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Sustainable performance measurement in public sectors: A systematic literature review

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Abstract: This paper provides a systematic review of the literature on how sustainable performance is measured and reported in the public sector. Analyzing 22 studies published in a period of 5 years (2017-2021), the author addresses two simple but meaningful questions, that is how the recent stream of literature on environment sustainability is reported in the public sector and what the common measurement methods for the phenomenon are. The findings indicate that public organizations mostly choose to adopt the Global Reporting Initiative (GRI) to report their sustainable or environmental performance; and given the crucial role, researches on environmental and sustainable performance of public sectors are still lagging behind compared to the private sectors. The author also proposes several insights for public organizational performance improvement.

Keywords: Sustainability performance, sustainable development, sustainable report, public sector, public organization.

1. Introduction

Both the public and private sectors have the same responsibilities to environmental, social and economic activities (Ball et al., 2009). In the last decade, there have been increasing concerns about sustainable practices in public organizations. Topics such as sustainable measurements, stakeholder interests, accountability and transparency of public organizations are most studied (García-Sánchez et al., 2013; Marx & Van Dyk, 2011; Lynch & Mosbah, 2017). However, the sustainability theme in the public sector seems to greatly lag behind that in the private sector (Domingues et al., 2017; Dumay et al., 2010; Guthrie & Farneti, 2008). As a result, it is important to assess environmental and sustainable performance in the public sector, which are still at an early stage and under-developed.

In this article, the public sector can be understood as the organizations "under

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government control that develops public goods or services" (OECD, 2015). This article has been mainly inspired by mapping existing literature on environmental sustainability in public sectors to find out the common measurement methods of sustainability. The author also looks at some other aspects of the recent literature review; e.g., main drivers for corporate sustainability in public sectors and in which level (central or local government) they are measuring sustainability. In general, there are fragmented frameworks used as evaluation tools for the environmental and sustainability performance of public sectors. Many of the frameworks are developed for specific domains of the public sectors or for institutional contexts (Lundberg et al., 2009; Ramos et al., 2021). However, most of them are based on the GRI. The GRI published a specific use of public sector organizations in 2005 (GRI, 2005) and a revised and updated supplement for public agencies in 2010 (GRI, 2010). Others are based on the United Nations (UN) such as the UN Millennium Development Goals, the UN Framework Convention on Climate Change, the UN Sustainable Development Goals (SDGs), and the International Framework of Integrated reporting and specific national frameworks to construct the sustainability indicators. Based on these frameworks, to assess the environmental and sustainability performance, the previous studies on public sectors use mainly three measurement methods including sustainability indicators (Mapar et al., 2017), sustainability reporting (Farneti & Guthrie, 2009a; Montecalvo et al., 2018; Navarro Galera et al., 2014) and environmental indicators (Myhre et al., 2013; Alpenberg et al., 2019).

At the present time, there is no one agreed worldwide standard or guideline. There are a number commonly used or referred to by organizations in selecting sustainability performance measures. The best known of these are the Sustainability Reporting Guidelines (GRI) or the Environment, Social and Governance Reports (ESG). From these standards, we can understand that sustainability performance in the public sector encompasses performance in connection with environmental activities, natural resource conservation and emission levels, aspects of employment, occupational health and safety, community relations, and stakeholder involvement (Adams, 2014). However, public organizations are different from private organizations in terms of the profit approach, ownership, accountability, competition, complexity and uncertainty (Ramos et al., 2021), and the motivations for sustainability are somehow different. Leaders and managers in public organizations are said to be driven by (i) operational management and governance (the company strategies) - the internal motivations and (ii) reporting demands made by stakeholders - the external motivations (Burritt & Schaltegger, 2010). Managers in the public sector are the most involved in the process of making sustainability reports and organizational leadership is identified as the main internal driver for sustainability decisions (Farneti & Guthrie, 2009b; Burritt & Schaltegger, 2010; Lozano, 2015). Scholars are making the sustainable issues become a hot topic on the table. Such that, it is very important for scholars to fulfill and improve the literature to give them more references to making sustainable decisions.

2. Methodology

The practices of disclosure of sustainability information and environmental sustainability performance by the private sector have insight studies. However, public sector awareness about these practices is still low. Therefore, this paper is particularly helpful to those researchers who are paying interest to the field. This systematic review follows the process recommended by Thorpe et al. (2005) and Pittaway et al. (2004) as the research design and methodology as the most suitable with our data and purpose.

