(8), 1641. https://doi.org/10.3390/polym12081641

Soares, J. M. A., da Silva, E. D., de Veras, B. O., Yara, R., de Albuquerque, P. B. S., & de Souza, M. P. (2022). Active biodegradable film based on chitosan and *Cenostigma Nordestinum*' extracts for use in the food industry. *Journal of Polymers and the Environment*, *30*(1), 217–231. https://doi.org/10.1007/s10924-021-02192-5

Soderstrom, S. B., & Weber, K. (2020). Organizational structure from interaction: Evidence from corporate sustainability efforts. *Administrative Science Quarterly*, *65*(1), 226–271.

Soleimanian, Y., Sanou, I., Turgeon, S. L., Canizares, D., & Khalloufi, S. (2022). Natural plant fibers obtained from agricultural residue used as an ingredient in food matrixes or packaging materials: A review. *Comprehensive Reviews in Food Science and Food Safety*, *21*(1), 371–415. https://doi.org/10.1111/1541-4337.12875

Steenis, N. D., van der Lans, I. A., van Herpen, E., & van Trijp, H. C. M. (2018). Effects of sustainable design strategies on consumer preferences for redesigned packaging. *Journal of Cleaner Production*, *205*, 854–865. https://doi.org/10.1016/j.jclepro.2018.09.137

Steenis, N. D., van Herpen, E., van der Lans, I. A., Ligthart, T. N., & van Trijp, H. C. M. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, *162*, 286–298. https://doi.org/10.1016/j.jclepro.2017.06.036

Su, D. N., Duong, T. H., Dinh, M. T. T., Nguyen-Phuoc, D. Q., & Johnson, L. W. (2021). Behavior towards shopping at retailers practicing sustainable grocery packaging: The influences of intra-personal and retailer-based contextual factors. *Journal of Cleaner Production*, *279*, 123683. https://doi.org/10.1016/j.jclepro.2020.123683

Sun, H., & Li, J. (2021). Behavioural choice of governments, enterprises and consumers on recyclable green logistics packaging. *Sustainable Production and Consumption*, *28*, 459–471. https://doi.org/10.1016/j.spc.2021.06.011

Svanes, E., Vold, M., Møller, H., Pettersen, M. K., Larsen, H., & Hanssen, O. J. (2010). Sustainable packaging design: A holistic methodology for packaging design. *Packaging Technology and Science: An International Journal*, *23*(3), 161–175.

Tan, C., Han, F., Zhang, S., Li, P., & Shang, N. (2021). Novel bio-based materials and applications in antimicrobial food packaging: Recent advances and future trends. *International Journal of Molecular Sciences*, *22*(18), 9663. https://doi.org/10.3390/ijms22189663

Tencati, A., Pogutz, S., Moda, B., Brambilla, M., & Cacia, C. (2016). Prevention policies addressing packaging and packaging waste: Some emerging trends. *Waste Management*, *56*, 35–45. https://doi.org/10.1016/j.wasman.2016.06.025

Testa, F., Iovino, R., & Iraldo, F. (2020). The circular economy and consumer behaviour: The mediating role of information seeking in buying circular packaging. *Business Strategy and the Environment*, *29*(8), 3435–3448.

Testa, F., Sarti, S., & Frey, M. (2019). Are green consumers really green? Exploring the factors behind the actual consumption of organic food products. *Business Strategy and the Environment*, *28*(2), 327–338.

Tian, J., Dong, Y., Vagnani, G., & Liu, P. (2023). Green innovation and the stock market value of heavily polluting firms: The role of environmental compliance costs and technological collaboration. *Business Strategy and the Environment*, *32*(7), 4938–4953. https://doi.org/10.1002/bse.3401

Tran, T. M. T., Woo, S. H., & Yuen, K. F. (2021). The impacts of sustainable inter-firm collaboration on business performance of shipping companies. *International Journal of Logistics Management*, *32*(3), 766–789. https://doi.org/10.1108/IJLM-11-2020-0453

