

**CAPITAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ISLAMABAD**



**Impact of Sustainable Development
Awareness on Project Success: An
Empirical Research through Sustainable
Project Management and Project
Quality**

by

Ifra Saeed

A thesis submitted in partial fulfillment for the
degree of Master of Science

in the

Faculty of Management & Social Sciences

Department of Management Sciences

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This thesis is dedicated to my father, who taught me that the best kind of knowledge to have been that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.



CERTIFICATE OF APPROVAL

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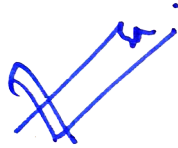
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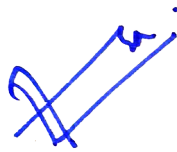
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Abstract

The aim of this study was to examine the impact of Impact of Sustainable Development Awareness on Project Success with mediating role of Sustainable Project Management and Project Quality. This study made a contribution to literature by linking the relationship of variables with conservation of resource theory. The study explained that there is a significant relationship between sustainable development awareness and project success. Hypothesis in this study are supported by a literature review conducted by the author. Furthermore, this study has two mediators performing serial mediation, sustainable project management and project quality. The study demonstrates that sustainable development awareness (independent variable) is positively related to first mediator, sustainable project management and sustainable project management to project success (dependent variable). Data was collected from 385 project team members, working in the National Agricultural Research Centre (NARC) and ARID Agricultural University, Islamabad. Quantitative research was conducted. Questionnaires survey method was used, and through Google Forms. PROCESS Macro by Andrew F. Hayes 2021 version 4.2 was used in SPSS for analysis of data. Descriptive statistics test, correlation, and mediation tests were run for the analysis of the data. Results of the study demonstrated that the first mediator, sustainable project management, is a significant mediator between sustainable development awareness and project success, while project quality was found insignificant as a second mediator. There are limitations that are discussed. Future research should consider time-lag studies with large sample size.

Keywords: Sustainable Development Awareness, Sustainable Project Management, Project Quality, Project Success, NARC, ARID.

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Chapter 1

Introduction

1.1 Background

The degree of perception and understanding that people and communities have about the idea of sustainable development and its significance is referred to as their level of sustainable development awareness. "Sustainable development" (World Commission on Environment and Development, WCED, 1987) attempts to satisfy present requirements without compromising the capacity of future generations to satisfy their own needs. It places a focus on how social, environmental, and economic factors should all be taken into account when making decisions. Today, it is believed that integrating economic, social, and environmental concerns is one of the key elements for project acceptability and success ([Chen et al., 2019](#); [Toljaga-Nikolić, Todorović, Dobrota, Obradović, & Obradović, 2020](#); [Shah, Asif, Shoukat, Polatci, & Rehman, 2022](#)).

Raising awareness about sustainable development is crucial because it helps individuals and communities understand the impact of their actions on the planet and encourages them to make more sustainable choices. According to [Lim and Mohamed \(1999\)](#), sustainable development is a method for achieving sustainability, which is more of a result or a way of life. [Kleindorfer, Singhal, and Van Wassenhove \(2005\)](#) further supported this statement by suggesting that the ultimate goal of sustainable development is sustainability. Sustainable development also plays a

optical role in the success of a project in project management. Hence, sustainability goals can be achieved by project sustainability management. By integrating sustainable practices and principles into project planning, implementation, and evaluation, organizations can achieve positive outcomes for society, environment and the economy.

The need for a comprehensive strategy that takes into account economic, ecological, and social factors is highlighted in recent work (Steurer, Langer, Konrad, & Martinuzzi, 2005; Lafferty & Hovden, 2003). Environment, economics, and society are the three elements that may be noticed when looking at definitions of sustainable development (Borg, Gericke, Höglund, & Bergman, 2014; Olsson, Gericke, & Chang Rundgren, 2016). Using NPV as the economic dimension, workers' circumstances as the social dimension, and life cycle assessment as the ecological dimension, Ma et al. (2020) suggested a project framework for creating project portfolios. The long-term viability of each of these three elements must be ensured for sustainable development to occur (Sandell, Öhman, & Östman, 2005; Alkis, 2008).

Preservation of forests and the expansion of green spaces, resource conservation, sustainable urbanization, the decline in environmental pollution (water, air, and soil pollution), the use of renewable energy sources (wind energy, geothermal energy, etc.) instead of non-renewable energy sources (coal, and petrol etc.), the reduction of environmental pollution (water, air, and soil pollution), and the security of natural resources (air, soil, water, agriculture, biodiversity and energy) are just a few of the issues that fall under.

The sustainable development's "society" dimension comprises the notions of human rights, peace, human security, gender equity, and inter-cultural understanding and cultural diversity (UNESCO, 2005), justice and social- services, health and education rights. (Atmaca, Kiray, & Pehlivan, 2019; Özmete, Akgül Gök, & Pak, 2023). According to Kuei and Lu (2013); Olsson et al. (2016); Atmaca et al. (2019), economic sustainability includes concerns like prudent resource use, expense balance and income, eliminating income distribution disparity, dependable environments for investments, sustainable production and cost, investments in vital regions, investments in high income regions, and research and development.

The Sustainable Development Goals (SDGs) of the United Nations offer a comprehensive framework for international efforts towards sustainable development. Advocating awareness and understanding of the Sustainable Development Goals can help individuals and communities affiliate their actions with the broader global agenda. An indicator-based approach underpinned the major global assessment of countries progress towards Millennium Development Goals and more recently towards Sustainable Development Goals (SDGs) (Sachs, 2012). It allows project managers to incorporate sustainability considerations into the project planning phase. This involves conducting thorough social and environmental impact assessments, identifying possible risks and opportunities, and developing strategies to lessen negative impacts and boost positive ones. Integrated planning helps classify sustainable alternatives, optimize resource use, and design eco-friendly processes contributing to long-term project success. The mandate to develop the proposal on the Sustainable Development Goals was included in Conference outcome document, “The future we want” (UN, 2012).

Sustainability and project quality are two interconnected aspects that play a vital part in ensuring the long-lasting success of any project. Quality is described as ‘what customer expects as a lasting experience’ (Basu, 2011). When considering sustainability in the context of project quality, it involves implementing practices and principles that prioritize environmental, social, and economic considerations throughout the project’s lifecycle. Quality implies the degree to which a project meets its objectives, delivers the desired outcomes and satisfies stakeholder requirements. Integrating sustainability into project quality requires careful planning, resource allocation, and execution. Sustainable prosperity impels inclusive and capable planning institutions, focused on green infrastructure (Geltner & De Neufville, 2012; R. Turner, 2016; J. A. Robinson & Acemoglu, 2012). It involves adopting sustainable practices and technologies that minimize resource consumption, reduce waste generation, mitigate environmental impacts and enhancing their quality and long-term viability. For example, incorporating energy-efficient systems, utilizing renewable materials, and designing for recyclability can contribute to the sustainability of a project without compromising its quality. Standard approaches to quality improvement will often enhance sustainability, through streamlining

of processes and better targeting of resources to achieve outcomes. However, explicit attention to all elements of the sustainable value equation will further highlight resource issues and encourage a more thoughtful and holistic approach to improving care for the whole population, hopefully driving progress towards a truly sustainable service (Mortimer, Isherwood, Wilkinson, & Vaux, 2018). Sustainability and project quality are intertwined concepts that must be addressed collectively to achieve meaningful and lasting project outcomes. By integrating sustainable practices into project quality, organizations can deliver projects that not only meet objectives but also minimize environmental impacts, promote social well-being, and contribute to long-term economic viability. The Conservation of Resource Theory proposed by Dr. Stevan Hobfoll states in his book “Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences” (1980), also emphasizes the need to protect resources from depletion or loss. Applying the COR theory to project sustainability, the importance of resource conservation throughout the project lifecycle increases. In the context of project sustainability, resources can include financial capital, human capital, natural resources, and social capital. By conserving these resources, projects can reduce costs and enhance their overall sustainability. Applying the Conservation of Resources theory to project sustainability, project managers and stakeholders can adopt a holistic approach that considers the efficient use, protection, and replenishment of resources throughout the project lifecycle. Sustainable development has 3 dimensions, namely environment, society and economy (Borg et al., 2014; Olsson et al., 2016). If resources are managed effectively, safeguarded against depletion, and invested in resource development, project teams can contribute to the overall quality of their projects. Implementing the principles of COR theory can lead to quality projects and long-term success.

1.2 Research Gap

In spite of the importance of sustainability, very less knowledge exists on this subject in project management text, which motivated this study. Although many research studies have been published around sustainability, there are less studies

regarding spreading awareness related to sustainability and its implementation. We aim to analyze sustainability by going through its three dimensions of environmental sustainability, economic sustainability and social sustainability and how it impacts on project success by using principles of sustainable project management and project quality. Although many research studies have been published around sustainability.

By creating new initiatives that are motivated by sustainability ideas, it may be integrated into companies (Labuschagne, Brent, & Van Erck, 2005). It is necessary to fully integrate sustainability throughout the whole project life cycle (Stanitsas, Kirytopoulos, & Leopoulos, 2021; Martinsuo & Killen, 2014; Ismayilova & Silvius, 2021). The triple-bottom-line concept, created by (Elkington, 1998) simultaneously reflects environmental, economic, and social issues from a microeconomic point of view. However, Sabini, Muzio, and Alderman (2019) found ambiguities in how sustainability is defined and how fundamental concepts like the triple bottom line and sustainability development goals (SDGs) are understood. The focus on aligning three goals of economic efficiency, social equity and environmental performance appears to have stepped up in more latest findings with indications that managing business using the triple bottom line can signify how sustainable and profitable the business (Ghannadpour, Hoseini, Bagherpour, & Ahmadi, 2021).

We have studied the impact of Sustainable Development Awareness on project success through the framework of Sustainable Project Management directing to more quality projects ultimately contributing towards project success. After analyzing the literature, I realized that much research has been done related to sustainable construction projects as compared to other sustainable projects which affect our environment directly. The stakeholders have attracted much consideration under the heading of sustainable construction (Frattari, Dalprà, Salvaterra, et al., 2012). Moreover, many researchers have studied project success through sustainable project management but there is still more room to analyze these variables in the context of project quality and achieving project success by creating awareness among project managers and team members. Also, these variables together would be very useful and would add much towards the research works as well as towards the study in Pakistan for project- centered companies.

1.3 Statement of the Problem

There is an absence of sufficient awareness and understanding of sustainable development practices among project managers and stakeholders. This knowledge gap hinders the integration of sustainable development principles and strategies into project management processes, leading to missed opportunities for social, environmental, and economic benefits. It also increases the risk of unsuccessful projects. To get long-term organizational success and enhanced project outcomes, there is a dire need of spreading awareness on how companies can better incorporate sustainability into practice. Sustainable development has become one of the crucial components of project management along with iron triangle.

Although, recently, it has been observed that a lot of promotions has been done for sustainable environment leading to the successful project conclusion, lack of attention has been paid to the possibility of distributing the information and spreading awareness of sustainable development through sustainable project management and project quality. This shortcoming has resulted the current study which aims to find out whether and how is sustainable development awareness beneficial for project success, through Sustainable Project management and Project Quality by testing the relationship among variables which helps to characterize the impact of sustainable development awareness on project success and help to enhance the existing literature of sustainability and project success.

1.4 Research Questions

Attempt has been made in this research paper to examine the relationship between the dimensions project sustainability, quality, and project success. The aforementioned issues serve as the foundation for the current study, which seeks to offer answers to the following concerns:

Research Question 1

Does Sustainable Development Awareness impacts on project success?

Research Question 2

What is Sustainable Project Management, and there exists any relationship between Project Success and Sustainable Development Awareness?

Research Question 3

What is project quality, and does it play a role in the link between project success and knowledge of sustainable development?

Research Question 4

Does Sustainable Project Management and Project Quality collectively equivocate in the relationship between sustainable development awareness and project completion in the identified sequence?

1.5 Research Objectives

This research goal is to predict and evaluate the expected model to determine the link between sustainable development awareness, sustainable project management and project success. Below are the study's particular objectives which are listed below:

Research Objective 1

Examining the impacts of Sustainable Development Awareness impacts on Project Success.

Research Objective 2

Investigating the relationship between Sustainable Development Awareness and Project Success mediated by the Sustainable Project Management.

Research Objective 3

Finding out the relationship between Project Success and Sustainable Development Awareness through Project Quality.

Research Objective 4

Helping to raise knowledge of Sustainable Development in order to integrate sustainable practices into projects.

Research Objective 5

Increasing project quality through sustainable development awareness.

Research Objective 6

Investigating Project Success through project quality and sustainable development awareness.

1.6 Significance of the Study

One of the ways for sustainable development initiatives to achieve their objective is for stakeholders and authorities to be aware of it so that they may steer their projects in the direction of sustainable development principles.

This research helped in spreading sustainable awareness and promote the adoption of sustainable practices throughout the project lifecycle. There is a necessity for more research and practical procedures on how companies can better incorporate sustainability into practice. By equipping project managers with the necessary knowledge and tools, the project seeks to enhance the addition of sustainability into project management practices, leading to more environmentally responsible, socially beneficial, and economically successful projects. Sustainable development awareness enhances project success through sustainable project management and project quality by fostering stakeholder engagement, integrating sustainability into planning, optimizing resource management, monitoring progress, sharing knowledge, and leaving a positive legacy. By prioritizing sustainability, projects can contribute to a more sustainable future while achieving their intended objectives. Recent years have seen a substantial increase in projects worldwide, due to which natural resources are depleted at a significant rate. Organizations are forced to practice in ways that cannot be sustained in the long term. Today, project management has emerged as a discipline to solve project implementation issues. Natural resources are one of the most crucial resources for every project, and its success depends entirely on it. To complete projects without having a negative impact on the environment, sustainable practices must be kept in mind. This study's goal is to determine the link between sustainability development awareness, sustainable project management, project quality and project success in project-based companies.