First, we chose Scopus (Elsevier's abstract and citation database) as the research database since Singh et al. (2021) showed that the coverage of journals in Scopus is wider than that in the Web of Science. Particularly, around 99.1 per cent of the journals listed in the Web of Science are also listed in the Scopus. Second, we considered only journal articles, conference papers and book chapters published in English in the five years period (2017-2021).

The author used the search strings: "Public sector" or "public organization" or "government" and "sustainability indicator*" or "sustainability report*" or "sustainability measurement*" or "sustainability assessment".

This process yielded 127 papers. Next step, I scanned the abstract of all the articles in the previous phase to eliminate irrelevant articles and ensure substantive content. As a result, I found 43 papers in two categories relevant and maybe relevant in this phase. Finally, I controlled the relevance of the articles by reading carefully the text of all 43 articles and continued to remove the irrelevant ones. Finally, I got a sample of 22 studies to be analyzed.

3. A scope of recent literature

After having the final sample of 22 studies, I formulated an excel table to take note when deeply analyzing the paper contents which include the title, author, published year, journal, citations, type of paper, geographical area, theory, industry, sustainability measurement method, level of public organizations and the process of governance or management. The results are shown in Table 1.

Table 1: An outlet of recent literature

Journal	**Frequency**	**Percentage (%)**
Sustainability	4	18
Public Money & Management (PMM)	2	9
International Journal of Public Administration	2	9
Journal of Environmental Management	2	9
Other journals with low frequency	12	55
Year of publication		
2021	7	32
2020	5	22
2019	1	4
2018	6	27
2017	3	14
Geographical area		
EU	9	40
America	5	23
Asia	1	5
Other continents	7	32

Source: Author.

From Table 1, we can highlight some initial descriptive statistics. Specifically, the analyzed sample is composed of 22 studies published from 2017 to 2021, mainly in PMM, the International Journal of Public Administration and the Journal of Environmental Management. We also can see that the number of works every year are distributed unevenly. The number of articles published every year from 2017 to 2021 is around three to six or seven papers. Our results once again show that scholars' interest in the environment performance and sustainability reports of the public sector is still low (Dumay et al., 2010; Park & Krause, 2021) given that there is a growing need for information on governmental sustainability and an increasing demands by stakeholders for public organizations to exercise greater social responsibility (Coglianese, 2009).

Table 1 also presents article distribution per country/region. Almost all papers are conducted in the EU context with 40%, while 23% are in America (US, Brazil, Mexico or Canada). Less has been done in Asia, Oceania and Middle East.

4. Sustainable performance in public sectors

Using content analysis of the 22 papers, the author sees that the papers were studied along various sectors such as health care (Deepak et al., 2021), construction and infrastructure (Hoornweg et al., 2018; Yan et al., 2021), and university and government offices (Mauro et al., 2020), where the sustainable development and environmental performance are considered important (Sheinbaum-Pardo et al., 2012; Alves et al., 2021; Mauro et al., 2020). Terms like

"sustainable development" and "sustainability" of public sectors do not have a common understanding and clear explanation but are mostly given by authors based on specific industry characteristics or government context. The results in Table 2 reveal that the GRI is the most common approach for evaluating the sustainable and environmental performance of public sectors (Mapar et al., 2017; Moreno-Pires & Fidélis, 2012; Schlör et al., 2013). In this context, environment is the main area of interest with 50% of the papers choosing to adopt it as the criterion for measuring sustainable performance (Niemann & Hoppe, 2018a; Mapar et al., 2017; Alpenberg et al., 2019). Particularly, studies assess environment profile of Iran municipalities of megacities by using HSE (Health Safety and Environment) indicators (Mapar et al., 2017); Consumption based indicator - by Greenhouse gas consumption (Dawkins et al., 2021); "green city" or "smart growth" in US local government (Park & Krause, 2021) etc. However, those indicators are mostly built by the authors themselves for local government by means of surveys with short answer yes/no questions (Alpenberg et al., 2019, Mapar et al., 2017), by interviews with key report preparers or content analysis of multi-years integrated reports with dummy questions (Larrinaga et al., 2018; Montecalvo et al., 2018b). There are very few papers with secondary data or worldwide representative data and they tend to be imitative. The remained papers analysed sustainability using sustainability reports and integrated reports, based on stakeholders (Mauro et al., 2020; Park & Krause, 2021; Frare et al., 2020) or governance perspective. In general, we observed that fragmented frameworks are used as references to build the environmental and sustainability performance indicators for public sectors. Many of them were developed for specific domains of the public sectors and country contexts. However, most sets of indicators and reports are based on international official guidelines, such as the Global Reporting Initiative (GRI, 2005, revised and updated in 2010), the United Nations (UN) frameworks such as UN Millennium Development Goals, the UN Framework Convention on Climate Change, the UN SDGs, Integrated Report frameworks (IR) and specific national frameworks to construct the sustainability indicators.

