

Review

# Sustainable Project Management: A Conceptualization-Oriented Review and a Framework Proposal for Future Studies

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**Abstract:** Today, more than ever, achieving sustainability of business activities, intertwining social, economic, and environmental perspectives, is one of the most challenging objectives for companies. Project management processes are no exception. This paper aims to contribute to the current research knowledge through a systematic review of the literature on the integration of project management and sustainability. Specifically, the aim was to clarify the research domains of sustainable project management, and to understand the current state of development and the future research directions. Results indicate that academic literature about this topic is still in its infancy, but that scholars' attention is growing, opening new research directions. Based on the literature review results, we propose a new conceptual framework linking five key dimensions of sustainable project management: corporate policies and practices, resource management, life cycle orientation, stakeholders' engagement, and organizational learning.

**Keywords:** systematic literature review; project management; sustainable project management; sustainability

## 1. Introduction

Project management and sustainability are both currently considered hot topics by managers [1–4]. In fact, there is an increasing interest in developing and proving new managerial practices for project management (PM), and principles of sustainability dominate every context of business and organizational management. Therefore, the integration of these two fields represents the future for project-based organizations.

Projects are influenced by the environment in which they are carried out, but they also contribute to the change of the same environment. From a sustainability perspective, the project delivery phase and the final deliverable produce impacts that could be particularly advantageous in the present, but could have negative effects for many stakeholders in future scenarios. In other words, to produce the deliverables for which it was undertaken, each project uses energy and produces social, economic, and environmental (SEE) impacts, which define the degree of sustainability of the project as a whole.

Sustainability creates a community vision that respects the prudent use of natural resources to ensure that present generations can achieve a high degree of economic security, and can achieve democracy and popular participation in community control while preserving integrity of the ecological system and of life [5]. The three aspects of sustainability identified as “Triple Bottom Line,” or alternatively “Triple P: people, planet, and profit” [6] show the balance or harmony between economic, social, and environmental aspects. These three pillars, however, are not stable, but are influenced by

constant movement due to social, political, economic, and environmental pressures, which produce their effects when the pillars link together [7]. According to Gimenez et al. [8] and Kleindorfer et al. [9], sustainability integrates social, environmental, and economic responsibility in order to create a rational use of present resources without compromising the ability of future generations to satisfy their needs.

The link between project and sustainability, even if under-examined, is evident. Projects are based on temporary endeavors that, consuming resources, deliver beneficial objectives. Sustainability defines criteria for proper use of resources and for the evaluation of outputs in terms of economic, social, and environmental impacts. The traditional project management approach allocates and exploits these resources, seeking the optimal combination of time, cost, and quality performances, to maximize the benefits of stakeholders [10]. This approach has proven to be very reductionist over time, because it does not consider wide-ranging social and environmental issues, which are the sustainability challenges. Furthermore, there is often a mismatch of evaluation between project success and project management success that limits the real integration of these sustainability issues; in fact, project success is next to the idea of effectiveness (achieved vs. targeted objectives), while project management success is next to the idea of efficiency (consumed resources vs. achieved targets) [11]. This generates some relevant trade-offs for project managers.

In one of the most important and widespread books containing the best PM practices, the Project Management Body of Knowledge (PMBOK) [12], sustainability is poorly addressed. This raises the need for a more holistic and coherent view of projects in terms of the degree of fitness with their environment and society at large [13].

Sustainability, as field of study, can provide project management with new perspectives, supporting project managers in their decision-making about planning, management, and control of the resources assigned to the project, considering the economic, social, and environmental impacts of not only the project life cycle, but also the asset's life cycle and the life cycle of the products this asset produces. The objective would be to ensure that decisions made are in the best interest of the clients, but without harming society and the environment [14]. For this reason, a sustainable approach would be particularly well suited to major projects that consume large quantities of materials and energy, and the products of which have lifelong impacts on the economy, society, and the natural environment.

In a literature review analysis conducted by Silvius and Shipper in 2014 [15], they gathered some initial definitions from previous studies of this new approach named *Sustainable Project Management* (SPM), providing a new definition that is currently the most complete and inclusive (p. 79): "Sustainable Project Management is the planning, monitoring and controlling of project delivery and support processes, with consideration of the environmental, economic and social aspects of the life cycle of the project's resources, processes, deliverables and effects, aimed at realizing benefits for stakeholders, and performed in a transparent, fair, and ethical way that includes proactive stakeholder participation." In a subsequent study, Silvius et al. [16] better explained the characteristics of this new concept, showing how it diverges from the traditional and modern meanings of project management.

Tharp [17] tried to explain the new project management approach that considers both internal and external factors, influencing project's success and often limiting the decision making of project managers. Specifically, alongside the traditional triple constraint (time, cost, and quality), also called the 'iron triangle' [10], there is another triple constraint that should be considered by project managers, and it is relative to the Triple Bottom Line (TBL). This new "double-triple constraint" should act inside the organization's strategic context. Even if the effect of considering social, environmental, and economic interests on the well-known 'triple constraint' of time, budget, and quality is still not so clear [18], a good project manager should balance these dimensions, and also make decisions about the SEE factors affecting project sustainability.

