

# A Study on Principle of Sustainability in Project Management

Mr. A.VARADHARAJAN<sup>1</sup>, M. SOWMIYA<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Civil Engineering, RVS Technical Campus, Coimbatore-600025, India.

<sup>2</sup>PG student, Department of Civil Engineering, RVS Technical Campus, Coimbatore-600025, India.

\*\*\*

**Abstract** - This research studies the eight principles of sustainability applied in Project Management. firstly, to review and identify key principles of sustainability in project management from existing literature; secondly, to adopt a multiple case study method to assess the applicability of the principles in project management; thirdly, to determine the barriers that impede certain principles to be applied in projects and the resulting trade-offs; and lastly, to refine the concept of sustainability in project management. The paper deductively studies the research question and adopts a qualitative mono-method research design, with a multiple case study strategy. All case studies fulfill the criteria of being multinational organizations, operating in the private sector, having sustainability as a strategic pillar and projects executed in developed countries with a similar macroeconomic climate. The data has been collected through the semi-structured interview technique and examined using a thematic analysis. The results show that not all eight principles of sustainability are implemented in project management despite of multiple proactive endeavors of engaging in social and environmentally focused business practices. The two principles that show a limited applicability in project management are values and ethics as well as consuming income and not capital. The theoretical contribution of the research is realized through the first collective analysis of the eight principles of sustainability and their implementation in project management through empirical case studies. The practical implication of the research is to offer guidance to organizations on what principles they need to build their sustainability project management practices on and to point out the commonly faced barriers and trade-offs.

## 1. INTRODUCTION

Sustainable project management is a field of study currently in its infancy but with great potential given the many benefits projects offer as vehicles of change. The incorporation of sustainability in project management can be used as a lever to deliver all projects sustainably. By exploring how the eight principles of sustainability have been applied to this field as well as elaborating on the definition of sustainable project management, the authors aim to attain an accelerated adoption of sustainability in organizations. Furthermore, the authors intend to close the gap between theory and application by pointing out the barriers and trade-offs faced by organizations in various industries.

## 1.1 Study on Sustainability

The most adopted definition of sustainable development, which is “to meet the needs of the present without compromising the ability of future generations to meet their own needs” An analysis of the WCED definition suggests that it is nature, life support systems and community that need to be sustained and people, economy and society that need to be developed Thus the authors see congruency in the terms ‘sustainability’ and ‘sustainable development’ thereby allowing the use of these terms synonymously throughout the thesis.

Another frequently cited definition for sustainable development is the triple- bottom-line also called the ‘Triple-P’ or ‘TBL’ which emphasises the consideration for the environment (planet), social (people) and economic (profit) impact of the business. These definitions fuelled the development of multiple other interpretations of the concepts in literature, which have been found to amount to 103 as reported by White Sustainable development, an integrative concept, also encompasses intra- and inter-generational equity and stakeholder involvement in the planning and decision making process. Furthermore, the temporal and spatial aspects of present vs. future and local vs. global respectively and the uncertainties associated with them are often acknowledged by academics and decision makers. With a common consensus on the key elements of sustainable development, the concept is still developing often being adapted to the context of the organization, their culture and policies.

Sustainability has been incorporated at multiple levels ranging from macro or global to micro or project. At a macro level, global organizations have taken a lead on bringing attention to common causes such as: continued support for human life on earth, long- term maintenance of biological and agricultural resources, stable human populations, limited growth economies, small scale, self-reliance and quality. These endeavours have been adopted by national governments while being focused on country specific themes.

The most common objectives are:

- Social progress which encompasses community health.
- Education and inclusion; protection of the environment
- Species and their habitat

- Prudent environmental resource usage and maintenance of economic growth and employment

## 1.2 Stages

To evaluate the level of integration of sustainability in an organization Willard developed a model, which defines five sustainability stages namely:

**Stage 1:** Pre- compliance

**Stage 2:** Compliance

**Stage 3:** Beyond Compliance

**Stage 4:** Integrated Strategy

**Stage 5:** Purpose and Passion

## 1.3 Purpose

The main aim of the paper is to understand how the eight principles of sustainability are incorporated in project management. To achieve this objective, this paper will do the following:

- Review and identify key principles of sustainability in project management in existing literature.
- Adopt the multiple case study method to assess the applicability of the principles in project management.
- Determine the barriers that impede certain principles to be applied in projects and the resulting trade-offs.
- Refine the concept of sustainability in project management.

## 1.4 Concepts Of Sustainability

- To determine the importance of Quality, Quality Control and its Management in the construction.
- To determine the knowledge about Quality control and its management in the labor's and engineer's view.
- To determine the impact of Quality control in the constructions for the developments.

