

Smart cities and Sustainable Development Goals – Barriers in the process to sustainable public procurement

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SUMMARY

A literature review on the barriers that hinder the implementation of sustainable public procurement (SPP) in different environments. Smart cities are not just technological cities, they must also be sustainable and value the optimization of resources, so that it is possible to ensure sustainable production and consumption patterns. This article aims to contribute to the survey of future research on the topic. Sustainable public procurement is part of the Sustainable Development Goals (SDGs), specifically SDG 12 - Sustainable Consumption and Production, in addition to the fact that it is one of the goals of the United Nations. Therefore, the implementation of SPP by governments throughout the world is necessary, standardized specifically according to the legislation of each country. Results indicate that there are several barriers aligned to SPP, often recurring for both public managers and suppliers. However, in the recent years, several countries have been adapting to the new agenda.

KEYWORDS: Smart and sustainable cities; Sustainable public procurement; Sustainable urban development.

1 INTRODUCTION

Nowadays, cities seek to achieve the production and circulation of knowledge in an ecologically conserved, safe, fair and well-governed human environment (YIGITCANLAR, 2011). The concept of the Smart City does not have a specific definition, result of interdisciplinarity and conceptualization. The relation between the definitions of smart and sustainable is widely discussed in universities, since there is a tendency in which being smart is not always associated with sustainability (AHVENNIENI et al., 2017).

The concept of “smart cities” is constantly associated with the solution of urban problems by means of technology and innovation (TRINDADE et al., 2017). However, technology cannot be the only characteristic of “smart cities”. Cities should be considered intelligent when it is also invested in the growth of human, social and environmental capital that generates sustainable urban development (CARAGLIU; DEL BO; NIJKAMP, 2011; CARRILLO, et al., 2014).

Although there is still no consensual and widely accepted definition on the subject, it is believed that smart cities are related to environmental concerns, but in reality, most of the times it is associated exclusively with technology (YIGITCANLAR, 2016). Yigitcanlar et al. (2019), states that for a city to be considered smart, it must also be sustainable. The goal of smart cities is to promote better use of public resources, increasing the quality of the services offered to citizens, while reducing the operational costs of public administration (ZANELLA et al., 2014).

A way to optimize spending on public resources is through Sustainable Public Procurement - SPP, which was recognized through Agenda 21 and Chapter III of the “Johannesburg Plan of Implementation” as one of the responsible instruments for achieving sustainability. Furthermore, the topic was considered as essential and / or primordial for all regions during the 19th session of the Commission on Sustainable Development, which took place in New York City in 2011, and was identified as an instrument for the realization of the sustainable production and consumption policy and transition to a green economy by the report related to the Green Economy, released by UNEP (UNEP, 2012).

The concept of sustainable procurement is receiving an increasing level of attention both locally and globally, as well as by academics and industry professionals. Impacts and benefits of SPP practices have been an important research agenda since 2002, as it has been considered a conduit for creating value for an organization (BOBIS; STANISZEWSK, 2009)

transforming markets, increasing the competitiveness of eco industries, saving money, protecting natural resources and promoting job creation, which, in turn, will contribute to sustainable development. (ISLAM et al., 2017).

The discussion on the topic of sustainable public procurement started by analyzing the relations between the public and private sectors. Authors such as Van Hoof and Lyon (2013) defend the use of the public procurement process by the government, to encourage sustainable practices in private companies. Existing research on sustainable public procurement was identified by Testa et al., (2016) on the public procurement process.

Sustainable public procurement is “a process by which organizations meet their needs for goods, services, constructions and utilities, in a way that obtains a good cost-benefit ratio on a lifetime basis in terms of generating benefits. It is not only for the organization, but also for society and the economy, minimizing damage to the environment” (United Nations Environment Programme [UNEP], 2011). Sustainable public procurement is one of the goals of the UN Sustainable Development Goals - SDGs. In the quest to ensure sustainable production and consumption patterns, nations should seek to promote SPP, in line with national policies and priorities. The SDG in question is 12 and goal 7.

SPPs seek to achieve, through the state's purchasing power, the inclusion of social, environmental and economic aspects (WALKER; BRAMMER, 2009). Its implementation depends on legal provision, public management initiatives and market adaptation in a multidimensional perspective. (FREITAS; VILLAC, 2019).

