

# Sustainability as a new school of thought in project management

Author

10455 words (excluding abstract & references); 12992 words including abstract and references

## ABSTRACT

Sustainability is one of the most important challenges of our time. It is recognized that projects play a pivotal role in the realization of more sustainable business practices and a developing theme in project management research is the relationship between projects and sustainability. As the literature on this topic is evolving, this paper discusses the question whether the growing attention for sustainability in project management research represents a new 'school of thought' in project management?

The study builds upon earlier work on schools of project management research, in which nine schools were identified. The question whether sustainability should be considered a new school of project management is answered by deriving the criteria for recognition as a school and performing a structured literature review on a sample of 71 articles on sustainability in project management, taken from the leading academic journals on this topic. As criteria for recognition as a school of project management, the criteria content, community and impact were found. After a content analysis of the articles in the sample, the conclusion is reached that sustainability qualifies a new, distinct and emerging school of thinking in project management. The defining characteristics of this sustainability school are: considering Projects in a societal perspective, having a Management for stakeholders approach, applying Triple bottom line criteria, and taking a Values based approach to projects and project management.

**Keywords:** Project management, Project management theory, Sustainability, Triple constraint

## 1. INTRODUCTION

Projects and their management are recognized as “*a way to sustainability*” (Marcelino-Sádaba et al., 2015; Huemann and Silvius, 2017). Sustainability is also recognized as “*an emerging field of study*” (Huemann and Silvius, 2017:4) that is “*picking up momentum*” (Silvius and Tharp, 2013: xix). With the relationship between sustainability and projects emerging, the question arises how considering sustainability changes project management and project management research?

Several studies (for example Labuschagne and Brent, 2006; Talbot and Venkatraman, 2011; Edum-Fotwe and Price, 2009) developed indicators to assess the sustainability quality of projects. However, content related definitions of sustainability may be adequate to assess the sustainability of the outputs and outcomes of projects, but they may *not* be adequate to cover the integration of sustainability into the management perspective on projects (Gareis et al., 2013).

As the insights on the integration of sustainability and project management are developing, Silvius et al. (2012) conclude that “*Integrating sustainability stretches the system boundaries of project management*”. Pasion and Silvius (2016) even suggest that sustainability should be considered a new and emerging school of project management. It is this question that is central to this paper: *Is the growing attention for sustainability in project management research representing a new ‘school of thought’ in project management?*

The recognition of ‘schools of thought’ in project management research evolved from a series of articles and papers that reflected upon the theory and theoretical perspectives that are being applied in or to projects (For example Söderlund, 2002; Bredillet et al., 2007a-c and 2008a-c). This paper builds upon these works and provides a structured literature review of the emerging

literature on sustainability in project management, in order to determine whether the integration of sustainability into project introduces a new school of project management.

The remainder of this article is organized as follows. The next paragraph will provide an overview of the development of the schools of project management and will analyse what criteria define a school. This paragraph will also discuss the emergence of the academic interest for the integration of sustainability into project management. Following this, paragraph 3 will present the research approach, sampling strategy and method of content analysis. Paragraph 4 presents the analysis of the selected sample of publications on sustainability in project management and the defining characteristics of the alleged sustainability school of thinking. The following paragraph will reflect on the potential criticism on a sustainability school, after which the paper will be concluded in paragraph 6 with a conclusion and recommendations for further development of the topic.

## **2. BACKGROUND**

### **2.1. Schools of thought in project management**

Several classifications of perspectives or schools of thought in project management were proposed by Anbari (1985), Söderlund (2002), Bredillet (2004), Kolltveit et al (2007), Turner et al. (2010), Biedenbach and Müller (2011) and Turner et al. (2013). In these last three publications, the authors agreed upon an elaborated set of nine schools of thought that was extensively discussed in a series of articles in 2007/2008 (Bredillet, et al., 2007a-c and 2008a-c).

These nine schools include the earlier proposed classifications. Table 1 presents these nine schools and their coverage of the other classifications.

Table 1. Overview of classifications of schools of project management

<i>Nine schools of project management as proposed by Bredillet et al. (2007a-c, 2008a-c); Turner et al. (2010); Biedenbach and Mueller (2011); Turner et al. (2013)</i>	<i>Earlier sets of schools of project management</i>				
	<i>Anbari (1985)</i>	<i>Soderlund (2002)</i>	<i>Bredillet (2004)</i>	<i>Kolltveit et al. (2007)</i>	<i>Kwak and Anbari (2008)</i>
<b>Optimization:</b> The project is a machine	Management science	Optimization	Optimization	Task	Operations research
<b>Modelling:</b> The project as a mirror				System	Performance management
<b>Governance:</b> The project a legal entity	Functional	Transaction cost	Transaction cost	Transaction cost / Stakeholder	Engineering/ Contracts/ Legal
<b>Behaviour:</b> The project as a social system	Behaviour	Behaviour	Behaviour	Leadership	Organisational behaviour / HRM
<b>Success:</b> The project as business objective	Functional	Success factors	Success factors	Business	Strategy
<b>Decision:</b> The project as a computer	Management science	Decision	Decision		IT/IS
<b>Process:</b> The project as an algorithm	Systems				Technology/ Innovation
<b>Contingency:</b> The project as a chameleon	Contingency	Contingency	Contingency		
<b>Marketing:</b> The project as a billboard		Marketing	Marketing		

The following section will provide a brief description of these nine schools.

### *The Optimization school*

The optimizing school is seen as the oldest school of thinking in project management, that emerged from the field of Operations Research in the 1940s and 1950s (Morris 1997). In this school, project management is about optimizing the schedule and duration of the project by mathematical optimization.

### *The Modelling school*

Where the optimizing school aims to optimize the project from the perspective of one or two objectives (such as time and cost), the modelling school aims to optimize the total project management system and the interactions among its components (Williams 2002). The modelling school therefore uses both hard en soft-systems theory to create an understanding of the different elements of the project, and their interaction, in order to obtain a full view of the total system.

### *The Governance school*

This school considers the project as a (legal) entity and focuses on the governance of this entity and the relationships between project participants. The contract sub-school of this school views the project as an interface between two legal entities, client and contractor, and describes how that interface should be managed (Barnes 1983). The temporary organization sub-school studies the mechanisms of governance between the project as a temporary organization (Lundin and Söderholm 1995; Turner and Müller 2003) and the permanent “project oriented” organization that hosts the project.

### *The Behaviour school*

The behaviour school acknowledges the temporary organization perspective of the Governance school and elaborates on this view by considering a project as a social system. Typical focus areas of this school therefore are leadership, team development, communication, conflict management and human resource management in the project,

### *The Success school*

This school focuses on success and failure of projects and views a project as a business objective. Within this school, studies tend to focus on either the elements that increase the likelihood of success, project success factors, or the criteria by which the success of a project is measured.

### *The Decision school*

The decision school focuses on “*factors relevant to the initiation, approval, and funding of projects as well as factors relevant to project completion, termination, and conclusions about their success or failure*” (Turner et al., 2013). This school focuses on the information processing and decision-making processes in projects, and the impact these have on the overall project.

### *The Process school*

The information processing perspective on projects links to the process school, as it views a project as a process. This process view can be found in most of the standards for project

management, that describe project management as a structured process: a phased approach from a start to a desired end state.

### *The Contingency school*

The contingency school recognizes that every project is different and that the management approach needs to be adapted to the specifics of the project. It considers differences between types of projects and project organizations and adapts the project management processes accordingly.

### *The Marketing school*

This school can be considered a reaction to the observed disconnect between the growing importance of projects and project management in organizations, and the view that project management is an operational/tactical matter that is not of much relevance or value to the organization's strategy or performance. And where project marketing traditionally was focused at the marketing of a contractor *for* a project, the marketing school introduces the perspectives of marketing *of* the project, to senior management, and marketing *by* the project, linking to needs of stakeholders and stakeholder management.

In their analysis of the last decade of IRNOP (the International Research Network on Organizing by Projects) and PMI REC (Project Management Institute's Research and Education Conference) conference papers, Pasian and Silviu (2016) reach the conclusion that some new schools are emerging, most notable *sustainability*. And as Turner et al. (2013) recognized that "*project*

*management is increasingly drawing on and making contributions to research in other fields of management.*”, the option to expand the schools is explicitly left open.

Answering the question whether sustainability should be considered a new school of thinking, however, requires a deeper understanding of how the authors that suggested a classification of schools or perspectives defined the concept of a ‘school’ in the first place.

## 2.2. Criteria for recognizing a school of thought

Turner et al. (2010) refer to the Oxford English dictionary for a definition of a school and define their schools of project management as “*a group of people applying common tools and methods, and developing appropriate methodologies for their projects by combining tools and methods from several schools. Each school may have lead authors strongly identified with the schools.*” (Turner et al., 2010:7). A later publication of largely the same group of authors defines a school as “*A group of researchers investigating and developing common methods, tools and techniques (for practitioners to use), often with one or more lead researchers providing the vision in that area.*” (Turner et al., 2013:8). The two definitions are largely equal, although the second definition appears to focus more on schools in project management *research*, whereas the first definition highlights also the *application* of common methods. This orientation on both theory and practice suggests that schools of thought may be a concept of less academic rigor than a scientific paradigm, the term that Pollack (2007) uses.

The term paradigm stems from Kuhn’s (1962) *The structure of scientific revolutions*, and can be defined as a “*commonly shared set of assumptions, values and concepts within a community,*



*which constitutes a way of viewing reality*” (Pollack, 2007: 266). Paradigms represent a deeper generic understanding of how phenomena, realities or relations can be explained in terms of rationalistic, positivistic, hermeneutic, phenomenological, etc. They are “*worldviews comprehending holistic ways of experiencing and thinking about the world including values, morals and aesthetics*” (Biedenbach and Mueller, 2011) and are based on a shared belief system among a community of researchers. Although having a more scientific background, paradigms also influence practice in terms of how situations are perceived, what is considered to be of value, and what is viewed as valid and effective action (Pollack, 2007: 266).

