

Article

Building Sustainably: A Pilot Study on the Project Manager's Contribution in Delivering Sustainable Construction Projects—A Maltese and International Perspective

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Received: 8 November 2020; Accepted: 3 December 2020; Published: 5 December 2020



Abstract: Despite ample technological advancements, the building industry is still seen as an unsustainable activity. To counteract this, building development is now being requested to be more sustainable. Due to the increasing complexity of sustainable projects' criteria, the project manager's role, tasked with the overall management of a building's different development phases, is changing, becoming increasingly crucial for the attainment of pre-established sustainability goals. Based on this premise, the research presented in this paper is a pilot study set to preliminarily establish and identify a set of project management processes and supporting practices from existing literature, and gauge their significance and possible added value provided. This was done via a purposely designed questionnaire distributed locally, in Malta, and globally amongst established project managers. Notwithstanding the preliminary nature of the study some interesting results were obtained. Among the main outcomes of the study, it is observed how all respondents are very aware about sustainability issues and that their decision-making role places them in an optimum position to bring forward a sustainability agenda for a particular project. In terms of intervention, pre-construction (43%) and construction (28%) were considered to be the main stages where a project manager usually gives the highest input. However, various challenges were also highlighted by the respondents, including clients' refusal to commit increased capital (34%), the requirement for further training (33%), and the lack of incentives aimed towards increasing the sustainability of projects (22%).

Keywords: building industry sustainability; project management; project life-cycle phases; sustainable development; qualitative analysis; barriers towards sustainability

1. Introduction

Buildings are often seen as significant resource sinks. Current trends in fact show that the overall energy consumption in buildings is significant, around 40% of the total energy consumption in Europe [1]. This is, however, only part of a larger problem, as the building industry also uses significant resources throughout the life-cycle of the building, from construction to eventual demolition. In fact, very often nowadays efforts on sustainability, including those related to the building industry, tend to look much more at a full and holistic life-cycle analysis rather than more specific operations oriented building sustainability [2–4]. In this context a number of countries have strengthened their building industry regulations at various project phases, to ensure the implementation and delivery of sustainable projects [5,6]. Such regulations nowadays span the entire project development phase, including the

initial construction project planning to the actual site construction management. Additionally, it is interesting to note that various researchers such as Wang et al. [7], Chan et al. [8], and Darko et al. [9], just to name a few, have studied key factors, drivers, and strategies affecting the diffusion of more “green” or “sustainable buildings.”

When it comes to implementing such projects, it is clear that a significant aspect in the sustainable design of buildings rests on architects and engineers. However, one often forgets that the complexities found in newer buildings require the input from additional professional figures typically tasked with overseeing the detailed design and construction of specific aspects of such buildings. One of these roles is that of the project manager, assigned with the overall management of a building’s different development phases, including the pre-construction, construction, and sometimes operations and decommissioning phases. As will be discussed in more detail in the literature review, the importance given to sustainability in modern buildings has become crucial, requiring that the way project management success is gauged evolves from the traditional accepted goals (timely delivery, budget, and quality) [10] to more specific long-term sustainable and environmentally friendly goals.

This of course consequently means that projects have become more complex to deliver, implement, and monitor. As a result, project managers are often called to adapt and improve over the traditional set of skills and practices they possess in order to remain capable of delivering sustainable projects effectively.

2. Scope of This Research

Based on this premise, the purpose of this paper is two-fold. It primarily seeks to analyze current project managers’ actual contribution, perspectives, and awareness towards delivering sustainable projects. In doing so, the paper aims to establish a baseline model of sustainable project management phases, essential processes, and supporting practices which aid a project manager in optimizing and delivering further sustainable projects. This is done via a thorough literature review of existing research studies on sustainable project management, relevant processes, and supporting practices.

Secondly, this research aims to determine to what extent the project manager’s processes and global trends have evolved to adapt to rising demands of sustainable projects requirements, including identifying weaknesses, challenges, and opportunities in current project management practices and recommend action steps to be considered for improvement so as to optimize the delivery of sustainable projects. The second aim is addressed via the use of a questionnaire distributed amongst established project managers, both locally in Malta and abroad.

The paper is therefore organized as follows. First an overview is given of the main literature review utilized to identify a baseline model of intervention processes and supporting practices by project managers for optimizing project sustainability through project management. Then an overview of how the qualitative data collection and analysis was carried out is conveyed. Major results derived from observations on local and international project managers’ perspectives and involvement in their typical day-to-day involvement on project activities are then presented, together with the paper’s conclusions and recommendations for improvements to overcome existing challenges, as demonstrated in this study, including possible future research directions.

It is important to point out that although, as discussed in the literature review, various authors through their studies have looked at specific areas of project management and sustainability, to the knowledge of the authors of this paper there has been very little research carried out looking specifically at the role of a project manager who ensures sound sustainable building development principles are taken into consideration throughout the entire sequence of project management phases, from pre-construction unto decommissioning.

3. Literature Review

Given that this research seeks to investigate the actual project managers’ obligations and added contribution in delivering sustainable projects, the literature review presented in this paper looks at

the evolvement of traditional project management trends towards a greener approach to sustainable project management practices.

Literature selection was based primarily on looking at main keywords such as “green project management”, “project managers and building sustainability”, and “sustainable project management processes and practices”, these being the underlying common patterns on the subject. Google Scholar was used as the main search engine, but further specific searches on “project management practices and sustainability” led also to the following databases i.e., MDPI, Scopus, Science Direct, Springer Link, PMI, Academia, and Research Gate. The first 300 document results found were reduced to 100 sources after analyzing the paper abstracts. When reviewing their content, these literature sources were reduced even further to 60 sources including some very well-known textbooks. Literature sources were reduced so as to focus only on developed frameworks, pillars, and intervention processes utilized in sustainable project management, including supporting practices for optimizing sustainability throughout a project life cycle, with specific reference to the construction industry. Timeframe of literature utilized ranged from 1988 to 2020. However, the highest distribution of sources reviewed and utilized for this particular research focus, were published in the last decade between 2010 to 2020.

