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Co-creating a sustainability performance assessment tool for public sector organisations

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Abstract

Organisations are increasingly being pushed to manage, assess and report their sustainability performance, including public sector organisations (PSO). Several approaches were developed to implement sustainability assessments at organisation level. However, the majority are still for the private sector and are often not supported by active stakeholder involvement. Several PSO have adapted private-oriented models to assess their sustainability performance, which are often not adequate due to public administration, whose main mission is to provide public services. The present work aims at developing a conceptual framework to support PSO and to assess their sustainability performance. The proposed approach is supported by two sustainability performance assessment systems – *Formal and Informal Sustainability Performance Assessment*. The *Formal Sustainability Performance Assessment* system, which is the main focus of this paper, consists of a checklist of objectives and practices and a set of twenty-nine (29) performance indicators. An initial proposal was drawn from the literature review and then assessed through a participatory process, involving practitioners and academics in semi-structured interviews, questionnaire surveys and a collaborative workshop. The Portuguese central public administration was used as a case study. The developed checklist of objectives and practices and related performance indicators will allow PSO to assess and communicate complex information about organisational sustainability. Reference values support the normalization of indicators' results, and consequently, the comparison of sustainability-related performance between PSO integrated into the context of the Portuguese central public administration. This research contributes to the debate on organisational sustainability assessment and communication, and the importance of selecting and developing sustainability indicators using co-creation processes with key-stakeholders.

Keywords: public organisations, sustainability indicators, strategies and practices, performance assessment and management, stakeholder engagement.

1 Introduction

Since the 1990s, there has been a growing concern regarding research relating to how private organisations incorporate Sustainable Development (SD) into their policies (Lozano, 2018, Palme et al., 2005). Currently, organisations from both private and public sectors are being pushed to assess

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their sustainability performance. There are various guidelines and frameworks to conduct sustainability assessments, but they are mainly developed for the private sector context (Adams et al., 2014; Williams et al., 2011; Lundberg et al., 2009).

Despite the diversity of methods and tools to assess sustainability, indicators are one of the approaches most used (Ramos, 2019; Ramos and Caeiro, 2010). Indicators have advantages over other methodologies, specifically, (i) can be selected considering the specific attributes of each situation (Boyd and Charles, 2006), (ii) can be identified by stakeholders using a set of criteria (Niemeijer and Groot, 2008; Donnelly et al., 2007), (iii) enable to represent comprehensibly and consistently a variety of environmental data (Jash, 2000) and a simplified representation of sustainability (Pope et al., 2017), and (iv) can support policy and management decisions by providing relevant monitoring information (McCool and Stankey, 2004). Organisations can assess their success through indicators in order to understand their performance on sustainability-related aspects (Franciosi et al. 2020, Jamous and Muller, 2013). Systems based on indicators have the potential to support decision-making, providing an overview of trends regularly. According to Wallis et al. (2007) and Ramos (2019), indicators that respond to environmental, social and economic aspects are essential for assessing sustainability since they allow the communication of information regarding processes, events or complex trends to a broad audience.

At the end of the 20th century, Public Sector Organisations (PSO) started to develop environmental or sustainability-related performance assessment indicator tools at the national level voluntarily, adapted to the specific characteristics of the public sector context (e.g., PMSGO, 1999; United Kingdom Government, 1997; USEPA, 1996). However, a participatory approach to co-develop performance indicators for organisations is often absent from processes developed by governmental entities (see, e.g., Government of USEPA, 2011; Canada, 2002) and frameworks developed by researchers (Ponce et al., 2019; Cantele et al., 2018; Myhre et al., 2013).

Recent studies show that research on sustainability accounting and reporting in the public sector is still an emerging research agenda (Manes-Rossi et al., 2020; Fusco and Ricci, 2019). Alternative accounts and reports have emerged to broaden the audience, particularly in countries where New Public Management (NPM) reforms demand a more participative role of citizens in the decision-making process of PSO (Manes Rossi and Orelli, 2019).

Previous research has discussed stakeholder engagement's essential role in considering key stakeholders' information needs and expectations (Kaur and Lodhia, 2018; Venturelli et al., 2018; Unerman, 2007), considering stakeholder as any individual or group that may affect or be affected by the performance and organizational objectives, as defined in the stakeholder theory by Freeman (1984). Participatory approaches can enhance the variety of stakeholder groups as value is created by cooperation among stakeholders (Herzig and Schaltegger, 2006).

The adoption of stakeholder engagement mechanisms to validate indicators can improve the acceptability, usefulness, transparency, longevity and ownership of the indicators developed (Ramos, 2019, Gillen and Scanlan, 2004). The integration of stakeholders into the decision process can also decrease conflicts between the different parts involved (Cloquell-Ballester et al., 2006). The case of enlisting diverse actors' support and participation is framed as *win-win* situations, as highlighted by Brown et al. (2009). Stakeholders participation in a two-way communication approach, meaning a decision preparation process and not a simple hearing, can be successful for the co-creation of knowledge (Newton and Elliott, 2016; Regeer and Bunders, 2009). In particular, for indicators development, including the definition of values for normalization and targets (Mascarenhas et al., 2015). Normalization is a practical step to combine multiple sustainability indicators, especially when there are stakeholder interests (Pollesch and Dale, 2016). However, according to the same authors, normalization could lead to loss of information and data resolution. Normalization effectively works

to communicate general information to stakeholders. Some stakeholder groups do not have specific knowledge on indicators but are interested in general information related to the sustainability performance of PSO regarding a thematic area (Wang et al., 2016) or to compare the overall sustainability performance between the same type of PSO.

The integration of SD principles into governmental processes at both levels (operational and strategic – particularly in the formulation of policies, processes and decision-making, and activities) is crucial for SD in the public sector (Adams et al., 2014; Dahl, 2012; Ponce et al., 2019). Also, PSO still lag on assessing their sustainability performance, particularly considering co-creation processes for the development of performance indicators and their normalization scales. To cover this gap, this research aims to develop a conceptual framework to support PSO to assess their sustainability performance through the use of a checklist of objectives and practices and adoption of indicators (including environmental, social and economic). A co-creation participatory approach was applied to a PSO in a Southern European country reality (Portugal). This work builds upon previous research regarding sustainability assessment and management in PSO in Portugal, namely the identification of the sustainability policies and practices of the Portuguese Central Public Administration (PCPA) (Figueira et al., 2018) and the development of a framework of informal stakeholder-driven sustainability performance assessment (Coutinho et al., 2018).

The present research can have theoretical and practical implications to public management research and practice, including their main actors, such as politicians, managers, practitioners and researchers. It provides a comprehensive framework that includes, on the one hand, the assessment of strategies and practices, at the moment dealt separately; on the other hand, the assessment in one tool of environmental, social and economic aspects co-created by key stakeholders.

The remaining of the paper is organised as follows. After the Introduction, section two presents a literature review of the use of sustainability performance indicators in PSO. Section three details the research methods adopted by describing the performance assessment conceptual framework and how it was developed through a co-creation process. Section four addresses co-creation process results, and then section five discusses them with the literature. Section six depicts the main conclusions, including the main scientific contributions for creating new knowledge and future developments.

2 Sustainability performance indicators in public sector organisations

Both the private and public sectors have similar responsibilities to implement measures to manage the environmental, social and economic aspects (Ball and Grubnic, 2007). Both conduct different activities to achieve their goals, which are repeatedly associated with significant negative impacts beyond organisational boundaries. The integration of SD principles and practices by organisations is crucial towards the national and global achievement of the SD Goals (SDGs), as defined in the 2030 Agenda (UN, 2015).

Generally, in Western European countries, PSO are defined as any organisation under government control that develops public goods or services (Lozano, 2018) and are created to fill societies' needs through political and social targets instead of commercial objectives (Carter et al., 1992). In this context, PSO are mainly service providers (van Dooren et al., 2015; Farneti and Guthrie, 2009; Ramos et al., 2007), which justifies that 75% of total costs are related to human resources (Macpherson, 2001).

The private sector usually adopts a profit maximization approach, whilst the public sector is more influenced by social, legal and political pressures (Carter et al., 1992). PSO are not focused on profit maximization, and the income generation potential is low (Boland and Fowler, 2000).

The public sector represents an essential part of international economic activities given its size and related activities (Walker and Brammer, 2012; Ball and Grubnic, 2007) as significant employers, providers of services, and consumers of resources (GRI, 2005). The public sector has the responsibility to be used as a role model to integrate sustainability practices in organisational management (Lozano, 2018; Dahl, 2012). However, environmental and sustainability performance assessment (e.g., Myhre et al., 2013; Lundberg et al., 2009; Enticott and Walker, 2008) and reporting (Domingues et al., 2017; Williams et al., 2011; GRI, 2005) are still in the early stages of development for the public sector when compared to the private sector. Both sectors have different characteristics, including ownership, trading status, competition, accountability, heterogeneity, complexity and uncertainty (Carter et al., 1992), which require specific tools for each sector in order to assess their sustainability performance.

Consequently, there has been a growing need and interest to integrate sustainability informed strategies and practices in the public sector (Zeemering, 2018; Brammer and Walker, 2011; Enticott and Walker, 2008) considering the significant challenges PSO still face (Kirst et al., 2019). A variety of reasons may justify the public sector's delay when compared to the private sector on the adoption of sustainability performance initiatives, including the lack of mandatory requirements for assessment (Guthrie and Farneti, 2008), specific guidelines (Lundberg et al., 2009), the absence of political support (Farneti et al., 2019) and employees with specific knowledge (Che Ku Kassim et al., 2019). In addition, cultural barriers, in particular a lack of public and political pressure and resistance towards change, are considered the main challenges for assessment implementation, as demonstrated for the circular economy context by Droege et al. (2021).

Organisations have recognised the need for tools to identify unsustainable activities (Singh et al., 2012). As highlighted previously, indicators have been increasingly identified as a useful tool for policy formulation and communication with the public to provide information on the performance of countries and governments in areas such as environment, society, and economy (Ramos, 2019; Zeemering, 2018; Singh et al., 2012; Bockstaller and Girardin, 2003). For instance, Jarrar and Schiuma (2007) argue that the use of performance indicators enables governmental institutions to assess their performance by monitoring their employees' productivity. According to Lundberg et al. (2009), indicators that express the results are the most important in performance assessment because they could be used to represent the impacts of the outputs of a system. There is an increasing trend in the use of performance indicators for accountability purposes, as a basis to obtain resources (Boland and Fowler, 2000) and to manage and achieve the organisation's objectives (Franciosi et al., 2020).

Table A1 (see Appendix A) shows a set of framework examples, guidelines and case study applications based on indicators for the environmental and sustainability performance assessment of PSO worldwide. Table A1 is based on the chronological identification of selected examples, considering: (i) name, aims and scope; (ii) main theme or domain; (iii) the number of indicators; and (vi) existence of a participatory process. Initiatives presented in Table A1 often include three sustainability dimensions (environmental, social and economic) across different PSO. Three main SD dimensions are considered yardsticks in sustainability assessment studies, which are often dealt with as having equal importance (Pope et al., 2017). Particularly to assess organisational performance and to consider beyond a narrow economic and financial perspective.

As highlighted by Ramos et al. (2020), there are several discussions around the scope of the sustainability concept and SD and the discourses that have emerged (Neumayer, 2010; Mebratu, 1998), reflecting its multi-dimensional scope, which includes ecological, political, ethical, socio-economic, democratic, cultural and theological dimensions (Vogt and Weber, 2019), with contributions from different scientific domains. However, despite the ongoing debate on sustainability frontiers, for the context of this research, an integrative analysis of sustainability performance in different dimensions is adopted, including economic, social and the environmental, representing the

'triple bottom line' (TBL) of sustainability (Elkington, 1997), since it is often considered one an almost ubiquitous representation of sustainability (Pope et al., 2017).

