

RESEARCH ARTICLE

Green public procurement as an effective way for sustainable development: A systematic literature review and bibliometric analysis

Pablo Ortega Carrasco¹  | Fabio Iannone²  | Vera Ferrón Vílchez¹  |
Francesco Testa² 

¹Department of Business & Management II, University of Granada, Granada, Spain

²Sant'Anna School of Advanced Studies, Institute of Management, Pisa, Italy

Correspondence

Pablo Ortega Carrasco, Department of Business & Management II, University of Granada. Campus Cartuja s/n, 18071 Granada, Spain.

Email: pablorte@correo.ugr.es

Funding information

* Funding for open access charge: Universidad de Granada / CBUA

Abstract

Green public procurement (GPP) has emerged as a strategic tool for sustainable development. However, the drivers and barriers to effective GPP implementation remain unclear. Additionally, the growing volume of GPP research necessitates inter-linking with sustainability concepts, such as sustainable development, to guide future research. This paper presents a systematic literature review and bibliometric analysis of GPP research between 2003 and 2023 to identify key themes, trends and research gaps. A dataset of 201 documents retrieved from the Web of Science database was analysed using *CitNetExplorer* and *VOSViewer*. By analysing prior literature on the effect of GPP on the achievement of sustainable development, we have found, among others concerns, that: (1) richer qualitative analysis on GPP is needed; (2) there is a gap in understanding localised factors influencing GPP in developing countries; and (3) the transformative role of digitalisation in promoting social and environmental outcomes in GPP is an essential factor. These findings will inform policymakers, practitioners and researchers on the effective implementation of GPP for sustainable development.

KEYWORDS

bibliometric analysis, *CitNetExplorer*, green public procurement, sustainable development, systematic literature review, *VOSViewer*

1 | INTRODUCTION

Pursuing sustainability requires active collaboration from multiple actors (Preuss, 2007). Private companies can employ various strategies to enhance operational efficiency and design eco-friendly products (Steger, 2004), alongside other initiatives and management practises. On the demand side, consumers play a crucial role by advocating for greener production and more ethical corporate behaviour

through their purchasing decisions (Peattie, 2001). Additionally, governments and public authorities (PAs) can implement directives and policies aimed at promoting sustainability across all sectors, including public procurement (Thomson & Jackson, 2007).

In the pre-COVID era, public procurement accounted for 12% of the GDP in OECD countries and almost 30% in developing countries, accounting for more than 30% of total government spending (OECD, 2019). In fact, wise choices in terms of public spending can

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Author(s). *Sustainable Development* published by ERP Environment and John Wiley & Sons Ltd.

affect consumption, thus changing the perception of private consumers and the availability of sustainable goods and services (Michelsen & de Boer, 2009; Preuss, 2007). Green public procurement (GPP) gives governments the dual role of acting as purchasers and policy makers at the same time while using their power to advance social justice (McCrudden, 2004). Therefore, GPP could play a prominent role in supporting PA's actions towards a more sustainable socio-economic system.

Analysing how GPP practises can favour the achievement of sustainable development (SD) goals is essential because of the crucial role of the consumption phase (Camacho-Otero et al., 2018; Tunn et al., 2019). Sustainable consumption has been identified as one of the essential requirements for SD (Wang et al., 2019). Consumption, to be sustainable, should focus on the environmental and social effects of related choices (Wong et al., 2024; Liu et al., 2017). There are several ways to foster sustainable consumption. For instance, establishing a positive relationship between the consumer and production sides through informing consumers about sustainable issues related to the products has been proven to create a long-term commitment to sustainability consumption (Weber et al., 2021). Consumers are often regarded as individuals; however, public purchasers also play an important role in pursuing SD (Chersan et al., 2020).

GPP has garnered significant scholarly attention in recent decades. The extensive body of research has necessitated various systematisation efforts, leading to the development of several systematic literature reviews (SLRs). These reviews focus on different aspects of GPP, such as internal dynamics, external drivers and the associated benefits. Key areas of focus include the strategic role of public procurement for organisations, incorporating sustainability dimensions (Guarnieri & Gomes, 2019); drivers and barriers to GPP adoption (Chersan et al., 2020); practises, uptake issues, effectiveness and regulatory concerns (Cheng et al., 2018); and the role of e-government in advancing GPP in developing countries (Adjei-Bamfo et al., 2019).

Authors have also conducted bibliometric analyses (BAs) mainly for descriptive purposes, focusing on identifying key aspects such as frequently used keywords, influential authors, prominent universities and dominant research areas (Pătărlăgeanu et al., 2020; Rejeb et al., 2023). These studies have contributed to a better understanding of the academic landscape surrounding GPP, but they often lack deeper insights into the underlying conceptual and thematic developments. In particular, how GPP can contribute to pursuing sustainability equilibrium by combining social, economic and environmental goals remains unexplored.

Thus, the objective of this work is twofold. First, we aim to identify the key concepts, scholars, countries and organisations that have contributed to the study of GPP in general, with a specific focus on its relationship with SD, stressing facilitating and hindering factors of the role of GPP towards a SD. Second, based on these findings, we seek to identify emerging trends and future research directions regarding the impact of GPP on achieving SD goals. To achieve these objectives, we conducted a bibliometric analysis (Broadus, 1987), which offered clear insights and an overview of the leading trends in the field (Bonilla et al., 2015). This was complemented by a SLR to highlight the

interconnections between key components within the research areas (Börner & Polley, 2014; Khizar et al., 2021). Our final sample comprises 201 documents covering the period from 2003—just before the publication of the EU's first directive on this subject—up to 2023. As a result, our analysis of the GPP literature provides at least five contributions. First, we highlight the need for more robust research methodologies that combine qualitative and quantitative approaches. Second, we identify a gap in understanding localised factors influencing GPP in nontraditional contexts, such as developing countries, emphasising the need for context-sensitive strategies. Third, we identify various organisational barriers that hinder GPP adoption to achieve SD. Fourth, we highlight the potential for digitalisation in the GPP and the lack of comprehensive research in this area. Lastly, we reveal the connection between the GPP and societal goals, particularly healthcare, signalling a shift towards more inclusive and sustainable procurement practises.

This work is structured as follows. Section 2 presents GPP, its relationship with SD, and the research questions. Section 3 outlines the research methodology of the bibliometric analysis and the SLR. In section 4, we offer the main findings of the bibliometric analysis and relevant descriptive statistics. Then, in Section 5, we present the main findings of the SLR, including an original contribution and classification of factors and features associated with GPP. Finally, Section 6 discusses the results and proposes future research streams, drawing conclusions and reporting the study limitations.

2 | THEORETICAL DEVELOPMENT

2.1 | Green public procurement and the role of the public sector

In 2011, the European Union (EU) defined GPP as 'a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured' (European Commission, 2011, p. 4). Although the EU's commitment to sustainable public procurement originated in the 1996 'Green Paper' (European Commission, 1996). The 'Helsinki Concordia Bus case' (Nash, 2009) affirmed the legitimacy of PAs using ecological criteria in contract awards. Principles included relevance to the contract, limited PA choice, explicit criterion declaration and non-discrimination. In 2004, Directives 2004/18/EC and 2004/17/EC urged environmental consideration in procurement (Official Journal of the European Union, 30 April 2004, 134). 2014 brought Directives 23 and 24, simplifying and enhancing flexibility, replacing 2004/18/EC. Directive 2014/25/EU covered GPP in water, energy, transport and postal services. These rules sought to embed societal goals that encompass environmental protection, social responsibility, innovation, climate change mitigation, employment, public health and other social and environmental considerations.

The GPP has not only been developed within the EU. For instance, a recent comparison (Iannone et al., 2019) highlighted that

GPP plays a fundamental role in China, where it is part of the national 12th five-year action plan (2011–2015) (Qiao & Wang, 2011; UNEP, 2017; Wang et al., 2020, 2021; Wu et al., 2014). In Japan, the Eco-Mark Programme was launched in 1989, which provided compulsory green purchasing for government agencies and entities subject to it (Ministry of Environment of Japan, 2016; UNEP, 2017). In the United States, where most initiatives are left to local authorities, an Environmental Preferable Purchasing (EPP) programme recommends that federal bodies include elements of environmental preference in contract awarding lasting more than 20 years (Iannone et al., 2019).

Analysing the factors that influence GPP is essential for direct and indirect approaches to social and environmental goals (Brammer & Walker, 2011). Stimulating social and environmental concerns by pressing suppliers to reduce their impacts illustrates an indirect approach (Brammer & Walker, 2011), while an example of a direct approach is measuring the impact of public procurement to improve the performance of a region in terms of long-term unemployment (Erridge & Hennigan, 2006). In the academic literature, there is more research on indirect approaches than direct ones. More research on the direct influence of GPP is needed as well as more comparative studies across products, sectors, countries and regions (Brammer & Walker, 2011).

2.2 | SD and GPP

SD encompasses the achievement of economic, social and environmental goals (Liu et al., 2017). GPP offers a strategic approach for PAs to embed environmental considerations throughout the life cycle of procured goods, services and works (De Giacomo et al., 2019). This involves integrating criteria like resource efficiency, minimised waste generation, reduced emissions and lower energy consumption within the purchasing decision-making process. As such, GPP serves as a powerful tool for promoting SD (Appolloni et al., 2019; Chersan et al., 2020; Manta et al., 2022) by leveraging the substantial purchasing power of the public sector to drive market transformation towards more environmentally friendly product and service offerings (Alhola et al., 2019; Morgan & Morley, 2014; Preuss, 2009).

Beyond environmental benefits, GPPs foster significant economic and social benefits. Studies demonstrate cost savings for PAs through reduced energy and water consumption, along with improved product durability achieved through GPP implementation (Preuss, 2009). Furthermore, GPP fosters job creation in the green economy and enhances citizen well-being by mitigating air and water pollution (McCrudden, 2004; Sönnichsen & Clement, 2020). However, realising the full potential of GPP requires addressing several challenges (Behraves et al., 2022). Limited awareness of GPPs among public sector decision makers can hinder their implementation. Developing clear, consistent GPP criteria across different product categories is an ongoing effort. Additionally, building PAs capacity for effective GPP implementation requires targeted training and resource allocation (Testa et al., 2016). Despite these challenges, the potential benefits of the GPP are undeniable, as it enables governments and public

institutions to significantly contribute to achieving several sustainable development goals (SDGs) (Appolloni et al., 2019; Manta et al., 2022). By strategically leveraging public procurement power, PAs can promote innovation in sustainable product development and market shift towards a more environmentally responsible future (Uehara, 2020).

Up to now, in the academic arena, few literature reviews on GPP have been conducted (Adjei-Bamfo et al., 2019; Chersan et al., 2020; Guarnieri & Gomes, 2019), with the notable exception of the review elaborated by Cheng et al. (2018), which, however, covered until 2016. Pătărlăgeanu et al. (2020) conducted a bibliometric analysis, and Rejeb et al. (2023) conducted a bibliometric analysis until 2021. Consequently, the current landscape of GPP research remains incomplete, with the purpose being to analyse its impact on SD achievement. Our research questions are as follows:

- RQ1a: What are the main concepts regarding the GPP, the authors, countries and affiliations?
- RQ1b: What are the main facilitating and hindering factors of GPP regarding the achievement of SD?
- RQ2: What are the future research directions and emerging trends regarding GPP and its effect on SD?

3 | RESEARCH METHODOLOGY

3.1 | Literature review protocol

A literature review is defined as ‘a systematic strategy for researching, selecting, and synthesising previous research’ (Moosavi et al., 2021, p. 3). It plays a central role in academic research in gathering existing knowledge and insights and reflecting state-of-the-art (Cropanzano, 2009). Linnenluecke et al. (2020, p. 3) stated that a literature review could help by ‘establishing a context and delimiting a research problem; seeking theoretical support; rationalising a problem and new lines of enquiry; [...] and avoiding fruitless research’.

We followed the four-step method proposed by Coalter and Tchangelova (2020): (1) identify the research questions; (2) define the barriers; (3) search and select the studies and bibliometric analysis; and (4) present the results. Moreover, we merged the Coalter and Tchangelova (2020) approach with the PRISMA 2020 methodology exposed by Page et al. (2021), where they proposed a comprehensive approach involving literature review and development and improvement guidance based on the former PRISMA (Liberati et al., 2009; Page et al., 2021). To define a specific framework for delimiting the research, we followed Seuring and Müller (2008). First, we used two databases: ‘Web of Science’ (WoS) and Scopus. Both tools are considered comprehensive databases that contain high-quality studies (Gao & Guo, 2014), and they are widely used in literature review (Mubako, 2018). This double extraction ensures robustness because they are the two major and most comprehensive sources of publication metadata and impact indicators (Pranckutė, 2021). Second, regarding the keywords, we went slightly beyond mere ‘Green Public Procurement’ because in some geographical areas (i.e., USA) the

TABLE 1 Characteristics of the research and query.

Database: <i>Web of Science (WoS), Scopus</i>	
Period: 2000–2023 *(01/08/2024 last search)	
Type of Documents: Articles, Early Access, and Review Articles	
Language: English	
Topics/Keywords:	
<i>Green Public Procurement</i>	<i>Green Public Purchas*</i>
<i>Sustainable Public Procurement</i>	<i>Sustainable Public Purchas*</i>
<i>Sustainable Public Policy</i>	
Advanced Search:	
(TS = (“Green Public Purchas*” OR “Green Public Procurement” OR “Sustainable Public Purchas*” OR “Sustainable Public Procurement” OR “Sustainable Procurement Policy”) AND PY = (“2000–2022”)) AND (DT=(“Article” OR “Early Access” OR “Review Articles”) AND LA=(“English”))	

expression ‘Sustainable Public Procurement’ is also used frequently. Third, related to the delimitation of the search period, we searched works published since 2000. This is due to the option provided by the databases. We conducted our final search in June 2024 and therefore decided to include works published until the end of 2023. This approach was adopted to ensure consistency and homogeneity in the analysis. Fourth, we included: articles, early access works and reviews written in English.

Table 1 lists the main characteristics of the proposed search protocol. Fifth, we selected topics to be included in the advanced search. We selected all variables directly related to GPP or Sustainable Public Procurement. In some regions, it is more frequently used Sustainable Public Procurement (US) than Green Public Procurement (EU). We also checked the list of topics in WoS and Scopus one by one because relevant works could not be detected in the first round. We manually checked ‘Sustainable Purchas*’, and ‘Sustainable Procurement’ as topics for search because many studies in reference to the public sector have included these two words (i.e., Walker & Brammer, 2012).

3.1.1 | Articles selection

Our initial database was composed of 648 articles organised into a shared spreadsheet. The first step is to detect and remove duplicates. This step was performed by two researchers, who split the total database and then exchanged the work done for a control check. The two researchers then worked simultaneously on the article’s title, excluding 84 articles from the database. The second screen was performed

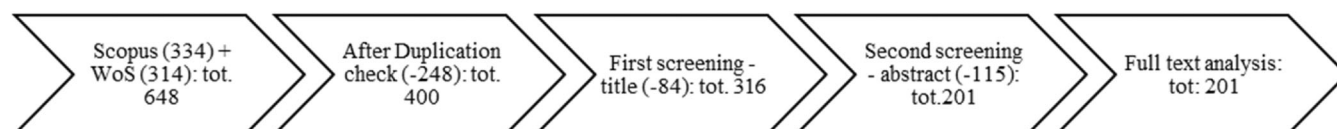
by carefully analysing the abstracts of the articles. In order to perform the title and abstract analyses, we only applied the exclusion criteria (=not relevant to the field of GPP/SPP). Both team members categorised each article into one of the following three groups: relevant (green), irrelevant (red) and unclear (yellow). Regarding unclear articles with related doubts about inclusion, both researchers, after reading the entire article, decided whether to include it. We decided to exclude 115 articles, mainly due to not adherence to the GPP field, but also to minor errors (>5) in the functioning of the databases (i.e., language different from English). Even if some scholars have done so in the literature review, we decided not to perform a qualitative assessment of the articles or to exclude articles based on their journals. Two independent researchers read the titles and abstracts. This step generated a database of 201 final documents for the full-text analysis. Figure 1 illustrates the process of adding and subtracting documents from the database according to the PRISMA diagram (Liberati et al., 2009; Page et al., 2021).

