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Strategies Construction Project Managers Use to Create Environmental Sustainability in Construction Projects

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This is to certify that the doctoral study by

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Abstract

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Harold K. Branch

MS, Touro University International, 2003

BS, Chicago State University, 2000

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Senior construction project managers who fail to create strategies for environmental sustainability risk losing their competitive advantage in the business environment. Based on stakeholder theory, the purpose of this multiple case study was to explore the strategies that senior project managers use to implement environmental sustainability in their construction projects. Data were obtained from semistructured interviews with 4 senior project managers from 4 construction companies located in the midwestern region of the United States who implemented environmentally sustainable practices in their project processes. The data analysis process included methodological triangulation. The interviews were transcribed, interpreted, and coded to generate themes, which were validated through member checking and archival documentation. The centralized themes included (a) stakeholder engagement, (b) terminology, and (c) cost. Construction projects require the use of appropriate strategies for implementation of environmental sustainability in their project processes, lest project failure occurs. The use of stakeholder engagement principles, to strengthen environmental sustainability interests, creates shared concern and helps generate a roadmap for using environmentally sustainable business strategies. The implications for positive social change include the potential to affect business practices by contributing new knowledge to develop strategies that project managers can use for implementing environmentally sustainable practices. Environmentally sustainable construction practices will enhance the social practice of caring for the environment and create health and well-being.

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Dedication

I thank God first for providing me with the opportunity to complete this DBA journey. I dedicate this doctoral study to my parents, who dreamed of seeing me completing this degree. I also dedicate this research to my immediate family members, who supported me with the ideal atmosphere for completing this study as without their support, this study would not have been completed.

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Section 1: Foundation of the Study

In the construction industry, environmental sustainability has become more than only a global perspective and is now a business strategy that affects business leaders (stakeholders) and project managers (Lozano, Ceulemans, & Seatter, 2014). Many leaders in the construction industry struggle to successfully implement environmental sustainability in their project processes (Barkemeyer, Holt, Preuss, & Tsang, 2014). When attempting to use environmentally sustainable practices in a competitive manner, project managers can implement only those practices that stakeholders allow (Poveda & Elbarkouky, 2015). Based on the literature review, research on environmental sustainability use in the construction industry is minimal.

In this study, I used several concepts to explore the idea that social, environmental, and economic interests in environmental sustainability influence the construction industry. I included a qualitative method of research and a case study research design. Section 1 includes the background of the business problem, the problem and purpose statements, and research question. The study includes a review of the research design and conceptual framework. The study also includes a review of scholarly literature that encompasses viewpoints dealing with economic, social, and environmental concerns that directly affect the implementation of environmentally sustainable processes in the construction industry.

Background of the Problem

Environmental sustainability evolved from the Brundtland Reports, published for the 1987 World Commission on Environment and Development (Brundtland, 1987). This

publication contains the manuscript *Our Common Future* (Brundtland & Khalid, 1987), which Grigg (2014) asserted contains the original definition of *environmentally sustainable development*. *Environmental sustainability* is defined as developing a process for protecting the environment that will meet the requirements of the present without compromising the capability of coming generations to meet the needs of citizens (Grigg, 2014).

Environmentally sustainable development refers to a successful merging of the three pillars of corporate sustainability: economic, social, and environmental. Kumi, Arhin, and Yeboah (2014) stated that environmentally sustainable development is an idealistic development paradigm, yet since the mid-1990s, project managers in businesses, governments, and society have accepted environmental sustainability as the controlling principle for their future developments. Although some project managers have made progress toward developing environmentally sustainable methods to improve their business processes (Ponnappa, 2014), the concept of environmental sustainability remains elusive, and its application has been difficult for many project managers to successfully implement (John, Jaegar-Erben, & Ruckert-John, 2016).

Business leaders discuss environmental sustainability to understand both its meaning, and how to implement it, but they do not fully understand its terms (Barkemeyer et al., 2014). The meaning of environmental sustainability is elusive because of the many interpretations that exist, and the reality that many individuals treat environmental sustainability in a superficial manner (Slawinski & Bansal, 2015). Some business leaders have asserted that the conservation of nature is not a primary concern

(Carroll & Buchholtz, 2014). In addition, even though most business leaders understand the importance of an environmentally sustainable solution, they refuse to use environmentally sustainable options because they appear complicated, expensive, or risky (Paganetto & Scandizzo, 2016).

Developing strategies for implementing environmental sustainability can be difficult (Kim, Brodhag, & Mebratu, 2014), and current research does not include clear methods for developing effective strategies for environmental sustainability within the construction environment. It is therefore necessary to develop strategies business leaders can use to support environmental sustainability through the construction of energy-efficient facilities or the use of recycled materials to produce economic value.

Problem Statement

Construction companies that lack strategies for environmentally sustainable practices are at risk of losing their competitive advantage (Epstein, Buhovac, & Yuthas, 2015). By 2020, U.S.-based construction companies that do not implement environmentally sustainable strategies within their project processes will lose a share of the $190 billion a year in profit to their competitors within the construction industry (Lu, Cui, & Le, 2013). The general business problem that I addressed in this study was that construction companies in the United States are facing a loss of profit due to the lack of environmentally sustainable practices. The specific business problem that I addressed in this study was that some project managers in construction companies in the United States lack strategies to implement environmentally sustainable practices in project management.

Purpose Statement

My purpose in this qualitative multiple case study was to explore the strategies that construction project managers use for implementing environmentally sustainable practices. The targeted population was four project managers of construction companies located in metropolitan Chicago, Illinois, who successfully use environmentally sustainable practices in their businesses. The implications for positive social change include the potential to affect business practices by contributing new knowledge to create strategies that project managers can use for implementing environmentally sustainable practices. Environmentally sustainable practices will enhance the social practice of caring for the environment and create health and well-being for generations to come.

Nature of the Study

The research method for this study was the qualitative method. Researchers use the qualitative method to gain insight from the perceptions of participants and to explore situations based on participants' experience (Merriam & Tisdell, 2015). The focus of the study was to explore strategies from the perspective of senior project managers; therefore, the qualitative method was appropriate. The quantitative method was not appropriate because I did not test a theory or a hypothesis and did not collect numerical data for inferential statistical testing. A mixed-method study was not appropriate because I did not collect, analyze, or mix both quantitative and qualitative research (Yin, 2015).

The multiple case study design was the most appropriate design for this study. A qualitative case study design is a comprehensive exploration strategy in which

researchers explore a specific and challenging phenomenon within its real-world setting (Martens & Carvalho, 2016; Richards, 2014; Yin, 2015). Researchers who conduct analysis through a case study also conduct exploratory or explanatory research and ask *how* or *what* questions to comprehend the characteristics of real-life events (Richards, 2014). Researchers conducting explanatory research studies identify working links between events through time (Richards, 2014; Yin, 2015). I considered grounded theory, phenomenology, and ethnography designs for this study.

The focus of grounded theory is on systemically discovering theories within the data (Khan, 2014), which was not my main goal in this study. The primary purpose of phenomenology is to explore the human experience from the viewpoint of those living the phenomenon (Merriam & Tisdell, 2015), which was not my purpose in this study, because the goal was to explore strategies for implementing environmental sustainability in the construction project management environment. An ethnographic study is also not suitable, because I concentrated on studying an entire culture of individuals to gain perspectives from those who live in that culture and this study focused on project managers in the construction industry and not people in a specific culture (Merriam & Tisdell, 2015).

Research Question

What strategies do construction project managers use to implement environmentally sustainable practices?

Interview Questions

1. What do you understand “environmentally sustainable practices” to mean?

2. What strategies are you using to implement environmentally sustainable practices in your project development?
3. What methods did you find worked best for implementing environmentally sustainable practices in your project development?
4. What were the challenges when implementing environmental sustainability in your project processes?
5. What additional information would you like to add that we have not discussed, but is pertinent to successful environmental sustainability implementation?

Conceptual Framework

Stakeholder theory grounded the conceptual framework for this qualitative multiple case study. Freeman (1984) defined *stakeholders* as any group or individual, largely managerial, who can influence, or be influenced by the actions of an organization. Phillips (2003) extended the work of Freeman and included a conceptual framework of business ethics and organizational management that addresses moral and ethical values that identify model behavior in an organization.

Sustainability and stakeholder theories formed this study's conceptual framework, which was designed to increase the economic and environmental value of a business through stakeholder buy in (Horisch, Freeman, & Schaltegger, 2014). Three aspects considered by researchers to increase stakeholder interactions for environmental sustainability are (a) strengthening environmental sustainability interests, (b) creating a shared interest in environmental sustainability based on individual interest, and (c) empowering stakeholders to act as intermediaries for environmentally sustainable

development (Horisch et al., 2014). In addition, there may be a need to create training, guidelines, and value-based environmental sustainability for all stakeholders to increase the viability of environmental sustainability in construction projects (Horisch et al., 2014). Stakeholder theory was a suitable way to ground the study and to explore the perceptions and experiences of construction project managers regarding environmentally sustainable strategies.

Operational Definitions

Environmental sustainability or environmentally sustainable: The terms *environmental sustainability* and *environmentally sustainable* are interchangeable and are used to describe an environment under which all things can exist in a social and productive harmony that meets and fulfills socioeconomic requirements for the present and future (Lu et al., 2013).

Green washing: Green washing refers to disseminating misleading information to present an environmentally responsible public image (Vries, Terwel, Ellemers, & Daamen, 2015).

Project leader: A project leader is an individual responsible for leading and guiding individuals on a construction project (Ihuah, Kakulu, & Eaton, 2014).

Project manager: A project manager is an individual responsible for managing a set of tasks or activities on a construction project (Lu et al., 2013). Project managers face a variety of unique, unexpected, undesirable, and unpredictable risks and are the key to any project success (Hwang & Chen, 2015).

Strategies: A strategy refers to the creation, employment, and evaluation of decisions within a company that enables leaders to achieve their long-term objectives (Epstein et al., 2015).

Triple bottom line: The triple bottom line is a process of managing social and environmental risks, financial obligations, and opportunities. Triple bottom line contributes to the efficient practices of businesses by refining strategies for competition (Thabrew, Perrone, Ewing, Abkowitz, & Hornberger, 2017).

Assumptions, Limitations, and Delimitations

Assumptions

An assumption is an accepted truth that a researcher uses to frame their interpretations of the data and to determine what information is relevant to their findings (Corbin & Strauss, 2014). My first assumption was that at least four appropriate participants would be available to take part in the interviews. My second assumption was that participants would provide truthful answers, if they understand that their answers were to remain confidential. My final assumption was that conducting interviews provided an opportunity to explore common themes involving the implementation of strategies senior project managers practice, as well as the effectiveness of these strategies (Lu et al., 2013).

Limitations

Limitations are characteristics of design or methodology that affect or influence the interpretation of findings in a research project (Katz, 2015). The first limitation to this study was that the data that I collected may not have represented all construction

company project managers who use environmentally sustainable practices. The second limitation, as stated by Richards (2014), was that participants' responses, opinions, knowledge, experiences, and worldviews could limit the conclusions of a study, which in this study refers to variation in the quality of knowledge and experiences of available project managers. A third limitation was each project manager's interpretation of strategies, because these aspects vary from company to company depending on the individual construction company's capacity, culture, mission, and goals. The fourth limitation included a potential reluctance of the project managers to share trade secrets and they may have chosen to withhold information they thought gave them a competitive advantage in the industry. The final limitation was the ambiguity of definitions and standards in the construction and environmental sustainability environments. The interpretation of these definitions and standards are open to hidden biases from the project manager's background, experience, construction aptitudes, and as the organizations' goals, missions, and fluency in the construction environment.

Delimitations

Delimitations of a study are selections made by a researcher that describe the boundaries of the study such as (a) things that the researcher is not doing and why the researcher has chosen not to do them, (b) literature that the researcher is not reviewing and why, (c) the population that the researcher is not studying and why, and (d) the methodological procedures that the researcher is not using and why (DePoy & Gitlin, 2015). The first delimitation in this study was that it included only project managers in senior leadership positions. The second delimitation was the small sample size; a larger

sample adds extra time and costs. The third delimitation was the population of the geographical location, which for convenience was restricted to metropolitan Chicago, Illinois. The fourth delimitation was the use of nonprobability sampling to select participants, which meant the results were not transferable to a larger population.

Significance of the Study

This study is valuable to business practice in construction because the abundance of data explored can guide business leaders to initiate environmentally sustainable practices. Project leaders in construction recognize the need for environmentally sustainable practices, yet many do not understand how to convince business leaders of the importance and practical implications of these practices. As stated by Kim et al. (2014), environmentally sustainable practices provide a business model that ensures a stable and valuable ecology that preserves the welfare of societies. Waligo, Clarke, and Hawkins (2014) further explained that environmentally sustainable methods affect the environmental condition of an area and its people by increasing the quality of water, climate, and air. Although companies once considered corporate social responsibility (CSR) strategies superficial to their company's approach, today they are vital tools to ensure business relevance and sustainability.

Contribution to Business Practice

This study contributes to the effective practice of business by filling a gap between construction project managers and the implementation of environmentally sustainable processes and strategies that will have long-term effects for both the environment and the business. The strategies for implementing environmental

sustainability remain challenging due to the complexities of sustainability, its multilayered nature of difficult problem solving, and the complex nature of its incorporation into the construction environment (Lu & Zhang, 2016). In addition, the features of environmental sustainability in the business environment are hard to measure, because their arrangement is nonlinear in nature (Waligo et al., 2014). Despite these issues, business leaders consider strategies for environmental sustainability in the construction industry as a way to increase their business status, whereas failing to comply with such principles can negatively influence the continued success of the business (Slawinski & Bansal, 2015). Business leaders may use the results of this study as a model to guide their companies as they assimilate environmentally sustainable practices into their business culture (Galpin, Whitttington, & Bell, 2015).

Implications for Social Change

The implications for positive social change include the potential for construction project managers to embrace strategies for growth and competitiveness in the 21st-century business sector (Lu et al., 2013). The strategies found in the study may help validate environmental sustainability processes for business practices using the triple bottom line. This study may contribute to efficient business practices by refining environmentally sustainable strategies allowing businesses to successfully compete in the construction industry. The results of the study may contribute to positive social change by protecting the environment and its natural resources.

A Review of the Professional and Academic Literature

Writing a comprehensive review of a research topic by examining related literature involved developing a plan, obtaining the proper business orientation, and emphasizing relatedness to the research (Corbin & Strauss, 2014; DePoy & Gitlin, 2015). Literature reviews start with an exhaustive review of currently published papers on the research topic to provide new perspectives on the themes of the study (Brady & Davies, 2014; Corbin & Strauss, 2014). The literature review in this study involved a comprehensive evaluation of the Walden Library databases to find articles and seminal works that relate to environmental sustainability in the construction industry.

The literature review includes an analysis and synthesis of the literature in the context of a theoretical framework and provides evidence of the development of environmental sustainability and its importance in the construction environment. Searches yielded 137 articles, of which approximately 130 are relevant to the topic of study, excluding regulations and data. Of the 137 references, 128 (93.4%) were published between 2014 and 2018, and 119 (86.8%) of the references, including dissertations, were peer reviewed and published between 2014 and 2018. The literature review contains 99 peer-reviewed journal articles and dissertations, of which 95 (95.9%) had publication dates between 2014 and 2018.

The literature review is organized into themes that arose from a discussion about the different aspects of environmental sustainability in the both business and construction environments. The first theme that I discuss deals with business strategies, including a business's standpoints and concepts, triple bottom line, and implications and challenges

for the business. These strategies provide a basis for the correlation between environmentally sustainable practices and the improvement of both the business and protection of natural resources (Waligo et al., 2014). The next themes that I discuss are the evolution of sustainability, the evolution of project management, and environmental sustainability in the construction industry, where the principles of environmental sustainability place demands on the construction manager that makes instituting these practices more involved (Briere, Proulx, Flores, & Laporte, 2015). The following theme addresses the potential problems that arise from the ambiguity of environmentally sustainable terminology, which results from the multiple backgrounds of stakeholders. The review concludes with an explanation of stakeholder theory and how this theory relates to developing environmentally sustainable strategies in the construction industry.