The study attempts to analyse the critical factors that are influencing performance so that it can be managed effectively. The results of this study may be useful to organizations because they use resources in order to develop and produce different products. Improving Project Portfolio Organizations may benefit from management techniques including risk management, portfolio steering, resource allocation, and project selection that focus on sustainability in addition to their potential to generate financial rewards and make a positive impact on the environment and society. Consequently, this study potentially offers a chance to test association of sustainable development awareness on project success. Present study also fills the current gap in literature. It would offer significant contribution in project management literature. Also, literature claims that businesses that include environmental responsibility in their economic plans may increase revenue creation through improved stakeholder connections and brand image while achieving cost savings from resource efficiency. (Hart, 1995; Hoffman & Ventresca, 1999). This study is useful to experts to identify the importance of sustainable practices, which affect project success and quality of overall project.

1.7 Supporting Theory

1.7.1 Conservation of Resource Theory (COR)

The theory of conservation of resources is a psychological structure that explains how individuals struggle to protect, to obtain, and maintain resources to achieve well-being and resilience. It was developed by Dr. Stevan Hobfoll in the late 1980s mentioned in his book, “Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences”. The core principle of the conservation of resources theory is that individuals are encouraged to obtain and preserve resources because these resources are essential for their overall well-being. The conservation of resources theory has been used to discuss resource loss over a long period of time (Demerouti, Bakker, & Bulters, 2004). Conservation of resource theory holds that humans’ primary motive is to safeguard, expand, and cultivate their resource bases in order to safeguard both their own selves and the social ties that support them.

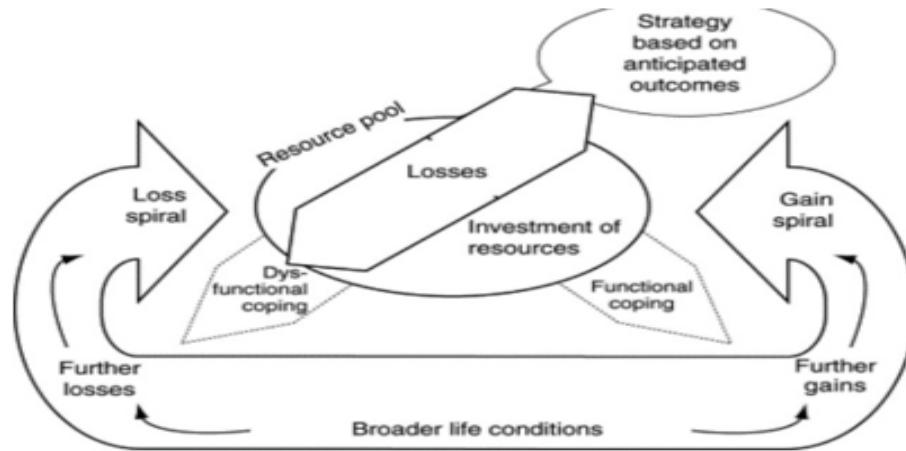


FIGURE 1.1: Processes of Resource Conservation

de Lange, Kooij, and van der Heijden (2015) suggested four key dimensions of sustainability, resource preservation and regeneration, priority and fairness, progress and stability, and a system-based perspective. The idea offers a framework for preventing resource loss, preserving existing resources, and accumulating resources required for engaging in appropriate behaviors. Conservation of resource theories are closely related to sustainability.

Key principles of resource theory include:

- Resource efficiency: Optimizing resource use through technological advancements, process improvements, and waste reduction.
- Circular economy: Promoting the reuse, recycling, and regeneration of resources to minimize waste and maximize resource value.
- Equitable distribution: Ensuring fair and equitable access to resources, addressing social and economic disparities.

Sustainability integrates aspects of both conservation and resource theories, attempting to satisfy wants now without sacrificing the potential of future generations to satisfy their own requirements. People who have abundant resources are usually in a better position to garner more resources (Hobfoll, 2002). It recognizes the interconnectedness of TBL which is social, environmental and economic systems and strives for a balance that promotes long-term well-being for both humans and the planet. Conservation of resource theory is closely related to sustainability

and emphasizes the importance of preserving and effectively utilizing resources for long-term well-being. Sustainability is a 'state' of indefinite continuance (Everard, 2011), this theory recognizes that resources, including natural, social, and economic resources, are essential for the functioning and development of individuals, organizations, and societies. It promotes responsible resource consumption, protection of ecosystems, and the equitable distribution of resources.

Awareness of conservation of resource theory is crucial for fostering sustainability. When individuals, organizations, and societies understand the value of resources and the potential consequences of their depletion or mismanagement, they are more likely to take proactive measures to preserve and sustainably utilize those resources. Sustainability can also be conceived as a capacity to maintain, renew and restore interrelated aspects of the natural environment, organization or society (Wilkinson, Hill, & Gollan, 2001). Increasing awareness of conservation of resource theory involves educating and informing stakeholders about the finite nature of resources, the interconnections between different resource types, and the potential impacts of resource depletion and degradation. This awareness can be raised through various channels, including educational institutions, awareness campaigns, media, and sustainability initiatives. By promoting awareness of conservation of resource theory, individuals and organizations can make more informed decisions and take actions that align with sustainable practices. This includes adopting resource-efficient technologies, implementing waste reduction measures, practicing responsible consumption and production, and supporting policies and initiatives that prioritize resource conservation.

Conservation of resource theory has also direct impact on project quality within the context of sustainability. The theory recognizes that resources, including natural, social, and economic resources, are essential for project execution and success. By applying the principles of conservation of resource theory, project teams can enhance project quality in several ways. It promotes the efficient and effective use of resources. This includes optimizing resource allocation, minimizing waste, and maximizing resource utilization throughout the project lifecycle. By carefully managing resources, projects can reduce costs, improve productivity, and ensure that resources are available when needed. This, in turn, enhances project

quality by enabling timely delivery, meeting project objectives, and maintaining stakeholder satisfaction.

Also, the theory emphasizes the importance of resource replenishment and sustainability. Projects that consider the long-term availability and viability of resources are better equipped to address potential resource constraints and risks (Wilkinson et al., 2001). This proactive approach to resource management reduces the likelihood of resource shortages or disruptions during project execution, thereby minimizing delays, rework, and quality issues.

Moreover, conservation of resource theory encourages the integration of sustainable practices into project planning and implementation. This includes considering environmental impacts, social responsibility, and economic viability. According to COR theory, Hobfoll (2002) described two key resources for individuals, that is one aspect of self (personal resources) and the other related to the social environment, such as social support resources. By addressing sustainability aspects, projects can mitigate risks, enhance stakeholder engagement, and improve overall project quality. Sustainable practices such as using eco-friendly materials, minimizing carbon footprint, and ensuring social inclusivity contribute to higher project quality by aligning with stakeholder expectations and industry best practices. Ultimately, by integrating the principles of conservation of resource theory into sustainability efforts, we can create a more resilient and sustainable future, ensuring that the resources we rely on are protected and available for current and future generations. By creating sustainability awareness among Project managers and teams, resources can be protected from depletion. By actively conserving resources, the project team can maintain the necessary means to deliver a high-quality and successful project.

Hence, conservation of resource theory plays a vital part in project quality within the realm of sustainability. By promoting efficient resource utilization, ensuring resource sustainability, recognizing resource interdependencies, and integrating sustainable practices, projects can achieve higher quality outcomes, meet stakeholder needs, and contribute to a more sustainable future.

Chapter 2

Literature Review

2.1 Introduction

Within the vast topic of project success, the following study of the literature has been recommended. The results of several investigations have been analyzed to identify a sizable gap in the body of knowledge. This chapter also aids in the formulation of the study's hypotheses and aids in comprehending the conceptual framework that is suggested.

2.2 Data Description

2.2.1 Sustainable Development Awareness

Raising awareness of sustainable development is crucial for ensuring that the planet will continue to be livable. Sustainable Projects are an integral part of development and have an impact on our environment. For organizations managing numerous portfolios, programs, and projects, the value of project management development has been recognized (Chofreh, Goni, Malik, Khan, & Klemeš, 2019). The philosophy of this approach, however, is primarily focused on profit without taking into account the societal and environmental aspects (Marcelino-Sádaba, González-Jaen, & Pérez-Ezcurdia, 2015). Traditional project management methods cannot be used to manage projects in a sustainable manner. Industrialization in the 20th

century was followed by environmental degradation brought on by thoughtless actions performed in the name of development under the influence of fast population growth, which raise fears about human health and the future of the planet in (Altunbaş & Gadanez, 2004). Therefore, the project management strategy needs to incorporate sustainability concepts. Sustainability can only be achieved when more and more people get awareness related to sustainability principles. There is a significant knowledge gap between the general public and business, and community engagement is required for the adoption of sustainable development (Garbie, 2015). Increasing employee understanding of sustainability can motivate managers to incorporate sustainability practices and ideas into their initiatives. Chofreh et al. (2019) says that one of the primary issues and important measures of corporate performance is sustainability. In order to help organizations gain a competitive edge, sustainability embedment within project management ideas and methodologies, or Sustainable Project Management, should be implemented.

Since the sustainability concept has been included into the organization's deliberate plan, premeditated plan, and ongoing operational activities, this embedding is vital, claim (A. G. Silvius & Schipper, 2015). Sustainable Project Management ideas and implementations are necessary for practitioners to sustainably evaluate risk, plan, organize, and manage the projects.

2.2.2 Sustainable Project Management

Projects are carried out to achieve predetermined objectives and goals. A project's entire benefits and value are increasingly given greater attention by businesses than the iron triangle objectives of scope, time, and cost (A. Silvius & Schipper, 2014). Project management now places a greater emphasis on sustainable project management (M. Pinto, Rosidi, & Baridwan, 2020; Hasheminasab, Gholipour, Kharrazi, Streimikiene, & Hashemkhani, 2020). The triple bottom line approach (economic, social, and environmental) is a framework for project management that includes sustainability. Marcelino-Sádaba et al. (2015) presents a four-dimensional paradigm for project management that incorporates sustainability. These dimensions, albeit not distinct from one another, have a significant impact on one another. Numerous social, ecological, and economic factors that are present in a

project can be used to assess its strategic value. De Wit (1988) emphasized that businesses must adopt environmentally friendly manufacturing by taking into account not only the activities in their own facility but also the entire production chain. All all these helps to improve environmental performance. Utilizing resources like electricity and water is crucial from an environmental standpoint (Labuschagne et al., 2005).

Only initiatives that are more complicated and subject to regulations (Lenferink, Tillema, & Arts, 2014; Zhu & Sarkis, 2006) are more concerned with sustainability challenges. According to Hwang and Ng (2013), in addition to the unpredictable nature and high cost of using green equipment and materials, managing green building projects can be difficult when choosing subcontractors that offer green construction services. According to Kuei and Lu (2013), external pressures from the supply chain's customers and regulators were essential for the adoption of green practices. Green purchasing (GP&P) is still in the early stages of development in project management.

2.2.3 Project Quality

In the third edition of book, "Leadership for Quality" quality is defined as "fitness for use" (JM, 1989). A new definition can be found in the seventh edition of Juran's Quality Handbook. The phrase "fit for purpose" describes quality today (Joseph, Marnewick, & Santana, 2016). Quality is described in the PMBOK Guide as "the degree to which a set of inherent characteristics fulfill requirements" (PMI, 2017).

The project's "triple constraint" is time, budget, and scope. Each of the three factors affects the project's and the project manager's success in equal measure (B. Turner, 2002). Project managers frequently strive to strike a balance between the three while attaining project objectives, even though they may make concessions on one or more of the three throughout project implementation to meet client expectations. Three criteria or objectives are specified and backed by the 'iron triangle' of time, money, and quality, which is utilized in project management literature (Atkinson, 1999; Morris & Hough, 1987; Meredith, Shafer, & Mantel Jr,

2017). Product quality and process quality are the two dimensions that make up project quality (B. Turner, 2002). A quality product will be produced if the procedures are up to par with the scope requirements. A quality project will be guaranteed by quality methods that uphold budget and timeline restrictions. In the book, “Project quality management: why, what and how” (Kenneth, 2005) Kenneth says that project managers routinely make trade-offs among the triple constraint to meet project objectives, but a project manager should never, ever trade off quality during project execution. Along with the conventional method of weighing time-cost trade-offs in project expedition choices, the project quality should also be taken into account (Dheerendra Babu, Nayak, & Shivashankar, 2013).

2.2.4 Project Success

Project achievement is a multidimensional concept (Shenhar & Dvir, 2007). The most frequently mentioned project success factors are cost, time, and scope items (Khan, Turner, & Maqsood, 2013). These elements are a part of the project success efficiency dimension. Sustainable development is rarely used to evaluate project success in the literature on Project Management. Project success levels (De Wit, 1988; Agarwal & Rathod, 2006; Fortune & White, 2006). Social and environmental sustainability components have more newly been added. (M. L. Martens & Carvalho, 2017; Carvalho & Rabechini Jr, 2017). As crucial elements influencing a project’s success, (R. Turner, 2016) emphasized the necessity of triple project limitations, customers happiness and stakeholder requirements. happiness.

2.3 Hypotheses of Study

2.3.1 Sustainable Development Awareness and Project Success

It is crucial to increase public knowledge of sustainable development if we want to keep the globe livable in the future. It is essential for project managers to integrate sustainable development into their projects. According to various studies,

many developing countries already have environmental laws, legal systems, and economic tools that are thought to be very advanced by international standards. Despite the fact that environmental conditions are getting worse (Huber, 2000; Fujisaki & Okamoto, 1997). Many countries frequently suffer with a general lack of public support for ecologically friendly actions, in addition to the absence of a legal and financial framework for environmental preservation. Awareness of sustainable development may be used to inform environmental policy development and management. Although both rich and developing nations are increasingly concerned about the environment, their perspectives on more environmental challenges vary (Mitsuda & Pashev, 1995). It is obvious that the only means of achieving the idea of sustainable development is via education. Programs should all achieve the four UNESCO (1999) objectives of knowledge, awareness, skills, and participation (Arba'at, Tajul, & Suriati, 2010). However, the negative effects on the environment have caused an increasing awareness and acceptance of the need for a more responsible attitude to the environment on a global scale (Fujisaki & Okamoto, 1997). A plan for ecologically and socially responsible building is a huge step in the right direction. The negative effects on the environment, particularly those caused by the building sector, have made people more aware of the need for methods that are more sustainable and responsible (Carvalho & Rabechini Jr, 2017). Construction professionals must be willing to alter their behaviour when exploring new terrain and willing to adopt new goods, ideas, and methods in order to enhance consideration for sustainability (Ofori, 2000). Project managers should aim for sustainability, and doing so may change how success is perceived. For this reason, creating sustainability awareness among project managers should be a top priority. When top management is aware of the principles and practices of sustainable development, project teams can easily incorporate them into project planning, implementation and evaluation. Sustainable development awareness helps project teams identify potential environmental and social risks early on. By assessing and addressing these risks, projects can become more resilient to changes in the operating environment, regulatory requirements, or stakeholder expectations. When projects incorporate sustainable development practices, they often enjoy a positive reputation among stakeholders, while achieving project success. This can lead to increased stakeholder satisfaction, support, and cooperation, which are crucial for

project success. According to [Cooke-Davies \(2002\)](#), project success is evaluated against the overall project goals, and the standards used to determine whether a project is successful or unsuccessful might be referred to as success criteria. According to [Lim and Mohamed \(1999\)](#), the norms or principles by which project success is or may be measured make up the criteria for evaluating project performance. The goal of project management is to complete tasks on schedule, on budget, and to the satisfaction of all stakeholders ([Chua, Kog, & Loh, 1999](#)).