3.1.2 | Full text analysis

The full text analysis phase was carried out in three stages: descriptive, in-depth and thematic analysis (Tranfield et al., 2003). The results are shown in Figure 2. The descriptive analysis organised the information into categories based on the journals that were included, the period covered and the geographical distribution of the data. The in-depth analysis foresaw an assessment of 14 parameters, ranging from the type of articles, sources of data, hypotheses, population, unit of analysis, drivers, barriers and KPI, with a residual category for collecting other information. We added these columns to the spreadsheet matrix to categorise the information within the papers and aggregate them for the GPP and SD analyses. In the third phase of the thematic analysis, a small SLR was performed on the 201 articles from the database. We searched the term ‘Sustainable Development’ within its title and abstract. Therefore, we obtained 50 articles that linked GPP and SD. However, we decided to go further into the details and read the abstract, and it was determined that only 14 articles had a clear relationship between GPP and SD. This can be checked in Appendix A.

3.2 | Bibliometric analysis

Several methods are commonly used for prior literature analysis. Ellegaard and Wallin (2015) highlighted that bibliometric and citation analysis has been consistently established as a research evaluation

**FIGURE 1** Extraction and selection processes based on the PRISMA diagram. Source: Authors.

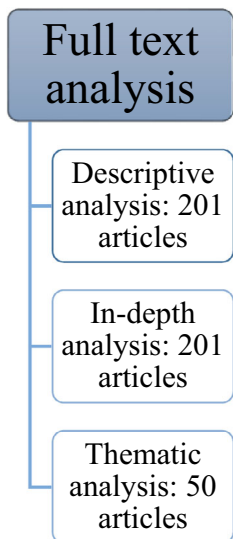
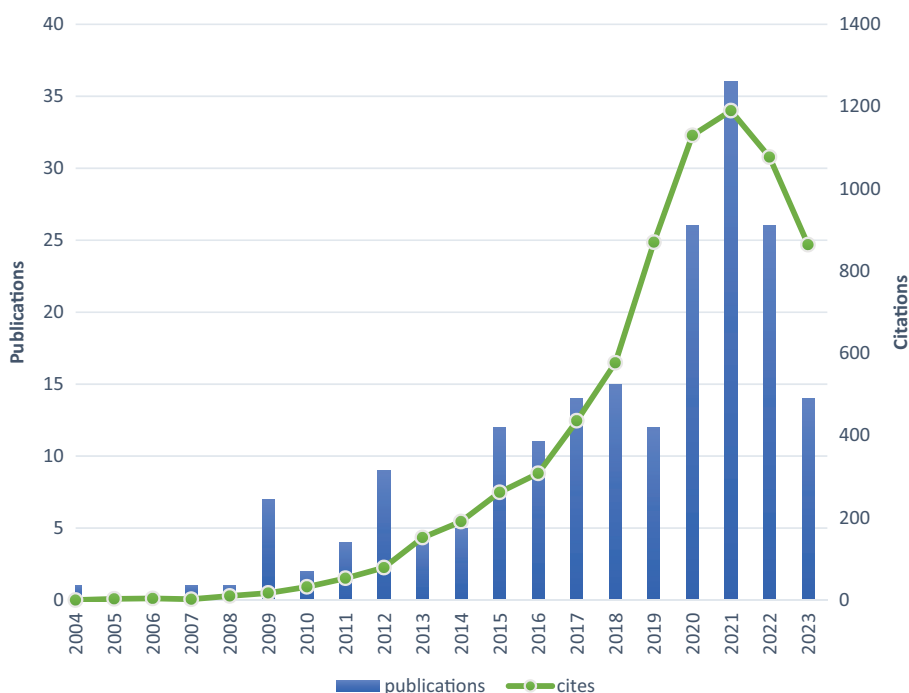


FIGURE 2 Process of article extraction and selection based on the PRISMA diagram. Source: Authors.

strategy, particularly for cases that analyse content and networks. Bibliometrics enable quantitative analysis of academic documents quantitatively (Mayr et al., 2014). The use of bibliometrics in a SLR highlights the connection between the key components of research areas are connected (Börner & Polley, 2014). Accordingly, researchers have used software such as *VOSviewer*, *CitNetExplorer* and *SciMat*, among others, to visualise bibliometric analysis. We presented the data using two visualisation programmes: *VOSviewer* and *CitNetExplorer*. *VOSviewer* displays large bibliometric maps in an easy-to-interpret way (Van Eck & Waltman, 2010) and shows distance-based visualisations of bibliometric networks that emerge from the analysis (Majerova

FIGURE 3 Number of documents and citations in our sample (2000–2023). Source: Extracted from the results of our database.



et al., 2021). *CitNetExplorer* clusters publications, shows the relationships between articles, and analyzes individual publications within the same cluster (Van Eck & Waltman, 2017). Results obtained from these softwares revealed the state of development and the main trends from the point of view of influence from the major journals, works, topics, authors, institutions and countries. We also conducted co-occurrence analysis. After selecting WoS as the source and uploading the plain text file, the two software applications provided all types of analyses that we conducted.

4 | RESULTS

4.1 | Bibliometric analysis

Our database contains 201 articles published in high-impact journals. Figure 3 illustrates the evolution of the number of documents and citations collected from 2000 until the end of 2023 with reference to the field of GPP. Although our algorithm covers the period of 2000–2023, the first publication appeared in 2004 (McCrudden, 2004). Hence, even if the figures show later stages, the beginning of the field was marked on that year.

The analysis of the results of the bibliometric study provides an answer to RQ1a, that is, the main works, journals, scholars, countries and organisations that/who have studied GPP. Concerning the main studies on GPP, we identified those that have been most cited. Table 2 shows the top 10 works over time in terms of the total number of citations for the period 2000–2023.

Related to academic journals, we analysed the impact and relevance of GPP in journals that published at least four works on GPP during the analysis period. The main academic journals are listed in

TABLE 2 Top 10 articles in the field of GPP and number of citations.

Title	Authors	Source title	Publication year	Total citations	Average per year
Towards a more Circular Economy: Proposing a framework linking sustainable public procurement and sustainable business models	Witjes and Lozano	<i>Resources, Conservation & Recycling</i>	2016	377	41.89
Sustainable procurement in the public sector: an international comparative study	Brammer and Walker	<i>International Journal of Operations & Production Management</i>	2011	374	26.71
Sustainable procurement in the United Kingdom public sector	Walker and Brammer	<i>Supply Chain Management-An International Journal</i>	2009	304	19
Using public procurement to achieve social outcomes	McCrudden	<i>Natural Resources Forum</i>	2004	263	12.52
Addressing sustainable development through public procurement: the case of local government	Preuss	<i>Supply Chain Management-An International Journal</i>	2009	191	11.94
Drawbacks and opportunities of green public procurement: an effective tool for sustainable production	Testa et al.	<i>Journal of Cleaner Production</i>	2016	158	17.56
The relationship between sustainable procurement and e-procurement in the public sector	Walker and Brammer	<i>International Journal of Production Economics</i>	2012	153	11.77
What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey	Testa et al.	<i>Ecological Economics</i>	2012	152	11.69
Exploiting the Potential of Public Procurement: Opportunities for Circular Economy	Alhola et al.	<i>Journal of Industrial Ecology</i>	2019	119	19.83
Green procurement in Norway; a survey of practices at the municipal and county level	Michelsen and de Boer	<i>Journal of Environmental Management</i>	2009	117	7.31

Table 3. The main contributors are 'Sustainability', 'Journal of Cleaner Production', 'Journal of Public Procurement', 'Ecological Economics' and 'Journal of Purchasing and Supply Management' with a minimum of five works each. These five journals (of the 80) published a total of 46.27% of the dataset.

Furthermore, Figure 4 shows four areas with significant impacts during the period studied. The dark blue points indicate two journals that were precursors in publishing on GPP: 'Supply Chain Management: an International Journal' that led the way on the GPP field and was one of the first to receive recognition on the topic, and 'Ecological Economics' that has had a high impact since GPP became a discipline. 'Journal of Cleaner Production', and to a lesser extent 'Resources, Conservation and Recycling' and the 'Journal of Purchasing and Supply Management' (green points) are the leaders in GPP publications in terms of relevance and recent impact. These are those that establish a clear framework path. The yellow points of journals, such as 'Sustainability', have increased in relevance in terms of the number of documents and citations since 2018.

Related to the work's precedence, this relates to the details on the countries or institutions (e.g., universities, research centres, research institutes) of the authors who elaborated on the research (Galjanić et al., 2022). For institutional analysis in VOSviewer, we chose 'organisations' as the citation analysis type, with 'citations' as weights and 'average per publication/year' as scores. Figure 5 shows the impact per year when colour denotes year or publication (i.e., lighter shades denoting recent publications), and circle size reflects relevance in overall citations (i.e., smaller circles represent less relevant

institutions). These criteria identified distinct main groups. The dark blue points represent the main institutions that began working on GPP, that is, 'Cardiff University' and 'University of Warwick' (i.e., Brammer & Walker, 2011; Preuss, 2009; Walker & Brammer, 2009, 2012). The Italian universities 'Bocconi University' and 'Scuola Superiore Sant'Anna' (both in light blue points) are followers in terms of relevance and a couple of years after the start (i.e., Testa et al., 2012, 2016). The groups represented as yellow points are the most relevant ones: 'Lund University', 'Arizona State University' and 'Universitat Politècnica de Valencia' (i.e., Hafsa et al., 2021; Kadefors et al., 2021; Montalbán-Domingo et al., 2020).

Finally, related to who the main authors are investigating in GPP, CitNetExplorer has been traditionally used to present the main publications across topics in academia. With this tool, connections between citations from the 10 main works in the field can be highlighted. Figure 6 shows these works for the GPP case, illustrating the time evolution of the main works. The first author's last name is shown, and each circle represents a work. The vertical axis indicates the year of publication, and the horizontal axis shows the level of connection between works. The main works with direct and indirect relations are closer to each other on the horizontal plane (Van Eck & Waltman, 2017). Figure 5 shows that the pioneer in the field is McCrudden (2004), who is at the top. McCrudden's study related GPP to achievement of social outcomes. Figure 5 also shows the group composed of four works that consolidated the field, namely, Parikka-Alhola (2008). Walker and Brammer (2009), Preuss (2009) and Michelsen and de Boer (2009).

TABLE 3 Main sources of documents from the sample (min. 3 docs).

Journal	Editorial	Number of documents	% of total
1. Sustainability	MDPI	32	15.92
2. Journal of Cleaner Production	Elsevier	31	15.42
3. Journal of Public Procurement	Emerald	15	7.46
4. Ecological Economics	Elsevier	7	3.48
5. Journal of Purchasing and Supply Management	Elsevier	5	2.49
6. Amfiteatru Economic	DOAJ Seal	3	1.49
7. Environment Development and Sustainability	Springer	3	1.49
8. International Journal of Operations Production Management	Emerald	3	1.49
9. International Journal of Public Sector Management	Emerald	3	1.49
10. Resources, Conservation and Recycling	Elsevier	3	1.49

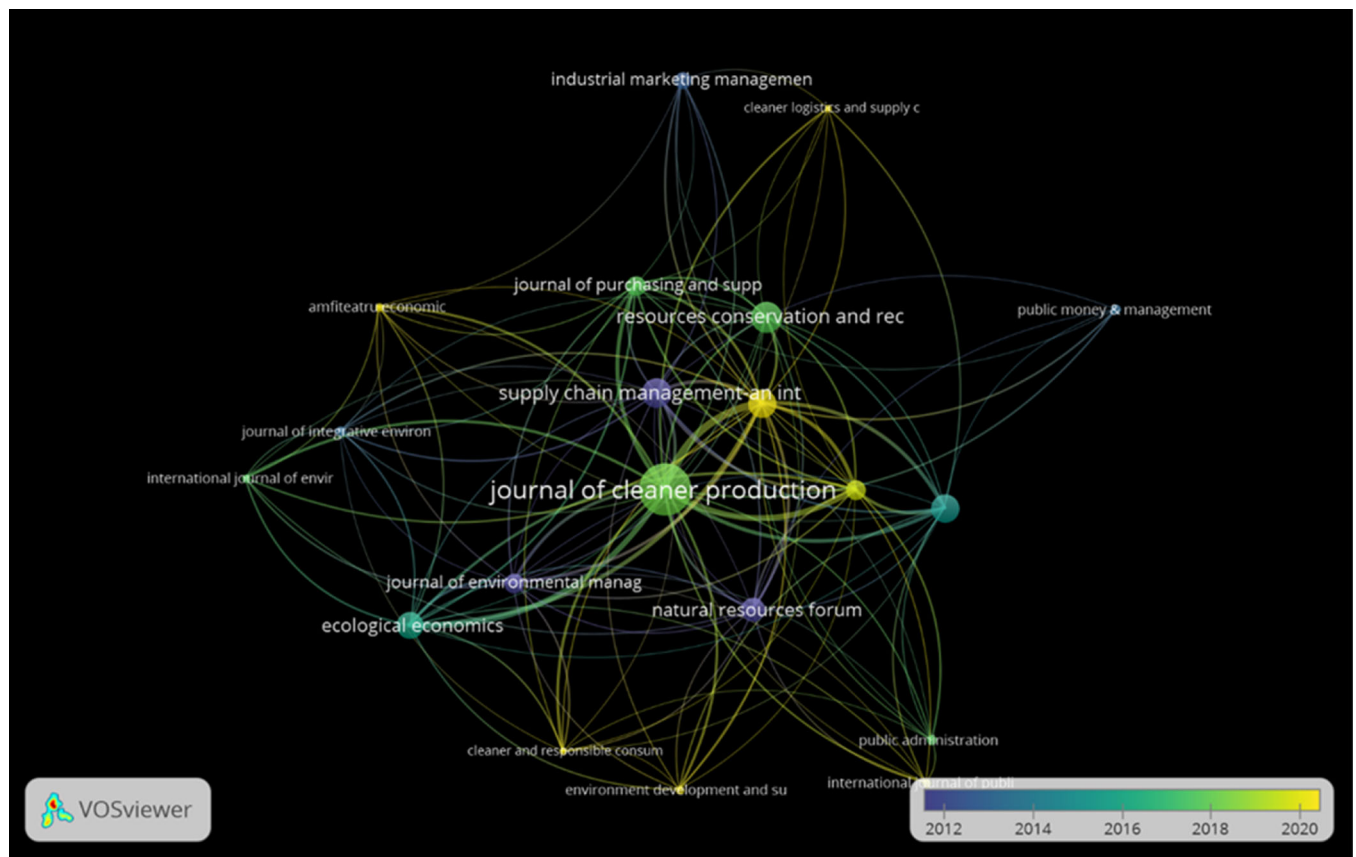


FIGURE 4 Importance of relationships between sources over time. Source: Map generated by VOSViewer based on the sample.