Table 2: Sustainable measurement

Measurement methods	Frequency	Percentage (%)
GRI guidelines using environment criteria	11	50
Sustainable report	5	23
Other methods*	6	27

Note: *Sustainability indicators built by authors; or issued by government; or integrated report.
Source: Author.

5. Discussion of the results and implications

Although public sectors have been engaging more in sustainability by publishing reports or sustainable indicators, it is still in an early stage (Domingues et al., 2017). The scant number of empirical studies on the topic per year as shown in Table 1 means that further research is needed to fulfill and improve the literature concerning the sustainable performance in public sector regarding measurements and reports. This should be done not only using the qualitative method but focusing also on the quantitative approach to quantify the performance of environmental and sustainable of public organizations and evaluate the impact of environmental and sustainability of public sectors on society and the economy.

To date, Europe is at the forefront in engaging sustainability in public sectors (Niemann & Hoppe, 2018b). The EU is introducing far-reaching legislation addressing recent issues; for example, The Non-Financial Reporting Directive (Directive 2014/95/EU, October 22, 2014), amending Directive 2013/34/EU as regards disclosure of non-financial information (environment, social responsibility, human rights, anti-corruption and bribery, and diversity on company boards) and other international standards such as the UN

Global Compact, OECD Guidelines, ISO 26000, or the GRI for public-interest companies with more than 500 employers. The guidelines on non-financial reporting (2017) were produced to help companies disclose relevant non-financial information in a more consistent and more comparable manner (applying also to public organizations). One of the most recent packages is a proposal for a Corporate Sustainability Reporting Directive (CSRD) amended by the European Commission in April 2021 to expand the scope of the Non-Financial Reporting Directive (NFRD) in sustainability reporting standards for environmental, social and governance reporting. The American continent, in response to the call of international organizations such as the UN, the OECD, and the World Bank also recommended their public organizations to adopt friendly environmental and sustainability practices. Specifically, the United States Environmental Protection Agency commits to protect human health and the environment by applying innovative approaches and advances in science and technology with the backup of government regulations and policies, and promotion of green business practices. Another example is the Economic Commission for Latin America and the Caribbean (CEPAL) or (ECLA), which designed a tool used by many scholars to measure sustainability by taking eight elements linked with social, economic and environmental aspects, (Sheinbaum-Pardo et al., 2012). In other parts of the world such as Asia, the Middle East and Oceania, given that fewer papers have been done, these regions are increasing their interest in the field since they have been participating in more and more international organizations and agreements, which indicate very high commitment to sustainable development. It is clear that different institutions in terms of geography, environment, and quality lead to different levels of engagement and commitment in sustainability (Uyar et al., 2021). Public sectors in developing countries usually have to deal with a lack of regulations or guidelines in publishing non-financial reporting or assessment tools. In developing countries, the institutional environment is also less transparent compared to that in developed countries (Kassim et al., 2019). This may result in a low level of disclosure of sustainability information (De Villiers & Marques, 2016). Therefore, we emphasize the role of European countries and international organizations as leaders in training, sponsoring and monitoring the sustainable extent and programs to the other parts of the world. Moreover, government in developing countries should take it upon themselves to improve their effectiveness, institutional environment and regulatory quality to create sound policies and regulations that can support sustainability reporting practices in the public sector.

