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# Optimizing Green Supply Chain Management Strategies

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
2019

Abstract

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MBA, Walden University, 2015

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## Abstract

Some business leaders in the manufacturing industry lack strategies to optimize green supply chain management strategies that increase profitability while reducing the carbon footprint. The lack of green supply chain strategies sub optimizes the use of resources business leaders use to meet their financial goals. The purpose of this qualitative single case study was to explore successful green supply chain strategies leaders used to increase profitability while reducing the carbon footprint. The participants were 7 business leaders in one manufacturing organization headquartered in Massachusetts who have sophisticated green supply chain strategies in place. The natural resource-based view theory was the conceptual framework for this study. Data were collected through semistructured interviews and organizational documents. Through thematic analysis, 3 key themes emerged: environmental management strategies, profit-increasing strategies, and governance strategies. The findings of this study might be of value to business leaders to reduce costs and create sustainable, competitive supply chains using responsible methods. The implications for social change include the potential for leaders to preserve finite natural resources for future generations and reduce the carbon footprint of manufacturing organizations.

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## Dedication

I dedicate this study to my wife, Monica, and my two sons – Marco and Dante. Without their love and support, I could not have found the strength and perseverance to keep pushing forward to achieve this endeavor. Also, to my entire family, whom I want to make proud of me.

## Acknowledgments

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Section 1: Foundation of the Study

## Background of the Problem

Stakeholder pressure, strict environmental regulations regarding pollution prevention and the depletion of natural resources have driven organizations to look for more sustainable ways of conducting business globally (Zhu & He, 2017). Business leaders need to comply with strict government, regulatory, and stakeholder requirements to reduce the carbon footprint while increasing operational efficiencies (Khaksar, Abbasnejad, Esmaeili, & TamoÅ¡aitienÄ, 2015). Effective green supply chain strategies improve supply chain competitiveness by increasing profitability while reducing the consumption of finite natural resources.

Some manufacturing organizations incurred supply chain cost reductions of 27% or more over a twelve-month period by using green supply chain management collaborative practices (Yan, Chien, & Yang, 2016). Little research exists on how business leaders may develop green supply chain strategies to increase profitability while lessening the impact on the environment. Therefore, opportunities exist to support further study in the use of environmentally-friendly business practices to reduce costs while lessening the impact on the environment. This study was an attempt to inform business leaders of optimal green supply chain management (GSCM) strategies that increase profitability and reduce the carbon footprint of their supply chains. Increasing profitability while reducing the carbon footprint is good for stakeholders and for promoting corporate social responsibilities.

## Problem Statement

Business leaders need to comply with strict government, regulatory, and stakeholder environmental requirements to reduce the carbon footprint while increasing operational efficiencies (Khaksar et al., 2015). Some manufacturing organizations incurred supply chain cost reductions of 27% or more over twelve months by using green supply chain management collaborative practices (Yan et al., 2016). The general business problem was that some business leaders fail to optimize green supply chain management practices, weakening their ability to increase profitability. The specific business problem was that some supply chain managers in the manufacturing industry lack strategies to optimize green supply chain management practices to increase profitability while reducing the carbon footprint.

## Purpose Statement

The purpose of this qualitative single case study was to explore successful green supply chain strategies that increase profitability while reducing the carbon footprint. The targeted population consisted of seven business leaders in one organization headquartered in Massachusetts who have sophisticated green supply chain strategies and environmental management systems in place. The implications for social change resulting from this study include the potential to implement environmentally friendly business practices to conserve finite resources for future generations while reducing the carbon footprint, which is healthy for the environment.

## Nature of the Study

I used a qualitative method for this study. Researchers use qualitative methods to better understand the current situation by looking at firsthand participant experiences to provide meaningful data (Park & Park, 2016). In this qualitative study, I explored, described, and explained the phenomena through open dialog with participants to gain information-rich data to recommend solutions to the specific business problem. Qualitative researchers explore a phenomenon through open discourse with participants to gain insight and rich data in order to recommend solutions for business problems (Dresch, Lacerda, & Miguel, 2015). Quantitative researchers collect numeric data to test hypotheses among predictor and criterion variables using statistical analysis (Yin, 2018). Researchers using the mixed-method approach combine quantitative and qualitative methods to conduct their studies (Yin, 2018). I did not collect numeric data for statistical testing of hypotheses; therefore, I rejected the quantitative method and consequently, the mixed method.

I used a single case study design to capture multiple perspectives from business leaders in the same organization, while understanding the complexity of the phenomena. I described the environment and developed an in-depth understanding of the phenomena. Applying research from other sources will provide a deeper understanding of the specific business problem (Yin, 2018). The primary objective of the phenomenological study is to find meaning or the essence of experiences (Song, 2017). The phenomenological design did not suit the purpose of this study in which I needed to develop a thorough understanding of the current state to optimize green supply chain strategies. Narrative

researchers explore participants' life stories and experiences over a specified period (Clandinin, Cave, & Berendonk, 2017). In this study, I did not focus on the life stories and experiences of participants.

## Research Question

The research question that guided this study is: What strategies do supply chain leaders in the manufacturing industry use to optimize green supply chain management practices to increase profitability while reducing the carbon footprint?

## Interview Questions

1. What green supply chain management practices are you currently using?
2. Why do you consider these green supply chain management practices successful?
3. How are successful green supply chain management practices incorporated into your organization's business strategies?
4. How can your position best influence changes to current supply chain management strategies to optimize financial performance?
5. Which green supply chain management practices, other than those that deliver cost reductions, do you recommend using that will increase profitability?
6. What changes do you recommend making that would optimize green supply chain strategies within your organization to increase profitability?
7. What additional comments do you have that relate to the successful strategies and implementation processes your organization has developed to optimize green supply chain management strategies?

## Conceptual Framework

In the theory of natural resource-based view (NRBV), Hart (1995) posited that strategies and competitive advantages relate to organizational capabilities that support environmentally sustainable economic activities. The policies of carbon footprint reduction, product stewardship, and sustainable development are the pillars supporting the NRBV concept. Optimizing the use of critical resources and capabilities also enhances an organization's ability to obtain sustainable competitive advantages (Hart, 1995). This theory was a means to support how green supply chain management strategies enable organizations to improve both economic and environmental performance by using this conceptual framework as a lens for the analysis.

## Operational Definitions

Many of the terms and concepts used in green supply chain management appear in both academic and business literature. The following terms appear most relevant to this study.

*Balanced Scorecard (BSC):* The balanced scorecard is a set of indicators and objectives which illustrate the strategic vision of the organization, which enables clear communication and evaluation in the execution of the organization's mission and strategic objectives (Quesado, Aibar Guzmán, & Lima Rodrigues, 2018).

*Green supply chain management:* Green supply chain management is the integration of environmental thinking into the supply chain, which includes manufacturing process, material sourcing and selection, product design and delivery of

the final product to the consumers as well as end-of-life management of the product after its useful life (Malviya & Kant, 2015).

*Life Cycle Assessment (LCA):* Business leaders use the life cycle assessment attempts to determine the potential environmental impact of a product throughout its entire life-cycle or at a specific stage in the product's life-cycle (He et al., 2015).

*Supply chain carbon footprint*: Supply chain carbon footprint is the level of emissions from supply chain manufacturing of a given product or service (Montoya-Torres, Gutierrez-Franco, & Blanco, 2015).

*Supply chain management*: Supply chain management is the integration of planning, analyzing, coordinating, and scheduling of every activity involved in sourcing and procurement, conversion and logistics management activities (Jaggernath & Khan, 2015).

*Supply chain strategy*: A supply chain strategy is a set of approaches utilized to integrate suppliers, manufacturing, warehouses, and stores so that products are produced and distributed in the right quantities, to the right location, at the right time, to minimize system-wide costs while satisfying service level requirements (Qrunfleh & Tarafdar, 2013).

*Sustainable Development*. Sustainable development is any activity that meets the requirements of the present, without sacrificing the ability of future generations to meet their needs (WCED, 1987).

*Triple Bottom Line (TBL)*: The triple bottom line is the measurement of enterprise performance through economic, social, and environmental parameters for

accountability to both stakeholders and shareholders, with the focus on the three dimensions: people, planet, and profit (Arslan & Kisacik, 2017).

## Assumptions, Limitations, and Delimitations

Assumptions are ideas that the researcher believes to be true and accurate but cannot verify (Elo et al., 2014). Limitations define potential weaknesses that may affect the reliability and validity of a study (Kirkwood & Price, 2013). Delimitations outline the scope or boundaries created by the design of the study (Nigh, 2017).

### Assumptions

The primary assumption at the onset of this study was that supply chain leaders were willing and able to implement successful green supply chain management strategies to increase profitability and reduce the carbon footprint. I assumed that the participants interviewed would provide thoughtful and honest responses, and those responses would align with some of the green supply chain management literature captured in this study to explore what successful strategies supply chain leaders use to increase profitability while reducing the carbon footprint. A final assumption is that this study will be of use to business leaders trying to increase profitability while reducing their carbon footprint in other regions and industries.

### Limitations

Limitations create a potential weakness that may influence a participant's response, which may include a study's sample size, time constraints, and geographical location (Leedy & Ormrod, 2013). The research study scoped to include seven business leaders from one organization operating in Massachusetts was a limitation. Another

limitation was limited, in any, transferability of the findings to other geographic regions or other industries.