Another term that is frequently used in the context of the classification of schools of thought is perspective. For example Kolltveitt et al. (2007) use this term when referring to what in other publications is considered a school of thought. In fact, Turner et al. (2010) use the terms perspective and school of thought as synonyms and also titled their book “*Perspectives on Projects*”. The term perspective implies that what is observed or perceived depends on the angle or the position from which the observation is made (Kolltveitt et al., 2007). Perspectives are mental models, that emphasize some aspects and leave others out.

Reflecting upon how the above mentioned works define a school of thought, it can be concluded that the defining elements of a school are *content*, *community* and *impact*. The next section discusses these three elements.

### *Content*

The defining element in a school is a shared vision, perspective (Kolltveitt et al., 2007) and/or set of beliefs (Biedenbach and Mueller, 2011) from which projects are considered

(Kolltveit et al., 2007). This vision of perspective can be a recognized theory or paradigm, but also be a set of principles or concepts that are sufficiently different from other existing schools may suffice.

The application of the defined perspective should result in *common methodologies, methods and/or tools* (Turner et al., 2010). However, it may take time for specific methodologies, methods and tools to develop. So, an emerging school of thought may not yet have fully developed methodologies and methods. An interesting element in the definition of Turner et al. (2010) is the statement that a new school of thought can *combine tools and methods from several other schools*. This emphasizes the suggestion that schools can build upon each other's body of knowledge or be elaborations of other schools.

### *Community*

In order to be recognized as a school of thought, a new perspective on project management must be discussed in *an academic and/or professional community* (Turner et al., 2010; Biedenbach and Mueller, 2011). There may be situations where the academic world is conceptualizing a new development, whereas in other cases professional practice is pushing new developments forward. However, a new school of thought should also appear from a *significant publication base* in academic outlets. This publication base may also show a number of *leading authors*. Söderlund (2002) talks in this context about "champions" and key contributors.

Next to publications, the development of a community also shows from *events*, such as conferences and congresses.

### *Impact*

Although not explicitly mentioned in the earlier publications, a school of thought should also have a certain impact. Potential schools may represent new perspectives, but when these perspectives are not noticed or picked-up by either the academic or the practitioners community, the school fails to have relevancy.

This criterion may be in a way included in the criterion *community*, but an explicit consideration of the *integration into practice* of the school's methodologies, methods and tools should be in order. A clear indicator of this impact can also be the *integration into standards*.

After having determined what criteria should be considered for the recognition of a school of thought, the findings paragraph of this paper will present an analysis of the emerging literature on sustainability in project management, based on these criteria. The following section will first provide a brief discussion of the emerging concept of sustainability in project management.

### 2.3. Sustainability in project management

The balance between economic growth and social wellbeing has been around as a political and managerial challenge for over 150 years (Dyllick and Hockerts, 2002). The 1972 book "*The Limits to Growth*" (Meadows et al., 1972) concluded that the combination of global population growth and economic development would lead to depletion of natural resources. This foresight

led to installation of the UN ‘World Commission on Development and Environment’, named the Brundtland Commission after its chair. In their report, the commission defines sustainable development as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on Environment and Development, 1987). By stating that "*In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations*", the Brundtland report points out the change aspect of sustainability (World Commission on Development and Environment, 1987). And as projects are seen as temporary organizations that realize change in organizations or across organizational boundaries (Silvius et al., 2012), "*the necessary change that we require towards sustainability will be boosted by applying the project management discipline to sustainability.*" (Marcelino-Sádaba et al., 2015).

With the interest of the relationship between project management and sustainability emerging, a good understanding of what sustainability is or includes is of eminent importance. According to the Brundtland report, "*sustainable development strategy aims at promoting harmony among human beings and between humanity and nature*" (World Commission on Development and Environment, 1987). John Elkington identifies, this as the ‘Triple Bottom Line’ (TBL) or ‘Triple-P (People, Planet, Profit)’ concept: Sustainability is about the balance or harmony between economic sustainability, social sustainability and environmental sustainability (Elkington, 1997).

The Triple Bottom Line helps in operationalizing the concept of sustainability. However, this operationalization also introduces the risk that the interrelations between the three perspectives

are overseen and that the social, environmental and economic perspectives are each considered in isolation. The holistic understanding of sustainability requires an integration of economic, environmental and social perspectives.

In addition to the Triple Bottom Line perspectives, several other dimension of sustainability can be found in literature. Silvius and Schipper (2014) identified in total 14 sustainability dimensions that are relevant to project management, based on a review of 164 academic publications on the topic (Table 2).

Table 2. Dimensions of sustainability.

<i>Dimension</i>	<i>Meaning</i>	<i>Source</i>
An <b>economic</b> dimension	Considering economic effects and benefits.	Elkington (1997)
A <b>social</b> dimension	Considering human and societal interests.	Elkington (1997); Labuschagne and Brent (2006)
An <b>ecological</b> dimension	Considering effects on nature and earth.	Elkington (1997)
A <b>time</b> dimension	Considering also long term effects.	Meadows et al. (1972); World Commission on Environment and Development, (1987); Gareis et al. (2013)
A <b>values</b> dimension	Understanding sustainability as a normative concept.	Schieg (2009); Gareis et al. (2013)
A <b>geographical</b> dimension	Considering both local and global effects.	Hurrell and Kingsbury (1992); Gareis et al. (2013)
A <b>performance</b> dimension	Considering failure and non-performance as a waste of resources and energy.	Silvius et al. (2012)
A <b>participation</b> dimension	Sustainable development requires inclusion and participation of stakeholders.	Freeman (1994); Eskerod and Huemann (2013)
A <b>waste</b> (reduction) dimension	Reducing and, if possible, preventing waste.	Braungart and McDonough (2002); Ma (2011); Maltzman and Shirley (2011)
A <b>transparency</b> dimension	Openly and proactively providing information to stakeholders.	International Organization for Standardization (2010)
An <b>accountability</b> dimension	Being willing and available to be held accountable for decisions and actions.	International Organization for Standardization (2010)
A <b>cultural</b> dimension	Respecting differences in values and culture.	Schieg (2009); Gareis et al. (2013)
A <b>risk</b> (reduction) dimension	Reducing and, if possible, avoiding certain risks.	Godfrey et al. (2009); Silvius (2016a)
A <b>political</b> dimension	Recognizing different interests of stakeholders.	Eskerod and Huemann (2013)

From the emerging literature on the integration of sustainability and project management, two types of relationship between sustainability and project management appeared (Silvius and Schipper, 2015; Kivilä et al., 2017): the sustainability of the project's *product* (the deliverable that the project realizes) and the sustainability of the project's *process* of delivering and managing the project.

The dimensions of sustainability summarized in table 2 provide input for integrating sustainability requirements into the *content* related aspects of the project, such as the specifications and design of the project's deliverable (Eid, 2009; Aarseth et al., 2017), materials used (Akadiri et al., 2013), benefits to be achieved (Silvius et al., 2012), business case (Weninger and Huemann, 2013), quality and success criteria (Martens and Carvalho, 2016b). Studies on the integration of sustainability into project management that take this content related perspective, often focus on operationalizing the Triple Bottom Line concept by developing sets of indicators on the different perspectives (For example Bell and Morse, 2003; Keeble et al., 2003; Labuschagne and Brent, 2006; Martens and Carvalho, 2017). Considering sustainability in these aspects will most of all result in a more sustainable project in terms of a more sustainable *deliverable*, however, this approach bears the risk of lacking the holistic approach of the integration of the economic, environmental and social perspectives.

Some studies focus on the integration of the dimensions of sustainability into the *processes* of project management and delivery, such as the identification and engagement of stakeholders (Eslerod and Huemann, 2013), the process of procurement in the project (Molenaar and Sobin, 2010), the identification and management of project risks (Silvius, 2016a), the communication in and by the project (Pade et al., 2008), and the selection and organization of the project team

(Silvius and Schipper, 2014). Gareis et al. (2013) observe that this perspective has received less attention than the content oriented perspective. A potential explanation for this is the temporary nature of projects (Gareis et al., 2013). This temporariness of projects may lead to the view that the sustainability, or unsustainability, of the project's process is less impactful. However, Labuschagne and Brent (2005), point out that in the process of developing and delivering the project, also many content related aspects are decided and that therefore a project's *process* and *product* interact.

### 3. METHODOLOGY

The main question that this paper discusses is whether the growing attention for sustainability in project management research represents a new school of thought?. The previous paragraph explored the criteria that define and justify a school of thought (Table 3)

Table 3. Criteria for a school of thought in project management..

<i>Criterion</i>	<i>Meaning</i>
<b>Content</b>	- Having a shared perspective or vision - Having common methods and/or tools
<b>Community</b>	- A significant publication base - A number of leading authors - Presence on events
<b>Impact</b>	- Integration into practice - Integration into standards

The process of answering the research question started from the content perspective, as a new school of thought most of all should represent unique content, that differentiates it from the other

schools. The study therefore performed a systematic literature review (Tranfield et al., 2003), with content analysis of the publications that discuss the integration of sustainability into project management.

### 3.1. Sample selection

Earlier literature reviews on the topic (Silvius and Schipper, 2014; Otegi-Olaso et al., 2015; Marcelino-Sádaba et al., 2015 and Aarseth et al., 2017) all report a significant uptake in number of relevant academic publications since 2010. Following the approach of Aarseth et al. (2017), the study focused on the journals that were identified as (combined) publishing the majority of academic research on project management and sustainability. These journals are the three highest ranked project management journals: International Journal of Project Management (IJPM), Project Management Journal (PMJ) and International Journal of Managing Projects in Business (IJMPiB) (Aarseth et al., 2017), completed with the Journal of Cleaner Production (JCLP), that was identified by Marcelino-Sádaba et al. (2015), as the main source of articles on the topic. Search strings for finding relevant articles were the combination of one of the following sustainability-related terms: “*Sustainable*”, “*Sustainability*”, “*Sustainable development*”, “*Ecological*”, “*Eco*”, “*Environmental*”, “*Green*”, “*Greening*”, “*Social*”, “*Societal*”, “*Corporate Social Responsibility*”, “*Social Responsibility*”, “*CSR*”, “*Development*”, “*Climate change*” and “*Carbon*”, and one of the following project management related terms: “*Project*” and “*Project management*”. The search strings were applied to the titles, abstracts and key-words of the articles in the four journals, using the search engines of the journal’s publishers.