According to recent studies ([Toljaga-Nikolić et al., 2020](#); [Chen et al., 2019](#); [Shah et al., 2022](#)), one of the crucial elements for project acceptability and success is the incorporation of social, environmental, and economic issues. Additionally, [Chua et al. \(1999\)](#) examined the project manager's authority, competence, commitment, and experience as elements determining project success. According to [Cicmil \(1997\)](#), the client's appreciation of the project's progression from concept to creation should serve as the benchmark for project success. [Belassi and Tukel \(1996\)](#) describe four major categories of critical success factors related to projects, project managers and teams, organizations, and the external environment. Knowledge is necessary to advance from awareness to the use of sustainable development techniques, claims ([Abidin, 2010](#)). Awareness is the first step on the way to success. In order to use resources wisely and sustainably for both the current and future generations, sustainable development attempts to evaluate progress not just in terms of economics but also in terms of the environment ([Harris, n.d.](#)). These objectives go beyond simple tasks for today's population. This is done in order to respect future societies' rights ([Küçük et al., 2022](#)).

The problem of sustainability now has a third dimension in addition to the economy and the environment ([Hermans, 2002](#)). Consistent and appropriate alignment on economic, social, and environmental concerns is required to create a sustainable society ([Summers et al., 2004](#)). Project managers concur nowadays that the environment and economics are an integral part of the overall. Due to the extreme impacts of ecological damage and biodiversity loss brought on by the use of non-renewable resources, global warming, and other factors, there is a growing global awareness of the need to conserve the environment ([Drumwright, 1994](#)). Company management (board of directors, senior executives) may be assisted by

company-wide sustainability management methods in aligning business and corporate strategy with important sustainability concerns (Schaltegger & Burritt, 2005). Sustainable agricultural projects aim to produce successful projects by enhancing the quality of life and protecting the environment efficiently and profitably (Chow & Chen, 2012).

Today's market is increasingly characterized by the presence of environmental issues and an emphasis on corporate environmental responsibility (Lee, Park, & Lee, 2013). Maintaining a balance between human needs for infrastructure, business operations, and buildings for shelter on the one hand, and protecting the natural resources and ecosystems on which we and future generations depend on the other, is the main goal of sustainable projects (Stall-Meadows & Davey, 2013). According to Mensah (2006); Erdogan and Baris (2007), managers don't have the skills or motivation to achieve the fundamental goals of social and environmental responsibility. Learning about the topic and becoming aware of one's obligations are the first steps in developing awareness (Küçük et al., 2022). This awareness involves being aware of the society's goals for sustainable development and offering ease in achieving the goals together with the necessary information and abilities (McKeown, Hopkins, Rizi, & Chrystalbridge, 2002). When this is accomplished, a society that is conscious of sustainable development and has transformed it into knowledge, skills, and behaviour may be created (Kucuk & Ekinici, 2021).

Our research investigates the awareness of the research and development industry regarding sustainability development and whether these individuals have absorbed the concept of sustainability in their current practices. This takes us to derive the first hypothesis of our study

H1: Sustainable Development Awareness has a significant impact on Project Success.

2.3.2 Sustainable Development Awareness and Sustainable Project Management

Awareness of sustainability issues can help project managers to make more informed decisions about the planning, execution, and evaluation of projects (Erdogan

& Baris, 2007). Sustainability awareness can help to create a more collaborative and supportive environment for project teams which leads to sustainable project management. According to Jones, Woods, and Guillaume (2016), sustainability can enhance business efficiency and the search for competitive advantage. When team members are aware of the importance of sustainability, they are more likely to be willing to work together to find sustainable solutions to problems (Isaksson, 2006). Raising awareness of sustainable development is essential for creating a more sustainable future. Suki (2013) operationalized consumer environmental concerns, knowledge of green products, knowledge of pricing, and knowledge of brand image as the four aspects of green awareness. It can also help to build trust and credibility with stakeholders. When stakeholders are aware that a project is being managed in a sustainable way, they are more likely to support the project and its outcomes (Zheng, Wen, & Qiang, 2020).

Sustainability is about eradicating waste; hence sustainable development is inherently a standardizing term reflecting ethical issues and values (P. Martens, 2007; D. Robinson, Perryman, & Hayday, 2004). Many authors including (Maltzman & Shirley, 2015) have spoken on the significance of eradicating waste. The Toyota production system's "The Seven Wastes" are overproduction, transportation, improper processing, needless inventory, unneeded or extra motion, and defects (Sutherland & Bennett, 2007).

Gareis, Huemann, Martinuzzi, Weninger, and Sedlacko (2013) noted that "Sustainable development in temporary companies such as projects and programs is barely considered". Gareis, Heumann, and Martinuzzi (2009) made this observation. According to Eid (2014), the project management guidelines "fail to seriously address the sustainability issue." Sustainability development awareness can help to make projects more sustainable, efficient, and effective. By raising awareness of sustainability issues, project managers can create a more sustainable future for our planet (Shah et al., 2022). A project needs to be beneficial to all of its stakeholders in order to be sustainable, and it also needs to be carried out in a way that is transparent, ethical, and fair, as well as including proactive stakeholder involvement (Institute Project Management Ireland, 2017). Every day, people work on projects that might vary from simple information technology (IT)

and building projects to more complicated ones. Sustainability is included into projects of all sizes to decrease waste and improve how project management is regarded (Shokri-Ghasabeh & Kavousi-Chabok, 2009). Project managers play a critical role in driving sustainable thinking in project management and achieving sustainable outcomes. According to Zheng et al. (2020), a project manager has to use diverse abilities in the present business environment to achieve sustainability in project management. As a result, team members should have a variety of talents to ensure sustainability and the project's effective execution. Chan (2006); Wang, Hashimoto, Moriguchi, Yue, and Lu (2012) described sustainable practice as carrying out management actions to protect and save resources. Because of their strategic relevance in persuading the whole project team to incorporate sustainability thinking and activities inside their project, project developers, who try to implement sustainable practices into their projects, were chosen for this study. (Halal & Davies, 2018; Sloan et al., 2022; Garrod, 2015) identified examples of sustainable practice as including saving energy, water saving, buying of locally produced product and recycling. The specifications and demands of the project's deliverable product and the standards for the project's quality change when the concepts of sustainability are included. (Tayntor, 2010; Eid, 2014; Maltzman & Shirley, 2015). Hence, we can say that sustainability development awareness is linked to sustainable project management by ensuring that projects are socially, environmentally, and economically sustainable, and by aligning projects with organizational strategy, corporate governance, and the wider world of society and the environment. This concept lead us to develop our next hypothesis:

H2: Sustainable Development Awareness has a significant impact on Sustainable Project Management.

2.3.3 Sustainable Development Awareness and Project Quality

Sustainable development awareness and project quality are mutually beneficial. Projects designed with sustainability in mind are more likely to focus on delivering high-quality outcomes that are socially, economically, and environmentally

responsible (McAdam & Leonard, 2003). Since more than ten years ago, there has been debate about the usefulness of quality management in relation to sustainable development generally (Garvare & Isaksson, 2001; Isaksson, 2006; Kleindorfer et al., 2005) and environmental sustainability specifically (Rusinko, 2005). Engaging stakeholders who have knowledge and expertise in sustainability related issues can provide valuable insights and guidance (Theyel, 2000). There are several angles and topics that still need to be studied in the realms of sustainability, thus there is a great need for study in these areas. (Kass, Shaw, & Steward, 2017). According to the Langkawi Declaration on Environment (1989), focus should be placed on fostering economic growth and sustainable development while maintaining a balanced viewpoint on the need to conserve the environment. This collaborative approach promotes a more comprehensive understanding of the project's impacts and requirements, leading to improved project quality. Project that is sustainable Success is a crucial factor that determines if a company's efforts will be successful (Yu, Guo, & Luu, 2018). By including sustainability metrics in the quality management framework, the project team can evaluate and assess the project's performance from a sustainable development perspective (Tayntor, 2010). This ensures that quality standards encompass not only technical aspects but also sustainability considerations. To create a strategy that would lessen the negative effects on the environment while also enhancing quality of life, employing cutting-edge technology to recycle, save energy, and limit the use of raw materials (Colicchia, Marchet, Melacini, & Perotti, 2013). Sustainable development awareness prompts project teams to consider the long-term value and benefits of their projects. According to (Kneipp, Gomes, Bichueti, Frizzo, & Perlin, 2019), sustainable-labelled words also take ethical and social considerations into account, which improves the quality of projects. Eco-labelled terminology, on the other hand, solely addresses environmental and economic factors. According to Shokri-Ghasabeh and Kavousi-Chabok (2009), sustainable project management aids in project success and should be practiced by more companies as it is one of the metrics for measuring project performance. Rather than focusing solely on short-term gains, projects that prioritize sustainability can deliver lasting positive impacts on the environment, society, and the economy. This long-term perspective is aligned with the principles of high-quality project management, which seeks to create sustainable value and benefits

for stakeholders. The topic of quality management's role in sustainable development frequently centers on how it might advance environmental goals (Sarkis, 2001). Sustainable development awareness contributes to project quality by fostering a holistic understanding of sustainability goals, promoting stakeholder engagement and collaboration, integrating sustainability criteria into quality standards, assessing environmental and social impacts, enhancing stakeholder satisfaction and reputation, and delivering long-term value. To accomplish particular goals that serve as success criteria, sustainable project management might alter corporate organization policies (Elkington, 1998). By considering sustainability throughout the project lifecycle, project teams can achieve higher-quality outcomes that align with the principles of sustainable development.

H3: Sustainable Development Awareness has a significant impact on Project Quality.

2.3.4 Sustainable Project Management and Project Quality

The requirements and demands of the project's deliverable product and the standards for the project's quality will change when the concepts of sustainability are included (Maltzman & Shirley, 2015; Eid, 2014; Tayntor, 2010). The needs of the project sponsor, customer, or end user are first and foremost tied to quality in the current project management standards (A. Silvius & Schipper, 2014). Project quality refers to meeting or exceeding the requirements and expectations of stakeholders. It involves delivering a project that fulfills its intended purpose, meets defined standards, and satisfies customer needs. Other stakeholders' needs or interests are considered to the extent that they might clash with the sponsor's needs (Eskerod & Huemann, 2013).

Including sustainability in project management calls for a comprehensive approach to the project's content, targeted result, and quality requirements (Gareis et al., 2013), including sustainability perspectives such as global and local, 'economic, social and environmental', and 'long term and short term', and developed together with a broad group of stakeholders (Eskerod & Huemann, 2013). Project quality

cannot exist without the senior executive team's complete dedication. The principles of the PRINCE2 or PMBOK project methodology, as well as the tried-and-true methods of business standards and completed projects, should be followed by quality management systems and processes.

[Yahya and Goh \(2001\)](#) discovered that parts of the ISO 9001 quality standard, such as remedial and preventive measures, design control, management responsibility, statistical methods, process control, document and data control, and quality systems, are related to an organizational quality system. In order to comply with the requirements of the standard that have to do with document and record control, [\(Gunnlaugsdottir, 2012\)](#) found that the implementation faced several challenging obstacles.

Businesses that follow a sustainable strategy are able to achieve their goals without jeopardizing the demands of their stakeholders, consumers, or the environment. Having a "green" profile has a monetary value, [\(Ulhoi, for the Improvement of Living, Conditions, et al., 1996\)](#). Customers and society in developed nations now look to businesses to act responsibly toward the environment. Sustainability should be embedded in the corporate culture. Since the 1970s, there has been a consistent drive to effectively integrate sustainability into all industries [\(Stall-Meadows & Davey, 2013; Donella, 1972; Marcelino-Sádaba et al., 2015; Glenn, Florescu, Team, et al., 2015; Abidin, 2010; Elkington, 1998; Glenn et al., 2015; Gladwin, Kennelly, & Krause, 1995; Brundtland, 1987\)](#). Nowadays, a lot of businesses want to include sustainability in all of their operations [\(Marcelino-Sádaba et al., 2015; Thomas & Lamm, 2012; Van den Brink & Benschop, 2012\)](#) and associate it with their strategic objectives [\(Tharp, 2012\)](#). Clearly defining project requirements and objectives is fundamental to delivering a quality project. Business excellence and ecological sustainability must coexist in harmony, [\(Hediger, 2000; Hensler & Edgeman, 2002\)](#). This involves engaging stakeholders to understand their expectations and documenting clear specifications. According to the current trend, a good product or service should not only be economically feasible, helpful, and accessible, but also sustainable. In addition, a quality organization is one that values sustainability as a fundamental component of all of its operations, from ethical procurement to environmental effect. Management ideas like

Total Quality Management (TQM) have been influenced by quality and customer emphasis. TQM work done consistently has been shown to boost economic performance, (Hendricks & Singhal, 1997; Hansson, 2003; Wrolstad & Krueger, 2001). Total Quality Management views quality as generating value for consumers, society, and government through these three areas. This demonstrates how the quality management concepts and practices are pertinent to and helpful for the sustainability agenda for businesses and society as a whole. We derive that sustainable project management and project quality are interconnected and contribute has been very less effort in the past to outline the criteria for success, hence which resonates with our next hypothesis:

H4: Sustainable Project Management has a significant impact on Project Quality.