The articles on environmental sustainability that I used within the literature review include an analysis of multiple sources of evidence from prior development of theoretical propositions. Where appropriate, a comparison of various points exists of view to support the relevance of the study. The primary research libraries and databases used included the Walden University Library, Mississippi State Library, Loyola University Library, Science Direct, Sage Premier, Google Scholar, ProQuest Central, Academic Search Complete/Premier, and Emerald Management Journals. The journal databases contained peer-reviewed articles in business, project management, construction management, and stakeholder management. To find appropriate sources, the search of academic literature was limited to include only online databases using keywords including *sustainability*, *environmentally sustainable buildings*, *project management*,

business paradox, *construction industry*, and *performance-based structures*. These keywords were combined with action keywords such as: *assessment*, *business models*, *elements*, and *value*, as well as variations of these words.

My purpose in this qualitative study was to explore the strategies construction that project managers use to implement environment sustainability. The construction industry is expanding, and Freeman (1984) noted in stakeholder theory that efficiency increases through innovation and sustainability. Important to note, however, is that when business leaders attempt to use environmentally sustainable practices to improve their competitive advantage, they can use the only methods or tools that are available for implementation (Poveda & Elbarkouky, 2015). Business leaders must be able to implement environmentally sustainable practices to meet current and future challenges present in the construction industry (Hwang & Chen, 2015).

Stakeholder Theory and Theory of Sustainability

Freeman (1984) introduced stakeholder theory in his book *Strategic Management: A Stakeholder Approach*, which was later expanded by Phillips (2003) in *Stakeholder Theory and Organizational Ethics*. In the work, Phillips (2003) provided a framework for business ethics, which addresses how the moral and ethical values of stakeholder theory interact with environmental sustainability. Stakeholder theory is largely concerned with the interest of the individual, which empowers project managers to act as intermediaries for environmentally sustainable development (Horisch et al., 2014; Miles, 2017). A second theory that contributed to this study was Loorbach and Wijsman's (2013) theory

of sustainability, which attempts to prioritize and integrate social responses to environmental and cultural problems.

O'Riordan and Fairbrass (2014) supported the conceptual framework of Phillips (2003) and Loorbach and Wijsman (2013) because the constructs of stakeholder theory are directly linked to environmental sustainability by creating an increase in the value a project manager places on the processes involved in their project. Horisch et al. (2014) support the two frameworks because they provide three focus areas that control a project managers' interactions with environmental sustainability. These focus areas include (a) strengthening environmental sustainability interests; (b) creating a shared interest in environmental sustainability, based on individual interest; and (c) empowering project managers to act as intermediaries for environmentally sustainable development. Waligo et al. (2014) stated that stakeholder theory and the theory of sustainability extend their views beyond maximizing short-term shareholder value, when the views on ethical issues do not appear to be conflicting but fundamentally interlinked, making stakeholder theory and the theory of sustainability similar by nature.

In contrast to stakeholder theory and the theory of sustainability is Flammer (2015) shareholder theory, which stated that businesses do not have any moral obligations or social responsibilities, and the primary focus should be on maximizing profit. It is important to note that shareholder theories do not include a holistic perspective that sufficiently explains the moral and ethical values involved in project implementation. In formulating their framework, Flammer neglected to understand the antecedents of sustainability, which include project managers, stakeholders, and CSR

(Heravi, Coffey, & Trigunarsyah, 2015). When it comes to stakeholders, Flammer's framework is similar to stakeholder theory, except that shareholder theory is more concerned with the problems that transpire when one individual represents another in business but has a different objective and/or holds differing viewpoints on vital business issues (Dedman et al., 2014).

As a conceptual framework, stakeholder theory serves as a tool that provides a comprehensive perspective on environmental sustainability. Freeman's (1984) intention for stakeholder theory was that it be used as a framework to examine stakeholders' interactions with companies. Phillips (2003) extended the framework to challenge companies to create and contribute to environmentally sustainable developments. Therefore, stakeholder theory works in conjunction with the theory of sustainability by addressing questions about durability of CSR within the business environment.

Sustainability and Business Strategy

In a global economy, energy efficiency is a significant factor in the quest to create and maintain a competitive business advantage (Mok, Shen, & Yang, 2015). Environmental sustainability as a business process is the foundation for low-cost business strategies that includes efficiency in every aspect of the planning procedures (Jiao et al., 2015). Stigka, Paravantis, and Mihalakakou (2014) stated that a company has to augment their environment with reliable resources and an environmentally sustainable energy system to achieve innovation and economic growth. Waligo et al. (2014) explained that a business, whose strategy includes solving environmental and social challenges, could benefit from the adoption of a second business strategy that not only meets the needs of

the company and its stakeholders in the present, but also protects, sustains, and improves the natural resources imperative to the future. However, many project managers still view environmental sustainability as a strategic challenge (Mok et al., 2015).

In project management, the financial, environmental, and social concerns are complex challenges when applied to the triple bottom line (Thabrew et al., 2017). The triple bottom line includes the social, environmental, and economic concerns of a business. CSR is one method of achieving environmental sustainability in operational construction costs (Slawinski & Bansal, 2015). Although many corporations focus solely on regulatory activity and investments, if they were to integrate CSR, they would see innovation and environmental sustainability emerge as core competencies throughout their business processes, as well as an improvement in their bottom line and corporate image (Glasgow et al., 2014).

Environmental Sustainability From a Business Standpoint

From a business perspective, environmentally sustainable construction is the practice of generating buildings using processes that are environmentally responsible and resource-efficient throughout the entire life cycle of a building. Environmentally sustainable building expands the classical building design considerations of economy, utility, durability, and comfort. Implementing environmental sustainability processes requires adequate resources to meet business goals and a clear understanding of roles and responsibilities across the business sector (Jiao et al., 2015). Understanding the need for natural resources is the responsibility of the leaders of the World Commission on

Environment and Development, which explains that economic development must meet the needs of both business ventures and stakeholders (Yang & Shen, 2014).

The viewpoint that many business leaders have regarding environmentally sustainable business practices is that their responsibility is to their business and not the fate of the planet (Kalamas, Cleveland, & Laroche, 2014). From a business perspective, it is simple and it is cheaper to buy products that will, in the long run, have a more negative effect on the environment than it is to buy products supporting environmental sustainability. A higher cost for the planet does not translate to a higher cost for the customer because it is not common practice for businesses to pay for damage their operations may have caused to the environment (Ali, 2014). It is difficult to measure the influence of a business' operation makes on the planet because no specific tools have been designed to determine this; therefore, environmental lawmakers are unable to fairly assign liability to any individual business (Slawinski & Bansal, 2015). In the end, the cost of environmental damage always remains external to the business sector (Ali, 2014).

Although the primary objective is to produce a business framework that brings together decision makers and those who implement those decisions to effect change, currently a lack of clarity exists with regard to environmental sustainability, which makes it difficult to employ policies and procedures aimed at protecting natural resources (Glasgow et al., 2014). It is important to note that business environments are multifaceted and evidence shows that dealing with environmental sustainability requires addressing a host of other issues before business leaders can implement appropriate environmental sustainability programs (Loorbach & Wijsman, 2013; Waligo et al., 2014). A single

example of an environmentally sustainable facility that encompasses all aspects of design, development, and use is nonexistent. Although scholars consistently research what is necessary for long-term global environmental sustainability, they fall short in determining exactly what is required in the construction aspect of the business sector. As a result, business leaders have limited points of reference when examining their options and making decisions on practices involving environmental sustainability in the construction industry (Glasgow et al., 2014).

Mok et al. (2015) claimed that the business aspect of environmental sustainability in the construction industry encompasses more than only environmental and social issues and must also provide continuous economic profit within the business sector. The focus of environmental sustainability in the construction industry is about the influence that operations have on the environment, but environmental sustainability also plays a role in determining future monetary gains.

The business industry is often seen as ambiguous because it only addresses the environmental effect of the resources it uses, which includes the product's life cycle, the removal of materials, and the destruction and recycling of these materials. (Wiedmann et al., 2015). Environmental sustainability in the business sector requires the cooperation of multiple entities to attain a single goal. When properly implemented in the project management process, environmental sustainability can influence and enhance the performance of the business.

Often in business, environmental sustainability becomes about the bottom line. Researchers have analyzed the value of environmental sustainability in a variety of areas,

including directions, revenues, share prices, and profits, and they have shown that environmental sustainability can pay off in many cases. Nevertheless, the strategies for using environmental sustainability should be less about how companies benefit, and more about how a course of action is either depleting, contaminating or sustaining natural resources (Robinson, Symonds, Gilbertson, & Ilozor, 2015). The literature on project management in the construction environment and how it relates to environmental sustainability comes from Wu (2014), who focused on relationships between environmental and financial prospects in sustainability. The financial prospects for environmental sustainability are profits that arise from the efficient use of materials and energy along with the integration of business values into a holistic package. Initial responses characterize many leaders in the business climate as resistant to change, with the majority of business leaders actively resisting any effort geared toward increased environmental regulations (Carter, 2014). A typical response from business leaders on stricter environmental regulation often includes trade-offs between a healthy environment and healthy financial growth, which usually never happens (Paganetto & Scandizzo, 2016). In most cases, business leaders view environmental sustainability as an obstacle to their economic growth.

Many business leaders believe that environmentally sustainable facilities are cost prohibitive and require a sizable investment (Smith, 2014). Environmentally sustainable construction costs include initial capital costs and short-term practice costs, which are often too high to justify the use of environmentally sustainable practices in a highly competitive market, despite the importance of protecting our natural resources (Paganetto

& Scandizzo, 2016). Hwang, Zhao, and Tan (2015) claimed that the additional cost of using environmentally sustainable construction materials is approximately 2% to 3% above the cost of conventional construction. For facilities to achieve the premium standard, the cost is approximately 15%, but the goal in most facilities is 12.5%. Smith (2014) estimated the upfront costs for a highly environmentally sustainable design could be anywhere from $1.50 to $3 per square foot and can also lead to up to a 14% reduction in energy costs. Project leaders usually hold costs to the lower end of the range, especially when building an environmentally sustainable facility is integral to the design and construction process from the outset, rather than introduced as an afterthought (Neumuller, Kellner, Gupta, & Lasch, 2015). Late considerations, which often stems from a client's belief that environmentally sustainable methods are more expensive than traditional construction, leads to delays in providing environmentally sustainable practices that can improve facility performance (Gan, Zuo, Ye, Skitmore, & Xiong, 2015).

The concern for many project managers in the construction industry is the life-cycle cost of environmental sustainability rather than the initial cost of construction. An engineer who is examining environmental sustainability may find it difficult to provide an appealing line-by-line cost analysis of a building because the engineer integrated the design for environmental sustainability solutions within the conception process, which contributes to how well the project is accepted by business leaders (Mok et al., 2015). Therefore, if a project manager provides environmentally sustainable construction according to stakeholders' cost expectations, conventional building practices need to be

examined to determine the most suitable manner of delivering the project (Heravi et al., 2015).

Determining the most cost-effective approach for environmentally sustainable construction is difficult, especially when dealing with the short-term costs associated with environmental sustainability (Paganetto & Scandizzo, 2016). In the past, project managers examined only the immediate costs of labor and materials, but when dealing with environmental sustainability project managers must now also consider life-cycle costs, such as maintenance, energy, water, waste management, and pollution, as well as climate changes, and the depletion of natural resources. When project managers try to compare conventional construction methods to those focused on environmental sustainability it becomes difficult to define the real costs of the project. Byers, Hall, and Amezaga (2014) showed that if current consumption trends continue through 2050 there will be a need for 2.5 times the natural resources available on the planet. It is important to note that the United States consumes nine times the world average, making the consumption of natural resources by the residents of the United States far greater than the rest of the world. Therefore, it is imperative that business leaders and project managers change their perspective on the necessity of environmentally sustainable construction.

From a business perspective, business owners need to work with project managers to determine what the cost difference is between environmentally sustainable and conventional construction. According to Kibert (2016), project managers must satisfy underlying questions regarding quality of life (purpose, community, well-being), leadership (collaboration, management, planning), resource allocation (materials, energy,

water), natural world (siting, land and water, biodiversity), and climate and risk (emissions, resilience).

Kibert (2016) discussed two methods to assess how much environmentally sustainable features will cost. The first method is to compare the value of the environmentally sustainable project against the original project budget and/or the original estimated cost of the project. There are two major problems with this approach, first, it assumes the initial value of the project is sufficient and it assumes that no changes or enhancements will be necessary. A second concern deals with projects whose project managers apply for the Leadership in Energy and Environmental Design (LEED) certification, but seldom provide the information necessary for meeting budget requirements. The range of reported costs usually runs at a no added cost to some benefit rate, which most frequently results in actual premium costs, nevertheless, this methodology is widely used and appears in many studies focused on analyzing the costs of environmentally sustainable projects

Rehm and Ade (2013) claimed that cost measurement when using environmentally sustainable methods is a challenge, as it is hard to gauge the equitability of the original budget when there are additional elements that may contribute to a project's budget performance. For example, the expense of individually added green features, such as comparing the building to its baseline, is a process that many project managers use for environmentally sustainable cost analyses. Such an approach is inadequate (Rehm & Ade, 2013), as individually priced elements do not determine a solution by integrated design, which makes it difficult to define added value. A second

example deals with the improvement of daylight in facilities through right orientation and the use of space planning. These adjustments tend to return positive feedback for environmental sustainability, because it views the improvements as a cost-effective addition to the baseline of the project. However, these adjustments do not reveal the design choices and subsequent trade-offs typical to the development and construction process, which could ultimately make the environmentally sustainable practice come at a premium cost.

The second method, project managers may employ is comparison of the cost of a population of environmentally sustainable buildings against the cost of similar buildings without the inclusion of environmentally sustainable elements. Kibert (2016) developed an approach that begins to eliminate some of the subjectivity involved when deciding what to build, as well as what it should cost. Kibert's (2016) approach focused on finding an adequate group of comparable buildings and then determining whether the buildings are comparable given the significant variations between them. Kibert's (2016) comparable building approach necessitates adjusting costs based on the location when determining a standard baseline. Because the comparison building approach puts a heavy demand on the gathering of data, many project managers refuse to use this method (Rehm & Ade, 2013).

This last approach has received the most criticism. Critics of this method say that attempting to compare the cost of a particular environmentally sustainable building, such as a school, with other buildings of comparable size and function in a different location provides little help in understanding the cost of environmentally sustainable design

(Rehm & Ade, 2013). Furthermore, they argue that the added cost impact of creating environmental sustainability may be small when compared with other building expenses, such as the cost of land and infrastructure (Kibert, 2016).

There is no single, comprehensive answer to the question of whether environmentally sustainable buildings cost the same as conventional buildings. Even though there is an agreement regarding the environmental and social benefits of environmentally sustainable facilities, there is not an agreement on the financial benefits. The general opinion, due to the lack of accurate and thorough financial and economic information, is that the introduction of environmentally sustainable construction practices will increase costs and reduce profits (Kibert, 2016). Environmentally sustainable buildings will incur a premium above the cost of standard construction but will also provide an assortment of financial and environmental benefits that conventional buildings do not (Kibert, 2016).

Project managers may examine the advantages of environmentally sustainable methods, such as energy savings, through a life-cycle cost methodology, not just using upfront or initial costs. However, most business leaders who examine the short- and long-term aspects of environmental sustainability methods focus more completely on short-term aspects. The assessment becomes focused on the economics of the project, such as discount rates, which are more likely to be valued in the short-term, rather than long-term issues, such as the social impact or environmental degradation of the project (Mok et al., 2015). Elements that lead to income consumption, and not capital gain, are often a concern in the business environment. While social and environmental impacts of a

project are not visible in the short-term, they can cause a decline in assets in the long-run. Environmental sustainability dictates that the natural capital should remain unchanged, which means that the source and capacity to absorb the by-product of the environment will have no ill effects. Furthermore, the removal of renewable assets should not exceed the level of renewal, and the renewal assets should not surpass the absorption capability of the environment when replicating waste (Jiao et al., 2015). Environmental sustainability is about behaving in a manner that improve lives and the maintains natural resources. Therefore, the organizational viewpoint needs to go beyond the short-term need for profits. Business leaders who focus only on short-term profits make decisions based solely on the bottom line, while those business leaders who incorporate environmental sustainability think about the long-term effects of their project (Glasgow et al., 2014).