The purchasing power behind SPP adoption is one of the most proactive ways for governments to engage in sustainability. However, the adoption of these policies varies considerably between local governments (PRIER; SCHWERIN; MCCUE, 2016).

According to Biderman et al., (2008), public purchases represent a substantial portion of the national and also international economy. Government consumption of goods and services is estimated to be around 8% to 25% of a nation's gross domestic product (GDP). According to data from the European Commission (2016), government costs for civil constructions, goods and services represent around 14% of the European Union's GDP. In developing countries, such as Brazil, SPPs can represent about 20.2% of GDP (IBGE, 2016).

In light of this, it is relevant to explore the relation of Sustainable Public Procurement as a sustainable instrument in the composition of smart cities. Thus, this article focuses on this theme and, based on a literature review, seeks to answer the question: what are the barriers to the implementation of Sustainable Public Procurement to reach the SDGs in smart cities?

2 OBJECTIVES

Through a literature review, this article aims to present and discuss the main barriers to implement SPP in achieving the Sustainable Development Goals in smart cities.

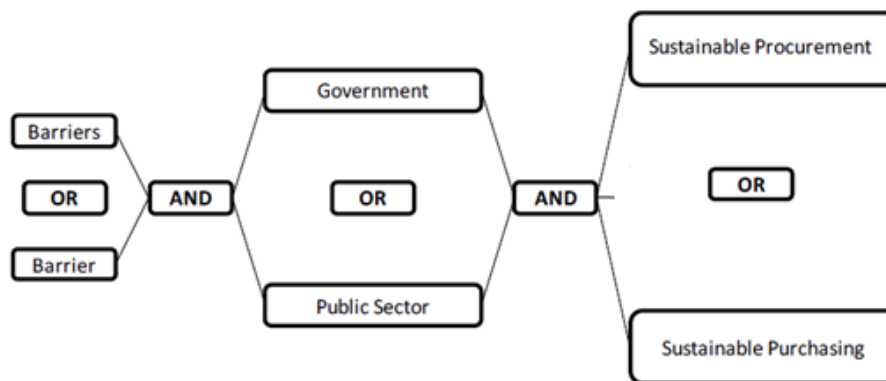
3 METHODOLOGY

A systematic search procedure for articles on the topic was conducted, in order to search for specific academic works and the consequent positioning of this research in the state of the art of SPP. The research sought to determine what has been produced in the academic

literature worldwide, in order to contextualize the hereby article. Thus, the data collection was systematized to allow observation of works in which the specific theme would be barriers to sustainable public procurement.

The database chosen was Scopus (www.scopus.com), which brings together a wide database, and makes it possible to search for articles in several journals with a calculated impact factor, which go through reliable criteria for indexing and approval, especially in the field of Social Sciences (HARZING; ALAKANGAS, 2016; MONGEON; PAUL-HUS, 2016). The terms inserted in the search are simplified in Figure 1.

Figure 1 - Graphical representation of keywords and operators in advanced search



Source: adapted DELMÔNICO, 2017

The Scopus tool allows searches to be carried out in two ways, normal and advanced. Normal searches (Document Search) are focused on small expressions or simple words, while advanced searches (Advanced Search) allow more complex word chains. In the hereby article, advanced research was adopted.

As shown in Figure 1, the keywords were presented - “(barriers AND barrier) AND (government OR public sector) AND (sustainable procurement OR sustainable purchasing)” returning a result of 2,582 articles, including book chapters, articles, publications in annals of congresses, among others. The result was refined by Scopus itself to show only the results containing “Articles” and “Reviews” offering a result of 2081 articles.

The next criterion adopted meets the disciplinary area - in this case, it was considered only files inserted in the fields of Environmental and Social Sciences (HARZING; ALAKANGAS, 2016; MONGEON; PAUL-HUS, 2016), reducing to 914 documents. The results were organized, from the highest to the lowest number of citations, observing together those of greatest relevance to the platform. The abstracts and themes that best fit the research proposal were also analyzed, reaching the number of 48 articles. The main results will be presented.