An initial assessment of the relevance of the publications for the study was based upon the abstract and the key-words of the article. After removing the articles that appeared to be not relevant to the study, a final sample of 71 articles remained (Table 4).

Table 4. Journal distribution of the sample of articles on sustainability and project management.

<i>Journal</i>	<i>Number of articles in the sample</i>
International Journal of Project Management (IJPM)	36
Project Management Journal (PMJ)	6
International Journal of Managing Projects in Business (IJMPiB)	11
Journal of Cleaner Production (JCLP)	18
Total	71

Compared with the literature studies of Marcelino-Sádaba et al. (2015) and Aarseth et al. (2017), the sample contained more relevant articles in the IJPM. A potential explanation for this could be that many of these articles (23 of the 42 in the sample) were published quite recently (2016 or 2017) and were therefore not included in the studies of Marcelino-Sádaba et al. (2015) and Aarseth et al. (2017). In August 2017, IJPM also published a special issue on sustainability and project management. So, where Marcelino-Sádaba et al. (2015) found that the JCLP was the main source of relevant articles, the IJPM appears to have caught up with that position.

Figure 1 presents the sample, per year of publication. From this Figure it can be observed that before the year 2000, the topic hardly attracted any academic interest. It took until the years 2004-2005 before publications numbers starting to grow. The time period 2010-2015 shows a

relatively stable academic interest, with the last two years, 2016 and 2017, a peak in publications.

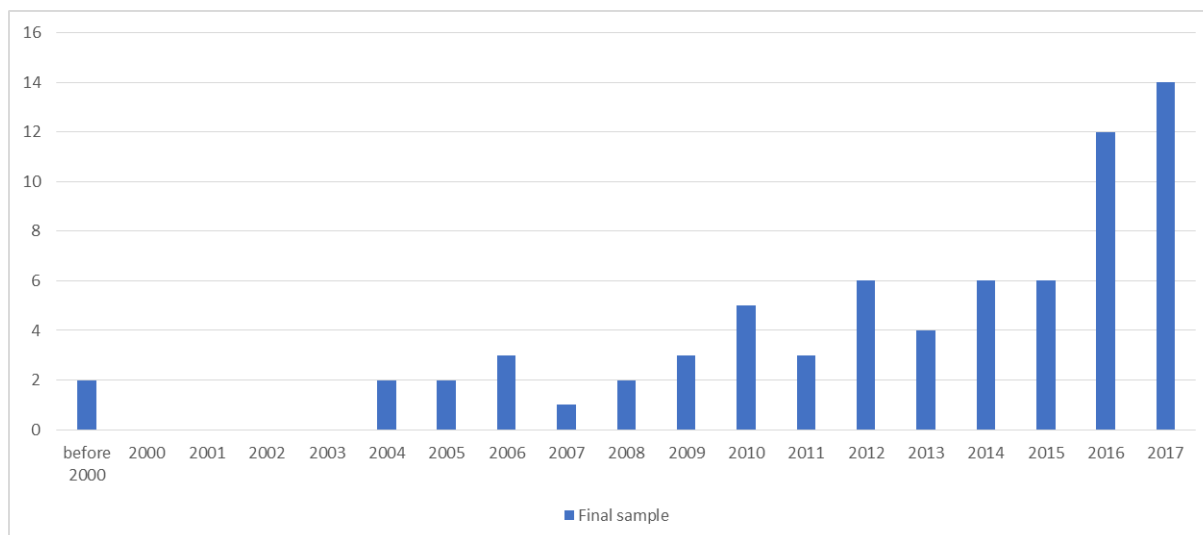


Figure 1. Overview of sample by publication year.

Based on this overview, it can be concluded that a relevant publication base on the topic indeed emerged in the past decade. However, the recent peaks in 2016 and 2017 are too young to draw any conclusions from.

### 3.2. Data analysis

For the content analysis of the articles, each article was read by the authors, and contents discussing the concepts of sustainability were identified, highlighted and coded (Jarvis et al., 2003). In this step, the study followed the approach taken by Pasian and Silvius (2016) and applied directed content analysis (Hsieh and Shannon, 2005), in which the characteristics of the

potential sustainability school of project management were operationalized in ‘clues’ that functioned as the coding scheme for the data analysis.

For the analysis of the criteria community and impact, a content analysis of the articles of the sample did not suffice. Additional data was collected by web-search (for the analysis of project management events) and analysis of project management standards (for the assessment of the criterion impact on standards).

#### 4. FINDINGS

This paragraph will discuss the criteria that define a school of thought in project management, content, community and impact, based on the analysis of the publications in the sample.

##### 4.1. Content

###### *Having a shared perspective or vision*

In a relatively young school of thought, it should be expected that a shared vision or perspective may not be eminent from the start. A common vision most likely needs time to develop through academic debate and empirical findings. Despite this limitation, Pasian and Silvius (2016) identified a number of ‘clues’ that define the sustainability school of thought: considering *Projects in a societal perspective*, having a *Management for stakeholders* approach and applying *Triple bottom line criteria for business case and project success*. These clues are discussed hereunder.

- *Projects in a societal perspective*

The Sustainability school adopts a societal perspective on projects and considers projects as instruments to realize societal change. This is stated most explicitly by Marcelino-Sádaba et al. (2015), who address the integration of sustainability concepts and project management from the perspective of sustainable development, They observe a “*lack of integration of sustainability and project management*”, where “*Organizations, nowadays are increasingly keen on to include sustainability in their business. Project management can help make this process a success but little guidance is available on how to apply sustainability to specific projects.*” (Marcelino-Sádaba et al., 2015:1).

Positioning projects in the context of society is also frequently found in the works of Gareis and Huemann, that state “*With project management making such a significant contribution to the global economy, developing relevant competence at all levels, individual, team, organization and society is seen as a key for better performance.*” (Gareis and Huemann, 2007). Also in their 2013 book on sustainable development and project management, they highlight the societal orientation of projects and refer to the development agenda of the United Nations as a development to consider (Gareis et al., 2013:41).

Cuppen et al. (2016) observe “*the wider social context in which projects are undertaken*” today, and Silviu and Schipper (2014) point at the recognition of this societal context of projects as the starting point of considering sustainability in project management. Silviu et al. (2017) illustrate this broadened perspective on the change that projects realize with Figure 2.

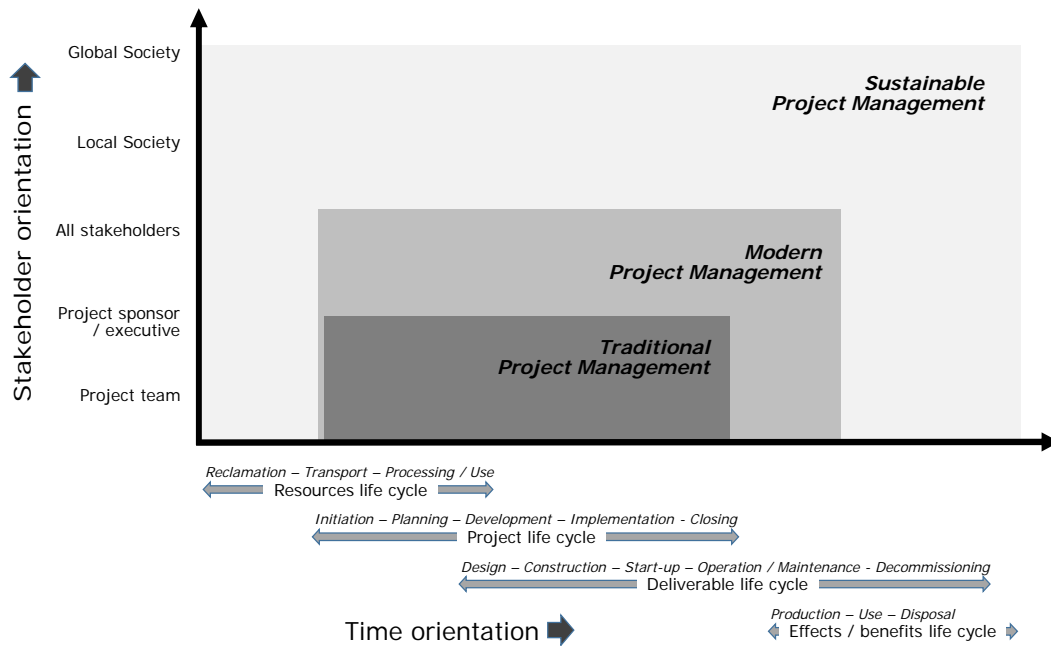


Figure 2. The broadened scope of sustainable project management (Silvius et al., 2017)

The broadened contextual orientation, builds upon the interacting life-cycles as proposed by Labuschagne and Brent (2005) and combines this concept with a wider stakeholder orientation, which includes a reference to the (local and global) society. Also Schieg (2009) references a societal perspective and concludes that projects, as they are part of the activities of business management, should adopt the CSR values of the organization, which implies “*the systematic combination of the interest in the project with the interest in public well-being.*” (Schieg, 2009:321).

