

EXPLORING SUSTAINABLE PROJECT MANAGEMENT PRACTICES: A PERSPECTIVE OF MEP CONTRACTORS IN SRI LANKA

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ABSTRACT

The construction industry can contribute to social inequality and environmental degradation. In order to address these concerns, effective management throughout their lifecycle is crucial. Sustainable Project Management (SPM) is a managerial concept that sustainability of a project from inception to completion. Although SPM has received less attention compared to other concepts, it assists project managers in achieving sustainability across all three bottom lines. This study examines the SPM methods employed by mechanical, electrical, and plumbing (MEP) contractors in Sri Lanka. MEP sector is selected to narrow down the scope of the study. Subsequently, a qualitative research approach was adopted to collect data with semi-structured interviews involving ten MEP contractors who have experience and exposure in the industry. The sample was selected using snowballing sampling to ensure the diverse representation of MEP contractors of different scales throughout the study. The research findings highlight that the adoption of SPM practices in Sri Lanka is relatively low compared to international standards, primarily due to a lack of awareness among project managers. Furthermore, MEP managers face challenges in exerting control over their environments, emphasizing the need for a change in attitudes. The results of this study will contribute to efforts aimed at reducing the environmental impact of construction activities, promoting social equity, and enhancing long-term economic viability. Moreover, these findings will serve as a catalyst for further research exploring potential improvements in the implementation of SPM practices.

Keywords: MEP; Project Management; Sustainable Communication; Sustainable Project Management; Sustainable Project Planning.

1. INTRODUCTION

Sustainable construction involves achieving social, economic, and environmental sustainability by using sustainable construction methodologies while delivering the best value for money for the client (Bandara et al., 2019; Silvius & Schipper, 2014). Its main expected outcomes are to maximise the occupants' comfort flexibility and save time through operational efficiency (Janjua et al., 2021). Further, there are other outcomes such as economic gains, including energy savings, reduced time usage, reduced design

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cost and minimum life cycle costs, and environmental gains inclusive of the adaptation to climatic changes, energy efficiency, and expert systems (Bandara et al., 2019).

However, the construction sector is recognised as a significant source of environmental contamination (Porrás, Walter, Soriano, & Ramirez, 2023). The reason for this is the large amounts of energy consumption for the processes of building material production and operations, including the function of mechanical, electrical, plumbing, and other building services (Xie, et al., 2022). This high responsibility placed on the construction industry for environmental pollution and the lack of growth in sustainable construction in developing countries designates the necessity for an ideal framework to satisfy all the needs expected to be accomplished by a construction project regarding sustainability (Benachio et al., 2020). When it is investigated the possibilities to motivate sustainable construction, Mechanical, Electrical (Porrás, Walter, Soriano, & Ramirez, 2023), and Plumbing (MEP) contractors' role becomes crucial in terms of reducing the operational and maintenance costs of a given project and reducing the environmental impact at greater levels (Ahmad, 2023; Olanrewaju, et al., 2021). According to Rodriguez et al., (2020), MEP can effectively achieve the reduction of operational carbon (OC) and embodied carbon (EC) to reduce the whole life carbon (WLC) of a building.

Even though MEP contributes largely to pollution and lack of sustainability, little attention has been paid to MEP practices toward sustainability. Therefore, this paper is aimed to assess sustainable project management (SPM) practices from the perspective of MEP contractors by investigating the challenges faced by them during the implementation of sustainable project management practices and providing solutions for those under the Sri Lankan context.

2. LITERATURE REVIEW

Sustainability of projects is becoming increasingly important due to the limited resources, the growing number of stakeholders, and the need to balance environmental, economic, and social objectives (Yu et al., 2018). When implementing sustainability in the projects, 'sustainable project management', which is the practice of controlling projects to ensure their sustainability goals are met is essential (Sabini et al., 2019). As Chawla et al. (2018) demonstrate, the project manager always has a significant role in implementing sustainability. However, there is a discrepancy between the standards for project management competencies and the competencies which are required for sustainable project management (Silvius & Schipper, 2014). Therefore, the project managers are unable to deliver the expected outcomes from their roles as sustainable project managers (Azzam, Zayat, & Marzouk, 2022). The reason for this is the lack of competencies of the professionals regarding the SPM. Therefore, it is important to align the competencies of project managers with the principles of sustainable project management. Figure 1 shows the expansion of the traditional project management role to the sustainable project management role including the discrete requirements which both have concerns.