Rauter, Jonker, and Baumgartner (2017) noted that environmental sustainability involves the application of several environmentally sustainable principles in business operations, including ecological sustainability, social sustainability, and sustained economic growth. Rauter et al. (2017) further noted that business leaders are beginning to include CSR in their decision-making process. Bocken, Short, Rana, and Evans (2014) recommended that project managers tackle environmental sustainability implementation in small segments to address the particular needs and requirements of the different business settings in the construction environment.

McKenzie, Bieler, and McNeil (2015) noted that businesses in different fields have varying practices when working to achieve their versions of sustainability. Many of

these practices have come from new ways of thinking about environmental concerns, for example, life-cycle analysis and preventive engineering, which have played significant roles in assisting businesses in moving toward more environmentally sustainable operations. Using environmental sustainability framework drives businesses toward preventive measures rather than relying on rehabilitation down the road. Weingaertner and Moberg (2014) point out that because of the business-individuality characteristic, a universal environmental sustainability definition is impractical, as it would not address all individual needs, priorities, and contributors of specific industries. These differences have kept project managers in the construction industry from considering the implementation of environmentally sustainable processes as an option. To understand and implement environmentally sustainable construction practices, it is vital that project managers realize environmental sustainability is necessary and must be properly addressed in order to ensure proper implementation. Although project managers understand that building environmentally sustainable facilities is a laudable act, efforts are not usually focused on environmental sustainability as developers are more often interested in building and selling, rather than building and operating. Environmentally sustainable building development is expensive, but the energy savings generated should ideally counter the additional costs incurred when making a building environmentally sustainable.

Concepts of Business Sustainability

The current concept of business sustainability arises from conversations that while different hold to the theme that social, environmental, and economic issues are competing

interests. According to Hashmi, Damanhouri, and Rana (2015) project managers must optimize social, environmental, and economic performance simultaneously if they would like to ensure both short- and long-term successes. However, to effectively implement environmental sustainability within the construction industry the practices must appeal to the bottom line of leaders in the business sector (Longoni, Golini, & Cagliano, 2014). Current concerns about environmental sustainability address the way organizing, producing, consuming, and living may have damaging effects on the future of natural resources, as trends show that in most cases business attitudes are not focused on environmental sustainability (Liebowitz & Liebowitz, 2015).

Stigka et al. (2014) claimed environmental sustainability is a useful but questionable concept as the primary focus of the concept deals with ideas that pertains to social justice and environmental care. The somewhat vague definition of environmental sustainability invites a debate on what concepts should be recognized as the responsibility of leaders in the business environment and what should be left up to project managers. Furthermore, the differing opinions between business leaders and project managers about what environmental sustainability means in practice, requires a dialogue regarding the operational and strategic priorities of the organization.

Creswell and Poth (2017) claimed interpretive research includes an analytical approach that discloses what environmentally sustainable practices will generate observable outcomes. Therefore, the primary task of an interpretive approach is to produce a description of the meanings and concepts used by project managers in an active construction environment. This approach attempts to acknowledge and

incorporate the different meanings held by various individuals involved and works to manufacture and sustain a sense of truth, particularly in the face of competing definitions of environmental sustainability (Waligo et al., 2014).

Sustainability Triple Bottom Line

Business leaders often utilize the triple bottom line to define sustainability, which is the process of managing social (people), financial (profit), and environmental opportunities against risk, as indicated in Figure 1.

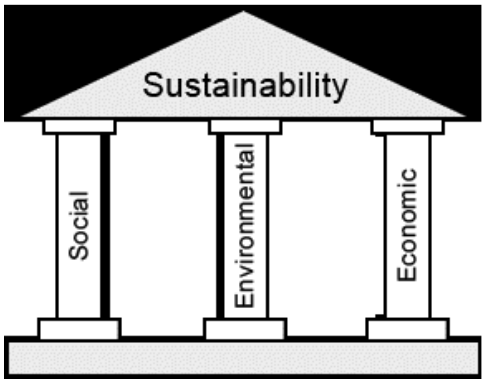

Figure 1. Example of how triple bottom line supports environmental sustainability.

Business leaders recognize that without profitability, the sustainment of care for the environment and people will cease. In the past businesses only had to account for their financial performance, while current business leaders feel increasingly pushed to show concern for three bottom lines. Thabrew et al. (2017) identified three key elements explaining how the components of a triple bottom line framework interacts when dealing with environmental sustainability. The first element focuses on integrating economic, environmental, and social aspects; the second on combining short-term and long-term aspects, and the third with consuming the income and not the capital.

Silvius and Schipper (2014) asserted that areas of social performance and reporting have a long tradition that is a key to the triple bottom line framework and sustainability. Polonsky, Kilbourne, and Vocino (2014) explained the balance of triple bottom line harmony is between social, environmental, and economic sustainability. The triple bottom line framework measures the social, environmental, and financial performance of a corporation over a period of time and then leaders of the company take into account the total cost involved in doing business. Virakul (2015) claimed the portrayal of pre-triple bottom line business activity as having a myopic focus on financial matters is a distortion of the truth. This argument is more an attack on the popularity of the notion of the triple bottom line rather than on its substance. The critique was primarily against the social component of the concept, although the same could be applied to the environmental aspect, which then makes the framework fall short of the integrative capacity of the components for practicing managers.

Environmental Sustainability Business Implications

If project managers are to implement environmental sustainability they must have a clear understanding of what elements are involved. The challenge is to realize the elements of environmental sustainability are not practical, but rather conceptual (Barkemeyer et al., 2014). Marcelino-Sadaba, Gonzalez-Jaen, & Perez-Ezcurdia (2015) explain that the naturally understood concept of environmental sustainability is difficult when expressed in concrete operational terms. This can be largely attributed to the fact that the connection between project management and environmental sustainability is still an evolving field of study, and the literature is scarce. However, researchers are

producing more studies each year (Barkemeyer et al., 2014), an important fact given that the focus of the first studies published about environmental sustainability dealt with defining terminology and researchers paid little attention to the implications of environmental sustainability in construction project management processes (Paganetto & Scandizzo, 2016).

In recent years, a new paradigm has begun to surface, in which construction strategies for environmental sustainability are in tune with societal efforts. As the new construction-as-society model emerges, it will require the efforts and ingenuity of the project managers involved in its conception. The model will challenge the current generation of project managers to apply their hard-won knowledge to new problems and to help lay the groundwork for future generations of project managers to utilize unique construction processes vital to reducing construction complexity (Portney & Berry, 2014). Project managers able to identify these hurdles and challenges will work with local legislature to shape the strategies for a new construction environment. The concept of environmental sustainability strategies within the construction industry is compelling, and if done right, both the construction industry and society will benefit (Zuo & Zhao, 2014).

When a project manager has the desire to construct green facilities they are often faced with a litany of challenges to overcome. First, rarely is there anything in the contract that addresses what is meant by "green" or which individual has the responsibility for ensuring that the facility meets environmentally sustainable standards. Secondly, it is of great concern in the construction industry as to what happens if a

project manager cannot meet green standards (Hwang et al., 2015). Thirdly, the construction industry's code of ethics requires project managers to discuss environmentally sustainable design approaches with stakeholders, which can further complicate their ability to implement environmental sustainability methods within the project. Finally, even when project managers strive for green certification the design team may face situations where environmental sustainability processes fall outside of their control. Although project design may meet green requirements, the certification process often falls to the Green Building Certification Institute, a third-party organization, and the design team should not be accountable for actions outside their span of control (Reith & Orova, 2015). While green-design practice is rapidly expanding in the construction industry, it is still new territory for most project managers.

Project managers are now trying to integrate environmental sustainability methods into their construction processes, because the use of environmental sustainability has produced positive outcomes for both clients and contractors. Studies have shown that environmental sustainability in construction uses 26% less energy, saves 13% on maintenance costs, generates less than 33% of greenhouse gas emissions, raises investment returns by 6.6%, has an additional 7.5% building value, and improves occupancy satisfaction by 27% (Cabeza, Rincon, Vilarino, Perez, & Castell, 2014). However, many project managers still refuse to adopt environmentally sustainable processes because of the initial cost. Because of the numerous benefits found when utilizing environmentally sustainable methods it is inevitable that new legislation will arise requiring those in the construction industry to implement these processes in their

work. Regardless of their personal views when new laws and requirements appear the construction industry must respond immediately to the changes (Hwang et al., 2015).

Governments, such as the United States, Japan, England, Australia, Germany, and Africa are using a mixture of mandates and incentives to strive for greener facilities in both the public and the private sectors (Hwang et al., 2015). Therefore, the necessity for environmentally sustainable design and construction is becoming more prominent. With green certification becoming a requirement for an increasing number of construction endeavors, project managers face a number of financial and regulatory risks if they fail to comply. For instance, in some areas, failure to meet green certification could result in numerous code violations or lead to a substantial loss of tax credits (Hess, Mai, & Brown, 2016). Unfortunately, concerns for the environment are still seen as a sales pitch, and legislation is being forced to become more stringent (Thomas, 2014). Governments are starting to impose more mandates on the construction industry, as their attention focuses on the wellbeing of the upwards of seven billion people on the planet that make environmentally sustainable construction necessary. Countries such as the United States, Japan, Germany, and England must overcome numerous obstacles as they endeavor to increase environmentally sustainable practices within the construction industry. These obstacles include: (a) fostering prosperity without compromising future generations; (b) increasing attention on environmental sustainability, so it can find its way into the mainstream; and (c) integrating environmental sustainability into projects and project management at a price that will not upset the current trend.

As a result of the information presented, there is an active interest in researching strategies that construction project managers use to implement environmentally sustainable practices. The literature reviews revealed discrepancies in both the environmental sustainability definitions and the pivotal roles business leaders play in answering the research question. Whether intentional or not, the effects of implementing environmentally sustainable practices still appear too complicated, too expensive, or too risky. Furthermore, an inadequate definition of environmental sustainability and lack of sufficient education among business leaders may deter construction project managers from implementing strategies needed for environmentally sustainable practices. Therefore, it is necessary to gain environmental sustainability support for the future development of energy-efficient facilities and the use of recycled materials to produce economic value. Once these ideals are realized, a situation will be created under which humans and the environment can exist in a productive harmony that fulfills social and economic requirements for future generations (Lu et al., 2013).

Challenges to Environmental Sustainability in the Business Sector

Business leaders experience many challenges when making the decision to use environmentally sustainable practices. The first challenge is there are too many metrics that claim to measure sustainability. Aspects of construction that business leaders normally measure are easy to incorporate, while concerns or goals without obvious metrics are difficult to implement in an efficient and timely manner. One reason environmentally sustainable initiatives are challenging to measure is that they often affect individuals and people at the macro level and therefore effects on the organization are

unclear (Mok et al., 2015). Frequently, the impact of environmentally sustainable initiatives is not immediately obvious and depend highly on not only who implements them, but also how they are implemented. Business leaders use a variety of metrices to measure sustainability, including the Global Reporting Initiative, the ecological footprint, and a life-cycle assessment. The use of numerous options often becomes more problematic and frequently fails to offer a simple solution (Ingwersen et al, 2014). Some of the questions that arise when examining sustainability metrices, are what makes one metrics better than another and how business leaders judge which metrics are most appropriate for their needs. Business leaders claim that it is important to know which environmental sustainability metrics are most meaningful so that they can efficiently integrate them with traditional business metrics.

Additionally, business leaders recognize that different metrics serve different purposes. Some metrics are only relevant to certain areas (e.g. products), whereas others focus on specific issues (e.g. manufacturing). The focus of some metrics is on carbons, whereas others focus on organizations. Some set common benchmarks, whereas others inspire leadership. These variations result in discord among the metrics, standards, and certifications involved in environmental sustainability (Thabrew et al., 2017). As a result, even prominent business leaders need guidance on which metrics are most suitable to help benchmark their commitments for environmental sustainability and identify areas that need improvement.

The second challenge business leaders face is that government policies and incentives are not always clearly aligned with environmental sustainability practice. The

government has at its disposal a variety of tools, such as taxes, regulations, and markets, to inspire businesses leaders to use environmental sustainability processes, but they are often piecemeal, poorly measured, or used ineffectively. Most business leaders want to do what is right, and properly outlined policies can help business leaders make appropriate decisions when it comes to implementing environmentally sustainable practices (Wu, Ellram, & Schuchard, 2014). When government policies are appropriately outlined business leaders can begin to incorporate long-term measures and innovations that will move them closer to the goal of total environmental sustainability. Furthermore, environmental sustainability policies that align will help foster the government's perspective on best practices and both current and future policy developments. It would also be beneficial to all sides to include business leaders in the development of these policies as it would help make the process proficient, effective, and reliable for both societal and business sectors (Meise, Rudolph, Kenning, & Phillips, 2014).

The third challenge facing business leaders is that very often they do not factor environmental sustainability into their purchase decisions. Many business leaders make decisions on what products to buy or how much energy to use that are sustainability-related trade-offs. Business leaders consistently trade-off social, environmental, or economic elements at various levels in favor of other elements (Beckmann, Hielscher, & Pies, 2014; Meise et al., 2014). For example, an individual agrees to incorporate cleaner energy into a new project, but then refuses to allow windmills on the property. It is imperative that business leaders understand how to make informed trade-offs regarding environmental sustainability. Therefore, understanding how environmental sustainability

is valued in the context of social, environmental, and economic factors, would help business leaders cultivate products that meet societal needs (Beckmann et al., 2014).

The fourth challenge to business leaders is that they do not know the best options for motivating their employees to undertake environmental sustainability initiatives. Many business leaders would like to pursue environmentally sustainable processes, but current business processes are primarily focused on the fiscal aspects of business and not the impact to the environmental (Rauter et al., 2017). Furthermore, many business leaders feel business mechanisms should allow leveraging of environmental sustainability initiatives and values for creating positive attitudes internally that will ensure progression toward environmentally sustainable goals. Business leaders also agree that it is easiest to generate ideas and start initiatives at the grassroots level (Yang & Shen, 2014); however, it is hard to sustain the momentum of successful innovation across an entire organization without commitment from all aspects of the organization (Mok et al., 2015).

The fifth challenge business leaders face is the belief that environmental sustainability does not fit into the business sector. Many business leaders question whether it pays to be environmentally sustainable, while public servants call them to defend and explain their environmentally sustainable activities (Reith & Orova, 2015). Current studies show that many business leaders do not fully understand or capture the value of sustainability-related investments (Meise et al., 2014). Many business leaders make their decisions based on the short-term impact to the bottom line, and often payback periods for environmental sustainability investments are long-term and therefore exceed the businesses requirements for project approval (Bansal & DesJardine, 2014).

This results in business leaders use intangibles to validate their environmental and social investments (Reith & Orova, 2015). It is clear that business leaders need to understand how to measure environmental sustainability returns in both short- and long-term metrics to justify their investment. Unfortunately, this will not happen until the value of environmental sustainability practices become part of the decision-making process and a part of the frameworks for profitability, only then will environmental sustainability gain acceptance as a legitimate value-creating activity (Waas et al., 2014).

The sixth challenge business leaders deal with is that they often have a difficult time discriminating between opportunities to protect the environment and those that threaten their business. Several considerations may threaten a business such as financial crises, climate changes, and local laws. The task of business leaders is to decide whether each issue is a significant opportunity or threat that deserves immediate attention and should be prioritized (Ali, 2014). Therefore, businesses leaders need direction on how to evaluate the severity of each issue, for both disclosure purposes and strategic planning. Because each element they face has intrinsic issues, business leaders need to have the correct tools for interpreting risk and then translating that risk into internal strategies that will benefit current and future projects (Hockman & Jensen, 2015).

The seventh challenge is business leaders have trouble communicating their accomplishments in a way that does not appear as greenwashing. Greenwashing occurs when organizational leaders disseminate deceptive information that presents an environmentally responsible public image. Therefore, statements made by businesses regarding environmental sustainability may appear to be reliable but sometimes lead to

suspicion or doubt about the accuracy of the information. Associated information is one method of dissemination and usually derives from organizations that make claims regarding size, structure, actions, or motivations (Vries et al., 2015). Even the most prominent businesses are cautious about publicizing their successes; as such, information can initiate public criticism for things that they may not be doing or not doing correctly (Bowen & Aragon-Correa, 2014). Due to the underlying mistrust, the public has regarding information business leaders need to know how to distribute information that is both accurate and clear. Sending the correct message is important, especially when dealing with CSR activities (Vries et al., 2015).