Positioning projects in the context of societal change is not a defining characteristic of any of the nine earlier recognized schools. Schools may have the potential to apply them from a societal perspective, but this application is optional. For example the Success school considers projects as organizations or instruments of realizing

objectives (Turner et al., 2013). However, it positions this change in the context of business objectives and not in the context of societal objectives. And representing the Process school, Gareis and Huemann (2007) elaborate on the concept of the project oriented organization and discuss the idea of a project oriented society. The Decision school provides guidance for improved decision-making. *“Over time, better decisions at various levels support the success of projects, strengthen the competitive position of organizations, and ultimately enhance the well-being of society.”* (Turner et al., 2013).

The above examples describe that the other schools of thinking may relate to the societal context of the project. However, it is an optional element. Whereas in the Sustainability school, it is a defining characteristic.

- *Management for stakeholders*

Several authors (AlWaer et al., 2008; Eskerod and Huemann, 2013; Bal et al., 2013; Labelle and Leyrie, 2013) recognize the need for a more open and proactive engagement of stakeholders as a consequence of integrating sustainability into project management. Eskerod and Huemann (2013) conclude that the current standards of project management guide practitioners towards the recognition of a rather limited group of stakeholders and to *“selling the project to the most important stakeholders rather than involving them and their interests into the creation of project objectives”* (Eskerod and Huemann, 2013:43. Referring to stakeholder theory (Freeman, 1984; 2007; 2010), Huemann et al. (2016) differentiate between a

‘management *of* stakeholders’ approach and a ‘management *for* stakeholders’ approach. In the management *of* stakeholders approach, stakeholders are seen primarily as providers of resources. The project needs the stakeholder to fulfil its purpose. The stakeholders are means and stakeholder management is the instrument used to make the stakeholders fulfil their role and prevent them from hindering the project.

In contrast, the management *for* stakeholders approach, recognizes all stakeholders as having their own right and legitimacy (Julian et al., 2008). They are not defined by their role in the project, but by their interests. “*Stakeholders are not means to specific aims in the organization but valuable in their own rights.*” (Eskerod and Huemann, 2013: p.40). This recognition implies that the orientation of the management of the project should be to shape the project in such a way that it combines the interests of many (all?) of the stakeholders and thereby provides value to many of them.

Huemann et al. (2016) conclude that in the context of sustainable development, a more holistic view of project stakeholder management is necessary “*Specifically it calls for different values. Values like transparency and fairness constitute a management for stakeholder approach.*” (Huemann et al., 2016:XV).

In the earlier recognized schools of thought, the Marketing school represents most prominently the orientation on stakeholders’ interests is prominent. Meeting or exceeding stakeholder needs and expectations, i.e. identified and unidentified requirements, and balancing competing interests, is considered a core activity for creating project success (Eskerod and Huemann, 2013). The Sustainability school

builds upon this orientation and develops the role of the stakeholders in the project even further, as stakeholder orientation is one of the cornerstones of the concepts of sustainability (International Organization for Standardization, 2010).

The management for stakeholders approach impacts not only the deliverable of the project, but also the delivery. Labelle and Leyrie (2013) conclude that sustainable project management implies that stakeholder communication becomes stakeholder participation. The information flow between project and stakeholders is no longer unidirectional but transformed into a dialogue that allowed participants to take part in developing the project (Libaert, 1998). Also Silvius and Schipper (2014:70) identify this 'proactive stakeholder participation' as one of the dimensions of 'sustainable project management'.

- *Triple bottom line criteria.*

Integrating sustainability in project management will influence the specifications and requirements of the project's deliverable or output, and the criteria for project success (Eid, 2009; Maltzman and Shirley, 2011; Taylor, 2010). For example the inclusion of environmental or social aspects in the project's objective and intended output and outcome (Silvius et al., 2012). In fact, based on their literature review, Silvius and Schipper (2014) conclude that 86% of the studies in their sample used the triple bottom line as dominant definition and concept.

The triple bottom line concept states that sustainability is about the balance or harmony between economic sustainability, social sustainability and environmental



sustainability (Silvius and Schipper, 2014). According to Savitz (2006), the triple bottom line concept captures the essence of sustainability.

Introducing the tripe bottom line perspectives into the requirements and success definition of projects creates the challenge of definition and measurability. Several frameworks or sets of sustainable development indicators (SDIs), are specifications of the triple bottom line (Adams and Frost, 2008). Unfortunately, there is not a unified understanding of what are relevant indicators for sustainability. In fact, the literature on SDIs is a veritable jungle of different approaches and numerous case studies (Olsson et al, 2004). Nevertheless, SDI frameworks may help in operationalizing the concept, however, they also introduce the risks that the interrelations between the three perspectives of the triple bottom line are overseen and that the social, environmental and economic perspectives are each considered in isolation. The holistic understanding of sustainability requires an integration of economic, environmental and social perspectives (Elkington, 1997; Linnenluecke et al., 2009).

Several studies, for example Eid (2009), Labuschagne and Brent (2006), Silvius and Schipper (2015) and Martens and Carvalho (2017) apply the triple bottom line concept in their development of sustainability indicators for project. However, it should be concluded from these studies that consensus on how to measure and assess sustainability in project has not emerged yet (Silvius and Schipper, 2015). And specialists actually question whether or not a common list is even possible, given the wide variety of conditions and the differences in values in different contexts (Hardi and Zdan, 1997). It should therefore be concluded that the measurement or

assessment of sustainability in projects and/or project management should be configurable to the characteristics and context of the project at hand (Silvius and Schipper, 2015). The triple bottom line concept may therefore first of all provide a conceptual model that identifies relevant perspectives on the project, such as the model proposed by Marcelino-Sádaba et al. (2015) (Figure 3).

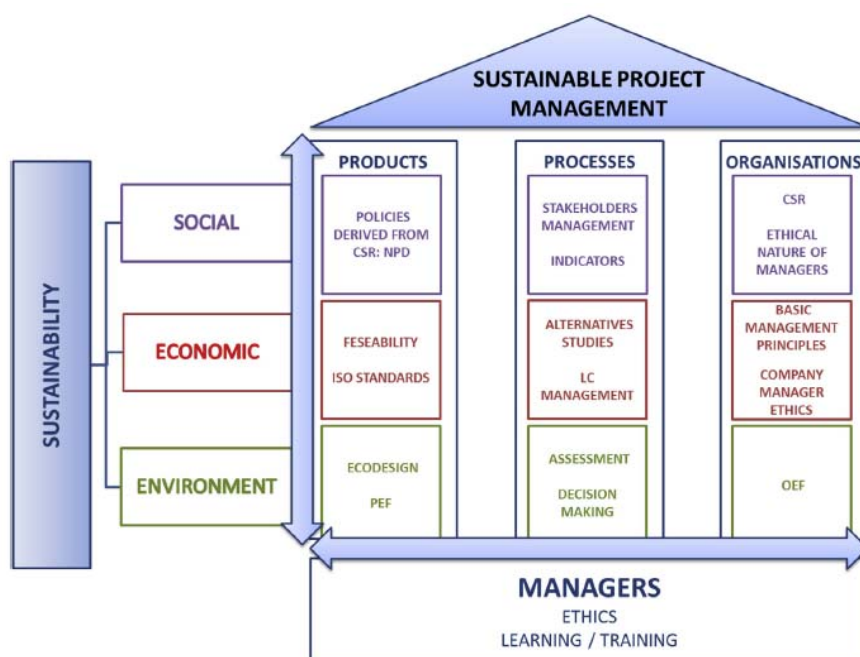


Figure 3. Conceptual model for managing sustainable projects (Marcelino-Sádaba et al., 2015)

The triple bottom line concept is not addressed in any of the earlier described nine schools of project management and is therefore a unique characteristic of the sustainability school of project management.

The analysis presented above builds upon the clues that Pasian and Silvius (2016) found for the sustainability school of project management. However, a justified question is

whether other defining characteristics emerged from the analysis. And although this introduces a subjective perspective by the researcher, a fourth defining characteristic, or clue, of the sustainability school, *Values based*, was identified.

- *Values based*

As argued by Robinson (2004) and Martens (2006), sustainable development is inevitably a normative concept, reflecting values and ethical considerations of society. “*Sustainability is the ideal state of sustainable development efforts*” (Keeyes and Huemann, 2017), which is based on the ethics and values of the actors (Clifton and Amran, 2011).

Following the conclusion that sustainability is embedded in the values of the social system that the sustainability relates to, a logical question is which values sustainability is based upon. In the earlier quoted Brundtland commission’s definition of sustainable development, the statement “*..the needs of the present without compromising the ability of future generations..*” (World Commission on Environment and Development, 1987) implies *equality* as a value of sustainability. In the definition, equality is applied to the rights of different generations, but the value may also be applied to the interests of different stakeholders. This interpretation can be found with the earlier mentioned stakeholder theory (Freeman, 2007; 2010). Other values associated with sustainability are *participation, fairness, respect, honesty* and *transparency* (Clifton and Amran, 2011; Robert et al., 2002; Steurer et al., 2005; Huemann et al., 2016).

Also projects have specific values, norms and rules (Gareis et al. 2009). These values are influenced by the project context, such as the organizations that host or contribute to the project, but also by the project manager and the individual team members (Silvius et al., 2012).

The aspect of values is not explicitly addressed in any of the earlier described nine schools of project management. Each school may inevitably be based on certain values, but these are implicit. The explicit recognition and discussion of values is a defining and unique characteristic of the sustainability school of project management.

The discussion of the four defining characteristics presented above represents the qualitative outcome of the content analysis of the study. Next to this qualitative analysis, the study also quantitatively assessed how these characteristics were included in the articles in the sample. Table 5 presents the results of this analysis.

Table 5. Journal distribution of the sample of articles on sustainability and project management.

<i>Journal</i>	<i>Characteristics of the sustainability school of thought</i>			
	<i>Projects in a societal perspective</i>	<i>Management for stakeholders</i>	<i>Triple bottom line criteria</i>	<i>Values based</i>
IJPM	33	30	35	20
PMJ	2	3	5	2
IJMPiB	9	10	11	6
JCLP	11	8	18	2
Total	55	51	69	30
	77%	72%	97%	42%

From this Table it shows that the Triple bottom line criteria are most present as defining characteristic in the publications of the sample. This confirms the finding of Silvius and Schipper (2014) in their literature review. The Values based characteristic was least prominent in the sample. Nevertheless, as sustainability is inevitably based upon a set of values, this clue is maintained as a defining characteristic.