According to the figure 1, traditional project management primarily focuses on the organisation and project level, whereas the sustainable project management broadens the scope to the next generation, then local, and global levels. It emphasises assessing the

global environmental impact, social and community factors and implementing strategies considering the globe rather than depending on a single project or organisation.



Figure 1: Expansion of sustainable project management

Source: (Silvius & Schipper, 2014)

According to Goedknecht and Silvius, (2012), the below mentioned SPM principles were identified initially through the literature review.

- Balancing or harmonising social, environmental and economic interests
- Both short-term and long-term orientation
- Both local and global orientation
- Values and ethics
- Transparency and accountability
- Consuming income, not capital

Issues related to sustainability often involve high levels of complexity and uncertainty. Therefore, it requires effective communication to deliver information and understanding among stakeholders (Porrás, Walter, Soriano, & Ramirez, 2023). Amongst several factors influencing sustainable project management implementation are discussed in the following subsections.

2.1 SUSTAINABLE PROJECT PLANNING

Sustainable project planning is vital for achieving socially, ecologically, and financially successful project outcomes (Yu et al., 2018). As per the same author, incorporating sustainable principles into project planning ensures that MEP systems are designed, installed, and operated in a way that optimises energy performance, minimises environmental impacts, and meets the specific needs of the project and its stakeholders. However, there is a lack of understanding and measurement regarding sustainable project planning in construction engineering projects. Therefore, by considering factors like energy planning for the construction period and continuous monitoring of energy consumption, it is required to explore the role of sustainable project planning and its impact in the MEP sector to maintain high-performance standards throughout a project lifecycle.

2.2 SUSTAINABLE STAKEHOLDER MANAGEMENT

Sustainable stakeholder management recognises the importance of considering the needs and interests of all stakeholders, aligning with the triple bottom line concept (Silvius & Schipper, 2014). Involving stakeholders throughout the project's lifecycle and evaluating the project's effects are crucial for sustainable project success (Porras, Walter, Soriano, & Ramirez, 2023). Involving stakeholders early in the decision-making processes related to MEP systems allows for better integration of sustainable technologies and strategies, as well as addressing their concerns and preferences. Hence, a critical examination of stakeholder engagement and management practices is necessary to implementation of sustainable MEP solutions which align with the project's objectives and contribute to long-term sustainability.

2.3 SHIFTS ASSOCIATED WITH SUSTAINABLE PROJECT MANAGEMENT

Figure 2 describes that there are three main shifts associated with the implementation of SPM practices which are namely the mind shift, paradigm shift and scope shift.

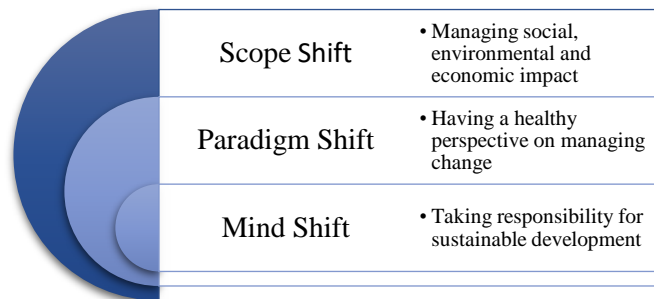


Figure 2: The three shifts of sustainable project management

Source: (Goedknecht & Silvius, 2012)

In the early stages of a project, the project manager can prioritise sustainability with a scope shift in his project managerial scope. This includes incorporating sustainable practices into the project's objectives, strategies, and decision-making processes. Once the project manager has adjusted their scope to include sustainability, then a paradigm shift is necessary for the entire project team. A paradigm shift refers to a fundamental change in the team's mindset and approach toward managing the project. In this case, it involves adopting a positive outlook on managing change and embracing sustainability as a core value. However, the successful implementation of SPM depends on the project team's willingness to take responsibility for sustainable development. Therefore, a mind shift is essential to ensure the project team's accountability.