Currently, and despite other possible conceptualisations, sustainability performance assessment based upon indicators that reflect the triple bottom line, i.e., integrating environmental, social and economic indicators (Roca and Searcy, 2012), are one approaches most used. From the different frameworks developed, the sector supplement for public agencies developed by the Global Reporting Initiative (GRI, 2005) suggests 105 indicators should be highlighted. According to Adams et al. (2014), this framework emerged because PSO information tended (i) to be scattered across several documents, (ii) to focus on policies rather than performance information, and (iii) to focus on measurement of external conditions (as in the *state of the environment* reports) rather than public agency performance and impacts. However, the analysis of GRI reports by public agencies conducted in 2010 (GRI, 2010) has revealed that reporting on the sector supplement items by PSO is fragmented. The types of disclosures provided by the different public agencies were substantially diverse and predominantly descriptive, with little quantitative performance data.

The examples of performance assessment initiatives, shown in Table A1, reflect a focus on the operational management component (e.g., water, wastewater, emissions of greenhouse gases, waste, energy efficiency, recycling, ecological transports, biodiversity, land use). The total number of indicators varies between 5 and 208, which shows a wide variety of objectives and approaches and a lack of methodological consensus. The multiple approaches undermine the potential comparability of performance among PSO from similar political and legal contexts. Considering the absence of standards for the sustainability performance of PSO, the attempts to develop similar methodological approaches could contribute to benchmarking and continuous improvement of sustainability performance.

Despite the usefulness and applicability of the frameworks reviewed in Table A1, the majority was developed by governmental bodies and published as grey literature. Consequently, case studies are dispersed, which problematised the process of scientific verification and robust research on how theoretical and practical applications could be associated and translated from academia to practitioners, and vice-versa. Many of the frameworks developed within academia and published in scientific journals were developed for specific domains of the public sector (see Table A1, e.g., water utilities – D'Inverno et al., 2020; Cantele et al., 2018; urban food systems – Landert et al., 2017; defence sector – Myhre et al., 2013; Wu, 2012; Ramos et al., 2007). There is a lack of research on the sector as a whole.

From the frameworks listed in Table A1, almost half of them highlighted that participatory related approaches were used, at least, based upon stakeholders' views in the final stages of the processes. Very few of these initiatives addressed the normalization of the performance indicators (e.g., Cantele et al., 2018 – See Table A1). The use of reference values, adapted to specific contexts, is fundamental to facilitate the comparability and benchmark among PSO (Ramos, 2019; Mascarenhas et al., 2015, 2010).

3 Methods

3.1 Overview of the performance assessment conceptual framework

A conceptual framework to assess the sustainability performance of PSO is here proposed (Figure 1). This tool was developed considering previous related works, in particular: (i) the model designed by Ramos et al. (2014) for sustainability reporting purposes; and (ii) a profile on sustainability policies and practices, developed for the PCPA by Figueira et al. (2018). Previous interlinked research supported the identification of the most relevant thematic areas for performance assessment in PSO and the

outline for the co-creation of sustainability objectives, practices and indicators to assess the sustainability performance of PSO.

The framework presents two sustainability performance assessment systems. The *Formal Sustainability Performance Assessment* is a self-assessment conducted by the organisation, supported by formal collected data and information, typically managed and prepared by technical staff. The *Informal Sustainability Performance Assessment* is a complimentary assessment system driven by the organisational stakeholders, in particular employees. The second system is mainly built upon qualitative data and information obtained through individual perceptions, observations and practice (presented in a separated article published by Coutinho et al., 2018).

The construction and characterization of the *Formal Sustainability Performance Assessment* system is the focus of the present article. It includes the following assessment levels, *Strategic* and *Operational*: (i) Strategic assessment — a checklist of sustainability objectives and related practices to assess the sustainability performance related to the existence of strategic instruments, such as policies, legislation, plans and programmes adopted by the organisation; (ii) Operational assessment — a set of indicators to assess the sustainability performance of organisational activities and operations. The strategic and operational assessment components are interlinked and clustered in the environmental, social and economic dimensions, meaning that there will be at least one performance indicator associated with each group of objectives and practices.

It should be noted that an initial prerequisite was considered for this assessment framework to be implemented in the future, related to the organisational profile and the surrounding environment. The framework encompasses a background module, named *Organisational Context*, which requires identifying the most relevant characteristics of the PSO and state of the environment in the surrounding area. The area considered is confined to the relevant local scale where the main facilities will be located. However, it could also include regional context variables, following a similar set of *environmental conditions* defined by the IS0 14031:2013 (ISO, 2013).

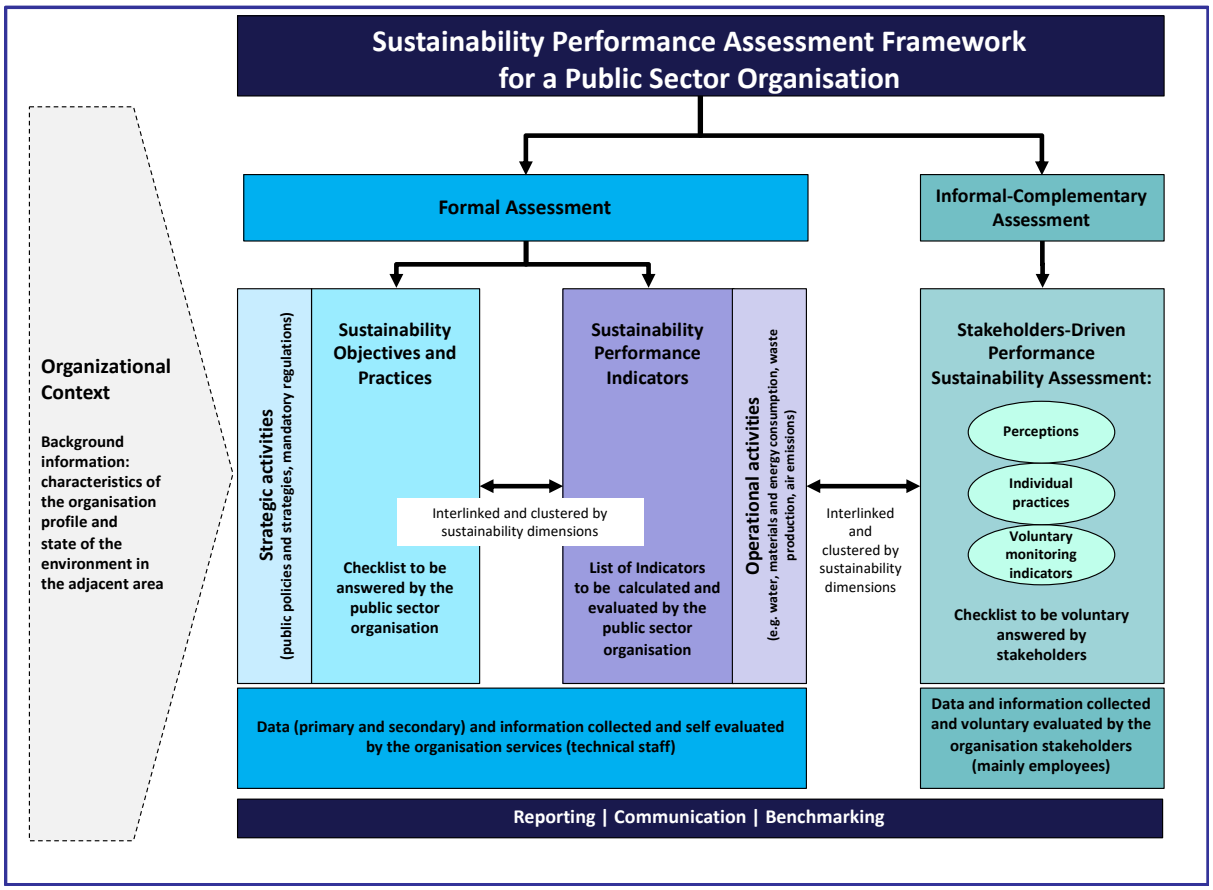

Figure 1. Sustainability performance assessment conceptual framework for public sector organisations.

When in practice, a PSO can run every year the present conceptual framework to assess their sustainability performance, including the above stated formal and informal systems. The latter can be used to cross-validate the formal technical data and information processed by the organisation. Cross-validation allows an evaluation of the strengths and weaknesses of both performance assessment systems. It also enables assessing its overall utility and societal value, as highlighted by Coutinho et al. (2018) and Ramos et al. (2014). The conceptual framework can also be applied in parallel with other measuring tools, such as the budget and financial statements.

3.2 Conceptualising the assessment framework through a co-creation process

A co-creation process was adopted to design the two assessment systems integrated into the framework. As previously mentioned, in the present article, the particular focus was on the *Formal Sustainability Performance Assessment*, using the PCPA case. All steps and characteristics of the *Informal Sustainability Performance Assessment* were thoroughly described in Coutinho et al. (2018).

The PCPA case can be defined as the subsector of public administrations that comprise all administrative departments of the State and other central agencies whose competence extends typically across the whole economic territory, encompassing direct and indirect administration (DGAEP, 2009). A variety of stakeholders were selected from different PCPA organisations and were involved during the construction process presented in the following phases. The methodological design process used a mixed-methods approach (Bhattacherjee, 2012; Creswell, 2014; Ritchie and Lewis, 2003), including semi-structured interviews, a questionnaire survey, and a participatory workshop comprising focus groups.

The PCPA was selected as an exploratory case study. Case studies are useful when an extensive and in-depth description of social phenomena is needed. The limited knowledge base and literature from which a conceptual assessment framework or hypotheses for a mixed formal and informal organisational sustainability assessment approach justifies the need to conduct an exploratory study (Saunders et al., 2012). To identify the case purposeful and convenience sampling approach (Given, 2008; Saunders et al., 2012) was adopted, despite meeting specified sample selection criteria relevant to the research aim, as highlighted by Saunders et al. (2012). The previously established contacts and scientific works conducted for this case and the author's familiarity with the sustainability initiatives in the Portuguese public sector context were some of the reasons for selecting this option. One of the limitations of using this specific case study, and in particular a convenience sampling approach, is that the results are not necessarily generalisable to other contexts. However, while it is expected that the derived general framework is generalisable to other public sector realities, the particular empirical findings obtained may not be since they are specific to the Portuguese case. Some of the limitations were mitigated by interlinking the data obtained from the different methods, interviews, questionnaires and workshop data with the findings from the literature review. Nevertheless, new empirical data from similar and different public sector contexts is needed, as well as *in situ* analysis, evaluation and real demonstrations.

The involved stakeholders participated in their expert capacities and on behalf of their organisations since they were formally appointed or confirmed after a direct invitation (nevertheless, participation did not imply institutional commitment nor endorsement of the results). Before the participatory events, the relevant materials (e.g., list of indicators) and a brief description of each task were sent to participants. The main criteria to select the involved key-stakeholders were the following: (i) represent the diversity of sectors in the PCPA; (ii) represent medium-level managers, mostly decision-makers, senior practitioners and experts, who are related to the performance management and assessment of their departments and/or the whole organisation; and (iii) include experts from academia (not integrated into the research team), in particular, to be included in the focus group phase.

The conceptualising process approach, which configured the co-creation process, was structured as an iterative two-way communication process. It integrates the steps described in the following sections, reflecting a transdisciplinary and participatory research approach that underlines the necessity to collaborate with a variety of societal stakeholders to design solutions and bring about sustainable transformation in the society, as highlighted by Lang et al. (2012) and Matschoss et al. (2020). Therefore, the adopted approach includes science-society and science-policy, interfacing throughout the research process (Newton and Elliott, 2017). It also assumes that the intensive involvement of relevant stakeholders (actors with a stake and knowledge) in the process of knowledge co-creation ensures that 'extended peer review' takes place at the same time (Regeer and Bunders, 2009).

3.2.1 **Performance checklist of objectives and practices**

A checklist of questions covering sustainability objectives and related strategic practices (e.g., strategic planning and management actions) for the Central Public Administration (CPA) was developed from a literature review. The design of the questions for the checklist considered scientific articles (e.g., Adams et al., 2014; Ameer and Othman, 2012; Boiral and Paillé, 2011; Le et al., 2014; Lee et al., 2013; Zeemering, 2018), guidelines and practices related to organisations' environmental and sustainability performance assessment (e.g., Deloitte, 2008; Government of Canada, 2000; GRI, 2018, 2005; Institute for Local Government, 2013; MORI Social Research Institute, 2002; USEPA, 1997; Lee, 1994).