In recent years, municipalities around the world have been increasing their knowledge about sustainable responsibility and adopting sustainability as a policy goal and integrating it into their service functions and processes. However, there is little understanding of how to measure environment sustainability-related performance (Park & Krause, 2021). The guidelines and frameworks to assess the environment and sustainability performance are under-developed and still at an early stage, mainly focused on the private sector context (Ramos et al., 2021). It should be not so difficult to understand why focus on the environment is one of the most common approaches in the literature since it brings a clear and concrete definition of a certain aspect of sustainability in the observed system (Schlör et al., 2013) which is easier to measure and for the public to understand. Moreover, organizations can be flexible in selecting the attributes considering the specific context of each situation or institution (Ramos et al., 2021). A second popular approach is based on people/stakeholders and governance perspective. Given its crucial role, public sectors are still lagging behind in terms of sustainable reports. The financial aspect and the compliance with standards are said to be very well performed, however, the perspective of sustainability seems to be under-exploited among public organizations (Domingues et al., 2017). Researchers in the field recently have paid interest to exploring the motivation of public organizations in publishing sustainability reports (Farneti & Guthrie, 2009a). Research has included how to enhance sustainability reporting

in the public sector (Montecalvo et al., 2018a), the relationship between sustainability reporting and organizational management (Domingues et al., 2017), the transparency of disclosed sustainability information in English-speaking and Nordic cross-country contexts (Navarro Galera et al., 2014) and so on. Sustainable reporting is usually used as a tool to increase the accountability of organizations (Niemann & Hoppe, 2018b), and to maintain the relationship with external stakeholders (Domingues et al., 2017). Together with the sustainability indicators, sustainable reporting has been becoming a main driver in supporting the assessment and communication of sustainability management practices and activities of public organizations. In this context, the author recommends that it is necessary to build up an international framework which could be utilized and referenced by all regions and countries specified according to geography and the institutional context. There remains the fact that even though it is the most common framework, GRI has been the cause of arguments among researchers (Domingues et al., 2017). Thus, it could be interesting if we could have fundamental guidelines to cite when providing reports or comparing the performance across countries or regions to learn and have the emerging lessons. A solid back up environment will help to greater improve the level of engaging in the sustainability of public sectors.

Regarding the theoretical framework, the author recognizes that the studied sample does not include the lens of theory in the research activity even though we may all recognize the role of having theory in research. Abend, (2008) stated that a theoretical framework provides a study with a well-defined and proven basis of argument, giving a basis for the author to develop the hypotheses, and finally to validate or disapprove the outputs. In light of this, we highly recommend that it is necessary to have the integration of institutional theory, legitimacy theory, stakeholder theory, and other theories to explain this phenomenon regarding the motivation to publish or evaluate sustainability and the obstacles that may occur or the recommendations for policies to encourage this activity within public sectors.

6. Conclusion

In this article, the author focuses on a systematic review of the literature on how environmental and sustainable performance is measured and reported in the public sector. Finally analyzing 22 papers published from 2017 to 2021, this study tackles questions about the recent stream of literature on environmental sustainability in the public sector and the common measurement methods of the phenomenon. In general, from the literature review, it is revealed that public organizations mostly choose to adopt sustainability indicators and reporting based on the GRI and UN sustainable framework in evaluating their sustainable or environmental performance. The results also evidence that given the crucial role, researches on environmental and sustainable performance of public sectors are still greatly lagging behind compared to the private sectors (Domingues et al., 2017). In this regard, further analysis about this field needs to be developed to fulfill and improve the research gaps based on our main suggestions above.

The main limitation of this study is from the method that the author used to collect studies. First, the sample was collected from the Scopus database, which may have meant a missing of some empirical studies that were listed only in other databases such as the Web of Science database from Clarivate. This shortcoming could have influenced the final results. However, Singh et al., (2021) showed that the coverage of journals in Scopus was wider than in Web of Science. Around 99.1% of the journals listed in the Web of Science database were also listed in Scopus. Furthermore, since the author implemented the search in terms of keywords in the articles only. This may have resulted in missing some papers if we had done the search in the title, abstract and keywords. However, as Thorpe et al. (2005) and Pittaway et al. (2004) confirmed, that although searching within the keyword of the articles only instead of the title, abstract and keywords may have some weakness, it is considered to be useful to provide

a narrow but sufficient sample. I therefore believe that the sample is sufficient for analyzing the literature on how environmentally sustainable performance is measured and reported in the public sector.

The author does believe that this article has in some ways contributed to the recent literature of the area, since this is among one of the first systematic literature reviews in the area. The author provides peers with a picture of the recent development of research on the measurement of governmental environment sustainability and at the same time leaves a large space for future study and improvement in the recent research gap.