4 RESULTS

4.1 BARRIERS TO SUSTAINABLE PUBLIC PROCUREMENT

The literature has already identified several obstacles to the adoption of public procurement practices: costs and resource constraints (PREUSS, 2007), low levels of awareness, decentralized purchasing structures, time pressures, conflicting priorities, lack of commitment from top management (MCMURRAY et al., 2014) and a strict leadership style of the main executives of an organization (ROMAN, 2017), availability and variety of goods and services produced in a sustainable way and challenges to identify sustainable sources of supply (WALKER; BRAMMER, 2009; BRAMMER; WALKER, 2011; YOUNG et al., 2015), lack of a common definition of the term sustainable purchases and absence of mandatory guidelines (GORMLY, 2014).

Assessing the process and indicators of sustainable public procurement is not a simple matter, in fact, Ahi and Searcy (2015) carried out a research through a structured analysis of the literature that sought to raise metrics of green and sustainable supply chains. The author found a lack of consensus on such metrics and proposed a conceptual framework for their development.

The barriers according to Tay et al. (2015), can be strategic (for corporate strategy) and functional (internal policies), or as Walker et al. (2008) shows, related to the internal organization (desire to reduce costs, level of leadership commitment and employee involvement) and external (for example, regulatory restrictions and customer demands).

Helen Walker and Stephen Brammer, in joint research, carried out two studies with a direct approach to SPP. The first of them was a survey on sustainable public procurement in the United Kingdom (WALKER; BRAMMER, 2009), in which a survey was used to investigate SPP practices in general, also carrying out an assessment of barriers in the opinion of English public managers through an open questionnaire. This research was widely accepted in the academic community, which often used the barriers identified in this study as a starting point for new academic work. The authors found a relation between education and environmental aspects, in addition to the fact that cost would be a decisive barrier to SPP, while support from public administration would be a facilitator.

Table 1 - Main barriers to sustainable public procurement - original text

Barriers	
Cost/Price	Quality Criteria
Awareness (Lack Of)	Supplier availability/awareness
Lack Resources	Lack Political Support
Lack Budget	Time Pressure
Decentralized/Devolved	Lack Guidance
Conflicting Priorities	Product Availability
Perceptions of Cost	Lack Pressure to Act
Attitude Culture	Election Cycle
Lack long-term view	Lack of Contract Management
Lack Top management commitment	Conflicting Environmental/social factors

Source: Walker and Brammer (2009), original text

Basically, barriers can be divided into categories, as shown in Chart 1 and explained below (WALKER; BRAMMER, 2009; BRAMMER; WALKER, 2011; YOUNG ET AL., 2015; PREUSS, 2007; MC MURRAY ET AL., 2014):

- Price and Perception cost - Environmentally friendly products and services for management tend to be more expensive than the others.
- Awareness - Refers to the low levels of awareness of public managers.
- Lack of resources or Lack of budget - Budget cuts become obstacles.
- Decentralization - The decentralized purchasing structure in the public sector can represent a problem.
- Conflicting priorities - The sustainable aspect must be assessed, but at certain times, social or economic aspects will take precedence, as will the processes of non-requirement for holding a bid faced with the Covid-19 pandemic.
- Lack of vision - Planning in the medium and long term.
- Lack of commitment by top management - Recognition that sustainability is a condition of the present and the future, and that SPP must be incorporated into the procurement processes and procedures.
- Supplier availability - Supplier of goods and services, may not have or be unfamiliar with the inputs based on sustainability criteria.
- Lack of political support - Standardization and instrumentalization of sustainability criteria. It varies according to the State inserted in the SDGs.
- Time pressure - Quick need to purchase a certain product, where promptness precedes sustainable. This barrier is often perceived in conjunction with "conflicting priorities".
- Lack of guidance / training - Public managers who are not trained are unlikely to adopt SPP, so the constant training of the purchasing team is necessary.
- Electoral cycle - Incentives in each government aimed at sustainability or not. It varies according to each country that is included in the SDGs.

A few years later, another article was developed by Walker and Brammer (2011), in which it was carried out an analysis with a survey of 280 public sector procurement agencies worldwide, in order to assess differences in approach to SPP and the barriers and facilitators they report. They found that the nature and extent of SPP practices vary across regions and highlight the most important barriers and facilitators, such as national policy environment and organizational contextual factors.