Nevertheless, whether these shifts in project management practices towards sustainability are essential for achieving sustainable outcomes in the industry, the limited research conducted in these areas leaves a significant knowledge gap. Further, whether there have been studies related to SPM, no research has identified how to effectively apply SPM practices within the MEP sector. Therefore, there is a critical need to explore sustainable project management practices, specifically within the MEP sector, to promote sustainable practices, enhance energy efficiency, and reduce environmental impacts in MEP systems, thereby advancing sustainability in the construction industry as a whole.

3. RESEARCH METHODOLOGY

In order to identify the available SPM practices in the construction industry, an initial literature synthesis was conducted. The review of the literature revealed a research gap, specifically the lack of studies examining SPM practices within the Sri Lankan context. Therefore, a qualitative approach was employed to investigate SPM practices in the MEP sector. This approach allows for a comprehensive understanding of the actual situation and provides valuable insights into people's perspectives.

Due to the limited number of recognised MEP contractors and a scarcity of experienced MEP project managers in Sri Lanka, the sample size for the study was limited to ten experts who are actively involved in MEP building service management. Semi-structured interviews were chosen as the primary method for data collection, as they allow for in-depth questioning guided by a comprehensive interview guide. The snowball sampling method was used to ensure the appropriate selection of interviewees, with the aim of identifying challenges and exploring potential solutions to promote sustainable construction practices within the MEP sector in the Sri Lankan context. The profiles of the interviewees are presented in table 1.

Table 1: Profiles of the interviewees

Code	Designation	Work Experience	Scope of Work	Professional Qualifications	Awareness on SPM
R-01	Project Manager	13 years	MEP Building Services Project Management	B.Sc. (Hons) in Quantity Surveying, M.Sc. in Project Management	Well aware
R-02	MEP Project Manager	10 years	MEP Building Services Project Management	Project Management Professional (PMP), MBA	Well aware
R-03	Project Manager	11 years	MEP Building Services Project Management	B.Sc. in Chemical Engineering	Not Aware
R-04	MEP Project manager	22 years	MEP Building Services Project Management	B.Sc. in Chemical Engineering	Not Aware
R-05	Project Manager	11 years	MEP Building Services Project Management	B.Sc. in Electrical Engineering, Project Management Professional (PMP)	Well aware
R-06	Project Planning Engineer	12 years	MEP Building Services Project Management	B.Sc. in Chemical Engineering	Aware
R-07	Project Manager	21 years	MEP Building Services Project Management	Project Management Professional (PMP)	Well aware
R-08	MEP Project manager	10 years	MEP Building Services Project Management	B.Sc. in Electrical Engineering, MBA	Aware

R-09	MEP Project manager	13 years	MEP Services Management	Building Project Management	Project Management Professional (PMP)	Well aware
R-10	MEP Project manager	14 years	MEP Services Management	Building Project Management	B.Sc. (Hons) in Quantity Surveying, Project Management Professional (PMP)	Well aware

As table 1 explains, a total of ten industry professionals with over ten years of experience as project managers in the MEP sector were interviewed to gather data. It revealed that the majority of the participants were either well aware or at least familiar with the concept of sustainable project management practices. However, it is noteworthy that two experienced professionals were unaware of the sustainable project management (SPM) concept despite their extensive industry experience.

4. ANALYSIS AND FINDINGS

This section presents key findings of the study broadly on three major headings such as current MEP practices, level of knowledge on SPM practices among MEP contractors, and solutions to the challenges faced by MEP contractors in implementing SPM in Sri Lanka.

4.1 THE CURRENT SPM PRACTICES IN SRI LANKA

In Sri Lanka, the awareness of the concept of SPM can be categorised into three levels. The first level comprises those who are well-informed about SPM practices. The second level has some understanding of the concept but questions whether it is part of sustainable development or just a new trend in project management. The third level has little to no clarity on SPM. One of the main reasons for this can be attributed to the fact that some current project managers lack formal qualifications in project management. As pointed out by R-02, many project managers in the industry come from non-project management backgrounds, which results in limited familiarity with project management concepts. The interviews revealed that project managers from other backgrounds generally have less awareness of SPM.