As already highlighted by Martens and Carvalho [19], project management and sustainability, taken individually, have been addressed and deeply studied by many studies, but the dualism of these two fields and how they interact inside project dynamics deserve more attention. We agree with this statement, and, given the increasing interest and number of studies on sustainability integration inside

project management, we aimed to investigate the specific research domains of sustainable project management to understand the current state of the topic and the future research directions.

The paper is organized as follows. First, we provide methodological details of the systematic literature review. We then report results deriving from the analysis of the papers included in the review. After that, we describe and analyze the main domains on which past research has focused, which have contributed to the development of a research stream on sustainable project management over the years. We then propose a new conceptual framework, which conveys all the key factors that give shape to the sustainable project management concept. Finally, we highlight limitations of this study and future research directions.

## 2. Materials and Methods

We conducted a systematic literature review (SLR) [20,21], which is a basic activity for eliciting important information about a research stream. Originally, SLR was used as a basis for policy decisions in medical and health care fields [22]. SLR, compared to other types of approach, is generally considered superior in terms of transparency. In fact, researchers who employ this kind of approach search past studies relevant to a specific topic through the setup of transparent rules of research that can be replicated by other researchers to verify the findings, or as a reliable starting point for further research [20].

Considering the research focus, we decide to search for articles using the terms “green project management,” “sustainable project management,” and “(project management) and (sustainability)” in title and abstract, within the Ebsco and Scopus online databases, because these are the most extensive in terms of included sources. The following step consisted of refining research boundaries with selection/exclusion criteria. In particular, we focused only on papers published in English in peer-reviewed journals and conferences. Further, papers were examined in a double selection process, first based on title and abstract, and then on a full-text analysis. Moreover, we adopted strict criteria to screen papers: according to research aims, we exclusively included papers dealing with the integration of sustainability concepts into the project management process. This selective need brought us to exclude a considerable number of papers from the initial search results. Specifically, we removed articles that did not investigate the aspects of sustainability inside project management processes and practices, but described the sustainability of the project, considering the features of the output/product/final deliverable of the project. This is obviously of interest for an overall evaluation of project sustainability, but it falls outside the scope of this study.

As illustrated in Figure 1, following the above guideline and considering articles published from 1994 to 31/12/2018, we obtained 450 articles. A selection based on analysis of the title and abstract reading lead us to a restricted set of 89 articles, which became 32 after a full text analysis: 30 papers in scientific journals and 2 conference papers.

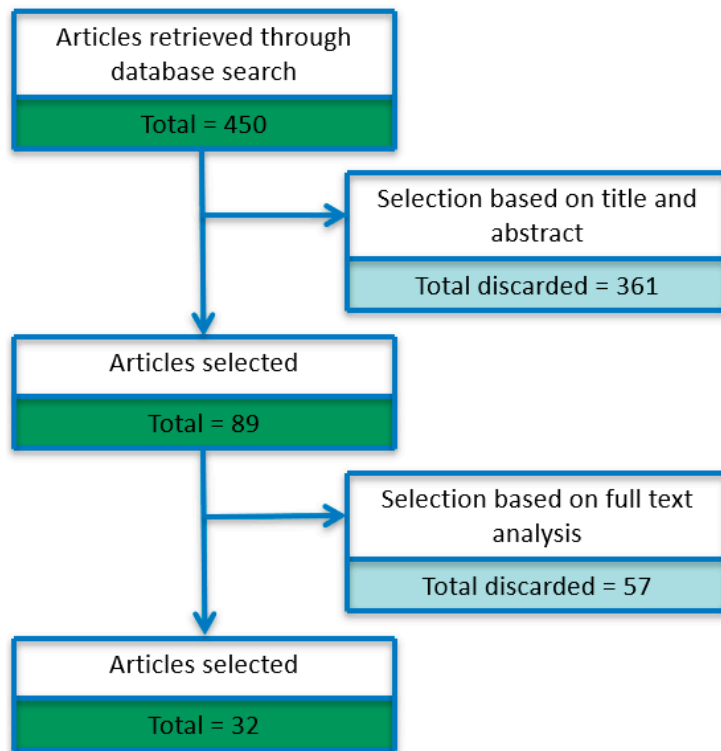


Figure 1. Paper selection process.

### 3. Results

We ordered articles included in the review by year to have a view of how the interest around this concept is developing (Silvius et al. (2019) had been indexed in Scopus since 2018 and published in 2019; we included it in the 2018 cluster). Indeed, Figure 2 shows a positive trend during the past few years with a peak on 2017; this underlines the increasing academic interest in the integration between sustainability and project management. This trend reflects the growing relevance of sustainability for organizations and firms, and is consistent with the trends found in other systematic literature reviews on sustainability within specific business domains, such as innovation or marketing [23,24].