The eighth challenge project managers confront is that they need clear guidelines on how to engage key stakeholders from different cultures. Briere et al. (2015) stated that while some business leaders have positive experiences when interacting with different cultures, other businesses operating in the same area may not and it is imperative that when working in diverse cultures business leaders understand that culture's unique viewpoints. Working with varying cultures means differing interpretations of environmental sustainability development due to their inherent social, economic, cultural, and spiritual beliefs (Galpin et al., 2015; Wu, 2014). Project leaders who can understand the culture they are working in will ignite a positive image and create a strong relationship that harbors mutual respect and trust (Krechovska & Prochazkova, 2014).

The ninth challenge for business leaders is that there is a lack of standards for sourcing environmentally sustainable products. Business leaders want to acquire goods and services that are environmentally and socially responsible, yet, the procedures are not

always straightforward, and industry-specific knowledge for product comparison and practice is not always available (Pagell & Shevchenko, 2014). Identifying a set of best practice procedures for environmentally sustainable sourcing would provide business leaders with objectives for benchmarking, as well as direction for managing their supply chains. It would also provide business leaders the opportunity for displaying their involvement with environmentally sustainable practices. Thus, the creation of standards for acquiring environmentally sustainable products would help consumers see and understand a particular business's methods for instituting environmentally sustainable practices, as well as providing other industries with environmentally sustainable practices that they can emulate (Longoni et al., 2014). Environmentally sustainable sourcing is not just about sustainability; rather, it is more about helping businesses to manage and mitigate their risks. This element in the business line is clearly a case for societal well-being, yet many business leaders remain perplexed regarding how to handle their environmentally sustainable supply chains (Pagell & Shevchenko, 2014).

The tenth challenge is that minimizing financial risk is clearly an important factor in adopting environmentally sustainable practices. Novel business leaders are more resistant to adopting environmentally sustainable practices because they perceive them to be unfeasible or impractical. Many business leaders feel that a full transition to environmentally sustainable practices may not occur in their lifetime, and they doubt environmentally sustainable practices would be beneficial or profitable to their bottom line. In addition, those approaching retirement are unlikely to risk learning to apply new production practices, especially if there are additional costs (Liebowitz & Liebowitz,

2015). Finally, the organizations that take the lead for environmental sustainability are assumed to end up losing. This is untrue and business leaders who are trailblazers in any movement, including sustainability, receive some clear rewards. For example, a business whose leaders take the initiative will attract a new customer base that fosters loyalty between employees and stakeholders. Mok et al. (2015) point out that it is important to note that there are some risks connected with being on the cutting edge. For instance, business leaders who overinvest in the construction industry and yet never produce the anticipated rewards are often taken over by other companies that will then build on their idea. Being a leader means taking chances and moving ahead of the status quo, while recognizing that despite the inevitable criticism, both externally and internally, the potential rewards are great (Vries et al., 2015). The ability of businesses to profit from the elusive upside and deflect risks is vital for ensuring that there are always businesses willing to raise the standards.

Despite the current negative view on the environmental situation there are business leaders creating new ventures. There has been an increase in traditional businesses whose leaders are aware of the current conditions, and yet are starting to use fewer resources, strengthening their existing resources, and beginning to renew and reuse the products they sell (Barkemeyer et al., 2014). New business models are emerging that allow for the business to profit from other business's waste and business leaders are beginning to take advantage of flexible supply chain relationships that build on shared interest (Pagell & Shevchenko, 2014).

Mok et al. (2015) states that the current model for businesses in the 21st century focuses on the importance of environmental sustainability, yet the majority of emphasis is still on the bottom line. Scholars have analyzed the significance of environmental sustainability from multiple directions, and in some cases, environmental sustainability is shown to pay high dividends (Liebowitz & Liebowitz, 2015). If business leaders are going to overcome their resistance to change and begin to adopt more environmentally sustainable practices these practices must be compatible with the existing business processes (Paganetto & Scandizzo, 2016). Environmental sustainability is more than just a business-level problem, and leaders from a variety of societies and business schools are recognizing that the present course of production and consumption hurts the environment and is causing a drain on natural resources. Businesses produce products and services consumed by individuals around the world, but the vast number of resources extracted for society's consumption creates a stream of waste that ends up in the land, air, and water, which then compromises human health (Bocken et al., 2014).

In the future, businesses may no longer be able to separate from society. The business-as-society paradigm will necessitate the energies and creativity of businesses across many sectors of industry to apply their knowledge to widespread problems and require the next generation to brainstorm issues of extraordinary importance and complexity. The business leaders who recognize and address the difficulties and challenges will shape the new business landscape. The conception of environmental sustainability is irrefutably convincing and if done right, both business and society will benefit (Barkemeyer et al., 2014).

Evolution of Sustainability

In 1972, a British book called *Blueprint for Survival* introduced the normative concept that is now known as environmental sustainability. The book became prominent and continued to be the focus of the no-growth U.S. economy in 1974 (Okiwelu, & Noutcha, 2016). In a 1978 United Nations document, the normative concept encapsulated the term eco-development and later the term environmental sustainability started appearing in technology issues and Group of Seven summit meetings (van Genderen, 2014). The year 2017 was the 45th anniversary of the first laws governing the international environment, and 15 years have passed since the declaration of the World Summit on Environmentally Sustainable Development, in 2002. In 1972, the legendary Stockholm Declaration was released and 15 years later in 1987, the Brundtland Report was created, followed by the Rio Declaration on Environment, yet to date there has been no significant change in the way we interact with our environment (Brundtland, 1987; Grigg, 2014).

Executive Order 13693 is the plan for social environmental sustainability for the next decade and represents an attempt to cut the federal government's greenhouse gas emission by 40% and to increase renewable sources to 30% in the next 10 years (Golden, Handfield, Daystar, & McConnell, 2015). The concept of environmental sustainability is at the forefront of many venues, with each having valid claims for its use. Therefore, the search for a single definition is futile, and multiple meanings of environmental sustainability are tolerable if an individual can explain all of them adequately.

Environmental sustainability has been exploding since the late 1980s when original publications in the field began to pull in new authors to help intensify its interaction in a multitude of disciplines of study (Vealey & Rivers, 2014). Yang and Shen (2014) noted that the popularity of citing factors for converting to environmentally sustainable practices is also increasing, and astute management is necessary if environmental sustainability is to be successful in a business where size, age, and information sources are major factors.

Despite the increase in the call for environmentally sustainable buildings, the movement itself is only a little over a decade old, and the term *environmentally sustainable concept design philosophy* is even more recent. Since its advent, the concept has become an essential part of most corporations and universities. Although the ideas at times are unclear, especially when integrating theory and strategies in the global environment, the breakdown of its traditional concepts reveals the use of human, social, and ecological resources to develop public policies and engineering principles (Aier & Gleichauf, 2015; Vealey & Rivers, 2014).

Lim, Xia, Skitmore, Gray, and Bridge (2015) discussed the evolution of environmental sustainability from an environmental standpoint and emphasized not only its importance, but also the ways it relates to construction, which then provides the framework for managing the construction environment. Briere et al. (2015) noted that the evolution of environmentally sustainable principles places demands on the construction environment that make instituting its practices more difficult than they already are. General construction projects are already challenging because of the frequent demands

for face time with stakeholders and cost overruns that usually end up placing a negative stigma on project execution. Lu and Zhang (2016) felt the focus should be on leaders of groups in organizations, whose leaders already face extraordinary demands that require special abilities for engaging in complex problem solving.

Environmental sustainability has become a term used for environmentally sound practices in business. The inaccurate use of the term tends to lead environmentalists to advise abandoning its use altogether (Marjaba & Chidiac, 2016). However, the development of environmental sustainability is important, and lacking clear guidance, vague terms have become influential factors in strategies to implement environmentally sustainable practices.

Evolution of Project Management

The practices of project management have been around for thousands of years and date back to the Egyptian era. There are many theories about how project management has evolved through time. However, organizational leaders started formally using project management tools and techniques in their complex projects in the mid-1950s (Liebowitz & Liebowitz, 2015). Project management is a critical topic because all organizations have been or eventually will become involve with executing new projects. Projects are diverse, such as new product development, production lines, and constructing new facilities. In the 1980s, everything was about quality, in the 1990s, the emphasis was on globalization and in the early 2000s, the focus was on velocity. Even though the efficient use of project management processes is approximately 150 years old, many project managers still fail to use it when developing and designing current and future projects.

If organizational leaders want to maintain a competitive edge, they must continue to revolutionize their processes in a short time frame through interaction with cross-functional experts. The cross-function expert is also known as the project manager, who has become a powerful and vital tool to organizational success. Project managers have a keen understanding of project management processes and the competencies necessary to apply its methods (Tabassi et al., 2016). Unfortunately, some project managers are still not using project management processes because of vagueness in the terms involved and false information about cost analysis (Tabassi et al., 2016).

Project management is not a new discipline and has been around for thousands of years. Project managers were responsible for planning, coordinating, and constructing some of the earliest wonders known to humanity. The fundamental principles of project management have not changed throughout the history of humanity, regardless of the advent of technology. The elements of project management include: (a) managing resources; (b) maintaining schedules; and (c) coordinating multiple events and tasks, even though ancient and historical marvels of project management did not have schedule optimization (Liebowitz & Liebowitz, 2015).

In the 19th century, project management started to evolve because of a need for structure in manufacturing and construction (Ihuah et al., 2014). The years 1900 to 1950 were the birth of modern project management with them the advent of the Gantt chart (Martinelli & Milosevic, 2016). As the 19th century progressed, challenges from labor laws and regulations from the federal government began to hinder business leaders and in 1910 Henry Gantt, the founding father of modern project management, developed a chart

that embodied planning and control techniques. This chart was helpful for project managers because they could now monitor and control project schedules from start to end (Martinelli & Milosevic, 2016).

In 1911, Frederic Taylor published *The Principles of Scientific Management*, which he wrote based on his experience in the steel industry. The objective of the book was to provide unskilled laborers the opportunity to obtain the skills necessary to work on complex projects. Taylor was also able to determine the number of laborers management could use to complete a task that to ensure project completion and job security. Determining the number of laborers necessary to complete a project helped managers ensure they had the right number of workers to keep labor costs under control. Furthermore, Taylor advocated for incentive-based wage systems, as well as timesaving techniques (Wilson & Wilson, 2016).

During the years between 1950 and 1980, the program evaluation review technique and the critical path method (CPM) appeared. During the aftermath of World War II, project managers began to follow two logical paths for conducting and managing projects. The first path, the program evaluation review technique, analyzed individual tasks by providing a minimum amount of time for completion. Huemann (2015) shared that the second path, CPM, factored in all of the activities involved, such as the completion time portion, and how it relates to identifying inadequacies, to determine the steps necessary for completion, were examined. Unfortunately, CPM soon became confusing to many involved in project management.

During the growth of computer use in the early 1980s, software emerged that further simplified project management processes. Project managers could now connect and communicate with project team members easily. The technology improved in the 1990s, and the Internet became an advantageous asset. Computer technicians began to improve systems for project management processes, but the modern age of computers and project management started to transform in the late 20th century (Pollack & Adler, 2015).

Since 2000, the growth of computer automation has helped to revolutionize project processes. Computer-controlled options and the development of complex algorithms help project managers complete work faster and with fewer mistakes than ever before. The growth of the Internet enabled the development of web-based project management applications that use mobile devices, computers, and wide-scale of Enterprise Resource Planning (ERP) systems (Pollack & Adler, 2015). The development of project management competencies allows multiple project teams to define plans and manage projects by aligning tasks, schedules, and resources into one cohesive package, which leads to the cross-utilization of information for purposes of information sharing. Computer systems allow the processes of project management to take place in real time locally, nationally, or globally. Dispersed project team members can view and interact with the same updated information concurrently, including project schedules, threaded discussions, and other relevant project documentation (Bosch-Sijtsema & Henriksson, 2014). As a result, project managers can ensure project delivery occurs on time and within budget. Project management processes are vital to an organization because they

(a) help reduce overhead costs; (b) customize work environment to meet operational needs and style of project teams; (c) ensure project team members share accurate, meaningful, and timely information; and (d) make sure team members meet critical task deadlines (Tabassi et al., 2016).

Environmental Sustainability in Project Environment

It is important to note that today project managers are aware of the benefits of environmentally sustainable construction, as prominent politicians, scholars, and journalists focus on the effects of natural resource consumption and greenhouse gas emissions (Stigka et al., 2014). Problems arise when project managers do not begin to adequately invest time in understanding how to implement environmental sustainability in their project execution; they then have a difficult time completing the projects on time and within budget (Reith & Orova, 2015). The new dynamics of the construction industry, which include higher energy prices, increased costs of building materials, and regulatory incentives, are pushing the market for growth and expansion of environmentally sustainable facilities. When considering the rapidly changing demographics of the United States, environmental sustainability makes sense from a business standpoint, but if project managers are not completely aware of how to define the effects and use of sustainability, renewable and clean energy will be lost, ultimately affecting future generations (Pietrosemoli, & Monroy, 2013).

Project managers are conscious of all facets of a project's life cycle and understand that each project requires different approaches for successful execution. A successful project manager is heavily reliant on situational leadership, must remain

entirely invested in their project, and must keep all parties aware of the interdependent components of the project's life cycle. Therefore, project managers are responsible for ensuring project owners understand and are fully aware of all aspects of an environmentally sustainable project, including the cost, schedule, and quality of work.

When project managers fail to engage or maintain active communication with project owners' uncertainty about scope and procedures arises, which can increase project completion dates and result in cost overrun (Mok et al., 2015). For example, at the beginning of a project to build a facility designed to include wind turbines as providers of energy for a new computer rack system, the project manager was energetic about the new process for providing additional energy. Unfortunately, over time, the project manager failed to maintain contact with the project owner and contractor, the project started to fall behind, and the contractor assigned to the project began making decisions on the installation of critical components. Furthermore, the project owner began making decisions based on information from outside sources, which created additional barriers to project execution. A lack of stakeholder engagement or communication was clearly the major problem between the parties involved and was only rectified when the project manager set up a meeting with the project owner and the contractor to alleviate any further damage to project execution (Briere et al., 2015).

Environmental sustainability is vital to the future of the construction industry. The objective of environmental sustainability is to reduce the environmental footprint left by the construction environment through improving resource efficiency and raising awareness for environmentally friendly facilities. Project managers should support the

renovation of older facilities as a way to reduce the need for new environmentally sustainable builds. In other words, project managers should focus on improving rather than building new, when available use facilities for more than one purpose, and when appropriate build flexible facilities that are adaptable to new functions or communities changing needs (Mok et al., 2015). Project managers should strive to improve information and knowledge provided to decision makers and ensures that they have adequate resources on the environmental impacts of the facilities they are creating. Furthermore, project managers should remove barriers that shape the various sets of requirements concerning the environmental performance of facilities, as well as improve material efficiency, which includes preventing and managing construction and demolition waste (Kibert, 2016). These tasks require that project managers be familiar with what it means to be environmentally sustainable and how it applies to the construction environment. John, Jaeger-Erben, and Ruckert-John (2016) point out that although the problem may not lie wholly with the project manager, the current internal system dynamics has no respective set of procedures for using environmental sustainability.

Environmental sustainability has grown in both importance and recognition with project managers in the business sector (Loorbach & Wijsman, 2013). The pressure on businesses for project managers to expand their procedures for accountability by providing economic performance reports to shareholders and environmentally sustainable solutions performance reports to stakeholders helps provide a change in mindset for consumer behavior and corporate policies. Ponnappa (2014) points out that further development of the project management profession requires project managers to take

responsibility for environmental sustainability, regardless of the fact that barriers to environmental sustainability continue to exist, including the ability to deliver an environmentally sustainable project within acceptable cost constraints.

Seely, Diambogne Diouf, Malischewski, Vaikath, & Young-Burns (2013) posit that an additional reason many project managers fail to incorporate environmental sustainability in their project execution is the second-class management stigma. Project managers are organized, passionate, and goal-oriented individuals who have a keen understanding of projects, their strategic role, how organizations succeed, and change, as well as possessing raw ambition, keen insight, shrewdness, and intelligence. However, because of current policies and project dynamics, project managers seem to make it only to the threshold of their positions, with little to no power to act, which results in their role as a second-class manager. Project managers are change agents capable of making projects their own by using their inherent skill sets and expertise to inspire a project team (John et al., 2016), but when project managers are second-class managers, their ability to execute projects is significantly lower, which can then lead to project failure. In addition, when project managers work in the government environment, they encounter new circumstances from stakeholders that add to the complexity and challenges of their position (O'Riordan & Fairbrass, 2014).