2.3.5 Project Quality has a Positive Relationship between Project Success

Quality is defined as conforming to a project's legislative, aesthetic, and functional requirements. Requirements can be simple or complex, and they can be described as a detailed description of the steps to be completed or in terms of the desired outcome (Hendricks & Singhal, 1997). However, if the requirements are sufficiently stated and the project is carried out in compliance with them, the project is said to be of a high quality (Wateridge, 1998). Hence, your team continuously provides high-quality products and services due to efficient project quality management. Project execution must adhere to the three constraints of time, money, and scope in order for the project to be considered to be of high quality (Ika, 2009). We may declare a project successful if it falls within the specified tolerance thresholds for each of these three dimensions. Olsson et al. (2016) suggested cost, time, and quality as the three success variables that ought to be mentioned in the description almost 50 years ago. Only two elements, time and budget, according to Adriana and Ioana-Maria (2013), who condenses that list and proposes doing so from the perspective of a consumer, are crucial. B. Turner (2002); Morris and Hough (1987), among many others, concur that money, time, and quality should be

considered as success criteria, but not entirely. According to a study, the concepts of quality assurance (evaluation of overall project performance), quality planning (identification of quality standards), and quality control (observing specific project results) are important for the implementation of quality management in project management (JM, 1989). The goal of quality management is to ensure that operations are properly managed and planned in order to achieve the required level of product quality (Yazici, 2009). There has been very less effort in the past to outline the criteria for success despite the fact that the reasons of project success and failure have been the topic of several research (Shenhar & Dvir, 2007; Wateridge, 1998). Since project success may be overly narrowly defined, (Linberg, 1999) even goes so far as to propose that a new theory of project success may be required. Success in project management is measured by the project management process, in particular by the project's timely, cost-effective, and high-quality completion. These three parameters describe the "efficiency of project execution" to a certain extent (Pinkerton, 2003). A project's failure might result from poor quality, which could increase expenses for the business.

H5: Project Quality has a positive relationship between Project Success.

2.3.6 Sustainable Project Management and Project Success

Project success is a multifaceted, arbitrary, and subjective term (Belassi & Tukel, 1996; Ika, 2009). Malik, Sarwar, and Orr (2021) suggested that Sustainable Project Management is a significant source of Project Success. (Adriana & Ioana-Maria, 2013; Carvalho & Rabechini Jr, 2017; A. G. Silvius & Schipper, 2015; Ebbesen & Hope, 2013; Khalifeh, Farrell, & Al-edenat, 2020; Martínez-Perales, Ortiz-Marcos, Juan Ruiz, & Lázaro, 2018; A. Silvius & Schipper, 2014; Yazici, 2009). In order to achieve sustainable results, the majority of businesses are matching the work assignments for their projects with sustainability principles (A. Silvius & Schipper, 2014; A. G. Silvius & Schipper, 2015; Aguilar-Fernández, Otegi-Olaso, Cruz-Villazón, & Fuentes-Ardeo, 2015; Shang, Low, & Lim, 2023). As with other

PM knowledge areas like scope and quality, the word sustainability may be used to describe a project or a product in the context of project management (Carvalho & Rabechini Jr, 2017; Rabechini Junior, Carvalho, Rodrigues, & Sbragia, 2011). There is a need for empirical study examining the connection between Sustainable Project Management and Project Success in poor nations (Stanitsas et al., 2021). With a few notable exclusions (e.g. Ullah et al., 2020; Malik et al., 2021) a thorough grasp of how sustainability is applied in the context of Pakistani project management and the extent to which businesses are adopting the Sustainable Project Management approach is lacking. In Pakistan's construction industry, Ullah et al. (2020) looked into Sustainable Project Management practices. The study's findings showed that while social sustainability is generally disregarded by construction enterprises, the environmental element is regarded as a significant problem. A. Silvius and Schipper (2014) describe a number of "impact areas" that serve as levers for the inclusion of sustainability consideration in projects.

One of these impact areas is project success. The most current project success reports (Meredith & Zwikael, 2020; M. Pinto et al., 2020) and models of project success (e.g. Shenhar & Dvir, 2007) tend to focus on a certain set of projects and stress certain unique project aspects that "drive" success. For their part, other models such those by (J. K. Pinto & Slevin, 1988) often fall short because they are too general and don't account for all the factors that contribute to a project's success. The success model of Meredith and Zwikael (2020) does not take sustainability into consideration. On the other hand, sustainability is a major theme of (Maltzman & Shirley, 2015) work. The majority of success models in use today still do not take stakeholder opinions and attributions into consideration. (Krejcie & Morgan, 1970; David, Hatchuel, et al., 2014), problems of timing (Shenhar & Dvir, 2007; Meredith & Zwikael, 2020), and sustainability considerations (Maltzman & Shirley, 2015; Carvalho & Rabechini Jr, 2017). The cost, and quality triangle were identified as the primary success criterion in a study of the telecommunications, information technology, and construction sectors in Norway and China (Mishra, Dangayach, & Mittal, 2011). Prior studies have largely concentrated on determining the direct connection between Sustainable Project Management and Project Success. (Mavi & Standing, 2018; Ebbesen & Hope, 2013; M. L. Martens

& Carvalho, 2016b; A. G. Silvius & Schipper, 2015; Rabechini Junior et al., 2011). However, it has not been able to pinpoint crucial ways to improve and solidify the connection.

To observe the association between Sustainable Project Management and Project Success, (Joslin & Müller, 2016) suggested including several moderating factors. There is plenty of potential for more study to acquire a better comprehension of the link between Sustainable Project Management and Project Success and the primary processes that effects this association (M. L. Martens & Carvalho, 2016b; Aarseth, Ahola, Aaltonen, Økland, & Andersen, 2017; Chofreh et al., 2019; Khalifeh et al., 2020; A. G. Silvius & Schipper, 2015). The conceptual model created in this study offers a more thorough knowledge of how sustainability consideration affects project management practices and is a crucial prerequisite for the much-needed incorporation of sustainability principles into project management. This takes us to derive the hypothesis of our study:

H6: Sustainable Project Management has positive impact on Project Success.

2.3.7 Sustainable Project Management Mediates the Relationship between Sustainable Development and Project Success

Ebbesen and Hope (2013) state that many practitioners view sustainability as a crucial element to take into account when designing and executing projects. An increasing corpus of research indicates a link between successful projects and sustainable project management (Adriana & Ioana-Maria, 2013; A. G. Silvius & Schipper, 2015; Carvalho & Rabechini Jr, 2017). Project success and knowledge of sustainability development are facilitated by sustainable project management. According to several research, successful projects are favorably mediated by sustainable project management (A. G. Silvius & Schipper, 2015). For instance, research conducted by M. L. Martens and Carvalho (2016a) used a sample of American and Brazilian businesses to observe the connection between sustainability and project performance.

The findings showed that sustainability is positively related to project success, and more businesses are incorporating sustainability strategies into their projects as a consequence. Without the team members having a solid understanding of what sustainability is and how to implement it, sustainable firms cannot succeed in their projects. The incorporation of sustainability practices and concepts into project operations may be encouraged by raising employee understanding of sustainability in the workplace. Academics in educational institutions have a duty to teach students about sustainability and sustainable development in their classes and other educational opportunities.

The inadequacy of current project management standards to resolve sustainability-related concerns should be the primary cause of the absence of a sustainable management strategy in reality (Eid, 2014). The relevance or level of acceptability of the economy, society, and environment, the three aspects or pillars of sustainability as well as other broad sustainability themes are researched and explored in these project-based organizations. Sustainability is defined as satisfying present needs without compromising the capacity of future generations. One of the biggest obstacles to project success is the absence of demand from clients and stakeholders (Wilson & Tagaza, 2006; Gan, Zuo, Ye, Skitmore, & Xiong, 2015; Heffernan, Pan, Liang, & De Wilde, 2015). Project customers typically compromise on quality and sustainability in order to save costs and expedite project completion because they are unaware of sustainability and so perceive it as a complex and ambiguous problem. To learn more about the connection between successful project completion and project sustainability management, participants from 200 initiatives were questioned by (Carvalho & Rabechini Jr, 2017). The results showed that project sustainability management has a positive and significant impact on the success of the project. For the purpose of answering the research question, "Does sustainability in project management give project success?"

M. L. Martens and Carvalho (2016b) also performed exploratory research." Experts in six different nations provided the data for collection. As a consequence, they identified crucial project management sustainability variables, which include economic, social and environmental aspects, and investigated the major effects of these variables on Project Success. Although academic study on sustainable

project management is still developing, most recent works focused on the phenomena of sustainable project management in the setting of the technologically advanced world. (Kivilä, Martinsuo, & Vuorinen, 2017; Stanitsas et al., 2021; Larsson & Larsson, 2020; Sabini & Alderman, 2021; Woźniak, 2021).

Sustainable project management has been viewed as a unique resource by businesses to assist and successfully finish the many stages of the project life cycle. It combines environmental, economic, and social factors (A. Silvius & Schipper, 2014). Businesses that better execute sustainable project management will raise people's awareness of project management, increasing the likelihood that a project will succeed. The following is a proposal we make in light of the debate above:

H7: Sustainable Project Management mediates the relationship between Sustainable Development Awareness and Project Success.

2.3.8 Project Quality Mediates the Relationship between Sustainable Development Awareness and Project Success

Higher levels of Sustainable Development Awareness led to improved Project Quality, which subsequently increases the likelihood of achieving Project Success (JM, 1989; Gartner & Naughton, 1988; Feigenbaum, 1999) all emphasized the significance of society related concerns as a factor of quality in their work on total quality management. According to some, Total Quality Management is continuously improved upon and evaluated, especially with the use of quality awards (Mcadam & Leonard, 2005). Continuous quality check results in better project performance. It is due to Sustainable Development Awareness which helps project teams understand and integrate sustainable practices into their project processes, resulting in higher Project Quality. Enhanced Project Quality, in turn, increases the chances of meeting project objectives and stakeholders' expectations, leading to improved project success (Zokaei, 2008) PRINCE 2, 2009 etc. largely concentrate on project life cycle procedures (Whitty & Schulz, 2007). It's important to note that the relationship between these variables may be influenced by various other factors such as project management practices, organizational culture, resources, and external

environmental factors. Additionally, the specific nature and context of the project, as well as the measures used to assess Sustainable Development Awareness, Project Quality, and Project Success. There is a need for a self-assessment instrument to gauge the level of citizen happiness as well as the caliber of the goods and services that public organizations are expected to offer to the community (Balci, 2012). According to Dianne and James, organizations who invest in quality programs are adopting a longer-term perspective of their systems and processes as well as their capacity to satisfy client needs in the future. A well aware project team can identify, monitor, and address quality related issues throughout the project lifecycle by implementing quality assurance practices, leading to higher levels of customer satisfaction and project success (Wilson & Tagaza, 2006). Project team must implement quality assurance techniques from the start of a project to establish robust processes, standards, and guidelines (Woźniak, 2021). As a result, a quality culture is promoted within the project team, promoting consistency and efficiency. Sustainable Development Awareness has an indirect influence on Project Success, mediated by the level of Project Quality. This highlights the importance of integrating sustainable development principles and practices into projects to enhance their overall quality and increase the likelihood of successful outcomes.

H8: Project Quality mediates the relationship between Project Success and Sustainable Development Awareness.

2.3.9 Sustainable Project Management and Project Quality Sequentially Mediate the Relationship between Sustainable Development Awareness and Project Success

Knowledge is necessary to advance from awareness to the use of sustainable development techniques, claims (Abidin, 2010). Understanding sustainable development enhances the environment in which initiatives are implemented. It encourages a comprehensive strategy that takes into account various points of view, encourages prudent resource management, and ultimately contributes to project success through improved decision-making, risk mitigation, innovation, stakeholder

engagement, long-term value creation, legal compliance, and quantifiable results. One of the biggest obstacles to project success is the absence of demand from clients and stakeholders (Wilson & Tagaza, 2006). According to a study by JM (1989), the concepts of quality assurance (evaluation of overall project performance), quality planning (identification of quality standards), and quality control (observing specific project results) are important for the implementation of quality management in project management. Integrating environmental, social, and economic factors into every stage of a project's lifetime has a substantial impact on sustainability. It encourages a comprehensive strategy that takes into account various points of view, encourages prudent resource management. Projects are planned and carried out with a focus on reducing adverse environmental effects, promoting social fairness, and maintaining economic viability when sustainability concepts are included.

There are several angles and topics that still need to be studied in the realms of sustainability, thus there is a great need for study in these areas. (Kass et al., 2017). Including sustainability in project management calls for a comprehensive approach to the project's content, targeted result, and quality requirements (Gareis et al., 2013). The success of a project is greatly influenced by quality. Customer satisfaction, stakeholder trust, effective risk management, on-time delivery, and cost control all result from high-quality projects. They establish a good reputation, guarantee long-term gains, and support a continual improvement culture. Higher levels of Sustainable Development Awareness led to improved Project Quality, which subsequently increases the likelihood of achieving Project Success (Gartner & Naughton, 1988). Quality also gives quantifiable measures of accomplishment and assures adherence to rules and regulations. The continual delivery of outstanding quality in both procedures and outputs is essential for project success. Since more than ten years ago, there has been debate about the usefulness of quality management in relation to sustainable development generally (Garvare & Isaksson, 2001).

H9: Sustainable Project Management and Project Quality sequentially mediate the relationship between Sustainable Development Awareness and Project Success.