R-01, R-06, and R-07 emphasised that, particularly in the mechanical, electrical, and plumbing (MEP) sector, the incorporation of inverter technologies, solar energy, and green-rated products can significantly contribute to sustainable building practices. These practices can lead to reduced operational costs and lower emissions in the long run, benefiting both the environment and building occupants. However, according to the experts, although there is potential for companies in Sri Lanka to adopt these practices, none of them are currently at a level where they can invest in international projects.

The SPM principles which were identified initially through the literature review were used during the interviews to identify the SPM practices in the Sri Lankan context.

4.1.1 Balancing or harmonising social, environmental, and economic interests

To ensure effective project execution, the experts emphasised the significance of adhering to sustainable principles throughout all project phases, including the crucial Project Charter stage. R-04, R-06, and R-08 highlighted the importance of engaging with all relevant stakeholders, including those not directly involved in the project, to understand their expectations and gain their support. The implementation of sustainable practices

should consider the outcomes and interests of all stakeholders. As an example, R-01 mentioned, "The Kandalama hotel serves as an illustration of sustainable development methods by avoiding ecological disruption, benefiting the local community, and maximising social and ecological advantages." Conversely, R-02 raised concerns about the Lotus Tower project due to worries about its societal impact and the disregard for stakeholder benefits. According to R-02, the Mahaweli development project demonstrated how to strike a balance between the interests of various stakeholders while achieving lasting results that benefited many individuals. However, it may be challenging to identify and involve all indirect stakeholders in large-scale projects.

4.1.2 Both short-term and long-term orientation

An experienced MEP project manager (R-07) stated, "The decision was made to switch from using traditional hard copies to implementing a soft copy method due to the skyrocketing cost of paper, which is a result of inflation in the country". With this change, the Gmail address of their company's project was utilised, and Google Drive was designated as the main database. They have divided their teams into ELE, PLMB, QA/QC, CAD, QS, and other relevant teams and established a workflow that suited everyone, granting access only to the relevant teams. For instance, the QS team was given view access to CAD files, IRs, MIRs, NCRs, VOs and CVIs without the ability to edit or delete those files. Similarly, other teams had restricted access based on their needs. Each team was responsible for updating the registers in Google Drive, utilising Google Sheets for this purpose. They scanned and uploaded all soft copies using smartphones, making our workflow smooth and efficient. R-07 explained, "This approach allowed to access documents quickly using the smartphones, even at the site, eliminating the need to carry hard copies everywhere. It provided greater mobility, flexibility, and ease of access whenever a document was required."

This demonstrates how project managers can integrate sustainable communication practices into their project management processes, even if the project's main focus is not sustainability. Practices such as transitioning to a soft copy method, utilising digital tools, implementing workflow and access control, and applying access restrictions based on needs can be employed. Through the implementation of these SPM practices, project managers effectively reduce paper consumption, improve accessibility, enhance collaboration, and streamline information management. This exemplifies that sustainable communication can be incorporated as a project management process, irrespective of whether the project's primary objective is sustainability. It showcases how project managers can consciously make choices to integrate sustainable practices into their projects, thereby contributing to environmental responsibility in the short and long term.

During the interviews, it was observed that projects in Sri Lanka often commence with short-term objectives but may eventually transition to long-term goals. As explained by R-08, "Project managers in Sri Lanka face challenges in implementing sustainable practices due to the country's tendency towards a short-term orientation." R-01 stated that the effectiveness of sustainable project management is influenced by various factors, including the project manager's characteristics and personality traits. According to R-06, "Long-term planning and orientation are considered crucial for sustainable projects, taking into account the project's duration and its impact on the environment and legal system." However, the constraints within the project manager's working environment and the prevailing short-term orientation in Sri Lanka make it difficult to consistently

implement sustainable techniques. Furthermore, the application of sustainable principles varies based on the project managers' personalities and their priorities for different project phases. Hence, the management of sustainable projects is subjective and dependent on multiple variables.