3.1. Sustainability and Project Management

Originally, the traditional accepted goals required to be delivered by a project manager were satisfying a timely delivery of the project, ensuring that the work was carried out within the prescribed budget, and producing a quality project [10]—often referred to as the “iron triangle” [11] or the triple constraint, an important concept in project management [12].

However, considering that the project manager is assigned with the overall management of a building’s different development phases, the project manager could be particularly suited to deliver on the promised sustainability of proposed building projects as proposed by Hope and Moehler [13]. Some authors, like Maltzman and Shirley [14], argue that project managers have always been, possibly unintentionally, suited for this ‘sustainable’ purpose. In fact, the role of the project manager requirement arose since the early 1950s, after the industrial revolution, with the advancements in more complex construction methods and material technologies, and to manage complex projects with greater resources more efficiently. Thereby the role of project manager always necessitated the efficient management of resources, to reduce costs, increase value, and protect scarce resources; and to constantly put forward a green and efficient project agenda. As elaborated in various literature, various challenges and opportunities exist in this field; despite the ample attempts to integrate sustainability in project management, there is still lack of international recognition and standard guidelines of sustainability in project management.

Nonetheless, rising pressures to ensure more sustainable development have increased the pressure for project managers to be knowledgeable in this field and take a leading role in the creation of sustainable building developments. This perspective has in fact been emphasized in literature by various authors. Silvius et al. [15], for example, argue that project managers are well placed to play a leadership role in considering sustainability in every decision and action whilst delivering their projects. The study further elaborates how the interest in scientific publications linking project management and sustainability has seen a significant increase. Bryde [16] describes how the role of project managers encapsulates a key role, summarizing both the scope of an integrator and a facilitator, thus making it a leadership role in promoting sustainability throughout project delivery. Sadaba et al. [17] emphasize that project managers trained in sustainability and sustainable project processes are one of the essential pillars to fully deliver sustainable development projects, further specifying that sustainable project processes involve the management of stakeholders, application of building sustainability standards, use of assessment tools and decision-making processes which altogether ensure sustainability.

Silvius [18] goes further in his analysis, by highlighting the fact that not only must project management consider sustainability as a pertinent issue in the whole process, but that given the

importance given to sustainability in modern times, sustainability should be considered as a “new school of thought in project management.”

3.2. Sustainable Project Managers’ Intervention Phases and Processes

The role of the project manager can be sub-divided into a number of tasks, spanning the entire life of a building, from project pre-construction to project decommissioning. In this context, Table 1 shows the main task areas, sub-divided and organized according to different project phases.

The sub-division presented in Table 1 is based on a number of literature texts available on the subject. Notable amongst them is the work by Taylor, who—as emphasized in his compiled checklist for sustainability in projects [19]—explains how sustainable projects have significant consideration of the whole life-cycle or cradle-to-cradle of the project, that is, from the inception to the decommissioning stages.

Other notable publications, which may be considered as pioneering on the subject of sustainable and green project management include that by Maltzman and Shirley [14], who discuss in depth where project managers can intervene and drive a project towards environmental sustainability; Silvius [20] who highlights the importance of risk identification and management towards sustainability at all project development phases; Silvius and Schipper [21] who produce a list of intervention processes based on the work of a number of authors; and Morgese [22], who demonstrates that all projects can be managed sustainably, irrespective of the project type.

Table 1. Sustainable projects intervention phases and processes list.

Phase Code No.	Project Phase Description
Project Phase 1—Pre-Construction	
1a	Clearly set defined and agreed sustainable project objectives with client [22,23]
1b	Advise for compliance to regulations or agreed standards [14,17]
1c	Engagement of sustainability-conscious stakeholders [24–27]
1d	Engagement of sustainability-conscious project team [24,25]
1e	Sustainable business case/investment analysis with life-cycle costing [28]
1f	Ensuring a sustainable project design and briefing/content [19,25]
1g	Project sequencing and scheduling for sustainability [19,22]
1h	Sustainable procurement or purchasing practices [19,21,22,24,25]
1i	Risk management towards sustainability [20,22,25,29,30]
1j	Cross-check project documents for compliance to agreed standards [14,17]
Project Phase 2—Construction	
2a	Organize a kick-off meeting with stakeholders to transmit sustainable plans [14,19,24]
2b	Project sequencing and scheduling for sustainability [19,22]
2c	Monitoring for compliance to regulations, agreed standards or requirements [14,17]
2d	Risk identification and implementation of sustainability management [20,22,25,29,30]
Project Phase 3—Operation	
3a	Co-ordinate testing and commissioning, project closure, certifications and compliances [24]
3b	Co-ordinate handover of operations manual and training to operators [19,21,24]
3c	Co-ordinate handover of management, operation, and maintenance plans [19,21,24]
3d	Obtain post-occupancy evaluation (POE) surveys to learn for future projects [14]
Project Phase 4—Decommissioning	
4a	Co-ordinate for feasibility studies for adaptive re-use rather than demolition [31]
4b	Co-ordinate for environmentally friendly decommissioning plans [31]
4c	Monitoring for compliance to regulations, agreed standards or requirements [14,17]
4d	Co-ordinate and implement a site waste management policy plan as per context [31]
4e	Risk identification and management towards sustainability [20,22,25,29,30]

Analyzing in detail the individual points listed in Table 1, it is important to list a number of additional authors which emphasize specific key points which helped in the formulation of this table. These include:

- Point 1(a): Toljaga-Nikolic et al. [23] who identified that the successful definition of a project's scope is crucial for sustainable project management, since a misunderstood or poorly defined project scope will result in project inefficiencies.
- Point 1(c): Robichaud and Anantatmula [24], Crawford [25], Carvalho and Rabechini [26], and Armenia et al. [27] who highlight the importance of engaging and selecting sustainability-conscious stakeholders to achieve project sustainability goals. In fact, in their studies they suggest a vital selection process to ensure that the right stakeholders are engaged from the start.
- Point 1(e): Kibert [28] who identifies the creation of a business case as one of the main principles of sustainable construction practices, specifically the understanding of operational costs not only construction costs, to determine the actual economic benefits.
- Point 2(b): Morgese [22] highlights the importance of logistics plans for materials, human resources, procurement, and schedule of projects activities ensuring these are handled in the most sustainable and efficient way.
- Point 2(d): Doskočil, and Lacko [29] who demonstrate that risk management together with knowledge management application are essential and critical success factor of sustainable projects. Likewise, Zou and Zhang [30] discuss how managing risks in construction projects is a very important management process in order to achieve the project objectives not only in terms of time, cost, and quality, but also in terms of safety and environment sustainability.
- Point 3(a): The importance in testing and commissioning, whilst ensuring building compliance with initial stipulated criteria, is an essential final step in green projects processes, as discussed by Robichaud and Anantatmula [24].
- Point 4(a): As stated and analyzed by Elefante [31], the greenest building process is the one that is already built. Extending the service life of the building stock is good business and an exceptional resource management tactic. The decision to demolish existing building stock should be based on thorough examination of the sustainable value of the building which can be possibly optimized through adaptive re-use.

4. Research Methodology

As discussed earlier in presenting the scope of this research, the methodology utilized in this research was divided into a number of stages. Following a critical literature review focused on compiling a baseline model of sustainable project management processes, procedures, and supporting practices which may be used to guide the actions of project manager throughout a project life-cycle, gathered from relevant literature, a data collection stage was performed through the use of purposely designed questionnaire. The data analysis stage ensued from the data collected from the questionnaires.

4.1. Data Collection Stage—Carrying Out the Questionnaire

Research data was collected through the use of a purposely designed questionnaire, containing 26 questions aimed at understanding the sustainable project management practices and phenomena. The questionnaire was based on the processes identified from literature review, as discussed earlier, and was divided into four specific sections, as shown in Table 2.

The questionnaire utilized both close-ended and open-ended questions. The former were based on the already established baseline compiled from literature aimed at determining the project manager's involvement, contribution, and awareness towards sustainable projects practices, while the latter was aimed at collecting further practical data which may have not been picked up from literature. An example of a close-ended question included "Yes" or "No" answer questions, which were mainly used in Sections 3 and 4 to determine which processes and practices are utilized (e.g., "Do you agree on a sustainable project scope or objectives including content with client?"). An example of an open-ended question included asking for further reasons and justifications from project managers as to why they

agree with Taylor’s statement about the project manager’s significant contribution to sustainable projects. The questionnaire itself was also pilot tested with experts in the field, and where required, changes were made based on the feedback received. Also, this pilot stage was used to ensure that the questions utilized were clear and cohesive and that there were no variances in responses by the same respondents when answered at different times.

Table 2. Description of sections contained in the questionnaire.

Section Number	Description
1	Demographic and technical background of respondents
2	Project manager approach to projects and general sustainability awareness, aimed at determining the project managers’ general approach to projects and their awareness of sustainability issues
3	Sustainable project management processes utilized, aimed at understanding the current trends related to the project managers’ involvement in a project’s sustainability
4	Supporting sustainable project management practices utilized, aimed at understanding the current project management tools and practices utilized to support sustainable projects delivery

The questionnaires were self-administered and distributed online. This eliminated further bias as the respondents could answer more honestly without the presence of an interviewer. The questionnaire was distributed to a total of 50 respondents, both locally in Malta and abroad. Since the scope of this research focused on investigating the project manager’s role in optimizing sustainable construction projects delivery, through project management processes and supporting practices, the sample of project managers chosen for the qualitative data analysis was selected from major project management companies dealing with the building and construction industry. Explicitly, the respondents were carefully selected based on the potential respondents meeting a specific criterion, that is, that of having “enough experience in the project management field, practically translating into a minimum of five years”. This type of sampling is known as “purposive” or “judgmental”, a non-probability sampling method widely used for qualitative research [32].

Whilst acknowledging that the number of respondents chosen is small, the fact that the respondents were carefully pre-selected makes the study still capable of capturing the major trends at least at this preliminary pilot stage. In total, 24 questionnaires were completed, with an equal distribution between local Maltese and foreign respondents. Specifically, besides the 12 Maltese respondents, four respondents were from the UK, three respondents were from China, two were respectively from the USA and the United Arab Emirates, whilst one respondent was from Denmark.

In terms of participation rate, it is worthwhile pointing out that questionnaires sent via e-mail are often ignored during the first round of sending out participation requests. In fact, on the second round when sending the questionnaires as reminders, a better response was observed. In the case of the local respondents some questionnaires were distributed by hand and were picked up after they were filled in. This of course facilitated and enhanced participation. For the non-local respondents only, online tools could be used to solicitate participation. Following the second round of questionnaire reminders, however, data saturation was deemed reached for qualitative analysis purposes, as common response patterns could be identified with the 24 questionnaire respondents.

4.2. Data Analysis Stage

The data obtained from the questionnaires enabled a primary understanding of sustainable project management practices evolvement and phenomena. Numerical conversion of the received qualitative data was carried out to facilitate pattern recognition, saturation of data, and extract meaningful observations made on trends in practices. Though data saturation for qualitative analysis was deemed reached with common patterns identified with the 24 questionnaire respondents, it has to be pointed

out that this research study is deemed as a preliminary investigative study, and that for results to be validated and verified quantitatively through statistical analysis the questionnaire should ideally be tested on a larger sample scale. This preliminary study can however, be used as an initial stage for the basis of furthering a quantitative research.

5. Results

In the results section the findings of this study based upon the information gathered from the respondents as described in the section above are presented. The results are divided into four main sections as per questionnaire design.

5.1. Section 1—Demographic and Technical Background of Respondents

The responses obtained from this first part of the questionnaire confirmed that the selected respondents had considerable experience in the field of project management, with around 79% of the respondents stating that they had over 10 years' experience. Twenty-one out of the 24 respondents also stated that they had a specific qualification in management or project management, with some also listing memberships and affiliations to societies or professional associations such as the Project Management Institute (PMI), the Association for Project Management (APM), and the International Project Management Association (IPMA).

As shown in Figure 1, 11 respondents (46%) described their main role as being that of a project/program manager employed within an organization. The remaining respondents were freelance project managers or covered directing, associate, and project leader positions. All respondents bar one, who stated that he had construction site work based only, described their duties as being varied, including both office-desk design project planning to on-site construction works planning.