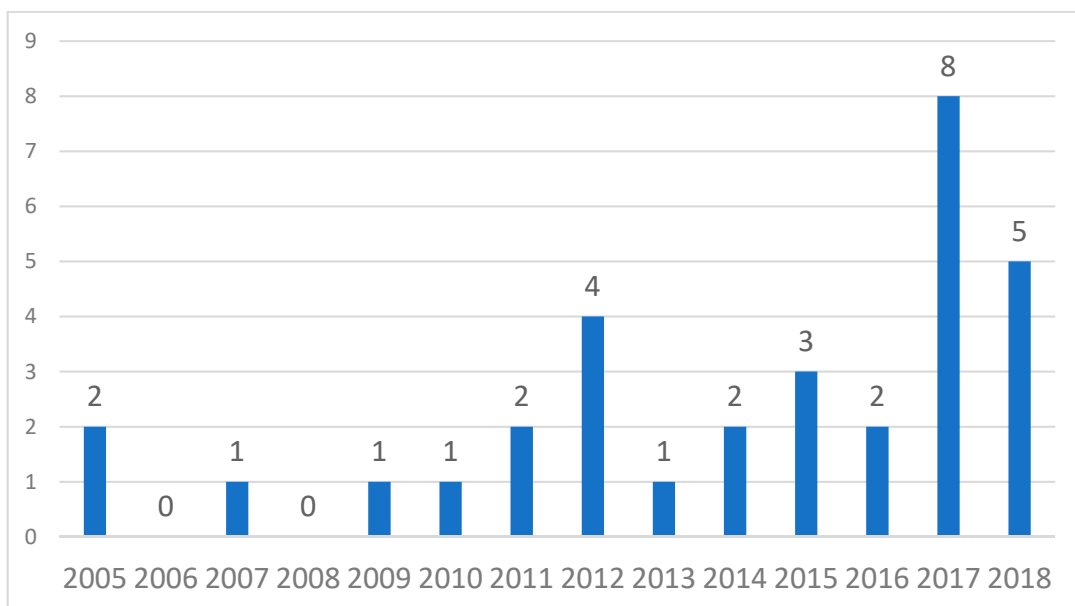


Figure 2. Number of papers on sustainable project management over time.

We then analyzed the content of the retrieved papers to identify most relevant dimensions involving the integration of project management and sustainability. These dimensions also represent specific research domains of SPM. The choice of these specific dimensions/domains emerged from the content examination, and was drawn from the topics and arguments encountered during the full-text analysis of selected papers. The papers were read very carefully, searching for aspects pertinent to project management, but argued from a sustainability perspective. Some of these aspects were common to multiple articles, so they were identified and then grouped into dimensions that were designed to summarize the common ground of papers' focus and perspective.

In fact, papers have addressed the issue of integration of sustainable principles from different perspectives. Some of them have faced the issue from a strategic and high-level point of view, pointing out the role of policies and practices developed at corporate level inside project management processes. Others have based their investigations on resources and material use efficiency (most of the time these were studies on the construction sector), focusing on issues more related to operational and practical fields. Further, other studies have chosen a wider perspective, considering project stakeholders' points of view, which is a very pervasive concept in project management today, present from project conception until the end and beyond (with the effects generated by the project's product).

The general rule followed for the extraction of the dimensions is that the dimensions should necessarily cover the key factors for proper integration of sustainability into project context, as much distinguished from one another as possible. This allowed us to provide a very high-level definition of a sustainable project management approach through the structuring of the resulting dimensions in a framework.

The five dimensions that emerged from the analysis are:

- Corporate policies and practices
- Resource management
- Life cycle orientation
- Stakeholders' engagement
- Organizational learning

Table 1 lists the papers analyzed for dimensions, source, publication year, total number of citations, and average citations per year. Some articles studied more than one dimension.

Table 1 shows that the dimensions that were first investigated were corporate policies and practices and life cycle orientation, as the first contributions appeared in 2005. The most investigated dimension (in terms of number of papers, i.e., 12 papers) was stakeholders' engagement, as can be also seen from Figure 3, which shows the share of papers for each domain.

Of course, some papers have addressed multiple dimensions simultaneously. Indeed, during the review process we found some papers that concerned more than one dimension. For example, Martens and Carvalho (2017) covered both the resource management and the stakeholders' engagement dimensions, which are described in the next paragraphs.

Finally, based on the number of citations (total and average per year), the most influential papers are those of Labuschagne et al. [25] and Gimenez et al. [8]. The first one is a seminal research paper on the topic of organizations' policies for incorporating principles of sustainability into developing new projects, while the second one deals with the topic of resource management for sustainability. The journals with the highest number of papers are the International Journal of Project Management (8) and the Journal of Cleaner Production (5).

The oldest SPM dimensions are corporate policies and practices and life cycle orientation, while the domain with the highest number of citations (total and average) is corporate policies and practices, even if the numbers of average citations per year is very close to the resource management area.

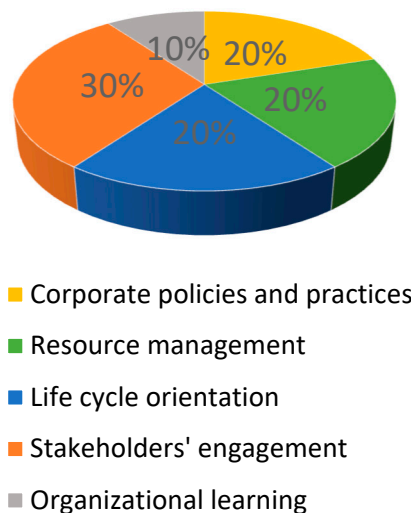
In the following section, we will describe the literature on each specific dimension. The five dimensions will be the pillars of the conceptual framework we propose as outcome of our study.