**Delimitations**

A delimitation may be that the findings cannot easily be transferable to a broader audience due to the boundaries created by the conceptual framework and the design of this study (Marshall & Rossman, 2016). Participants' discussions focused solely on green supply chain business practices that enable successful green supply chain strategies that increase profitability and reduce the carbon footprint was a delimitation. Another delimitation was the metric for assessing environmental impact limited to Green House Gas (GHG) emissions only.

## Significance of the Study

External pressures such as governmental laws, regulations, market forces, and institutional pressures drive the formation and structure of organizational environmental management systems (Liston-heyes & Vazquez Brust, 2016). Business leaders need to become more competitive by increasing profitability while complying with political and regulatory environmental requirements (Diab, Al-Bourini, & Abu-Rumman, 2015). This study is significant because of potentially enabling business leaders to become more competitive by increasing profitability and complying with regulatory environmental requirements. The purpose of this study was to determine what successful green supply chain strategies leaders used to increase profitability while reducing the carbon footprint. This study contains insights helpful to business leaders who pursue sustainable supply

chain strategies with sophisticated environmental management systems as part of their overall business plans.

**Contribution to Business Practice**

Exploring successful green supply chain management strategies may help business leaders in the United States become more competitive in the 21st century global market. Competitive strategies help business leaders increase profitability by reducing costs (Bhardwaj, 2016). Optimizing green supply chain strategies is a means for business leaders to increase profitability while reducing the carbon footprint. Forming sustainable social and environmental resources, which are difficult to imitate, create competitive advantages (Hong & Guo, 2018). The principal contribution to business practice is the ability to create sustainable and competitive supply chains using responsible methods.

**Implications for Social Change**

The implications for social change include the potential to improve the competitiveness of supply chains operating in the United States while implementing environmentally friendly business practices to conserve finite resources for future generations. Bhardwaj (2016) posited that any operating system that has minimized inefficiencies is more ecologically sustainable. Environmental management systems reduce the impact on the environment by institutionalizing green practices and new measures by developing innovative technologies, processes, and products (Bhardwaj, 2016). Processes such as product reuse, remanufacturing, and recycling, eliminate waste by creating closed-loop supply systems. Closed-loop supply chains produce more efficient manufacturing and distribution methods by reducing the consumption of finite

natural resources. Decreasing the consumption of finite natural resources, while reducing the carbon footprint are methods organizations may use to create sustainable supply chains in a socially responsible manner.

## A Review of the Professional and Academic Literature

The need to address environmental issues surrounding business operations has gained attention, leading to the development of green supply chain initiatives. Corporate social responsibility, strict environmental regulations regarding pollution prevention, and the depletion of natural resources have driven organizations to look for more sustainable methods of conducting business (Zhu & He, 2017). Due to this trend, economic and environmental performance measures should align with corporate strategies to ensure sustainability and create competitive advantages. Many developing economies are dependent on their natural resources for economic growth and development. Green growth can be favorable for developing economies if the policies are compatible with the country's existing framework regarding natural resource consumption and poverty alleviation (Barbier, 2016). The purpose of this qualitative single case study was to explore how successful green supply chain management strategies increase profitability and reduce the carbon footprint of supply chains in the United States.

This section contains a review of the literature and resources related to the research question and problem statement. The research question queries what successful green supply chain strategies are business leaders using to increase profitability and reduce the carbon footprint? With this literature review, I aimed to relate the conceptual framework and the professional and academic literature with the data collection from

business leaders in Massachusetts, to substantiate the findings and to provide recommendations and identify opportunities for future research. Seminal works provided a foundation for supply chain theory and practice across regions and industries. Scholarly journal articles were a means for me to provide both qualitative and quantitative evidence to support the need for further research on successful green supply chain strategies.

In this literature review, I begin with a review of the conceptual framework. I continue with an examination of the literature on green supply chain practices, which then transitions to a focused search for GSCM strategies that increase profitability while reducing the carbon footprint. I selected sources based on the research question as it relates to the conceptual framework. The literature includes information regarding the green supply chain management concept and practices, pressures that influence green supply chain management (GSCM), benefits of GSCM, strategies to optimize GSCM, triple bottom line, and the balanced scorecard. Sources ranged from peer-reviewed scholarly articles, books, and electronic media. Search criteria included the following words or phrases: *green supply chain management, sustainable supply chain management, product life cycle, environmental performance, green logistics, supply chain design, performance, sustainability, green procurement, supply chain management, customer collaboration,* and *supply chain collaboration*.

I used the following Walden University Library databases: Thoreau, Business Source Complete, Science Direct, EBSCO, Emerald Insight, Taylor & Francis ABI/INFORM Complete, ProQuest Central, Google Scholar, SAGE Premiere, and

Emerald Management Journals as well as other relevant websites. The study contains 102 sources of which 92 are peer-reviewed, with 87 or 85% of them, published in 2015 or after.

**Conceptual Framework**

Natural resource-based view theory (NRBV) is a conceptual framework for incorporating environment challenges into strategic management. Barney (1991) postulated that organizational resources and capabilities that are valuable, rare, and inimitable determine the competitive position of organizations with environmental concerns. The sharing of resources and capabilities creates competitive advantages (Yusuf et al., 2017). Organizational leaders could improve their performance if they can exploit as well as preserve finite natural resources in their operating environment (Barney, 1991). Barney (1991) agreed with Yusuf et al. (2017) that an organization may create sustainable competitive advantages through collaborative efforts.

Choi and Hwang (2015) added that unique environmental, competitive advantages might lead to higher performance. NRBV aligns with this study because of the implementation of GSCM practices aids organizations in developing distinct environmental management capabilities that lead to higher performance (Choi & Hwang, 2015). Additionally, supplier and customer collaboration are necessary to improve both economic and environmental performance.

The three components of NRBV, (a) pollution prevention, (b) product stewardship, and (c) sustainable development, contain the essential mechanisms to create successful GSCM strategies. Pollution prevention strategies generate cost reduction

opportunities by minimizing emissions, effluents, and waste to reduce costs by using continuous improvement methods (Hart, 1995). Environmental and economic benefits of pollution prevention come from using green suppliers, substituting raw materials that are less harmful to the environment and shipment consolidations, which minimize waste and pollution (Yunus & Michalisin, 2016). Product stewardship enables a firm to reduce product lifecycle costs by introducing environmental concerns into the product design and development processes (Hart, 1995). Hart (1995) and Yunus and Michalisin (2016) agreed that the components of pollution prevention and product stewardship initiatives deliver favorable environmental and economic returns to the organization.

Optimizing the use of resources promotes sustainability and minimizes waste. Sustainable development strategies, the third component of NRBV, attempt to uncouple unfavorable links between the environment and the economy, particularly in developing countries where reducing the dependency on material and energy consumption and minimizing waste and emissions require a robust green supply chain management strategy (Hart, 1995). NRBV theorists emphasized the benefit of leveraging intra- and interorganizational resources and capabilities in resource-constrained situations (Hart, 1995). Designing a sustainable supply chain will enhance the firm's competitiveness and performance (Bhardwaj, 2016). Choi and Hwang (2015) noted that supply chain leaders consider closed-loop supply chains a strategic resource that directly improves a firm's performance. Bhardwaj (2016) and Hart (1995) agreed that optimizing all three components of NRBV improves green supply chain strategies and the use of finite

resources through collaborative efforts and synergies may increase profitability while reducing the carbon footprint.

**Green Supply Chain Management**

Supply chain leaders using GSCM practices to integrate environmental thinking into supply chain management. GSCM practices are a set of activities that promote efficiency and synergy among the supply chain members who drive environmental performance enhancement, waste reduction, and costs savings (Cosimato & Troisi, 2015). GSCM activities start with product design and raw material procurement, continue throughout the various manufacturing processes, and end with the delivery and distribution of the product to the customer. In GSCM, the end-product delivery to the customer should also include the disposal of the used product (Jaggernath, 2015). Integrating environmental thinking includes attention to practices that promote environmental-friendly and ecologically responsible lifestyles and decisions. Such practices enable the protection of the environment, and the preservation of natural resources for present and future generations (Verma, Dixit, & Singh, 2018). Jaggernath (2015) and Verma et al. (2018) noted that socially responsible organizations might lessen their impact on the environment while controlling costs and increasing profitability. Cosimato and Troisi (2015) postulated that green supply chain collaborative efforts also promote efficiencies and reduce waste.

Three components of GSCM are (a) upstream supply chain, (b) internal supply chain, and (c) downstream supply chain (Verma et al., 2018). These three components break down into six practices. The six GSCM practices are as follows: green design,

green purchasing, green process planning, green logistics, and green manufacturing (Kumar, Luthra, Govindan, Kumar, & Haleem, 2016). Supply chain leaders use these six green supply chain management practices throughout the supply chain to optimize green supply chain strategies that increase profitability and reduce the carbon footprint.

**Green design.** Supply chain leaders use green design to reduce the consumption of materials through reuse and recycling while reducing costs and the impact on the environment. Green design is the design of goods that lessen the consumption of materials and energy, facilitate the reuse, recycling, and recovery of materials and parts while avoiding the use of hazardous products (Diab et al., 2015). The decrease in material consumption through reuse, recycling, and material substitution reduces costs and promotes product stewardship and corporate social responsibility. The benefits of using green initiatives in product design include receiving royalties for licensing the innovative technology, developing unique manufacturing capabilities, and creating proprietary information that may provide sustainable competitive advantages (Li, Jayaraman, Paulraj, & Shang, 2015). Profit-maximizing organizations determine the greenness of designs by considering the trade-off between revenue from environmentally conscious consumers, and the cost of green technology development (Hong & Guo, 2018). Li et al. (2015) postulated that one of the benefits of green design is the creation of sustainable competitive advantages. Hong and Guo (2018) noted the need to weigh the costs of green design against revenue streams to maximize profits. Green design efforts contribute to an organization's ability to differentiate its business offerings from

their competitors by providing eco-friendly products and services, which in turn reduces costs.