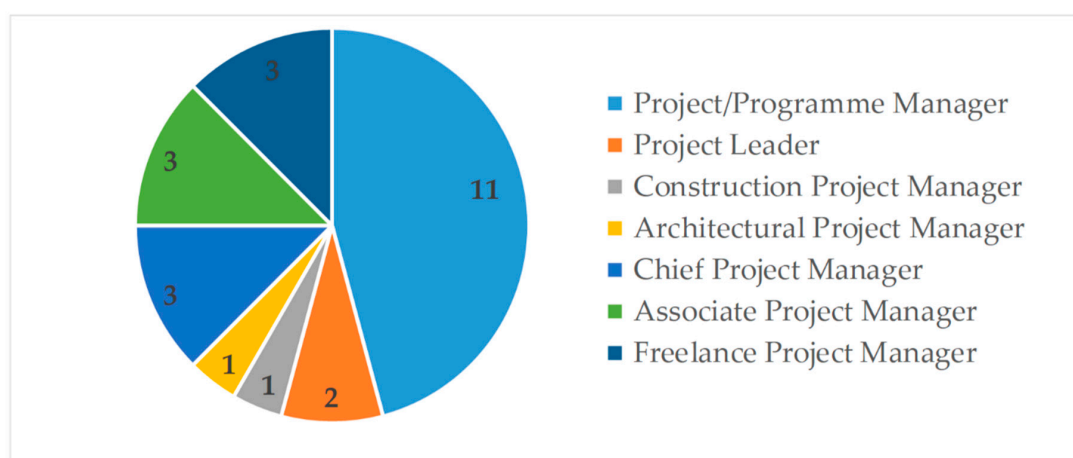


Figure 1. Type of project management role.

5.2. Section 2—Project Manager Approach to Projects and General Sustainability Awareness

The responses obtained from this second part of the questionnaire showed that all respondents were aware and agree that their positions as project managers helps them in optimizing sustainability through good project management practices, irrespective of their level within the organization. The latter mostly due to the selection criteria employed, which ensured that all respondents had an adequate and significant involvement in their organization's projects. The main justifications given to their reasoning were attributed to their decision-making role (33% of respondents) and their role in project risk management (27% of respondents), which places them in an optimum position to bring forward a sustainability agenda for a particular project.

Respondents also highlighted the fact that traditional project management processes have been gradually changing to more sustainable practices because of the supporting stricter environmental

and construction regulations not only on environmental management, but also in regard to health and safety.

In regards to the respondents' viewpoint on how project managers can optimize a project's sustainability, the respondents singled out "resource optimization and waste reduction" as the single most important aspect, with "construction pollution monitoring and control" and "implementation of environmental and sustainable construction regulations" following suit. Figure 2 shows the full range of replies of how many out of the 24 respondents agreed that a particular aspect can optimize a project's sustainability. Although their specific role within the organization did not affect their response in terms of their importance towards building sustainability, their role did affect what contribution their role was mostly important for. Higher rank project managers, e.g., Project Leaders and Chief/Directing Project Managers, specifically emphasized that their contribution lies mostly towards "project innovation and green technologies" and "integrated management processes". This could have been the case that their role empowered them to have a stronger say possibly also based on more experience in running such projects. Other minor differences on their specific contribution resulting from role type differences included the Construction Project Manager highlighting the fact that his position allowed him to do project management interventions at construction phase only.

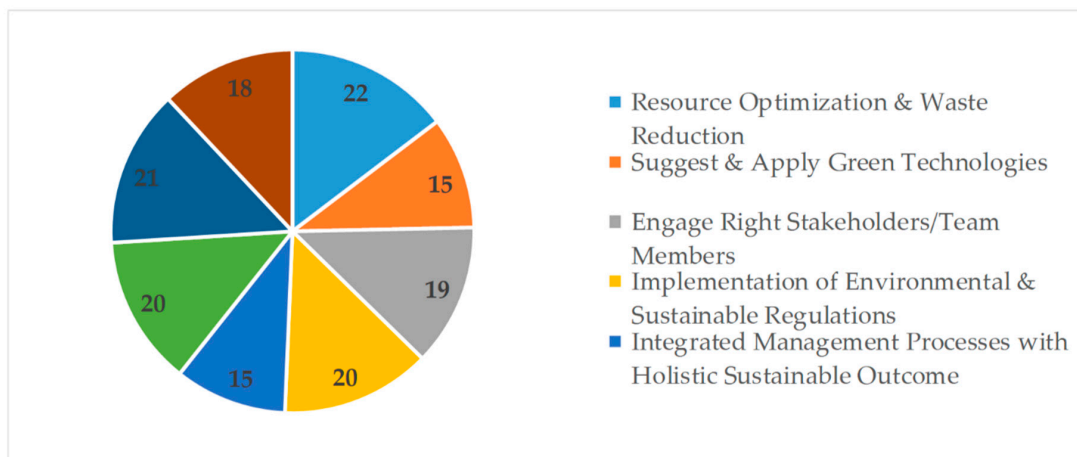


Figure 2. Project Manager's contribution to sustainable projects.

When asked about major barriers encountered by project managers when attempting to implement sustainable projects and contribute towards sustainability in projects, respondents listed "Client's refusal due to upfront costs" and "Lack of sustainability awareness and trained resources" as the main barriers. Figure 3 shows the full range of replies of how many out of the 24 respondents agreed that a particular aspect proved to be a barrier in implementing sustainable projects.