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, *14*(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Turkcu, D., Tura, N., & Ojanen, V. (2022). A conceptual framework of the sustainability challenges experienced during the life cycle of biobased packaging products. *Sustainability*, *14*(17), 10465. https://doi.org/10.3390/su141710465

United Nations Environment Programme. (2022). Our planet is choking on plastic. Retrieved 23 December, 2022 from https://www.unep.org/interactives/beat-plastic-pollution/

van Eck, N. J., & Waltman, L. (2011). *VOSviewer manual: Manual for VOSviewer version 1.5.0*. Retrieved September 20, 2022, from https://www.vosviewer.com/documentation/Manual_VOSviewer_1.5.0.pdf

van Eck, N.J., & Waltman, L. (2014). Visualizing Bibliometric Networks. In Y. Ding, R. Rousseau, & D. Wolfram (Eds.), *Measuring scholarly impact: Methods and practice* (pp. 285–320). Cham: Springer. https://doi.org/10.1007/978-3-319-10377-8_13

Varghese, S., Dhanraj, N. D., Rebello, S., Sindhu, R., Binod, P., Pandey, A., Jisha, M. S., & Awasthi, M. K. (2022). Leads and hurdles to sustainable microbial bioplastic production. *Chemosphere*, *305*, 135390. https://doi.org/10.1016/j.chemosphere.2022.135390

Vernuccio, M., Cozzolino, A., & Michelini, L. (2010). An exploratory study of marketing, logistics, and ethics in packaging innovation. *European Journal of Innovation Management*, *13*(3), 333–354. https://doi.org/10.1108/14601061011060157

Wahab, S. N., Osman, L. H., Koay, S. B., & Long, K. T. (2021). Exploring green packaging acceptance in fast moving consumer goods in emerging economy: The case of Malaysia. *The log*, *17*(4), 503–517. https://doi.org/10.17270/J.LOG.2021.616

Wang, C. S., Shi, J. W., He, M., Ding, L., Li, S. P., Wang, Z. H., & Wei, J. (2018). High strength cellulose/ATT composite films with good oxygen barrier property for sustainable packaging applications. *Cellulose*, *25*(7), 4145–4154. https://doi.org/10.1007/s10570-018-1855-7

Wang, J., Han, X., Zhang, C., Liu, K., & Duan, G. (2022). Source of nanocellulose and its application in nanocomposite packaging material: A review. *Nanomaterials*, *12*(18), 3158. https://doi.org/10.3390/nano12183158

Wang, R.-L., Hsu, T.-F., & Hu, C.-Z. (2021). A bibliometric study of research topics and sustainability of packaging in the greater China region. *Sustainability*, *13*(10), 5384.

Wang, T., Kim, J., & Whelton, A. J. (2019). Management of plastic bottle and filter waste during the large-scale Flint Michigan lead contaminated drinking water incident. *Resources, Conservation and Recycling*, *140*, 115–124.

Wei, C. F., Chiang, C. T., Kou, T. C., & Lee, B. C. (2017). Toward sustainable livelihoods: Investigating the drivers of purchase behavior for green products. *Business Strategy and the Environment*, *26*(5), 626–639.

White, G. R. T., Sarpong, D., & Ndrecaj, V. (2015). Sustainable packaging: Regulations and operational challenges in a manufacturing SME. *International Journal of Social Ecology and Sustainable Development*, *6*(3), 31–40. https://doi.org/10.4018/IJSESD.2015070103

White, G. R. T., Wang, X., & Li, D. (2015). Inter-organisational green packaging design: A case study of influencing factors and constraints in the automotive supply chain. *International Journal of Production Research*, *53*(21), 6561–6566. https://doi.org/10.1080/00207543.2014.975854

Williams, A. T., & Rangel-Buitrago, N. (2022). The past, present, and future of plastic pollution. *Marine Pollution Bulletin*, *176*, 113429.

Wright, C., & Nyberg, D. (2017). An inconvenient truth: How organizations translate climate change into business as usual. *Academy of Management Journal*, *60*(5), 1633–1661.

Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of Business Research*, *101*, 697–706.