**Green purchasing**. Green purchasing is a practice that considers the environmental objectives of the organization to reduce waste and lessen the impact on the environment (Song, 2017). Proactive supplier collaboration improves sustainable performance by integrating internal and external resources (Hong & Guo, 2018). Green purchasing practices are solidified by flowing down green supply chain initiatives through supplier collaborative contractual agreements. Process-based green purchasing attains sustainability through robust processes, and responsible managerial behaviors (Song, 2017). Purchasing activities have a considerable influence on sustainable supply chains through the purchasing of raw materials, components, and services (Islam, Karia, Fauzi, & Soliman, 2017). Green purchasing competencies have a positive effect on environmental and economic performance (Yook, Choi, & Suresh, 2017). Islam et al. (2017) and Yook et al. (2017) agreed that investments in green purchasing activities deliver a favorable return on investments which may increase profitability. Supply chain managers using a collaborative supply chain approach enable green purchasing processes for organizations to create sustainable performance measures in a socially responsible manner.

**Green process planning**. Process optimization reduces operational costs and promotes innovativeness, which creates sustainable competitive advantages while producing stronger supply chain relations through strengthening collaborative efforts. Green process planning results in a collaborative environment with joint planning and

management of environmental initiatives (Wong, Wong, & Boon-Itt, 2015). Cooperative planning efforts reduce costs and promote synergies that drive efficiencies and systemic supply chain improvements. Eliminating waste and optimizing green process efficiencies cut costs while minimizing the carbon footprint. Green process planning lessens the environmental impact by reducing or eliminates process waste and reducing operational costs. Green process innovations reduce emissions of toxic materials, pollution prevention, waste and the reduction of raw material consumption during manufacturing processes (Shafique, Asghar, & Rahman, 2017). Green process innovation affects a firm's operations throughout the product's entire lifecycle as goods and processes mature and sunset. Green processes that create shorter product life cycles enable process innovations that generate sustainable competitive advantages. Supply chain leaders use green innovations to differentiate their products and services, which enable them to charge competitive prices, and increase profits by generating innovative solutions (Nanath & Pillai, 2017). Shafique et al. (2017) and Nanath and Pillai (2017) both noted that innovative green processes enhance organizational performance and increase profits. Opportunities to reduce costs through green process innovations exist in both the manufacturing and logistical processes that are not readily reproducible, which creates competitive advantages.

The elimination of waste and environmental pollutants promotes corporate social responsibility and increases profitability while reducing the carbon footprint. Practices of collaborative process planning for procurement related to cost-effectiveness and shipping time efficiencies (Yan et al., 2016). Increased customer satisfaction comes through

improved performance metrics such as improvements in quality, delivery, and manufacturing flexibility (Dai, Cantor, & Montabon, 2017). Inefficiencies in existing production processes reduce or eliminate waste, thereby increasing the potential for cost-saving efficiencies, reduced cycle times, quality, and flexibility improvements (Dai et al., 2017). Yan et al. (2016) and Dai et al. (2017) agreed that green process improvements contribute to efficiencies, which increase profitability and customer satisfaction through improved performance. Process innovations are difficult to imitate and thus create sustainable competitive advantages.

**Green logistics**. The efficient circulation of information and product in a manner that reduces the impact on the environment are essential ingredients in exploring how green logistics is an essential element of green supply chain management practices. Green logistics encompasses the planning, and execution of efficient, cost-effective material, product and information flow, from the point of use, to the point of reuse or disposal (Cosimato & Troisi, 2015). Successful business leaders consider the economic costs of transportation and reverse logistics against the environmental objectives of recyclable materials (Yang, 2017). Transportation is the primary source of air pollution and the production of greenhouse gases that hurt the environment and human health (Asrawi, Saleh, & Othman, 2017). The delivery of goods to the point of consumption takes place in smaller lot sizes and using environmentally friendly vehicles (Verma et al., 2018). Effective green logistics management can lead not only to operational and economic performance improvements but also contribute to long-lasting competitive reinforcement (Cosimato & Troisi, 2015). Customer demand, environmental awareness,

and financial support are the primary drivers for adopting green logistics services (Asrawi et al., 2017). In rebuttal to Yang (2017), Asrawi et al. (2017) postulated that outside forces like customer pressures and lack of financial support might influence business decisions that may unfavorably affect the organization's decision to use green logistics practices.

Transportation and packaging costs contain many opportunities for business leaders to reduce costs and lessen the burden on the environment by eliminating waste. Returnable transport packaging minimizes environmental impact through waste reduction while reducing operational costs (Yusuf et al., 2017). Efficient and safe warehousing design enhances ease of product storage, access, and retrieval and creates operational improvements (Cosimato & Troisi, 2015). Organizations that use closed-loop supply chains as a competitive strategy receive returns on investment such as higher profitability, and tighter control over a product's entire lifecycle (Cosimato & Troisi, 2015). Yusuf et al. (2017) and Cosimato and Troisi (2015) agreed that green logistics plays a significant role in optimizing green supply chain strategies by reducing transportation costs and by creating closed-loop supply chains, which reduce material cost and consumption.

**Green manufacturing**. Remanufacturing saves energy, reduces material consumption, and lessens the impact on the environment. Design for remanufacturing is the first step in returning products to a better condition for resale or reuse to reduce operational costs (Islam et al., 2017). Remanufacturing's primary objective is to maximize profit for the firm by reducing material costs and supply volatility by reducing

the impact of obsolescence (Diaz & Marsillac, 2017). Cost reductions associated with the reclamation of material can substantially reduce the cost of goods sold, thereby increasing profitability while reducing the carbon footprint. Business leaders use a remanufacturing strategy to extend the original life of a product at the end of the product's life, by restoring used products to like-new conditions through disassembly, cleaning, repairing, and replacing parts, and reassembly (Diallo, Venkatadri, Khatab, & Bhakthavatchalam, 2017). Current estimates hold that remanufactured product sales exceed $100 billion per year (Diaz & Marsillac, 2017). Renewable materials are being used to reduce the number of materials used for packaging, and helps to reduce material cost (Verma et al., 2018). Diaz and Marsillac (2017) concurred with Verma et al. (2018) that green manufacturing reduces material consumption and costs which contribute to increasing profitability. Green manufacturing is a viable approach to cost reductions and environmental sustainability.

## Pressures that Influence Green Supply Chain Strategies

Many internal and external pressures influence an organization's economic and environmental management policies and procedures. Laws and regulations shape the boundaries of corporate methods at global and regional levels. Stakeholders are now demanding business leaders achieve environmental sustainability and long-term profitability (Liu, Zhu, & Seuring, 2017).

**Government and civil society**. External pressures, such as governmental laws, regulations, market forces, and institutional pressures, drive the formation and structure of organizational environmental management systems. Governments that have the most

potent authority over markets can influence strategies and policies to reduce pollution and increase the sustainability of products (Madani & Rasti-Barzoki, 2017). Federal and local governments affect the economic development of communities through commercial zoning and infrastructure planning (Zender, 2017). Repair, recycle, and disposal initiatives are programs that induce higher measures of performance while complying with environmental laws and regulations (Khor, Udin, Ramayah, & Hazen, 2016). Madani and Rasti-Barzoki (2017) and Khor et al. (2016) are in support that organizations should understand the pressures prevalent in the environment, and how green supply chain strategies can be a source of competitive advantage. Business leaders who take a proactive environmental management position may create competitive advantages by developing innovative inimitable capabilities.

Organizational leaders that incorporate green activities into their supply chains evolve from a reactive approach, that focuses on complying with legislation, to a proactive method, which improves regulatory compliance and value seeking to enhance organizational strategy development. Environmentally proactive firms are more willing to deploy resources and capabilities to launch green initiatives (Liu et al., 2017). Environmentally proactive organizations require their business leaders to fully understand which capabilities improve the effectiveness and efficiency of green initiatives (Liu et al., 2017). Organizational leaders motivated by long-term sustainability and survival focus more on reactive efforts to environmental pressures and adopt a more passive position and minimize risk by imitating successful competitors (Vanpoucke, Quintens, & Van Engelshoven, 2016). Supply chain leaders must comply with

environmental issues and regulations while having the ability to identify opportunities to recover revenues or reduce costs. The proactive approach of creating environmental business practices that positively influence legislation and society creates sustainable competitive advantages by creating unique competencies. Proactive environmental responsiveness is related to better financial performance (Li et al., 2015). Vanpoucke et al. (2016) and Li et al. (2015) agreed that a proactive approach to creating environmental business practices improves financial performance while creating sustainable competitive advantages. Organizational leaders whose environmental management systems are considered best practices solidify their supply chain strategies through their ability to influence environmental laws and policies.