### *Having common methods and/or tools*

The defining characteristics of the Sustainability school of thought, as outlined in the previous section, also lead to the development of specific methods and/or tools. For example Huemann et al. (2016) describe how the management for stakeholders approach, that is necessary for the integration of sustainability into project management leads to new methods in project stakeholder management, specifically aimed at engagement and participation of stakeholders is the process of the project. They observe that existing tools for project stakeholder analysis are often project-centric and therefore less suitable for stakeholder engagement base on a management for stakeholders approach (Huemann et al., 2016). They therefore propose new methods, such as systemic calculations, that allow thinking about the stakeholder relations in a more holistic way.

On another field of project management, Silvius (2015b) discusses the implications of considering the triple bottom line concept in the business case of projects. He concludes that the traditional return on investment methods, such as discounted cash flow and pay-back period, are not fit for the consideration environmental and societal aspects, even if

these effects could be valued in monetary terms. Therefore it is concluded that integrating sustainability indicators into the business case of projects requires a multi-criteria approach in business case evaluation (Silvius, 2015b).

Another method that is specific to the Sustainability school is that of the Sustainability Management Plan (SMP) (GPM Global, 2014; Silvius, 2015c). The SMP is a document that as part of the project planning documents specifically addresses the sustainability risks and opportunities of the project.

Recently, also some specific instruments have been developed for the purpose of assessing and evaluating the sustainability aspects of a project, both ex-ante and ex-post. For example the Sustainable Footprint Methodology (Oehlmann, 2011) and the Sustainable Project Management maturity model (Silvius and Schipper, 2015). In both these tools, the triple bottom line concept is recognizable as the conceptual starting point of the instruments.

Reflecting upon the content contribution the scholars representing the sustainability school have made, it should be concluded that these contributions are defining a new perspective on projects and project management. This new perspective is also sufficiently distinct from the perspectives of existing schools, in order to be recognized as a new school of thinking.

This sustainability perspective also led to the development of new and specific techniques and methods, however, this development is still ongoing.

#### 4.2. Community

### *A significant publication base*

The first indicator of an academic community is a significant publication base. The sample that was selected for the study (Figure 1) confirmed the emergence of a literature base that was identified in the earlier studies by Silvius and Schipper (2014), Otegi-Olaso et al. (2015), Marcelino-Sádaba et al. (2015) and Aarseth et al. (2017). And although the samples of these studies varied, based on the selection criteria of the study, the academic foundation of the sustainability school is starting to take form.

### *A number of leading authors*

In their analysis of the academic community on the topic of sustainable project management, Otegi-Olaso et al. (2015) identify a number of (key) contributors. They mention, amongst others, Labuschagne, Sánchez, Gareis, Schieg, Silvius, Tam and Eskerod. As their article does not reveal the criteria for identifying these authors as key contributors, the study developed its own criteria for key contributor ship, based on quantity (number of publications in the sample) and quality (measured by citations) of the academic contribution of different author teams. The study therefore analysed the authorship of the publications, plus the authors these articles referenced. An author, or author group, was considered a key contributor when they had three or more articles in the sample. When an author or author group was represented in the sample with one or

two articles, an additional criterion was that they had multiple academic publications that were not included in the sample and that their work was referenced by at least 15 articles in the sample.

Based upon these criteria, Table 6 presents an overview of the researchers or research groups that were identified as key contributors to the academic community on sustainability in project management.

Table 6. Overview of key-contributors of the sustainability school.

<i>Name of researchers</i>	<i>Main affiliation</i>	<i>Period of activity</i>	<i>Main publications</i>	<i>Affiliated co-authors</i>	<i>Main contributions</i>
<b>Labuschagne and Brent</b>	University of Pretoria, South Africa	2004 - 2008	Labuschagne and Brent (2005; 2006; 2008), Brent and Petrick (2007)	A. Fourie, W. Petrick	The interaction of the life cycles of project, deliverable and products.
<b>Silvius and Schipper</b>	HU University of Applied Sciences Utrecht, the Netherlands	2009 - today	Silvius et al. (2012), Silvius and Schipper (2014; 2017), Huemann and Silvius (2017)	J. Tharp, S. Nedeski, M. Kampinga	Principles of sustainable project management, Sustainable project management maturity model
<b>Huemann and Gareis</b>	Vienna University of Economics and Business, Austria	2010 - today	Gareis et al. (2013), Eskerod and Huemann (2013), Huemann and Silvius (2017)	P. Eskerod, C. Ringhofer, L. Keays	Principles of sustainable project management, Management for stakeholders approach
<b>Monteiro de Carvalho and Martens</b>	University of São Paulo, Brazil	2013 - Today	Brones et al. (2014), Brones and Carvalho (2015), Martens and Carvalho (2016a; 2016b; 2017), Carvalho and Rabechini (2017)	F.A. Brones, R. Rabechini, E.S. Zancul	Practitioner's consideration of sustainability, Relationship between sustainability and project success
<b>Klalegg, Aarseth and others</b>	Norwegian University of Science and Technology, Norway	2009-2011, 2015 - today	Klalegg (2009), Klalegg and Haavaldsen(2011), Aarseth et al. (2017)	A. Økland, K. Aaltonen, N. Olsson	Project sustainability strategies



And while other authors also made notable contributions, these were more incidental. The key contributors author teams listed above each made a more substantial contribution to the publication base and should be considered most influential. What may be noticed from the geographical locations of the teams is that North America is not strongly contributing to the sustainability school.

#### *Presence on events*

A third indicator for the existence of a community was a certain presence of the school on events, such as conferences. For the assessment of this criterion the study selected international project management conferences in the past 7 years (2010 – 2016) that had were fully or partly oriented towards an academic audience. As fully academic project management conferences, the bi-annual conference of the International Research Network on Organizing by Projects (IRNOP), PMI's bi-annual Research and Education Conference (PMI-REC) and the Project Organizing track on the annual European Academy of Management (EURAM) conference were identified. As partly academic, the IPMA World Congresses, the IPMA Expert Seminars, the IPMA Research Seminars and the PMI Global Conferences were identified. Table 7 presents the presence of sustainability at these events.

Table 7. Presence of sustainability on international project management congresses and seminars (2010-2016).

<i>Year</i>	<i>Event</i>	<i>Orientation</i>	<i>Presence of sustainability</i>
2010	IPMA Expert Seminar	Practitioners + Academics	This event was themed "Survival and Sustainability as Challenges for Projects"
2010	PMI Research and Education Conference	Academics + Educators	This event included a track on "Sustainability and Society"
2010	IPMA World Congress	Practitioners + Academics	This event included several sessions on sustainability as one of the new fields in project management
2011	IRNOP Conference	Academics	This event included a track on "Sustainability"
2011	PMI Global Congress EMEA	Practitioners + Academics	This event included a Research Working Session themed "Sustainability and Project Management: The Future is Now"
2011	IPMA World Congress	Practitioners + Academics	This event included a track on "Social and Corporate Responsibility"
2012	IPMA World Congress	Practitioners + Academics	This event included a track on "Project Management and Sustainable Development"
2013	IPMA World Congress	Practitioners + Academics	This event included a track on "Balance in Projects, Business, the Environment and the Needs of Societies"
2014	PMI Research and Education Conference	Academics + Educators	This event included a track on "Sustainability"
2014	IPMA World Congress	Practitioners + Academics	This event included a track on "Sustainability"
2015	PMI Global Congress NA	Practitioners + Academics	This event included some sessions on sustainability in project management
2015	IRNOP Conference	Academics	This event included a panel discussion on Climate Change and the Management of Projects in the 21st Century
2015	IPMA World Congress	Practitioners + Academics	This event included a track on "Sustainability and the Realization of Benefits"
2016	European Academy of Management (EURAM)	Academics	Sustainable development and project management was one of the themes in the project organising track
2016	PMI Global Congress EMEA	Practitioners + Academics	This event included some 'education sessions' on sustainability in project management
2016	IPMA Research seminar	Academics	This event was themed "Sustainability and Project Management"

About half of the events investigated (Table 6), included sustainability, or a sustainability related topic, recognizable in the program in the form of a theme, track or stream. In almost all events, sustainability was visible in one or more sessions.

Based on this finding, it can be concluded that also this indicator points towards the emergence of sustainability as a school of thought.

Based upon on analysis of academic publications, leading author themes and events, it is concluded that in the past ten years, sustainability established itself as a topic of study that is studied and discussed by a significant academic community. And although not explicitly analysed in this study, it should be noticed that also in the professional bodies communities have formed around the topic of sustainability. For example within PMI there is an active Special Interest Group on the topic.

#### 4.3. Impact

##### *Integration into practice*

Silvius et al. (2013) observe that studies on the integration of the concepts of sustainability are mostly conceptual studies of an interpretive nature, giving meaning to how the concepts of sustainability *could* be interpreted in the context of projects, or of a normative nature, prescribing how sustainability *should* be integrated into projects and project management. Empirical studies, describing the practice of how the concepts of sustainability are integrated into projects, are limited. Most empirical studies that were

published (for example Bell and Morse, 2003; Pade et al., 2008; Brent and Tredoux, 2013; Janeš and Faganel, 2013) typically cover one or multiple case studies using qualitative methods. More recently, studies that study a larger sample of empirical practice were published (for example Martens and Carvalho; 2017), indicating that also the practice of integrating sustainability in project management is evolving.

The review of project sustainability strategies by Aarseth et al. (2017) synthesized and affirmed different strategies that organizations implemented in their evaluation of the sustainability of their projects. Their contribution provides an overview how organizations are picking up the topic and implemented them into their project management practices.