One of the common signs that an organization is using second-class managers is a lack of commitment to the established policies and practices designed for project management. This familiar pattern often involves being stuck in a staff role that initially has broad assignments, but quickly becomes a dead end (Armstrong & Taylor, 2014).

O'Riordan and Fairbrass (2014) states that project managers should not make any decisions unless fully endorsed by the stakeholders. Although many organizational leaders are attempting to combat this notion, disconnects among management practices, compliance efforts, and accountability for programs are frequently occurring problems. An often-recognized result is the overshadowing of a project managers' position in the construction environment, despite the fact that organizational leaders understand that the continually changing environment of a project elicits the need for project managers. Hwang et al. (2015) further point out that project management makes sense from an organizational point of view because research has shown that project managers are vital to project success.

Environmental sustainability initiatives in project management are critical to the future of the construction industry. Project managers must be familiar with what it means to be environmentally sustainable and how it applies to the construction environment. Loorback and Wijsman (2013) pointed out that concepts of environmental sustainability have grown in importance and recognition with project managers in the business sector. Currently, the pressure on organizations is for project managers to expand their procedures for accountability by reporting their economic performance to shareholders and their performance level for environmentally sustainable solutions to stakeholders, which can provide a change in mindset for consumer behavior and corporate policies. Therefore, further development of the project management profession requires project managers to take responsibility for environmental sustainability, something Vice President Mary McKinley set forth at the 2008 World Congress of the International

Project Management Association by the International Project Management Association, when she stated that all project managers to start implementing environmental sustainability into their projects (Ponnappa, 2014).

The environment will not meet current construction demands unless more biodegradable products are utilized and limits are placed on the use of natural resources. Unfortunately, environmental, social, and economic pillars of environmental sustainability frequently portray themselves as equal, even though environmental sustainability is the primary context of the social and economic environment (Kumi et al., 2014). It is important to note that project managers have the capacity to exploit the capabilities of the environment, understand the segment's business drivers, and recognize that construction attitudes are foundations for defining environmental sustainability (Longoni et al., 2014). Yang and Shen (2014) stated that although project managers have the capability, the lack of environmental sustainability approval from stakeholders deters the implementation of environmental sustainability initiatives. This attitude challenges many project managers' fundamental goals for assuming that the current wisdom for environmental sustainability will directly affect economic developments (Yang & Shen, 2014). Lorek and Spangenberg (2014) questioned how we meet the needs economically, environmentally, and socially, to allow future generations to maintain and live in an environmentally diverse world. This question has since become the standard of environmental sustainability for project managers, which requires a development that meets present needs without compromising future generations' ability to care for their

needs. The issues project managers face for implementing environmentally sustainable construction consist of the following:

- Limitations of the world and the rising resource cost constraints.
- Organizations facing a growing number of stakeholders not concerned with environmental issues and corporate social responsibilities.
- Policies and local government regulations becoming broader and stricter on environmental problems.
- Rapid increases in media attention, environmental accountability, and transparency have formed a force that magnifies its impact in construction (Liebowitz & Liebowitz, 2015).

However, the main reasons project managers do not invest in strategies for environmental sustainability are

- The multitude of metrics in place to measure sustainability, even though they are not clear.
- Government policies need to connect explicitly to environmental sustainability processes.
- Project managers are not factoring environmental sustainability into their purchase decisions.
- Project managers do not understand how to motivate stakeholders to use environmental sustainability initiatives.
- Environmental sustainability does not neatly fit into a company's business processes.

- Some project managers have problems discriminating between the most significant opportunities and threats in the environment.
- Project managers have problems communicating their achievements and they want to avoid the appearance of greenwashing.
- Project managers need better procedures for engaging key stakeholders;
- There is no respective set of proceedings for using sustainability.
- Project managers who lead in the environmental sustainability frontier often end up losing (Hwang et al., 2015).

Problem With Environmental Sustainability Terminology

The business environment is experiencing a resurgence in leaders recognizing the power of environmental sustainability and the ways it can affect positive social and environmental change. Such change starts in college classrooms, moves to corporate America, and then to entrepreneurs in the developing world. In this way a movement is building and along with it a broad array of buzzwords and acronyms. Stakeholders from multiple backgrounds are now trying to wade through these tongue-tangling terms that will eventually shape the environment.

Environmental sustainability includes making proactive decisions that minimize harmful impact and maintain a balance between ecological flexibility, economic affluence, political integrity, and cultural vitality to ensure desirable conditions for all species both now and in the future. Individuals currently use environmental sustainability terminology for environmental practices, although they tend to use it in the wrong perspective (Marjaba & Chidiac, 2016). Environmental sustainability is influential and

widely used, yet many scholars criticize it as a failure because nobody can explicitly explain its terminology (McKenzie et al., 2015).

The notion of environmental sustainability has become a central topic among business leaders and society (Rauter et al., 2017). Reith and Orova (2015) explained that environmental sustainability is no longer solely about the environment, as its implication for progression requires a well-defined business strategy for application in the construction industry if it is to help maintain a competitive advantage (Barkemeyer et al., 2014). Therefore, if the terminology of environmental sustainability is not clear or adequately defined, project managers will not be able to understand business perspectives, which will ultimately lead to the non-incorporation of strategies for environmentally sustainable practices within the construction environment (Lu & Zhang, 2016).

Project managers who attempt to define "environmental sustainability" and the ways it fits into the business setting tend to struggle with both its definition and requirements (Stigka et al., 2014). Imran, Alam, and Beaumont (2014) claimed that recent surveys have indicated that organizational leaders have problems defining the terminology associated with environmental sustainability in a way that is relevant to their businesses. While environmental sustainability is on their agenda, it ranks as one of the last items of importance among other agenda items.

There are over 300 published definitions about the development of environmental sustainability, and all have different viewpoints based on competing interests (Mori & Yamashita, 2015), which make the primary problem deciphering which definition is most

applicable. Trico et al. (2016) noted that project managers should focus on clarifying the terminology of environmental sustainability from the standpoint of the construction industry's mission, vision, and culture when seeking to address the differences in definitions. McKenzie et al. (2015) explained that project managers must work with terminology that is clear, concise, and that captures the root of sustainability; they need become accustomed to the industry's verbiage, as well as their business's path and processes, to understand and evaluate where environmental sustainability fits in the business setting. Mok et al. (2015) claimed that project managers should concentrate not only on the implementation of environmental sustainability, but also on the ways that initiatives of environmental sustainability might influence the business environment. How successfully project managers implement environmental sustainability into an organization's processes will depend on how well the project managers perceive, value, and understand the terminology associated with it. Unclear terminology will impede understanding, which will make it difficult to determine what strategies should be utilized to implement environmentally sustainable practices in their construction processes (Petersen & Snapp, 2015).

Ambiguity of Environmental Sustainability Terminology

When project managers address environmental sustainability in an organizational manner, their processes must meet the strengths and weaknesses of the environment. When this is not done, project managers end up with a flawed approach or imprecise project execution (Rolstadas, Pinto, Falster, & Venkataraman, 2015). When incorrect methods are introduced project managers are forced to redefine processes and

expectations to meet a project's financial obligations (Mok et al., 2015). Consequently, the concepts of environmental sustainability and project management appear to be at odds with each other despite the fact that the objectives of both environmental sustainability and project management are to implement long-term environmental or societal sustainment that arises from business activities. The differences regarding environmentally sustainable development and project management principles appear in Table 1 (Ponnappa, 2014).

Table 1

Comparison of Project Management and Environmentally Sustainable Development Terms

Project management	Environmentally sustainable development
Short-term oriented	Long-term oriented
Sponsor-narrow stakeholder	Current and future generation
Deliverable/Result oriented	Life-cycle oriented
Scope, time, budget	People, planet, profit
Reduced complexity	Increasing complexity
Top-down decision making	Consensus/bottom up
Fact based	Precautionary
Linear and mathematical analysis	Systemic approach-ecosystem
Net present value-internal rate of return	Triple bottom line

The apparent cause for the ambiguity between project management and environmental sustainability depends on the source's background, culture, industry climate, and country's ambiance, which along with characteristics of environmental sustainability can be as elusive as they can be diverse (Galpin et al., 2015; Wu, 2014). Additionally, a project manager's background, experience, viewpoint, interpretation, and knowledge of what it means to be environmentally sustainable can also affect their

understanding of the definition (Marcelino-Sadaba et al., 2015). This divergence has stimulated a variety of environmental sustainability terminologies and elements across industries, which has left business leaders and those in academic circles seeking to give environmental sustainability a more business-environment focus (Lozano et al., 2014). For instance, Lim, Xia, Skitmore, Gray, and Bridge (2015) maintained that the concept of environmental sustainability is first and foremost an initiative and Stigka et al. (2014) agreed with Lim et al. (2015) that the nature of environmental sustainability has changed from its original environment-only focus. From another perspective, Slawinski and Bansal (2015) asserted that environmental sustainability refers to strategic management approaches to endure change and uncertainty. Wu (2014) stated that environmental sustainability is about harmony among different environments and industries, while Stigka et al. concluded environmental sustainability represents an attempt to address an organization's self-sufficiency and autonomy. McKenzie et al. (2015) deemed these terminology disagreements as natural and necessary to the assortment of industry objectives and diverse organizational cultures. The diversity of terminologies is daunting to environmentally sustainable initiatives, as without a concrete terminology, the planning and implementation of environmentally sustainable programs becomes hazy for project managers and policy makers (Gatti & Seele, 2014).

Transition and Summary

Section 1 of this study included an explanation of the nature of the study, research question, conceptual framework, and operational definitions. In section 1, I addressed the assumptions, limitations, delimitations, and significance of the study. I explained the

contribution to business practices, the implication for social change, and reviewed the professional academic literature, which provided the foundation for the study, along with an elaboration on how the content of the study fits the research. In addition, the review of the current academic literature expanded the issues of sustainability.

Section 2 includes a discussion on various aspects of the study, such as the role of the researcher, the participants, and the research method and design. The project section also includes discussions on the sample, ethics of the study, data collection techniques and analysis, and reliability of the study. In Section 3, I will address the findings, the application of professional practice, the implication of social change, recommendation for action, recommendation for further study, my reflections, and a conclusion.

Section 2: The Project

In Section 2, I will restate the purpose of my study and explain my role as the researcher. I will also identify the research participants, research method and design, population and sampling, ethical research requirements, data collection instruments, data collection techniques, data organization techniques, and the reliability and validity of the study.

Purpose Statement

My purpose in this qualitative multiple case study was to explore the strategies construction that project managers use for implementing environmentally sustainable practices. The targeted population was four project managers of construction companies located in metropolitan Chicago, Illinois, who successfully use environmentally sustainable practices in their businesses. The implications for positive social change include the potential to affect business practices by contributing new knowledge to create strategies that project managers can use for implementing environmentally sustainable practices. Environmentally sustainable practices will enhance the social practice of caring for the environment and create health and well-being for generations to come.

Role of the Researcher

The role of a researcher in a qualitative study is to explore and understand a phenomenon through personal interaction and effective listening (Brady & Davies, 2014). A researcher conducting a qualitative study can explore a situation through the personal experiences of those directly connected to the phenomenon (Morse, 2015). As the individual performing the research, I am familiar with the topic of this study because I am

the chief of engineering and a project manager for a major company with vast experience in project execution. My personal experience and business connections in the construction environment did not affect the selection of senior project managers to interview. To remain mindful of possible bias, I did not interview project managers I know or with whom I have a working relationship, because the individuals I work with or supervise are in other states or countries. I chose the southwest section of Chicago, Illinois, because of its proximity and the variance of its population. A researcher should have a clear understanding of the purpose of their study (Berger, 2015). Furthermore, as Creswell and Poth (2017) noted, researchers should not report nonexistent data as part of a study and should only focus on the need, which in this case means exploring environmental sustainability strategies for project managers in the construction environment.

I ensured that I adhered to ethical procedures throughout the study by following the protocols of the *Belmont Report* (Oquendo, Stanley, Ellis, & Mann, 2014), and by protecting the privacy of all individuals and treating them with courtesy and respect. To mitigate bias, I identified any potential bias and engaged in bracketing, or used a process for exposing bias, which I could not readily eliminate. Bracketing is a method that some researchers use in qualitative research to mitigate the potentially damaging effects of biases that may taint the research process (Sorsa, Kiikkala, & Astedt-Kurki, 2015). In addition, I recognized that I have a worldview that I interpret through my personal lens. A researcher's role is to be an active listener while the data unscramble, to view the data

through the lens of the participant, and then to tell the story (Beyers, Braun, Marshall, & De Bruycker, 2014).

Adhering to a protocol for each interview is vital for ensuring a researcher uses a standard method (Creswell & Poth, 2017). I followed the recommendation of Robinson (2014) and used transparency in the interview process to ensure each participant had the same information. To remain transparent, I openly debated all aspects of the study with participants, including the purpose and my selection methods. I obtained permission from each participant to record each interview and I took notes as a means of recording observations, ideas, and theories based on each interviewee's comments. After the interviews, I provided the participants with a summary of my analysis for their review and requested either their approval or suggestions for changes. To conclude the interview, I expressed my appreciation to the participants for their time, knowledge, and insights. A researcher may form opinions and conclusions from data-driven themes (Marshall & Rossman, 2014) and as part of the standardized practice, I collected the data, organized the data by themes that emerged from the research, and used data triangulation to explore the data to ensure credibility (Leung, 2015).

Participants

To identify participants' eligibility criteria for the study, I used the Illinois Department of Building and Zoning database system to review a list of all current construction contractors within the area of Chicago, Illinois. The database had a list of 227 construction contractors registered in 2016 for licenses in the Chicago area (City of Chicago, 2018). The database listed the names, locations, and numbers of each

construction contractor. I selected contractors in the southwest region of Chicago, because it has a larger demographic of contractors and is close to my home.

The individuals I contacted for interviews were project managers from construction contract companies and contractors who had three or more years as project professionals in metropolitan Chicago, Illinois. The main criterion for senior project managers was the successful implementation of environmental sustainability in their project processes for more than 2 years. Only senior project managers who met the criteria were eligible to participate in the study. To gain access to participants, I used the Illinois Department of Building and Zoning database system, recommendations of human resource coordinators, professional networking, and company websites. According to Yin (2015), a minimum of four participants in the sample is essential for planning case study research, and I selected four small- to medium-size construction companies from the database to ensure that I had enough participants who aligned with the research question. I contacted potential participants by phone and obtained their e-mail addresses to provide them with information on the study. I also provided a consent form for each participant to sign (see Appendix A) before conducting interviews. I took notes, recorded all interviews, and stored each participant's information on a USB drive. In addition, following the recommendation of Bromley, Mikesell, Jones, and Khodyakov (2015), I protected the identity of participants and organizations by not disclosing their names. After I completed the research, I will keep all documents and evidence in a safe for 5 years. After 5 years, I will destroy the evidence by shredding it.

Research Method and Design

When selecting a research method, researchers identify the most efficient method for achieving the goal of the study and answering research questions (Merriam & Tisdell, 2015). The research method for this qualitative multiple case study was suitable for exploring the strategies that some project managers use to implement environmental sustainability in their project processes from their perspective as project managers, despite the fact that research regarding effective strategies and methods for implementing environmental sustainability is not widely available. I conducted a multiple case study by interviewing participants and reviewing documents from several construction companies in metropolitan Chicago.