Not enough, Walker, together with Professor Lutz Preus (PREUSS; WALKER, 2011), carried out a study where the psychological factors for effective SPP action were presented as difficulties, being them: 01) individual factors of a cognitive and affective nature that interact with (2) organizational factors, such as management control, organizational structure and organizational culture. In turn, the interaction of these barriers is formed by (3) adaptation processes in small work groups, which can provide anchoring for individuals, but also produce pressures for compliance. The adaptation of processes in the organization, such as internal resistance and coordination problems in large decentralized organizations and also (5) the adaptation processes between organizations, composed of a series of isomorphic pressures,

problems of horizontal coordination between different public and vertical organisms among the various members of the public sector supply chain.

Delmônico (2018) in his research points out that cultural barriers constitute a significant barrier to sustainable public purchases, in addition to the fact that the disarticulation of the public sector in relation to planning, organization, direction and control is also a major obstacle. Several studies point in the same direction - acquisition costs, budget constraints and organizational culture are critical barriers to SPP implementation (ZHU ET AL., 2013; BRAMMER; WALKER, 2011; WALKER; BRAMMER, 2009).

In the same understanding, Gelderman et al., (2019) evaluated the influence of five external forces, which are, 'legal forces', 'political forces', 'market forces', 'social and economic forces' that would be obstacles to sustainable public procurement. It was noticed by the researchers, with some exceptions, that legal and financial responsibility still prevails over responsibility for performance in order to achieve sustainable public contracts. Sustainability gets attention, but the real effects are not easy to monitor.

It was part of the hereby results, a study by Hasselbalch, Costa, and Blecken (2014) at the United Nations - UN, where the objective was to assess the perception of the most important barriers to be overcome for the implementation of SPP at the UN. The most important barriers were identified in relation to resources (especially training needs and lack of internal experience), performance measurement and supply and demand issues.

Arbjørn and Freytag (2012), who studied the possibilities of mutual learning between the public and private sectors through the bibliographic evaluation of sustainable public procurement and public-private partnerships.

Finally, another study on SPP barriers was carried out by Sajjad, Eweje, and Tappin (2015), seeking to analyze suppliers, instead of the public sector, of sustainable public purchases, in this case companies. In this research, factors that motivate suppliers to adopt sustainability criteria and which barriers would be present in the process were evaluated. The authors categorized sustainability motivators into internal and external (for example, WALKER et al., 2008). Internal sustainability motivators were divided into two subcategories: instrumental and regulatory drivers. The first "assumes that the corporation is an instrument of wealth creation as a strategic tool for the promotion of economic objectives" (JAMALI, 2008, p. 219), while normative motivations, on the other hand, are governed by ethical values and morals of the owners / managers of a company (Donaldson and Preston, 1995). External motivators, on the other hand, market drivers (consumer), government (legislation) and social factors (civil society organizations and media) can trigger organizational proactivity to improve sustainability (CHKANIKOVA; MONT, 2015).

The results of the study revealed that there are several motivators and barriers to the implementation of sustainable products. The ethical values of senior and risk management are the main internal reasons for companies to adopt this approach. Concerned parties' expectations and pressures were reported as external factors that motivate companies to adopt sustainable inputs. On the other hand, the lack of awareness and negative perceptions were internal barriers to the implementation of sustainable products and services, while problems of suppliers, lack of government and customer support are revealed as external barriers to the strategy of supplying sustainable inputs. (SAJJAD; EWEJE; TAPPIN, 2015).

Still on the bias of the supplier of sustainable inputs to the public sector, it was found that in emerging economies, the main barriers are linked to the lack of commitment from top management and complexity in the supply chain, lack of customer demand for sustainable products, weak governmental regulatory system, lack of promotion of sustainable products, and technical obstructions are the important commonly accepted barriers to adopting the supply chain (TUMPA et al., 2019).

4.2 SUSTAINABLE PUBLIC PROCUREMENT IN THE WORLD

Around the world, several countries have already adopted SPP in their acquisition processes. Gelderman et al. (2017), sought to understand the actors and factors that influence the speed of implementation of sustainability initiatives in hospitals in the Netherlands, it was evident the influence of senior management in the implementation of sustainable acquisitions and contracts. Other factors, such as the communication between purchasing professionals in support of senior management and technical training on the subject, were of great value.

In turn, in Saudi Arabia, the completion of a study, identified that all parties involved in the procurement process must be engaged in the SPP process. The government could overcome financial, regulatory and political barriers (WALKER; BRAMMER, 2009). While on the other hand, companies have a responsibility to establish guidelines for implementation, training and awareness (ISLAM et al., 2017).