Yadav, S., Kumar Mangla, S., Priyamvada, P., Borkar, A., & Khanna, A. (2023). An energy-efficient model for PPE waste management in a closed-loop supply chain. *Business Strategy and the Environment*, *33*(2), 1191–1207. https://doi.org/10.1002/bse.3541

Yaradoddi, J. S., Banapurmath, N. R., Ganachari, S. V., Soudagar, M. E. M., Mubarak, N. M., Hallad, S., Hugar, S., & Fayaz, H. (2020). Biodegradable carboxymethyl cellulose based material for sustainable packaging application. *Scientific Reports*, *10*(1), 21960. https://doi.org/10.1038/s41598-020-78912-z

Yarimoglu, E., & Binboga, G. (2019). Understanding sustainable consumption in an emerging country: The antecedents and consequences of the ecologically conscious consumer behavior model. *Business Strategy and the Environment*, *28*(4), 642–651.

Yee, F. M., Shaharudin, M. R., Ma, G. X., Zailani, S. H. M., & Kanapathy, K. (2021). Green purchasing capabilities and practices towards Firm's triple bottom line in Malaysia. *Journal of Cleaner Production*, *307*, 127268. https://doi.org/10.1016/j.jclepro.2021.127268

Yokokawa, N., Amasawa, E., & Hirao, M. (2021). Design assessment framework for food packaging integrating consumer preferences and environmental impact. *Sustainable Production and Consumption*, *27*, 1514–1525. https://doi.org/10.1016/j.spc.2021.03.027

Yokokawa, N., Masuda, Y., Amasawa, E., Sugiyama, H., & Hirao, M. (2020). Systematic packaging design tools integrating functional and environmental consequences on product life cycle: Case studies on laundry detergent and milk. *Packaging Technology and Science*, *33*(11), 445–459. https://doi.org/10.1002/pts.2526

Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R. (2012). Sustainable supply chain management (SSCM) in Malaysia: A survey. *International Journal of Production Economics*, *140*(1), 330–340. https://doi.org/10.1016/j.ijpe.2012.02.008

Zeng, K. X., Gu, J., & Cao, C. Y. (2020). Facile approach for ecofriendly, low-cost, and water-resistant paper coatings via palm kernel oil. *ACS Applied Materials & Interfaces*, *12*(16), 18987–18996. https://doi.org/10.1021/acsami.0c00067

Zeng, T. (2022). Impacts of consumers' perceived risks in eco-design packaging on food wastage behaviors. *British Food Journal*, *124*(8), 2512–2532. https://doi.org/10.1108/BFJ-05-2021-0603

Zeng, T., & Durif, F. (2019). The influence of consumers' perceived risks towards eco-design packaging upon the purchasing decision process: An exploratory study. *Sustainability*, *11*(21), 6131.

Zeng, T., & Durif, F. (2020). The impact of eco-design packaging on food waste avoidance: A conceptual framework. *Journal of Promotion Management*, *26*(5), 768–790. https://doi.org/10.1080/10496491.2020.1729320

Zhao, Y., Li, B., Li, C., Xu, Y., Luo, Y., Liang, D., & Huang, C. (2021). Comprehensive review of polysaccharide-based materials in edible packaging: A sustainable approach. *Food*, *10*(8), 1845. https://doi.org/10.3390/foods10081845

Zhu, Y., Wang, Z. M., Chen, Z. M., Lin, C., Li, P., Huang, Z. M., Cai, P., Wu, C. X., & Zeng, Q. Y. (2022). High value-added utilization of artificial marble wastes and potential applications in biodegradable sustainable packaging. *Composites Science and Technology*, *229*, 109682. https://doi.org/10.1016/j.compscitech.2022.109682

Zytner, P., Wu, F., Misra, M., & Mohanty, A. K. (2020). Toughening of biodegradable poly(3-hydroxybutyrate-co-3-hydroxyvalerate)/poly(ε-caprolactone) blends by in situ reactive compatibilization. *ACS Omega*, *5*(25), 14900–14910. https://doi.org/10.1021/acsomega.9b04379

SUPPORTING INFORMATION

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