Research Method

The dynamics of qualitative research methods supported my study by helping to define strategies that construction project managers need to implement environmental sustainability into their project processes. Qualitative research is a formation of scientific analysis that spans different disciplines, fields, and subject matter and comprises many approaches (Katz, 2015). Researchers use qualitative research methods to understand difficult social processes; to capture essential characteristics of a phenomenon from the viewpoint of study participants; and to uncover beliefs, values, and motivations that underlie individual business behaviors (Gan et al., 2015). The common feature of qualitative research is that its focus is to create an understanding of data. Qualitative research methods provide an explicit rendering of the structure, order, and broad patterns found among groups of participants (Brady & Davies, 2014). Qualitative research

methods are also flexible because they can adapt to different settings, which enable concepts, data collection tools, and data collection methods to adjust as the research progresses (Merriam & Tisdell, 2015). Researchers use qualitative research methods to let meanings emerge from firsthand experience, ensure accurate reporting, and cite quotations of conversations (Gan et al., 2015). Qualitative research can help researchers understand how participants derive meaning from their surroundings and how a participants' meaning influences their behavior (Morse, 2015). For all of the reasons listed above the qualitative research method was best for this study.

I examined the possibility of using quantitative methods. However, quantitative research involves using statistical data to prove or disapprove a hypothesis that measures specific variables to test hypotheses (Paufler & Amrein-Beardsley, 2014). I also considered a mixed-method approach, but mixed-methods research involves using more than one method of data collection in a study. The mixed-methods approach includes both qualitative and quantitative data, methods, methodologies, and paradigms in a research study. This approach is appropriate if quantitative or qualitative methods alone are not sufficient for meeting the needs of a study. My intent was to understand what strategies some project managers use to implement environmental sustainability in their project processes, which made quantitative or mixed-methods approaches unsuitable for this study, because the qualitative research method by itself was sufficient for collecting data to meet my purpose in this study.

Research Design

The purpose of a case study inquiry is to address research questions that require an extensive understanding of social or organizational processes (Richards, 2014). Case study researchers explore events and programs over a prolonged period (Rule & John, 2015). Case study research is most useful when a researcher is conducting evaluations, studying a phenomenon in a normal setting, or trying to determine what happens or why it happens (Yin, 2015). According to Richards (2014), a case study provides an opportunity for researchers to get close to the participants and their interactions in a day-to-day routine approach and was appropriate as the purpose of this study was to explore concerns within the context of the construction environment. Kibert (2016) used this approach to examine environmental sustainability in project management, because case studies are common research designs in business (Yin, 2015).

According to Lewis (2015), other research designs exist that qualitative researchers can use to conduct similar studies. For instance, the qualitative researcher can conduct research through a phenomenological approach, grounded theory, or ethnographic design. The case study inquiry was the most appropriate for this study because I sought strategies for implementing environmental sustainability in the construction environment. Researchers using the phenomenological research method can capture individual perspectives and uncover themes that challenge structural or normative assumptions from individual experiences (Bevan, 2014), but the phenomenological design is best suited for instances where the purpose is to understand lived experiences (Lewis, 2015). Therefore, the phenomenology design was the least suitable method to

explore the implementation of environmental sustainability in the construction environment, which was the intent of this study.

Grounded theory was not a suitable research design because the main goal of a grounded theory design is to cultivate a theory from collected data (Ruppel & Mey, 2015). Researchers develop grounded theory research by interacting with many individuals (Creswell & Poth, 2017). In this approach, researchers collect data that grounds a developing theory by exploring the activities and social involvement of individuals (Ruppel & Mey, 2015). My main goal in this study was not to develop theory systemically, but to explore strategies that senior project managers need for implementing environmental sustainability in their project processes. Researchers should use the grounded theory design when developing a theory, therefore making the grounded theory approach unsuitable for this study.

Ethnographic researchers study cultural groups in their natural setting through a prolonged period (Kohtala & Hyysalo, 2015). Researchers who use the ethnographic research design must become part of the cultural group to study individuals in that culture (Lewis, 2015). Lewis (2015) described ethnographic research as a comprehensive evaluation of individuals in a routine manner that requires continual individual surveillance for collecting data. Therefore, ethnographic research can be expensive and time consuming (Merriam & Tisdell, 2015). The focus of ethnographic research is not to understand a phenomenon from participants' viewpoint, but to understand the behaviors of a culture. Thus, ethnography was not an appropriate method for this study.

Researchers reach data saturation when the sampling of more data does not lead to any new information related to their research questions (Morse, 2015; Yin, 2015). Data saturation means that no additional data is available to develop new properties of categories, and the relationships between the categories are separate (Morse, 2015). When researchers see that their data is repeating, they become confident that the categories are saturated, the description of these categories is solid, and theory can emerge (Leung, 2015). I repeated the data collection process until the data became repetitive and I could no longer collect new data. Data saturation became apparent when the data become repetitive during the interview process (Leung, 2015). The number of interviews that I conducted depended on data saturation. I continued to conduct interviews, review literature, and document reviews of project managers until I achieved data saturation.

Population and Sampling

Project leaders from the areas within and around metropolitan Chicago, Illinois, have different levels of knowledge and experience instituting environmental sustainability in their project processes. The population size for this multiple case study was four project managers. This study included the purposeful sampling as the method for selecting project managers in metropolitan Chicago, Illinois. Purposeful sampling is a technique that researchers use to make a connection to information-rich cases that align with a subject of interest (Palinkas et al., 2015). Purposeful sampling is a technique use in exploratory qualitative research, where resources are limited to a small number of cases that will be crucial to explaining the phenomenon of interest (Palinkas et al., 2015).

According to Lewis (2015), researchers can obtain favorable information by using a select few participants obtained through purposeful sampling. I used purposeful sampling to gain information from four project managers in various demographics.

The population size that I interviewed for this multiple case study began with four project managers from construction companies in metropolitan Chicago, Illinois. The participants included project managers with at least 3 years of experience incorporating environmental sustainability into their project operations. A researcher should have a provisional number of participants or range in mind (Robinson, 2014) and the actual number of participants will be dependent upon data saturation (Yin, 2015).

I sampled the pool of project managers and collected a diverse range of responses. The sampling for this study was purposeful and Palinkas et al. (2015) and Duan et al. (2015) noted that researchers use a purposeful sample to access participants who best fit the study and can contribute rich data. Duan et al. (2005) claimed that researchers use purposeful sampling so participants can share their individual experiences and, therefore, provide a variety of responses. In a related study, Amoatey, Ameyaw, Adaku, and Famiyeh (2015) used purposeful sampling to collect information to determine which challenges face project managers in executing construction projects.

Yin (2015) indicated that interviewing three to five participants in a case study design could be enough to achieve the necessary results. Marshall and Rossman (2014) noted that selecting the appropriate sample size is one of the essential elements of creating reliable research and guidelines for sample sizes in case studies are difficult to determine, because there can be an inconsistency regarding the ideal sample size for

qualitative research. Sample size should correlate directly with data saturation, and researchers need to spend more time with participants when sample sizes are small (Malterud, Siersma, & Guassora, 2016; Marshall & Rossman, 2014). The initial sample size that I interviewed was four participants.

Data saturation for this study involved bringing together at least four participants until there was redundancy in the information. I achieved saturation after the interviews stopped providing new data and information on the topic. Researchers using a case study approach have the benefit of opportunities arising during the interview process that may lead to data saturation (Yin, 2015). I used purposeful sampling to obtain a multitude of data on environmental sustainability in the construction environment and to achieve data saturation.

The participants were project managers who have been successful using environmental sustainability processes in their project execution. Only project managers with at least 3 years of experience incorporating environmental sustainability into their project operations were eligible because they were able to provide in-depth data about their environmentally sustainable processes. The purposeful sample consisted of several leaders from different construction companies. The population was senior project managers who have managed several successful environmentally sustainable projects in Chicago, Illinois. This population was suitable for this study because project managers have a wealth of knowledge and can influence the use of environmental sustainability in the construction environment. I conducted the interviews at the construction project managers' offices to accommodate their schedules.

Ethical Research

I presented an informed consent form in person to those who agreed to participate in the study (see Appendix A). The consent form contained pertinent information about the study, as well as a request for permission to use their responses as data. The consent form also had information about my intention to record the semi-structured interviews and an option to decline this action, along with a brief background of this study. I used the consent form to address the approximate amount of time I needed to complete the interview and the number of questions asked, as well as to explain that participants would not receive any compensation for participating. I provided the benefits and risks to the participants, as well as the details on how I will maintain their privacy and confidentiality (McConnell, 2014). The consent form also included the voluntary nature of the interview, the participants' option to remove themselves from the study verbally or in writing at any point during the research process, and clarification for maintaining and protecting the data and the participants' privacy rights for 5 years (McConnell, 2014).

Before commencing the semi-structured interview, I ensured participants understood all the issues and ethical points addressed in the consent form, and I placed additional emphasis on the voluntary nature of the study, the opportunities to withdraw, and the compensation topic. To protect the rights of participants, I plan to retain and safely store all data and consent forms for 5 years after the study's publication. Anyone who challenges or questions the study's results or has intentions to further the conclusions of this study can rely on the stored documents for authenticity. After the 5-

year period, I plan to destroy the data by cleaning and burning the password-protected flash drive (McConnell, 2014).

Data Collection Instruments

This study included a qualitative research method with a multiple case study research design. Documentation, records, interviews, direct observations, participant observations, and artifacts are six frequently used sources of evidence in case study research (Yin, 2015). I was the primary data collection instrument, and I used two additional data sources to collect study data. The study included semi-structured interviews and company documents as additional sources of research in data collection. The study included interview questions to explore the strategies that project managers need to implement environmental sustainability in their project processes. The interview included consistent, open-ended questions based on the study's conceptual framework.

The data collection process was face-to-face semi-structured interviews with project managers in charge of implementing environmental sustainability practices. The use of a semi-structured qualitative interview technique is an appropriate format for case study research because open-ended questions are a flexible approach that accommodates a wide range of experiences (Bevan, 2014; Rule & John, 2015). Open-ended questions accommodate for the need for the researcher to ask for more explanation on the answer to gain a deeper understanding of the issues (Muhwezi, Acai, & Otim, 2014). All participants received a list of broad questions in advance of the interview to provide time to reflect on the use of environmental sustainability within their company.

I focused the interviews on the process and strategy of integrating environmental sustainability in their project processes. I used interviews with open-ended questions to collect in-depth responses about individual experiences, perceptions, and knowledge regarding the implementation of environmental sustainability processes in their company (Palinkas et al., 2015). I documented each participant's response received from the interview questions. Documenting participant's responses will help ensure there is no bias capture in a study (Bevan, 2014).

Documentary information can be relevant and an important source of evidence in case study research (Yin, 2015). In addition to semi-structured interviews, I used company documents as additional instruments of research in data collection. The study process included a letter of cooperation from each construction company owner for the use of approved documentation that contributed to this study. The research process included the solicitation of various company documents, including but not limited to the company's project records, company's website, and company's pamphlets. I reviewed only the company documents that provided evidence of environmentally sustainable strategies use in project execution. The research process included the submission of my written description of the document to the respective document provider as a quality control process that ensured I captured an appropriate interpretation of their environmental sustainability strategies.

I enhanced the reliability of the data collection instruments by conducting member checking with the individuals from whom I received interview responses. The research process included the submission of a concise synthesis of each interview

question response from the participants as a quality control process to ensure I captured an appropriate interpretation from each participant's strategies for implementing environmental sustainability in their project processes. The interview questions appear in Appendix B.

Data Collection Technique

In qualitative research, there are three main types of data collection processes, in-depth interviews, direct observations, and written documentation (Lewis, 2015). Interview methods are most often used in qualitative case studies (Lewis, 2015), while direct observation is a technique used to collect data in the natural environment, and written documentation includes company records, correspondence, and reports such as environmental sustainability reports and company historical information (Vines et al., 2014). I used interviews and written documentation reviews as the data collection techniques for the multiple case study.

I used a face-to-face semi-structured interview technique because it produced the most detailed information about the strategies and processes project managers use to implement environmental sustainability practices. Semi-structured interviews are effective and convenient in gathering information (Merriam & Tisdell, 2015) and the interview method allowed for member checking of data with the participants.

The interview questions included open-ended questions, follow-up questions, probing questions, and specifying and direct questions (Merriam & Tisdell, 2015). The development of questions came directly from the research problem. I followed-up with probing questions that helped extend the participants' answers after the structured

interview question. Specifying and directing questions helped to develop a precise description of the data I retrieved from the participant (Merriam & Tisdell, 2015).

With the participants' permission, I recorded each interview to ensure accuracy (Marshall & Rossman, 2014). I took notes during each interview to record additional information. Marshall and Rossman (2014) outlined three types of notes that individuals should record during an interview, which are observational, methodological, and theoretical. I used observational memos, such as field notes that enabled me to record significant situations during the interview. Methodological memos are used for recording issues regarding the methods employed, and theoretical memos focused on themes that emerge from the interview process (Marshall & Rossman, 2014).

Marshall and Rossman (2014) suggested that each interview should last no more than 90 minutes. After each interview, I provided a debriefing session so each participant could ask questions, make comments, or add additional information (Marshall & Rossman, 2014). I also conducted follow-up interviews so participants could examine the interview information and preliminary findings.

The advantage of using semi-structured interviews is that they are flexible, accessible, and capable of revealing facts that are not recognizable at first glance (Bevan, 2014). Merriam and Tisdell (2015) argued that semi-structured interviews are the most effective and convenient means of gathering information. Semi-structured interview techniques are based on the conversation, so the interviewer can modify the pace and order of the open-ended questions to engage the participant (Merriam & Tisdell, 2015). Another advantage of a semi-structured interview technique is that it is helpful for

understanding the perceptions of the participants in their social environment (Merriam & Tisdell, 2015).

The disadvantage of conducting a semi-structured interview is (a) researchers may lack essential interview skills to conduct interviews, (b) researchers may fail to plan the time and the research becomes expensive, and (c) researchers must be able to ask valid questions (Palinkas et al., 2015). An unstructured interview includes an assumption that the researcher does not have all the relevant facts or know all the necessary questions to ask during the interview (Palinkas et al., 2015). The interview process is not a neutral and completely objective tool because the interviewer and participant can affect the study through their personal perspectives on using environmental sustainability processes. To mitigate the disadvantages, I used a reflexive process before, during, and after the interviews to garner a better understanding of how the participant interprets the asked questions (Marshall & Rossman, 2014).

I used data collection from the documentation, in addition to interviews, to receive background information about the company and its environmental sustainability reports. The data from the documentation provided a way to corroborate the data I received from the participants (Lewis, 2015). The documentation review came from two different sources: environmental sustainability implementation reports, available on the company website; and annual reports (Marshall & Rossman, 2014).

The advantage of using documentation review is to have the ability to triangulate the data using the interview data (Lewis, 2015). Data triangulation requires multiple sources of data such as interviews, observations, and documentation. The role of

triangulation in a case study is to analyze all the interrelated parts of the company (Leung, 2015). I used the data from the interviews, observation, and document reviews to compare and validate environmental sustainability implementation information to ensure reliability (Lewis, 2015). Another advantage of using company documents is the inclusion of the details of events and settings, as well as having the information in documents available for repeat reviews. The disadvantage is some documents can be difficult to retrieve, and reporting can reflect biases (Yin, 2015).

Researchers conduct pilot studies to create an opportunity to scope out evidence, ideas, and tactics that may deliver a clear understanding of a study (Yin, 2015). This study's research question aligned with the study's specific business problem, purpose statement, and conceptual framework. Therefore, I did not conduct a pilot study after receiving approval from the Institutional Review Board.

Member checking is a process when participants check the research findings to ensure that the conclusions are true to their experiences (Bevan, 2014). After I analyzed the interview data, I conducted a follow-up meeting with the participants to reveal the findings of the research to ensure the data was accurate.

Data Organization Technique

I organized all data using NVivo 10 software to aid in organizing and coding common themes throughout the proposal. Using NVivo, I had the opportunity to find and retrieve references from my computer and import data from Microsoft Word and OneNote to make data retrieval simpler. NVivo 10 software was also able to transcribe audio recordings from interviews (Male, 2015).

To ensure privacy, I followed Walden's Institutional Review Board requirements for protecting human rights when gathering information for the research as noted by McConnell (2014). I also password protected all electronic data, audio, and transcriptions put on the thumb drive. I stored all field notes, files, and thumb drives in a secure safe for 5 years. After 5 years, I will delete all information on the thumb drive and shred all files and field notes.

Data Analysis

Qualitative research is often heavy on results and descriptions and lighter on how a researcher retrieves the information (Marshall & Rossman, 2014). When using data analysis, researchers should use a technique that maintains the accuracy of each participant's perspective (Marshall & Rossman, 2014). The data analysis technique I used in the study was methodological triangulation, which allows for combining multiple methods to gather data. Multiple sources provide evidence, verification, and validity while allowing researchers to address a broader range of issues (Yin, 2015). Case study findings will be convincing to any researcher if interviews, field notes, documents, observations, or other sources complement the study (Marshall & Rossman, 2014).