**Stakeholder.** Stakeholders influence managerial goals and objectives, which drive organizational economic and environmental performance targets. Green supply chain strategies benefit the firm by improving the effectiveness and efficiency of its resource and capability deployment (Liu et al., 2017). Stakeholder pressures can positively influence environmental attitudes (Liston-heyes & Vazquez Brust, 2016). Supply chains' environmental decisions are interrelated with the economic feasibility of green investments and sustainable constraints that represent stakeholders' environmental concerns. Zhu and He (2017) posited that organizations should focus on using market forces, or price competition to improve the greenness level of their business offerings. Stakeholder cooperation, based on direct company-stakeholders dialogue, can contribute to making organizations respond to market requests and environmental regulations, thus building and sustaining competitive advantages in the global market (Cosimato & Troisi,

2015). The setting of regulatory requirements and guidelines can trigger improved communication and sharing of best practices within the firm, triggering stakeholders to commit more resources thereby improving information flow between customers and suppliers, which leads to improvements in performance (Liston-heyes & Vazquez Brust, 2016). The accumulation of green supply chain management resources and capabilities creates distinctive strategic assets that achieve business and environmental sustainability (Yunus & Michalisin, 2016). Liu et al. (2017) and Liston-heyes and Vazquez Brust (2016) agreed that stakeholders who influence how to allocate resources effectively and efficiently through capability deployment create competitive advantages. The improved competencies and skills gained by business leaders include globalization, the environment, and supply chain integration and innovation.

**Benefits of Green Supply Chain Management**

GSCM practices enhance the firm's strategic competitiveness in ways that sustain our environment and improve economic performance. The use of collaborative GSCM practices reduces the impact on the environment without sacrificing quality, cost, reliability, performance or energy utilization efficiency (Wei, Ju, & Angkasa, 2016). 2016). Supply chain leaders use GSCM practices to reduce the environmental impact of manufacturing organizations through the responsible disposal of products, which improve the economic and social positioning of organizations. GSCM has a positive impact on organizational performance (Shafique et al., 2017). Wei et al. (2016) and Shafique et al. (2017) both postulated that GSCM practices contribute to cost reduction and environmental and social benefits.

Cost reductions and operational efficiencies contribute to increased profitability. Environmental responsiveness is positively related to better financial performance (Li et al., 2015). Organizations that implement GSCM practices will reduce organizational costs, and protect the environment while improving environmental performance (Shafique et al., 2017). Organizational leaders strive to minimize costs as well as maximize profits via sustainable measures (Jaggernath, 2015). Supply chain managers use GSCM methods to focus on the elimination of waste associated with environmental sustainability. Optimal supply chain configurations improve cash flow and increase customer value over the entire product life cycle (Li et al., 2015). The primary drivers of organizational financial performance are the more efficient use of raw materials and energy, waste reduction, and process refinements throughout the product lifecycle (Schmidt, Foerstl, & Schaltenbrand, 2017). There are intangible benefits associated with implementing green supply chain practices that improve corporate image, corporate social legitimacy, and competitive advantages (Yang, 2017). Li et al. (2015) and Yang (2017) agreed that green supply chain practices deliver both tangible and intangible benefits to the organization.

Organizations continue to reduce adverse environmental impacts from pollution reduction and are now considering how to optimize the use of finite natural resources, by proactively seeking new, more environmentally friendly, technologies, and processes. The development of proactive environmental policies that drive environmental concerns will improve corporate social responsibilities. Collaborative efforts improve the strategic and tactical aspects of eco-efficient supply chain planning. There is a positive

relationship between green product design to environmental performance and economic performance (Li et al., 2015). Incorporating ecological factors into supply chain models will reduce costs while reducing the carbon footprint. Carbon footprint reduction has become an essential part of environmental performance. Internal green practices and external green collaborations positively affect economic and environmental performance (Yang, 2017). Investments in technologies or processes that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services (Shah, Arjoon, & Rambocas, 2016). Environmental supplier development programs include knowledge transfer and communication, investment and resource mobilization, and management and organizational practices. Shah et al. (2016) and Yang (2017) concurred that green practices and technologies favorably contribute to both economic and environmental organizational performance.

**Corporate Social Responsibility**

Corporate social responsibility (CSR) refers to how organizations integrate social and environmental concerns in their business operations while meeting the objectives and values of stakeholders and society (Reddy & Kala, 2018). Organizational leaders need to act consistently in ways that balance the expectations of stakeholders while achieving the right balance of corporate performance measures that include CSR concerns. The level of organizational support, the durability of perspective and consistency, and the reporting content are leading CSR indicators for sustainability (Svensson et al., 2016). Business leaders need to find sustainable methods to meet economic, social, and environmental stakeholder concerns. The inclusion of social and environmental obligations supports

sustainable development without challenging price-based competition and cost pressures (Lamarche & Bodet, 2018). Organizational leaders facilitate and adopt GSCM as an innovative strategy for higher profits and in turn help society and economy (Verma et al., 2018). GSCM methods have a secure connection to CSR by decreasing the consumption of finite natural resources, reducing waste, and sustaining healthy environments (Tabesh, Batt, & Butler, 2016). Business leaders use a CSR approach to hold organizations accountable in ways that endorse the organization's ethical values, its respect for people and communities, and the natural environment (Reddy & Kala, 2018). There is limited research available that studies the integration of managerial practices into social aspects. (Zhang, Tse, Doherty, Li, & Akhtar, 2018). Organizational leaders who utilize eco-friendly and less costly methods have increased their efficiency and improved their environmental performance while increasing growth with their supply chain partners (Jaggernath, 2015). Reddy and Kala (2018) agreed with Lamarche and Bodet (2018) in that the benefits of GSCM practices and strategies are enablers for organizations to meet their goals and objectives, while not sacrificing the objectives and values of stakeholders and society. In rebuttal, Zhang et al. (2018) noted that limited research exists that relates managerial practices to social aspects. Leadership's commitment to creating socially responsible organizations with environmentally conscious corporate cultures is what enables the creation of sustainable competitive advantages.

**Strategies to Optimize Green Supply Chain Management**

Top-performing supply chains exhibit three distinctive traits: (a) agility, (b) adaptability, and (c) alignment (De Kluyver, 2010). Agility refers to the ability to

quickly react to sudden changes in the market to ensure the use of the most cost-effective methods to support demand-supply alignment (De Kluyver, 2010). Agility and resiliency help supply chains quickly recovery from unexpected setbacks and are better prepared to manage risk. Improving flexibility, velocity, and visibility builds a resilient supply chain. Resiliency enables the supply chain to reduce the impact of disruptions and strengthens their ability to recover quickly. Adaptability refers to the ability to flex to changes in market conditions and changes in environmental policies, law, and regulations (De Kluyver, 2010). Adaptable supply chains are better able to flex to evolutions in markets or strategies (De Kluyver, 2010). There are three stages in developing a GSCM strategy for carbon footprint reduction: (a) develop a long-term plan, (b) create a roadmap, and (c) implement and track (Carola, Lusa, & Coves, 2018).

**ISO 14001 certification**. Supply chain partners want to do business with organizations that meet their business needs while operating in a socially responsible manner. ISO 14001 certification is an international validation standard whose purpose is to support environmental protection and prevent pollution. ISO 14001 certification guides the establishment, implementation, maintenance, and improvement of robust, credible and reliable environmental management systems and is a prerequisite for meeting local, state, federal, and international laws (Jayaram & Avittathur, 2015). ISO 14001 certification is intended for organizations, seeking to manage their environmental obligations systematically, to mature to a state of environmental sustainability (ISO, n.d.). The adoption of ISO 14001 standards builds competitive advantages across the supply chain (Jayaram & Avittathur, 2015). Certification programs, such as ISO 14001 also help

organizations advertise the environmental friendliness of their products and processes (Earnhart, 2017). ISO 14001 certification has a positive association with an organization's long-term financial performance through increased sales and improved profit margins (Lee, Noh, Choi, & Rha, 2017; Zhang et al., 2018). Organizations that are ISO 14001 certified have experienced increases in business growth, gain international recognition, and achieve competitive advantages by improving economic and environmental performance which enables sustainable growth (Verma et al., 2018). ISO 14001 certification establishes a baseline from which organizations can build economic and environmental performance improvements that support sustainable competitive advantages. Jayaram and Avittathur (2015) and Lee et al. (2017) concurred that ISO 14001 certification create competitive advantages and increase profitability. ISO 14001 drives supply chain alignment by establishing standard environmental management practices that may be used to develop long-term environmental plans.

**Supply chain collaboration**. Cooperation among partners is a necessary means to improve the environmental performance of a supply chain (Hong & Guo, 2018). In using supply chain collaboration, leaders discuss how organizations work efficiently executes strategies toward a common goal (Scholten & Schilder, 2015). Organizations with active environmental strategies have more collaboration with suppliers as well as ecological processes such as green design, green packaging, and reverse logistics and other processes on the level of cooperation with customers. Green supply chain integration requires suppliers and customers to work closely together (Wei et al., 2016). Organizational resource mobilization through proactive green supply chain strategies

leads to favorable corporate environmental and financial performance (Hong & Guo, 2018). Environmental supplier development programs aim to improve supplier performance and create competitive advantages (Dou, Zhu, & Sarkis, 2014). Organizations need to find strong supply chain partners who have the leadership, vision, realism, and competence to be successful (Jaggernath, 2015). In agreement with Hong and Guo (2018), Dou et al. (2014) noted an improvement in supply chain environmental performance occurs through collaboration between cooperating supply chain members. Collaboration up and down the supply chain enables organizations to streamline their processes, which drives alignment and agility.

Collaborative efforts develop synergies that leaders use to exploit market opportunities, neutralize threats, and reduce costs in which better positions are participating members in their respective markets. Value chains are the participative processes in which people and organizations generate and develop a value proposition for their customers (Alves, Fernandes, & Raposo, 2016). Organizational leaders, through collaborative efforts, use concepts such as lean design, green procurement, and design to reduce costs and achieve sustainability in their supply chains (Kumar et al., 2016). Without collaboration, joint planning, integrated systems, forecasting, and information sharing, innovation no longer acts as an enabler for better supply chain performance. Alves et al. (2016) agreed with Kumar et al. (2016) in that collaborative efforts increase the resiliency of the entire supply chain's value stream. These collaborative efforts have enabled organizations to reduce costs while minimizing the carbon footprint.