## 1.5 Principles

The eight dimensions identified, also referred to as principles of sustainable development in project management, are:

- Balancing or harmonising social, environmental and economic interests;
- Local, regional and global orientation;

- Both short-term and long-term orientation;
- Values and ethics;
- Transparency and accountability;
- Stakeholder participation;
- Risk reduction and
- Consuming income and not capital

## 2. LITERATURE REVIEW

- **“Project sustainability strategies: A systematic literature review. Aarseth, Wenche et. al., (2016)”** suggest that, Project sustainability strategies: A systematic literature review. International Journal of Project Management. 10.1016/j.ijproman.2016.11.006. Because research focusing on sustainability in a project context is still nascent and fragmented, we carried out a systematic literature review covering all research published in five leading journals in the fields of project management and sustainable production prior to 2016. Our analysis revealed two distinct perspectives in the project sustainability research; one assumes the perspective of the project organisation delivering the asset while the second assumes the perspective of the host organisation. We identify and describe eight distinct strategies used by either the project organisation, its host, or both in collaboration to support sustainability goals. We complement the findings of our literature review with an illustrative empirical case focusing on the delivery of an innovative seawater-based heating solution in Norway.
- **“The Sustainable Project Management: A Review and future possibility V.K.Chawla et. al., (2018)”** suggest that Sustainability in project operations such as financial, social and environmental sustainability is one of the most prominent issues of the present times to address. The increased focus on sustainable business operations has changed the viewpoint of researchers and corporate community towards the project management. Today sustainability in business operations along with sustainability of natural and environmental resources are of paramount significance which has further caused a huge impact on conception, planning, scheduling and execution of the project management activities. In this paper, a literature review between 1987 and 2018 on different issues affecting the sustainability in project management is carried out. The present study also identifies and discusses the future possibilities to apply computational procedures in order to estimate and optimize the sustainability issues in the management of projects, for example the computational evolutionary algorithms can be applied to formulate the multi-objective decision making problem after considering critical factors of sustainability in the projects and then

yielding optimized solutions for the formulated problem to achieve sustainability in the projects. A new integrated framework with the inclusion of feedback function for assessment of each decision and actions taken towards the sustainability of the projects is also identified and presented.

- **“Sustainability in project management: A literature review and impact analysis Silvius, A.J. Gilbert & Schipper, R.P.J.. (2014)”** suggest that, Sustainability is one of the most important challenges of our time. How can we develop prosperity, without compromising the life of future generations? Companies are integrating ideas of sustainability in their marketing, corporate communication, annual reports and in their actions. Projects play a pivotal role in the realisation of more sustainable business practices, and the concept of sustainability has more recently also been linked to project management. The emerging literature on this topic provides strong indications that considering sustainability impacts project management processes and practices. However, the standards for project management fail to address the sustainability agenda.
- **“Sustainable Project Management: A Conceptualization-Oriented Review and a Framework Proposal for Future Studies Stefano Armenia et.al., (2019)”** suggest that, Today, more than ever, achieving sustainability of business activities, intertwining social, economic, and environmental perspectives, is one of the most challenging objectives for companies. Project management processes are no exception. This paper aims to contribute to the current research knowledge through a systematic review of the literature on the integration of project management and sustainability. Specifically, the aim was to clarify the research domains of sustainable project management, and to understand the current state of development and the future research directions. Results indicate that academic literature about this topic is still in its infancy, but that scholars attention is growing, opening new research directions. Based on the literature review results, we propose a new conceptual framework linking five key dimensions of sustainable project management: corporate policies and practices, resource management, life cycle orientation, stakeholders engagement, and organizational learn.

Finally, to not deceive subjects, upon establishing the first contact with them, the authors introduced themselves as well as the purpose of their study. As aforementioned, the guiding questions of the interview were also disclosed to ensure that participants were fully aware of the project aspects the researchers aimed to touch upon. The authors maintained transparency throughout the whole research process and clearly answered any questions as well as addressed any

concerns highlighted by participants. All participants were also offered a copy of the final version of the thesis.

## 2.1 Practical Method

### 2.1.1 Interview

A script that structures the course of the interview that may contain topics or detailed sequence of carefully worded questions is referred to as an interview guide. In the realm of this study the authors adopt a semi-structured interview method, which outlines topics and suggests questions to be asked. The degree to which the interviewers follow the order and wording of questions is predetermined by the interviewers and is binding to maintain coherence in between subsequent interviews. For this study the authors chose to follow the order of questions/themes however worded them differently to accommodate the style of participants.