The semi-structured interview process began with interviews of project managers from construction companies in southwest Chicago. I asked each participant five open-ended questions that supported the following research question: What strategies do construction project managers use to implement environmentally sustainable practices (see Appendix B)? During each interview, I collected data by taking quality notes and audio recording the interviews for accuracy.

After I collected the data, I analyzed the data. Analyzing data involves working through the data to discover meaningful themes, patterns, and descriptions that answer central research questions (Yin, 2015). The data I collected dictated the categories. The approach identified and highlighted the strategies that project managers need to implement environmental sustainability in their construction projects. I analyzed the data using Yin's (2015) data analysis method. This process included five steps: (a) compiling the data, (b) disassembling the data, (c) reassembling the data, (d) interpreting the meaning of the data, and (e) concluding the data (Yin, 2015). Akhavan and Pezeshkan (2014) used this method for data analysis for qualitative multiple case studies and confirmed its appropriateness.

I imported the data into NVivo 10 from Microsoft Word. After this process, I compiled the data, a method used to organize data (Yin, 2015). After I compiled the data, I disassembled the data. Disassembling involves a strict procedure of coding data (Yin, 2015). Coding is the process of labeling and segmenting data into categories, providing descriptive words or names, and grouping the data (Pierre & Jackson, 2014). Coding data is vital to identifying patterns and themes (Male, 2015). I used the auto-coding feature in NVivo 10 to determine the similarities in data and prevalent themes, thus detecting consistencies among the participants' viewpoints.

After I disassembled the data, I began the process of reassembling the data. Reassembling is a data analysis process that involves aligning data under several arrangements until emerging themes are satisfactory (Mueller, Straatmann, Hattrup, & Jochum, 2014). Successful reassembling will be evident if themes start to emerge from

the data analysis (Male, 2015; Yin, 2015). Next, I interpreted the meaning of the data. Interpreting the meaning of the data is a process that involves the researcher making sense of the data (Yin, 2015). The researcher's ability to understand and describe the data is critical during data interpreting (Pierre & Jackson, 2014). The final step in data analysis is concluding the data (Yin, 2015). Concluding the data involves developing a sequence of statements noting the findings of a study from the perspective of a larger set of ideas (Pierre & Jackson, 2014). Concluding themes and patterns that derive from the central research question is the main aspect for understanding the findings of a qualitative research study (Yin, 2015).

A researcher can use data analysis software for creating themes (Pierre & Jackson, 2014). NVivo 10 software permitted me to input, store, code, and explore themes and patterns. The NVivo 10 software is appropriate for identifying themes (Pierre & Jackson, 2014). Advantages of using NVivo 10 includes the capability to store data in a single location with instant access to information and the ability to use a continuous coding scheme (Pierre & Jackson, 2014). Utilizing NVivo 10 increases the rigor in qualitative research (Mueller et al., 2014). The NVivo software will help me to align the data with previous literature (Pierre & Jackson, 2014).

The connection between the literature, methodology, and result of the study is the conceptual framework (Wu, 2014). I analyzed the data through the viewpoint of stakeholder theory, and I used this framework to help interpret the strategies that construction project managers use to implement environmentally sustainable practices. By examining why some project managers fail to implement strategies in their

construction projects through the lens of stakeholder theory, I compared the data I collected with reputable theories relevant to the phenomenon. I also used member checking to verify data. I measured the data by the frequency of recurring themes found in the data and compared my findings to previous studies such as those of Rehm and Ade (2013) to validate the findings.

Reliability and Validity

A researcher conducting a qualitative study must ensure reliability and validity. The process of meeting both includes addressing dependability, credibility, transferability, confirmability, and data saturation. The intent of reliability and validity in qualitative research is to make qualitative research rigorous and trustworthy (Morse, 2015). A researcher may use triangulation (Morse, 2015), in addition to member checking, to ensure data saturation, reliability, and validity (Leung, 2015). I addressed the components of reliability and validity in the next paragraphs.

Dependability

Researchers address reliability through dependability. Lishner (2015) defines dependability as corresponding to the reliability of the information. Dependability requires considering all the changes that occur in a research process and how these processes affect the way research is being conducted (Marshall & Rossman, 2014). If future researchers receive a detailed description of the research design and process, dependability will help enhance the research if they follow a similar research framework (Lishner, 2015). I presented a detailed explanation of the research methodology so future researchers can duplicate the study (Bevan, 2014). The detailed explanation included the

data collection technique, data organization, and data analysis. Each step of the research process described the methods and in what way they related to each other (Creswell & Poth, 2017).

I enhanced the reliability and validity of the data collection instrument by using member checking (Creswell & Poth, 2017). Member checking is a process where participants check the research findings to ensure that the findings are in line with their experiences (Leung, 2015). After I examined all data from the interviews and documentation, I had a follow-up meeting to ensure all information is accurate.

Credibility

Researchers address credibility through the legitimacy of the data found (Yin, 2015). Credibility refers to the communication that involves the way participants perceive and respond to the interview questions and the way a researcher perceives the participants' understanding of their responses (Dasgupta, 2015). During the interview, I strove to build rapport with the participants to obtain honest and open responses. I restated or summarized the interviewee answers and then asked questions to determine accuracy. I used member checking to provide an opportunity for participants to re-examine their findings for accuracy. The participants could agree either that the summaries reflected their views, feelings, or experiences, or that they did not, in which case I could make revisions. The study is only credible if the participants affirm the study is accurate and complete (Dasgupta, 2015).

Transferability

Researchers achieve transferability when they can provide consistent, replicable results with various data to produce a reliable study (Portney & Watkins, 2015). I based transferability on the generalization process of the study findings by drawing a valid conclusion from the context of the study. By garnering a thorough understanding of the research context and its assumptions, readers and future researchers can evaluate the use of this study in the context of other studies (Portney & Watkins, 2015).

Confirmability

Qualitative research assumes that researchers bring a unique viewpoint to the study. Confirmability refers to the degree to which the results can either confirm or corroborate with others in different contexts (Marshall & Rossman, 2014). This study included a thorough account of the data collection instruments and techniques, along with the data organization I used to confirm the results of the findings. The method I used to confirm the study included member checking to make sure that what was being shared was reliable, valid and that I captured the true meaning and accuracy of the data.

Data Saturation

Researchers reach data saturation when the sampling of more data does not lead to any new information that relates to their research questions (Morse, 2015; Yin, 2015). No additional data is available to develop new properties of categories, and the relationships between the categories are separate (Morse, 2015). When researchers understand that their data is repeating it allows them to feel confident that the categories are saturated, that the description of these categories are solid, and that patterns can

emerge (Leung, 2015). Data saturation will become apparent when the data starts to become repetitive during the interview process (Leung, 2015). I repeated the data collection process until the data becomes repetitive. The number of interviews I conducted depended on data saturation. I continued to conduct interviews, review literature, and document reviews of project managers until I achieved data saturation.

Transition and Summary

Section 2 included an in-depth review of project details. The section included the purpose of the study, my role as the researcher, and the identification of the participants. I included the data collection method, design, and evaluation procedures. Section 2 included a discussion on the population selection and sampling approach as well as the ethical, reliability, and validity processes I used in the study. In Section 3, I shifted my attention to the research and findings. The final section will include reflections, an application to the profession, implications for social change, and recommendations for future research.

Section 3: Application to Professional Practice and Implications for Change

Introduction

My purpose in this qualitative multiple case study was to explore the strategies that construction project managers use for implementing environmentally sustainable practices. The data came from interviews, with four senior project managers in metropolitan Chicago, Illinois, company documents, and archival records from. I used a semistructured interview process where the participants had five interview questions to answer. After each interview, I validated the answers with the participants. I conducted a follow-up interview and then reviewed company documents that were related to the study. After finishing data collection and organization of the data, I used methodological triangulation for analyzing the collected data. Based on the data analysis of the interview responses from the participants, and each company's documents, three centralized themes emerged. The centralized themes were (a) stakeholder engagement, (b) terminology, and (c) cost. The four minor themes were (a) stakeholder pressure, (b) project scoping, (c) integrate innovation, and (d) project charter. The findings revealed several strategies aligned with the conceptual framework, which I discussed in the literature review of Section 1, including the new studies published since completing the proposal for my study.

Presentation of the Findings

A multiple case study was the most appropriate method for this study. The population included senior project managers from four different construction companies, which were represented in the study as P1, P2, P3, and P4. The data collection method

involved a semistructured interview process and scanned data from a review of company records, which included documents, project charters and manuals, and reports related to planning, processes and procedures, and other project management reports.

The data that I collected and analyzed from the interview and company records provided rich information and contributed to answering the research question: What strategies do construction project managers use to implement environmentally sustainable practices? The bulk of the data for this research came from the four interview participants. The rich data obtained from the four cases was enough to achieve data saturation, allowed themes to recur, until no new information emerged from the interviews and recorded documents. I used member checking and methodological triangulation, as recommended by Bevan (2014), for attaining data saturation in qualitative research. Data analysis included examining the findings of the interviews to establish a baseline for strategies employed by the study participants. I identified probable concepts after repetitive inspection of the interview data, and with the aid of NVivo software, I scanned the documentation collected from each company's records. The methodological triangulation process in the study included validating the answers given by the study participants against a secondary source of information. The identified secondary source of information presented by participants was in concurrence with the answers to the interview questions identified in the themes. The data inspection process contributed to developing a summary of the experiences shared by the participants. After in-depth review and analysis of the collected data, three centralized themes emerged as summarized in Table 2.

Table 2

Summary of Emergent Themes

Theme	Description of Themes	Occurrence
	Stakeholder engagement (communication)	P1, P2, P3, P4
	Terminology	P1, P2, P3, P4
	Cost	P1, P2, P3, P4
	Pressure from stakeholders for immediate customer satisfaction	P1, P3, P4
	Project Scoping	P2, P4
	Integrate innovation and sustainability	P1
	Introduce sustainability in the project charter	P2

The following subsections include comparisons of the main themes within the conceptual framework, the articles discussed in the literature review in Section 1, and the new studies published since completing the proposal for this study. The three main themes and the four minor themes emerged from each of the four case studies.

Theme 1: Stakeholder Engagement

Stakeholder engagement was the first central theme according to the four study participants. The initial function of environmental sustainability starts with stakeholder engagement. Stakeholder engagement is the process by which the project manager communicates with all individuals that have direct or indirect concerns with the project or can influence the implementation of its decisions (Bal, Bryde, Fearon, & Ochieng, 2013). P1, P2, P3, P4 mentioned that two-way flow of communication from initial to final stage leads to more committed stakeholders. P2 claims a well-managed stakeholder engagement plan will help decrease stakeholder's negative stigma towards environmental sustainability. P3 also states a strongly managed stakeholder engagement plan will help keep stakeholders engaged which will increase economic sustainability. P2 proposed that

the use of a meaningful stakeholder engagement process will help build a positive two-way process between the project managers and the stakeholders.

Findings for the stakeholder engagement theme confirm earlier studies highlighted in the literature review. Briere et al. (2015) suggested that studies regarding lack of stakeholder engagement or communication were ostensibly the primary problem between stakeholders and project managers. Project managers should engage with stakeholders in dialogue to find out what social and environmental issues matter most to improve decision-making and accountability. Stakeholder engagement allows the flow of information to be continuously updated between project managers and stakeholder's current demands and trends. Hwang et al. (2015) stated that project managers need better procedures for engaging key stakeholders. Horisch et al. (2014) suggested three strategies that project managers should consider to increase stakeholder interactions for environmental sustainability: (a) strengthen environmental sustainability interests, (b) create a shared interest in environmental sustainability based on individual interest, and (c) empower stakeholders to act as intermediaries for environmentally sustainable development. Horisch et al. (2014) also suggested that there may be a need to create training, guidelines, and value-based sustainability for all stakeholders to increase the viability of environmental sustainability in construction projects.

The findings of this study also supported studies published since the beginning of this study. Noted were lack of stakeholder engagement (Akotia & Opoku, 2018; Davila, Rodriguez-Lluesma, & Elvira, 2018; Li, Zhang, Ng, & Skitmore, 2018; Schaltegger & Burritt, 2018) and why stakeholder engagement is important to environmental

sustainability (Akotia & Opoku, 2018; Lockrey, Verghese, Crossin, & Nguyend, 2018; Phua, 2018; Yu, Shi, Zuo, & Chen, 2018; Zhou, Irizarry, & Lu, 2018).

This theme links to stakeholder theory. Freeman (1984) stated the intention for stakeholder theory was for it to be used as a framework to examine stakeholders' interactions, which is the perfect antecedent for stakeholder engagement. Horisch et al. (2014) claimed that stakeholder theory was designed to increase the economic and environmental value of a business through stakeholder buy-in. Therefore, stakeholder theory would be the most appropriate way to ground stakeholder engagement and to explore the perceptions and experiences of construction project managers regarding environmentally sustainable strategies.

Theme 2: Ambiguous Terminology

Ambiguous terminology emerged as a second central theme from the four study participants. More than 300 published definitions exist about the development of environmental sustainability, and all have different terminologies based on competing interests (Mori & Yamashita, 2015), making the process of deciphering and interpreting which definition is most applicable challenging. The various terminologies lead to environmental sustainability terminology becoming ambiguous. Weingaertner and Moberg (2014) pointed out that because of the business-individuality characteristic, a universal environmental sustainability definition is impractical, because it would not address all individual needs, priorities, and contributors within a specific industry. The apparent cause for the ambiguity of interpretation between project management and environmental sustainability depends on the source's background, culture, industry

climate, and country's ambience, which along with characteristics of environmental sustainability, can be as elusive as they can be diverse (Galpin et al., 2015; Wu, 2014).

In addition, a project manager's background, experience, viewpoint, interpretation, and knowledge of what it means to be environmentally sustainable can affect their understanding of the definition (Marcelino-Sadaba et al., 2015). P1, P2, P3, and P4 all agreed that ambiguous terminology was a problem for implementing environmental sustainability. Paganetto and Scandizzo (2016) stated that the first studies published about environmental sustainability dealt with defining terminology, and researchers paid little attention to the implications of environmental sustainability in construction project management processes. Although environmental sustainability is influential and widely used, many scholars criticize it as a failure because few can explicitly explain its terminology (McKenzie et al., 2015). P1 and P3 stated that most stakeholders are confused about the different terminologies used in construction environmental sustainability. For example, the word sustainable to a project manager means the human practices that do not harm, modify, or deplete the environment, species, or ecosystems, and stakeholder understanding is how long will the building and its associated parts last. McKenzie et al. (2015) claimed this disagreement with terminology is natural because of the assortment of industry objectives and diverse organizational cultures referring to the term.

Findings of the ambiguous theme terminology confirm that environmental sustainability is not clear or adequately defined and stakeholders do not fully understand the environmental perspective, which will ultimately lead to the non-incorporation of

strategies for environmentally sustainable practices within the construction environment (Lu & Zhang, 2016). Petersen and Snapp (2015) claimed that unclear terminology impedes understanding, which makes it difficult to determine what strategies should be utilized to implement environmentally sustainable practices in construction processes. Marcelino-Sadaba et al. (2015) explained that the concept of environmental sustainability, pertaining to nature, is difficult when expressed in concrete operational terms. The difficulty is primarily attributed to the fact that the connection between project management and environmental sustainability is still an evolving field of study and the literature is scarce. However, the development of environmental sustainability is essential, and lacking clear guidance, vague terms have become influential factors in strategies, or lack thereof, to implement environmentally sustainable practices.

Findings on the theme ambiguous terminology confirmed that individuals who currently use environmental sustainability terminology for environmental practices tend to use it in the wrong capacity (Marjaba & Chidiac, 2016). Stakeholders continue to discuss environmental sustainability to understand both its meaning, and how to implement it, but do not fully understand its terms (Barkemeyer et al., 2014). Imran et al. (2014) claimed that recent surveys have indicated that stakeholders have problems defining terminology that is associated with environmental sustainability in a way that is relevant to their businesses. Project managers who attempt to define "environmental sustainability" and the ways it fits into the business setting tend to struggle with both its definition and requirements (Stigka et al., 2014). The incorrect use of the term tends to lead stakeholders to abandon its use altogether (Marjaba & Chidiac, 2016).