2.4 Research Model

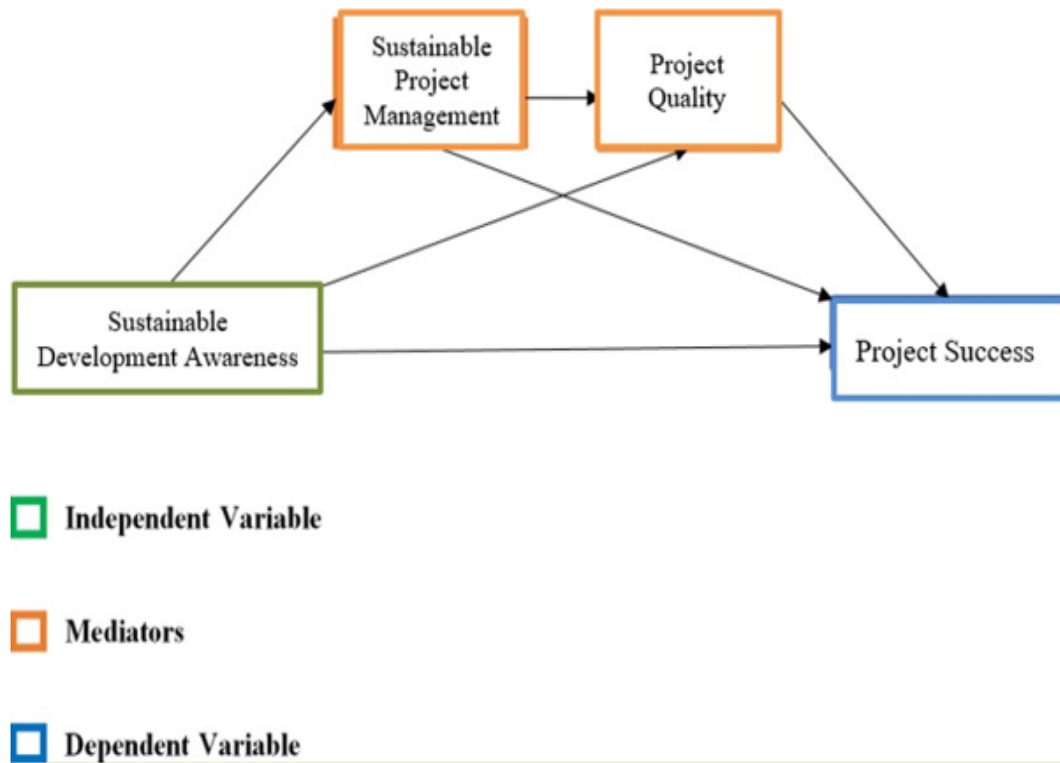


FIGURE 2.1: Research Model

2.5 Summary of Hypotheses

H₁: Sustainable Development Awareness has a significant impact on Project Success.

H₂: Sustainable Development Awareness has a significant impact on Sustainable Project Management.

H₃: Sustainable Development Awareness has a significant impact on Project Quality.

H₄: Sustainable Project Management has a significant impact on Project Quality.

H₅: Project Quality has a positive relationship between Project Success.

H₆: Sustainable Project Management has positive impact on Project Success

H₇: Sustainable Project Management mediates the relationship between Sustainable Development Awareness and Project Success

H₈: Project Quality mediates the relationship between Sustainable Development Awareness and Project Success.

H₉: Sustainable Project Management and Project Quality sequentially mediate the relationship between Sustainable Development Awareness and Project Success.

Chapter 3

Research Methodology

3.1 Research Philosophy

The technique of gathering data and information to do research is known as research methodology. This study employs the hypothetical deductive research method, which is established on the idea of discovering reality through data, in which prior work and accepted theories are used to support and illustrate the proposed hypotheses, which is then put to the test empirically to determine whether it is accurate. The hypothetical-deductive (HD) method is a cyclic pattern of reasoning and observation used to develop and evaluate suggested explanations (i.e., hypotheses and/or theories) of perplexing natural phenomena. It is sometimes referred to as the scientific process ([Lawson, 2010](#)). In accordance with this fictitious deductive approach, scientific experiments begin by formulating a hypothesis based on the available literature that maybe confirmed or disapproved when various statistical tests are run against the data for each item, which are used to evaluate the relative assertions. In the book, *Theories of Scientific Method*, [Nola and Sankey \(2014\)](#) says that sometimes the hypothesis is created to explain a fact or facts that are already known; it is then put to the test by drawing further conclusions from it. The suggested hypotheses are considered to be accepted if the results support it, otherwise it is said to be rejected, in accordance with the underlying theory. It is then suggested to examine how strongly competing hypotheses are verified by their predictions to compare the descriptive value of those hypotheses. Quantitative approaches are favored to reach a big population. Comparative

to qualitative research, quantitative research uses techniques including surveys, organized observations, and experiments (Coghlan & Brydon-Miller, 2014). To demonstrate the link between the variables employed in this study, a quantitative technique has been used to collect the data for the variable in this research. Quantitative research's goal is to provide knowledge and foster understanding of the social world (Allen, 2017).

The chapter covers the actions that must be taken in the data analysis process, which is a crucial stage in producing the findings. The material pertaining to the data collecting and analysis processes was covered in detail in this chapter. Through this method, the findings of our study are attained.

3.2 Research Design

The study, which was based on the deductive method, employed an altered survey to collect data, and the links between the independent variable, the dependent variable, the mediator, and the moderator were observed. For better understanding, a quantitative evaluation of the data was conducted.

In order to administer the surveys in the usual settings of their work atmosphere, the respondents were called to their places of employment. Because they weren't present, the research interferences had no effect on the study's conclusions. Researchers may opt to do qualitative or quantitative research, depending on the questions they are aiming to address. The current study is quantitative in nature because it relies on questionnaires to collect information from participants. To analyze the data, statistical programs like SPSS and others were employed.

3.3 Sampling and Population

3.3.1 Population

The method of taking a sample is frequently used to gather data and determine demographic characteristics. This investigation primarily focuses on Pakistan's

sustainable research initiatives. Due to the purely academic manner in which research projects are carried out across a range of areas where understanding of sustainable development is extremely important, the Pakistani research organization National Agricultural Research Centre (NARC) and Arid Agriculture University was contacted for this very purpose to obtain the necessary information about their completed/ongoing research projects. They frequently include sustainable approaches while creating new products. NARC and ARID university were gracious enough to enable this study and grant access to those who were interested in the topics that were chosen.

3.3.2 Sample and Procedures

Following the footprints previous studies, we have collect data using Snowball sampling technique because it's the most suitable way for data collection. It begins with one or more study participants. It then continues on the basis of referrals from those participants. With this sampling technique, a main data source names additional possible data sources who might take part in the research studies. A researcher can create a sample using this strategy only through recommendations. We drew our conclusion from the sample size of 385 respondents as sample size of about 385 will give us a sufficient sample size to draw assumptions at the 95% confidence level with a 5% margin of error, according to (Robert & Daryle, 1970). We calculated the sample size using Andrew Fisher's Formula, a sample calculation formula or sample size calculator or by putting values in sample size calculator in easycalculation.com. The respondents were specifically the projects employees who had a direct impact on the project performance, including the project managers, and project team members. However, support staff was excluded from this group. Almost 387 project managers and project employees were approached in total for data collection.

3.4 Unit of Analysis

The unit of analysis interprets which characteristics are required to be evaluated in current study from various individuals which have experience on different projects.

The unit of analysis is the level of aggregation used to describe the data collected during the subsequent data analysis stage. Our unit of analyses is an individual who is currently working or have done any sustainable project in the specified project-based organization.

3.5 Research Instrument

3.5.1 Sustainable Development Awareness

A 36-item scale was adapted from ([Atmaca et al., 2019](#)) for measuring Sustainable Development Awareness. Measures of Sustainable Development Awareness were developed by ([Terzi, Mustafa, ERGÜL, Ahmet, & Mehmet, 2019](#)). According to the study's theoretical framework, the three sub-dimensions of the Sustainable Development Awareness Scale are the economy, society, and environment. The scale's content validity was boosted by the scale's higher item count in this research compared to earlier scales. The environmental sub-dimension of the scale is measured by 14 items, the economic sub-dimension by 13, and the social sub-dimension by 9 items.

Compared to previous created scales, these items express the characteristics of these sub- dimensions in a more thorough and complete manner. Again, responses were tallied using a 5-point Likert scale methodology, with 1 denoting "strongly disagree" and 5 denoting "strongly agree." Questions were likes Economic development should be planned to prevent unemployment.

3.5.2 Sustainable Project Management

The 14 item Sustainable Project Management construct was derived from ([A. G. Silvius & Schipper, 2015](#)). These pieces were chosen because they represent pertinent literature that relates project management to sustainability issues. Questions were likes of Sustainable resources were used for the completion of project activities. Responses were recorded using a Likert scale of 1 to 5 with 5 representing great

agreement. This scale was chosen for our study because it incorporates the material already in existence and builds a link between sustainability and project management.

3.5.3 Project Quality

A 5-item scale which was used earlier by [Mahaney and Lederer \(2003\)](#), used to measure project quality. Once more, responses were documented using a 5-point Likert scale, where 1 represents strongly disagree and 5 represents strongly agree. Two of the inquiries used to determine this variable was Our quality team is continuously reviewing the ongoing project and Our quality team is 100% independent to review any ongoing project.

3.5.4 Project Success

The project management literature lacks a universally accepted method for measuring project success and current differences of opinion on foundation of project success criteria ([Ika, 2009](#); [Ngacho & Das, 2014](#); [Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2015](#); [Joslin & Müller, 2016](#)). To measure Project Success, constructs were adapted from ([Aga, Noorderhaven, & Vallejo, 2016](#)). The 14 elements that make up this project success metric encompass cost, time, client use, performance, satisfaction, and effectiveness. Each of these items was rated on a Likert scale of 1 to 5, with 5 representing strongly agree. Questions which were included were that the project outcomes were likely to be sustained and the project outcomes have directly benefited the end users, through increasing efficiency or effectiveness.

3.6 Timeline of Study

The collection of data was completed within 3 months. Data was gathered using a cross-sectional approach. One method of doing research is longitudinal, while the other is cross-sectional, according to ([Saunders, Lewis, & Thornhill, 2012](#)). Cross-sectional data gathering has a limited time frame, whereas longitudinal data

collection has an unlimited time frame. A cross-sectional approach was used due to limited time and resources. The data were gathered in 1 month for this study. The data that was used was taken from the project-based organization known as National Agricultural Research Centre (NARC) and Arid Agriculture University which is in Islamabad, Pakistan. The research study is time bound, so a cross-sectional method was used. However, this schedule could change based on variables like participant availability, data quality, and unforeseen difficulties encountered during the research process.

3.7 Descriptive Statistics

3.7.1 Gender

Out of 385 respondents, 167 were men and 218 were women as shown in Table 1 below. This information indicates that 43% of responders were men and 57% were women. The findings of these tests show that there were more female respondents than male respondents.

TABLE 3.1: Gender Frequency

Gender	Frequency	Respondent Percentage
Male	167	43%
Female	218	57%

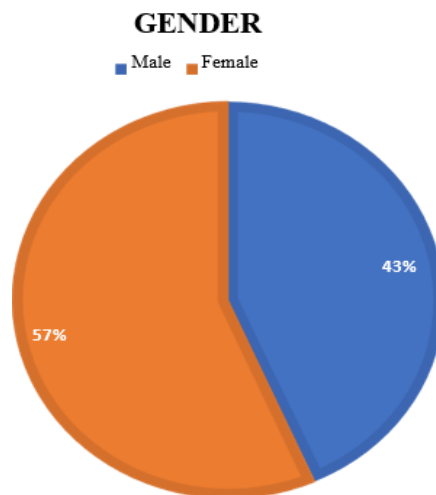


FIGURE 3.1: Gender Frequency

3.7.2 Age

25.5% of respondents were between the ages of 18 yrs. and 24yrs., 51.2 % respondents had age between 24-34 yrs., 12.7% respondents had age between 35 yrs. to 44 yrs., while 5.2% respondents had age between 45 yrs. to 54 yrs. and 5.5 % respondents had age above 55 years.

TABLE 3.2: Frequencies of Age

Ages	Percentage Age
18 yrs. - 24 yrs.	25.50%
25 yrs. - 34 yrs.	52.20%
35 yrs. - 44 yrs.	12.70%
45 yrs. - 54 yrs.	5.20%
55 yrs. or above	5.50%

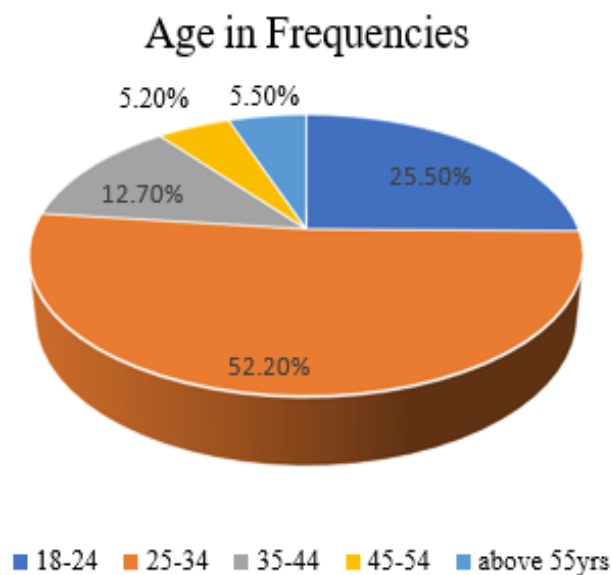


FIGURE 3.2: Age Frequency

3.7.3 Education

The current survey, however, included 56.6% female respondents and 43.4% male respondents. 3.6% of participants had a degree, which is the same as having completed 10 years of schooling, 26.5% had a degree equivalent to 16 years of education, 12.5% held a Msc level degree, 41.0% held Mphil level degree and 16.4% held a Ph. D. level degree.

TABLE 3.3: Respondent’s Education in Percentage

Education	Percentage Education
Matric	3.60%
Intermédiaire	0.00%
Bachelors	26.50%
M.Sc.	12.50%
MS/ M.Phil.	41.00%
Ph.D.	16.40%

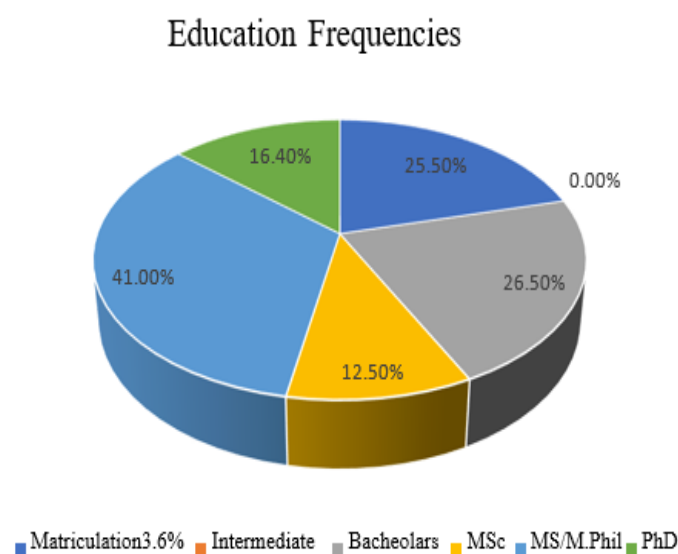


FIGURE 3.3: Education Frequency

3.7.4 Work Experience

65.7% of respondents have experience ranging from one to three years, 17.7% respondents had 4- 7 years’ experience, 8.1% had 8-11 years’ experience, while 5.7% respondents had experience of above 15 years.