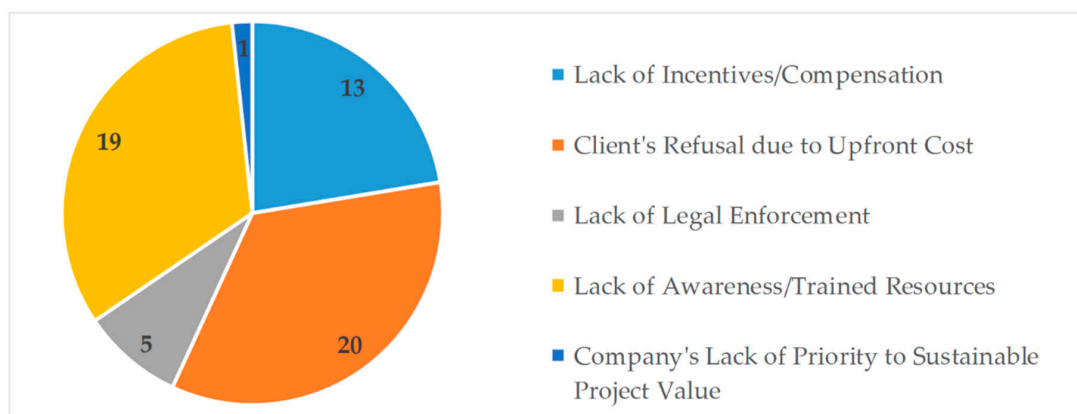


Figure 3. Obstacles project managers face in implementing sustainable projects.

5.3. Section 3—Sustainable Project Management Processes Utilized

As shown in Figure 4, all project managers agreed and argued that their greatest contribution and impact towards sustainability can be made within the pre-construction phase of the project life-cycle, with the least intervention being during the operation stage. It was emphasized by both foreign and local project managers that, ideally, the project management starts from project initiation for co-ordination of market and feasibility studies, investment, or business-case analysis; ensuring that the right sustainable value is implemented from the start of the project.

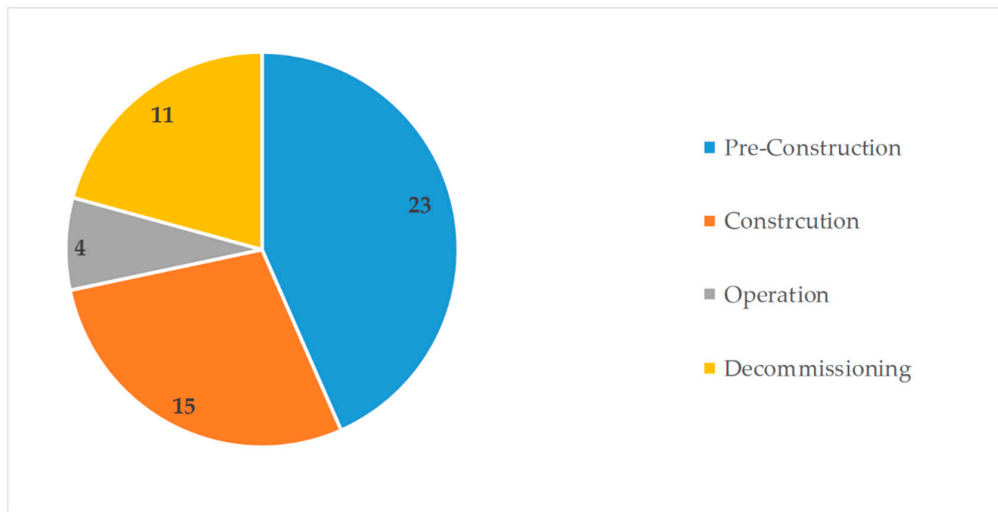


Figure 4. Project managers' interventions for optimizing project sustainability.

Delving into more detail at each individual stage, the following main trends and practices could be deduced. In this context, Figures 5–8 show a graphical representation of the type of input project managers in the four different phases typically give. The answers are based on a number of pre-set close-ended questions as part of the study. In this case, the data is shown both in its totality and segregated by local (Maltese) and foreign respondents.

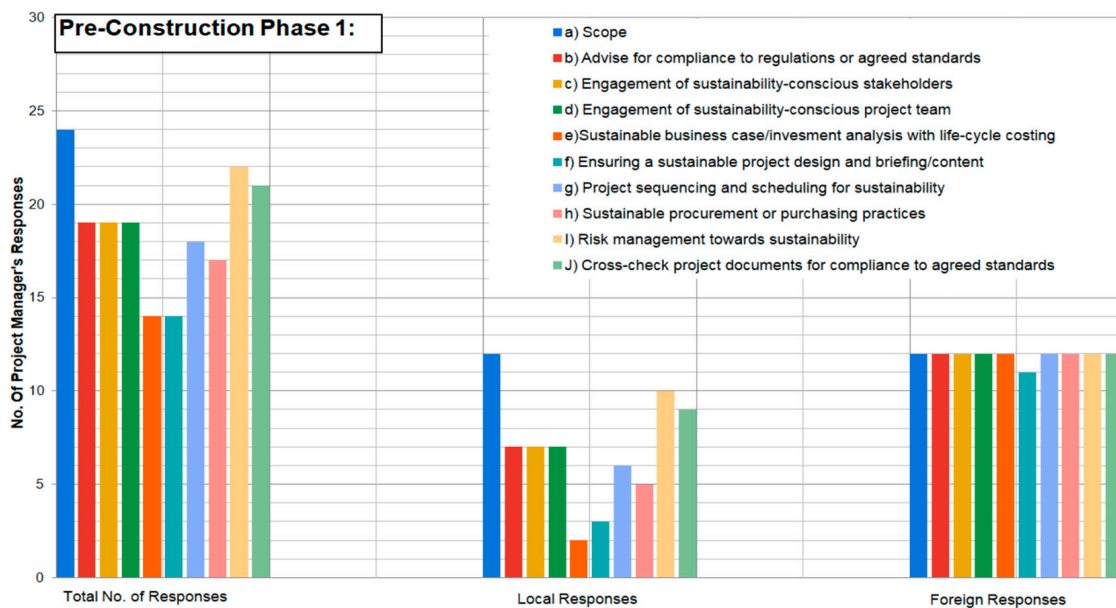


Figure 5. Project manager sustainable contributions at "Pre-Construction" phase.