Collaboration among organizations is a crucial role in multinational corporation's ability to meet their strategic objectives where analytical, interpersonal, leadership, change management, and project management competencies are critical to success (Kumar, Verma, Sharma, & Khan, 2017). Multinational companies are more concerned about their reputations, given the higher scope of their markets (Earnhart, 2017). The degree of supply chain alignment and their level of integration directly relate to the degree of supply chain collaboration (Sarkis, Bai, Lopes De Sousa Jabbour, Jabbour, & Sobreiro, 2016). Sustainable operations management has helped organizations define strategies, actions, and techniques that support operational policies to achieve economic and environmental objectives simultaneously (Sarkis et al., 2016). A key enabler to supply chain alignment is the creation and sharing of knowledge between supply chain members to create a customer value proposition. Collaborative efforts may help break through barriers multinational companies encounter to address global and regional environmental concerns and deliver economic and environmental stakeholder benefits. In rebuttal to Kumar et al. (2017), Earnhart (2017) noted that multinational organizations are influenced more by their corporate reputations as opposed to the level of collaboration in their supply chains. Synergies gained by cooperating supply chain members create sustainable competitive advantages through economies of scale and the creation of environmental management innovations.

**Innovation**. High levels of integration among supply chain members promote innovation. Organizations that consider cross-cultural collaboration for connecting global and local knowledge build a shared culture of innovation across the entire supply

chain. Innovations in communication systems strengthen supply chain relationships and market performance through shared intelligence. Capabilities to collaborate and share information, enabled by IT resources, may allow firms to improve sustainable performance and are difficult for competitors to imitate. Modeling potential remanufacturing scenarios can assist organizations in making optimal strategic decisions before implementing green initiatives (Diaz & Marsillac, 2017). Establishing the correct metrics, interrelationships, and customer service levels drive supply chain performance. Most manufacturing organizations, and their customers, in developing countries, understand how to leverage their relationships to develop innovative capabilities (Adebanjo, Teh, & Ahmed, 2018). Innovation is one of the most reliable methods for organizations to respond to internal and external changes in the environment. Innovation is an enabler to deciding the optimal alternatives to choose in reducing the carbon footprint (Carola et al., 2018). Adebanjo et al. (2018) agreed with Carola et al. (2018) in that understanding how to leverage innovation to improve economic and environmental performance. From an NRBV perspective, an organization's capacity to develop innovative capabilities should lead to creating competitive advantages by creating operational and environmental efficiencies while maintaining market competitiveness (Adebanjo et al., 2018). A value-adding innovation conceptual framework links collaboration, capabilities, organizational performance, and competitive advantages.

**Customer collaboration**. Improved customer collaboration increases the operational performance dimensions of flexibility, delivery, quality, and cost. Organizations should solicit input from their customers to internalize environmental

concerns into the design of their products and services (Yunus & Michalisin, 2016). Customer collaboration refers to the level of engagement an organization has with its clients in jointly planning for GSCM initiatives and environmental management practices (Hong & Guo, 2018). Responsive supply chains require higher levels of interaction between upstream suppliers and downstream customers. Collaboration enhances supply chain performance by integrating an organization's functions, by effectively linking them to external operations of both suppliers and customers (Hong & Guo, 2018). Increased integration between suppliers and customers may lead to improvements in innovativeness (Yunus & Michalisin, 2016). In agreement with Yunus and Michalisin (2016), Hong and Guo (2018) noted that increased customer collaboration improves supply chain performance by creating innovative capabilities. Organizations need to meet the demands and expectations of customers that address environmental concerns to achieve sustainable business strategies.

**Knowledge sharing**. Learning organizations can enable resilient systems that can create competitive advantages when they are flexible and can manage through adversity. Business leaders use systems thinking to enable the creation of learning organizations. Systems can structure themselves, to build new structures that learn and diversify (Meadows, 2008). Self-learning systems help organizational leaders adapt and learn, to create improved structures that create sustainable competitive advantages (Meadows, 2008). Reinforcing and feedback loops contribute to building control plans that ensure systemic problems remain in place (Meadows, 2008). Creating learning organizations that are flexible and create efficiencies over time supports continuous

improvement. Systems thinking is a means to help the organizational leaders identify structure in complex situations, and enables them to recognize leverage points that will influence change using the optimal amount of resources (Senge, 2006). A risk associated with this approach is the need for a better understanding of dynamic complexity versus detail complexity (Senge, 2006). The focus should be on influencing patterns and significant interrelationships, as opposed to creating more complexity by focusing on detailed tactical information (Senge, 2006). Meadows (2008) agreed with Senge (2006) in that systems thinking enables organizations to simplify complex systems that support problem-solving. Systems thinking and the learning organization approach are enablers for improving supply chain collaboration and integration.

Supply chain partners should align themselves with organizations that can collaborate and share information at the same rate, and with similar strategies, to improve efficiencies. Knowledge transfer requires the development of secure and trustworthy relations, especially within organizational and geographical boundaries (Jensen, 2015). Information processing is a means to explore the role of how an organization's absorptive capacity links a firm's responsive strategy with performance by determining how efficiently organizational information matriculates in decision-making (Jensen, 2015). Absorptive capacity is a necessary competency for organizations that strive to deliver innovative products to customers, and are flexible to clients' changing requirements. Continuous innovation drives incremental learning and operational performance (Jensen, 2015). Links between supplier innovation and manufacturer's performance provide evidence that buyer-supplier collaboration and interorganizational learning improve

efficiencies and performance. New data encryption technologies, such as blockchain allow digital data exchange in a fast and reliable manner (Writer, 2018). Some supply chain leaders use blockchain technology to exchange data and execute transactions in a standardized and secure manner. The blockchain process is used as a solution for identity management, which allows the tracking of who is performing what transactions when, and at what location, as the transaction occurs when the product moves through the supply chain (Kshetri, 2018). Jensen (2015) and Writer (2018) agreed that secure knowledge transfer in a fast and reliable manner enables incremental learning which contributes to increased collaboration. The improved transaction traceability blockchain offers secure data transfer. An organization's ability to exchange and absorb information from outside sources quickly and efficiently contribute to its competitive advantages. Singh, Rastogi, and Aggarwal (2016) introduced the concept of Interpretive Structure Modeling (ISM) to decompose complex systems into sub-systems or elements to gain a better understanding. These structures are a means to determine how knowledge is shared, used, and set up in groups and cross-cultural team collaboration, and how organizations learn and adapt in complex and changing business environments (Singh et al., 2016). Business leaders might use this method to evaluate the relationships of both upstream and downstream supply chains to construct a model that assesses the effectiveness of supply chain collaboration.

**Life cycle assessment (LCA).** The life-cycle assessment (LCA) is a useful tool for evaluating the environmental impact or carbon footprint of products and processes (Carola et al., 2018). The purpose of LCA is to ensure the components, and design of the

product satisfy environmental standards (Jaggernath, 2015). Cost reductions attained by reducing product life cycles and waste minimization create sustainable competitive advantages. Business leaders use LCA models to help evaluate sustainability efforts, environmental impacts, and natural resource consumption of various processes across industries (Egilmez, Bhutta, Erenay, Park, & Gedik, 2017). Carola et al. (2018) agreed with Egilmez et al. (2017), noting that the use of LCA helps to assess the environmental impact of an organization's products and processes. Effective supply chain leaders use LCA to reduce the impact on the environment by finding the greenest product in each process.

**Triple Bottom Line and the Balanced Scorecard**

Business leaders use the triple bottom line (TBL) to measure enterprise performance through economic development, environmental stewardship, and social justice measures which hold the organization accountable to both shareholders and stakeholders (Coskun & Kisacik, 2017). Organizations may achieve sustainable competitive advantages by efficiently balancing the interests of these three dimensions to serve the needs of the present, without compromising future generations' ability to meet their own needs (Zender, 2017). Coskun and Kisacik (2017) and Zender (2017) noted that TBL is a useful tool that enables organizations to balance economic, social, and environmental concerns. The economic, social, and environmental dimensions affect the future value of the enterprise.

Business leaders use the TBL approach to enhance the decision-making process to increase profitability while reducing the carbon footprint and provides a new viewing

window for investors and shareholders. BSC is useful tool business leaders use to control information. Business leaders use the TBL to efficiently integrate an organization's strategic planning with its day-to-day operations while providing an easy-to-access tool for assessing sustainable business practices (Svensson et al., 2016). Establishing key performance metrics is essential to align organizational goals and objectives while managing multiple strategies simultaneously. Business leaders implement the TBL to provide more visibility regarding sustainable development indicators. Integrating economic, environmental, and CSR metrics into performance criteria enables the creation of a sustainable management operating system (Matthews, Power, Touboulic, & Marques, 2015). Performance metrics drive organizational behavior and corporate culture. The balanced scorecard is a select set of indicators and objectives that reflect the strategic vision of the organization. Business leaders use the BSC approach to help meet stakeholders' expectations, and help to articulate and communicate strategic objectives and while evaluating the effectiveness of their implementation (Quesado et al., 2018). BSC metrics indicate the balance between external metrics related to shareholders, customers, and internal metrics related to critical processes, such as innovation, learning, and growth. The use of the BSC helps the organization translating the organization's vision and performance measures into four dimensions: (a) financial, (b) customer, (c) internal processes, and (d) learning and growth (Quesado et al., 2018). Matthews et al. (2015) and Quesado et al. (2018) agreed that the use of the BSC is an effective means to coordinate people and encourage their motivation by creating a tactical focus and vision, which aligns with strategic goals and objectives of the organization. Measuring

environmental impact enables business leaders to put policies in place that lessen the impact on the environment and improve corporate social responsibility.