The checklist was built on questions related to objectives and sustainability practices to identify performance signs to assess the strategic actions and behaviours of the PSO. The checklist is composed of *general aspects*, economic, environmental and social-related dimensions, following a SD scheme.

General aspects represent transdisciplinary and transversal dimensions, interlinking sustainability aspects, usually considered under the triple-bottom-line approach. Economic, environmental, and social aspects are considered different dimensions even though some of the objectives and practices under each aspect can also be related to others, as Lozano and Huisingh (2011) discussed.

A checklist method includes a list of items that needed to be verified, checked or inspected. The checklists are used in several fields, including performance management and assessment (see, e.g., van Dooren et al., 2015). The checklists allow inspection and analysis of sustainability-related topics and their interlinked features, factors or aspects, regarding management processes and operations from the organisational performance perspective.

The checklist of questions defined the groundwork and established the links with the performance indicators components, through the SD dimensions' scheme, above-identified (detailed in the subsequent section).

3.2.2 Selection and development of indicators by stakeholders

It was assumed for the present work that indicators are a necessary approach to evaluate the sustainability implications of organisational activities (Franciosi et al., 2020) and play fundamental roles in the sustainability assessment of decision-making processes (Pope et al., 2017; Sala et al., 2015). In this context, indicators were adopted as a core tool to support the operational sustainability performance assessment in the CPA. Indicators could assess the current performance state of a PSO, support the analysis of the performance trends over time, and compare the performance among similar PSO.

A preliminary list of indicators for sustainability performance assessment in PSO was drawn from a comprehensive literature review that focused upon approaches, concepts, frameworks and case study applications (presented in Table A1, Appendix A), including the GRI sector supplement for public agencies (GRI, 2005). Despite GRI guidelines' limitations, they are often used in European countries and recognised worldwide to disclose the sustainability performance of PSO (Domingues et al., 2017).

A first draft list of one hundred forty-seven (147) indicators comprised of sixty-eight (68) related to environmental aspects, fifty-eight (58) to social issues, and twenty-one (21) that addressed economic aspects. In this draft list, some indicators were similar, only varying in nomenclature. They were kept to verify which indicator formulation and respective names were more understandable and valuable; and also, to verify the possible distractions or misinterpretations from stakeholders while working on the list.

The preliminary list of indicators was assessed through semi-structured interviews with twenty-six (26) key stakeholders from the PCPA (based on the criteria defined in section 3.2), representing eleven (11) different ministries: internal affairs – three (3); agriculture and sea – three (3); environment, land use management and energy – three (3); national defence – three (3); economy – three (3); education and science – two (2); finances – two (2); justice – four (4); foreign affairs – one (1), health – one (1); solidarity, employment and social security – one (1). Other three (3) stakeholders were contacted, but they did not agree to participate, owing to time restrictions and lack of knowledge for completing the evaluation process. Similar motives were also identified by Donnelly et al. (2007) for a similar process of developing an indicator set through the involvement of stakeholders, who stated that these two reasons might explain the level of involvement in participatory processes.

The semi-structured interviews conducted with twenty-six key informants were developed and managed (design, administration and analysis) by the research team. The interviews followed the procedures and recommendations presented by Saunders et al. (2012) following per standard social science protocol (Bernard, 2006). A guide containing a selected list of indicators were used for the

scoring procedure. The interviews were conducted in person and via the internet. Interviewees graded a pre-established list of indicators and suggested additional indicators. They were initially conducted in August and September 2014.

During the interviews, the stakeholders could propose or co-create new indicators to include in the list. The interviewees' involvement in the design and development of the indicators was crucial to include their opinions, values, concerns and common goals in the selection process (see, e.g., Ramos, 2019; Mascarenhas et al., 2015; Beratan et al., 2004; Valentin and Spangenberg, 2000). Following the model proposed by Cloquell-Ballester et al. (2006), the stakeholders were informed before the interviews about the following aspects: (i) the objectives of the research; (ii) the method of validating the final set of indicators; (iii) the typology of participants in the validation process and the criteria used for their selection; (iv) the initial number of indicators in the proposal; (v) the estimated time to perform this task; and (vi) the potential use of the information obtained.

Each indicator was assessed according to the stakeholder's analysis, using a qualitative scoring procedure that covered three main criteria: (i) comprehensibility; (ii) relevancy/usefulness; and (iii) feasibility/operability, as defined by Coutinho et al. (2018) and Ramos et al. (2004). Comprehensibility refers to the indicator's ability to communicate the information to an appropriate level for decision-making and for the general public to understand. Relevancy is related to the technical importance of assessing the information of the specific indicator and providing support for the organisation´s management decisions. Feasibility addresses the ability of PSO to implement an information system to measure the indicator across time (from the data collection to reporting stage). Each criterion was scored using a Likert scale from 1 to 5 resulting in five ranking classes — very weak: 1; weak: 2; fair: 3; good:4; very good: 5.

The selected list of indicators was developed using two steps. Firstly, a cut-off of indicators with an average score equal to or less than 3.5 was performed (average of all interviewed stakeholders' three criteria). Thereby included only the questions rated by the stakeholders as *Good* and *Very Good*: > 3.5. Secondly, stakeholders' qualitative inputs (comments and suggestions) regarding the preliminary list of indicators were also considered.

The resulting list of indicators was then submitted to validation in a participatory workshop conducted in December 2014. In total, nineteen (19) participants were involved, six (6) experts from academia and thirteen (13) practitioners from PSO, from the previously mentioned eleven (11) ministries. Participants from PSO also participated in the previous interview stage to assess the preliminary list of indicators. The research team was present in the workshop to: (i) introduce the goals of the exercise; (ii) explain the participatory procedure; (iii) answer any queries and requests for clarification; and (iv) make sure the goals were accomplished.

The overall robustness of the indicators was discussed in the workshop. Consequently, the indicators were adjusted according to their comprehensiveness and acceptability. In the final analysis, indicators were validated by the participants using the same method adopted in the interviews (scoring each indicator according to three criteria using a Likert scale from 1 to 5). Besides the validation step, participants were invited to (i) add comments and suggestions for each indicator implementation (from data collection to reporting), and (ii) propose additional indicators or substitute existent indicators. To conclude the indicator selection and development stage, the individual results from the follow-up questionnaire conducted in July 2020 (structured by a dichotomous scale of agreement) was used to clarify the level of acceptance.

The final indicator set also reflects the research team's qualitative post-assessment (ten elements, composed by senior and junior researchers, from different nationalities and with experience and background in organisational sustainability assessment and management, public administration,

transdisciplinary and participatory approaches). This step was designed to ensure that the final set of indicators were appropriate for assessing the PSO's sustainability issues. It also considered a correspondence between the indicator set and the performance checklist of sustainability objectives and related practices.

3.2.3 Selection of reference values for normalization

This phase was designed for developing reference values for each indicator to obtain a standard scale of sustainability for the Portuguese context. Normalization is a crucial step to allow indicators with different measurement units to become unit-free and to be comparable or to be aggregated into a final score or index (Mascarenhas et al., 2015; Pollesch and Dale, 2016). In the present research, normalization was focussed upon: (i) comparing indicators assessed by different organisations from the PCPA; (ii) aggregating indicators when evaluated with different units of measurement; and (iii) obtaining the sustainability performance of specific PSO.

In the first part of the participatory workshop (described in 3.2.2), participants evaluated each indicator individually. In the second part, participants were divided into groups according to their expertise. Three focus groups were created covering the main sustainability dimensions: environmental (five (5) participants from PSO and three (3) participants from academia); economic (four (4) participants from PSO and two (2) participants from academia); and social (four (4) participants from PSO and one (1) participant from academia).

Each group was responsible for the following tasks: (i) identifying reference values (e.g., minimum, maximum, targets, benchmarks) for each sustainability performance indicator; and (ii) proposing ranking performance scales of five categories to obtain a standardised scale for each indicator (normalization function). Each group was responsible for the indicators of their respective thematic area.

All reference values were discussed within each group. Groups used the internet to search for options and discuss the reference values between them. All group members participated and agreed on the reference values chosen through an interactive discussion process to reach a consensus, mediated by the research team. In each group, a person selected by them was responsible for documenting the agreed-upon values. Participants proposed reference values using their own experiences and knowledge, guidelines and the national and European legislation. The group responsible for the environmental indicators suggested using a benchmarking approach to decide the appropriate references. Benchmarking is a technique that can be used in the environmental field to compare organisations' environmental performance due to the inexistence of standards on how many natural resources, like water and energy, public organisations should save to be considered *sustainable*. Consequently, reports from CPA from other countries were used, including Affairs (2013), Auditor-General South Africa (2013), Autoridad portuaria de la Bahía de Algeciras (2009), Department of Economic Development (2010), Department of the Environment and Heritage (2006), Department of Transport (2012), Ministerio de Defensa (2011), Pension and Report (2013) and Washington State Department of Ecology (2012).

For each indicator, different ranking performance scales and respective references values were identified considering focus groups results. The normalization function ranged from 1 to 5, where 1 represents a very weak performance, and 5 represents a very good performance. The use of reference values external to the PSO was chosen to avoid the bias of dependence on different alternatives (in this case, organisations) (Dias and Domingues, 2014). When using internal normalization procedures, i.e. normalizing results according to the minimum or maximum values of a specific group of organisations, the results will depend on the alternatives that are being considered (Pollesch and Dale, 2016), which may result in biased results. In this research, external references were defined to

establish boundaries for each indicator that do not depend on the PSO being considered. Using external reference values will allow PSO to assess their performance by indicators and thematic areas and compare their performance with other PSO from the same context.

To mitigate the limitations related with the time lag of the empirical data collected in the first stage of the research, the final results were updated by an online follow-up questionnaire involving the same participants in July 2020. The two-step process was designed to document potential changes in the public sector's needs, perspectives and views, after two different legislative periods, 2011-2015 and 2016-2019, and to identify new issues that became relevant during the time interval. The results were again post-evaluated and discussed within the research team to ensure the proposed ranking scales' consistency and scientific credibility for the three sustainability dimensions and respective indicators.

The limitations associated with interview, workshop and questionnaire, e.g., validity, reliability and generalizability, such as those associated with participant and observer error and bias (Saunders et al., 2012) were considered in the discussion of results and conclusions. The diversity and number of key-stakeholders engaged in the process can potentially bias the results towards relevance in the research and not reflect the full spectrum of societal views, concerns and aspirations (Ramos et al., 2007, 2014). Nevertheless, they represent a group of stakeholders that is both aware of the practicalities and the theoretical implications of the proposed framework and represent the sectoral diversity of the PCPA.

4 Results

4.1 Performance checklist of sustainability objectives and related practices

The developed checklist of sustainability objectives and related practices is presented in Appendix B – Table B1. It includes a list of questions for performance appraisal regarding formal and objective information. The list of questions is based on clear, verifiable facts that an CPA organisation can self-evaluate, specifically managers (preferably from the sustainability area).

The obtained checklist includes questions divided into four main dimensions: (i) general or inter-linked; (ii) environmental; (iii) economic; and (iv) social. The checklist is based upon closed and open-ended questions, including the use of a Likert-scale for some of them. Most of the responses are closed-ended regarding multiple-choice, where in general only one answer/option is allowed; there are also open-ended responses, where a description is required. A document is requested when necessary for the validation of the response given by the organisation. For instance, the organisation's environmental/sustainability policy or strategy stated that this was implemented or developed.

4.2 Selection and development of indicators by stakeholders

The final list of performance indicators selected through the surveys' results and research team analysis was obtained (Table 1). An average value score of 3.5 was used to select indicators. Nevertheless, in some cases, the research team considered indicators with a lower average value, adding or merging them with the existent indicators. This helped the researchers avoid inconsistencies among the checklist elements (emerged from section 4.1) and the selected key-indicators based on purely quantitative assessments.