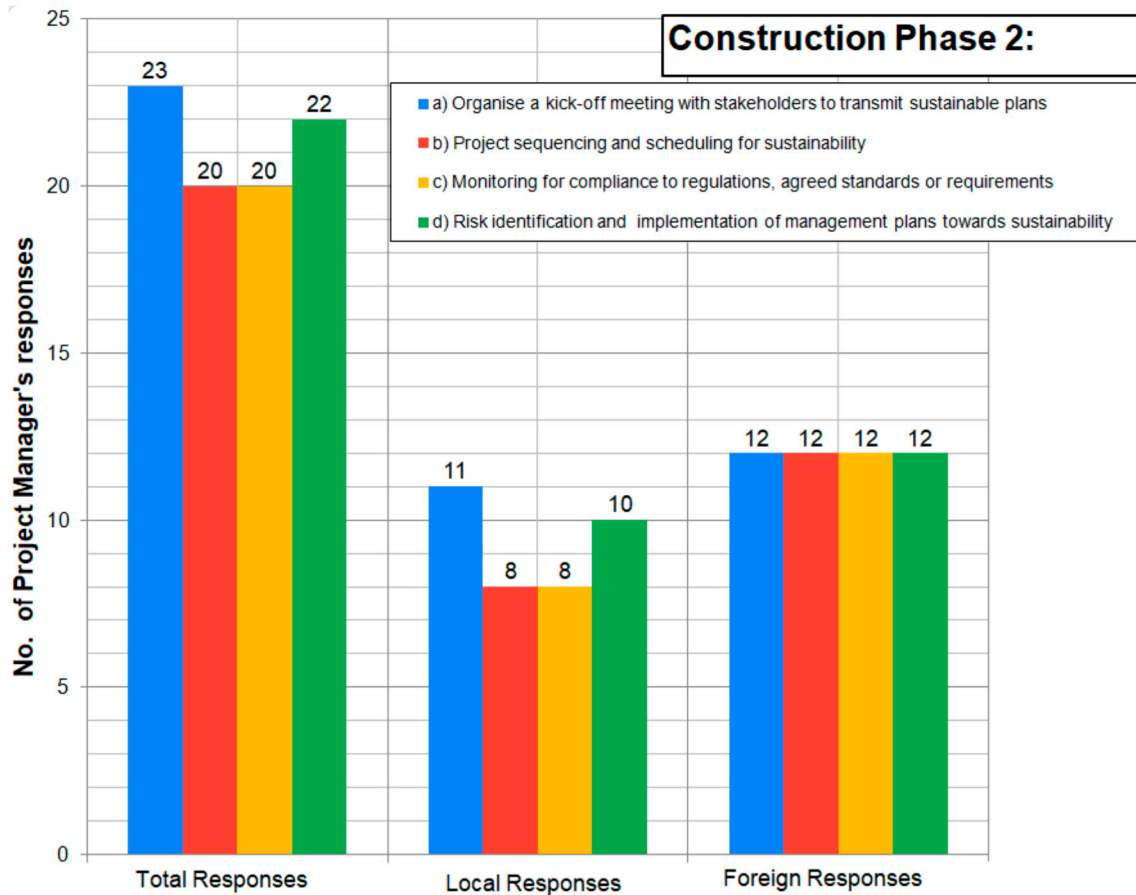


Figure 6. Project manager sustainable contributions at “Construction” phase.

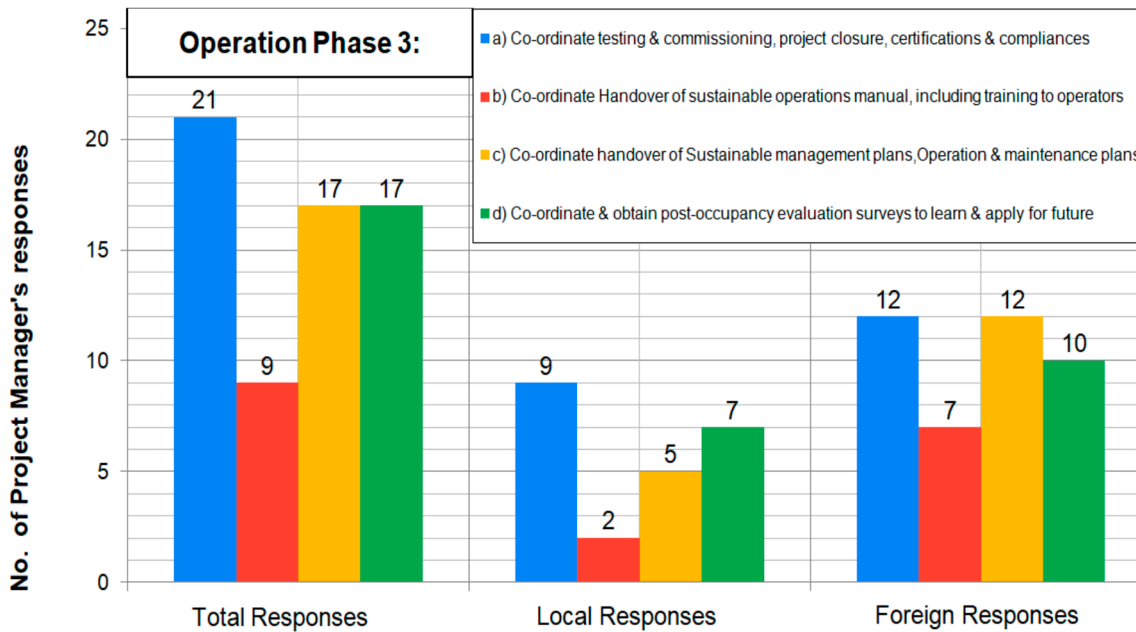


Figure 7. Project manager sustainable contributions at “Operation” phase.