## Summary

Many global forces influence a supply chain's ability to adapt and meet customer needs. A thorough understanding of how these forces affect corporate environmental strategies and improve organizational performance improves efficiencies, manages risk, and lessens the impact on the environment. Product life cycles affect how supply chain partners implement innovation and technologies that reduce waste and reduce the carbon footprint. The rate of information sharing among supply chain members can affect decision making throughout the supply chain.

Supply chain member collaboration enables leaders to mobilize resources where stakeholder benefit opportunities exist. Innovation between supply chain partners improves when synergies drive strategies are mutually beneficial to supply chain members. Collaboration improves supply chain resilience by strengthening integration links with suppliers and customers, which enables flexibility and agility to environmental change. Optimization models enable risk sharing and reduce waste by eliminating or reducing non-value-added activities before the execution of activities. Improved technologies act as enablers to strengthen the sharing of knowledge among supply chain members.

## Transition

In the first section, I presented the background of the problem statement, purpose statement, nature of the study, research question, interview questions, conceptual

framework, the definition of key terms, assumptions, limitations, and delimitations, the significance of the study, and a review of the professional and academic literature. In Section 2, I will relate the purpose statement, the role of the researcher, study participants, research method and design, population and sampling, ethical research, data collection, data analysis, and reliability and validity of the study to the research question. In Section 3, I will reflect on the purpose of the study, provide a summary of the findings, discuss the application to business practice, present the impact to social change, and conclude with recommendations for action and identify opportunities for further research.

Section 2: The Project

## Purpose Statement

The purpose of this qualitative single case study was to explore successful green supply chain strategies that increase profitability while reducing the carbon footprint. The targeted population consisted of seven business leaders in one organization headquartered in Massachusetts who have sophisticated green supply chain strategies and environmental management systems in place. The implications for social change resulting from this study include the potential to implement environmentally friendly business practices to conserve finite resources for future generations while reducing the carbon footprint, which is healthy for the environment.

## Role of the Researcher

A researcher conducting a quantitative method study is the primary data collection instrument (Yin, 2018). In this qualitative single case study, I was the primary instrument for data collection. My education, knowledge, and experience in the supply chain are extensive. I hold a bachelor of science in global supply chain management with more than 23 years of supply chain and operations experience in various industries. To mitigate bias and increase the validity of this study I used the same interview protocol and posed the same questions to each participant. I conformed to the ethical research standards for research on human beings and treated participants with justice, beneficence, and respect (U.S. Department of Health and Human Services, 1979). Ethical guidelines from both the Belmont Report and the Walden University's Institutional Review Board (IRB) ensured that I used an ethical approach to collect data.

I used seven open-ended questions based on the overarching research question to solicit comprehensive responses. I selected seven business leaders from a single manufacturing organization as interview participants. Morse (2015) noted that researchers need to interview participants until they achieve data saturation. Data saturation occurs when no additional issues or insights emerge, and all relevant conceptual areas are explored and exhausted (Fusch & Ness, 2015). Data saturation signals when the emerging theory is comprehensive and credible (Hennink, Kaiser, & Marconi, 2016). At the point of data saturation, no new data nor insights are revealed, which makes further data capture redundant.

After collecting and analyzing data from participants, I synthesized the data and compared it to the conceptual framework and the literature review. Interview protocol helped in ensuring that the transcripts were complete and contained the appropriate level of detail and accuracy. The protocol to conduct the interviews is in Appendix B.

Adhering to the interview protocol ensured that I treated each participant equally and did not miss any essential steps in the data gathering process. The interview questions were open-ended to ensure that each participant provided rich, in-depth explanations related to the research question. I recognized each participant's voluntary involvement in the study and protected them from harm by concealing their identities. I am the only person with access to information provided by the participants, such as their titles, names, and organizational information.

Member checking enabled me to validate, verify, and assess the trustworthiness of the qualitative data collected (Birt, Scott, Cavers, Campbell, & Walter, 2016). I recorded

each interview session, summarized and transcribed the data to a journal that the participants reviewed and approved to ensure the capture of true meaning. I kept a reflective journal to document decisions, lessons learned, and insights to identify and mitigate researcher bias.

## Participants

The participant population came from a single manufacturing organization, which had sophisticated environmental management systems and green supply chain strategies in place. I selected seven business leaders from different functions who influence business strategy, and who were stakeholders in green supply chain strategies to triangulate data. The business leaders chosen were director level or higher, and they had direct authority and responsibility to influence decisions that impact supply chain strategies. The eligibility requirements for participant selection were (a) participants were stakeholders of supply chain strategies, (b) the participant had a history of creating successful green supply chain strategies for the organization, (c) the participant had been in their current position for at least 2 or more years.

I scheduled interview sessions using the organization's electronic calendars. I used video conferencing to facilitate ease of accessibility to participants. The interview sessions were audio-recorded with prior permission from the participants.

## Research Method and Design

In this study, I used a qualitative methodology to explore a phenomenon. I used a single case study design to collect relevant data to answer the research question. I also

reviewed the motives for not using alternative methods and designs and justified the reasons for not using them.

**Research Method**

Researchers use qualitative methods to understand a phenomenon by looking at firsthand participant experiences to provide meaningful data (Park & Park, 2016). The exploratory approach is appropriate to study the chosen phenomenon because of the lack of green supply chain management research available in research available. By using a qualitative approach, I was able to apply the conceptual framework to the phenomenon as an aid in answering the research question.

Quantitative researchers collect and analyze numerical data to create accurate and reliable measurements for statistical analysis (Goertzen, 2017). This method was not suitable for my study because of the exploratory approach required to uncover what motivations exist to uncover observed behaviors. Qualitative researchers focus on the discovery of findings captured from research in natural conditions, whereas quantitative researchers focus on predicting and controlling social phenomena (Park & Park, 2016). Goertzen (2017) and Park and Park (2016) both noted that quantitative research captures data to model phenomena. Discovery versus justification was the primary reason for selecting a qualitative approach.

A researcher uses the mixed-method approach to combine contains both qualitative and quantitative techniques into a single study (Yin, 2018). Although mixed-method research was suitable for this study, the need to explore and discover participant behavior in a natural setting is more critical and, required a qualitative-only approach.

Furthermore, mixed-method researchers require more time to complete their study because of the need to capture two different types of data (McKim, 2016). Yin (2018) and McKim (2016) both noted that mixed-method researchers focus on capturing numerical data.

**Research Design**

Case study design is the study of the particularity and complexity of a single case, and researchers use case studies to understand activities under certain circumstances (Stake, 1995). My study was an attempt to inform business leaders that successful green supply chain management strategies increase profitability while reducing the carbon footprint. I used the case study design to provide the structure needed to explore real-life contemporary phenomena, by interviewing business leaders in a single organization in Massachusetts. The case study design was harmonious with the methodology, the data capturing techniques, and data analysis of this proposed study. Using a single case study design, I described the setting and developed an in-depth understanding of the phenomena. Researchers explore the phenomena by capturing detailed data using multiple sources to report a case description and case-based themes. Researchers use a narrative design to explore life experiences within a specified period (Song, 2017). I chose a case study design because of the need to describe a limited system of successful green supply chain strategies in Massachusetts. Researchers use the phenomenological design to find meaning or the essence of experiences (Song, 2017). The need to explore and describe the nature of successful business strategies did not fit well with the finding of meaning or the essence of experiences. The limited system, coupled with the data

collection methods used to describe a particular business strategy made the case study design the optimal approach for my study.

## Population and Sampling

The target population consisted of seven business leaders in a manufacturing organization headquartered in Massachusetts. I selected this organization because of the maturity of their environmental management systems and green supply chain strategies. I selected a sample of seven business leaders from a single organization who had the authority to influence business strategies and were stakeholders in green supply chain strategies to triangulate the data collected. In positivist qualitative research, data collection should come from a representative sample of the sub-segments of the population (Boddy, 2016). Collecting data from business leaders in different functions assisted in triangulating data while providing different levels and perspectives of the same phenomenon (Fusch & Ness, 2015). Purposeful sampling is the ideal selection of case studies where the most knowledgeable participants' aid in answering the research question (van Rijnsoever, 2017). Researchers use a purposeful sampling strategy to maximize the representation of a range of perspectives on an issue to challenge or support a hypothesis (Fossey, Harvey, McDermott, & Davidson, 2002). Fusch and Ness (2015) and van Rijnsoever (2017) both noted that purposeful sampling of business leaders from different functions would assist in triangulating data. Reaching out to business leaders from different functions from a single organization captured enough data to answer the research question.

A sample size of seven business leaders was sufficient to reach data saturation. I reserved the right to interview additional participants if needed to achieve data saturation. Van Rijnsoever (2017) noted that in qualitative studies, the sample size is flexible and is at the discretion of the researcher's judgment. The determination of sample size, which directly relates to data saturation, is critical to the quality of a study (Malterud, Siersma, & Guassora, 2016). I used coding to govern the frequency of themes to determine code saturation for more concrete data that aligned with the goals of the study. I used codes to govern meaning saturation for data requiring more in-depth and more productive insights. Smaller sample sizes may be desirable to capture precise, concrete data, while the need for more significant sample sizes may exists to capture subtle or conceptual issues (Hennink et al., 2016). Van Rijnsoever (2017) noted that the sample size might vary until the researcher attains data saturation. A researcher may attain data saturation at different points in time for code and meaning saturation depending on the richness of the data captured (Hennink et al., 2016).