Figure 7 shows the five groups of authors that emerged regarding GPP research. The purple group are ‘the originators’, that is, Walker and Brammer who elaborated on the foundational works and had the highest overall number of citations (Brammer & Walker, 2011, Walker & Brammer, 2009, 2012). The dark blue group is ‘the Italian School’: Iraldo, Frey and Testa, who usually work together (Testa et al., 2012, 2016), have created a strong cluster in GPP research, generating knowledge from the Italian context. Note that de Boer is also involved in the cluster with four key works in the field (i.e., Igarashi et al., 2017; Michelsen & de Boer, 2009). The lighter blue group is composed by international collaborators: Luitzen de Boer usually work

on the field GPP in the Norwegian context (i.e., Igarashi et al., 2017; Michelsen & de Boer, 2009). Grandia, from the Dutch school, published a total of five relevant works in our sample, with a significant impact on the field of GPP research (i.e., Grandia, 2016; Grandia et al., 2015). The reinforcing group (green point) is formed by Liu and Wang, who usually research and publish together in the Chinese context (i.e., Liu et al., 2019; Wand et al., 2020). Aldenius is another relevant author on GPP, working from a Swedish perspective (i.e., Aldenius & Khan, 2017). The Italian professor Appolloni (i.e., Appolloni et al., 2011; Liu et al., 2021) usually work with Chinese authors (i.e., Liu et al., 2021). Finally, the yellow group are the new

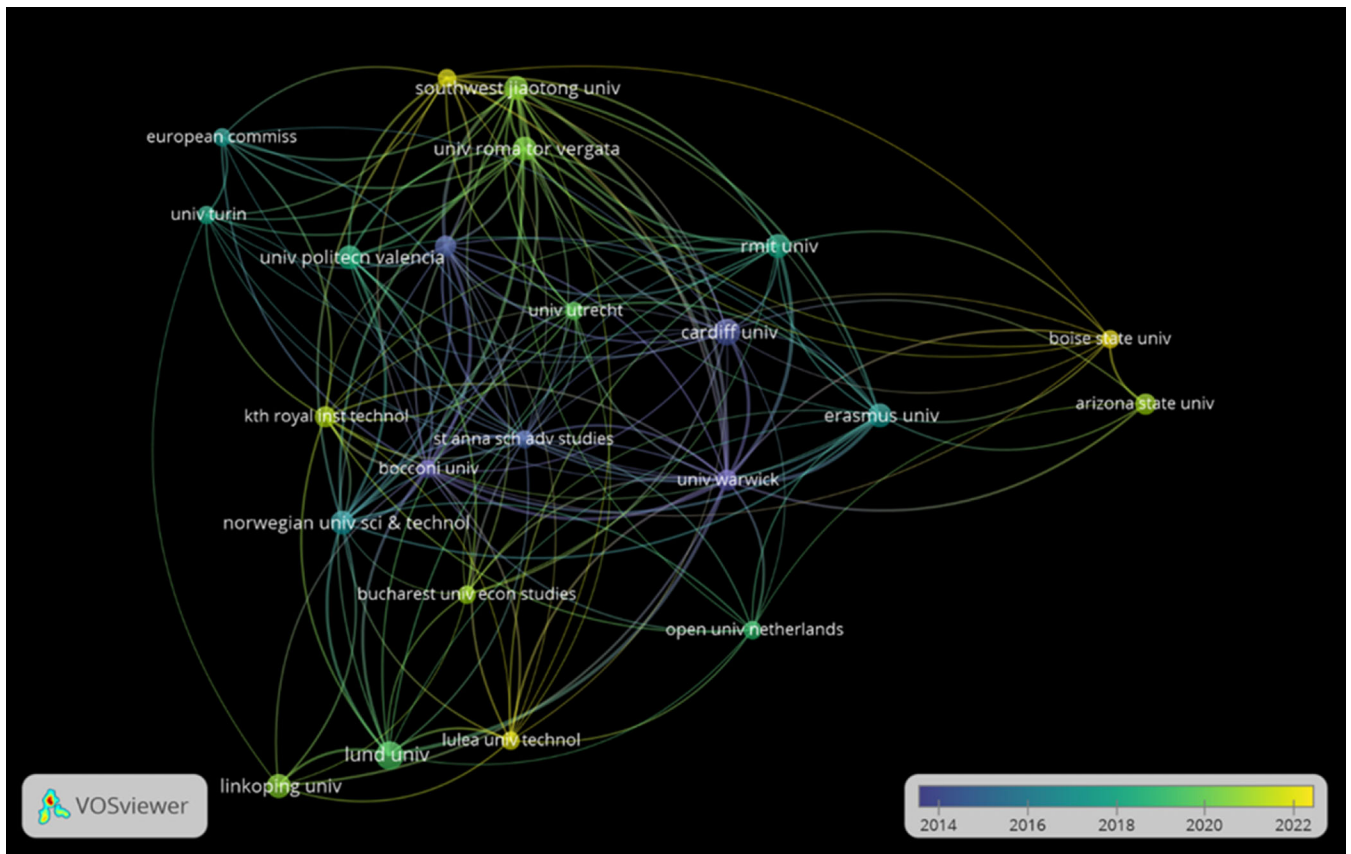


FIGURE 5 Links and importance of relationships between institutional sources. Source: Map generated by VOSviewer based on the sample.

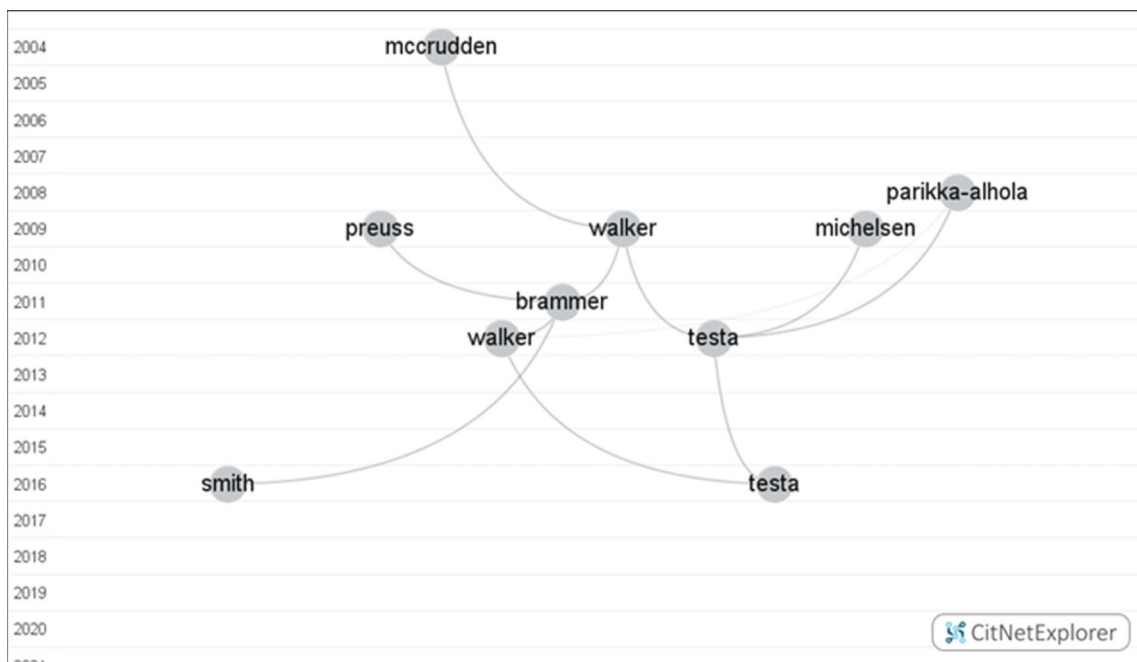


FIGURE 6 Evolution of GPP from 2000 to 2023, highlighting the first author and the links between authors. Source: Map generated by CitNetExplorer based on the sample.

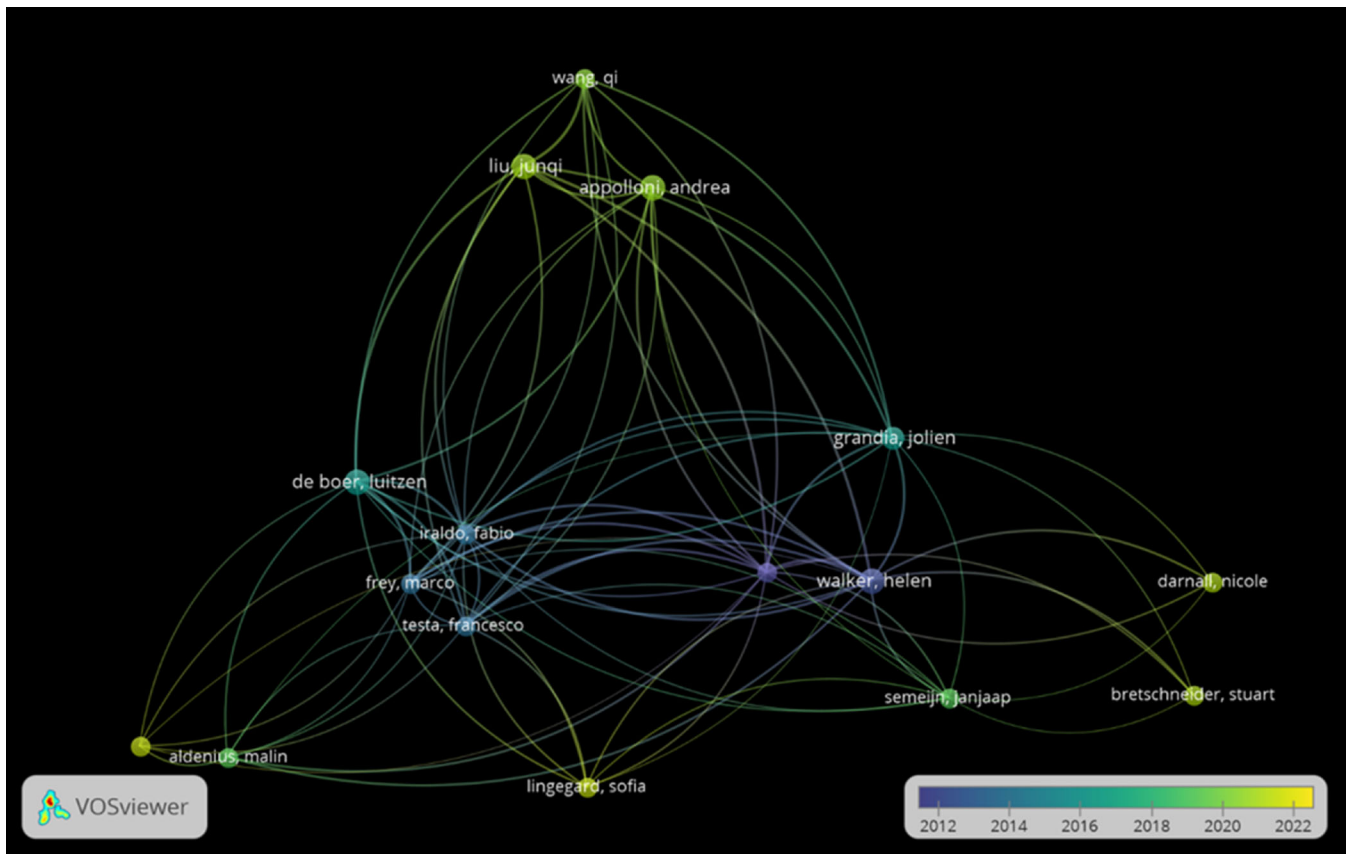


FIGURE 7 Relationships between authors (2000–2023). Source: Map generated by VOSViewer based on the sample.

joiners, that is, Darnall and Bretschneider (e.g., Hafsa et al., 2021; Hsueh et al., 2020), who work on GPP in the United States; Lingegård with three published works (e.g., Lingegård et al., 2021), who reports on the Swedish context (e.g., Kadefors et al., 2021); and Ma, who offers a recent Chinese perspective (i.e., Ma et al., 2021).

Appendix A contains an extraction from the database that links SD with GPP within its abstract, indicating (1) authors, (2) journals and (3) institutions. The purpose of this is to capture all documents that would help identify the relationship. Afterwards, a careful selection of those that clearly link GPP and SD was conducted by reading the documents and considering only those that are published with that relationship explicitly mentioned.

GPP has emerged globally as a vital mechanism for achieving SDGs by integrating environmental and social criteria into procurement processes. Researchers such as Adjei-Bamfo, Maloreh-Nyamekye and Ahenkan (University of Ghana) emphasised in *Resources Conservation and Recycling* (Adjei-Bamfo et al., 2019) how e-government can facilitate GPP in developing countries by streamlining procurement processes to enhance sustainability and transparency.

Biberos-Bendezú et al. 2022 (Pontificia Universidad Católica del Perú) in *Integrated Environmental Assessment and Management* (2022) demonstrated how incorporating environmental decision-making in Peru's public procurement supports national sustainability efforts. They emphasised the potential of GPPs to reduce environmental footprints in low-income countries.

Bratt et al. (Blekinge Institute of Technology) in *the Journal of Cleaner Production* (2013) proposed a framework for integrating sustainability into public procurement, reinforcing GPP's role in promoting long-term environmental and social benefits in developed economies. Similarly, Burchard-Dziubinska and Jakubiec (University of Lodz) in *Comparative Economic Research* (2012) examined the implementation of GPP in Polish local governments, highlighting its importance for sustainable regional development.

Further contributions include works by Chiarini, Opoku and Vagnoni (University of Ferrara, University College London) in *Journal of Cleaner Production* (Chiarini & Vagnoni, 2016), which focus on sustainable procurement practises in public healthcare, and by Manta et al. (Romanian Academy of Sciences) in *Amfiteatru Economic* (Manta et al., 2022), which discuss GPP as a tool for achieving SD across public sectors.

4.2 | Systematic literature review

In addition to the results of the bibliometric analysis presented above, Appendix B defines all the characteristics we captured from the database, and Appendix C contains information on the characteristics of GPP articles, showing: the method used for the research (i.e., qualitative, quantitative or mixed), source of information (i.e., primary, secondary or mixed), unit of analysis (i.e., local, national, supranational, etc.), theoretical framework used, sample size in the

TABLE 4 Summary of facilitators and barriers to GPP.