TABLE 3.4: Experience Levels in Percentage

Projects Experience	Percentage
1 Year - 3 Years	65.70%
4 Years - 7 Years	17.70%
8 Years – 11 Years	8.10%
12 Years – 15 Years	2.90%
Over 15 Years	5.70%

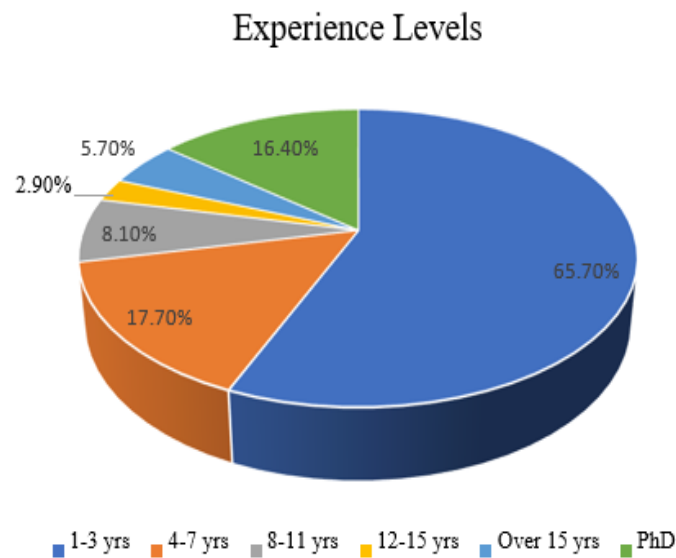


FIGURE 3.4: Experience Level

3.8 Measurement of Variables

TABLE 3.5: Instruments

Variables	Scale	Items
Sustainable Development Awareness	(Atmaca et al., 2019)	36
Sustainable Project Management	(A. Silvius & Schipper, 2014)	14
Project Quality	(Mahaney & Lederer, 2003)	5
Project Success	(Aga et al., 2016)	14

3.9 Reliability Analysis

According to [Field \(2005\)](#), Cronbach Alpha is the most reliable indicator of dependability scale or analysis. As can be observed from the findings, the Chronbach's Alpha value is over 0.6, which is considered to be within an acceptable range ([van Zyl, Neudecker, & Nel, 2000](#)). The dependability of a single construct was assessed and for Sustainable Development Awareness the reliability was 0.78,

sustainable project management and project quality presented a reliability of 0.73 and 0.70 respectively. The reliability for the constructs of Project Success is 0.71.

TABLE 3.6: Reliabilities

Variables	Items	Cronbach's Alpha
Sustainable Development Awareness	7	0.78
Sustainable Project Management	7	0.73
Project Quality	5	0.7
Project Success	5	0.71

3.10 Exploratory Factor Analysis

Exploratory Factor Analysis is usually used to uncover the factor structure of a measure and to test its internal reliability (Joreskog, 1969). Factor Analysis is used as a data reduction technique. It takes a large number of variables and reduces and makes it precise to represent them in different smaller factor, those factors are made up of the initial set of variables. EFA, has been used to find out the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990). Factor Analysis is a method for examining whether a number of variables of interest are related to a smaller number of unobserved factors. This is done by gathering variables based on inter-correlations among a set of variables. First EFA was performed to investigate the factor structure of the questionnaire and reveal the underlying latent factors.

Then we performed Varimax Rotation because it simplifies solutions and enhances interpretation of the results. It is a type of rotation intended to make each factor have a small number of large factor loadings and a large number of zero (or small) factor loadings. Thus, following a varimax rotation, each original variable tends to be associated with a small number of factors, and each factor represents only a small number of variables (Kaiser, 1970).

3.10.1 KMO and Bartlett's Test

The table below presents Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's test of Sphericity. KMO is a test conducted to examine the strength of the partial correlation (how the factors explain each other) between the variables. Henry Kaiser introduced a Measure of Sampling Adequacy (MSA) of factor analytic data matrices in 1970 (Kaiser, 1970). KMO values closer to 1.0 are considered ideal while values less than 0.5 are unacceptable. Bartlett's test of Sphericity is used to test the null hypothesis that the correlation matrix is an identity matrix (Bartlett, 1937). An identity correlation matrix means your variables are unrelated and not ideal for factor analysis.

From our result, we had significant level for the Bartlett's test below 0.05 suggest there is substantial correlation in the data. Variable collinearity indicates how strongly a single variable is correlated with other variables. KMO value of .756 indicates that the degree of information among the variables overlap greatly/the presence of a strong partial correlation. Hence, it is plausible to conduct factor analysis.

TABLE 3.7: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.756*
Approx. Chi-Square	
Bartlett's Test of Sphericity	1519.326
df	66
Significance level	.000**

3.10.2 Total Variance

Percentage of Variance gives the percentage of variance that can be ascribed to each specific factor relative to the total variance in all the factors. The Total Variance Explained for factors should have rotation sums of squared loadings to be greater than 60%. For the first four factors, variance is accounted for 66.34%. In the table the percentage of variance for each component before rotation and after rotation is mentioned. The eigenvalue represents the total variance explained by each factor. Factors having eigenvalues over one 1 are selected for further study.

TABLE 3.8: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of-Variance	Cumulative %	Total	%of-Variance	Cumulative %	Total	%of Variance	Cumulative %
1	4.099	34.161	34.161	4.099	34.161	34.161	3.052	25.435	25.435
2	1.5	12.5	46.662	1.5	12.5	46.662	1.735	14.459	39.894
3	1.348	11.229	57.891	1.348	11.229	57.891	1.623	13.527	53.421
4	1.014	8.452	66.344	1.014	8.452	66.344	1.551	12.922	66.344
5	0.885	7.378	73.722						
6	0.704	5.87	79.592						
7	0.629	5.239	84.83						
8	0.522	4.354	89.184						
9	0.389	3.244	92.429						
10	0.333	2.775	95.204						
11	0.324	2.701	97.905						
12	0.251	2.095	100						

Eigenvalue is significant at > 0

Extraction Method: Principal Component Analysis.

3.10.3 Communalities

In the communalities table, we check the quantity of original information present in each variable that can be obtained from a common factor. That is, the higher the communality the larger the amount of information that will be taken out. When EFA was performed for the first time, the extraction of 12 variables were below 0.5, they were removed, to make our model fit.

TABLE 3.9: Communalities

	Initial	Extraction
SDA3	1	0.528
SDA4	1	0.657
SDA5	1	0.64
SDA6	1	0.682
SDA7	1	0.641
SPM5	1	0.699
SPM7	1	0.78
PQ1	1	0.488
PQ3	1	0.671
PQ5	1	0.682
PS1	1	0.724
PS2	1	0.769

Extraction > 0.5

SDA= Sustainable Development Awareness

SPM= Sustainable Project Management

PQ= Project Quality

PS= Project Success

Extraction Method: Principal Component Analysis.

Chapter 4

Results and Analysis

4.1 Data Examining and Findings

Results from the current study are stated and elaborated in this chapter. Both narrative and tabular forms of alpha reliability, descriptive statistics, correlations, along with both mediator variables, the outcomes of a linear mediated regression analysis are shown. Discussions of the study's results, their theoretical and practical ramifications, as well as its advantages and disadvantages, as well as future research prospects, are also included.

4.2 Regression Analysis

To gauge the relationship between the independent and dependent variables, regression analysis was performed. The ordinary least square method was used for the regression analysis. The index for each variable was created using this procedure, which involved detailing several inquiries for each variable. It was used to the average calculation after the index creation. Both narrative and tabular forms of alpha reliability, descriptive statistics, correlations, along with both mediator variables, the outcomes of a linear mediated regression analysis are shown. Regression analysis quantifies the extent to which an independent variable is substantially and favorably correlated with a dependent variable. The values of the R- squared is presented in below table:

TABLE 4.1: Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.495a	0.245	0.243		0.39814

n =385, a= constant, SDA

4.3 Correlation Analysis

A formula is used to analyze data using the quantifiable approach of correlation, which assists to both define the relationship between chosen variables and also determine its nature. The correlation values are stated in table 8. The result indicates that Sustainable project management was positively correlated with a value of 0.59 and Project Quality is also positively correlated with Sustainable Development Awareness with 0.52 and Sustainable Development Awareness is also positively correlated with Project Success with a value of 0.49. Sustainable Project Management is also positively related with Project Success with a value of 0.49 and Sustainable Development Awareness is positively related with Project Success with value of 0.49. The significance threshold for each value is 0.01(2 tailed). Each construct's reliability is shown in parentheses.

TABLE 4.2: Correlation Analysis

	SDA	SPM	PQ	PS
1. SDA	1			
2. SPM	0.597**	1		
3. PQ	0.277**	0.525**	1	
4. PS	0.422**	0.541**	0.49**	1

N=385

SDA= Sustainable Development Awareness

SPM= Sustainable Project Management

PQ= Project Quality

PS= Project Success

Correlation is significant at the 0.01 level**

The correlation statistical approach, which deals with the strength of the association between variables using a formula, was used to assess the relationship between the variables. It measures the linear connection between the different variables. The findings of the bivariate correlation analysis were regarded as significant at $p \leq 0.01$. According to Table 9 given above, the Sustainable Development Awareness was significantly and positively related to Project Success 0.422, Sustainable Project Management and with Project Quality 0.525.

The first mediator Sustainable Project Management (M1) is positively correlated with Sustainable Development Awareness 0.597. It is a positive value which means that increasing Sustainable Development Awareness increases Sustainable Project Management. The second mediator Project Quality (M2) is also positively correlated with Sustainable Development Awareness 0.277 and contributes significantly towards Project Success 0.497. Sustainable Project Management (M1) is significantly and positively correlated with Project Success 0.541.

4.4 Mediation Analysis

Mediation Analysis enables us to investigate the effect of one or more independent variables on a dependent variable via a third variable called mediator. In mediation analysis, the mediator variable is placed in between independent and dependent variables. The mediator variable then serves to clarify the nature of the relationship between the exposure and outcome variable ([MacKinnon, Lockwood, & Williams, 2004](#)).

Variable X represents Sustainable Development Awareness that believes the direction of Project Success which is denoted by Y in the present dissertation. The variable X, Sustainable Development Awareness is an independent variable and is also called casual variable whereas variable Y which is Project Success, is called outcome or dependent Variable. The graphic below displays the unmediated model: Path c in the model above displays the overall impact. The effect of Sustainable Development Awareness on Project Success is mediated by Sustainable Project Management and Project Quality.

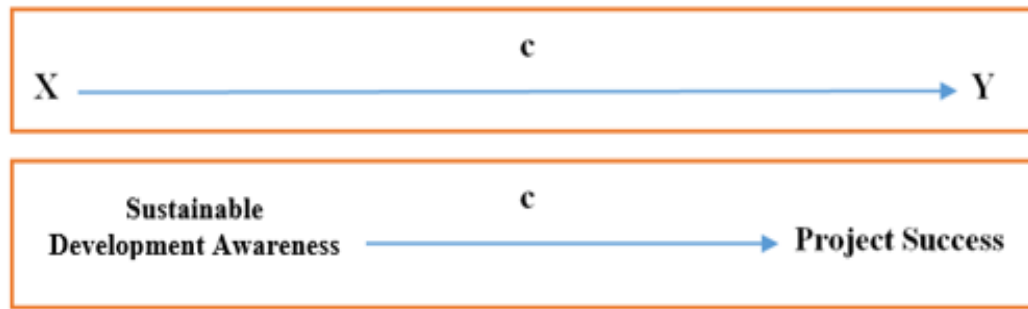


FIGURE 4.1: Unmediated Model

In the mediating model, the dependent variable Project Success is represented by Y, independent variable Sustainable Development Awareness is denoted by X. The first mediating variable, Sustainable Project Management is denoted by M1 and second mediating variable Project Quality is denoted by M2. The mediation takes place in the sequence stated i.e first by Sustainable Project Management M1 and then by Project Quality M2. Effect of one first Mediator Sustainable Project management M1 Only.

The mediating model with just the first mediator M1 is shown in **Figure 4.2** i.e. Sustainable Project Management.

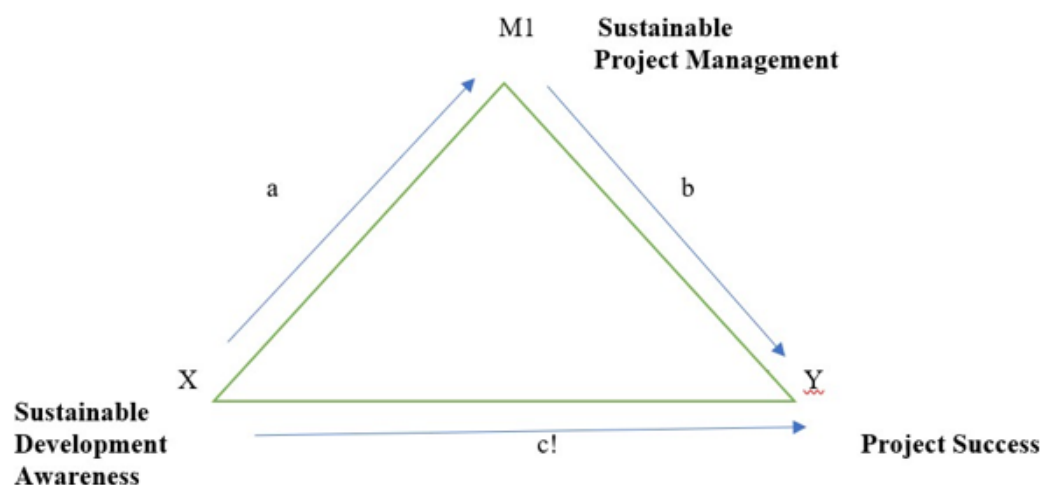


FIGURE 4.2: Mediated Model with one Mediator M1 (Sustainable Project Management)

Figure 4.3 displays the coefficients for the paths a, b and c! with just 1 mediator, M1. The scores of mediation test with one mediator of M1 (Sustainable project management) are shown in **Table 4.2**.