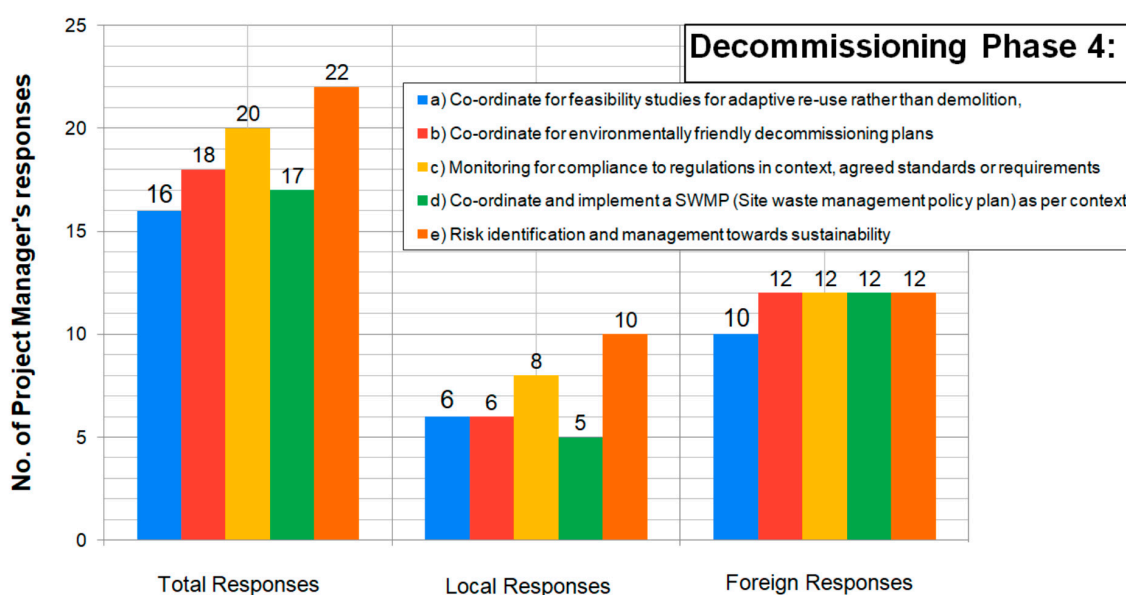


Figure 8. Project manager sustainable contributions at “Decommissioning” phase.

Comparing the results for the total respondents it can be seen that for the local context, the greatest sustainability contributions are carried out during the construction phase, whilst for the foreign respondents major contributing factors occur at the pre-construction phase. This is due to an increasing awareness in engaging the project manager to contribute towards sustainability from the beginning of the project at initiation stage. For both local and foreign respondents, the lowest project manager’s contribution towards project sustainability was at the operation phase.

Taking into consideration the overall pre-construction phase and comparing foreign with local trends it can be deduced that the Maltese project manager contribution towards sustainability and environmental practices during the pre-construction phases is still growing. In fact, there was lesser input from the project manager’s side during the pre-construction phase than the construction phase. As explained by local respondents, lack of involvement by the company at pre-construction stage resulting in not fully contributing during this particular stage. The foreign project managers’ contribution was practically equivalent and high in both the construction and pre-construction phases. Lack of awareness for sustainability integration in the project processes listed for each phase and lack of local legal enforcements with clear responsibilities for construction and environmental compliances contributed to the general understanding amongst local Maltese project managers that monitoring for compliance to regulations is not given the full contribution and attention during the pre-construction, construction, and later phases.

5.4. Section 4—Supporting Sustainable Project Management Practices Utilized

The final section analyses the supporting practices project managers utilize in order to optimize sustainable projects. Project practices were found to be an essential element in literature collated, to aid in the further reduction of a project’s carbon footprint. In this case, Figures 9 and 10 show a graphical representation of the supporting sustainable projects practices mainly utilized by project managers. All project managers stated that they make use of paperless and virtual systems as much as possible, including virtual conferencing whenever possible. Greener data management (e.g. offsite storage systems), recording, and sharing systems were also highly utilized.

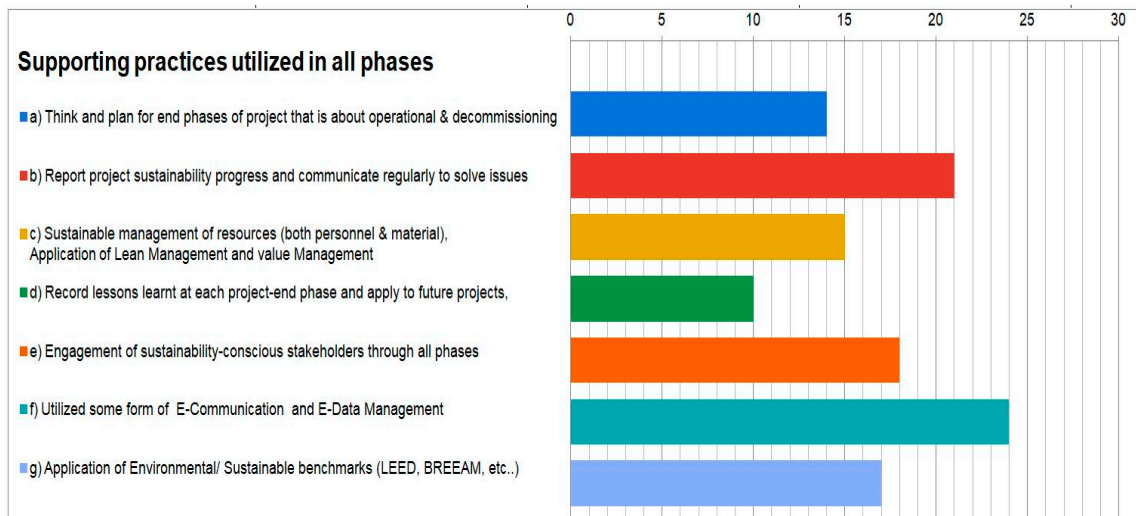


Figure 9. Supporting sustainable projects practices applied in all phases.