**Table 1.** Systematic literature review outcomes.

| Dimension                               | Author                                      | Journal/Book  | Year | # Cit. | Average # Cit./year | # Cit. Dimension | Average # Cit. Dimension/Year | Average # Cit. Dimension/Year/Paper |
|---|---|---|------|--------|---------------------|------------------|-------------------------------|-------------------------------------|
| <i>Corporate policies and practices</i> | Silvius and de Graaf                        | Journal of Cleaner Production                                       | 2019 | 0      | 0                   | 680              | 48                            | 6                                   |
|   | Uribe et al.                                | Sustainability  | 2018 | 2      | 2.0                 |                  |                               |                                     |
|   | Silvius                                     | Journal of Cleaner Production                                       | 2017 | 15     | 7.5                 |                  |                               |                                     |
|   | Aguilar-Fernández et al.                    | IEEE 8th International Conference                                   | 2015 | 2      | 0.5                 |                  |                               |                                     |
|   | Corder et al.                               | Chemical Engineering Research and Design                            | 2012 | 13     | 1.9                 |                  |                               |                                     |
|   | Gareis et al.                               | Project Perspectives  | 2011 | 45     | 5.6                 |                  |                               |                                     |
|   | Baumgartner and Ebner                       | Sustainable Development   | 2010 | 192    | 21.3                |                  |                               |                                     |
|   | Labuschagne et al.                          | Journal of Cleaner Production                                       | 2005 | 411    | 29.4                |                  |                               |                                     |
| <i>Resource management</i>              | Martens and Carvalho                        | International Journal of Project Management                         | 2017 | 30     | 15.0                | 457              | 45                            | 5.62                                |
|   | Silvius and Schipper                        | International Journal of Information Systems and Project Management | 2016 | 4      | 1.3                 |                  |                               |                                     |
|   | Daneshpour and Takala                       | Management and Production Engineering Review                        | 2017 | 0      | 0.0                 |                  |                               |                                     |
|   | Martens and Carvalho                        | Journal of Cleaner Production                                       | 2016 | 21     | 7.0                 |                  |                               |                                     |
|   | Marcelino-Sádaba et al.                     | Journal of Cleaner Production                                       | 2015 | 61     | 15.3                |                  |                               |                                     |
|   | Silvius and Schipper                        | Social Business   | 2014 | 95     | 19.0                |                  |                               |                                     |
|   | Gimenez et al.                              | International Journal of Production Economics                       | 2012 | 240    | 34.3                |                  |                               |                                     |
| <i>Life cycle orientation</i>           | Deland                                      | PMI® Global Congress 2009   | 2009 | 6      | 0.6                 | 222              | 16                            | 2                                   |
|   | Silvius and de Graaf                        | Journal of Cleaner Production                                       | 2019 | 0      | 0                   |                  |                               |                                     |
|   | Gunhan                                      | Practice Periodical on Structural Design and Construction           | 2018 | 1      | 1.0                 |                  |                               |                                     |
|   | Yu, W.D. et al.                             | Sustainability  | 2018 | 3      | 3.0                 |                  |                               |                                     |
|   | Silvius et al.                              | International Journal of Project Management                         | 2017 | 16     | 8.0                 |                  |                               |                                     |
|   | Daneshpour and Takala                       | Management and Production Engineering Review                        | 2017 | 0      | 0.0                 |                  |                               |                                     |
|   | Sanchez                                     | Journal of Cleaner Production                                       | 2015 | 38     | 9.5                 |                  |                               |                                     |
|   | Silvius and Schipper                        | Journal of Human Resource and Sustainability Studies                | 2014 | 45     | 9.0                 |                  |                               |                                     |
| Labuschagne and Brent                   | International Journal of Project Management | 2005  | 119  | 8.5    |                     |                  |                               |                                     |

Table 1. Cont.