The sample consisted of seven business leaders in one manufacturing organization headquartered in Massachusetts. I used semistructured one-on-one interviews with each business leader, director level or higher, from each function. Business leaders at the director level or higher had the authority and knowledge to sufficiently answer the interview questions. I asked the same interview questions of every participant and used a stratified sampling strategy to categorize participants by function. Each interview session was 90 minutes in length. Participants signed written informed consent forms

documenting their willingness to participate prior to the interview sessions. I used video conferencing to conduct the interviews.

## Ethical Research

I conformed to the ethical research standards for research on human beings and will treat participants with fairness, and respect (U.S. Department of Health and Human Services, 1979). I followed the appropriate research procedures for ethical research outlined in the Belmont Report (U.S. Department of Health and Human Services, 1979). Ethical guidelines from both the Belmont Report and Walden University (IRB) ensured I collected data in an ethical manner. The IRB is an independent body affiliated with universities to oversee the protection of human participants in research (Domenech Rodríguez, Corralejo, Vouvalis, & Mirly, 2017). The reports previously described, coupled with IRB approval number 09-04-19-0399355 provided the necessary guidelines, resources, and authorization for the engagement of human participants in my study.

The informed consent form and interview protocol provided both structure and an ethical approach to the data collection process. The interview questions (see Appendix A) along with the letter of cooperation and interview protocol provided the necessary informed consent and structure to collect data professionally. Many IRB chairs view consent forms as a supportive component of the consent process in that they reassure participants about how the researcher is bound to protect the confidentiality of the participant (Resnik, Miller, Kwok, Engel, & Sandler, 2015). The reassurance of confidentiality was a means to create an environment of open, truthful communication between the participants and me.

I identified a cooperating organization through existing professional contacts. I conducted telephone introductions with a business leader from the cooperating organization to investigate their qualifications to provide meaningful data. I sent the consent form to the cooperating business leader after acceptance, securing their willingness to participate. I scheduled interviews with participants through the organization's business calendar, using video conferencing which were audio recorded. Participants could withdraw from the study at any time using any form of written or verbal communication to ensure traceability. I reminded participants that their involvement was voluntary and that there was no compensation for their participation in the study. The participants engaged themselves in the study of their own free will and understood the worthiness of their contribution to the study. I will keep data for 5 years to protect the confidentiality of participants. After 5 years, I will permanently destroy all collected data.

I applied the use of pseudonyms to participants and organizations to preserve their anonymity. The use of pseudonyms is a minimum desirable standard used in research not to harm participants (Mukungu, 2017). Researchers need to take reasonable precautions to protect confidential information obtained through or stored in any medium, recognizing by the extent and limits of confidentiality that laws may governed, established by institutional rules, or professional or scientific relationships. I used pseudonyms to protect the participants and cooperating organization's anonymity which should provide enough participant protection and adhere to my obligation to the scientific or professional relationship.

## Data Collection Instruments

The primary data for this qualitative single case study will come from one-on-one interviews with business leaders. I was the primary instrument for data collection. The research question is: What strategies do supply chain leaders in the manufacturing industry use to optimize green supply chain management practices to increase profitability while reducing the carbon footprint? I used semistructured one-on-one interviews with open-ended questions to answer the research question. The interview protocol is a list of questions and prompts designed to guide the interview in a focused, yet flexible and conversational, manner (Fossey et al., 2002). I documented the interviews using an electronic audio recording device and handwritten notes to support latent content analysis. Inductive codes are content driven and raised by participants spontaneously, whereas deductive codes are researcher-driven, and originate from the interview protocol (Hennink et al., 2016). The discovery of themes, using codes, during and after the interview sessions enabled me to understand when I reached data saturation quickly. I recorded coding and pseudonyms manually in a record book to extract tacit knowledge from the participants. I used organizational documents to triangulate data collected from the participants.

I allocated 30 minutes in each interview session to allow participants the opportunity to validate a summary and my interpretation of their interview responses. Researchers who involve participants in the interpretation of data can enhance the trustworthiness of their results (Birt et al., 2016). Interview protocol, as well as member checking, helped to improve the validity and reliability of this study. Birt et al. (2016)

and Kallio, Pietilä, Johnson, and Kangasniemi (2016) agreed that organizing the data will support an accurate and timely analysis. Secondary data consisted of organizational reports which illustrate the processes and metrics used to report sustainability efforts to internal and external stakeholders.

## Data Organization Technique

The primary data for this qualitative single case study came from one-on-one semistructured interviews with business leaders. I was the primary instrument for data collection. I documented the interviews using a manual recording device and handwritten notes. To organize the data, I recorded the date and name of the participant at the beginning of the interview to create a legend for the coding system. Creating a coding scheme helped to ensure the meaning is congruent across codes, which enhanced the validity and the certainty of the findings (Morse, 2015). I notified the participants that their names were for the reference coding system. Alter and Gonzalez (2018) noted that researchers should protect the confidentiality of participants. I did not record the participant's names in the general notes nor audio recordings. I collected copies of company documents for review and evaluation to triangulate the data collected from the interviews.

The reassurance of confidentiality and anonymity are enablers to creating an environment of open and truthful communication between participants and myself. I will archive data for 5 years. I entered coding data into Atlas.ti software for analyses and did not grant anyone access. I stored all electronic data on a single USB drive and handwritten notes in a single notepad. I kept the legend or key to the coding system in a

separate file on the USB drive. I placed all electronic data captured in a password-protected folder and store them in a secure file cabinet.

## Data Analysis

Qualitative analysis is the process of reviewing, synthesizing, and interpreting data to describe and explain particular phenomena (Fossey et al., 2002). To organize and analyze the data, I used the qualitative computer software package Atlas.ti to support detailed analysis. Qualitative software aids researchers in making the analytical processes more transparent, by using programmed outputs to illustrate themes in the coding processes and data outputs. Triangulation is the use of multiple methods in the study of the same phenomena (Denzin, 1973). Fossey et al. (2002) and Denzin (1973) agreed that the collection of data from multiple functional leaders, along with process documents will support the saturation of data to triangulate. My objective was to acquire different perspectives about the particular phenomena, while simultaneously searching for shared meanings. Atlas.ti software supported the repeatability, validity, and reliability of the data analysis.

## Reliability and Validity

The primary data for this qualitative single case study came from one-on-one semistructured interviews with seven business leaders. I was the primary instrument for data collection. As the primary instrument for data collection, reliability is threatened by instrument decay due to ambiguity, distortions in the communicating of true meanings, imperfect interview questions (Marshall & Rossman, 2016). The determination of quality in qualitative case study research is determined by how well the subjective

meaning, actions, and social context of the interviewed participants are reflected (Fossey et al., 2002). Marshall and Rossman (2016) and Fossey et al. (2002) both noted that the authentic capture of true meaning from participant interviews determines the quality of qualitative data.

I used member checking to verify the accuracy of data and interpretations collected. Researchers use member checking to allow participants an opportunity to validate the accuracy of the collected data (Birt et al., 2016). Soliciting feedback from participants by having them review their interview transcripts also improved the clarity of communication. Using member checking added to the rigor and credibility of my qualitative study (Birt et al., 2016). One of the advantages offered by qualitative research is that it can examine and theorize contextual phenomena (Yardley, 2017). Exploiting the advantages of qualitative case study research was essential to this study because of the need to explore how green supply chain strategies increase profitability and reduce the carbon footprint of supply chains in the United States.

Confirmability relates to how researchers demonstrate how intimately their findings are related to their conclusions in a way that is traceable and reproducible (Moon, Brewer, Januchowski-Hartley, Adams, & Blackman, 2016). I anchored the research findings to the experiences and preferences of the participants. Minimizing researcher bias helped to ensure the data captured was authentic for detailed analysis and valuable recommendations. Reflexivity helped reduce researcher bias through critical self-reflection about potential biases and predispositions that I may have brought to the qualitative study (Cypress, 2017). Triangulation is a method of ensuring credibility and

validity in qualitative studies (Yin, 2018). Triangulation is the use of multiple methods in the study of the same phenomena (Denzin, 1973). Researchers use triangulation to ascertain the validity of the inferences derived from multiple data sources (Fusch & Ness, 2015). Soliciting data from different functional business leaders and organizational documents, and cross-referencing inferences between participants, supported the reliability and validity of this study as well as assisted in attaining data saturation.

Transferability refers to the degree to which the phenomena or findings apply to theory, practice or future research (Moon et al., 2016). Transferability is the extent to which findings may or may not be relevant to other contexts. A thick description of the findings is essential to transfer findings to other contexts (Morse, 2015). A robust plan to ensure reliability and validity helped to ensure my research would contribute to the existing body of knowledge.

Morse (2015) noted that researchers need to collect data until they achieve data saturation. Data saturation occurs when no new data, information, themes, or patterns emerge from data collection efforts (Fusch & Ness, 2015). Researchers using a qualitative case study approach, use member checking, data collection from multiple sources, and methodological triangulation to reach data saturation (Hennink et al., 2016). I asked participants probing questions, engaged the participants in member checking, collected additional data from organizational documents, and used a methodological triangulation to reach data saturation.