Appendix

No.	Paper	Year	Authors	Journal
1	Co-creating a sustainability performance assessment tool for public sector organizations	2021	Ramos T. B., Domingues A. R., Caeiro S., Cartaxo J., Painho M., Antunes P., Santos R., Videira N., Walker R.M., Huisingh D.	Journal of Cleaner Production
2	Sustainability reporting in the public realm - trends and patterns in knowledge development	2021	Stefanescu C.A.	Sustainability (Switzerland)
3	Exploring the landscape of sustainability performance management systems in U.S. local governments	2021	Park A.Y.S., Krause R.M.	Journal of Environmental Management
4	Sustainability reporting in justice systems: a comparative research in two European countries	2021	Fusco F., Civitillo R., Ricci P., Morawska S., Pustułka K., Banasik P.	Meditari Accountancy Research
5	Does governance quality explain the sustainability reporting tendency of the public sector? Worldwide evidence	2021	Uyar A., Karmani M., Kuzey C., Kilic M., Yaacoub C.	International Journal of Public Administration
6	Do footprint indicators support learning about sustainable consumption among Swedish public officials?	2021	Dawkins E., Kløcker Larsen R., André K., Axelsson K.	Ecological Indicators
7	Sustainable Stock Market and Sustainability Reporting Propensity of the Public Sector: Mediating Role of the Private Sector	2021	Uyar A., Kuzey C., Kilic M.	International Journal of Public Administration
8	Sustainability indicators for municipal solid waste management: A case study of the Recife Metropolitan Region, Brazil	2020	Jucá J.F.T., Barbosa K.R.M., Sobral M.C.	Waste Management and Research
9	Toward a sustainable development indicators system for small municipalities	2020	Frare M.B., Clauberg A.P.C., Sehnem S., Campos L.M.S., Spuldaro J.	Sustainable Development
10	Environmental disclosure as a tool for public sector legitimacy: A Twitter intelligence approach	2020	Bonsón E., Perea D., Bednárová M.	International Journal of Public Administration in the Digital Age

11	Moving from social and sustainability reporting to integrated reporting: Exploring the potential of Italian public-funded universities' reports	2020	Mauro S.G., Cinquini L., Simonini E., Tenucci A.	Sustainability (Switzerland)
12	The politics of local government environmental evaluations: Assessing bureaucracy in post-Reformasi Indonesia	2020	Alfirdaus L., Rouli Manalu S.	Pacific Journalism Review
13	The use of environmental performance indicators in "the greenest city in Europe"	2019	Alpenberg J., Wnuk-Pel T., Adamsson P., Petersson J.	Baltic Journal of Management
14	The potential of integrated reporting to enhance sustainability reporting in the public sector	2018	Montecalvo M., Farneti F., de Villiers C.	Public Money and Management
15	Sustainability accounting regulation in Spanish public sector organizations	2018	Larrinaga C., Luque-Vilchez M., Fernández R.	Public Money and Management
16	Environmental orientation in Swedish local governments	2018	Alpenberg J., Wnuk-Pel T., Henebäck A.	Sustainability (Switzerland)
17	Overcoming the barriers to the diffusion of sustainability reporting in Italian LGOs: Better stick or carrot?	2018	Giacomini D., Rocca L., Carini C., Mazzoleni M.	Sustainability (Switzerland)
18	Sustainability reporting by local governments: a magic tool? Lessons on use and usefulness from European pioneers	2018	Niemann L., Hoppe T.	Public Management Review
19	Using sustainability cost curves to evaluate urban infrastructure in Canada	2018	Hoornweg D., Hosseini M., Thibert J., German M., Engle J., Plitt R., Kennedy C.	CSCE General Conference 2018, Held as Part of the Canadian Society for Civil Engineering Annual Conference 2018
20	Sustainability indicators for municipalities of megacities: Integrating health, safety and environmental performance	2017	Mapar M., Jafari M.J., Mansouri N., Arjmandi R., Azizinejad R., Ramos T.B.	Ecological Indicators
21	Sustainability reporting in public sector organizations: Exploring the relation between the reporting process and organizational change management for sustainability	2017	Domingues A.R., Lozano R., Ceulemans K., Ramos T.B.	Journal of Environmental Management
22	Environmental sustainability evaluation method in public works audit: Analysis of the Maciço do Morro da Cruz - Florianopolis, SC, Brazil	2017	De Castro A.R.V., Rodrigues A.P., De Castro O.V., Jr.	33rd PLEA International Conference: Design to Thrive, PLEA 2017

Source: Author.

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