| Dimension                       | Author                    | Journal/Book   | Year | # Cit. | Average # Cit./year | # Cit. Dimension | Average # Cit. Dimension/Year | Average # Cit. Dimension/Year/Paper |
|---------------------------------|---------------------------|--|------|--------|---------------------|------------------|-------------------------------|-------------------------------------|
| <i>Stakeholders' engagement</i> | Yu, M. et al.             | Sustainability   | 2018 | 2      | 2.0                 | 547              | 46                            | 3.8                                 |
|                                 | Carvalho and Rabechini    | International Journal of Project Management            | 2017 | 19     | 9.5                 |                  |                               |                                     |
|                                 | Kivilä et al.             | International Journal of Project Management            | 2017 | 18     | 9.0                 |                  |                               |                                     |
|                                 | Silvius et al.            | International Journal of Project Management            | 2017 | 16     | 8.0                 |                  |                               |                                     |
|                                 | Aarseth                   | International Journal of Project Management            | 2017 | 25     | 12.5                |                  |                               |                                     |
|                                 | Martens and Carvalho      | International Journal of Project Management            | 2017 | 30     | 15.0                |                  |                               |                                     |
|                                 | Banihashemi et al.        | International Journal of Project Management            | 2017 | 18     | 9.0                 |                  |                               |                                     |
|                                 | Marcelino-Sádaba et al.   | Journal of Cleaner Production                          | 2015 | 61     | 15.3                |                  |                               |                                     |
|                                 | Silvius and Schipper      | Social Business  | 2014 | 95     | 19.0                |                  |                               |                                     |
|                                 | Eskerod and Huemann       | International Journal of Managing Projects in Business | 2013 | 52     | 8.7                 |                  |                               |                                     |
| <i>Organizational learning</i>  | Robichaud and Anantatmula | Journal of Management in Engineering                   | 2011 | 171    | 21.4                | 207              | 21                            | 5.25                                |
|                                 | Abidin and Pasquire,      | International Journal of Project Management            | 2007 | 40     | 3.3                 |                  |                               |                                     |
|                                 | Marcelino-Sádaba et al.   | Journal of Cleaner Production                          | 2015 | 61     | 15.3                |                  |                               |                                     |
|                                 | Silvius et al.            | PM World Journal                                       | 2012 | 9      | 1.3                 |                  |                               |                                     |
|                                 | Bond et al.               | Impact Assessment and Project Appraisal                | 2012 | 131    | 18.7                |                  |                               |                                     |
| Deland                          | PMI® Global Congress 2009 | 2009   | 6    | 0.6    |                     |                  |                               |                                     |



**Figure 3.** Distribution of papers per sustainable project management (SPM) dimension/research domain.

## 4. Discussion

### 4.1. Corporate Policies and Practices

The rules, processes, and decisions responsible for translating strategy into projects become, over time, a suite of corporate project management practices that, in turn, define the context for management practices on individual level [26]. These corporate policies and practices influence all the organizations' stakeholders who are undertaking projects within or for it.

There were several studies that detail sustainability principles inside corporations. Baumgartner and Ebner [27] argued that corporate sustainability could be developed by firms when sustainable development is incorporated by the organization, and that it contains, like sustainable development, the three pillars: economic, ecological, and social. This leads to a new perspective of project sustainability: from the "classic" economic sustainability to a *Project Sustainability Value* founded (and measured) on the equilibrium between economic, social, and environmental dimensions.

According to Labuschagne et al. [25], organizations can incorporate principles of sustainability into their activities by, among other strategies, developing new projects driven by sustainability principles. The same principles that, together with the organizational strategy, change the time-orientation of the projects [28] shape the set of policies and practices belonging to the organization, and its vision about the *resources' value*.

The content and understanding of corporate sustainability vary according to the context [29]. Equally, the project should transparently and consistently assess which sustainability indicators or aspects are most relevant [30]. Therefore, corporate sustainability and single project implementation are strongly related. In fact, the strategy of the organization with respect to sustainability influences the organizational context of the project and the opinions about sustainability of actors within project context [31].

Therefore, to effectively implement sustainability principles in project management processes, organizations should first consider sustainability at a corporate level, outlining which should be the policies and *project sustainable management practices* that define the way to do business of the organization. However, although change towards sustainability contributes, in turn, to the improvement of corporate governance (minimization of risks, reinforcing regulations of the codes of conduct inside organization, etc.) [32], the principles and policies of corporate sustainability are still difficult to integrate into project management systems [33].



#### 4.2. Resource Management

Most definitions of sustainability have addressed the concept by way of the relationships between humans and resources used by them [34,35], highlighting the key role of citizens, institutions, and companies in a responsible use of resources.

At the operational level, environmental sustainability refers to this issue about use of energy and other resources, and the production of waste as a result of human actions. Therefore, environmental sustainability addresses waste reduction, pollution reduction, energy efficiency, emissions reduction, reduced consumption of hazardous, harmful and toxic materials, and the decrease in the frequency of environmental accidents [8]. Following this set of important aspects, Deland [36] stated that sustainable project management is about minimizing the resources that a project manager and their team use to work on a project, from project initiation through to its closing. From a wider life cycle perspective, and especially in a construction environment, projects' deliveries generally consume a significant amount of resources and have potential to negatively influence the environment [37]. Therefore, in these contexts, sustainability addresses resources management not only during the planning, implementation, or closing phase, but also at the decommissioning stage of the project's deliverable (in terms of its durability, reusability, and recyclability) [15].

Empirical evidence provided by Martens and Carvalho [38] shows that environmental policies and resource saving appear with higher importance in project management contexts as a key factor of sustainability, so it seems that project managers are working on project resource consumption, focusing on eco-efficiency and projects' environmental impacts.

Besides natural resources and financial ones, there are also human resources. In fact, sustainable project management implies that the project manager also considers the social capital of the organization, preserving the capacity to guarantee its productivity over time; organizations, either permanent or temporary, should not compromise with physical or mental exhaustion the ability of their employees to produce [16].

In PM, standards resource management is a key process. In particular, PMBOK [12] explains resource levelling as a process of improvement to provide a balanced workforce, which gives support and facilitates resource usage. From a sustainability prospective, this can be seen as doing the same job with less resources [39].