The indicators presented in Table 1 are relevant for the performance assessment in PSO, considering the desired balance and interlinks among the main sustainability dimensions and the assumed association between the two assessment levels, strategic and operational. Indicators that were similar or that did not apply to all PCPA were not considered, despite having an average score above the cut-off.

Table 1. List of sustainability indicators for PSO obtained through interviews and research team's analysis.

Code	Name of the indicator
Economic	
XX00	Revenues (includes state budget, own sources revenues)
XX01	Expenditures (includes current and capital expenditures)
EC01	Sustainability accounting
EC02	Labour productivity
EC03	Average payment period
EC04	Average collection period
EC05	Strategic initiatives conducted by the public sector organisation with impact assessment
Environmental	
EN06	Consumption of materials
EN07	Consumption of electricity
XX02	Activities that interfere with natural and cultural heritage
EN09	Consumption of water
EN10	Production of urban solid waste
EN11	Reuse, recover and recycle of urban solid waste
EN12	Greenhouse gas (GHG) emissions
EN13	Indoor air quality
EN14	Indoor noise
EN15	Dematerialisation of services
EN16	Suppliers or contracted service providers with environmental or social certification
EN17	Green Public Procurement
Social	
SO18	Green jobs
SO19	Employees' training activities
SO20	Satisfaction of employees with the organisation
SO21	Satisfaction of employees with daily work
XX03	Satisfaction of employees with work conditions
SO22	Work-related health problems
SO23	Corruption cases
SO24	Employees' turnover
SO25	Discrimination complaints
SO26	Users' satisfaction
SO27	Stakeholder engagement in strategic initiatives related to the public sector organisation
SO28	Voluntary actions conducted by the public sector organisation to support local communities
SO29	Compliance of mandatory and voluntary regulations and codes
XX – Temporary codes; EC – Economic aspects; EN – Environmental aspects; SO – Social aspects	

The list of indicators presented in Table 1 was submitted to a final post-scoring in the participative workshop and follow-up questionnaire, described in the methods section.

In the workshop, all twenty-nine (29) indicators had a mean score above 3.6 regarding the criterion comprehensibility, above 3.8 regarding the criterion relevance, and above 3.4 considering the criterion feasibility. This evaluation was rechecked in the follow-up questionnaire survey and discussed within the research team to obtain the final list presented in Table 2.

Concerning the criterion feasibility, indicators related to *Indoor air quality* (average score of 2.7) and *Indoor noise levels* (average score of 2.8) were not excluded even though the average value score was

between *Poor* and Fair. The decision was based on the fact that they address significant mandatory aspects of sustainability performance in PSOs that can impact the workers' health and are regulated by national legislation. In addition, air quality and noise levels are considered significant aspects that need to be included in a complete environmental performance assessment by studies in the public sector context (see, e.g., Domingues et al., 2015; Mazzi et al., 2012; Petrosillo et al., 2012; Lundberg et al., 2009). The indicator relative to the number of *Activities that interfere with natural and cultural heritage* (average score of 3.1) was excluded from the final list of indicators not only because of the obtained score, but since it was already incorporated in the conceptual framework in the background module, *Organisational Context* (presented in section 3.1) (for details see Appendix C).

The background module is a vital component to understanding the local context of PSO. Its components were created based on the list of sustainability indicators, including part of the excluded indicators. For instance, indicators related to revenues and expenditures were incorporated into the organisation's characterisation (Appendix C). Despite being relevant indicators of the PSOs' financial performance, revenues and expenditures are not directly comparable, and they are already part of the mandatory reporting in PSO. Other indicators were added to the list of sustainability indicators according to stakeholder inputs during the workshop. An indicator related to the production of energy from renewable sources by PSO (EN08) was included. It was initially incorporated in the indicator EN07 *Consumption of electricity* during the participatory process. However, it was after determined that it should be an independent indicator because it assesses another sustainability aspect. Finally, the indicator regarding the *Satisfaction of employees with the work conditions* (XX03) was incorporated into the indicator SO21 *Satisfaction of employees with daily work*. It was concluded that they both assessed the same sustainability aspect.

The proposed framework is associated with tools that already exist in the PCPA context to broaden the current scope and potentially avoid enhancing the number of multiple assessment tools PCPA already needs to comply with. Notably, by linking at the strategic level, the Assessment and Accountability Framework (QUAR), which is connected to the *Organisational Context* (Appendix C); and at the operational level, the Integrated System for Management and Performance Assessment in the Portuguese Public Administration (SIADAP) that is associated to the indicator EC 02 on labour productivity.

Table 2. The final list of sustainability indicators for PSO. It was obtained through the participatory workshop, the follow-up questionnaire survey with PSO practitioners and academics, and the research team's analyses.

Code	Name of the indicator	Description	Unit of measurement (per year of assessment)
Economy			
EC01	Sustainability accounting	Total gross and capital expenditures related to sustainability practices (activities that impact non-financial performance, related to, e.g., energy; water; waste reuse, recovery and recycling; indoor air quality; indoor noise; social responsibility).	% of total expenditure excluding wages
EC02	Labour productivity	Labour productivity is measured by accomplishing the objectives established in the Integrated System for Management and Performance Assessment in the Portuguese Public Administration (SIADAP).	% of objectives fulfilled
EC03	Average payment period	Average period taken by the public sector organisation to conclude payments to suppliers or contracted service providers.	Average No. of days

Code	Name of the indicator	Description	Unit of measurement (per year of assessment)
EC04	Average collection period	Average period taken by the public sector organisation to receive payments for services provided.	Average No. of days
EC05	Strategic initiatives conducted by the public sector organisation with impact assessment	Impact assessment studies to assess economic, environmental and/or social impacts of strategic initiatives (including policies, legislation, plans and programmes) managed by the public sector organisation. These studies are designed to identify potential positive and negative impacts.	% of studies, considering the total amount of impact assessment studies
Environment			
EN06	Consumption of materials	Total weight of material consumed by the public sector organisation: office paper.	t/employee
EN07	Consumption of electricity	Consumption of electricity by the public sector organisation.	kWh/employee
EN08	Energy produced from renewable energy sources by the public sector organisation	Percentage of energy consumed from renewable energy sources that are produced by the public sector organisation.	% of renewable energy produced considering the total energy consumption
EN09	Consumption of water	Water consumption in the public sector organisation.	m^3/ employee
EN10	Production of urban solid waste	Production of urban solid waste in the public sector organisation.	t/employee
EN11	Reuse, recover and recycle of urban solid waste	Reuse, recover or recycle of urban solid waste in the public sector organisation, e.g., energy or organic valorisation, selective waste collection (paper, plastics, glass, aluminium). All materials that replace raw materials purchased or obtained from internal or external sources, excluding by-products and goods produced by the organisation.	t/employee
EN12	Greenhouse gas (GHG) emissions	GHG emissions originated from the public sector organisations, including, (i) direct emissions from sources owned or controlled by the organisation such as fleet emissions, and (ii) indirect emissions from electricity consumed by the organisation.	t CO_2 eq/employee
EN13	Indoor air quality	Percentage of parameters in the public sector organisation that do not comply with the national legislation: Particulate Matter, CO_2, CO, O_3, HCOH and Volatile Organic Compounds (VOC) (mg/m^3), microorganisms (UFC/m^3), humidity (%) and Temperature (°C).	% of measures that do not comply with the national legislation
EN14	Indoor noise	Percentage of parameters related to noise levels in the public sector organisation that do not comply with the national legislation.	% of measures that do not comply with the national legislation
EN15	Dematerialisation of services	Dematerialisation of services is assessed by identifying in the public sector organisation the public services that can be made available online; the public services that are available online; and the total of public services available in the organisation.	% of services available online

Code	Name of the indicator	Description	Unit of measurement (per year of assessment)
EN16	Suppliers or contracted service providers with environmental or social certification	Suppliers or contracted service providers with, at least, one of the following instruments: Environmental Management System – ISO 14001, Environmental Management System – EMAS, Environmental Performance Evaluation System – ISO 14031, eco-labels (e.g., EU eco-label), social and environmental reports, sustainability reports, Social Responsibility Management System – SA8000, Social Responsibility Management System – ISO 26000, Social Responsibility Management System – NP 4469-1).	% of suppliers or contracted service providers
EN17	Green Public Procurement	Pre-contractual procedures and public contracts that include environmental criteria according to the Green Public Procurement law.	% of the pre-contractual procedures and public contracts that include environmental criteria (considering the total number of procedures and contracts)
Society			
SO18	Green jobs	Employees with daily tasks related to the environment and sustainability in the public sector organisation (e.g., environmental education and trainee, pollution control, sustainability accounting, environmental management).	% of employees
SO19	Employees' training activities	Employees engaged in training initiatives related to social responsibility, environmental management or sustainability accounting.	% of employees
SO20	Satisfaction of employees with the public sector organisation	Employees that are satisfied with the work conditions in the public sector organisations. It includes quality, safety, comfort, economic justice, labour flexibility, the work environment, and conditions of the organisation's facilities.	% of employees
SO21	Satisfaction of employees with daily work	Employees that are satisfied with their daily work.	% of employees
SO22	Work-related health problems	Identification of employees who did not work due to injuries or damages caused by work-related activities.	Average No. of days of absence/employee

Code	Name of the indicator	Description	Unit of measurement (per year of assessment)
SO23	Corruption cases	Identification of cases of non-compliance with the anti-corruption regulation of public sector organisations. If the regulation does not exist, it should be identified cases that initiated disciplinary or criminal proceedings related to: (i) misuse of public resources; (ii) offers of money or material goods to streamline processes; (iii) acceptance of bonuses or commissions to choose a company that provides services or sells products to the government; (iv) receive and/or request money from private companies to adopt or implement projects/programmes that benefit them; (v) hire, without public tender or bidding, companies to provide public services; and (vi) use public money for personal interests.	No. of cases of non-compliance with corruption regulations or recommendations
SO24	Employees' turnover	Identification of new employees and transference of employees from other public sector organisations.	% of employees' turnover
SO25	Discrimination complaints	Grievances about labour practices and human rights addressed and solved through formal/legal grievance mechanisms (e.g., sexual orientation, religious, race, gender, age).	No./employee or user
SO26	Users' satisfaction	Evaluation of the satisfaction of the public sector organisation's users.	% of users' satisfaction, considering the total amount of users
SO27	Stakeholder engagement in strategic initiatives related to the public sector organisation	Consulting and participation of stakeholders (e.g., employees, industries, non-governmental organisations, other public institutions, private institutions, communities, public) contributing to the conception, implementation and follow up of strategic instruments, including new policies, legislation, plans and programmes, related to the public sector organisation.	% of stakeholder engagement initiatives, concerning the total no. of strategic instruments
SO28	Voluntary actions conducted by the public sector organisation to support local communities	Number of voluntary actions to support the local community, where the organisation's main facilities are located.	No. of actions
SO29	Compliance of mandatory and voluntary regulations and codes	Compliance with mandatory and voluntary regulations, namely environmental (indoor air quality, indoor noise, waste), safety and health, labour Code, quality.	% of compliance with law and voluntary regulations

EC – Economic aspects; EN – Environmental aspects; SO – Social aspects

The feedback received from the follow-up questionnaire confirmed the indicators selected and highlighted the importance of integrating the indicators' value for the planning system and monitoring activities already in place in PSO. Specifically, the performance assessment of the entity, employees and their external contracts.

The contribution of stakeholders in this process reduced the preliminary proposal of one hundred forty-seven (147) to twenty-nine (29) performance indicators, whereby stakeholders, mostly from academia and PSO, co-created the key indicators to assess the operational aspects related to the sustainability performance in PSO. This participatory approach was used to co-develop and evaluate the list of indicators that will integrate the sustainability performance assessment conceptual framework for PSO, reflecting the stakeholders' views, values and opinions, which constitutes a requisition in indicators' validation (Bockstaller and Girardin, 2003).