#### *Integration into standards.*

The attention that is being given to the relation between sustainability and project management by the academic community, seems to be in contrast with the way the standards and best practices for project management address this relationship. Eid (2009) concludes in his study on sustainable development and project management that the standards for project management “*fail to seriously address the sustainability agenda*”. And more recently, Silvius (2015a) concludes that “*on the logical areas of impact, the standards of project management processes (PMBOK® Guide, PRINCE2® and ISO 21500) fail to refer convincingly to sustainability considerations*”. However, it might be argued that with the explicit reference to sustainability in the new IPMA Individual Competence Baseline version 4 (International Project Management Association, 2015),

this situation is about to change. ICB4 competence element Perspective 3 “*Compliance, regulations and standards*”, includes the indicator “*Identify, and ensure that the project complies with relevant sustainability principles and objectives*”. And the description of this key competence indicator states that the project manager should be able to “*assess the impact of the project on the environment and society*” and that he/she “*researches, recommends and applies measures to limit or compensate negative consequences*”. With the explicit reference to the effects of project’s processes and products on the environment and society, the ICB4 acknowledges the relation between projects and sustainability, and establishes a role for the project manager in this relationship. Also the recently published ISO 21505 standard on governance of project, programme and portfolio management (International Organization for Standardization, 2017) refers explicitly to sustainability and states that “*The governance of projects, programmes and portfolios should reflect the organization’s commitment to ethical values and sustainability*”.

These explicit references should be considered a breakthrough for sustainability thinking in project management and a recognition of the sustainability school of thinking.

Nevertheless, it will be interesting to observe how sustainability will be picked-up by the globally most established standard of project management, the PMBOK® Guide. Despite efforts of PMI members and contributors, the 5<sup>th</sup> edition of the Guide (Project Management Institute, 2013) did not reflect the concepts that define the sustainability school of thinking, and neither does the review version of the 6<sup>th</sup> edition. PMI’s argumentation for this that the Guide reflects best practices of project management and

that the practice of integrating sustainability concepts into project management was not developed enough.

A final standard that should not be forgotten in this discussion is Projects Integrating Sustainability Methods PRiSM (Carboni et al., 2013). PRiSM aims to provide a project management methodology, based upon the ISO 21500 project management processes, that integrates the consideration of sustainability into the project management process. It does so by integrating a sustainability impact analysis in the project initiating phase, that feeds into a Sustainability Management Plan for the project. Throughout the project life-cycle this SMP is managed and at the closure of the project the sustainability aspects of the project are reviewed in a meeting that includes also the sustainability or CSR officer of the organization.

A specific and new sustainable project management methodology as PRiSM may not be adopted by the market quickly. However, it provides a model and a number of methods or practices that can inspire organizations to integrate sustainability considerations in their existing project management methodologies.

Reflecting on the observations made above, it is concluded that on the criterion Impact, the sustainability school shows enough evidence of integration into practice and into professional standards in order to be recognized as a new school of thought.

#### 4.4. Summary

In this paragraph the emergence of sustainability, and its underlying concepts, in project management was analysed on the criteria that define a school of thought: content, community and impact. Based on this analysis, it was concluded that all three criteria are met and that, in the last decade, sustainability emerged as a new school of thinking in project management.

## **5. POTENTIAL CRITICISM**

The Sustainability school also faced criticism. This paragraph discusses the arguments why sustainability may not be considered a new school of thought in project management.

### *Old wine in new bottles*

The sustainability school may be considered as ‘nothing new’. Stakeholder orientation has always been an aspect of good project management, and the consideration of environmental and societal aspects will probably depend on how relevant these aspects are for the project.

There may be some truth in this argument in the sense that there may always have been projects and project managers that applied the concepts of sustainability to their projects, either consciously or unconsciously. However, the further development of these concepts and considerations further in terms of methodologies, methods and tools, as described in the previous paragraph, is one of the defining elements of the Sustainability school. It develops the integration of sustainability into project management from an implicit consideration of some project managers to an explicit methodology of many.

*Integrating sustainability is not the responsibility of the project manager*

A frequently heard argument against sustainability in project management is that the sustainability of the project is primarily the responsibility of the project sponsor and not of the project manager. The reasoning behind this argument is that defining aspects of the project, such as the requirements and specifications of the deliverable, the business case, and sometimes also the materials used, are logically defined by the project's sponsor or client.

The counterargument for this is that the project sponsor, in his definition of the project, will logically focus on the project/deliverable of the project and not that much on the process/delivery of the project. That leaves the process of organizing and executing the project as an opportunity for the project manager to enhance the sustainability of the project. Aspects of sustainable project management that will typically be the responsibility of the project manager is the configuration and organization of the project team, the communication within the team, optimizing the processes of project execution (For example procurement), optimizing traveling and transport within the project, the engagement and participation of stakeholders in the project, organizational learning through the project, etc. (Silvius and Schipper, 2014).

However, the role and influence of the project manager expands beyond his or her responsibility in the project. Several studies conclude a central role of the project manager with regards to sustainability, also of the product/deliverable (e.g. Maltzman and Shirley, 2011; Goedknecht and Silvius, 2012). What these studies have in common is that



they highlight the opportunity that the role of the project manager offers. The project manager has a central position in the project and that provides the opportunity to influence many aspects of the project. This influence is not limited to the process of executing the project but, by the 'power of agenda', extends to the deliverable and objectives of the project. The 'power of agenda' that the project manager has, provides him or her with the opportunity to discuss sustainability aspects, concerns or issues with the project sponsor, within the project team or with other stakeholders (Silvius, 2016b).

### *Sustainability only makes sense in the product*

This argument highlights the temporary aspect of projects and concludes that emphasizing sustainability in a temporary activity, such as a project, makes little sense. Considering sustainability in the product/deliverable of the project makes sense, but considering sustainability in the process/delivery has little impact.

This argument has been countered by the impact analysis that Silvius and Schipper (2014) performed. In their analysis of 'impact areas' of sustainability in project management they found impact areas that referred to both the *deliverable* of the project, such as the project specifications, requirements, deliverable, quality criteria and materials used, and the *delivery* of the project, such as recognition of the context of the project, recognition and engagement of stakeholders, selection and organization of project team, project sequencing and scheduling, risk identification and management planning, project communication, project handover and organizational learning.

Labuschagne and Brent (2005) point out that the delivery of the project and its deliverable (in their terminology the ‘asset’, are in fact interrelated. “*Aligning project management (and appraisal) methodologies with the principles of sustainable development therefore requires that the sustainability consequences of asset and product life cycles must be considered during the project life cycle.*” (Labuschagne and Brent, 2005).

### *Sustainability is too ambiguous*

The concept of sustainability is understood intuitively, but not easily expressed in concrete operational terms (Briassoulis, 2001). Its exact meaning remains ambiguous and subject to ongoing debate. Robinson (2004) points out that this ‘constructive ambiguity’ makes the concept flexible, as it can be translated in a range of actions adapted to the needs and possibilities of a diverse set of stakeholders. However, the ambiguity of sustainability also entails the risk that the concept becomes meaningless. Engelman (2013) talks in this context about ‘sustainababble’: “*sustainability means anything from environmentally better to cool*”. If sustainability is to move beyond the gap between rhetoric and action, it should become a decision-guiding strategy, defined as a way forward to realise a desired future (Hugé et al., 2013).

The ambiguity of sustainability may be an issue, however, it should also be acknowledged that several authors have provided concrete interpretations of the concepts of sustainability within the context of project management. The tools and methods of

sustainable project management are examples of this and they provide practical guidance on how to interpret and implement sustainability.

*Sustainability is not relevant to all project types*

This argument highlights that different aspects and criteria of sustainability have different relevance for different projects. For example the criteria of water usage may be relevant to a construction project, but less to a software development project. This argument makes sense and in fact, also applies to considering sustainability on an organizational or corporate level. The content and understanding of corporate sustainability varies according to the context (van Marrewijk, 2003). Organizations should therefore assess which aspects and indicators are relevant to their industry. However, this should be done in a transparent way and with engagement of relevant stakeholders.

The same applies to integrating sustainability into project management. Based on the characteristics of the project, and with consultation or participation of stakeholders, the project should transparently assess which sustainability indicators or aspect are most relevant. Methods or tools that integrate the concepts of sustainability in projects and project management should therefore provide flexibility and be configurable to the characteristics and context of the project at hand (Silvius and Schipper, 2015).

After discussing the criticism on sustainability as new perspective on project management, the criteria for recognizing sustainability as a school of thought still stand. The criticism arguments

provide aspects and hurdles to take into account, but do not undermine the assessment of criteria discussed in the findings paragraph.

## 6. CONCLUSION

The integration of the concepts of sustainability into the processes, standards and practices of project management is an emerging field of study and is picking up momentum. As the literature on this topic is evolving, this paper set out to discuss whether the growing attention for sustainability in project management research represents a new 'school of thought' in project management? By doing this, it built upon the earlier work by Turner et al. (2010) that identified and discussed nine schools of thought in project management and project management research. After reviewing the literature on schools of project management, the study derived three criteria that define a school of thought:

*Content*: having a shared perspective or vision and having common methods and/or tools;

*Community*: a significant publication base, a number of leading authors and presence on events;

*Impact*: integration into practice and integration into standards.

Based on a review of the emerging publication base on sustainability in project management, it was concluded that on all three criteria, sustainability qualifies as a new school of thought in project management.

On the criterion *content* the study found four commonly shared characteristics that define the sustainability school of thought: considering *Projects in a societal perspective*, having a *Management for stakeholders approach*, applying *Triple bottom line criteria*, and taking a

*Values based* approach to projects and project management. And although the application of the triple bottom line criteria was the most present characteristic in the publications of the sample, the other characteristics were sufficiently present to confirm them as a defining characteristic. These defining characteristics of the sustainability school are sufficiently distinct from existing perspectives, to be recognized as a new school of thinking.