Finally, project efficiency, as the right application of resources (including capital, material, and human resources) is a key factor in accomplishing the desired outcomes [40]; therefore, from a project portfolio perspective, most advanced technologies and techniques to monitor resources allocation allow organizations to gain a competitive advantage [19].

#### 4.3. Life Cycle Orientation

Various project life cycle approaches exist in the literature, e.g., control-oriented, quality-oriented, company-specific approaches [41]. Due to different levels of complexity and scope of projects, there is still no consensus about which the best approach should be.

Although the orientation of these approaches is often limited to the life cycle of the project, and therefore focused on short-term evaluations, given the nature of projects as temporary organizations [16], companies are increasing their interest in the impacts a project could have on society, the environment, and the economy, even long after the project's completion (i.e., beyond the normally considered project life cycle) [42]. In fact, the social and environmental impacts of human actions and decisions are often not visible or appreciable in the short-term. If companies want to preserve the ability of future generations to meet their needs (the core meaning of sustainable development), they have to cope with sustainably maintaining a balance between short and long term outcomes, so implementing a life cycle orientation [31].

Labuschagne and Brent [42] argued that, when considering sustainability in project management, not just the total life cycle of the project should be taken into account (whatever the specific approach is), but also the asset's life cycle, where "asset" means the result of the project (e.g., change in assets, systems,

behavior, etc.), and the life cycle of the products this asset produces. Starting from Labuschagne and Brent's concept, Yu et al. [43] developed a sustainability evaluation framework for construction projects that considered the project lifecycle (i.e., feasibility study, planning, procurement, construction, and turnover), as well as the facility lifecycle (i.e., operation, maintenance, and demolition); Silvius and Schipper [44] described these interacting life cycles in more general terms, considering the project's *resources, processes, and effects*.

Extending the project life cycle concept is more impactful on project success now than in the past [45]. Project management is switching from the implementation phase to considering the evaluation of success over both the project and product life cycle. Empirical evidences support this approach, as shown by Gunhan [46] in a study on sustainable building construction, in which life cycle assessment has proven to be a major analysis that impacts project owners' decisions and the future success of the project.

Integrating the concept of sustainability into project management may very well stretch the "systems boundaries" of project management in terms of a life cycle perspective [44]. However, to effectively address sustainability issues in project management, companies need first to clearly understand the various life cycles phases involved in a project and their interactions [47]. Therefore, further development of the project management profession requires consideration of the responsibility of sustainability from a full and wide life cycle perspective within projects [39], from resources to implementation to outcomes.

#### 4.4. Stakeholders' Engagement

Project stakeholders management is one of the most important knowledge areas in the PM discipline, as the project success is measured based on stakeholders' satisfaction, which can vary according to the different perspectives [48]. Although project managers' decision-making is still largely dominated by the 'iron triangle' (time, cost, quality), sustainability principles are strongly considered for stakeholder transparency and accountability [16]. This is in line with the "stakeholder theory" of Freeman [49], by which all stakeholders of a company or an organization, not limited to shareholders/financiers, deserve adequate management attention, taking into account their interests.

Sustainability is becoming increasingly important for project success, as stakeholders require ethicality, eco-friendliness, and economic efficiency during a project's life cycle [50]. This is particularly true for large projects, which generally involve and affect many stakeholders, each of whom has their own priorities and perceptions of sustainability value. Therefore, to ensure a project's sustainability, the different perceptions of stakeholders should be understood and consequently managed [51,52]. This fact leads to a higher degree of complexity within the project scope, and highlights the need to manage this complexity [53]. For this reason, a project management process, which aims for a sustainable perspective inclusion, should take into account a joint, open, flexible, and detailed negotiation and shaping process among multiple stakeholders [54]. Of course, the most important are the customer and the final user, i.e., the *client*. Following Garvare and Isaksson [55], the sustainability stakeholders could be identified in three main macro-blocks: *individual* (PM, project team members), *organization* (project sponsor, shareholders), and *global society* (local and global communities).

According to the ISO 26000 guideline, proactive stakeholder engagement is one of the basic principles of sustainability [56]; Martens and Carvalho [38] included stakeholder management among the key factors for sustainability in the project management context, together with sustainable innovation business model, economic and competitive advantage, and environmental policies and resource saving. Robichaud and Anantatmula [57] stated that sustainable projects require a more detailed communications analysis and plan to keep stakeholders informed throughout the project. Moreover, Banihashemi et al. [58] found that having stakeholders who support sustainable delivery are central to the success of integrating sustainability into project management practices. Therefore, effective sustainable project management should aim for, among other things, the proactive involvement and engagement of stakeholders in project activities, from the definition of requirements, assessment

of costs and benefits, project planning and scheduling, identification and assessment of risks, handling of issues, and project reporting [15].

The role of sustainability has not yet been explored in the relationship between stakeholders and project management [32]. In addition, from a practical perspective, there is still the tendency to favor the traditional management of stakeholders, instead of their engagement from the sustainability point of view [59]. Nevertheless, the stakeholders' engagement can be the connection between traditional project management and the social and ethical aspects, improving their participation and coordination [37].