4.3 Selection of reference values for normalization of the sustainability indicators

Table 3 depicts the reference values from the discussions of the focus groups among academics and PSO practitioners. These values are applicable to the PCPA as some are based on the Portuguese legislation and a qualitative assessment made by the research team considering the reality of PSO in Portugal. A similar approach was used in the city of Basel (Switzerland) to implement a sustainability assessment of the food and agriculture systems (Landert et al., 2017). According to these authors, a final list of indicators was discussed with stakeholders, and a scale from 0% to 100% was created for each indicator based on best practices in the literature and discussed with experts. Landert et al. (2017) pointed out that the process of creating a sustainability assessment of the food and agriculture systems with stakeholders enabled them to identify specific areas of improvement.

Table 3. Reference values for normalization of the sustainability indicators.

Indicator Code	**Unit of measurement (per year of assessment)**	**Categories**				
		Very weak	**Weak**	**Fair**	**Good**	**Very good**
Economic						
EC01	% of total expenditure excluding wages	0	]0-5[	5	]5-10[	≥ 10
EC02	% of objectives fulfilled	<30	[30-50[	[50-70[	[70-90[	≥90
EC03	Average No. of days	≥90	]60-90[	60	[30-60[	<30
EC04	Average No. of days	≥90	]60-90[	60	[30-60[	<30
EC05	% of studies, considering the total amount of impact assessment studies	<30	[30-50[	[50-70[	[70-90[	≥90
Environmental						
EN06	t/employee	≥ 0.07	]0.03-0.07[	0.03	]0.01-0.03[	≤ 0.01
EN07	kWh/employee	≥ 4787	]4259-4787[	4259	]2773-4259[	≤ 2773
EN08	% of renewable energy produced considering the total energy consumption	0	]0-15[	15	]15-31[	≥ 31
EN09	m^3/ employee	≥ 55	[18-55[	[11-18[	]5-11[	≤ 5
EN10	t/employee	≥ 0,5	[0,4-0,5[	[0,3-0,4[	]0,1-0,3[	≤ 0,1
EN11	t/employee	0	]0-25[	25	]25-50[	≥ 50

Indicator Code	Unit of measurement (per year of assessment)	Categories				
		Very weak	**Weak**	**Fair**	**Good**	**Very good**
EN12	t CO_2 eq/employee	≥ 8,43	]7,25-8,43[	7.25	]6,30-7,25[	≤ 6,30
EN13	% of measures that do not comply with the national legislation	<50	[50-75[	[75-90[	[90-100[	≥ 100
EN14	% of measures that do not comply with the national legislation	<50	[50-75[	[75-90[	[90-100[	≥ 100
EN15	% of services available online	<30	[30-50[	[50-70[	[70-90[	≥90
EN16	% of suppliers or contracted service providers	<30	[30-50[	[50-70[	[70-90[	≥90
EN17	% of the pre-contractual procedures and public contracts that include environmental criteria (considering the total number of procedures and contracts)	<30	[30-50[	[50-70[	[70-90[	≥90
Social						
SO18	% of employees	0	]0-5[	[5-10[		≥10
SO19	% of employees	<3	[3-6]	[7-15]	[16-44]	≥45
SO20	% of employees	<30	[30-50[	[50-70[	[70-90[	≥90
SO21	% of employees	<30	[30-50[	[50-70[	[70-90[	≥90
SO22	Average No. of days of absence/employee	>13	[7-12]	[4-6]	[1-3]	0
SO23	No. of corruption cases	≥ 1		Not applicable		0
SO24	% of employees' turnover	0	[1-3]	[4-6]	[7-9]	≥ 10
SO25	No./employee or user	≥ 1		Not applicable		0
SO26	% of satisfaction considering the total amount of users	<30	[30-50[	[50-70[	[70-90[	≥90
SO27	% of stakeholder engagement initiatives	<30	[30-50[	[50-70[	[70-90[	≥90

Indicator Code	Unit of measurement (per year of assessment)	Categories				
		Very weak	Weak	Fair	Good	Very good
	concerning the total no. of strategic instruments					
SO28	No.	0	1	2	[3-4]	≥5
SO29	% of compliance	<30	[30-50[	[50-70[	[70-90[	≥90

Reference values related to economic, social and part of the environmental indicators were selected based on the experience and knowledge of the workshop's participants with final adjustments by the research team. Most of them were associated with a scale from 0% to 100% as there were no specific reference values. Hence, in most cases, the category *Fair* was associated with the existence of at least 50% of the information positively assessed with success (accomplishment).

In the case of indicators EN06, EN07 and EN12 benchmarking results were obtained estimating the maximum, minimum and median of the values found in order to propose their scales. Benchmarking was used for indicators EN06 (based on the of materials by other CPA, EN07 (based on the electricity consumed per capita in Portugal), and EN12 (based on the GHG emissions per capita in Portugal).

A target normalization approach was used for EN08 and EN11. A target-driven normalization scheme is considered a suitable method in the context of sustainability assessment as it can be linked to regulations, giving information about the status quo of the achievement of specific targets (Mayer, 2008; Moldan et al., 2012; Pollesch and Dale, 2016). EN08 values were obtained based on Portuguese legislation (including Decree-Law 141/2010, 31st December, amended by Decree-Law 39/2013, 18th March, that partially transposed the European Directive 2009/28/EC of the European Parliament and of the Council of 23rd April). The legislation established the national targets for the use of energy from renewable sources in the final gross consumption of energy and energy consumption in transport in 2020. EN11 scale was created based on the Strategic Plan for Urban Waste PERSU 2020 (Decree-Law 73/2011, 17th June, was the third amendment to the Decree-Law 178/2006, 5th September, which transposed the European Directive 2008/98/EC of the European Parliament and of the Council of 19th November). The EC03 and EC04 are also based on Portuguese legislation for the public sector (e.g., Decree-Law 65-A/2011, 17th May).

In other cases, participants used literature to decide reference values. For example, EN09 and EN10 values were discussed by the participants, based on the findings from Pedroso (2000) and INE Statistics Portugal (2013) respectively.

Participants in the workshop used multiple methods to select reference values for the normalization of the sustainability indicators, including a percentage scale, benchmarking, the use of targets based on national legislation, and consulting literature on the specific topic. According to Pollesch and Dale (2016), different normalization procedures can be used, particularly when considering the complexity and the holistic approach to sustainability assessment. As Latawiec and Agol (2016) and Moreno Pires et al. (2014) discussed, the identification of the adequate level of standardization should consider the context and culturally specific inputs to facilitate comparability and optimize resources to conduct a sustainability assessment. Nevertheless, indicator normalization benefits sustainability assessment communication and reporting by transforming differing indicator measures onto similar scales or unit-free measures (Pollesch and Dale, 2016).

5 Discussion

The proposed conceptual framework for PSO, supported by two sustainability performance assessment systems— *Formal and Informal Sustainability Performance Assessment,* the latter illustrated by Coutinho et al. (2018)*,* presents an approach to improve the implementation's effectivity and feasibility. The two main components of the proposed framework (illustrated in Figure 1) could support sustainability transitions and go beyond the current prioritisation of the financial performance (see, e.g., Alcaraz-Quiles et al., 2015; Goswami and Lodhia, 2014; Williams et al., 2011) and bureaucratic principles (Lazzini et al., 2014). Its relative simplicity, context-dependency and openness (e.g., user-friendly checklist of objectives and practices and a small number of indicators) are key features that could contribute to a paradigm shift in organisational sustainability assessment in the public sector. Organisational stakeholders are a central driver to conduct part of the self-assessment.

The *Formal Sustainability Performance Assessment* system consists of a self-assessment addressing sustainability objectives and practices (performance checklist) and sustainability performance indicators. It was built upon the performance indicator set (table 2) with the reference values (table 3).

Previous research has shown that increasingly, and with a general nature, PSO leaders are aware and concerned with transparency, social responsibility and sustainability (Ponce et al., 2019). However, currently, PSO fail to assess their strategies (Adams et al., 2014). They often omit detailed policy descriptions in their annual reporting and communication activities, how measures are implemented, and how performance assessments relate to defined objectives (Guthrie and Farneti, 2008). Thus, the performance checklist of sustainability objectives and practices can support PSO in adopting a strategic assessment and communication tool.

Some pioneer examples in the military department (see, e.g., Myhre et al., 2013, for the Norwegian case) attempted to evaluate the environmental aspects and impacts, showing how it can be put into practice. In the late 1990s, PSO started adopting checking tools to conduct a unit's self-assessment of its environmental pressures and impacts (see, e.g., US Army, 2001; US Air Force, 1998). These assessments were considered core tools in evaluating the state of their unit's environmental performance, e.g., assessing the unit's environmental programme's effectiveness or compliance with environmental laws and regulations.

The approaches reviewed in the present work inspired the proposed performance checklist of sustainability objectives and practices to PSO sustainability performance assessment (overview presented in Table A1). The overview stimulated the expansion (in scope, content and method) and the self-assessment application. It can also be associated with sustainability reporting practices in PSO. Previous studies have pointed out that different phases of organisational processes, including planning and reporting, are rarely analysed as dependent organisational practices (see, e.g., Kaur and Lodhia, 2018; Schaltegger, 2012; Schaltegger and Wagner, 2006). Strategic aspects are often left out of the scope of sustainability assessment systems, which can jeopardise the significance of the performance assessment results.

The co-creation process developed in this research aimed to show how a comprehensive list of performance indicators, and related reference scales, can be created for PSO. The process has implications for researchers, public managers, politicians and decision-makers as it provides a tool to assess sustainability issues that reflect the values, concerns and hopes of key stakeholders. The framework presented reflects stakeholders' information needs and expectations, considered essential in previous studies (e.g., Kaur and Lodhia, 2018; Venturelli et al., 2018; Unerman, 2007). Results also show how value (Herzig and Schaltegger, 2006) and knowledge (Newton and Elliott, 2016; Regeer and Bunders, 2009) can be created through stakeholders cooperation.

In co-creation processes, there is a risk of misrepresentation of the sustainability dimensions. Besides representing a balanced framework, i.e. economic, environmental and social aspects with the same number of indicators per thematic dimension, the most important is to comprise significant aspects for the public management context and key stakeholders. The concept of sustainability, discussed by Ramos et al. (2020), was followed to guarantee a final list of indicators suitable to the PSO context. The concept of sustainability used has also previously been emphasised for sustainability assessments by Pope et al. (2017).

In the scoring procedure adopted in the co-creation process, there was a risk to end up with indicators, either suggested or highly scored, less important to the context of organisational sustainability. However, the risk was mitigated. Participants were aware that the preliminary list of indicators was draft by academics, seen as experts by stakeholders. Consequently, participants may have believed that the indicators' list was already suitable for the purpose, which may have influenced a high average scoring of the indicators and few additional comments, also discussed by Coutinho et al. (2018). Key stakeholders engaged in the co-creation process may undermine their role as acknowledgeable stakeholders, disbelieving their contribution in providing valuable information about sustainability aspects.

At the same time, despite being considered significant environmental aspects to be included in PSO performance assessment frameworks (see, e.g., Domingues et al., 2015; Mazzi et al., 2012; Petrosillo et al., 2012), air quality, noise and biodiversity were not highly graded by stakeholders. Indoor air quality and noise were maintained in the list of indicators, and biodiversity was considered in the checklist due to their legal status and importance.

The need to adjust the results of the co-creation process shows some of the pitfalls of transdisciplinary research. Participants will not necessarily consider the scoring procedure holistically. On the contrary, they mainly focus on individually scoring each indicator, disregarding the implications of assigning high scores to specific indicators and the broader context (e.g., considering regulations). Nevertheless, the workshop conducted allowed collaborative discussion within the focus groups about the final list of the indicators under each thematic area, which mitigated the shortcomings of the individual perspectives obtained in the interviews.