4.1.3 Both local and global orientation

The majority of experts agreed that the application of this principle is contingent upon the type of project. R-02 emphasised the need for a global perspective during the initiation and planning stages, while a local approach is crucial during the execution, monitoring, and control phases. As an illustration, R-01 provided an example of how this concept could be applied in the context of the Northern Province airport project, where local considerations were necessary to enhance connectivity and expand its scope. R-06 expressed, "By adhering to the first principle and incorporating locally produced items during construction, stakeholders can foster collaboration." However, it was observed during the interview that MEP construction service organisations in Sri Lanka primarily rely on imported goods due to limited local manufacturing, making it challenging to depend on locally sourced materials. While using locally made materials may be feasible for civil construction, it is less practical for MEP building services.

4.1.4 Values and ethics

All the experts unanimously agreed on the significance of the values and ethics principle in sustainable project management. To ensure responsible and ethical execution throughout the entire project life cycle and to consider the interests of all stakeholders, R-06 emphasised the importance of establishing the right values and ethics from the project's initiation. The efficient implementation also requires proper reporting and cost capturing. R-03 stressed the need to initiate these processes early on in the project and maintain adherence to them. It should be noted that, according to the experts, the second principle of accountability and transparency aligns with these procedures.

4.1.5 Consuming income, not Capital

Regarding the application of the financial sustainability principle, the experts expressed differing opinions. R-02, R-03, and R-10 emphasised the importance of effective cost management and cash flow planning to ensure project success. However, R-01 emphasised that the type of development and potential income sources determine its viability. R-04 and R-06 agreed with R-01's assessment and added that income utilisation without solely relying on capital varies depending on the project. Additionally, R-09 stated, "While it is crucial to implement financially sustainable principles, the management of the company ultimately bears the responsibility of guiding employees to adhere to them."

4.2 THE LEVEL OF KNOWLEDGE ON SPM PRACTICES AMONG MEP CONTRACTORS IN SRI LANKA

Based on the data, it can be concluded that project managers in Sri Lanka's building services industry possess varying levels of awareness regarding Sustainable Project Management (SPM) methods. While some project managers demonstrate a strong understanding of the concept and its methods, others have a vague comprehension, and some possess minimal knowledge. The lack of awareness can be attributed to the fact that

many project managers in Sri Lanka come from engineering backgrounds rather than project management backgrounds.

Furthermore, the data indicates that professionals with more expertise in project management exhibit a deeper awareness of SPM procedures. However, due to specific constraints, some experts have been unable to implement SPM practices. For instance, R-03 provided a clear example of utilising a sustainable approach by adopting soft copies instead of traditional hard copies. Unfortunately, some project managers face challenges in incorporating new techniques into their projects due to resistance to change.

The overall conclusion drawn from the analysis is that project managers in Sri Lanka would greatly benefit from increased awareness regarding the significance and advantages of implementing SPM principles. Additionally, providing project management training and education to individuals with engineering backgrounds is essential to enhance their understanding of project management practices and principles.

4.3 SOLUTIONS TO THE CHALLENGES FACED BY MEP CONTRACTORS IN IMPLEMENTING SPM PRACTICES IN SRI LANKA

The interviewees were requested to provide solutions to the challenges encountered by MEP contractors when implementing sustainable project management practices in Sri Lanka. These solutions will be discussed in the following subsections.

4.3.1 Challenges faced when implementing Scope Shift

Resistance to change emerges as a significant challenge in the sector. Multiple interviewees have noted that the Sri Lankan industry hesitates to embrace change, resulting in missed opportunities. R-05 highlights, "We observe resistance to change and the adoption of new ideas in various industries. Perhaps this stems from Sri Lankans' rigid mindset or their skepticism towards technology." However, it would have been unconventional if we had incorporated these elements into our daily routines and activities. Following R-05's statement, R-03 reveals the effort required to persuade team members to adopt new approaches. Yet, resistance to change, particularly among experienced professionals, remains a major obstacle that hinders their full potential.