#### 4.5. Organizational Learning

Projects are organizational activities that provide an opportunity for continuous learning, since projects include specific processes for knowledge management, making it easier to accumulate knowledge generated by experience [37]. The PMBOK Guide, indeed, mentions 'historical information and lessons learned' as part of the 'corporate knowledge base' of the organization [12]. Learning processes are fundamental in project management and must be carefully addressed inside the management process of the project, because, when effectively managed, they prevent mistakes and inefficiencies, thus improving the degree of success of the project.

In light of the need to implement a sustainability approach, learning is critical for future improvement of sustainability assessment [60]. For example, one of the central concepts of sustainability is about minimizing waste. Organizations based on sustainability concepts should therefore learn from past projects in order to, from a portfolio perspective, not 'waste' energy, resources, and materials on unsuccessful projects, and, from a single-project perspective, not use energy resources and materials inefficiently [61].

Learning occurs also at project team level. Companies must provide teams with training and learning about sustainability in order to successfully integrate it into projects. Team learning is a fundamental requirement. In fact, team leaders/project managers can experience more commitment, more engagement, and higher performance of the team when sustainability is an underlying purpose [36].

#### 4.6. Sustainable Project Management Conceptual Framework

Based on the conceptualization of the dimensions of sustainability integration in projects found in the literature and described in the previous paragraphs, we developed a conceptual framework that shows key dimensions and the relationships among them (Figure 4).

The five dimensions emerging from the reviewed papers and described above represent key factors for the effective integration of a sustainable approach into project management processes and practices.

Research on PM and corporate sustainability acknowledges that corporations' support for sustainable development influences how sustainable development principles are addressed within projects [62]. Corporate policies and practices are important guidelines on how organizational resources should be managed within projects, and in SPM should be based on a new vision of project sustainability value and of resources' value. Empirical evidence shows that resource saving appears with higher importance in a project management context as key factor of sustainability [38]. In this framework, the meaning of "resource" includes also human resources, one of the elements of the intellectual capital of the organization, and whose productivity needs to be preserved.

Considering the temporal point of view, effective integration of sustainability in project management needs the inclusion and analysis of not just the life cycle of the project processes, but also the life cycle of the resources used and effects (products) caused by a project. Of course, as regards organizational PM methodologies, the sustainable management of a project's process life cycle influences (and is influenced by) all the classical practices of PM knowledge areas (e.g., time, cost, quality, risk . . . ). This extensive thoughtfulness of time periods relative to project's inputs and outputs

could be called an “extended project life cycle,” reflecting the all-encompassing life cycle orientation of the approach.

Nevertheless, integrating the concept of sustainability into project management leads to new *Projects’ Extended Boundaries*, not only in terms of a life cycle perspective, but also in terms of relationships with stakeholders and organizational learning.

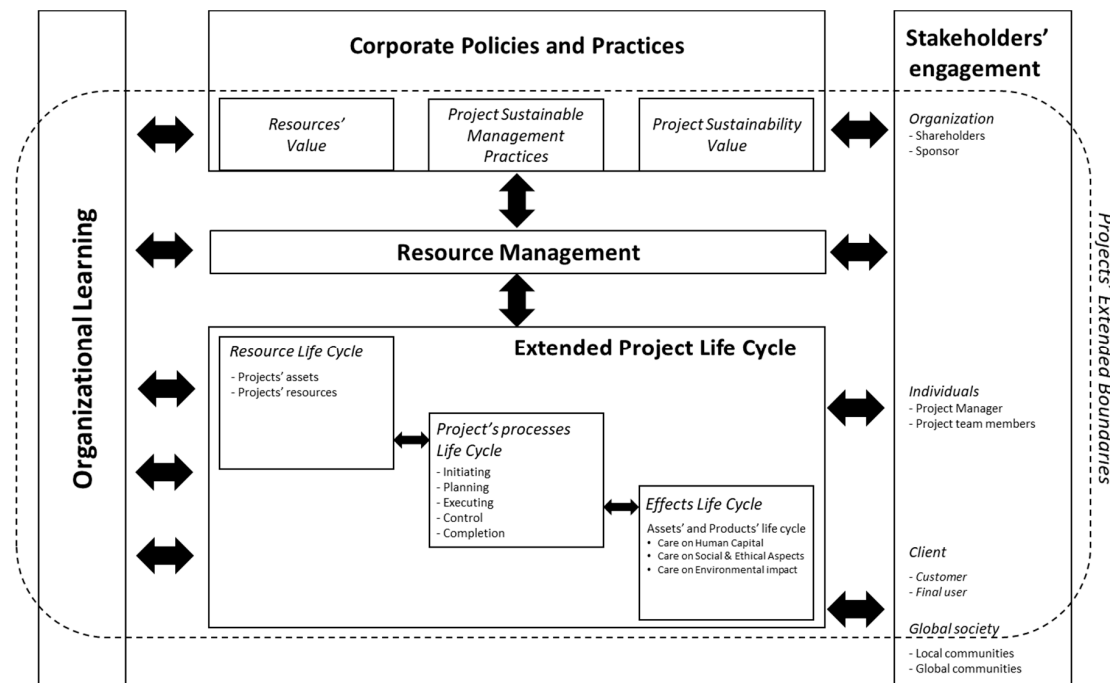


Figure 4. Sustainable project management framework.