Factor	Facilitators /barriers	Component	References	Factor	Facilitators /barriers	Component	References
Political	Facilitators	Government commitment and expectations	Wontner et al. (2020)	Organisational	Facilitators	Environmental training and environmental management	Aragão and Jabbour (2017), Leger et al., (2013), Pacheco-Blanco and Bastante-Ceca (2016)
		Clear political vision and an adequate basis for decision-making	Lundmark et al. (2021)			Organisational leadership in environmental, human rights, philanthropic, and safety issues	Bansal and Roth (2000)
		Clear policies	Palm and Backman (2017)			Management support	Vluggen et al. (2020)
		Presence of effective social and environmental laws and rewards and recognition associated with compliance	Adjei-Bamfo et al., 2020; Liu et al. (2021)			Resources, awareness levels	McMurray et al. (2014)
		National objectives	Lindfors and Ammenberg (2021)			EMAS/ISO 14001, information and training initiatives, awareness of technicalities	Chiarini and Vagnoni (2016), Testa et al. (2012, 2016)
		Support from executive leadership and political system, liberal orientation of community	Rodriguez-Plesa et al. (2022)			Large size	Chiarini and Vagnoni (2016), Michelsen and de Boer (2009), Rosell (2021), Testa et al. (2012, 2016)
	Barriers	Lack of a legal framework on sustainable procurement	Treviño-Lozano (2021)	Barriers	Implementation of support mechanisms	Erridge and Hennigan (2015)	
		Lack of clear guidelines and regulations for GPP integration in procurement process	Adjei-Bamfo and Maloreh-Nyamekye (2021)		Compliance with EU procurement directives	Erridge and Hennigan (2015)	
		Political opposition and corruption	Treviño-Lozano (2021)		Institutional conflicts	Mercado et al. (2016)	
		Lack of evaluation and recognition, bureaucracy	Rosell (2021)		Priority conflicts	Walker and Brammer (2009)	
		Decentralised purchasing structures, especially if decentralisation is excessive	Leal et al., (2019); Placek et al. (2021).		Resource limitations, performance measurement, and supply and demand issues	Hasselbalch et al. (2014).	
		Cultural factors; perceptions of disconnection within the public sector	Delmonico et al. (2015)		Inadequate knowledge of available options	Leal et al. (2019)	

TABLE 4 (Continued)

Factor	Facilitators /barriers	Component	References	Factor	Facilitators /barriers	Component	References
Stakeholders	Facilitators	Social acceptance of sustainability	Keulemans and Van de Walle (2017)	Individual	Facilitators	Public officers' culture	Preuss (2009)
		Comprehension of related benefits from GPP	Lingegård et al. (2021)			Individual commitment	Brammer and Walker (2011)
	Barriers	Lack of knowledge and skills; lack of technical capacity	Adjei-Bamfo and Maloreh-Nyamekye (2021), Treviño-Lozano (2021)		Moral/ethical motivations, and educational background	Leal et al. (2019) Nikolaou and Loizou (2015)	
		Incomplete awareness or knowledge	Testa et al. (2016)		Barriers	Risk aversion	Prier et al. (2016)

case of empirical works, and geographical scope. In summary, slightly more work was conducted using qualitative methods (93 studies, 46.2%) than quantitative approaches (84 studies, 41.8%). Only 25 studies (12.4%) used a mixed qualitative/quantitative approach. Most articles were based on primary data (96 out of 201, 47.7%), followed closely by secondary data (97 out of 201, 48.2%), and a mixed approach (9 out of 201, 4.5%). Regarding the unit of analysis, the majority focused on the analysis of national level (73 out of 201), such as ministries, governments, national agencies and so forth. The second most represented category was the local level (50). Only 40 of the 201 documents were based on a theoretical background. The most frequently used theory (six in total) was Institutional Theory, such as in Ahsan and Rahman (2017), which examined the challenges of implementing GPP in the Australian health sector. Thirty-nine out of 201 works included hypotheses, working mostly with an exploratory approach. Forty-nine out of the 201 works had samples of more than 200 cases, suggesting that many studies used small sample sizes. The largest sample found to date was that of Badell and Rosell (2021), who explained GPP as a research tool to quantify commitment to environmental policies, with a sample of 743,061 EU-level tenders. Giacomo et al. (2019) also aimed to understand whether the introduction of GPP can stimulate the internalisation of LCC in public tenders and studied 1900 public tenders in the EU. Finally, related to the geographical scope of the studies, research was widely distributed, as presented in Figure 7. European Union (EU) countries were the most studied, with 48% of the sample, followed by the United Kingdom, the United States, China, Japan and Brazil.

5 | DISCUSSION

5.1 | Facilitating and hindering GPP for sustainable development

RQ1b attempts to identify the main facilitating and hindering factors of GPP in achieving SD. Through a systematic review of the literature,

we identified four categories of key drivers and barriers that have significantly influenced the implementation of GPP in general and its contribution to the achievement of SD: (1) political, (2) stakeholders-related, (3) organisational and (4) individual factors. For each category are presented the drivers (facilitating factors) and barriers (hindering factors). Table 4 presents some drivers and barriers of GPP identified in previous literature. For an expanded version of the table, consult Appendix D.

The **first category** we found is represented by **political** factors affecting GPP. Important drivers include governmental commitment and expectations (Wontner et al., 2020) with a clear political vision and an adequate basis for decision-making (Lundmark et al., 2021; Palm & Backman, 2017), effective social and environmental laws and rewards and recognition associated with compliance (Adjei-Bamfo et al., 2020; Liu et al., 2021), as well as national objectives (Lindfors & Ammenberg, 2021). Regarding local governments, support from executive leadership and political systems increases both green and social equity public procurement practises (Rodriguez-Plesa et al., 2022). Regarding political orientations, a more liberal community is more likely to engage in GPP practises (Rodriguez-Plesa et al., 2022). Anthonissen and Braet (2016) highlighted the effectiveness of including environmental award criteria in public tenders to enhance the impact of GPP, provided they are relevant (Parikka-Alhola, 2008). The use of citywide purchase contracts to reduce costs can also foster the adoption of GPP (Leal et al., 2020), standardisation (Rainville, 2017) and centralisation (Roman, 2017).

Leal et al. (2020) also found that rules and rule enforcement are more likely to lead companies to adopt green purchasing policies. Finally, Liu et al. (2021) showed that the administrative level of the public sector positively moderates the mediating effect produced by knowledge of GPP implementation policies and negatively moderates the mediating effect produced by knowledge of GPP benefits.

Effective implementation of the GPP is impeded by several political barriers. One key barrier is the absence of a legal framework on GPPs (Treviño-Lozano, 2021), which hinders the establishment of clear guidelines and regulations for integrating environmental and

social considerations into procurement processes (Adjei-Bamfo & Maloreh-Nyamekye, 2021). There is a lack of clarity in relation to the enforcement of policies and laws, and political opposition and corruption can hinder GPP adoption (Treviño-Lozano, 2021). Other barriers include a lack of evaluation and recognition, excessive bureaucracy (Rosell, 2021), and decentralised purchasing structures (Leal Filho et al., 2019), especially if decentralisation is excessive (Placek et al., 2021). Conversely, Stritch et al. (2020) highlighted centralisation as a possible barrier (see also Hsueh et al., 2020).

Leal et al. (2020) found that the number of weeks for routine low-cost purchases was negatively related to the probability of municipalities adopting green purchasing practises. Lack of political will and budget constraints pose obstacles to the allocation of resources and support for GPP initiatives (Adjei-Bamfo & Maloreh-Nyamekye, 2021; Ahsan & Rahman, 2017). Financial constraints also hinder the adoption of GPP practises (Brammer & Walker, 2011), especially when the economy is prioritised over non-economic dimensions (Treviño-Lozano, 2021) or when sustainability is not considered a priority in the early design of public procurement.

The high costs associated with sustainable goods and services, coupled with limited availability, present challenges for institutions seeking to incorporate sustainability criteria into their GPP decisions (Dimand, 2022). Furthermore, cultural factors and perceptions of disconnection within the public sector regarding GPP can create additional hurdles (Delmonico et al., 2015). Addressing these cultural barriers is crucial for fostering shared understanding and commitment to GPP across organisational levels. It is important to note that private companies can also face financial constraints, and government support in policymaking and direct financial funding for social entrepreneurial activities (e.g., firms settled up by immigrants in Sweden) can favour such initiatives (Kordestani et al., 2017).

The **second category** of factors is related to the **stakeholders**. The support of stakeholders can play an important role in the adoption of GPPs (Oruezabala & Rico, 2012). Both companies and citizens¹ are more strongly inclined to accept a more expensive procurement offer if that price difference is due to the inclusion of environmental and social objectives (Keulemans & Van de Walle, 2017) regarding pressure from citizens and local interest groups (Raj et al., 2020; Vluggen et al., 2019). Some stakeholders have limited capacity, lack the necessary knowledge and skills to effectively engage in sustainable procurement practises (Adjei-Bamfo & Maloreh-Nyamekye, 2021), or lack awareness and knowledge of how to design green tenders (Testa et al., 2016), also due to a lack of technical capacity (Treviño-Lozano, 2021). Such stakeholders include procurement entities, members of tender evaluation committees in various sectors, suppliers, regulatory and standardisation institutions, citizens and political executives. Moreover, understanding the diverse ways in which project actors (e.g., buyers and contractors) benefit from implementing integrated contracts is important for actors to be incentivised to initiate innovation and sustainability (Lingegård et al., 2021). Inadequate monitoring and inspection systems contribute to the challenge of ensuring compliance with sustainability criteria (Smith et al., 2019). Conversely, Leal Filho et al. (2019) found that third-party pressures or

stakeholder demands and expectations were not critical drivers of GPP implementation.

The **third category** includes **organisational** factors related to public entities, town halls and government. The alignment between GPP and environmental training has been observed, indicating a coevolutionary relationship among GPP, environmental training and environmental management (Aragão & Jabbour, 2017; Leger et al., 2013; Pacheco-Blanco & Bastante-Ceca, 2016). Organisational leadership is a crucial facilitator for GPP engagement, particularly regarding environmental, human rights, philanthropic and safety issues (Bansal & Roth, 2000), including management support (Vluggen et al., 2020). Settling up indicators (KPIs) can help to foster GPP by controlling different variables (Smith et al., 2016). Facilitating factors include resources, awareness levels (i.e., McMurray et al., 2014), EMAS/ISO 14001 certifications, information and training initiatives and the level of awareness of technicalities across the organisation (Chiarini & Vagnoni, 2016; Testa et al., 2012, 2016). Large corporations have been identified as influential drivers of GPP (Chiarini & Vagnoni, 2016; Michelsen & de Boer, 2009; Rosell, 2021; Testa et al., 2012, 2016). Innovation capability (Al Nuaimi & Khan, 2019) and institutional innovativeness (Roman, 2017) have also been identified as strong drivers of GPP towards SD. Rewards and incentives can also have a positive impact on the implementation of GPP (Zhu et al., 2013). Supportive mechanisms such as low emission specifications, contract splitting and the inclusion of social clauses can also facilitate the integration of sustainability criteria into procurement processes (Erridge & Hennigan, 2015).

Difficulties in complying with EU procurement directives and challenges in integrating social aspects and costs have been identified as internal organisational barriers to GPP implementation (Erridge & Hennigan, 2015), although the use of tools such as the carbon footprint can help (Tsai, 2017). Lifecycle cost analysis in GPP can also be promoted through training programmes and awareness campaigns (De Giacomo et al., 2019; Lindfors & Ammenberg, 2021). To overcome these barriers, the development of skills and confidence among procurement professionals is required through training (Aragão & Jabbour, 2017; Mendonça et al., 2021) that can enhance environmental skills (Michelsen & de Boer, 2009). Multidisciplinary teams tend to be the best option for solving this GPP barrier (Leger et al., 2013). It is essential to address the lack of knowledge and practise concerning costing life and social aspects, resource limitations, performance measurements and supply and demand issues (Hasselbalch et al., 2014). Furthermore, a lack of policies and guidelines for sustainable procurement, limited resources, high costs of sustainable goods (Walker & Brammer, 2009), and inadequate knowledge of available options need to be addressed to enhance the implementation of GPP (Leal Filho et al., 2019).

Finally, other **individual factors** also play a role, such as gender (i.e., women) and age (i.e., older citizens). For instance, according to Keulemans and Van de Walle (2017), being female or an older person strongly supports GPP. The culture of public officers has also been identified as crucial in fostering GPP (Preuss, 2009). Individual commitment also plays a vital role in the discretionary aspects of GPPs,

such as philanthropy and procurement from small and local businesses (Brammer & Walker, 2011), and generally for moral and ethical motivations. Educational background can motivate GPP implementation (Leal Filho et al., 2019; Nikolaou & Loizou, 2015). Leadership has also been identified as a key driver of GPP (Melon, 2020), while risk aversion can represent a barrier (Prier et al., 2016).

5.2 | GPP and SD

GPP advances SD by encouraging public sector adoption of environmentally friendly practises. One benefit of GPP to SD is its promotion of firms' environmental practises. Ma et al. (2021) showed that GPP incentivises companies to obtain environmental certifications, thus providing them with a competitive edge. Nash (2009) added that GPP encourages sustainable production and consumption, thus helping to shift towards a circular economy.

GPPs also support broader social outcomes. McCrudden (2004) noted that GPPs can advance social objectives such as fair labour practises and community development. Manta et al. (2022) emphasised that aligning procurement with sustainability goals ensures that economic growth is paired with environmental and social responsibility.

Two key drivers for the implementation of GPP towards SD are stakeholder engagement and strong policy frameworks. Oliveira et al. (2021) emphasised that involving a diverse range of stakeholders, including suppliers and government agencies, helps tailor GPPs to specific sustainability goals, promoting innovation and shared responsibility. Similarly, Olsson et al. (2022) highlighted the role of EU-level policy frameworks, which set clear standards and best practises, encouraging sectors like construction to align with SD objectives.

However, psychological resistance and lack of knowledge act as barriers to GPP implementation. Preuss and Walker (2015) identified resistance to change and the perception of complexity in sustainable procurement as psychological hurdles that can impede adoption in the public sector. Additionally, Pătărlăgeanu et al. (2020) noted that insufficient public officials' knowledge about GPP can hinder effective implementation, suggesting the need for targeted training to overcome these challenges.

5.3 | Future research directions and emerging trends in GPP and its effect on SD

The examination of GPP reveals several critical directions for future research that can significantly contribute to SD. This section delineates five primary areas of focus for further research to reply to RQ2 concerning future direction on GPP towards SD: methods advances, the geographical and contextual analysis of sensitivity, how to overcome internal barriers, technological integration and digitalisation, and finally, policy interventions and social outcomes.

First, regarding methodological advancements, the current landscape of GPP research is characterised by a diverse array of methodologies, ranging from qualitative to quantitative approaches.

However, there is an urgent need for more robust hypothesis testing, particularly through larger sample sizes and richer qualitative explorations. Future studies could benefit from integrating mixed-methods approaches, as suggested by Testa et al. (2016), to enhance the depth and breadth of sustainable procurement research. This methodological synergy can facilitate a more comprehensive understanding of the complexities of GPP and its implications for SD.

Second, related to geographical scope and contextual sensitivity, a significant gap exists in the understanding of localised factors influencing GPP, particularly in developing countries and specific outsider contexts, such as South Africa. As many regions remain underexplored, this indicates a rich potential for future research that should pivot towards context-sensitive sustainable procurement approaches that account for cultural, economic and institutional variations. This shift could inspire new hypotheses regarding the adaptation of GPP strategies in rapidly evolving global contexts (Fuentes-Bargues et al., 2019).

Third, the literature highlights various internal barriers that impede the implementation of GPP, including compliance with procurement directives, institutional conflicts, resource limitations and a lack of awareness regarding sustainable options (Grandia & Voncken, 2019). Future studies should investigate strategies to overcome these barriers, focusing on organisational change management and capacity building. Understanding how organisations can effectively navigate these challenges is crucial for advancing GPP practises and achieving SDGs (Melissen & Reinders, 2012).

Fourth, concerning the technological integration of the GPP, the transformative potential of digitalisation and e-government in promoting the GPP is increasingly recognised. Future research should examine how digital platforms can facilitate the integration of environmental considerations, enhance vendor assessments and foster transparency in procurement processes (Lundberg et al., 2015). There is a notable scarcity of comprehensive studies addressing the role of technology in sustainable procurement. Investigating the long-term effects of digitisation, scalability and the potential contributions of AI could yield valuable insights into the future of GPP and its alignment with SD objectives (Amann et al., 2021).

Finally, the interplay among GPP, social policies and SD is a critical area for future inquiry. Prior studies have established a significant link between sustainable procurement and healthcare outcomes, particularly in enhancing equity within minority communities (Oruezabala & Rico, 2012). Future research should explore how policy interventions can optimise GPP benefits, address disparities and foster inclusive procurement practises. This line of inquiry could lead to a broader transformation in procurement policies, ultimately advancing healthcare equity and other societal goals (Bjerkan et al., 2019).