The development of specific project management methodologies, methods and tools that integrate these share views is emergent. Some methods and tooling has been made available, but experience with these tools is still limited.

On the criterion *community* it was observed that the past decade saw a significant increase in academic publications on the topic, with the in 2017 published special issue of the International Journal of Project Management as most recent highlight. The study also identified five leading author teams that made significant contributions to the development of the topic, and found that sustainability has been a recurring topic on international project management events in the last couple of years.

On the criterion *impact* it was observed that in recent years, the standards of project management, most notably the IPMA Individual Competence Baseline version 4 and the ISO 21505 guideline on the governance of projects, programmes and portfolios, are explicitly referring to sustainability as a perspective that should be taken into account in the management and governance of projects. Also in project management practice, the consideration of sustainability seems to be evolving, as indicated in studies by Aarseth et al. (2017) and Martens and Carvalho (2017).

This article also identified five potential counter arguments for recognizing sustainability as a school of project management, but concluded that these arguments, although providing additional aspects to take into account, did not made the case for dismissal of the sustainability project management school.

#### *Recommendations for further research*

The concepts of sustainability have different relevance to different organizational and societal contexts and a ‘one size fits all’ approach “*bears the risk of providing an ‘average’ solution, that fails to fit the specifics of the diversity of real-life projects*”. (Huemann and Silviu, 2017). One direction for further research should therefore be the specification the sustainability school of project management to different contexts, for example per industry. In the published studies into sustainability in project management, the building/construction industry is well represented. However, other sectors that strongly rely on projects, for example the information technology sector, are hardly covered.

The diversity of sustainability in project management should also be reflected in the types and methodologies of research on the topic. These research methodologies should be capable of capturing diverse results and outcomes. Sustainability is too important for the future of the project management profession to be addressed in generalizations.

## **REFERENCES**

- Aarseth, W., Ahola, T., Aaltonen, K., Økland, A. and Andersen, B. (2017), Project sustainability strategies: A systematic literature review, *International Journal of Project Management*, 35(6), 1071–1083.
- Adams, C. A., & Frost, G. R. (2008), “Integrating sustainability reporting into management practices”, *Accounting Forum*, (32), 288-302.
- Akadiri, P.O., Olomolaiye, P.O. and Chinyio, E.A. (2013), “Multi-criteria evaluation model for the selection of sustainable materials for building projects”, *Automation in Construction*, 30, 113–125.
- AlWaer, H., Sibley, M. and Lewis, J. (2008), “Different Stakeholder Perceptions of Sustainability Assessment”, *Architectural Science Review*, 51(1), 48-59.
- Anbari, F. T. (1985). “A systems approach to project evaluation”, *Project Management Journal*, 16(3), 21–26.
- Bal, M., Bryde, D., Fearon, D. and Ochieng, E., (2013), “Stakeholder Engagement: Achieving Sustainability in the Construction Sector”, *Sustainability*, 6, 695-710.
- Bell, S and Morse, S. (2003), *Measuring Sustainability Learning from doing*, Earthscan, London.
- Biedenbach, T. Müller, R. (2011). “Paradigms in project management research: examples from 15 years of IRNOP conferences”, *International Journal of Managing Projects in Business*, 4(1), 82-104
- Bredillet, C.N. (2004). *Theories and research in project management: Critical review and return to the future*. Thèse de Doctorat, Lille School of Management (ESC Lille), France.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2007a). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 1)”, *Project Management Journal*, 38(2), 3-4.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2007b). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 2)”, *Project Management Journal*, 38(3), 3-5.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2007c). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 3)”, *Project Management Journal*, 38(4), 2-4.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2008a). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 4)”, *Project Management Journal*, 39(1), 2-6.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2008b). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 5)”, *Project Management Journal*, 39(2), 2-4.
- Bredillet, C.N., Turner, J.R. & Anbari, F.T., (2008c). “Exploring Research in Project Management: Nine Schools of Project Management Research (Part 6)”, *Project Management Journal*, 39(3), 2-5.

Brent, A.C. and Petrick, W. (2007), “Environmental Impact Assessment (EIA) during project execution phases: Towards a stage-gate project management model for the raw materials processing industry of the energy sector”, *Impact Assessment and Project Appraisal*, 25 (2), 111-122.

Brent, A.C. and Tredoux, C. (2013), “Integrating sustainability into technology-oriented project management: Cases from South Africa”, in Silvius A.J.G. and Tharp, J. (Eds.), *Sustainability Integration for Effective Project Management*, IGI Global Publishing.

Briassoulis, H. (2001), “Sustainable Development and its Indicators: Through a (Planner’s) Glass Darkly”, *Journal of Environmental Planning and Management*, 44(3), 409–427.

Brones, F.A., Carvalho, M.M., Zancul, E.S. (2014), “Ecodesign in project management: a missing link for the integration of sustainability in product development?”, *Journal of Cleaner Production*, 80(1), 106–118.

Brones, F., Carvalho, M.M., Zancul, E.S. (2017), “Reviews, action and learning on change management for ecodesign transition.”, *Journal of Cleaner Production*, 142, 8–22.

Carboni, J., González, M. and Hodgkinson, J. (2013), *The GPM® Guide to Sustainability In Project Management*, GPM Global.

Carvalho, M.M. and Rabechini, R. (2017), “Can project sustainability management impact project success? An empirical study applying a contingent approach.”, *International Journal of Project Management*, 35(6), 1120–1132.

Clifton, D. and Amran, A. (2011), “The stakeholder approach: a sustainability perspective”, *Journal of Business Ethics*, 98, 121–136.

Cuppen, E., Bosch-Rekvelde, M.G.C., Pikaar, E. and Meho, D.C. (2016), “Stakeholder engagement in large-scale energy infrastructure projects: Revealing perspectives using Q methodology”, *International Journal of Project Management*, 34(7), 1347-1359.

Dyllick, T. and Hockerts, K. (2002) “Beyond the business case for corporate sustainability”, in *Business Strategy and the Environment*, 11. 130-141.

Edum-Fotwe, F.T. & Price, A.D.F. (2009), “A Social Ontology for Appraising Sustainability of Construction Projects and Developments.”, *International Journal of Project Management*, 27(4), 313-322.

Eid, M. (2009) *Sustainable Development & Project Management*, Lambert Academic Publishing, Cologne.

Elkington, J. (1997). *Cannibals with Forks: the Triple Bottom Line of 21st Century Business*. Oxford: Capstone Publishing Ltd.



Eskerod, P. and Huemann, M. (2013), "Sustainable development and project stakeholder management: what standards say", *International Journal of Managing Projects in Business*, 6(1), 36 – 50.

Freeman, R.E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman/Ballinger.

Freeman, R.E., Harrison, J.S. and Wicks, A.C. (2007), *Managing for Stakeholders: Survival, Reputation, and Success*, Yale University Press, Yale.

Freeman, R.E., Harrison, J.S., Wicks, A.C., Parmar, B.L. and De Colle, S. (2010), *Stakeholder Theory: The State of the Art*, Cambridge University Press, Cambridge.

Gareis R, and Huemann M., (2007), Maturity-Models for the project-oriented company, in Turner, J.R. (Ed.) *The Gower handbook of project management*. fourth ed., Gower, Farnham.

Gareis, R., Huemann, M. and Martinuzzi, A. (2009) "Relating sustainable development and project management", IRNOP IX, Berlin.

Gareis, R., Huemann, M., Martinuzzi, R-A., with the assistance of Weninger, C. and Sedlacko, M. (2013), *Project Management & Sustainable Development Principles*, Project Management Institute, Newtown Square, PA USA.

Goedknecht, D. and Silviu, A.J.G. (2012), "The implementation of sustainability principles in project management", Proceedings of the 26th IPMA World Congress, Crete, 875 - 882.

GPM Global. (2014). *Sustainability Management Plan 1.2*. GPM Global.

Hardi, P. and Zdan, T. (1997). "The Bellagio Principles for Assessment, Assessing Sustainable Development: Principles and Practice", International Institute for Sustainable Development, Winnipeg, Canada

Hsieh H.-F. and Shannon S. (2005), "Three approaches to qualitative content analysis", *Qualitative Health Research*, 15, 1277–1288.

Huemann, M., Eskerod, P. and Ringhofer, C. (2016), *Rethinking project stakeholder management*, Project Management Institute, Newtown Square, PA USA.

Huemann, M. and Silviu, A.J.G. (2015), "Call for papers: International Journal of Project Management Theme: "Managing projects & sustainability", *International Journal of Project Management*, 33, 719-720.

Huemann, M. and Silviu, A.J.G. (2017), "Projects to create the future: Managing projects meets sustainable development", *International Journal of Project Management*, 35(6), 1066–1070.