The proposed conceptual framework does not intend to be a "fits all tool". The goal is to provide a suitable hands-on, flexible tool to assess sustainability aspects that are significant in the public sector context and, most importantly, to compare sustainability performance among PSO. The limitation in comparing performances has been noted in previous research as PSO adopt different indicators associated with different methodologies (Mazzi et al., 2012). Sustainability performance is comparable between PSO by adopting the same framework and using normalization references, absent from other sustainability assessment frameworks. Nevertheless, keeping in mind that assessment approaches including indicators should be placed in a specific context (e.g., cultural, institutional, organisational) to understand the particular characteristics that will tailor the process, as discussed by Ramos (2019).

A stabilised indicator set with normalization references could drive and support implementing mandatory sustainability performance assessments in the public sector context. Different PSO could reach comparable scores and support continuous improvement across time. While sustainability performance assessment continues to be mainly a voluntary practice within the public sector, in the private sector, companies with more than 500 employees have to report non-financial information in Europe formally (according to the Non-Financial Reporting Directive 2014/95/EU (European Commission, 2014).

PSO are unlikely to adopt comprehensive sustainability performance measures if they remain voluntary and without a perceived need to be competitive (Adams et al., 2014). For instance, when sustainability reports are published, they are often not as relevant, detailed, rigorous and reliable as financial statements due to their voluntary status (Gray and Milne, 2002). The compulsory status of a sustainability performance tool can potentially enhance the adoption of the sustainability concept within PSO.

PSO are significantly responsible for applying policies and actions related to sustainability (Ball et al., 2014). They also constitute a significant economic activities' component by creating value for society and being responsible for many nation's employees associated with resources' consumption and significant impacts. The specific characteristics of the PSO, namely to fill societies needs through political and social targets instead of commercial objectives (Carter et al., 1992), justify the existence of sustainability performance tools tailored for their characteristics, like the one developed in this research.

It is possible to note that the conceptual framework's general architecture can be potentially applied to private and public organisations. Both sectors have several common structural characteristics and should assess some similar sustainability aspects. However, the developed tool's internal components were designed for the specific public sector setting, including tailored objectives, practices, and indicators. Therefore, although this research is based on one case study in the public sector, there are theoretical and practical lessons for developing and using sustainability assessments in the private and public sectors, also pointed out by Droege et al. (2021) for a similar research challenge. The present article can contribute to the stakeholder theory (Freeman, 1984) by highlighting the crucial role stakeholder engagement processes can have in co-creating a sustainability assessment framework. Organisations can broaden the scope of current frameworks to consider sustainability aspects relevant to key stakeholders, including multiple perspectives in organisational sustainability performance assessment tools.

The proposed conceptual framework can support PSO in managing and assessing their sustainability performance at strategic and operational levels, their evolution across time and comparison between PSO due to normalization reference values. Overall, the developed framework was designed to mitigate the disadvantages of many frameworks that focus primarily on one of the sustainability dimensions (e.g., environmental), in operational activities unlinked to the strategy and disregarding the inputs from voluntary collaborative assessments organisational stakeholders, in particular by employees.

6 Conclusions

The public sector has been pressured to assess its current sustainability status and progress in making improvements. Some PSO have started to adopt sustainability strategies and practices, but few have adopted a comprehensive approach to evaluate and communicate their sustainability performance. This research documents that adopting these tools and the links between strategies and operations are still underdeveloped. This work contributed to fill this gap by proposing a framework that includes a performance checklist of sustainability objectives and related practices (at the strategic level) and associated sustainability performance indicators (at the operational level).

A participatory approach was used to co-create a list of indicators and reference values for normalization, corresponding to the framework's *Formal Sustainability Performance Assessment* system. The performance indicators were evaluated and co-developed through interviews, a survey questionnaire and a participatory workshop, including three selection criteria: comprehensibility, relevancy and feasibility. This process was used to address the practical needs and aspirations of PSO key stakeholders based on a collaborative-interactive process.

Stakeholders of eleven ministries of the PCPA and academics co-worked in the participative process, which was considered to be the key factor for this type of initiative for enhancing accountability and transparency for the process. The final list of twenty-nine (29) indicators and the associated reference values for normalization were developed, which provided additional benefits for simplifying complex information and communication of organisational sustainability. Also, it filled the gap of the inexistence of standards related to the sustainability performance of PSO, enabling the comparison of the sustainability performance among PSO for the specific context case of PCPA.

Among the limitations of the approach was the restricted number of stakeholder groups (public sector practitioners and academic experts) involved. This may have resulted in the omission of topics that other key stakeholders (e.g., general citizens, non-governmental organisations, companies) would have considered to be relevant.

This research contributes to the debate on sustainability assessment and communication in PSO and the importance of selecting and developing sustainability indicators using co-creation processes with key-stakeholders. For future developments, it is expected that the conceptual framework will also include other essential components, namely the meta-performance, to assess the effectiveness of PSO own performance indicators and assess the system as a whole. This conceptual framework could be tested in PSO from the PCPA and other similar contexts, such as the southern European PSO, with the necessary adaptations in the reference values for normalization. Also, it would be valuable to reflect on how the conceptual framework can integrate the existent planning, management control and reporting systems, and what links could be established with private sector organisations, exploring how the developed framework is potentially adaptable and usable. Finally, the flexibility to account for new global changes and trends in sustainability, including health, environmental, economic and social crisis, should also be an important angle to explore as an emerging research priority. It is essential that future studies address how this kind of framework could prepare and support organizational systems resilience by including scenarios of crisis into management and assessment models.

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Appendix A

Table A1. Frameworks based on sustainability indicators for performance assessment of public sector organizations (initiatives with participatory process are marked with *).

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
USEPA (1996)	**Compliance Indicators.** It assesses environmental compliance in federal facilities. Standard indicators measure changes in the programmes' compliance. Similarly, the 'consumer price index' measures changes in the rate of inflation relative to a given base year. Compliance indicators are intended to measure the level of relatively serious non-compliance at major federal facilities.	Environmental: recycling, waste, wastewater and operations.	5
United Kingdom Government (1997)	**Greening Government.** The initiative was created in 1997. The Greening Government initiative represents an attempt to mainstream the environment across the entire work of government. It incorporates environmental objectives in operational aspects of departmental performance. Besides, by greening the fundamental objectives of departments ensures significance is given to environmental impacts in policy appraisal and development. Its objective is to contribute to the government´s annual report on sustainable development, including indicators on green government operations.	Environmental: efficiency energy, GHG emissions, ecological transport, use and conservation of water, use and conservation of paper, waste management, procurement, biodiversity and environmental management system; Social: training and awareness on environmental issues and communication and sharing of information with stakeholders; Economic.	Not available
Marbek Resource Consultants (1999)	**Environmental Performance Measurement for Sustainable Government Operations**. It supports Canadian federal departments/agencies to evaluate indicators by providing details on their definition and guidance on their calculation. It is intended to complement the generic guidelines for planning and implementing the environmental performance measures from ISO 14031. The starting point for establishing environmental performance measures for the operations of federal departments is the environmental goals that departments/agencies have set in their sustainable development strategies.	Environmental: contaminated sites, hazardous waste, water efficiency, solid waste management, ozone-depleting substances, fleet management, energy use in Federal facilities, green procurement, storage tanks, releases, wastewater, and GHG emissions.	82
Mohinger (1999a, 1999b, 2000)	**Environmental performance indicators: Internal Performance-Direct Effects-Environmental quality.** It develops a baseline to measure and track progress on environmental stewardship within the ministries of the Government of Jamaica. It examines methods of measuring and monitoring the success of water, energy conservation and green	Environmental: water, energy efficiency, ecological procurement and waste; Social; Economic.	11

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
	purchasing programmes. A baseline is developed by setting targets and tracking whether they are being achieved. Internal performance indicators are a measurement of activities implemented by an organisation in order to reduce its environmental impacts. Indicators measure the direct outcome of an organisation´s environmental activities and programmes (e.g., estimating the number of trees saved as a result of purchasing green paper).		
Minister of Public Works and Government Services Canada (2000)	**Sustainable development in government operations: a coordinated approach.** It outlines a part of the government-wide effort to set standard directions to sustainable development strategies. It is intended to promote green government and recommend best practices. It proposes a toolbox for collaboratively developing performance measures for priority areas and offers a sample set of concrete targets.	Environmental: procurement, waste management, water conservation, energy efficiency, land use management); Social: human resources management.	22
Natural Heritage Trust (2000)	**Public Environmental Reporting: An Australian Approach.** This framework supports private and public sector organisations' reporting.	Environmental	Each organisation chooses how many indicators they need to use regarding the key factors of most significance to organisational operations.
Government of Canada (2002)* [1]	**Environmental performance measures; Environmental load- Coast load-Efficiency Measure-Activity-Proportion**. It provides environmental performance measures within the scope of Greening Government reporting guidelines. The guidelines support departments and agencies to measure their progress regarding the eight priority areas identified.	Environmental: energy efficiency, land use management, procurement, vehicle fleet management, waste management, water conservation, wastewater management and environmental management systems); Social: human resources management.	58
United Kingdom Government (2002)*	**Framework for sustainable development on the government estate.** The overarching aim of the Framework is to increase the contribution that all departments make to sustainable development, improving the performance of the Estate and reporting on the progress. The framework was released in stages to cover the most significant sustainable	Environmental: waste, energy, procurement and biodiversity; Social: social impacts; Economic: estate management.	12

*With participatory process.

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
	development impacts associated with managing the different departments. The first three parts of the framework include overachieving commitments to identify, manage and report on key impacts of the Estate, as well as the first suite of targets to tackle specific sustainable development impacts from business travels and water use. The remaining parts cover waste, energy, procurement, estate management, biodiversity and social impacts.		
DEFRA (2005)*	**Securing the future - delivering the UK sustainable development strategy**. The United Kingdom Government proposed the creation of a common framework that contains a set of strategies for sustainable development. This framework includes (i) a shared understanding of sustainable development; (ii) a vision of what the government seeks to achieve, including guiding principles; (iii) priorities for action in the United Kingdom and at international level; and (iii) indicators for monitoring key issues.	Environmental: GHG emissions, energy, transportation, water, waste, biodiversity, land use, air pollution, ecological impacts; Social: demography employment, education, social justice, mobility, accessibility and well-being; Economic: productivity, economic results, investment;	68
GRI (2005, 2010)	**GRI Reporting in Government Agencies.** It is a supplement to the general guidelines specific for public agencies. The first pilot version 1.0 was published in 2005, following 2002 guidelines.	Environmental; Social: human rights, work, responsibility productive and society. Implementation of measures and public policies; Economic: expenditures, acquisitions, administrative efficiency.	105
Department of the Environment and Heritage (2006)*	**Triple Bottom Line Summary Report 2004-05**. It is based on the mission of leading the protection and conservation of the environment. The Australian Department of Environment and Culture developed a report based on the GRI guidelines, showing the performance of the organisation on objectives previously defined for the period 2004-2005.	Environmental: energy, waste, GHG emissions, water, biodiversity; Social: labour practice and decent work, human rights, society, product responsibility; Economic: sustainability in the supply chain.	56. Authors use indicators from GRI, including those contained in the pilot version of the GRI's Public Agency Sector Supplement.
Ramos et al. (2007)*	**Environmental performance policy indicators for the public sector: The case of the defence sector**. It develops a set of performance indicators for environmental policy, mainly applied to the defence sector. A list of 135 indicators was established according to previous studies and the Portuguese defence sector characteristics. Experts scored indicators for	Environmental: travel on duty, land use, busy area, energy, wastewater, atmospheric emissions, contaminations and soil erosion and noise.	41. based on previous studies, the Portuguese defence sector characteristics and surveys