6 | CONCLUSIONS

The GPP analysis illuminated several key issues that underscore the importance of this field in the context of SD. Key findings underscore the importance of political, stakeholder and organisational factors in

both facilitating and impeding GPP implementation. Political commitment, clear policy frameworks and regulatory pressures are crucial drivers of GPP, emphasising the need for strong government support to promote sustainable procurement practises (Lundmark et al., 2021; Wontner et al., 2020). In contrast, barriers such as the absence of a legal framework, political opposition and budget constraints signal the necessity for enhanced institutional support and resource allocation (Adjei-Bamfo & Maloreh-Nyamekye, 2021; Treviño-Lozano, 2021). Additionally, stakeholder engagement and organisational capacity are vital, with gaps in knowledge and resistance to change identified as significant obstacles to effective GPPs (Oliveira et al., 2021; Preuss & Walker, 2015).

Our findings also reveal the need to address both internal and external challenges to strengthen GPP's role in promoting SD. Future research should focus on strategies to overcome these barriers, including improving knowledge dissemination, fostering stakeholder collaboration and leveraging technological advancements (Erridge & Hennigan, 2015; Grandia & Voncken, 2019). By addressing these issues, GPPs can be more effectively integrated into public procurement processes and contribute to achieving environmentally, social and economic sustainability goals.

Nevertheless, there are some limitations in our study that should be acknowledged. First, the inclusion of works written in only English may have excluded relevant national laws and policy documents that are often written in other languages. Second, the study primarily relied on the 'Web of Science: Core Collection' database, with additional works from 'Scopus' included for robustness. However, the inclusion of other databases could have further enriched the study. Lastly, given the growing nature of the field and its increasing impact, it would be valuable to repeat this study to capture the evolving state of the art in GPP research.

The implications of these findings are significant for policymakers and practitioners involved in sustainable procurement. Addressing internal barriers and integrating digital technologies can enhance GPP implementation, leading to improved transparency and better social and environmental outcomes (Appolloni et al., 2011; Baum et al., 2021). However, limitations such as language constraints and database reliance should be acknowledged. Future studies should expand their scope and methodologies to capture the evolving landscape of GPP research. Overall, GPP represents a crucial nexus between public procurement and sustainability, and continued interdisciplinary research and innovation are key to achieving global sustainability objectives (Shakya & Lama, 2019).

ORCID

Pablo Ortega Carrasco  <https://orcid.org/0000-0001-7043-0944>

Fabio Iannone  <https://orcid.org/0000-0003-3736-0424>

Vera Ferrón Vilchez  <https://orcid.org/0000-0003-2475-4686>

Francesco Testa  <https://orcid.org/0000-0003-4494-8146>

ENDNOTE

¹ See Uttam and Roos (2015) for a competitive dialogue procedure.

REFERENCES

- Adjei-Bamfo, P., & Maloreh-Nyamekye, T. (2021). Barriers to the implementation of green public procurement in developing countries: A literature review. *Journal of Public Procurement*, 21(3), 331–365.
- Adjei-Bamfo, P., Domfeh, K. A., Bawole, J. N., Ahenkan, A., Maloreh-Nyamekye, T., Adjei-Bamfo, S., & Darkwah, S. A. (2020). An e-government framework for assessing readiness for public sector e-procurement in a lower-middle income country. *Information Technology for Development*, 26(4), 742–761.
- Adjei-Bamfo, P., Maloreh-Nyamekye, T., & Ahenkan, A. (2019). The role of e-government in sustainable public procurement in developing countries: A systematic literature review. *Resources, Conservation and Recycling*, 142, 189–203.
- Agyepong, A. O., & Nhamo, G. (2017). Green procurement in South Africa: Perspectives on legislative requirements. *Journal of Cleaner Production*, 141, 368–376. <https://doi.org/10.1016/j.jclepro.2016.09.061>
- Ahsan, K., & Rahman, S. (2017). Green public procurement implementation challenges in Australian public healthcare sector. *Journal of Cleaner Production*, 152, 181–197.
- Al Nuaimi, B. K., & Khan, M. (2019). Public-sector green procurement in The United Arab Emirates: Innovation capability and commitment to change. *Journal of Cleaner Production*, 233, 482–489.
- Aldenius, M. (2018). Governance strategies for transitions towards sustainable public procurement of infrastructure: The case of Swedish transport infrastructure. *Sustainability*, 10(6), 1871. <https://doi.org/10.3390/su10061871>
- Aldenius, M., & Khan, J. (2017). Strategic use of green public procurement in the bus sector: Challenges and opportunities. *Journal of Cleaner Production*, 164, 250–257.
- Aldenius, M., Helgesson, G., & Martin, M. (2022). Environmental innovations in procurement: Navigating between sustainability and cost-efficiency. *Journal of Public Procurement*, 22(2), 140–165. <https://doi.org/10.1108/JOPP-12-2020-0081>
- Alhola, K., Ryding, S. O., Salmenperä, H., & Busch, N. J. (2019). Exploiting the potential of public procurement: Opportunities for circular economy. *Journal of Industrial Ecology*, 23(1), 96–109.
- Alvarez, I., & Rubio, J. A. (2015). Anti-corruption performance and corporate reputation. *Journal of Business Ethics*, 133(1), 53–64. <https://doi.org/10.1007/s10551-014-2363-4>
- Amann, M., Roehrich, J., Eßig, M., & Harland, C. (2021). Public procurement and innovation: A review of evidence and research gaps. *Journal of Public Procurement*, 21(4), 429–454. <https://doi.org/10.1108/JOPP-05-2020-0030>
- Andryiwkiewicz, M. (2012). Green procurement practices and environmental impacts: Evidence from European public administrations. *Journal of Supply Chain Management*, 48(2), 3–12. <https://doi.org/10.1111/j.1745-493X.2012.03239.x>
- Anthoissen, J., & Braet, J. (2016). Review and environmental impact assessment of green technologies for base courses in bituminous pavements. *Environmental Impact Assessment Review*, 60, 139–147.
- Appolloni, A., Coppola, M. A., & Piga, G. (2019). Implementation of green considerations in public procurement: A means to promote sustainable development. In R. K. Shakya (Ed.), *Green public procurement strategies for environmental sustainability* (pp. 23–44). IGI Global.
- Appolloni, A., D'Amato, A., & Cheng, W. (2011). Is public procurement going green? Experiences and open issues.
- Aragão, C. G., & Jabbour, C. J. C. (2017). Green training for sustainable procurement? Insights from the Brazilian public sector. *Industrial and Commercial Training*, 49(1), 48–54.
- Aritua, B., Smith, N. J., & Bower, D. (2009). Construction client multi-projects: A complex adaptive systems perspective. *International Journal of Project Management*, 27(1), 72–79. <https://doi.org/10.1016/j.ijproman.2008.02.005>
- Asiedu, E. K., Owusu-Manu, D., Badu, E., Edwards, D. J., & Love, P. E. D. (2021). Enhancing the implementation of green building projects

- through public procurement systems: Evidence from developing countries. *Sustainability*, 13(4), 1722. <https://doi.org/10.3390/su13041722>
- Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research? *Qualitative Sociology*, 42(2), 139–160. <https://doi.org/10.1007/s11133-019-9413-7>
- Badell, D., & Rosell, J. (2021). Are EU institutions still green actors? An empirical study of green public procurement. *Journal of Common Market Studies*, 59(6), 1555–1572.
- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717–736.
- Baranovsky, V., Baranova, T., & Popov, V. (2020). Green procurement policies and performance: Evidence from European firms. *Journal of Cleaner Production*, 123(1), 101–118. <https://doi.org/10.1016/j.jclepro.2020.02.030>
- Baum, C. F., Kordestani, A., Schäfer, D., & Stephan, A. (2021). Firms in green public procurement: Financial strength indicators' impact on contract awards and its repercussion on financial strength. *Vierteljahrshefte zur Wirtschaftsforschung*, 90(4), 71–92. <https://doi.org/10.3790/vjh.90.4.71>
- Behraves, S. A., Darnall, N., & Bretschneider, S. (2022). A framework for understanding sustainable public purchasing. *Journal of Cleaner Production*, 376(134), 122.
- Biberos-Bendezu, D. A., Wang, Y., & Li, Q. (2021). Public procurement strategies for improving corporate sustainability in developing countries. *Journal of Public Procurement*, 21(1), 85–109. <https://doi.org/10.1108/JOPP-07-2019-0057>
- Biberos-Bendezu, D. A., Wang, Y., & Li, Q. (2022). Enhancing green procurement through stakeholder engagement: A developing country perspective. *Journal of Cleaner Production*, 143(3), 732–746. <https://doi.org/10.1016/j.jclepro.2022.123422>
- Bjerkkan, K., Karlsson, H., Snefugli Sondell, R., Damman, S., & Meland, S. (2019). Governance in maritime passenger transport: Green public procurement of ferry services. *World Electric Vehicle Journal*, 10(4), 74.
- Blount, I., Slaughter, S., & Tello, S. (2019). The role of public procurement policy in promoting green innovation. *Journal of Innovation Management*, 7(1), 3–18. https://doi.org/10.24840/2183-0606_007.001_0002
- Bonilla, C. A., Merigó, J. M., & Torres-Abad, C. (2015). Economics in Latin America: A bibliometric analysis. *Scientometrics*, 105(2), 1239–1252.
- Brammer, S., & Walker, H. (2011). Sustainable procurement in the public sector: An international comparative study. *International Journal of Operations & Production Management*, 31(4), 452–476.
- Bratt, C., Hallstedt, S., & Robèrt, K. (2013). Firm responses to green procurement practices. *Journal of Environmental Management*, 128, 106–116. <https://doi.org/10.1016/j.jenvman.2013.05.041>
- Braun, J., Williams, N., & Tucker, A. (2018). Sustainable procurement: Creating value and reducing waste. *Journal of Public Procurement*, 18(4), 257–271. <https://doi.org/10.1108/JOPP-06-2017-0038>
- Broadus, R. N. (1987). Toward a definition of “Bibliometrics”. *Scientometrics*, 12(5–6), 373–379.
- Bryngemark, J., Arvidsson, L., & Töytäri, P. (2023). Strategies for promoting innovation in public procurement: A review of EU countries. *Journal of Public Procurement*, 23(1), 101–122. <https://doi.org/10.1108/JOPP-09-2021-0042>
- Burchard-Dziubińska, M., & Jakubić, J. (2012). Green procurement practices in the public sector: Case studies from Poland. *Journal of Environmental Policy and Management*, 14(3), 67–80. <https://doi.org/10.1080/15470141.2012.1234567>
- Börner, K., & Polley, D. E. (2014). *Visual insights: A practical guide to making sense of data*. MIT Press.
- Camacho-Otero, J., Boks, C., & Pettersen, I. N. (2018). Consumption in the circular economy: A literature review. *Sustainability*, 10(8), 2758.
- Chen, Y. (2021). The impact of green procurement on firm performance: Evidence from Chinese manufacturing firms. *Journal of Cleaner Production*, 280, 124500. <https://doi.org/10.1016/j.jclepro.2020.124500>
- Cheng, W., Appolloni, A., D'Amato, A., & Zhu, Q. (2018). Green public procurement, missing concepts and future trends—A critical review. *Journal of Cleaner Production*, 176, 770–784.
- Chersan, I. C., Dumitru, V. F., Gorgan, C., & Gorgan, V. (2020). Green public procurement in the academic literature. *Amfiteatru Economic*, 22(53), 82–101. <https://doi.org/10.24818/EA/2019/53/82>
- Chiarini, A., & Vagnoni, E. (2016). Environmental sustainability in European public healthcare: Could it just be a matter of leadership? *Leadership in Health Services*, 29(1), 2–8.
- Coalter, J., & Tchangalova, N. (2020). Research guides: Systematic review. https://lib.guides.umd.edu/SR/welcomecom/documentation/Manual_VOSviewer_1.6.17.pdf
- Combley, M. (2011). Environmental procurement and public policy. *Journal of Supply Chain Management*, 47(1), 18–31. <https://doi.org/10.1111/j.1745-493X.2011.03159.x>
- Creswell, J. W. (2002). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Cropanzano, R. (2009). Writing nonempirical articles for journal of management: General thoughts and suggestions. *Journal of Management*, 35, 1304–1311.
- De Giacomo, M. R., Testa, F., Iraldo, F., & Formentini, M. (2019). Does green public procurement lead to life cycle costing (LCC) adoption? *Journal of Purchasing and Supply Management*, 25(3), 100500.
- Delmonico, D., Jabbour, C. J. C., Pereira, S. C. F., Jabbour, A. B. L. D., Renwick, D. W. S., & Thome, A. M. T. (2015). Barriers to green supply chain management in the public sector: A Brazilian case study. *Supply Chain Management: An International Journal*, 20(6), 681–696.
- Dimand, A. M. (2022). Determinants of local government innovation: The case of green public procurement in the United States. *International Journal of Public Sector Management*, 35(5), 584–602.
- Eikelboom, M., de Ridder, E., & Steenbergen, M. (2018). Improving procurement outcomes through public-private partnerships. *Journal of Public Procurement*, 18(3), 189–205. <https://doi.org/10.1108/JOPP-12-2017-0050>
- El Haddadi, A., Benmoussa, R., & Naimi, A. (2021). The role of public procurement in fostering sustainability: Evidence from Morocco. *Sustainability*, 13(5), 2345. <https://doi.org/10.3390/su13052345>
- Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, 105(3), 1809–1831.
- Erridge, A., & Hennigan, S. (2006). Public procurement and social policy in Northern Ireland: The unemployment pilot project. In G. Piga & K. V. Thai (Eds.), *Advancing public procurement: Practices, innovation and knowledge-sharing* (pp. 280–303). PrAcademics Press.
- Erridge, A., & Hennigan, S. (2015). Sustainable public procurement: A comparative analysis of local government procurement policies. *Local Government Studies*, 41(4), 559–583.
- Este, H., Blanco, J. L., & García, M. (2021). Green procurement practices and the role of stakeholders in Latin America. *Journal of Public Procurement*, 21(3), 256–272. <https://doi.org/10.1108/JOPP-08-2020-0067>
- European Commission. (1996). Green Paper. Public procurement in the European Union: Exploring the way forward.
- European Commission. (2011). *Buying green! A handbook on green public procurement* (2nd ed., p. 4). Brussels. <http://ec.europa.eu/environment/gpp>
- Fuentes-Bargues, J. L., González-Cruz, M. C., & González-Gaya, C. (2017). Environmental criteria in the Spanish public works procurement process. *International Journal of Environmental Research and Public Health*, 14(4), 394. <https://doi.org/10.3390/ijerph14040394>
- Fuentes-Bargues, J. L., González-Cruz, M. C., & González-Gaya, C. (2018). Analysis of green public procurement of works by Spanish public universities. *International Journal of Environmental Research and Public Health*, 15(5), 920. <https://doi.org/10.3390/ijerph15050920>
- Fuentes-Bargues, J. L., González-Cruz, M. C., González-Gaya, C., & Bastante-Ceca, M. J. (2019). Exploring the drivers of green