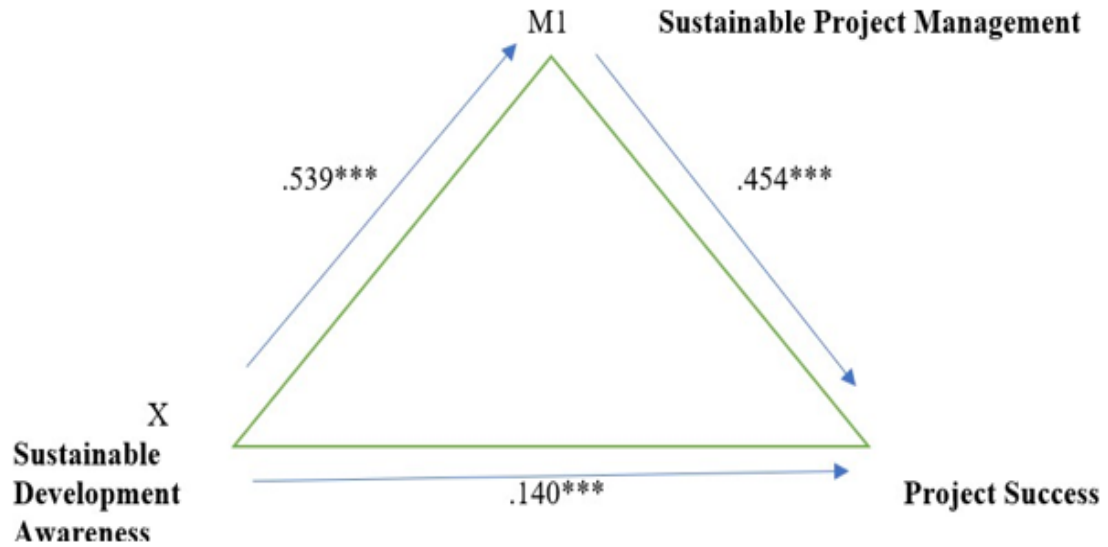


FIGURE 4.3: Coefficients of Mediated Model with only M₁

Table 4.2 demonstrates the mediation results with only Sustainable Project Management M₁ as mediator between Sustainable Development Awareness and Project Success.

TABLE 4.3: Effects of Only Sustainable Project Management as a Mediator (M₁)

Independent Variable	Effect of IV on M1	Effect of M1 on DV	Direct Effect	Bootstrapping Result for Indirect Effects	
				LL CI	UL CI
Sustainable Development Awareness	0.539	0.454	0.14	0.156	0.325

N= 385

*p<.001; ***p<.001

M₁= First Mediator, CI= Confidence Interval, UL= Upper Limit, LL= Lower Limit

4.4.1 Mediation Results with Process (Model 4)

Effect of one first Mediator Project Quality M2 Only Mediating model with only Second mediator Project Quality (M2) is shown in **Figure 4.4**.

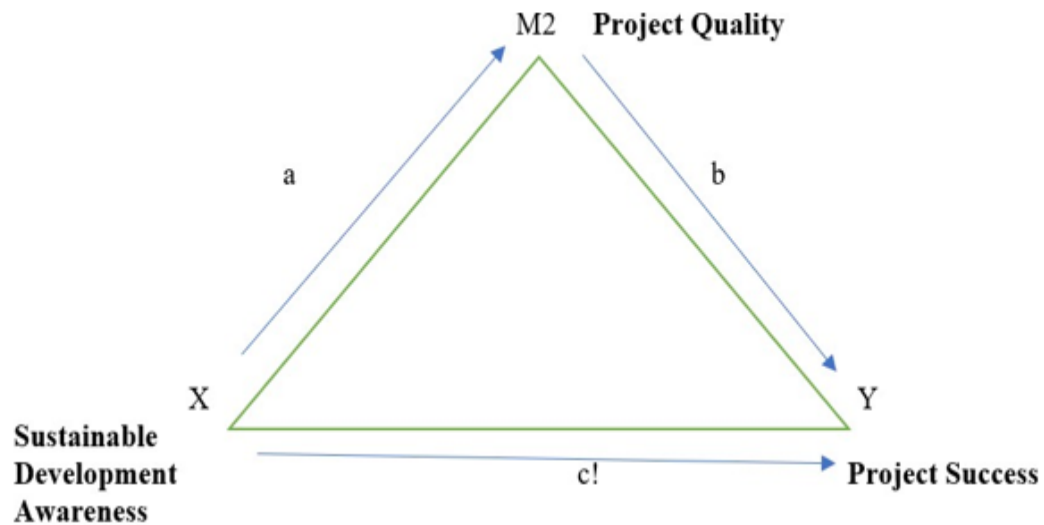


FIGURE 4.4: Mediated Model with Only M2 (Project Quality)

Figure 4.5 exhibits the coefficients for the paths *a*, *b* and *c!* with just 1 mediator, M2. The answers of mediation test with second mediator of M2 (Project Quality) are shown in **Table 4.3**.

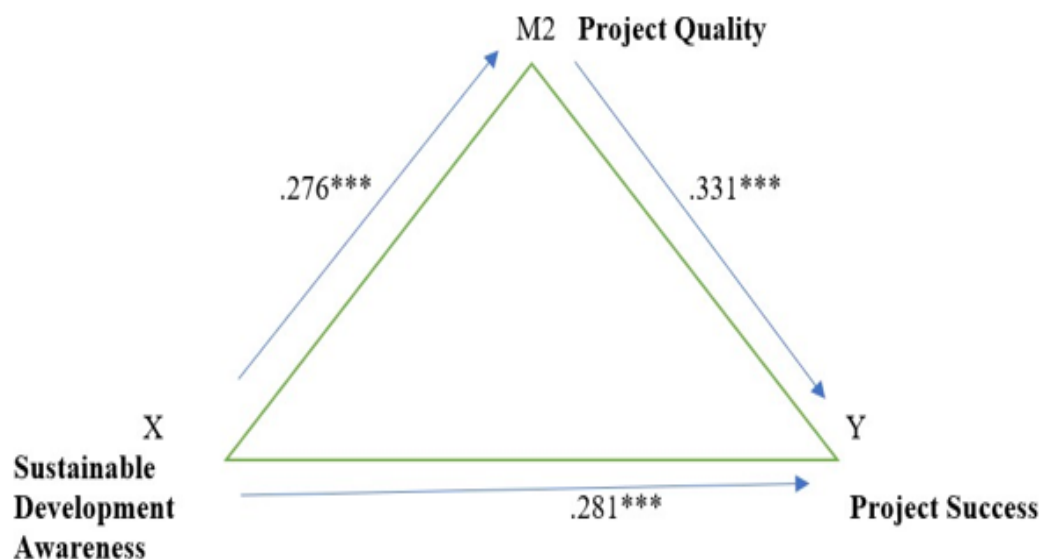


FIGURE 4.5: Coefficients of Mediated Model with only M2 (Project Quality)

TABLE 4.4: Effects of Only Project Quality as a Mediator (M2)

Independent Variable	Effect of IV on M2	Effect of M2 on DV	Direct Effect	Bootstrapping Result for Indirect Effects	
				LL CI	UL CI
Sustainable Development Awareness	0.276	0.3316	0.281	.486	.153

N= 385

*p<.001; ***p<.001

M2= Second Mediator, CI= Confidence Interval, UL= Upper Limit, LL= Lower Limit

The mediating model with both mediators M1 (Sustainable Project Management) and M2 (Project Quality) is shown in the following **Figure 4.5** below:

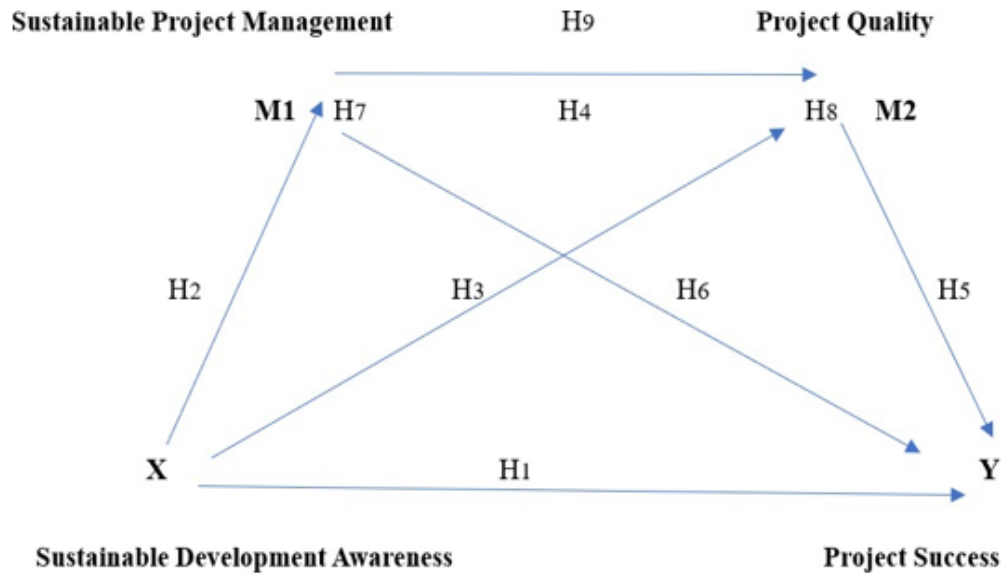


FIGURE 4.6: Mediated Model 1 with both Mediators

A. F. Hayes and Scharkow (2013), process technique was used to conduct meditational analysis. Model 4, which is provided in the documentation for the Process method (A. F. Hayes & Scharkow, 2013), was utilized to learn more about the mediation of a single mediator i.e first to test mediation of mediator Sustainable

Project Management (M1) alone between Sustainable Development Awareness (IV) and Project Success (DV) and secondly to test mediation of only Project Quality (M2) between Sustainable Development Awareness (Independent Variable) and Project Success (Dependent Variable) To assess the mediation of both mediators Sustainable Project Management (M1) and Project Quality (M2) in serial and in stated sequence between Sustainable Development Awareness (Independent Variable) and Project Success (Dependent Variable) Model 6 offered in Process procedure documentation was used (N. Hayes, 2013). Bootstrapping is a non-parametric approach which produces an estimate of the indirect effect with a 95% confidence range. If the confidence interval does not contain 0, then the indirect impact is substantially different from zero at a two-tailed p-value of less than 0.05. The bootstrapping strategy enables the researcher to examine mediation without the drawbacks of the preceding stepwise approach (Preacher & Hayes, 2008). The bootstrapping method's resampling with replacement technique also allows for the creation of a better estimate.

From this, we can see that the indirect effect via Project Quality and Sustainable Project Management on the relation between Sustainable Development Awareness and Project Success falls between 0.048 and 0.151. For these outcomes, 0 was not present in confidence interval so it means that the Sustainable Project Management and Project Quality mediates the relationship between Sustainable Development Awareness and Project Success. The direct effect of Sustainable Development Awareness is significant ($p < 0.000$), and the coefficient beta is 0.156 so it means that Sustainable Development Awareness and Project quality mediates the relationship between Sustainable Development Awareness and Project Success, so the hypothesis was therefore fully supported.s

4.4.2 Mediation Results with Process (Model 6)

Impacts of Sustainable Project Management (M1) as a Mediator between Sustainable Development Awareness (Independent Variable) and Project Success (Dependent Variable) existence of second mediator (M2) Project Quality is shown in table . In our mediation analysis, we can observe that effect of sustainable development awareness on project success which is our first hypothesis is supported as the sign

of LLCI and ULCI are positive and its effect is also positive. Our second hypothesis, which is sustainable development awareness has positive impact on sustainable project management is also supported as the values are positive and significant. As per our findings, our third hypothesis, which is sustainable development awareness has positive impact on project quality is not supported as the values of LLCI and ULCI are different, as LLCI has negative value and ULCI has positive value. The value of effect is also negative. Hence, we can say that sustainable development awareness has insignificant impact on project quality.

TABLE 4.5: Mediation Analysis Results (with both Mediators M1 & M2)

	Effect	Boot SE	Bootstrapping Result for Indirect Effects	
			LL CI	ULCI
Total	0.229	0.0464	0.133	0.315
Direct	0.156	0.046	0.065	0.246
Ind 1	0.152	0.041	0.069	0.23
Ind 2	-0.015	0.018	-0.06	0.012
Ind 3	0.092	0.026	0.151	0.048

N= 385, CI= Confidence Interval, UL= Upper Limit, LL= Lower Limit

Direct= SDA→PS

Ind 1= SDA→SPM→PS

Ind 2= SDA→PQ→PS

Ind 3= SDA→SPM→PQ→PS

4.5 Hypotheses Summary

TABLE 4.6: Hypotheses Result Summary

Hypotheses	Statement	Results
H1	Sustainable Development Awareness has a positive impact on Project Success.	Supported
H2	Sustainable Development Awareness has positive impact on Sustainable Project Management.	Supported
H3	Sustainable Development Awareness has a positive impact on Project Quality.	Not Supported
H4	Sustainable Project Management has a positive impact on Project Quality.	Supported
H5	Project Quality has a positive relationship between Project Success.	Supported
H6	Sustainable Project Management has positive impact on Project Success	Supported
H7	Sustainable Project Management mediates the relationship between Sustainable Development Awareness and Project Success	Supported
H8	Project Quality mediates the relationship between Sustainable Development Awareness and Project Success.	Supported
H9	Sustainable Project Management and Project Quality sequentially mediate the relationship between Sustainable Development Awareness and Project Success.	Supported

Chapter 5

Discussion and Conclusion

The consequences of the research in terms of management and academic associations were covered in the chapter that followed. The chapter also includes information about the chapter's advantages, disadvantages, and suggested next steps. The overall study's conclusion, which is based on the study, is contained in the final portion of this chapter.