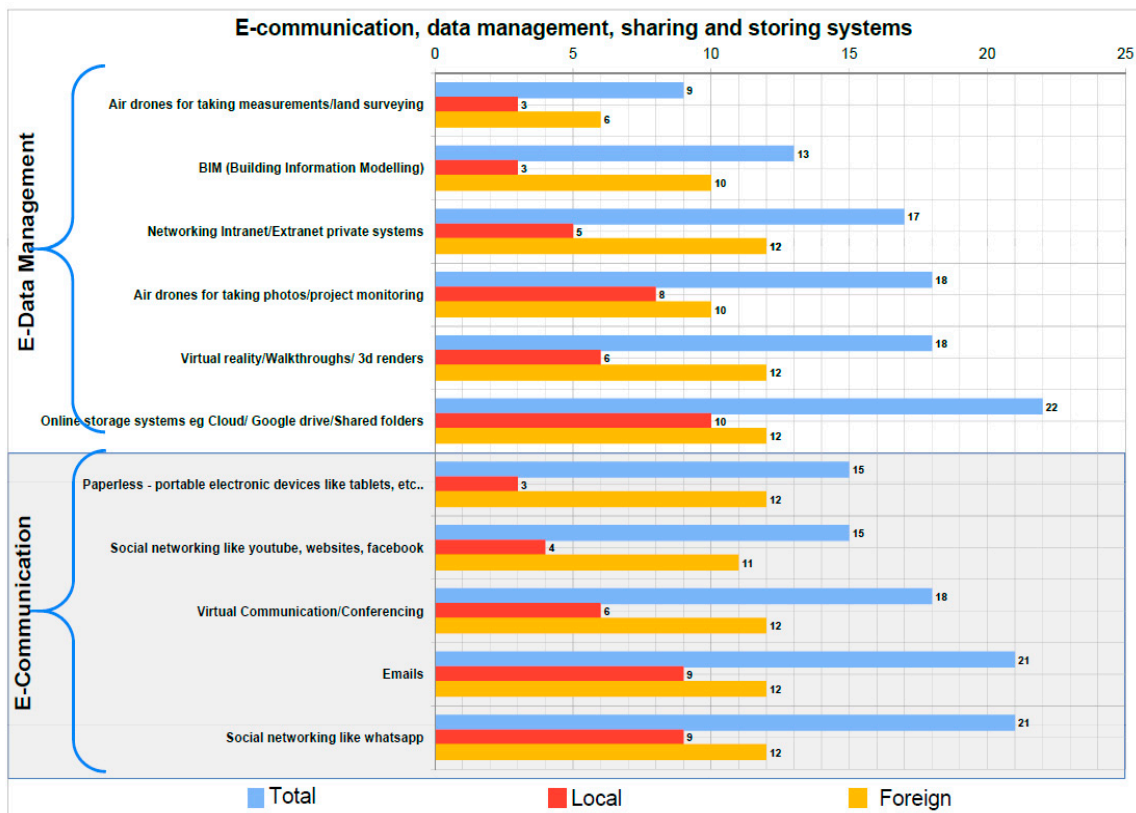


Figure 10. E-communication and E-data management usage by project managers.

One important difference between the local and foreign respondents is their use of Building Information Modelling (BIM). This is widely used internationally but still growing in use locally. In the UK, the use of BIM has also become mandatory in public sector works. For sustainable management of resources, “value management” was stated to be widely used internationally for project resource optimization but still new and very little practiced locally. Similarly, environmental certifications, e.g. the UK based Building Research Establishment Environmental Assessment Method (BREEAM) or the US based Leadership in Energy and Environmental Design (LEED), are extensively used internationally, including being mandatory as part of development permit application and approval process in some countries.

Foreign respondents agreed on the importance of mandatory continuous professional development to support them in delivering more sustainability in projects, through application of latest evolving innovations, standards, regulations, methodologies, and tools. Locally continuous professional development and training is still a relatively new concept.

6. Conclusions

The research presented in this paper provides a pilot study of the role project managers have in the realization of sustainable building projects. Following a thorough literature review which analyzed project management processes and supporting practices currently utilized by project managers in the fulfilment of their duties, a qualitative analysis was carried out with established local and foreign project managers.

In general, and as demonstrated from observations made on the data obtained, there is untapped potential and growing demand for project managers to aid in optimizing the sustainability of construction projects. Reviewing both existing literature and the responses from the foreign respondents, it becomes clear that, to deliver set sustainable goals, project managers require not just a one-time intervention, but a pro-active, integrated and continuous effort to direct and lead project team towards sustainability. Positions held as project managers helped respondents in optimizing sustainability through good project management practice. Having a decision-making role and a role in project risk management gave project managers the optimum placing to bring forth the sustainability agenda for a project. A shift from traditional project management processes to more sustainable practice supporting stricter environmental and construction regulations has also added to the shift.

Various challenges however exist, including the requirement for further training, upgrading, and guidance in all traditional project management knowledge areas and processes. Additionally, as identified from the project managers' feedback, further support, especially from building regulation authorities and relevant entities, is deemed essential in making certain sustainable project processes and supporting practices mandatory.

In terms of the main differences between local and foreign project managers, these were mainly of cultural and legislative based variations. Due to the rising need to put up with construction demands, many of the sustainable processes and supporting practices already employed by foreign project managers are still filtering through, gradually taking the place of traditional practices.

The future looks towards an increase in the awareness of sustainable projects which involves project managers from the start of a project and aims towards better integration of data with a focus on sustainability at the forefront of a project. Engaging the project manager to contribute towards sustainability from the beginning of the project is crucial to this industry if the aim is to meet future building and environmental goals most effectively.

In conclusion, this paper through this preliminary research highlighted specific areas where more research needs to be done; specifically, in better identifying the challenges reported by the surveyed project managers and studying the actual effect or correlation these have on the end result, and identifying what areas additional and specialized training needs to be given to project managers as a means to improve on their capability to deliver sustainable projects.

Author Contributions: This article is the result of the joint work by all authors. The primary research topic was derived from a thesis research study and data collection, which was carried out for completion of masters in project management by R.B. under supervision of R.D.G. This initial research study was further adapted and reviewed by S.P.B. Where thereafter, all authors edited the manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: The manuscript is a revised version of an original scientific contribution that was presented at the 15th Sustainable Development of Energy, Water and Environmental Systems (SDEWES) conference held between the 1st and the 5th of September 2020 in Cologne, Germany and that was subsequently invited to be submitted for review for inclusion in a special issue of Sustainability dedicated to the said Conference. Compared to the original Conference paper the abstract, introduction and the literature review have been extensively revised

and expanded to explain further the research available on the subject matter and to address how the paper tackles current existing research gaps.

Conflicts of Interest: The authors declare no conflict of interest.

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