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
	their relevancy and feasibility in order to obtain the final list of 41 indicators to assess the Portuguese defence sector.		
Chai (2009)	**Sustainability Performance Evaluation System in Government A Balanced Scorecard Approach Towards Sustainable Development.** It presents a sustainability performance evaluation system.	Environmental; Social; Economic; Internal process; Growth and learning.	Examples of each dimension are given.
Lundberg et al. (2009)*	**Framework for environmental performance measurement in a Swedish public sector organisation**. It develops a performance measurement tool for public sector organisations through operational and strategic objectives. This Framework was applied to the performance evaluation of the railway administration of Sweden.	Environmental: atmospheric emissions, energy, noise, land use, materials, chemical substances, waste and hazardous pollutants.	28. Authors considered these indicators examples that need further improvement and refinement
Cabinet Office (2011)	**Greening Government Commitments: Guidance on measurement and reporting.** It provides an overview of reporting requirements for the Greening Government Commitments of the United Kingdom, enables consistent reporting across government.	Environmental: GHG emissions, domestic flights, waste, paper consumption, water, sustainable procurement; Social: transparency commitment.	9
Wu (2012)Wu and Wang (2011)*	**Development of an environmental performance indicator framework to evaluate an Environmental Management Systems (EMS) for the Shoalwater Bay Training Area (SWBTA).** It develops an Environmental Performance Indicator (EPI) framework to estimate how significant the EMS is to maintain the sustainable environmental management of military training activities. Application to SWBTA, Queensland (Australia).	Environmental: environmental-related input, environmental-related output (water quality, soil quality, waste generation and discharge), biodiversity, habitat, protected areas, heritage, and environmental quality of adjacent areas.	208. based on major activities/operations of the SWBTA and (Ramos et al., 2007)
USEPA (2012)	**A Framework for Sustainability Indicators at the Environmental Protection Agency (EPA)**. The purpose of this document consists of providing a set of useful methods and guidelines to assist decision-making processes of EPA, based on the use of sustainability indicators. This document was written as a part of a project completed in September 2011 on the development of sustainability indicators to (i) support the development and inclusion of sustainability indicators available in electronic format from 2012; (ii) support national research programmes to select sustainability indicators that are consistent with	Environmental: air, water, energy and materials; Social: local communities, public health and security; Economic.	Not available

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
	national and sustainability programmes; and (iii) monitor trends relevant to long-term sustainability.		
The Scottish Govern (2012)	**The Scottish Government Public Sector Sustainability Report 2011-12.** It reports on Scottish Government performance concerning sustainability, and it aims to improve performance management through greater accountability and transparency.	Environmental: GHG emissions, energy use, waste management, business travel, water consumption, climate change adaptation, Environmental Management Systems, action on biodiversity, sustainable procurement.	49
Controller and Auditor-General (2013)	**Public sector financial sustainability.** It suggests indicators for the public sector financial sustainability performance and report.	Environmental; Social; Economic; Financial.	21
DEFRA (2013)*	**Sustainable Development Indicators**. In February 2011, the UK Government published the government's strategy to integrate sustainability principles into their activities and operations, supported by the publication of a new set of indicators. Initially, this set of indicators consisted of 68 indicators (12 key indicators and 23 supplementary). Between 24th July 2012 and 15th October 2012, DEFRA initiated a public consultation to reduce this set of indicators. The publication of the responses during the public consultation was held in July 2013. These indicators are intended to reflect the needs and expectations for information from stakeholders. Each measure is assessed using a set of *traffic lights* that show whether changes in the trends are showing clear improvement or deterioration. Whenever data was available, two assessment periods were used: long-term (usually back to 1990), and short-term (for the last 5-year period). They complement the *National Wellbeing Measures* published by the national statistical agency.	Environmental: GHG emissions, natural resource use, wildlife – bird population indices, water use; Social: healthy life expectancy, social capital, social mobility in adulthood, housing provision; Economic: economic prosperity, long-term unemployment, poverty, knowledge and skills.	68/35
Myhre et al. (2013)	**Development of environmental performance indicators supported by an environmental information system: Application to the Norwegian defence sector.** This conceptual model is aimed at developing environmental performance indicators supported by an environmental information system as a tool to evaluate the environmental effects in the defence sector.	Environmental: travel on duty, waste, hazardous waste, energy consumption, atmospheric emissions, substances that degraded the ozone layer, recycling, environmental reports.	37. Authors choose indicators from previous studies

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
Sustainable Development Office and Environment Canada (2013)	**Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada.** It reports actions and achievements related to climate change and air quality, water quality and availability, nature and environmental footprint in Canada.	Environmental: addressing climate change and air quality, maintaining water quality and availability, protecting nature, shrinking environmental footprint.	61
Domingues et al. (2015)	**Defining criteria and indicators for a sustainability label of local public services.** It suggests a list of indicators and criteria to assess sustainability aspects of local public services, based on criteria from the European Union Eco-label and indicators from the GRI guidelines.	Environmental: environmental protection and management; Social: ethic and social responsibility; Economic aspects.	36
Landert et al. (2017)*	**Development of a Holistic Sustainability Assessment Method for Urban Food System Governance.** The indicators focus on policies and measures of public administration and local politics. It is based on the guidelines for Sustainability Assessment of Food and Agriculture Systems (SAFA) by the Food and Agriculture Organization (FAO). It was applied in the city of Basel, Switzerland.	Environmental; Economic; Social; Governance, based on SAFA guidelines	97
Cantele et al. (2018)	**Development of a Framework for Assessing the Sustainability Reporting Disclosure of Water Utilities in Italy.** It selects the performance indicators based on SASB's sustainability accounting and GRI standards and a benchmarking-scoring technique.	Environmental: related to water use and quality, wastewater, energy, climate change; Economic: related to the water service	39
Hatakeyama (2018)*	**Development of five conceptual frameworks of comparative indicators sets for local administrations in Japan.** It selects Sustainable Development Indicators based on the three dimensions of Sustainable Development. The five frameworks were developed based on municipalities policy priorities defined by practitioners.	Environmental; Social; Economic	12 to 16, depending on the framework
Ponce et al. (2019)	**Design of a tool based on measurement indicators for responsible public procurement in Spain.** It aims the development of a facilitating a tool, composed of a series of ethical and sustainable indicators, in line with the Spanish Law, which allows comparative measurement and comparison of the responsible behaviour of administrations concerning their public contracts. It includes indicators for the different phases of the contract (preparation, awarding, execution).	Environmental: addressing GHG emissions, energy and water use, waste management, use of ecological products, environmental management. Social: ethic and social responsibility	48

Author(s)	Name, aims and scope	Theme/domain	No. of indicators
D'Inverno et al. (2020)*	**Selection of performance indicators to evaluate the water utilities performance**, encompassing financial and economic indexes together with environmental sustainability and service quality measures. It was applied in the Italy context. A final global index was also developed.	Environmental: water losses; Economic: Net incomes, Tax; Social: quality of the service; Finance: Financial autonomy.	8

Appendix B

Table B1. Strategic sustainability performance assessment: Checklist of objectives and practices in public sector organisations.

Objectives and sustainability practices	Response type
General aspects	
1. Does the organisation have an environmental and/or sustainability policy or strategy?	Yes, it was implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
If *yes, implemented*, is this information communicated and available to employees and/or the general public?	Yes/No. If yes, how (online information; information printed; other)
If not (No, but it is planned; No, it is not planned), are there environmental and/or sustainability objectives defined in other policies or strategies of the organisation?	Yes/No
2. Does the organisation have a performance management and/or evaluation system?	Yes, it was implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
If yes (Yes, it was implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed), which is the management and/or evaluation system?	Select one or more options: Balanced Scorecard, ISO 14031, ISO 14001, EMAS, SA 8000, ISO 26000, NP 4469-1, ISO 9001, OHSAS 18001, other.
If *yes, implemented*, which ones have certification?	Open-ended: descriptive text
3. Does the organisation develop sustainability reports?	Yes, they are developed annually and verified by an independent entity; Yes, they are developed annually; Yes, they are being developed; No, but they are planned; No, they are not planned.
If yes (Yes, they are developed annually and verified by an independent entity; Yes, they are developed annually; Yes, they are being developed), does the organisation follow any national or international guideline?	Yes (which one?; Open-ended: descriptive text)/ No
4. Are there institutional cooperation mechanisms for management and/or evaluation of sustainability performance (e.g., monitoring programmes established between entities)?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
If yes (Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed), which type of protocol and entities are involved?	Open-ended: descriptive text
5. Is there a department in the organisation responsible for managing environmental and/or sustainability issues?	Yes/No

Objectives and sustainability practices		Response type
6. Does the organisation have sustainable building principles and practices, including maintenance activities?		Yes/No. If the answer is yes, select one or more options: green roofs, double glazing (acoustic and thermal insulation), bioclimatic architecture, interior patio, other.
7. Do buildings have any energy performance certification?		Yes/No. If the answer is yes, which is the level of certification?
Economic		
8. Does the organisation require financial audits?		Yes, they are requested and produced annually; Yes, they were requested, and they are being developed; Yes, they were requested; No, but they were planned; No, they are not planned.
EC01	9. Are there objectives associated with a financial commitment at medium- and long-term to develop initiatives that promote the improvement of environmental and sustainability performance of the organisation?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, are there any related practices?	Yes/No
	10. Does the organisation invest in research related to the environment and/or sustainability?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	11. Is there a system that includes periodic monitoring of current and future capital expenditures associated with environmental and/or sustainability practices developed or implemented by the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EC02	12. Are there objectives associated with a policy or strategy in the organisation to motivate employees to improve their performance?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	13. Is there a system that includes periodic monitoring of the labour productivity of the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	14. Is there a system that includes incentives to improve employers' labour performance?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EC03	15. Are there objectives associated with a policy or strategy in the organisation that include the fulfilment of payments to suppliers or contracted service providers within the period stipulated in the contract and the sanctions associated with non-compliance?	Yes/No
	If yes, there is an associated target? Which?	Open-ended: descriptive text

Objectives and sustainability practices		Response type
	If not, is there any related practice?	Yes/No
	16. Is there a system that includes periodic monitoring of the average payment period of the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EC04	17. Are there objectives associated with a policy or strategy in the organisation that include compliance with the collection of amounts due for services provided within the period stipulated in the contract and sanctions associated with non-compliance?	Yes/No
	If yes, there is an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	18. Is there a system that includes periodic monitoring of the average collection period of the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EC05	19. Are there objectives that require prior identification of economic and environmental and/or social positive and negative impacts caused by strategic instruments (including policies, legislation, plans and programmes) that are this organisation responsibility?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	20. Is there a system that includes periodic monitoring of positive and negative impacts caused by the implementation of the strategic initiatives?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
Environmental		
EN06	21. Are there objectives associated with a policy or strategy in the organisation to reduce the consumption of materials (paper/paperboard, including for packaging purposes, and consumer electronics, like toners and equipment)?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	22. Is there a system that includes periodic monitoring of the consumption of materials (paper/paperboard, including for packaging purposes, and consumer electronics, like toners and equipment) in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.