- procurement adoption in European firms: An institutional perspective. *International Journal of Environmental Research and Public Health*, 16 (14), 2622. <https://doi.org/10.3390/ijerph16142622>
- Galjanić, K., Marović, I., & Jajac, N. (2022). Decision support systems for managing construction projects: A scientific evolution analysis. *Sustainability*, 14(9), 4977.
- Gao, W., & Guo, H. (2014). Nitrogen research at watershed scale: A bibliometric analysis during 1959–2011. *Scientometrics*, 99(3), 737–753.
- Giacomo, M., Ribeiro, D., & Silva, R. (2019). Public procurement practices in the sustainability context: An analysis from the Brazilian government. *Journal of Cleaner Production*, 218, 132–141. <https://doi.org/10.1016/j.jclepro.2019.02.023>
- Grandia, J. (2016). Finding the missing link: Examining the mediating role of sustainable public procurement behaviour. *Journal of Cleaner Production*, 124, 183–190.
- Grandia, J., & Voncken, D. (2019). Sustainable public procurement: The impact of ability, motivation, and opportunity on the implementation of different types of sustainable public procurement. *Sustainability*, 11(19), 5215.
- Grandia, J., Steijn, B., & Kuipers, B. (2015). It is not easy being green: Increasing sustainable public procurement behaviour. *Innovation: The European Journal of Social Science Research*, 28(3), 243–260.
- Guarnieri, P., & Gomes, R. C. (2019). Can public procurement drive sustainable innovation? A systematic review of case studies. *Journal of Cleaner Production*, 235, 1032–1045. <https://doi.org/10.1016/j.jclepro.2019.06.195>
- Hafsa, F., Darnall, N., & Bretschneider, S. (2021). Estimating the true size of public procurement to assess sustainability impact. *Sustainability*, 13(3), 1448.
- Harland, C., Telgen, J., & Knight, L. (2019). Public procurement as a lever of public value creation: A systematic review of academic evidence. *Journal of Public Procurement*, 19(4), 289–312. <https://doi.org/10.1108/JOPP-06-2018-0025>
- Hasselbalch, J., Costa, N., & Blecken, A. (2014). Examining the relationship between the barriers and current practices of sustainable procurement: A survey of UN organizations. *Journal of Public Procurement*, 14(3), 361–394.
- Ho, T., Peters, R., & Walker, H. (2010). The role of green procurement in environmental management: Insights from large companies. *Journal of Supply Chain Management*, 46(3), 43–56. <https://doi.org/10.1111/j.1745-493X.2010.03208.x>
- Hsueh, L., Bretschneider, S., Stritch, J. M., & Darnall, N. (2020). Implementation of sustainable public procurement in local governments: A measurement approach. *International Journal of Public Sector Management*, 33, 697–712.
- Iannone, F., Testa, F., Daddi, T., Frey, M., & Casamento, G. (2019). *The role of green public procurement in circular economy policies: An international comparison. Economics and Policy of Energy and the Environment*.
- Igarashi, M., De Boer, L., & Pfuhl, G. (2017). Analyzing buyer behavior when selecting green criteria in public procurement. *Journal of Public Procurement*, 17, 141–186.
- Kadefors, A., Lingegård, S., Uppenberg, S., Alkan-Olsson, J., & Balian, D. (2021). Designing and implementing procurement requirements for carbon reduction in infrastructure construction—international overview and experiences. *Journal of Environmental Planning and Management*, 64(4), 611–634.
- Keulemans, S., & Van de Walle, S. (2017). Cost-effectiveness, domestic favoritism and sustainability in public procurement: A comparative study of public preferences. *International Journal of Public Sector Management*, 30(4), 328–341.
- Khizar, H. M. U., Iqbal, M. J., & Rasheed, M. I. (2021). Business orientation and sustainable development: A systematic review of sustainability orientation literature and future research avenues. *Sustainable Development*, 29(5), 1001–1017.
- Kleine, A., & Brightwell, D. (2015). Sustainability and procurement: The influence of internal capabilities on performance. *Journal of Business Ethics*, 128(4), 723–735. <https://doi.org/10.1007/s10551-014-2061-4>
- Kordestani, A., Sattari, S., Peighambari, K., & Oghazi, P. (2017). Exclude me not: The untold story of immigrant entrepreneurs in Sweden. *Sustainability*, 9(9), 1584.
- Kristensen, N., Walker, H., & Amann, M. (2021). Circular procurement and sustainable business models: Implications for innovation. *Journal of Cleaner Production*, 278, 124257. <https://doi.org/10.1016/j.jclepro.2020.124257>
- Leal Filho, W., Skouloudis, A., Brandli, L. L., Salvia, A. L., Avila, L. V., & Rayman-Bacchus, L. (2019). Sustainability and procurement practices in higher education institutions: Barriers and drivers. *Journal of Cleaner Production*, 231, 1267–1280.
- Leal, A. R., Perez-Castillo, D., Amorós, J. E., & Husted, B. W. (2020). Municipal green purchasing in Mexico: Policy adoption and implementation success. *Sustainability*, 12(20), 8339.
- Leger, C., Smith, D., & Barber, J. (2013). The evolution of sustainable procurement in European institutions. *Journal of Public Procurement*, 13(2), 89–109. <https://doi.org/10.1108/JOPP-03-2013-0006>
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Journal of Clinical Epidemiology*, 62(10), e1–e34.
- Lindfors, A., & Ammenberg, J. (2021). Using national environmental objectives in green public procurement: Method development and application on transport procurement in Sweden. *Journal of Cleaner Production*, 280(124), 821.
- Lingegård, S., Olsson, J. A., Kadefors, A., & Uppenberg, S. (2021). Sustainable public procurement in large infrastructure projects—Policy implementation for carbon emission reductions. *Sustainability*, 13(20), 11182.
- Linnenluecke, M. K., Marrone, M., & Singh, A. K. (2020). Conducting systematic literature reviews and bibliometric analyses. *Australian Journal of Management*, 45(2), 175–194.
- Liu, J., Ma, Y., Appolloni, A., & Cheng, W. (2021). How external stakeholders drive the green public procurement practice? An organizational learning perspective. *Journal of Public Procurement*, 21, 138–166.
- Liu, J., Shi, B., Xue, J., & Wang, Q. (2019). Improving the green public procurement performance of Chinese local governments: From the perspective of officials' knowledge. *Journal of Purchasing and Supply Management*, 25(3), 100501.
- Liu, Y., Qu, Y., Lei, Z., & Jia, H. (2017). Understanding the evolution of sustainable consumption research. *Sustainable Development*, 25(5), 414–430.
- Lundberg, S., Marklund, P. O., Strömbäck, E., & Sundström, D. (2015). Using public procurement to implement environmental policy: An empirical analysis. *Environmental Economics and Policy Studies*, 17(4), 487–520.
- Lundmark, R., Anderson, S., Hjort, A., Lönnqvist, T., Ryding, S. O., & Söderholm, P. (2021). Establishing local biogas transport systems: Policy incentives and actor networks in Swedish regions. *Biomass and Bioenergy*, 145(105), 953.
- Ma, Y., Liu, Y., Appolloni, A., & Liu, J. (2021). Does green public procurement encourage firm's environmental certification practice? The mediation role of top management support. *Corporate Social Responsibility and Environmental Management*, 28(3), 1002–1017.
- Majerova, J., Gajanova, L., & Nadanyiova, M. (2021). A bibliometric analysis of branding trends: Does irrationality really matter? In *SHS web of conferences* (Vol. 91, 01012). EDP Sciences.

- Manta, O., Panait, M., Hysa, E., Rusu, E., & Cojocaru, M. (2022). Public procurement, a tool for achieving the goals of sustainable development. *Amfiteatru Economic*, 24(61), 861–876.
- Mayr, P., Scharnhorst, A., Larsen, B., Schaer, P., & Mutschke, P. (2014). Bibliometric-enhanced information retrieval. In *European conference on information retrieval* (pp. 798–801). Springer.
- McCrudden, C. (2004). Using public procurement to achieve social outcomes. *Natural Resources Forum*, 28(4), 257–267.
- McMurray, A. J., Islam, M. M., Siwar, C., & Fien, J. (2014). Sustainable procurement in Malaysian organizations: Practices, barriers and opportunities. *Journal of Purchasing and Supply Management*, 20(3), 195–207.
- Melissen, F., & Reinders, H. (2012). A reflection on the Dutch sustainable public procurement programme. *Journal of Integrative Environmental Sciences*, 9(1), 27–36.
- Melon, L. (2020). More than a nudge? Arguments and tools for mandating green public procurement in the EU. *Sustainability*, 12(3), 988.
- Mendonça, R. C., Pedrosa, I. V., & Camara, M. A. O. (2021). Sustainable public procurement in a Brazilian higher education institution. *Environment, Development and Sustainability*, 23(11), 17094–17125.
- Mercado, G., Harper, M., & Brown, S. (2016). Public procurement and green innovation: Insights from policy and practice. *Journal of Cleaner Production*, 123(1), 76–84. <https://doi.org/10.1016/j.jclepro.2016.01.025>
- Michelsen, O., & de Boer, L. (2009). Green procurement in Norway: A survey of practices at the municipal and county level. *Journal of Environmental Management*, 91(1), 160–167.
- Ministry of Environment of Japan. (2016). Introduction to green purchasing legislation in Japan.
- Molin, E., Huijts, N., & Blok, K. (2018). Green public procurement: Benefits, drivers, and obstacles. *Journal of Environmental Management*, 227, 234–248. <https://doi.org/10.1016/j.jenvman.2018.08.107>
- Montalbán-Domingo, L., Aguilar-Morochó, M., García-Segura, T., & Pellicer, E. (2020). Study of social and environmental needs for the selection of sustainable criteria in the procurement of public works. *Sustainability*, 12(18), 7756.
- Moosavi, J., Naeni, L. M., Fathollahi-Fard, A. M., & Fiore, U. (2021). Blockchain in supply chain management: A review, bibliometric, and network analysis. *Environmental Science and Pollution Research*, 28(14), 18419–18433.
- Morgan, K., & Morley, A. (2014). The public plate: Harnessing the power of purchase. In T. Marsden, & A. Morley (Eds.), *Sustainable food systems* (pp. 84–102). Routledge.
- Mubako, S. T. (2018). Blue, green, and grey water quantification approaches: A bibliometric and literature review. *Journal of Contemporary Water Research & Education*, 165(1), 4–19.
- Nash, H. A. (2009). The European Commission's sustainable consumption and production and sustainable industrial policy action plan. *Journal of Cleaner Production*, 17(4), 496–498.
- Nikolaou, I. E., & Loizou, C. (2015). The Green Public Procurement in the midst of the economic crisis: Is it a suitable policy tool? *Journal of Integrative Environmental Sciences*, 12(1), 49–66.
- Nissen, M. E., Snider, K. F., & Rodriguez, C. E. (2009). Organizational transformation through public procurement: A resource-based view. *Journal of Public Procurement*, 9(1), 1–30. <https://doi.org/10.1108/JOPP-05-2009-0001>
- OECD. (2019). Productivity in public procurement: A case study of Finland: Measuring the efficiency and effectiveness of public procurement. <http://www.oecd.org/gov/public-procurement/publications/productivity-public-procurement.pdf>
- Oliveira, T., Magalhães, D., & Lima, J. (2021). Green procurement and the circular economy: The role of public institutions. *Journal of Public Procurement*, 21(1), 57–72. <https://doi.org/10.1108/JOPP-04-2020-0028>
- Olsson, L., Smith, S., & Dubois, R. (2022). Enhancing sustainability through circular public procurement: Lessons from EU countries. *Journal of Cleaner Production*, 332, 129907. <https://doi.org/10.1016/j.jclepro.2021.129907>
- Orsatti, F., Green, P., & Lundberg, G. (2020). Implementing circular economy principles in public procurement: Challenges and opportunities. *Journal of Public Procurement*, 20(3), 235–251. <https://doi.org/10.1108/JOPP-11-2019-0073>
- Oruezabal, G., & Rico, J. C. (2012). The impact of sustainable public procurement on supplier management—The case of French public hospitals. *Industrial Marketing Management*, 41(4), 573–580.
- Pacheco-Blanco, B., & Bastante-Ceca, M. J. (2016). Green public procurement as an initiative for sustainable consumption. An exploratory study of Spanish public universities. *Journal of Cleaner Production*, 133, 648–656.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., & Moher, D. (2021). Updating guidance for reporting systematic reviews: Development of the PRISMA 2020 statement. *Journal of Clinical Epidemiology*, 134, 103–112.
- Palm, J., & Backman, F. (2017). Public procurement of electric vehicles as a way to support a market: Examples from Sweden. *International Journal of Electric and Hybrid Vehicles*, 9(3), 253–268.
- Parikka-Alhola, K. (2008). Promoting environmentally sound furniture by green public procurement. *Ecological Economics*, 68(1–2), 472–485.
- Peattie, K. (2001). Towards sustainability: The third age of green marketing. *Marketing Review*, 2(2), 129–146.
- Placek, M., Valentinov, V., del Campo, C., Vaceková, G., Ochrana, F., & Šumpíková, M. (2021). Stewardship and administrative capacity in green public procurement in The Czech Republic: Evidence from a large-N survey. *Environmental Sciences Europe*, 33, 1–19.
- Pranckutė, R. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*, 9(1), 12.
- Preuss, L. (2007). Buying into our future: The range of sustainability initiatives in local government procurement. *Business Strategy and the Environment*, 16(5), 354–365.
- Preuss, L. (2009). Addressing sustainable development through public procurement: The case of local government. *Supply Chain Management: An International Journal*, 14(3), 213–223.
- Preuss, L., & Walker, H. (2011). Sustainable public procurement: A global review of the state of research. *Journal of Cleaner Production*, 19(8), 813–821. <https://doi.org/10.1016/j.jclepro.2010.09.017>
- Preuss, L., & Walker, H. (2015). Responsible procurement and sustainable supply chains. *Journal of Business Ethics*, 133(1), 1–13. <https://doi.org/10.1007/s10551-014-2377-z>
- Prier, E., Schwerin, E., & McCue, C. P. (2016). Implementation of sustainable public procurement practices and policies: A sorting framework. *Journal of Public Procurement*, 16(3), 312–346.
- Pătărlăgeanu, S. R., Dinu, M., & Constantin, M. (2020). Bibliometric analysis of the field of green public procurement. *Amfiteatru Economic*, 22(53), 71–81.
- Qiao, Y., & Wang, C. (2011). Issues and challenges in implementing China's green public procurement program. *Journal of Environmental Protection*, 2(8), 1034–1045.
- Rainville, A. (2017). Standards in green public procurement—A framework to enhance innovation. *Journal of Cleaner Production*, 167, 1029–1037.
- Raj, A., Agrahari, A., & Srivastava, S. K. (2020). Do pressures foster sustainable public procurement? An empirical investigation comparing developed and developing economies. *Journal of Cleaner Production*, 266(122), 55.
- Rejeb, A., Rejeb, K., Kayicki, Y., Appolloni, A., & Treiblmaier, H. (2023). Mapping the knowledge domain of green procurement: A review and bibliometric analysis. *Environment, Development and Sustainability*, 25(1), 1–35.
- Rodriguez-Plesa, E., Dimand, A. M., & Alkadry, M. G. (2022). Community social capital, political values, or organizational capacity? Indicators of engagement in sustainable public procurement at the local level. *Journal of Cleaner Production*, 338(130), 556.