Another challenge arises from project managers' limited ability to alter the project scope. Experts assert that once the scope has been established, project managers have minimal influence over it. As mentioned by R-02, "If we neglect the social aspects during the project design, there is a high probability of sustainability failure. Expanding the scope to include social factors may lead to conflicts in the Sri Lankan context. Hence, it is challenging and difficult to address them."

4.3.2 Challenges faced when implementing Paradigm Shift

Project managers often face challenges when it comes to delegating duties and responsibilities. According to R-05, the failure to assign appropriate responsibilities, even for minor tasks, can lead to significant issues later in the project. As highlighted by R-07, "it is essential for all stakeholders to contribute to the project, as the responsibility cannot be solely shouldered by one person."

4.3.3 Challenges faced when implementing Mind Shift

Another major issue in Sri Lanka is the absence of international norms and practices. The project management sector in the country is currently undergoing a transitional period.

As stated in R-01, this change has already begun, and the sector is expected to adopt more international standards in the near future. However, experts have emphasised that in order to achieve advanced sustainability practices, the sector must embrace additional international norms and standards. Table 2 provides an overview of the three shifts of Sustainable Project Management (SPM), along with the associated challenges and proposed practices to overcome them.

Table 2: Shifts followed to implement SPM practices and their challenges

Shift Type	Challenges	Practices followed/ Practices to be followed
Scope Shift	Less power for Project Managers	Have meetings with the management.
	The high cost can occur due to scope shifts.	Have meetings with the clients.
	Higher authoritarian decisions are taken by the higher management of the companies.	Pitching the idea of SPM to the management and clients
Paradigm Shift	Less interest in going for internationally standardised sustainable development projects in Sri Lankan context.	Highlight examples and benefits from international projects
	Resistance to change.	Conduct pocket meetings regularly (daily, weekly, or monthly)
	The fixed mindset of experienced professionals	Highlight and promote the benefits for the project team members.
Mind Shift	Lack of extrinsic motivation due to less number of international projects carried out in Sri Lanka	Show examples from other projects or other countries.
	Attitudinal issues	Approach the youngsters first and then gradually go to senior levels.
	Not following orders	Conduct pocket meetings regularly (daily, weekly, or monthly)
Mind Shift	Lack of Communication skills	Assign Project team leaders.
		Assign tasks.
		Establish sustainable communication platforms.
		Distinguish Hierarchical levels among project team members.

Table 2 illustrates that each shift type presents unique challenges and requires specific practices to be followed for effective management. For example, one challenge related to scope shifts in project management is the reduced decision-making authority for project managers. To tackle these challenges, it is crucial to conduct meetings with both management and clients. These meetings serve as a platform for open dialogue and negotiation, ensuring that everyone involved shares a common understanding of project requirements and objectives. Additionally, such meetings allow project managers to advocate for Sustainable Project Management (SPM), highlighting its benefits and emphasising the importance of incorporating sustainable practices.

By implementing these practices, project managers can address the challenges associated with each shift type and drive successful sustainable project management within the MEP sector. However, there are challenges to implementing SPM practices in the MEP sector in Sri Lanka, as described in Table 3.