Objectives and sustainability practices		Response type
EN07	23. Are there objectives associated with a policy or strategy in the organisation to reduce the consumption of electricity?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	24. Is there a system that includes periodic monitoring of electricity consumption in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	25. Does the organisation have measures to increase energy efficiency in the organisation?	Yes/No. If the answer is yes, select one or more options: implementation of energy-saving lamps, automatic off-switch for the lights, use of air conditioning instead of heating boilers, sealing doors and windows, energy-saving mode settings on for all electronic equipment, other
EN08	26. Are there objectives associated with a policy or strategy in the organisation to increase the production of energy from renewable sources by the organisation?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	27. Is there a system that includes periodic monitoring of energy produced from renewable sources by the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN09	28. Are there objectives associated with a policy or strategy in the organisation to reduce consumption of water?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	29. Is there a system that includes periodic monitoring of the consumption of water in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	30. Does the organisation have measures to reduce the consumption of water in the organisation (e.g., water flow restrictors for taps and showers, automatic/timed flushing systems)?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
	31. Does the organisation have measures to collect and reuse rainwater in different uses in the organisation (e.g., for watering plants and washing green spaces and floors)?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
EN10	32. Are there objectives associated with a policy or strategy in the organisation to decrease the amount of waste generated?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No

Objectives and sustainability practices		Response type
	33. Is there a system that includes periodic monitoring of the generation of urban solid waste in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN11	34. Are there objectives associated with a policy or strategy in the organisation to encourage reuse, recovery and recycling of urban solid waste? If yes, is there an associated target? Which? If not, is there any related practice?	Yes/No Open-ended: descriptive text Yes/No
	35. Is there a system that includes periodic monitoring of urban solid waste generated that is reused, recovered or recycled in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN12	36. Are there objectives associated with a policy or strategy in the organisation to prevent the emission of greenhouse gases? If yes, is there an associated target? Which? If not, is there any related practice?	Yes/No Open-ended: descriptive text Yes/No
	37. Is there a system that includes periodic monitoring of greenhouse gases emissions in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	38. Does the organisation give preference to the use of public transport for business travel, namely rail transport?	Yes/No
EN13	39. Are there objectives associated with a policy or strategy in the organisation to ensure the indoor air quality in accordance with the national law? If not, is there any related practice?	Yes/No Yes/No
	40. Is there a system that includes periodic monitoring of indoor air quality in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN14	41. Are there objectives associated with a policy or strategy in the organisation to ensure indoor noise levels following the national law? If not, is there any related practice?	Yes/No Yes/No
	42. Is there a system that includes periodic monitoring of noise levels in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN15	43. Are there objectives associated with a policy or strategy in the organisation to encourage the provision of public services associated with the organisation in an online platform? If yes, there is an associated target? Which?	Yes/No Open-ended: descriptive text

Objectives and sustainability practices		Response type
	If not, is there any related practice?	Yes/No
	44. Is there a system that includes periodic monitoring of public services associated with the organisation in an online platform?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	45. Does the organisation have measures to reduce the use of printed materials through the provision of public services associated with the organisation in an online platform (e.g., payslip, information, internal and external communications)?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
EN16	46. Are there objectives associated with a policy or strategy in the organisation to preferably choose suppliers or contracted service providers with environmental or social certifications?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	47. Is there a system that includes periodic monitoring of suppliers or contracted service providers that have environmental or social certifications?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
EN17	48. Are there objectives associated with a policy or strategy in the organisation that requires the integration of environmental criteria in the pre-contractual procedures and public procurement procedures?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	49. Does the organisation have a strategic orientation to purchase hybrid, plug-in or 100% electric vehicles rather than vehicles with conventional fuels (petrol, diesel, gas)?	Yes/No/Not applicable
Social		
SO18	50. Are there objectives associated with a policy or strategy in the organisation to promote green jobs?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	51. Is there a system that includes periodic monitoring of the number of green jobs in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.

Objectives and sustainability practices		Response type
SO19	52. Are there objectives associated with a policy or strategy in the organisation to engage employees in sustainable practices training (social responsibility, environmental management, sustainability accounting)?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	53. Is there a system that includes periodic monitoring of the number of employees of the organisation involved in sustainable practices training (social, environmental management, sustainability accounting)?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO20 SO21	54. Are there objectives associated with a policy or strategy in the organisation to ensure that every job meets similar conditions, safety and comfort, and social and economic justice?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	55. Is there a system that includes periodic monitoring of employee satisfaction in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	56. Does the organisation have practices to promote labour flexibility to manage equally personal and professional life?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
SO22	57. Are there objectives associated with a policy or strategy in the organisation to mitigate (eliminate, prevent, reduce, offset) health problems that may be associated with the activities related to the organisation (e.g., the use of ergonomic furniture, mandatory resting periods)?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	58. Is there a system that includes periodic monitoring of the effects on the health of employees of the organisation, including the identification of activities/materials that may have significant risks?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	59. Does the organisation have practices related to the promotion of employees' health?	Yes/No. If yes, which measures: Protocols with sports facilities, protocols with wellness centres, the existence of a canteen with healthy food, ergonomic practices, other
SO23	60. Are there objectives associated with a policy or strategy in the organisation to prevent bribery and corruption?	Yes/No

Objectives and sustainability practices		Response type
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	61. Is there a system that includes periodic monitoring of potential risk factors related to bribery and corruption?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO24	62. Are there objectives associated with a policy or strategy in the organisation to ensure that the turnover of employees is under the satisfactory provision of public services by the organisation?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	63. Is there a system that includes periodic monitoring of the turnover of employees in the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO25	64. Are there objectives associated with a policy or strategy in the organisation to reduce discrimination (e.g., sexual orientation, religious, race, gender, age)?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	65. Is there a system that includes periodic monitoring of complaints related to discrimination?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO26	66. Are there objectives associated with a policy or strategy in the organisation to improve users' satisfaction?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	67. Is there a system that includes periodic monitoring of users' satisfaction?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO27	68. Are there objectives associated with a policy or strategy in the organisation to promote the involvement of stakeholders (e.g., employees, non-governmental organisations, local community, the general public) in the design, implementation and monitoring of strategic initiatives (policies, legislation, plans and programmes) related to the organisation?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No

Objectives and sustainability practices		Response type
	69. Is there a system that includes periodic monitoring of the involvement of stakeholders in the strategic instruments of the organisation?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
SO28	70. Are there objectives associated with a policy or strategy in the organisation to promote activities to support local communities?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	71. Is there a system that includes periodic monitoring of the organisation's voluntary actions to support local communities?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.
	72. Does the organisation have practices to promote cooperation with other public or private authorities and institutions to support local communities?	Yes, they are implemented; Yes, they are developed but not implemented; Yes, they are being developed; No, but they are planned; No, they are not planned.
SO29	73. Are there objectives associated with a policy or strategy in the organisation to reduce cases of non-compliance with mandatory and voluntary regulations and codes (e.g., promotion of safety and health at work, including fire safety and worker exposure to asbestos; regulation of acoustic requirements of buildings)?	Yes/No
	If yes, is there an associated target? Which?	Open-ended: descriptive text
	If not, is there any related practice?	Yes/No
	74. Is there a system that includes periodic monitoring of compliance with cases of non-compliance with mandatory and voluntary regulations and codes (e.g., promotion of safety and health at work, including fire safety and worker exposure to asbestos; regulation of acoustic requirements of buildings)?	Yes, it is implemented; Yes, it was developed, but it is not implemented; Yes, it is being developed; No, but it is planned; No, it is not planned.

Appendix C - Organisational Context

I. Characterisation of the organisation

1. General background

- Name of the organisation
- E-mail
- Address
- Post Code
- City council
- Telephone

2. Select the NUTS II region of the organisation

- North
- Centre
- Lisbon and Tejo Valley
- Alentejo
- Algarve
- Madeira
- Azores

3. The total area occupied by the facilities of the organisation (m^2 or ha)

4. Total construct gross area occupied by the facilities of the organisation (m^2 or ha)

5. Please indicate, using the terms of the Assessment and Accountability Framework (QUAR) or the organic law, the organisation's mission.

6. Using the second level of COFOG Classification System (Classification of the Functions of Government), please indicate the function/s performed by the organisation.

Note: in the multiple-choice list below, capital letters indicate the ten (10) fundamental COFOG's divisions: for example, Defence, or Health. Within the corresponding division, please indicate which of the function(s) are performed explicitly by the organisation. Please consult the detailed descriptions of each group on the following page: UNSTATS COFOG https://unstats.un.org/unsd/classifications/

- **G010 GENERAL PUBLIC SERVICES**
- G0101 Executive and legislative organs, financial and fiscal affairs, external affairs.
- G0102 Foreign economic aid.
- G0103 General services.
- G0104 Basic research.
- G0105 R&D general public services.
- G0106 General public services n.e.c.
- G0107 Public debt transactions.
- G0108 Transfers of a general character between different levels of government.
- **G020 DEFENCE**
- G0201 Military defence.
- G0202 Civil defence.
- G0203 Foreign military aid.
- G0204 R&D defence.
- G0205 Defence n.e.c.
- **G030 PUBLIC ORDER AND SAFETY**
- G0301 Police services.

- G0302 Fire-protection services.
- G0303 Law courts.
- G0304 Prisons.
- G0305 R&D public order and safety.
- G0306 Public order and safety n.e.c.
- **G040 ECONOMIC AFFAIRS**
- G0401 General economic, commercial and labour affairs.
- G0402 Agriculture, forestry, fishing and hunting.
- G0403 Fuel and energy.
- G0404 Mining, manufacturing and construction.
- G0405 Transport.
- G0406 Communication.
- G0407 Other industries.
- G0408 R&D economic affairs.
- G0409 Economic affairs n.e.c.
- **G050 ENVIRONMENTAL PROTECTION**
- G0501 Waste management.
- G0502 Wastewater management.
- G0503 Pollution abatement.
- G0504 Protection of biodiversity and landscape.
- G0505 R&D environmental protection.
- G0506 Environmental protection n.e.c.
- **G060 HOUSING AND COMMUNITY AMENITIES**
- G0601 Housing development.
- G0602 Community development.
- G0603 Water supply.
- G0604 Street lighting.
- G0605 R&D housing and community amenities.
- G0606 Housing and community amenities n.e.c.
- **G070 HEALTH**
- G0701 Medical products, appliances and equipment.
- G0702 Outpatient services.
- G0703 Hospital services.
- G0704 Public health services.
- G0705 R&D health.
- G0706 Health n.e.c.
- **G080 RECREATION, CULTURE AND RELIGION**
- G0801 Recreational and sporting services.
- G0802 Cultural services.
- G0803 Broadcasting and publishing services.
- G0804 Religious and other community services.
- G0805 R&D recreation, culture and religion.
- G0806 Recreation, culture and religion n.e.c.
- **G090 EDUCATION**
- G0901 Pre-primary and primary education.
- G0902 Secondary education.
- G0903 Post-secondary non-tertiary education.
- G0904 Tertiary education.
- G0905 Education not definable by level.
- G0906 Subsidiary services to education.
- G0907 R&D education.
- G0908 Education n.e.c.
- **G100 SOCIAL PROTECTION**
- G1001 Sickness and disability.

— G1002 Old age.
— G1003 Survivors.
— G1004 Family and children.
— G1005 Unemployment.
— G1006 Housing.
— G1007 Social exclusion n.e.c.
— G1008 R&D social protection
— G1009 Social protection n.e.c.

7. Total number of employees

7.1. Total number of employees in the PSO

7.2. Total number of employees in the ministry where it belongs (if the ministry itself is not being assessed)

8. Expenditures (includes current and capital expenditures)

9. Revenues (includes state budget, own source)

II. Characterisation of the surrounding area where the main facilities of the PSO are located

1. Type of surrounding area (select the most predominant)
   — Urban (concentrated settlement with high population densities)
   — Industrial (industrial parks or isolated but large industries)
   — Rural (dispersed settlement, with agricultural and/or forestry units)
   — Mixed (unclear existence of a predominant type)
   — Other (please specify)

2. Activities related to the PSO that take place in:
   — Natural heritage areas (all monuments constituted by physical and biological formations that require their conservation because of their singularity, rarity or representativeness in landscape, scientific or ecological terms)
   — Cultural heritage areas (all goods, matter or immaterial, which by their intrinsic value represent the identity of a society, and are therefore relevant for preservation, namely classified monuments by national or international entities)

3. Classify the state of the environment of the surrounding area (it should be considered the area relevant for the development of the activities related to the organisation)	Evaluation guide
3.1. Quality of air	1 – Very weak; 2 – Weak; 3 – Fair; 4 – Good; 5 – Very good
3.2. Quality of water (e.g., rivers, lakes, estuaries)	(same as 3.1)
3.3. Noise (if assessed as lower than fair, specify the primary sources of noise such as electrical or electronic equipment, road, air and/or rail traffic)	(same as 3.1)
3.4. Quality of the soil	(same as 3.1)

3. Classify the state of the environment of the surrounding area (it should be considered the area relevant for the development of the activities related to the organisation)	Evaluation guide
3.5. Waste collection and general cleaning	(same as 3.1)
3.6. Existence of relevant nature and biodiversity values for conservation	1 – Existent and with protection status; 3 – Existent; 5 – Non-existent
3.7. Existence of relevant archaeological heritage values for conservation	(same as 3.6)
3.8. Spatial planning	(same as 3.1)
3.9. Income and social status of the local community	(same as 3.1)
3.10. Crime	(same as 3.1)