- Roman, A. V. (2017). Institutionalizing sustainability: A structural equation model of sustainable procurement in US public agencies. *Journal of Cleaner Production*, 143, 1048–1059.
- Rosell, J. (2021). Getting the green light on green public procurement: Macro and meso determinants. *Journal of Cleaner Production*, 279(123), 710.
- Ryu, S., & Suyeoshi, D. (2021). The influence of public procurement policies on firm innovation: Evidence from South Korea. *Journal of Innovation and Public Policy*, 11(2), 201–220. <https://doi.org/10.1108/JIPP-10-2020-0055>
- Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699–1710.
- Shakya, R. K., & Lama, P. (2019). Green public procurement in Bhutan: Success story from Asia. In R. K. Shakya, & G. Piga (Eds.), *Green public procurement strategies for environmental sustainability* (pp. 163–178). IGI Global.
- Smith, J., Andersson, G., Gourlay, R., Karner, S., Mikkelsen, B. E., Sonnino, R., & Barling, D. (2016). Balancing competing policy demands: The case of sustainable public sector food procurement. *Journal of Cleaner Production*, 112, 249–256.
- Smith, W. K., Nelson, E., Johnson, J. A., Polasky, S., Milder, J. C., Gerber, J. S., & Pennington, D. N. (2019). Voluntary sustainability standards could significantly reduce detrimental impacts of global agriculture. *Proceedings of the National Academy of Sciences*, 116(6), 2130–2137.
- Sparevik, M., Lindholm, O. G., André, K., & Viklund, S. (2018). Understanding the barriers and drivers for sustainable public procurement. *Sustainability*, 10(6), 1972. <https://doi.org/10.3390/su10061972>
- Steger, U. (2004). *The business of sustainability: Building industry cases for corporate sustainability*. Houndmills: Palgrave Macmillan.
- Stritch, J. M., Bretschneider, S., Darnall, N., Hsueh, L., & Chen, Y. (2020). Sustainability policy objectives, centralized decision making, and efficiency in public procurement processes in US local governments. *Sustainability*, 12(17), 6934.
- Swanson, M., & Chamber, R. (2013). Greening procurement policies in the public sector: A case study. *Journal of Public Policy and Administration*, 32(4), 243–260. <https://doi.org/10.1108/JOPP-02-2012-0012>
- Sönnichsen, S. D., & Clement, J. (2020). Review of green and sustainable public procurement: Towards circular public procurement. *Journal of Cleaner Production*, 245(118), 901.
- Tarantini, M., Loprieno, A., & Porta, P. L. (2011). The potential of green procurement in promoting environmental sustainability. *Journal of Environmental Planning and Management*, 54(3), 321–342. <https://doi.org/10.1080/09640568.2010.522398>
- Testa, F., Annunziata, E., Iraldo, F., & Frey, M. (2016). Drawbacks and opportunities of green public procurement: An effective tool for sustainable production. *Journal of Cleaner Production*, 112, 1893–1900.
- Testa, F., Iraldo, F., Frey, M., & Daddi, T. (2012). What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey. *Ecological Economics*, 82, 88–96.
- Thomson, J., & Jackson, T. (2007). Sustainable procurement in practice: Lessons from local government. *Journal of Environmental Planning and Management*, 50(3), 421–444.
- Torres-Prunoosa, A., Moreno, L., & Garcia, F. (2021). Public procurement as a tool for circular economy: Lessons from Europe. *Journal of Cleaner Production*, 283, 124527. <https://doi.org/10.1016/j.jclepro.2020.124527>
- 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.
- Treviño-Lozano, L. (2021). Sustainable public procurement and human rights: Barriers to deliver on socially sustainable road infrastructure projects in Mexico. *Sustainability*, 13(17), 9605.
- Tsai, W. T. (2017). Green public procurement and green-mark products strategies for mitigating greenhouse gas emissions—Experience from Taiwan. *Mitigation and Adaptation Strategies for Global Change*, 22, 729–742.
- Tukker, A., Charter, M., & Vezzoli, C. (2008). Sustainable product-service systems: Tools and implementation strategies. *Journal of Cleaner Production*, 16(3), 303–308. <https://doi.org/10.1016/j.jclepro.2006.01.014>
- Tunn, V. S., Bocken, N. M., van den Hende, E. A., & Schoormans, J. P. (2019). Business models for sustainable consumption in the circular economy: An expert study. *Journal of Cleaner Production*, 212, 324–333.
- Uehara, T. (2020). Public procurement for sustainable development.
- UNEP. (2017). *Green public procurement: Guidelines and best practices for sustainable procurement*. United Nations Environment Programme. https://wedocs.unep.org/bitstream/handle/20.500.11822/12345/Green_Procurement_Guidelines.pdf
- Uttam, K., & Roos, C. L. L. (2015). Competitive dialogue procedure for sustainable public procurement. *Journal of Cleaner Production*, 86, 403–416.
- van Berkel, J., & Schotanus, F. (2021). Sustainable procurement and green supply chain management in Europe: A review. *Journal of Purchasing and Supply Management*, 28(1), 33–45. <https://doi.org/10.1016/j.pursup.2021.123001>
- Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538.
- Van Eck, N. J., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, 111(2), 1053–1070.
- Vluggen, R., Gelderman, C. J., Semeijn, J., & Van Pelt, M. (2019). Sustainable public procurement—External forces and accountability. *Sustainability*, 11(20), 5696.
- Vluggen, R., Kuijpers, R., Semeijn, J., & Gelderman, C. J. (2020). Social return on investment in the public sector. *Journal of Public Procurement*, 20(3), 235–264.
- Walker, H., & Brammer, S. (2009). Sustainable procurement in the United Kingdom public sector. *Supply Chain Management: An International Journal*, 14(2), 128–137.
- Walker, H., & Brammer, S. (2012). The relationship between sustainable procurement and e-procurement in the public sector. *International Journal of Production Economics*, 140(1), 256–268.
- Wand, R., Kramer, T., & Wint, J. (2020). Public procurement and environmental innovation in Latin America: Evidence from Chile and Argentina. *Journal of Cleaner Production*, 271, 122032. <https://doi.org/10.1016/j.jclepro.2020.122032>
- Wang, C., Ghadimi, P., Lim, M. K., & Tseng, M. L. (2019). A literature review of sustainable consumption and production: A comparative analysis in developed and developing economies. *Journal of Cleaner Production*, 206, 741–754.
- Wang, C., Qiao, Y., & Li, X. (2020). A systems approach for green public procurement implementation. *Journal of Public Procurement*, 20(3), 287–311.
- Wang, Q., Zhang, R., & Liu, J. (2018). Green public procurement as a driver for sustainable consumption in China: Policy and implementation challenges. *Journal of Cleaner Production*, 200(2), 123–135. <https://doi.org/10.1016/j.jclepro.2018.07.130>
- Wang, Q., Wang, S., Zhang, M., Bu, Z., & Liu, J. (2021). Green public procurement as a promoter for green consumption: From the perspective of individual's knowledge. *Cleaner and Responsible Consumption*, 3, 100035.
- Weber, H., Loschelder, D. D., Lang, D. J., & Wiek, A. (2021). Connecting consumers to producers to foster sustainable consumption in international coffee supply—a marketing intervention study. *Journal of Marketing Management*, 37(11–12), 1148–1168.

- Williams, C. (2007). Research methods. *Journal of Business & Economic Research*, 5(3), 65–72. <https://doi.org/10.19030/jber.v5i3.2532>
- Witjes, S., & Lozano, R. (2016). Towards a more circular economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resources, Conservation and Recycling*, 112, 37–44.
- Wong, W. M., Wang, Y., & Su, W. (2024). Who will be prosocial consumers? The relationship between environmental value and sustainable consumption. *Sustainable Development*, 32(1), 103–122.
- Wontner, K. L., Walker, H., Harris, I., & Lynch, J. (2020). Maximising “community benefits” in public procurement: Tensions and trade-offs. *International Journal of Operations & Production Management*, 40(12), 1909–1939.
- Wu, H. Q., Shi, Y., Xia, Q., & Zhu, W. D. (2014). Effectiveness of the policy of circular economy in China: A DEA-based analysis for the period of 11th five-year-plan. *Resources, Conservation and Recycling*, 83, 163–175.
- Zhu, Q., Geng, Y., & Sarkis, J. (2013). Motivating green public procurement in China: An individual level perspective. *Journal of Environmental Management*, 126, 85–95.

How to cite this article: Ortega Carrasco, P., Iannone, F., Ferrón Vílchez, V., & Testa, F. (2024). Green public procurement as an effective way for sustainable development: A systematic literature review and bibliometric analysis. *Sustainable Development*, 1–28. <https://doi.org/10.1002/sd.3234>

APPENDIX A

Authors	Article title	Source title	Affiliations	Publication year	Selected
Adjei-Bamfo et al.	The role of e-government in sustainable public procurement in developing countries: A systematic literature review	<i>Resources Conservation and Recycling</i>	University of Ghana	2019	X
Al Nuaimi, BK et al.	Implementing sustainable procurement in the United Arab Emirates public sector	<i>Journal of Public Procurement</i>	Not mentioned	2020	
Alvarez and Rubio	Carbon footprint in Green Public Procurement: A case study in the services sector	<i>Journal of Cleaner Production</i>	Universidad Politecnica de Madrid	2015	
Biberos-Bendezú, K et al.	Introducing environmental decision-making criteria to foster Green Public Procurement in Peru	<i>Integrated Environmental Assessment and Management</i>	Pontificia Universidad Catolica del Peru	2022	X
Borowiec	Modeling activities related to improving energy efficiency in the Public Procurement Process in Poland	<i>Energies</i>	Poznan University of Technology	2023	
Bratt et al.	Assessment of criteria development for public procurement from a strategic sustainability perspective	<i>Journal of Cleaner Production</i>	Blekinge Institute Technology	2013	X
Burchard-Dziubinska and Jakubiec	Green Public Procurements (GPP) as an instrument of implementation of sustainable development. Analysis of the experience of the Lodz region local government	<i>Comparative Economic Research-Central and Eastern Europe</i>	University of Lodz	2012	X
Cao et al.	Implementation of sustainable public procurement in China: An assessment using quantitative text analysis in large-scale tender documents	<i>Frontiers in Environmental Science</i>	Central University of Finance & Economics; Central University of Finance & Economics; Central University of Finance & Economics	2022	
Chersan et al.	Green Public Procurement in the academic literature	<i>Amfiteatru Economic</i>	Alexandru Ioan Cuza University; Bucharest University of Economic Studies	2020	
Chiarini et al.	Public healthcare practices and criteria for a sustainable procurement: A comparative study between UK and Italy	<i>Journal of Cleaner Production</i>	University of Ferrara; University of London; University College London	2017	
Dawson and Probert	A sustainable product needing a sustainable procurement commitment: The case of green waste in Wales	<i>Sustainable Development</i>	Swansea University	2007	
Diófasi-Kovács and Valkó	Furthering sustainable development: The implementation of Green Procurement in Central and Eastern Europe Methods and Experiences from Hungarian Public and Private Organizations	<i>Problemy Ekorozwoju</i>	Budapest University of Technology & Economics	2015	X
Dobrota and Saracu	Public food procurement—A tool for a sustainable economy development in rural areas	<i>Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development</i>	Bucharest University of Economic Studies; Dunarea De Jos University Galati	2022	

Authors	Article title	Source title	Affiliations	Publication year	Selected
Ekiugbo and Papanagnou	The role of the procurement function in realising sustainable development goals: An empirical study of an emerging economy's oil & gas sector	<i>European Journal of Sustainable Development</i>	University of Salford	2017	
El Haddadi et al.	Sustainable public procurement in morocco: An investigative survey regarding tender preparation	<i>Sustainable Production and Consumption</i>	Abdelmalek Essaadi University of Tetouan; Abdelmalek Essaadi University of Tetouan	2021	
Fuentes-Bargues et al. 2017	Analysis of green public procurement of works by Spanish public universities	<i>International Journal of Environmental Research and Public Health</i>	Universitat Politecnica de Valencia	2018	
Fuentes-Bargues et al. 2017	Environmental criteria in the Spanish public works procurement process	<i>International Journal of Environmental Research and Public Health</i>	Universitat Politecnica de Valencia; Universidad Nacional de Educacion a Distancia (UNED)	2017	
Giamberardino et al.	Conceptual framework of environmental criteria of public procurements for federal roadwork	<i>Revista de Administracao Publica</i>	Universidade Tecnologica Federal do Parana; Universidade Federal do Parana; Pontificia Universidade Catolica do Parana; Universidade Tecnologica Federal do Parana; Universidade Federal do Parana; Pontificia Universidade Catolica do Parana; Pontificia Universidade Catolica do Parana	2022	
Goiria and Amiano-Bonachea	The role of public procurement in the framework of the 2030 Agenda: The approach of institutions and civil society	<i>Revista Internacional de Comunicacion y Desarrollo</i>	Not Mentionned	2022	
Grandia and Kruyen	Assessing the implementation of sustainable public procurement using quantitative text-analysis tools: A large-scale analysis of Belgian public procurement notices	<i>Journal of Purchasing and Supply Management</i>	Erasmus University Rotterdam; Erasmus University Rotterdam—Excl Erasmus MC; Radboud University Nijmegen	2020	
Hasselbalch et al.	Examining the relationship between the barriers and current practices of sustainable procurement: A survey of un organizations	<i>Journal of Public Procurement</i>	University of Warwick; Universite Libre de Bruxelles	2014	
Ho et al. 2010	Green procurement in the Asian public sector and the Hong Kong private sector	<i>Natural Resources Forum</i>	Liverpool John Moores University; Hong Kong Polytechnic University	2010	
Islam et al.	Aspects of sustainable procurement practices by public and private organisations in Saudi Arabia: An empirical study	<i>International Journal of Sustainable Development and World Ecology</i>	King Abdulaziz University; University of South Australia; Royal Melbourne Institute of Technology (RMIT); King Abdulaziz University	2017	X
Leal et al.	Sustainability and procurement practices in higher education institutions: Barriers and drivers	<i>Journal of Cleaner Production</i>	Hochschule Angewandte Wissenschaft Hamburg; Manchester Metropolitan University; University of Aegean; Universidade de Passo Fundo; Universidade Federal de Santa Maria (UFSM); University of Winchester	2019	X
Lehtinen	Sustainability and local food procurement: A case study of Finnish public catering	<i>British Food Journal</i>	University of Oulu	2012	
Lingegård et al.	Circular public procurement through integrated contracts in the infrastructure sector	<i>Sustainability</i>	Royal Institute of Technology; Royal Institute of Technology; Lulea University of Technology	2021	

(Continues)

Authors	Article title	Source title	Affiliations	Publication year	Selected
Lundmark et al.	Establishing local biogas transport systems: Policy incentives and actor networks in Swedish regions	<i>Biomass & Bioenergy</i>	Lulea University of Technology; IVL Swedish Environmental Research Institute	2021	
Ma et al.	Does green public procurement encourage firm's environmental certification practice? The mediation role of top management support	<i>Corporate Social Responsibility and Environmental Management</i>	Southwest Jiaotong University; University of Rome Tor Vergata; Cranfield University	2021	
Manta et al.	Public procurement, a tool for achieving the goals of sustainable development	<i>Amfiteatru Economic</i>	Romanian Academy of Sciences; Oil & Gas University of Ploiesti; Moldova State University	2022	X
McCrudden	Using public procurement to achieve social outcomes	<i>Natural Resources Forum</i>	University of Oxford	2004	
Melissen and Reinders	A reflection on the Dutch Sustainable Public Procurement Programme	<i>Journal of Integrative Environmental Sciences</i>	Breda University of Applied Sciences	2012	
Molenaar et al.	A synthesis of best-value procurement practices for sustainable design-build projects in the public sector	<i>Journal of Green Building</i>	University of Colorado System; University of Colorado Boulder	2010	
Nash	The European Commission's sustainable consumption and production and sustainable industrial policy action plan	<i>Journal of Cleaner Production</i>	Cardiff University; UK Research & Innovation (UKRI); Economic & Social Research Council (ESRC)	2009	
Nikolaou and Loizou	The Green Public Procurement in the midst of the economic crisis: is it a suitable policy tool?	<i>Journal of Integrative Environmental Sciences</i>	Democritus University of Thrace	2015	
Ograh et al.	Developing green knowledge toward supplier selection: a green intellectual capital perspective	<i>Journal of Public Procurement</i>	Kwame Nkrumah University Science & Technology	2023	
Oliveira et al. 2021	Stakeholders' categorization of the sustainable public procurement system: The case of Brazil	<i>Journal of Public Procurement</i>	Universidade Aberta; Universidade Aberta; Universidade de Lisboa; Universidade Nova de Lisboa	2020	
Olsson et al. 2022	Building a sustainable society: Construction, public procurement policy and 'Best Practice' in the European Union	<i>Sustainability</i>	Karlstad University; Karlstad University; Centre of Natural Hazards & Disaster Science (CNDS); Uppsala University; Royal Melbourne Institute of Technology (RMIT)	2021	
Patarlageanu et al.	Bibliometric analysis of the field of green public procurement	<i>Amfiteatru Economic</i>	Bucharest University of Economic Studies	2020	
Preuss	Addressing sustainable development through public procurement: The case of local government	<i>Supply Chain Management: An International Journal</i>	University of London; Royal Holloway University London	2009	X
Preuss and Walker	Psychological barriers in the road to sustainable development: Evidence from public sector procurement	<i>Public Administration</i>	University of London; Royal Holloway University London; Cardiff University	2011	X
Rejeb et al.	Mapping the knowledge domain of green procurement: A review and bibliometric analysis	<i>Environment Development and Sustainability</i>	University of Rome Tor Vergata; Universite de Carthage; Sheffield Hallam University; University of Sussex	2023	X
Stefanovic	SDG performance in local organic food systems and the role of sustainable public procurement	<i>Sustainability</i>	Universitat Kassel	2022	
Treviño-Lozano	Sustainable public procurement and human rights: Barriers to deliver on socially sustainable road infrastructure projects in Mexico	<i>Sustainability</i>	University of Greenwich; Universidad Panamericana—Ciudad de Mexico	2021	X