### 2.1.2 Conducting the Interview

Since the first few minutes of any interview has a significant impact on the results grasped from a discussion (Saunders et al., 2012, p.389), the interviewers made sure that apt introductions highlighting the study and the background of the interviewers were made, that appreciation was shown towards the time and effort invested by project managers in taking part in the research, that participants were aware of the ethical considerations made for the study and that the process of the interview was clearly explained to them. This established credibility in the researchers whilst enhancing the interviewee's level of confidence. If a signed copy of the Consent Form hadn't been returned prior to the interview, their consent to take part in the study as well as to audio record the conversation was obtained at that point.

### 2.1.3 Transcribing the Interview

Audio-recording an interview is deemed to be beneficial and therefore interviews were first audio-recorded and later transcribed to ensure that the data has been captured accurately. This provides the additional benefit of maintaining focus on what the respondents are discussing without the distraction of taking notes. One interview was not recorded, as the interviewee did not agree to it, but notes were taken to ensure that the responses of the participant are recorded. Hence, the transcript of this interview is not fully congruent with the word order or grammar of the respondent as it principally emphasised on mirroring the content when transcribing the answers. Research Process

The research process was initiated with the literature review process. The authors delivered a Gantt chart that outlined the schedule for meetings, chapter draft completion and chapter reviews. By presenting a research proposal and through discussions with the supervisor, the authors were able to focus on the research question for the thesis. The

Introduction and Theoretical background chapter drafts were successfully submitted following which the authors obtained the feedback of the supervisor. Efforts were subsequently concentrated on drafting the Ethical Consent form and the Interview Guide and were submitted. In the meantime the researchers began drafting the Methodology chapter for the thesis and submitted.

#### 2.1.4 Quality Criteria

- Quality criteria are often split on the basis of the epistemological standpoint of the researcher to be positivist or interpretivist. While the positivist view suggests evaluating the quality criteria in terms of validity and reliability from an internal and external perspective, the interpretivist view proposes two primary criteria of trustworthiness involving credibility, transferability, dependability and conformability as well as authenticity. While multiple authors have drawn parallels between the positivist and interpretivist criteria, the necessity for the differentiation arises from the view that a single absolute account of social reality is debatable. The parallels that are drawn are as follows: credibility parallels with internal validity, transferability corresponds to external validity, dependability parallels with reliability and conformability corresponds to objectivity. The authors of the study choose an interpretivist epistemological standpoint and use a qualitative research methodology, the quality criteria of trustworthiness encapsulating credibility, transferability, dependability and conformability as well as authenticity will be studied.

### 3 EMPIRICAL FINDINGS AND ANALYSIS

#### 3.1 Case Study Introduction

To answer the research question, the authors chose six case studies that were selected through the heterogeneous purposive sampling technique and that fulfilled the sample size requirement (Saunders, 2012, p.45). Additionally, the criteria established to select the case studies were: multinational organisations, operating in the private sector, having sustainability as a strategic pillar and projects executed in developed countries with a similar macroeconomic climate. The case studies were heterogeneous in terms of the industries that the projects belonged to. The assumptions in place for selecting the following case studies are enlisted below:

- To assess the spatial aspects of sustainability it was important to look at multinational organizations
- To assess ways of achieving social and environmental sustainability while simultaneously gaining profits, it

was necessary to choose samples from the competitive private sector.

- Sustainability as a strategic pillar often filters down through the systems, processes, practices and policies of a company to the project management level.
- The location of the research team as well as their professional network influenced the type of data samples they had access to. Therefore the research used projects that were headquartered in developed countries of Europe and USA.

The projects belong to six different industries namely Pharmaceutical, IT (Information Technology), Automotive, Transportation, Furniture and FMCG (Fast-moving consumer goods). Each of them fulfilled the criteria presented above and deemed fit for the study. An advantage of the selection of case studies is that prior research has seen a concentration of case studies in the building and construction, manufacturing, regional development and energy industry. Therefore this empirical study provides findings from new industries.