5.1 Discussion on Results

The study's goal was to determine the effects of Sustainable Development Awareness on Project Success by attaining maximum level of Project Quality received through implementing sustainable practices in project management by spreading sustainable development awareness. This study examined the mediating impact of the conceptual model of sustainable project management and project quality in the specified sequence between the Sustainable Development Awareness and Project Success in the research and development-oriented project-based organizations in Islamabad, Pakistan. The result of this research has suggested that there is a significant correlation between the independent variable (Sustainable Development Awareness) and dependent variable (Project Success) even when mediated by the Sustainable Project Management (M1) and Project Quality (M2). The results of this study maybe used by policy makers and practitioners to execute projects efficiently and effectively since they give evidence from the Pakistani R

& D organization sector. Nine hypotheses were generated for this study, and all of them were validated by data and theoretical conclusions.

5.2 Managerial Implications

The recent study's data suggested that sustainable development awareness has noteworthy impact on Project Success, through the mediation of sustainable project management. It means that project success can be significantly increased when people are aware of sustainable practices, and they want to implement them.

This report also has management ramifications, advising project managers of research-oriented initiatives, particularly in the framework of Pakistan, to have a basic understanding of sustainable development methods in order to increase the likelihood that their projects would be completed successfully. Project Managers of project-based organizations particularly in the framework of Pakistan, need to define the notion of Project Success among the staff in order to facilitate the successful application of sustainable practices and the exploitation and execution of the principles targeted by sustainable development.

Managers must identify the unforeseen circumstances that donot have an influence on the adoption of sustainable practices inside their companies. After making a decision, the necessary steps must be taken to increase project success. Hofstede & Minkov (1991) asserts that an organization's culture has a key impact in its success. The practices that have a good effect on the project-oriented organizations be chosen by the management. For projects to advance and remain relevant in an environmentally responsible manner, managers must implement sustainable methods. They must also search for a thorough system for sustainable development awareness via sustainable project management sharing the correct knowledge, with right number of individuals at exact time to right individuals.

5.3 Limitations and Strengths

Both the study's merits and weaknesses are many, as it is not possible to cover every aspect and same is the case with my research study. The study's strength in

providing fresh perspective in the project management research field is. Since this study is the first to integrate sustainable project management and project quality as a mediator with this model, it provides fresh information to both scholars and practitioners. My research study has filled a research gap by making contributions to existing literature.

Some limitations associated with this study are related to the time and resource constraint. The study was restricted to a brief period of time.

- The study was confined to the approachable organizations since the academic calendar and the Master level semester schedule do not provide adequate time and resources to perform the study at a comprehensive level by analyzing numerous project-based firms in diverse cities and time delays.
- The instrument used for measurement, however despite this, it was a useful tool for measuring the independent variable, dependent variable, and mediator. Their dependability was validated by the Cronbach's alpha; however, they could have different effects depending on the age they were developed in and the atmosphere of the country under study.
- Furthermore, most of the project team members were busy with their project activities and because of which they were not ready to give data properly, most of the team responded to questions without reading the statements, resulting in low generalizability of the study as response rate was very low.

5.4 Direction for Future Research

The research was conducted to determine the relationship between sustainable development awareness and project success with a mediating role of sustainable project management and project quality.

- In future a study can be conducted with a different independent variable like environmental sustainability or ecological sustainability.
- Future research studies can be conducted with a different unit of analysis.

- Future studies should consider a larger sample size. A larger sample size could be used for this study's replication, and the study's effectiveness and generalizability might be reevaluated. Also, it will be helpful in giving more accurate results.
- While the current study collected data in a cross-sectional method, longitudinal studies should be conducted in the future.
- Future researchers can test these relationships in other cultures or countries.
- The current study used the cross-sectional method for the collection of the data; in the future research longitudinal study needs to be conducted.
- Future study can be conducted to check why impact of project quality is not significant.
- The same approach should be used for the upcoming research, which should be carried out independently in the private and governmental sectors. This might result in outcomes that are different from those of this study.
- The study's credibility will grow as a result of the replication of the linked study's findings. To confirm that the estimates were freely and bias-free provided by the respondents, the same or a comparable sample can be measured again in the future using the same or a similar instrument.
- Lastly, we analyzed our data using SPSS tool, in future research study can be conducted by using advanced tools for analysis like M Plus or Smart PLS which are used for analyzing complex models in detail.

By raising awareness of sustainable development, which may eventually make a substantial contribution to project success, this research has paved the way for future studies that will help construct a framework for sustainable development practices among various practitioners.

Societal scientists might use the current research study to focus on the societal factors that negatively affect the association between project success and awareness of sustainable development. The study's findings may be used in ongoing research

to help project sponsors choose the right framework for sustainable practices that strikes a balance between the behavioral and outcome-based approaches.

The study may be used by academics to assess the sustainable practices that work best in emerging economies, particularly in project-based businesses, in this era of the globalized economy. Making the right judgments at the right time is crucial and significantly more vital since it greatly affects the project's success. Failure to do so might quickly shift the project's course. Researchers can utilize the findings of the study as a starting point and as a benchmark for conducting follow-up experiments to see whether the same impact holds true in other social and environmental, or demographic circumstances.

5.5 Conclusion

The goal of the study was to investigate how knowledge of sustainable development affects project success in project-based organizations, with sustainable project management and project quality serving as mediators. It was deduced that the mediation of the project quality is not significant. We can add other variables related to project management and test their relationship with sustainable project management and project success in the context of Pakistan project-based organizations.

The study successfully illustrates how everyone has a unique sense of project success and views it from their own point of view. To standardize the project's performance, the specialists must develop uniform measures of units. The company needs to concentrate on sustainable work practices which improve the project success and ultimately protect our environment. Sustainable practices can help strengthen community bonds, improve quality of life and provide hope for a better future. Environmentally, sustainable practices can help protect natural resources, mitigate and adapt to climate change and promote biodiversity. The project-based organizations especially involved in research and development, need to focus on the spreading awareness of sustainable practices so that they can acquire sustainable environment. These organizations should advocate sustainability by engaging maximum possible project manager.

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Appendix-A

Questionnaire

Dear Respondent

Dear Respondent, I am a student of MS Project Management in Capital University of Science and Technology Islamabad. I am conducting research thesis on title: **Impact of Sustainable Development Awareness on Project Success: An Empirical Research through Sustainable Project Management and Project Quality.**

For this, I need your valuable feedback. You are requested to please spare few minutes. I assure you that this data will remain confidential and will only be used for academic purpose. It will not be shared with anyone. You need not mention

Sincerely,

Ifra Saeed,

MS Research Scholar,

Faculty of Management and Social Sciences,

Capital University Science and Technology, Islamabad.

Section 1: Demographics

Gender	Male	Female			
Education	None	Matric	Intermediate	Bachelor	MSc
	MS/MPhil	PhD			
Age (yrs.)	18 -24	25-34	35-44	45-54	55-above
Projects	01-Mar	04-Jul	08-Nov	Dec-15	Over 15
Experience (yrs.)					

Section 2: Sustainable Development Awareness

Please tick the relevant choices: 1= strongly disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree.

Sr. No.	Questions					
1	Individuals should procure in the direction of their desires and wishes without regard to their needs	1	2	3	4	5
2	We must use current economic resources with conservation, thinking about future generations.	1	2	3	4	5
3	Debt to be made for research and development should be made considering economic balances.	1	2	3	4	5
4	Green economic policies should be able to reduce poverty and differences in income distribution.	1	2	3	4	5
5	Economic development should be planned according to Green PM to prevent unemployment	1	2	3	4	5
6	Economic policies should be shaped by sustainable production	1	2	3	4	5
7	Economic policies should be shaped so as not to destroy natural resources.	1	2	3	4	5

8	Livestock, agricultural and industrial production should be focused on applications that will generate high profits in the short term (use of GMO products, hormonal animals etc.).	1	2	3	4	5
9	For economic investments, environments where life and property safety are provided must be established.	1	2	3	4	5
10	For economic development, non-production sectors should be emphasized	1	2	3	4	5
11	The production of high-tech products for economic development should be supported	1	2	3	4	5
12	Investments in agriculture and livestock sectors should be supported for economic development.	1	2	3	4	5
13	Research and development (R\&D) studies for economic development should be supported.	1	2	3	4	5
14	Equal opportunities should be offered to individuals in society (women/men, rich/poor, race/religion etc.).	1	2	3	4	5
15	For all individuals in society, environments should be created to enable the individual to learn life-long	1	2	3	4	5
16	Individuals should be provided with integrating and enhancing social services (such as nurseries, shelter homes, social assistance foundations etc.).	1	2	3	4	5
17	Access to education and health services should be provided to all individuals in society	1	2	3	4	5
18	Individuals should be provided with environments where they feel safe while living	1	2	3	4	5
19	Interaction of cultures in society should be supported and developed	1	2	3	4	5

20	The society must take responsibility to keep the well-being of individuals and families above the minimum	1	2	3	4	5
21	Urbanization (city, town, etc.) should be to protect the soul and body health of the society	1	2	3	4	5
22	The work of governmental and non-governmental organizations involved in activities for the sustainable environment should be supported	1	2	3	4	5
23	Any intervention that damages natural life (wrong use of pesticide, prohibited hunting, etc.) must be punished for the continuation of biological diversity.	1	2	3	4	5
24	The use of public transportation at short distances does not help to maintain atmospheric equilibrium	1	2	3	4	5
25	I think that vehicles with the least impact on degradation of ecological balance should be preferred when buying one	1	2	3	4	5
26	Energy saving products should be preferred in order to use energy sources for a longer time.	1	2	3	4	5
27	The use of renewable energy sources needs to be widespread to leave a liveable world.	1	2	3	4	5
28	Every individual has responsibility to protect existing resources (water, air, soil etc.) for future generations to survive ecological problems	1	2	3	4	5
29	Industrial establishments should take cautions to protect environmental health and prevent pollution of natural resources	1	2	3	4	5
30	Green areas can be dispensed with for urbanization and industrialization	1	2	3	4	5

31	In order to leave a greener world for future generations, responsibility for afforestation and the protection of the trees is the responsibility of each individual.	1	2	3	4	5
32	I think that each individual has responsibilities in the process of recycling wastes so that the raw material resources can be used by future generations.	1	2	3	4	5
33	Wastes should be separated according to their characteristics and reused, so that raw material sources can be used by future generations.	1	2	3	4	5
34	I think that nothing can be done individually to prevent global climate change	1	2	3	4	5
35	I think global warming poses a serious threat to the future of our world if cautions are not taken	1	2	3	4	5
36	I think that ecological footprint should be minimized for the continuation of the world's livability	1	2	3	4	5

Section 3: Sustainable Project Management

Please tick the relevant choices: 1= strongly disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree.

Sr. No.	Questions					
1	Within the project decision making, the environmental footprint was essential to take into consideration.	1	2	3	4	5
2	We spent a considerable percentage of project time and budget on health and safety practices.	1	2	3	4	5
3	Sustainable resources were used for the completion of project activities	1	2	3	4	5

4	We listened to other people's points of view, seeking to understand them.	1	2	3	4	5
5	Within the project decision making, the economic, social and environmental consequences were crucial for the project.	1	2	3	4	5
6	The amount of energy used in the project was essential to take into consideration	1	2	3	4	5
7	Within the project decision making, stakeholder engagement was essential to take into consideration.	1	2	3	4	5
8	We had knowledge about the community's opinion	1	2	3	4	5
9	Within the project decision making, health and safety issues were checked	1	2	3	4	5
10	The waste produced during project work was crucial to dispose of.	1	2	3	4	5
11	Within the project decision making, the carbon footprint was essential to take into consideration.	1	2	3	4	5
12	The sustainability of the project life cycle was important throughout the project	1	2	3	4	5
13	The procurement process was sustainable throughout the project.	1	2	3	4	5
14	Renewable resources were essential for project completion.	1	2	3	4	5

Section 4: Project Quality

Please tick the relevant choices: 1= strongly disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree.

Sr.No.	Questions					
1	Our system implementation 100% free from faults	1	2	3	4	5
2	We always adhere to the standards in implementing our systems	1	2	3	4	5
3	Our quality team is continuously reviewing the ongoing project	1	2	3	4	5
4	Our quality team is 100% independent to review any ongoing project.	1	2	3	4	5
5	The project we deliver almost meet user expectations	1	2	3	4	5

Section 5: Project Success

Please tick the relevant choices: 1= strongly disagree, 2= Disagree, 3 = Neutral, 4= Agree, 5= Strongly Agree.

Sr.No.	Questions					
1	The project was completed on time.	1	2	3	4	5
2	The project was completed according to the budget allocated	1	2	3	4	5
3	The project outcomes were used by the intended end users.	1	2	3	4	5
4	The project outcomes were likely to be sustained.	1	2	3	4	5
5	The project outcomes have directly benefited the end users, through increasing efficiency or effectiveness.	1	2	3	4	5
6	Given the problem for which it was developed, the project seems to do the best job of solving that problem	1	2	3	4	5
7	I was satisfied with the process by which the project was implemented	1	2	3	4	5

8	Project team members were satisfied with the process by which the project was implemented.	1	2	3	4	5
9	The project had no or minimal start-up problems because it was readily accepted by its end users	1	2	3	4	5
10	The project has directly led to improved performance for the endusers/target beneficiaries.	1	2	3	4	5
11	The project has made a visible positive impact on the target beneficiaries	1	2	3	4	5
12	Project specifications were met by the time of handover to the target beneficiaries	1	2	3	4	5
13	The target beneficiaries were satisfied with the outcomes of the project	1	2	3	4	5
14	Our principal donors were satisfied with the outcomes of the project implementation.	1	2	3	4	5

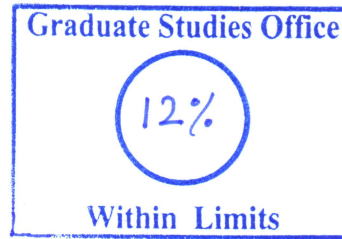
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