Hurrell, A. and Kingsbury, B. (1992). *The International Politics of the Environment: Actors and Institutions*, Oxford: Clarendon Press

- International Organization for Standardization. (2010), *ISO 26000:2010, Guidance on Social Responsibility*, Geneva.
- International Organization for Standardization. (2017), *ISO 21505:2017, Project, programme and portfolio management - Guidance on governance*, Geneva.
- International Project Management Association (2015), *Individual Competence Baseline version 4, International Project Management Association*, Nijkerk, the Netherlands.
- Janeš, A. and Faganel, A. (2013), “Instruments and Methods for Integrating Sustainability in Project Management: Case Study from Slovenia”, in Silvius A.J.G. and Tharp, J. (Eds.), *Sustainability Integration for Effective Project Management*, IGI Global Publishing.
- Jarvis, C.B., MacKenzie, S.B. and Podsakoff, P.M. (2003), “A critical review of construct indicators and measurement model misspecification in marketing and consumer research”, *Journal of Consumer research*, 30(2), 199–218.
- Jugdev, K. und Müller, R. (2005), “A retrospective look at our evolving understanding of project success.”, *Project Management Journal*, 36(4), 19–31.
- Julian, S.D., Ofori-Dankwa, J.C., and Justis, R.T. (2008). Understanding strategic responses to interest group pressures. *Strategic Management Journal*, 29, 963-84.
- Keeble, J.J., Topiol, S. and Berkeley, S. (2003), “Using Indicators to Measure Sustainability Performance at a Corporate and Project Level”, *Journal of Business Ethics*, 44(2-3), 149-158.
- Keeyes, L.A. and Huemann, M. (2017), “Project Benefits Co-creation: Shaping Sustainable Development Benefits”, *International Journal of Project Management*, 35(6), 1196–1212.
- Kivilä, J., Martinsuo, M. and Vuorinen, L. (2017), “Sustainable project management through project control in infrastructure projects”, *International Journal of Project Management*, 35(6), 1167-1183.
- Klakegg, O.J., (2009), "Pursuing relevance and sustainability: Improvement strategies for major public projects", *International Journal of Managing Projects in Business*, 2(4), 499-518.
- Klakegg, O.J. and Haavaldsen, T. (2011), “Governance of major public investment projects: In pursuit of relevance and sustainability”, *International Journal of Managing Projects in Business*, 4(1), 157-167.
- Kolltveit, B., Karlsen, J., Gronhaug, K. (2007), “Perspectives on project management”, *International Journal of Project Management*, 25(1), 3–9.
- Kuhn T. (1962, *The structure of scientific revolutions*, University of Chicago Press, Chicago.
- Kwak, Y.H., and Anbari, F.T. (2008). *Impact on project management of allied disciplines: Trends and future of project management practices and research*. Project Management Institute, Newtown Square.

Labelle, F. and Leyrie, C. (2013), "Stakepartner Management in Projects", *The Journal of Modern Project Management*, May-August.

Labuschagne, C. and Brent, A. C. (2005), "Sustainable Project Life Cycle Management: the need to integrate life cycles in the manufacturing sector.", *International Journal of Project Management*, 23(2), 159-168.

Labuschagne, C. and Brent, A. C. (2006), "Social indicators for sustainable project and technology life cycle management in the process industry", *International Journal of Life Cycle Assessment*, 11(1), 3-15.

Labuschagne, C. and Brent, A. C. (2008), "An industry perspective of the completeness and relevance of a social assessment framework for project and technology management in the manufacturing sector", *Journal of Cleaner Production*, 16(3), 253-262.

Linnenluecke, M. K., Russell, S. V. and Griffiths, A. (2009). "Subcultures and sustainability practices: The impact on understanding corporate sustainability", *Business Strategy and the Environment*, 18(7), 432-452.

Lundin, R. A. and Söderholm, A. (1995), "A theory of the temporary organization", *Scandinavian Journal of Management*, 11, 437-455.

Maltzman, R. and Shirley, D. (2011), *Green Project Management*, CRC press, Boca Raton, FL USA.

Marcelino-Sádaba, S., Pérez-Ezcurdia, A., González-Jaen, L.F. (2015), "Using Project Management as a way to sustainability. From a comprehensive review to a framework definition", *Journal of Cleaner Production*, 99, 1-16.

Martens, P. (2006), "Sustainability: science or fiction?", *Sustainability: Science, Practice, & Policy*, 2(1), 36-41.

Martens, M.L. and Carvalho, M.M. (2016a). "The challenge of introducing sustainability into project management function: multiple-case studies.", *Journal of Cleaner Production*, 17, 29-40.

Martens, M.L. and Carvalho, M.M. (2016b). "Sustainability and success variables in the project management context: an expert panel", *Project Management Journal*, 47(6), 24-43.

Martens, M.L. and Carvalho, M.M. (2017). "Key factors of sustainability in project management context: A survey exploring the project managers' perspective", *International Journal of Project Management*, 35(6), 1084-1102.

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The Limits to Growth*. Universe Books.

Molenaar, K.R. and Sobin, N. (2010), "A synthesis of best-value procurement practices for sustainable design-build projects in the public sector", *Journal of Green Building*, 5(4), 148-157.

- Oehlmann, I. (2011), *The Sustainable Footprint Methodology*, Lambert Academic Publishing, Cologne.
- Økland, A. (2015), “Gap Analysis for Incorporating Sustainability in Project Management”, *Procedia*, 64, 103-109.
- Olsson, J.A., Hilding-Rydevik, T., Aalbu H. and Bradley, K. (2004) “Indicators for Sustainable Development”, Discussion paper, European Regional Network on Sustainable Development.
- Otegi-Olaso, J.R., Aguilar-Fernández, M.E., Cruz-Villazón, C. and Fuentes-Ardeo, L. (2015). “Towards Sustainable Project Management. a Literature Review”, 19th International Congress on Project Management and Engineering, Granada.
- Packendorff, J. (1995). “Inquiring into the temporary organization: new directions for project management research”, *Scandinavian Journal of Management*, 11(4), 319–333.
- Pade, C., Mallinson, B., and Sewry, D. (2008), “An Elaboration of Critical Success Factors for Rural ICT Project Sustainability in Developing Countries: Exploring the Dwesa Case”, *The Journal of Information Technology Case and Application*, 10(4).
- Pasian, B. and Silvius, A.J.G. (2016), “A Review of Project Management Research in IRNOP and PMI Conferences from 2009 to 2014 to Identify Emerging Perspectives”, European Academy of Management (EURAM), Paris.
- Pollack, J. (2007), “The changing paradigms of project management”, *International Journal of Project Management*, 25, 266–274.
- Project Management Institute (2013), *A Guide to Project Management Body of Knowledge (PMBOK® Guide)*, Fifth edition, Project Management Institute, Newtown Square, PA USA.
- Robert, K.-H., Schmidt-Bleek, B., de Larderel, J.A., Basile, G., Jansen, J.L., Kuehr, R., Thomas, P.P., Suzuki, M., Hawken, P. and Wackernagel, M. (2002), “Strategic sustainable development—selection, design and synergies of applied tools”, *Journal of Cleaner Production*, 10, 197–214.
- Robinson, J. (2004), “Squaring the circle? Some thoughts on the idea of sustainable development.”, *Ecological Economics*, 48, 369-384.
- Savitz, A.W. (2006). *The Triple-Bottom Line: How Today's Best-Run Companies Are Achieving Economic, Social and Environmental Success—And How You Can Too*, John Willey & Sons, San Francisco.
- Schieg, M. (2009), “The model of corporate social responsibility in project management”, *Business: Theory & Practice*, 10(4), 315–321.
- Silvius, A.J.G. (2015a), “Considering Sustainability in Project Management Processes”, in: Thomas, K.D. (Ed.), *Handbook of Research on Sustainable Development and Economics*, IGI Global Publishing.

Silvius, A.J.G. (2015b), “Sustainability Evaluation of IT/IS Projects”, *International Journal of Green Computing*, 6(2), 1-15.

Silvius, A.J.G. (2015c), *Model Project SMP*, retrieved from <http://www.slideshare.net/GilbertSilvius/model-project-smp>

Silvius, A.J.G. (2016a), “Integrating sustainability into project risk management”, in Bodea, S. Purnus, A., Huemann, M & Hajdu, M. (Eds.), *Managing Project Risks for Competitive Advantage in Changing Business Environments*, IGI Global.

Silvius, A.J.G. (2016b), “Sustainability as a competence of Project Managers”, *PM World Journal*, V(IX), 1-13.

Silvius, A.J.G., Kampinga, M., Paniagua, S. and Mooi, H. (2017) “Considering Sustainability in Project Management Decision Making; An investigation using Q-methodology”, *International Journal of Project Management*, 35(6), 1133–1150.

Silvius, A.J.G. and Schipper, R. (2014), “Sustainability in Project Management: A literature review and impact analysis”, *Social Business*, 4(1).

Silvius, A.J.G. and Schipper, R. (2015), “Developing a Maturity Model for Assessing Sustainable Project Management”, *Journal of Modern Project Management*, 3(1): 16-27.

Silvius, A.J.G., Schipper, R., and Nedeski, S. (2013). Sustainability in Project Management: Reality Bites. *PM World Journal*, II(II).

Silvius A.J.G., Schipper, R., Planko, J., van den Brink, J. and Köhler, A. (2012), *Sustainability in Project Management*, Gower Publishing, Farnham.

Silvius A.J.G. and Tharp, J. (Eds.) (2013), *Sustainability Integration for Effective Project Management*, IGI Global Publishing.

Söderlund, J. (2002). “On the development of project management research: Schools of thought and Critique”, *Project Management*, 8, 20–31.

Steurer, R., Langer, M., Konrad, A. and Martinuzzi, A. (2005), “Corporations, stakeholders and sustainable development I: a theoretical exploration of business–society relations”, *Journal of Business Ethics*, 61, 263–281.

Talbot, J. and Venkataraman, R. (2011), “Integration Of Sustainability Principles Into Project Baselines Using A Comprehensive Indicator Set”, *International Business & Economics Research Journal*, 10(9), 29-40.

Taylor, T. (2010), *Sustainability Interventions - for Managers of Projects and Programmes*, The Higher Education Academy – Centre for Education in the Built Environment.

Tranfield, D., Denyer, D. and Smart, P. (2003), “Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review”, *British Journal of Management*, 14, 207-222.

Turner, J.R., Anbari, F., and Bredillet, C. (2013). “Perspectives on research in project management: the nine schools”, *Global Business Perspectives*, 1(1), pp. 3-28.

Turner, J.R., Huemann, M., Anbari, F.T., and Bredillet, C.N. (2010), *Perspectives on Projects*, Routledge, London.

Turner, J.R. and Müller, R. (2003), “On the nature of the project as a temporary organization”, *International Journal of Project Management*, 21(3), 1–8.

Winch, G. M. (2002), *Managing construction projects: An information processing approach*. Oxford: Blackwell Science.

World Commission on Environment and Development. (1987). *Our Common Future*. Oxford, UK: Oxford University Press.