Authors	Article title	Source title	Affiliations	Publication year	Selected
Tsai	Green public procurement and green-mark products strategies for mitigating greenhouse gas emissions-experience from Taiwan	<i>Mitigation and Adaptation Strategies for Global Change</i>	National Pingtung University Science & Technology	2017	
Wang et al. 2018	A systems approach for green public procurement implementation	<i>Journal of Public Procurement</i>	Renmin University of China; Missouri State University; Tennessee State University	2020	X
Wang et al.	Green public procurement as a promoter for green consumption: From the perspective of individual's knowledge	<i>Cleaner and Responsible Consumption</i>	Southwest Jiaotong University; Xihua University; Qingdao University of Technology	2021	
Willar et al.	Sustainable construction practices in the execution of infrastructure projects: The extent of implementation	<i>Smart and Sustainable Built Environment</i>	Not mentioned	2021	
Zhang et al.	Managing sustainable public procurement: A nationwide survey in China	<i>Sustainability</i>	Maastricht University	2022	X
Zhu et al.	Motivating green public procurement in China: An individual level perspective	<i>Journal of Environmental Management</i>	Dalian University of Technology; Chinese Academy of Sciences; Shenyang Institute of Applied Ecology, CAS; Clark University	2013	

APPENDIX B

B.1 | INFORMATION COLLECTED FROM EACH ARTICLE

The type of information	Definition	Items/categories
Qualitative/quantitative	A qualitative article follows 'an iterative process in which improved understanding to the scientific community is achieved by making new significant distinctions resulting from getting closer to the phenomenon studied' (Aspers & Corte, 2019, p. 8). A quantitative article conducts quantitative research which 'is the process of collecting, analysing, interpreting, and writing the results of a study' (Creswell, 2002, p. 3).	Qualitative, quantitative, mixed
Methods	Methods is defined as follows: 'Quantitative and qualitative research methods investigate and explore the different claims to knowledge and both methods are designed to address a specific type of research question' (Williams, 2007, p. 6).	Questionnaire, interview, focus group discussion, content analysis, literature review, and observations
Unit of analysis	A unit of analysis is any item from which data can be collected and measured.	Government, regional authorities, local municipalities, state-owned companies, public institutions (i.e., hospitals, universities), and other entities.
Source of information	Defined as how the researcher gathered the data analysed in the article. Primary data (collected from the researcher) and secondary data (already collected by a third-party) were included as sources of information.	Primary, secondary, and both
Theoretical framework	Defined as follows: 'Theoretical framework is the structure that can hold or support a theory of a study' (Swanson & Chermack, 2013, p. 122).	Description
Sample size	The number of individuals included in a research study to represent the population is defined.	Numerical
Population	A population is the entire group on which conclusions are based.	Numerical
Geographical scope (country analysis)	Countries or regional scope analysed in the research.	Name of country or region (i.e., study on Europe)
Identification of drivers (factors)	Defined as 'something that makes other things progress, develop, or grow stronger' (Combley, 2011, p. 259).	Description
Identification of barriers (factors)	Defined as 'something that prevents something else from happening or makes it more difficult' (Combley, 2011, p. 63).	Description
Future research (proposed by the different authors)	Recommendations or areas of investigation suggested by various authors for further study and exploration in a particular field or topic, aimed at expanding knowledge, addressing gaps, and advancing the understanding and practises in that area.	Description

APPENDIX C

C.1 | OVERVIEW OF PREVIOUS GPP RESEARCH AND KEY
MESSAGES

	Category overview	Key messages
Methods	<ul style="list-style-type: none"> Qualitative (45.8%) Quantitative (41.6%) Mixed qualitative/quantitative (7.2%) Literature review and bibliometric analysis (5.4%) 	<p>Qualitative</p> <ul style="list-style-type: none"> <i>Case study</i>: 20% out of the overall number of studies used a single case study, mainly through <i>interviews</i> (Kristensen et al., 2021; Mendonça et al., 2021; Palm & Backman, 2017; Sparrevik et al., 2018); but less commonly through <i>content analysis of documents</i> (Aldenius, 2018; Alhola et al., 2019). Only one case study was combined with a <i>survey</i> (Braun et al., 2018). <i>Multiple case studies</i>: A few studies adopted multiple case studies (i.e., Mercado et al., 2016; Vluggen et al., 2019, 2020). <i>Narrative approach</i>: Other authors, e.g., McCrudden (2004) and Rainville (2017), adopted a narrative approach, aimed at mapping exercises. Melissen and Reinders (2012) and Melon (2020) also used a narrative approach, but for critical assessment. <i>Delphi</i>: Finally, Wang et al. (2020) used the Delphi methodology, and Tukker et al. (2008) summarised a policy brief. <p>Quantitative</p> <ul style="list-style-type: none"> <i>Survey</i>: most adopted quantitative methodology (20.7% out of the overall studies). <i>Analysis of observations</i>: 14% out of the overall studies. <i>Case study approach</i> with the use of secondary data: (Alvarez & Rubio, 2015; Anthonissen & Braet, 2016; Badell & Rosell, 2021; Biberos-Bendezu et al., 2021). <i>Descriptive analysis</i>: van Berkel and Schotanus (2021). <p>Mixed qualitative/quantitative</p> <ul style="list-style-type: none"> Quali-quantitative mixed approach used case studies, interviews, surveys, focus groups, and primary and secondary data: Aragão and Jabbour (2017) used quantitative data and also conducted telephone interviews to supplement their data; Aldenius et al. (2022) supplemented interviews with content analysis; Kleine and Brightwell (2015) adopted both a survey and focus group; Testa et al. (2016) adopted content analysis. <p>Literature review and bibliometric analysis</p> <ul style="list-style-type: none"> <i>SLR</i>: Molin et al. (2018); Adjei-Bamfo et al. (2019); Guarnieri & Gomes (2019); Chersan et al. (2020); Cheng et al. (2018) <i>Literature review</i> (not SLR): Andryiwkiewicz (2012), de Leonardis (2011); Hafsa et al. (2021). <i>Bibliometric analysis</i>: Pătărlăgeanu et al. (2020); Torres-Prunonosa et al. (2021); Wang et al. (2018).
Source of information	<ul style="list-style-type: none"> Primary data (47.7%) Secondary data (48.2%) Mixed approach (4.5%) 	<ul style="list-style-type: none"> <i>Unit of analysis</i>: the majority focused on the analysis at the <i>national level</i> (73 out of 201), including ministries, governments, and national agencies. The second most represented category was the <i>local level</i> (50), while few studies focused on the <i>educational level</i> (11), <i>regional level</i> (12), and <i>supranational level</i> (8) (i.e., EU, UN, global, etc.) Residual categories: <i>hospitals</i> (Oruezabala & Rico, 2012); <i>firms</i> (Nikolaou & Loizou, 2015; Ryu & Sueyoshi, 2021); <i>state-owned companies</i> (Adjei-Bamfo & Maloreh-Nyamekye, 2021; Al Nuaimi & Khan, 2019; Aritua et al., 2009).
Theoretical framework, hypotheses, and sample	<ul style="list-style-type: none"> 19% based on a theoretical framework Exploratory studies Small number of survey participants 	<ul style="list-style-type: none"> Only 40 of the 201 documents were based on a <i>theoretical background</i>, with n. 6 on institutional theory (i.e., Ahsan & Rahman, 2017; El Haddadi et al., 2021). Only 39 of 201 documents tested their <i>proposed hypotheses</i>, working mostly with an exploratory approach. Only 49 of the 201 documents had samples of more than 200 cases, suggesting that many studies used <i>small sample sizes</i>. (i.e., Badell & Rosell, 2021; De Giacomo et al., 2019).
Geographical focus	<ul style="list-style-type: none"> 48% EU Other countries studied UK, the US, China, Japan, and Brazil 	<ul style="list-style-type: none"> <i>EU</i>: Sweden (23 articles, 12%) was the first country studied in the EU but also worldwide, together with the UK. This is due to some early movers (Nissen et al., 2009; Parikka-Alhola, 2008) that have been frequently cited, but also to the consolidated interest by other authors during the last decade (e.g., Bratt et al., 2013; Lundberg et al., 2015; Uttam & Roos, 2015; Bryngemark et al. (2023). <i>Italy</i> (16 articles, 8.7%), is the second EU country (and the fourth worldwide). The early movers in Italy began some years later than in the UK and Sweden, but before the U.S. (Appolloni et al., 2011, Tarantini et al., 2011; Testa et al., 2012).

(Continues)

Category overview

Key messages

Compared with other countries, Italy has been the focus of several studies on its own and not in comparison with other countries. Regarding the *Netherlands* (12 articles, 6.5%), apart from an early mover (Melissen & Reinders, 2012), all articles were published between 2015 and 2022 (e.g., Grandia, 2016; Grandia & Voncken, 2019; Eikelboom et al., 2018; Vluggen et al., 2020). *Spain* (11 articles, 6.0%) has been recently targeted by some scholars, with a focus on university procurement (e.g., Fuentes-Bargues et al., 2018; Pacheco-Blanco & Bastante-Ceca, 2016). Finally, other countries have also been studied, such as *Finland* (2.7%), *France* (2.2%), *Germany* (2.2%), *Romania* (1.6%), *Belgium* (1.6%), and *Latvia* and *Hungary*. *Poland* is closing the gap, with an n.1 study in 2023.

- *UK* (10%): has been targeted since the beginning, with the first mover studies by Walker & Brammer, 2009, 2012—see also Brammer & Walker, 2011), Preuss (2009), and Preuss and Walker (2011). The interest in sustainable procurement continued to grow in the following years (i.e., Alhola et al., 2019; Baranovsky et al., 2020).
- *USA* (9%): several scholars concentrated on national (Lingegård et al., 2021) and local government levels (Stritch et al., 2020). Most studies have been conducted in the last 5 years (2018–2022 (e.g., Blount et al., 2019; Chen, 2021; Dimand, 2022; Orsatti et al., 2020).
- *China* (5%): was ranked fourth, and, apart from some early scholars (Ho et al., 2010; Zhu et al., 2013) most of the studies were concentrated in a period of 3 years (2019–2021).
- *Brazil*: where most articles (7 out of 9) were published from 2017 to 2021.
- *African continent*: is also the focus of increasing interest, especially in *South Africa* (i.e., Agyepong & Nhamo, 2017; Harland et al., 2019) and *Ghana* (i.e., Adjei-Bamfo & Maloreh-Nyamekye, 2021; Asiedu et al., 2021; Este et al., 2021). A special mention to a high-impact study focused on South Africa (McCrudden, 2004).

APPENDIX D

D.1 | SUMMARY OF FACILITATORS AND BARRIERS TO GPP

Factor	Facilitators /barriers	Component	References	Factor	Facilitators /barriers	Component	References
Political	Facilitators	Government commitment and expectations	Wontner et al. (2020)	Organisational	Facilitators	Environmental training and environmental management	Aragão and Jabbour (2017), Leger et al., (2013), Pacheco-Blanco and Bastante-Ceca (2016)
		Clear political vision and an adequate basis for decision-making	Lundmark et al. (2021)			Organisational leadership in environmental, human rights, philanthropic, and safety issues	Bansal and Roth (2000)
		Clear policies	Palm and Backman (2017)			Management support	Vluggen et al. (2020)
		Presence of effective social and environmental laws and rewards and recognition associated with compliance	Adjei-Bamfo et al., (2020); Liu et al. (2021)			Resources, awareness levels	McMurray et al. (2014)
		National objectives	Lindfors and Ammenberg (2021)			EMAS/ISO 14001, information and training initiatives, awareness of technicalities	Chiarini and Vagnoni (2016), Testa et al. (2012, 2016)
		Support from executive leadership and political system, liberal orientation of community	Rodriguez-Plesa et al. (2022)			Large size	Chiarini and Vagnoni (2016), Michelsen and de Boer (2009), Rosell (2021), Testa et al. (2012, 2016)
		Including environmental award criteria in public tenders	Anthonissen and Braet (2016); Parikka-Alhola (2008)			Institutional innovativeness	Roman (2017)
		Use of citywide purchase contracts	Leal et al. (2020)			Rewards and incentives	Zhu et al. (2013)
		Standardisation	Rainville (2017)			Carbon footprint	Tsai (2017)
		Centralisation	Roman (2017)			Multidisciplinary teams	Leger et al. (2013)
	Barriers	Lack of a legal framework on sustainable procurement	Treviño-Lozano (2021)		Barriers	Implementation of support mechanisms	Erridge and Hennigan (2015)
		Lack of clear guidelines and regulations for GPP integration in procurement process	Adjei-Bamfo and Maloreh-Nyamekye (2021)			Compliance with EU procurement directives	Erridge and Hennigan (2015)
		Political opposition and corruption	Treviño-Lozano (2021)			Institutional conflicts	Mercado et al. (2016)

(Continues)

Factor	Facilitators /barriers	Component	References	Factor	Facilitators /barriers	Component	References
		Lack of evaluation and recognition, bureaucracy	Rosell (2021)			Priority conflicts	Walker and Brammer (2009)
		Decentralised purchasing structures, especially if decentralisation is excessive	Leal Filho et al. (2019); Placek et al. (2021).			Resource limitations, performance measurement, and supply and demand issues	Hasselbalch et al. (2014).
		Centralisation	Stritch et al. (2020); Hsueh et al. (2020)			Lack of policy and guidelines	Walker and Brammer (2009)
		Financial constraints	Brammer and Walker (2011); Treviño-Lozano (2021)			High costs of sustainable goods	Walker and Brammer (2009)
		Cultural factors; perceptions of disconnection within the public sector	Delmonico et al. (2015)			Inadequate knowledge of available options	Leal Filho et al. (2019)
Stakeholders	Facilitators	Support	Oruezabala and Rico (2012)	Individual	Facilitators	Gender (women) or age (older person)	Keulemans and Van de Walle (2017)
		Social acceptance of sustainability	Keulemans and Van de Walle (2017)			Public officers' culture	Preuss (2009)
		Comprehension of related benefits from GPP	Lingegård et al. (2021)			Individual commitment	Brammer and Walker (2011)
	Barriers	Lack of knowledge and skills; lack of technical capacity.	Adjei-Bamfo and Maloreh-Nyamekye (2021), Treviño-Lozano (2021)			Moral/ethical motivations, and educational background	Leal Filho et al. (2019) Nikolaou and Loizou (2015)
		Incomplete awareness or knowledge	Testa et al. (2016)		Barriers	Risk aversion	Prier et al. (2016)