The outputs (i.e., deliverables) resulting from the project implementation have their effects (direct/indirect and in the short/long term) on a plethora of stakeholders, which are divided, in this representation, into the following macroblocks: organization (project sponsor, shareholders), individuals (PM, project team members), client (customer and final user), and global society (local and global communities). Each macroblock considers the stakeholders’ engagement/influence and the projects’ outcomes, i.e., the positive or negative effects on which the project can be considered successful from a sustainability perspective.

Finally, as learning excellence is a core value included in some business excellence models that are considered the best frameworks for organizational sustainability [63], we included organizational learning and learning processes in the framework, because the development of organizational capabilities leads to successful, and in particular, sustainable projects. Learning should derive from evaluation of impacts on stakeholders, updating corporate policies and practices, resource management, and extended project life cycle management over time.

In our opinion, a definition of sustainable project management should include the concepts contained in the developed framework, starting from its alignment with corporate policies for sustainability. Therefore, we propose the following definition: “Sustainable project management is the managerial practice aiming at pursuing project objectives by maximizing economic, social, and environmental benefits through the proactive involvement of stakeholders, the consideration of the extended life cycle of resources, processes, and effects, and continuous organizational learning.”

## 5. Conclusions

Although the concept of sustainable project management is still in its infancy, the literature review confirmed the positive trends of research towards sustainability integration into project management processes.

Projects are the core business of many organizations, so they cannot ignore this new pathway; rather, they should update their project management processes to include sustainability principles.

This work has focused on an innovative trend, a new paradigm, sustainable project management, which is pushing sustainability within project management processes, but this trend is developing at different rate, according to industrial contexts. For example, building/construction projects are by nature more concerned about integration of sustainable approaches, as they strongly contribute to global carbon emissions and demand a huge amount of energy; on the other hand, information technology projects seem to be less affected by sustainability concerns even if, in recent years, the topic of green IT has been emerging. Therefore, as differences due to context may cause different development rates in SPM practices, this could generate divergences at the level of conceptual structure. This topic deserves further investigation.

Through an analysis of the studies included in the review, we identified five dimensions that are the principal research domains, considered *loci* of key factors for effective integration of a sustainable approach into project management practices. These dimensions are: corporate policies and practices, resource management, life cycle orientation, stakeholders' engagement, and organizational learning. The five dimensions, linked within a conceptual framework, give a high-level description of the sustainable project management approach.

This study has implications for both scholars and managers. In terms of theoretical implications, it provides a synthesis of current knowledge on the new topic of sustainable project management, highlighting the most relevant dimensions and linking them through a conceptual framework. As such, it can be used as a reference point for scholars interested in the topic of sustainable project management. In terms of managerial implications, this study shows most relevant dimensions on which project managers should focus to integrate sustainability into their project management.

In recent years, the emerging topic, which follows the research directions inside the main research domain of SPM, i.e., life cycle orientation is the "extended product life cycle management." However, our findings suggest that all five dimensions/research domains contain fruitful future research opportunities. In fact, sustainable project management is still in its infancy, and empirical studies devoted to theory building, such as case studies, are a necessary starting point for identifying causal effect links among innovative SPM practices and effects in terms of sustainable value generated. As regards the five dimensions/domains, some important research directions for future studies are:

- Developing effective guidelines in linking corporate policies about sustainability with SPM practices;
- Conducting empirical analysis about different SPM practices in different industrial contexts linked to resource management;
- Conducting empirical analysis about the effects of SPM on companies' competitive advantage, from both economic and strategic perspectives;
- Identifying which are the organizational capabilities for an effective SPM;
- Analyzing the impact and the contribution of SPM in PM systems, and in the practices belonging to the different PM knowledge areas;
- Analyzing strategic and operational advantages of extended product life cycle management in a projects environment;
- Identification and consolidation of best practices and models for stakeholders' engagement/management towards a continuous improvement and organizational learning.

Of course, this research has some limitations that should be acknowledged. The first limitation is that the choice of the five dimensions and the consequent development of the framework are based on a limited number of studies, since the topic is still in its infancy.

However, in our opinion, the framework can be a good starting point for a more precise definition and understanding of factors characterizing this new potential paradigm for project-based companies, including other project management knowledge areas. Future research should, therefore, be devoted to testing and enriching this framework through exploratory research involving in-depth case studies and interviews with industry experts. This could result in a refined/modified framework that could be tested through large scale studies involving different industries (so as to highlight significant differences based on industry peculiarities), as well as different countries (so as to identify significant differences due to distinctive cultural features).

The second limitation is that we decided to not include normative competences of underlying concepts of justice, equity, social–ecological integrity, and ethics. Although these competences are certainly important for sustainability integration in projects, we believe that they belong more to the soft skills of project manager than to a structured framework, with the understanding that instructions and guidance about ethics and moral values are mainly indicated by the corporate policies and practices dimension.

We hope that this study will represent a reference point for scholars interested in the research stream of sustainable project management, and will stimulate further research on this new and relevant topic.

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