- Pharmaceutical drug testing
- IT Solution Development
- Automobile Component Packing Solution
- Railway Electronics Design and Delivery
- Furniture Manufacturing for office space
- 100% Sustainable Coffee

#### 3.2 Empirical Findings

The authors believe that the essence of a research lies in studying all the data available and highlighting all relevant findings. This allows for pointing out all intricacies, disparities and winning evidence without getting biased. The authors have reported the findings under themes and further divided them into sub themes in order to point out categories under which evidence has been provided

- Balanced or harmonised consideration of social, environmental and economic interests.
- Local, regional and global orientation
- Short-term and long-term orientation
- Values and ethics consideration
- Transparency and accountability consideration
- Risk reduction

- Stakeholder participation
- Consumption of income and not capital

### 3.3 Empirical Analysis

- Unplanned human resourcing issues
- Lack of reference point to measure sustainable alternatives
- Scope change resulting in inefficiencies
- Inability to define scope and implicitly PPP considerations
- Lack of sustainability regulations for prototype development
- Dependency on alternative transportation fuel developments
- Financial burden of sustainable alternatives
- Customer confusion over the meaning of sustainable product or process
- Problems in defining the demand for sustainable products
- Lack of control over the supply chain
- High security vs. access from remote locations and from more energy efficient appliances
- Efficiency vs. reliability
- Efficiency vs. quality

## 4 CONCLUSIONS

This chapter summarises the answers to the research questions. In the first section it reinforces the purpose of the study highlighting then the managerial implications that can inform good business practices. Subsequently, the chapter emphasises the theoretical contributions made by the research followed by a presentation of the limitations to the work that have been proactively identified throughout the study

### Managerial Implications

The managerial implications for project managers working in companies that fulfil the sampling criteria for the study have been highlighted below in terms of best practices on ways to incorporate the different principles of sustainability in project management.

### Theoretical Contributions

The research focussed on understanding how the eight principles of sustainability are implemented in project management. With over 200 publications in the field, the authors identified researchers who addressed distinctive subsets of the eight principles found in literature. These are:

1. balancing or harmonising social, environmental and economic interests;
2. local, regional and global orientation;
3. both short-term and long-term orientation;
4. values and ethics;
5. transparency and accountability;
6. stakeholder participation;
7. risk reduction and
8. consuming income and not capital.

Hence, a theoretical implication of the study is to provide a holistic understanding of the sustainability principles in project management by critically discussing and empirically testing all eight fundamentals academics have pointed to. While literature suggests that the principles are not yet incorporated in projects and related practices, the study challenged these findings in six out of the eight fundamentals. As a consequence, the research provided evidence to the increased consideration of the social and environmental pillar in project business cases, related decision making and activities. Similarly, it highlighted areas of research where further academic effort is needed to fully understand the cause of negligence of the remaining two fundamentals and aid a quick adoption of them.

### Limitations

A limitation to the study was that few papers that appeared to be relevant based on their abstract or based on citations from key articles were not found or access to them was conditioned to paying a fee, hence not used for the study. Also, it is important to be noted that the articles cited by this paper were spread across multiple journals, with an object of study mostly different from project management (eg. Journal of Cleaner Production, Ecological Economics, Building and Environment, etc.). This presented a challenge to conducting a comprehensive literature review on the chosen topic as well as highlighted the need to address and engage audiences from the project management field in future publications.

The ethical consideration of anonymity made by the participants have resulted in codes used throughout the thesis thereby limiting the ability of future researchers to reflect and re-examine the companies.

### Recommendations for Future Research

- In this research the authors assessed the implementation of the eight sustainability principles in project management. Checking the mutual exclusivity and collective exhaustivity of those was out of the scope of this study, hence pointing towards a research topic that further studies could embrace.
- Currently, research lacks criteria based on which companies or projects that incorporate sustainability in project management practices can be identified. The authors thus propose an explanatory research on the same. When selecting project case studies, the authors assumed as prerequisite that the organisation executing the project should have sustainability as a strategic pillar. While the selection of case studies based on this assumption have proven to be exemplifiers, the authors propose a formal research to evidentiate the causal relationship between 'sustainability as an organisational strategic pillar' and 'sustainability incorporation in project management'.
- Finally, through this study the authors have pointed out multiple barriers and trade-offs that companies faced when implementing sustainability at a project tactical level. Hence, further research can build on assessing and addressing these barriers and trade-offs through the development of prescriptive actions directed to project managers. The authors believe that further research in this domain will be able to encourage good management practices and will make academic research more relevant to the corporate world QC helps to finish the project with minimum time duration than the estimated time.

### REFERENCES

1. Aarseth, Wenche et. al., (2016), "Project sustainability strategies: A systematic literature review". International Journal of Project Management. 10.1016/j.ijproman.2016.11.006.
2. Lauri Vuorinen et al., (2017), "Sustainable project management through project control in infrastructure projects", International Journal of Project Management, Received 1 March 2016; received in revised form 9 February 2017; accepted 9 February 2017.
3. V.K.Chawla et. al.,(2018), "The Sustainable Project Management: A Review and future possibility", Journal of Project Management, Received: July 5, 2017 Accepted: February 04, 2018.