In a second study, (BRAMMER; WALKER, 2011), the authors present sustainable procurement practices in the public sector of 20 different countries, noticing differences in each region of the world - also presenting the main facilitators and barriers on the subject. Another author who founded the barriers in England was Morgan (2008), who also assessed the scope and barriers to sustainable public procurement in that country.

McMurray et al. (2013), adopted the barriers proposed by Walker and Brammer (2009), represented in Chart 1 to assess opportunities and barriers in organizations in a study in Malaysia. Based on a survey with public and private managers in this country, it was found that the lack of awareness represented the most significant barrier to the implementation of sustainable procurement, regardless of the organization or sector. Continuing with studies in Asia on the subject, Ho et. al (2010), showed that the Hong Kong government's involvement in sustainable procurement directly influences its effectiveness.

China, on the other hand, has developed a lot during the last decades with a policy of encouraging industrialization. Everything happened without a sustainable planning scheme, which brought serious environmental problems. China in the last decade was embryonic in terms of SPP and sustainable inputs, due to the fact that sustainable government procurement policies were not absorbed by managers, but has been developing over the time with the awareness and efforts of the government, industry and universities (GENG Y.; DOBERSTEIN B., 2008).

In Latin America there is a limitation of studies on the subject, according to (FAHRNIMIA et al., 2015; WALKER et al., 2012), which also raises scientific interest on the possible barriers that may be an obstacle to the more prominent development of sustainable public procurement initiatives. Evidence suggests that, in less developed countries, the

implementation of SPP practices in public organizations has considerably low acceptance (ISLAM et al., 2017).

Because of the new environmental laws and governance systems (JABBOUR et al., 2014), Brazil has been striving to align the public sector with sustainability. In the last decades, there have been several significant government efforts (programs, normative instructions, laws) to expand sustainability initiatives (DELMÔNICO, 2018).

Couto and Ribeiro, (2016) categorized barriers to the implementation of SPP in Brazil, which are: institutional aspects; knowledge and information; and economic aspects. Such categories show the path to be followed for the effective implementation of sustainable public procurement in the country. It is worth mentioning that, unlike the other authors, the point of greatest prominence refers to “knowledge and information”, since in the authors' view there are sufficient information instruments, but it comes up against the lack of interest or the technical capacity for correct use .

Despite the considerable increase in sustainable public purchases in Brazil in recent years, there is still a concern that few public purchases made in the country incorporate any sustainability criteria (OLIVEIRA; SANTOS, 2015).

In the specific case of Brazil, Oliveira and Santos (2015) states that the Brazilian State has contributed incipiently to sustainable development, through the SPP. Finally, they point out beyond the barriers pointed out by Walker and Preus (2011), the large number of corruptions in bidding, and highlight the need to improve the inspection method.

5 CONCLUSIONS

This article presented, through a literature review, a theoretical basis on the barriers of sustainable public procurement in reaching the SDGs. Within the reviewed studies, the importance of the studies by Walker and Brammer, McMurray is evident. Among these, Walker and Brammer (2008; 2009; 2011) when mapping the barriers as shown in Table 1, became a reference in the subject, with their studies replicated or the barriers confirmed. Thus, the main barriers that were perceived on a recurring basis, in the various contexts presented are those related to: 1) high cost, 2) training of the elements involved and; 3) incentives from top management.

The high cost stems from the fact that sustainable production methods can be more expensive than conventional ones, in certain cases it is not the reality, but it remains a cultural aspect. The possibility of existing budget restrictions - a cost factor - remains an important barrier that cannot be overlooked in the purchase process. The lack of knowledge or training of those involved was constantly present, where in several surveys the employees responsible for the acquisition process were not familiar with the sustainability criteria to be inserted in public purchases - Training and improvement are necessary. Finally, the leadership's lack of incentive also presented itself as a constant obstacle, except when present in some European countries, becoming a facilitator. When senior management is not interested in the sustainability aspect, it becomes even more difficult to stimulate and mobilize other stakeholders, or even lead to the fatigue of employees who are supportive or encouraged to SPP, when they realize that their work depends or is hampered by the decision top element. The future is challenging, with the SPP goal as an opportunity to change paradigms in the

perspectives of administrators and public policy makers, only then, cities can become sustainable and truly intelligent.

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