Table 3: Solutions suggested by the interviewees for respective challenges

Challenge	Expert Opinion
Unstable economy	This is a significant obstacle that is currently being faced. Limited options are available, primarily those that are financially feasible. In many cases, the only option is to negotiate.
Lack of investment in sustainability	Integrate proper sustainable practices into Project Management focusing on less material wastage, proper material handling, accurate documentation and carry out sustainable construction methods.
Obstructive Policies	This varies between companies. In my company, there is not a bureaucratic structure instead there is an autocratic one. In a bureaucratic approach, professionals have more power and there is a more organized method of decision-making, but in an autocratic approach, the senior management has more authority and can make decisions without input from others.
The absence of a methodical approach to implementing plans to achieve sustainability	The task at hand presents a challenge, and a systematic approach can be implemented during the development of a team. Utilizing a Quality Management System (QMS) can aid in monitoring and maintaining this systematic approach.
lack of comprehension regarding the potential advantages of being proactive and the economic risks associated with the outcomes of unsustainability	There is also an issue in that a post-project analysis, or "lesson learned" document, is not typically created. In international projects, it is common practice to create such a document to allow both the company and its employees to learn from the project's successes and failures.
Environmental or social sustainability improvements are not prioritised in internal capital allocation decisions.	The challenge exists and it is related to an attitude issue., carry out pocket meetings, awareness sessions among project staff and labours
The challenge of interacting with governmental organisations	It is a common occurrence and cannot be overcome without a fundamental change in society.
shortage of well-trained staff and labour with proper knowledge and expertise in sustainable practices	It is also difficult to train individuals for repetitive tasks, resulting in a lack of development of specific skills over time. Recruit or train staff with required competency levels.
Project managers do not possess the required KSAs (knowledge, skill, ability)	One of the significant issues is that many project managers come from engineering backgrounds and lack the necessary project management mindset. Project Managers should only be appointed with proper project managerial educational qualities.
Insufficient attention given to researching the involvement of promoting successful adoption of green procurement practices at the local level.	As project managers, we can only do implementing a systematic approach and so we can't force beyond that. Prioritise sustainable bottom lines as a way of promoting sustainability for project planning and management sessions.
ISO 14000 certification issues	Conduct negotiations with relevant authorities, maintain proper QMS documentation, Adopt to soft copy methods from hardcopy methods.
HSE issues	Though these issues exist, there is a slight trend of progress. Carry out proper health & safety awareness sessions.

As presented in Table, the unstable economy was identified as a significant challenge that limited available options and necessitated negotiations. The absence of a systematic approach to implementing sustainability plans and a lack of understanding regarding the benefits of proactive measures also contribute to these challenges. Furthermore, environmental and social sustainability improvements are often not given priority in internal capital allocation decisions. Additionally, project managers' lack of essential knowledge, skills, and abilities, combined with insufficient attention given to promoting green procurement practices at the local level, further impede progress. As a result, it has been determined that overcoming these obstacles may require significant societal changes, negotiations with relevant authorities, and the adoption of a systematic project management approach. Further the findings seem applicable not only to the MEP sector but also to the Civil construction sector as well. However, the impact would be different

due to the high number of clearances carried out within MEP sector when compared to Civil sector.

5. CONCLUSIONS

Sustainable project management (SPM) is a crucial concept in project management across various industries. Specifically, in the construction sector, SPM plays a vital role in promoting sustainability, reducing environmental impact during construction activities, and ensuring long-term economic viability. However, there is a lack of literature addressing the application of SPM in the Sri Lankan environment, especially from the perspective of MEP contractors. Therefore, the objective of this study was to explore the feasibility of implementing SPM practices among Project Managers in Sri Lanka's MEP contractor industry.

To achieve this goal, the study conducted a literature review and semi-structured interviews with industry experts. The purpose was to identify SPM practices, assess the level of awareness and understanding among MEP contractors, and uncover potential challenges. The findings revealed that MEP project managers should incorporate sustainable practices into their projects, including stakeholder management, project planning, and sustainable communication. However, the study also identified obstacles to implementing SPM practices, such as stakeholder attitudes, resistance to change, and limited awareness among higher management.

Based on these findings, the study recommends several actions to promote SPM practices among project management professionals. These include raising awareness through continuing professional development programs and knowledge exchange, conducting industry-specific studies to understand how SPM practices can be incorporated, and establishing a separate body to advocate for SPM practices. Additionally, the study proposes investigating the impact of SPM practices on civil engineering construction in the Sri Lankan infrastructure industry, developing a framework for Sri Lankan project managers to adopt SPM practices, and researching the distinctions between lean construction techniques, SPM practices, and sustainable construction techniques to identify the most effective practices.

It is important to note that the study focused specifically on MEP/building services, as this sector significantly impacts building operations costs and emissions compared to civil/infrastructure development. Therefore, the study provides valuable insights and recommendations for promoting sustainable practices among MEP contractors in the construction industry. It emphasises the potential for significant environmental, economic, and social improvements within the sector through the adoption of sustainable practices. Furthermore, the study contributes to actionable steps for promoting and integrating SPM practices, ultimately paving the way for a more sustainable and responsible construction industry in Sri Lanka.

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