Stakeholders must become accustomed to the industry's verbiage, and their business's path and processes, to understand and evaluate where environmental sustainability fits within the business setting (McKenzie et al., 2015). Some stakeholders still refuse using project management processes because of vagueness in the terms involved and false information about cost analysis (Tabassi et al., 2016). Project managers must work with terminology that is clear and concise, and captures the deeper meaning of sustainability. Project managers should focus on clarifying the terminology of environmental sustainability from the standpoint of the construction industry's mission, vision, and culture when seeking to address the differences in definitions (Trico et al., 2016).

Theme 3: Cost

The cost was another central theme that emerged according to the data collected from the four study participants. Sustainable construction requires a long-term assessment when considering original capital cost against the running costs of a facility (Mok et al., 2015). It appeared that the short-term costs of sustainable practices are too high to justify their application in a highly competitive market. Despite the significant advances in best practice, a delay exists in the implementation of sustainable practices that improve facility performance. This delay is primarily due to the lack of stakeholder's demand and the acceptance that methods used for sustainable facilities are more expensive than traditional construction methods (Byers et al., 2014). P1 concluded that the concern for many project managers in the construction industry is the life-cycle cost of environmental sustainability, rather than the initial cost of construction. P1 also stated

that stakeholders believed that environmentally sustainable construction costs include initial costs and short-term practice costs, which are often too high to justify the use of environmentally sustainable practices. P2 indicated that a project could not succeed without stakeholders understanding all components of the project with the real cost of completion transparent. P2 mentioned that it is difficult to determine the most cost-effective approach for environmentally sustainable construction, especially when dealing with the short-term costs associated with environmental sustainability. P3 hinted that engineers who examine environmental sustainability might find it difficult to provide an appealing line-by-line cost analysis of a building because engineers integrate the design for environmental sustainability solutions within the conception process, to how well the project is accepted by stakeholders. P4 indicated that environmentally sustainable buildings will incur a premium above the cost of typical construction but will also provide a multitude of economic and environmental benefits that conventional facilities cannot support. P1, P3, and P4 stated that the general opinion, from most stakeholders, is due to the lack of accurate and thorough financial and economic information, and the thought that environmentally sustainable construction practices will increase costs and reduce profits. Therefore, many stakeholders still refuse to adopt environmentally sustainable processes because of the initial cost (Mok et al., 2015).

Findings within this theme of cost confirm earlier studies highlighted in the literature review. Environmentally sustainable construction costs include initial capital costs and short-term practice costs, which are often too high to justify the use of environmentally sustainable practices in a highly competitive market, despite the

importance of protecting natural resources (Paganetto & Scandizzo, 2016). Smith (2014) stated that stakeholders believe that environmentally sustainable facilities are cost prohibitive and require a sizable investment (Smith, 2014). Hwang et al. (2015) claimed that the additional cost of using environmentally sustainable construction materials is approximately 2% to 3% above the cost of conventional construction materials. In the past, project managers examined only the immediate costs of labor and materials, but when dealing with environmental sustainability project managers must now also consider life-cycle costs, such as maintenance, energy, water, waste management, and pollution, as well as climate changes, and the depletion of natural resources. When project managers try to compare conventional construction methods to those focused on environmental sustainability, it becomes difficult to define the real costs of the project (Byers et al., 2014).

The findings are tied to stakeholder theory (Freeman, 1984), in which stakeholders should play an active role in addressing the moral and ethical values that identify the model behavior to "build or not to build" decision in an organization. Even though there is agreement regarding the environmental and social benefits of environmentally sustainable facilities, not enough agreement exists on the financial benefits.

Minor Themes

For the four minor themes, pressure from stakeholders for immediate customer satisfaction, project scoping, integrate innovation and sustainability, and introduce sustainability in the project charter not all participants discussed the minor themes.

Pressure from stakeholders for immediate customer satisfaction was brought up by P1, P3, and P4; but it was mentioned only without an explanation. It could be inferred that this is one reason why stakeholders may be reluctance to engage with environmentally sustainable construction practices. Project scoping was noted by P2 and P4, but, again, it was not discussed in any detail. The final two minor themes of integrate innovation and sustainability and introduce sustainability in the project charter were each brought up only once by two participants and not discussed. However, senior project managers in the construction industry could integrate these components into their business strategies to play a role in creating, and sustaining, environmental sustainability in the construction industry.

Applications to Professional Practice

In this study of four senior project managers in different construction companies, I used to implement environmental sustainability in their construction processes. Sustainability is one of the most communicated subjects among scholars and practitioners, but the subject is misunderstood by many (Vries et al., 2015). The meaning of *sustainability* is often blurred by different interpretations and a likelihood exists that the term will be treated superficially. Despite the issues, business leaders consider strategies for environmental sustainability in the construction industry as a way to increase their business status, whereas failing to comply with such principles can negatively influence the success of their business (Slawinski & Bansal, 2015). The findings of this study included centralized themes that might be informative to the industry's best practice for implementing strategies in the construction environment. The

findings could also help senior project managers of other organizations in developing and using strategies for their project processes.

Using a stakeholder engagement plan advised by P1, P2, P3, and P4 might help to avoid associated communication problems that affect strategy development. According to Galpin et al.'s study (2015), terminology that is ambiguous and project cost that is misleading stem from not having a well-managed stakeholder engagement plan. According to the study participants, having a well-managed stakeholder engagement plan contributes to reducing ambiguous terminology and misleading cost, associated with project development for environmental sustainability (Paganetto & Scandizzo, 2016).

Implications for Social Change

The objective of this qualitative multiple case study was to explore strategies senior project managers use to implement environmentally sustainable practices. The strategies found in the study may help validate environmental sustainability processes for business practices using the stakeholder engagement plan. This study may contribute to efficient business practices by refining environmentally sustainable strategies, which will allow businesses to be successful in the environmental construction industry. The results of the study may contribute to positive social change by protecting the environment and its natural resources. The findings, conclusions, and recommendations of this study provide strategies for implementing environmental sustainability in construction project processes (Rana & Evans, 2014). Current studies regarding lack of stakeholder engagement, cost and ambiguous terminology were apparently the primary problem between stakeholders and project managers (Briere et al., 2015). Project managers should

engage with stakeholders in a discussion to understand the social and environmental issues that matter most to improve decision-making and accountability.

Recommendations for Action

The results presented in this study can help senior project managers create strategies for environmental sustainability in construction projects by using the stakeholder engagement plan. The senior project managers in the construction industry can play a significant role in creating strategies for environmental sustainability by following the specific recommendations listed below:

a) Educate the growing number of stakeholders not concerned with environmental issues and corporate social and environmental responsibility,
b) reduce ambiguous terminology,
c) ensure environmental sustainability fits into a company's business processes; and
d) engage with stakeholders.

The themes found in the study support these four recommendations might be helpful for construction project managers and stakeholders. Furthermore, the two minor themes of integrating innovation and sustainability into business plans, and introducing sustainability into the project charters, would be beneficial. Although these recommendations were only mentioned once, briefly, by single participants, senior project managers in the construction industry could integrate these components into their business strategies to play a role in creating, and sustaining, environmental sustainability.

To foster the use of the stakeholder engagement plan outlined above, I will forward a findings summary to all participants and their companies. I will disseminate the

study findings to more audience members in construction, either by visiting companies, conducting public conferences, or through electronic communications.

Recommendations for Further Research

The purpose of this qualitative multiple case study was to explore the strategies construction project managers use for implementing environmentally sustainable practices. The findings of this research validate earlier and current literature. One limitation identified in this study was the small sample size of four senior managers in which access to participants was relatively available. The number of participating companies can be more than four, and the sample size for each organization can be more than one senior project manager. Conducting single case studies might be another useful approach to explore insightful details of techniques used by senior project managers to gather even deeper insight from participants.

Another limitation of this study is that the data collected from participants may not represent all construction companies who use environmentally sustainable practices. Researchers cannot make direct observations within a population. The best way for researchers to represent all construction companies is to use quantitative sampling to collect data from a larger number of individuals and use inferential statistics, which enables the researcher to determine the characteristics of a larger population. According to Lewis (2015), researchers can collect statistical information by using a sample of a population to make inferences or generalizations that may apply to a variety of populations or to the larger population in general. A quantitative study might also be useful to explore the relationship between variables on strategies construction project

managers use for implementing environmentally sustainable practices, which may help future researchers who intend to conduct qualitative research. Researchers may expand the study to other areas outside of Chicago, Illinois to confirm or disconfirm generalizing the study findings in Chicago, Illinois.

Other limitations were participants' responses, opinions, knowledge, experiences, and worldviews. Project managers' interpretations of strategies, which vary from company to company depending on the individual construction company's capacity, culture, mission, and goals; and ambiguity of definitions within the construction environment, all of which can influence the conclusions of a study.

Reflections

This was my first study within the doctoral field of business. I was not aware of the required level of detail for a doctoral study prior to beginning the program. A business study at the doctoral level is more detailed and methodically aligned than I had expected. The research alignment and level of integrity between sections of the study template were helpful in modifying my rationale for conducting an academic study and in communicating with business leaders and senior project managers. Some delays occurred during the interview session due to emergencies arising on their project sites. There was also some difficulty in obtaining the archival documents, to accompany the case studies, as a secondary source of data because records were at an alternate location. I consciously used the information and data provided by the senior project managers during interviews and secondary data sources to base my findings to remain unbiased.

Most of the themes that surfaced were anticipated. I also found new themes that I did not expect in my earlier research, which are positive lessons for my career development. One important lesson I learned in this doctoral study is that social change can have a significant effect on business sustainability. Findings from this study improved my knowledge in business administration and construction project management. The identified themes are informative for senior project managers who are looking for strategies for implementing sustainability in their project processes.

Summary and Study Conclusions

The purpose of this qualitative multiple case study was to explore the strategies construction project managers use for implementing environmentally sustainable practices. The study is valuable for senior project managers that seek to implement sustainable practices in their construction project processes. Implementing sustainable practices in construction project processes will help provide a business model that ensures a stable and valuable ecology that preserves the welfare of societies.

The study findings included seven themes, three major centralized themes and four minor themes. The centralized themes were (a) stakeholder engagement, (b) terminology, and (c) cost. The four minor themes were (a) stakeholder pressure, (b) project scoping, (c) integrate innovation, and (d) project charter. The findings of the study aligned with the literature, the current studies, and the conceptual framework.

The stakeholder engagement plan was a key project performance indicator. A well-managed stakeholder engagement plan will keep stakeholders engaged and build a positive two-way communication between project managers and stakeholders, which will

help decrease stakeholder's negative stigma toward environmental sustainability. Senior project managers could improve their business sustainability by adhering to latest strategies published in the literature and from findings of this study.

Senior project managers need to ensure stakeholders are aware of current laws and trends for initiating environmental sustainability practices. There should be a shared vision, values, and strategy in adopting environmentally sustainable strategies for the construction industry. Engaging with stakeholders before project initiation might contribute to improving environmental sustainability awareness for practices in the construction industry.

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Appendix A: Informed Consent for Participants Older Than 18 Years

You are invited to take part in a research study of the strategies that construction project managers use to implement sustainable practices. You are being asked to participate in the study because you are (a) serving as a senior project management position in a mid-size company in the State of Illinois and (b) you have supervisory responsibility for the implementation of sustainability in your organization. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part in it.

This study is being conducted by a researcher named Harold Branch, who is a doctoral student at Walden University.

Background information:
The purpose of this study is to explore strategies that construction project managers use to implement sustainable practices. Themes from senior leaders in the project management area, regarding environmentally sustainable strategies may be helpful in developing effective methods construction project managers can use to implement environmental sustainability in their project processes.

Procedures:
If you agree to be in this study, you will be asked to:

- Participate in a semi-structured, audiotaped interview with the researcher, regarding strategies senior project managers practice for implementing environmental sustainability into their project processes. The duration of the interview will be thirty to sixty minutes.
- Member checking the interview data, which is ensuring your opinions about the initial findings and my interpretations, are accurate.

Here are some sample questions:

1. What strategies are you using to implement sustainable practices in your project development?
2. What methods did you find worked best for implementing sustainable practices in your project development?

Voluntary nature of the study:
This study is voluntary. Everyone will respect your decision as to whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to take part in the study now, you can still change your mind later. You may stop at any time.

Risks and benefits of being in the study:
There are minimal risks associated with this study. More importantly, your participation will contribute to the knowledge base relevant to strategies some project managers do not

have for implementing sustainability in their project processes. You will be given a copy of the results of this study for your personal keeping.

Compensation:
No compensation will be provided for your participation in this study.

Confidentiality:
Any information that you provide (i.e. responses to interview questions) will be kept confidential. The researcher will not use your personal information for any purpose outside of this research project. Additionally, the researcher will not include your name or anything else that could identify you in the written report. The electronic information will be stored on a password protected flash drive, and documents related to this study will be kept in a locked file storage cabinet, to which only the researcher will have access. Data will be maintained for five years, after which it will be destroyed.

Contacts and questions:
You may contact the researcher, Harold Branch, at 630-460-1110 or harold.branch@waldenu.edu. You may also contact the researcher's faculty mentor and doctoral study chair, Dr. Douglas Keevers, at 904-703-9121 or Douglas.Keevers@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1210. Walden University's approval number for this study is 05-08-18-0041516 and it expires on May 7th, 2019.

Statement of consent:
I have read the above information, and I understand the study well enough to make a decision about my involvement. By signing this consent form, I am agreeing to be a participant in the study based on the terms described above. I will receive a copy of the signed consent form for my records.

Printed name of participant _____

Date of consent _____

Participant's written signature _____

Researcher's written signature _____

Appendix B: Semistructured Interview Questions and Demographic Questions

1. How many years do you have as a project manager?
2. How many years have you been implementing environmental sustainability in your project processes?
3. How many successful environmentally sustainable projects have you completed within the last three years?
4. What is the total number of projects that your company completed in the last three years?
5. What is your area of service?

Interview Questions:

1. What do you understand "environmentally sustainable practices" to mean?
2. What strategies are you using to implement environmentally sustainable practices in your project development?
3. What methods did you find worked best for implementing environmentally sustainable practices in your project development?
4. What were the challenges when implementing environmental sustainability in your project processes?
5. What additional information would you like to add that we have not discussed, but is pertinent to successful environmental sustainability implementation?

Appendix C: Email Invitation to Participate

Invitation to participate in the research project titled "Exploring Sustainable Strategies in the Construction Industry"

STUDENT RESEARCHER: Harold Branch

PROJECT SUPERVISOR: Dr. Douglas Keevers

STUDENT'S PROSPECTIVE DEGREE: Doctor of Business Administration

Dear Prospective Participant,

My name is Harold Branch, a doctoral student at Walden University. I am conducting interviews as part of a research study to explore strategies that construction project managers use to implement sustainable practices. Themes from senior leaders in the project management environment regarding sustainability strategies may be helpful in developing effective strategies for construction project managers to implement sustainability in their project processes. You are being invited to take part in a research study of the strategies that construction project managers use to implement sustainable practices. You were chosen to potentially participate in the study because you are (a) serving as a senior project management position in a mid-size company in the State of Illinois and (b) you have supervisory responsibility for the implementation of sustainability in your organization. If you agree to be interviewed, the interviews will take roughly 30 to 60 minutes. For the interviews, we can meet at a secure location where you would feel comfortable. To ensure that you have shared exactly what they intended to share, the information you provided will be reviewed directly after the

interview so that you may elaborate or clarify. I will attempt to minimize the time you spend on this process.

I am ultimately trying to capture your thoughts and perspectives as construction project manager regarding environmentally sustainable strategies used in construction. Your responses to the questions will be kept confidential. Each interview will be assigned a number code to help ensure that personal identifiers are not revealed during the analysis and write up of the findings. There is no compensation for participating in this study, and you can withdraw from participation at any time. Your participation will be a valuable addition to this research, and the findings could lead to greater understanding of how to most effectively implement environmentally sustainable strategies in the construction industry. If you are willing to participate, please let me know and I can tell you more about the interviewing process. If you have any questions, please do not hesitate to ask. Thank you for your time.

Sincerely,

Harold Branch