## Transition and Summary

In Section 2, I identified the main points of this study which included the purpose statement, role of the researcher, research method and design, data collection, ethical research, data collection and analysis, and reliability and validity. In this section, I compiled the approaches and protocol that I will use to ensure this study is valid and reliable.

In Section 3, I present the findings, analyze the data, and interpret the results of the data captured and process documents reviewed. I will relate the conceptual framework to the findings and the literature. I will explain how the study contributes to both social change and business practice and will conclude with my reflections.

Section 3: Application to Professional Practice and Implications for Change

## Introduction

The purpose of this qualitative single case study was to explore successful green supply chain strategies that increase profitability while reducing the carbon footprint. The sample consisted of business leaders who are stakeholders of supply chain strategies. This section includes a review of the findings, application for business practice, implications for social change, and recommendations for action and future research.

The data were collected from organizational documents and interviews of seven business leaders from one manufacturing organization headquartered in Massachusetts. I used semistructured interviews with each business leader, at director level or higher, from different functions. The three emergent themes were environmental management strategies, profit increasing strategies, and governance strategies. The findings of this research may inform business leaders as to the supply chain strategies business leaders use to increase profitability while reducing the carbon footprint.

## Presentation of the Findings

The research question of this study was: What strategies do supply chain leaders in the manufacturing industry use to optimize green supply chain management practices to increase profitability while reducing the carbon footprint? I obtained detailed information about green supply chain strategies leaders used to increase profitability while reducing the carbon footprint by using semistructured interviews with open-ended questions. I selected seven business leaders from different functions who influence business strategy, and who were stakeholders in green supply chain strategies to

triangulate data. The business leaders chosen were director level or higher, and they had direct authority and responsibility to influence decisions that impact supply chain strategies. I conducted the interviews through recorded video conferencing sessions with the participants' prior approval. The time allotted for the interviews included 30 minutes to conduct member checking to validate the transcription of the data collected. In addition, I obtained information from the organization's sustainability and audit reports that contained data pertaining to environmental management strategies, profit increasing strategies, and governance strategies to triangulate the data collected. The alignment between the data collected and organizational documents established redundancies existed which confirmed the attainment of data saturation.

After confirming data saturation, I then performed data stratification to identify emergent themes or strategies from the triangulated data. I used code names P1, P2, P3, P4, P5, P6, and P7 to maintain the participants' confidentiality. To code, sort, and analyze data, I use Atlas.ti software package. Table 1 is a display of the three emergent strategies business leaders used to increase profitability while reducing the carbon footprint. The strategies discovered were (a) environmental management strategies, (b) profit-increasing strategies, and (c) governance strategies.

Table 1

*Strategies used to Increase Profitability while Reducing the Carbon Footprint*

| Strategy | Percentage of use by the company |
|---|---|
| Environmental management strategies | 100% |
| Profit increasing strategies | 75% |
| Governance strategies | 75% |

**Theme 1: Environmental Management Strategies**

The first theme that emerged was environmental management strategies, which lessen the impact on the environment through product, process, and supplier innovations. P6 stated, "If we drive supplier green practices, we know they'll be more profitable and be able to give us better competitive costs." Organizational documents support environmental concerns in which the chief executive officer stated, "Everything we design is made to keep the earth's most precious resources safer, cleaner, and more useful for our customers." The findings in this section confirm the research of Carola et al. (2018) who noted the three stages in developing a GSCM strategy for carbon footprint reduction are: (a) develop a long-term plan, (b) create a roadmap, and (c) implement and track. Such practices enable the protection of the environment, and the preservation of natural resources for present and future generations (Verma et al., 2018). Table 2 is a display of the tactics business leaders used to execute environmental strategies that reduce the carbon footprint. All seven participants discussed the use of process and product efficiencies to increase profitability. Five of the seven participants discussed using some form of social stewardship tactic to execute environmental strategies.

Table 2

*Tactics used to Execute Environmental Strategies*

| Strategy | Percentage of use by the company |
|---|---|
| Product efficiencies | 100% |
| Process efficiencies | 100% |
| Social stewardship | 71% |

**Product efficiencies.** Environmentally sustainable products provide tangible evidence of supply chain sustainability and profit improvement initiatives. P3 stated, "Our products that drive sustainability for our customers, it is the biggest thing from our supply chain piece." I used the organization's sustainability report to substantiate these findings which illustrated that customers chose their products for superior performance in delivering value in water conservation, energy efficiency, and meeting safety and regulation requirements. Third-party sustainability audits confirm that materials are procured from responsible suppliers that are held to anticorruption policies, anti-human trafficking policies, and conflict minerals policies.

**Process efficiencies.** Process efficiencies have a favorable impact on economic and environmental sustainability initiatives. Process efficiencies and governance systems ensure that economic and environmental initiatives increase profitability while reducing the carbon footprint by driving desired results and behaviors. P4 contributed that their factories repurpose components through customer product return programs to reclaim metal and avoid depositing waste in landfills. P4 noted, "efficient planning processes reduce transportation costs and reduce harmful emissions into the environment." This finding aligns with the research of Yan et al. (2016) in that collaborative process planning increases cost-effectiveness and shipping time efficiencies. P1 noted that production efficiencies improved both service reliability and employee safety. P4 added that their warehouses are using LED lighting, motion sensors to reduce power consumption, and large fans in their factories to help moderate temperatures more efficiently. P6 stated,

Eighty-two sites worldwide have sustainability goals that include metrics such as GHG emissions, and Hazardous material disposal with long-term goals that go out to the year 2024. Two sustainability engineers have been hired who report directly to members who sit on the sustainability steering committee.

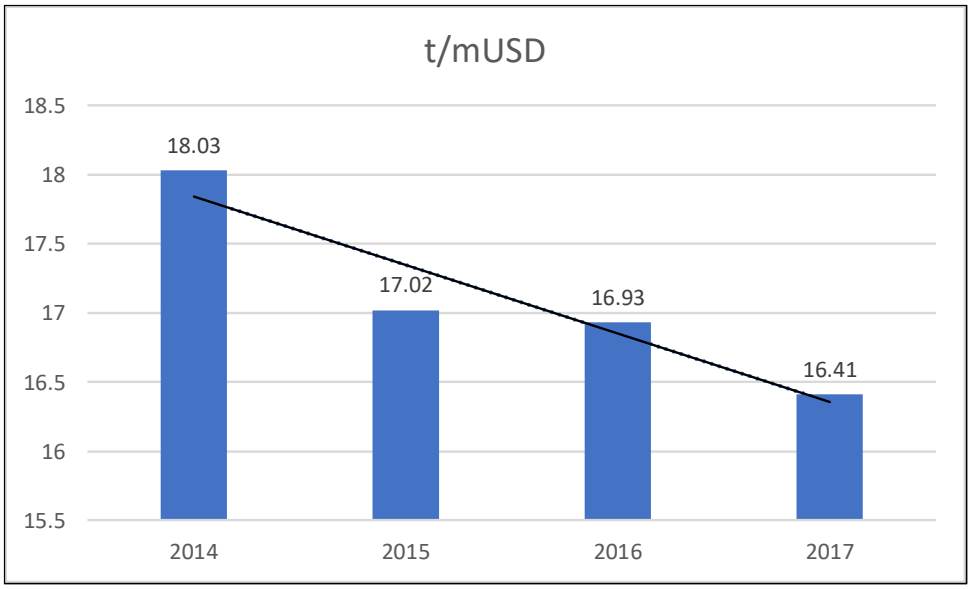


*Figure 1.* Green house gas emissions per revenues (t/mUSD = tons per Million US dollars) *Note*. From ISS-oekom Corporate Rating conducted May 2019

P2 stated, "The organization has a 3-year plan to reduce GHG emissions measured in metric tons per annum." I used data taken from the organization's sustainability audit report to construct Figure 1, which is an illustration of the past performance of GHG emission intensity as it relates to annual revenue. I used organizational documents to confirm the responses from participants in that GHG emissions have been reduced, and that a roadmap is in place for further reductions over the next 5 years. The empirical data

in Figure 1 qualifies the tactics and strategies used by business leaders to reduce the carbon footprint delivered favorable results year over year.

Environmental compliance processes for suppliers flow down to suppliers through the corporate website and the supplier assessment process. P6 noted that managing the compliance with their supply base in China occurred through regularly scheduled audits. I use organizational documents and the corporate website to verify that global trade compliance policies such as human trafficking policy, conflict minerals policy, and the supplier quality manual are part of the organization's supply chain practices. These documents and policies outline minimum environmental and legal requirements suppliers need to meet in order to do business with the organization. P4 added, "Sourcing materials from responsible suppliers that share our values is a priority for our company and our stakeholders." This finding confirms the research of Yook et al. (2017) in that green purchasing competencies have a positive effect on environmental performance.

**Social stewardship**. Environmentally related social stewardship activities is a tactic used to promote corporate social responsibility strategies. P6 contributed that the organization often conducts events where employees remove 7 tons of trash from the community. P7 stated, "The organization held an event to revitalize a poor section of the South Bronx." Organizational documents contained information regarding the organization's focus on bringing clean water to the world's most disadvantaged communities through the installation of water purification systems. In addition, the organization also conducts industry training that educates users in the proper installation and application of their products. Furthermore, I used organizational documents to

confirm there were various corporate citizenship activities that delivered substantial returns to the local, state, and global communities.

**Alignment to the conceptual framework.** The findings regarding environmental management strategies align with the natural resource-based view conceptual framework because organizations that develops distinct environmental management capabilities that may create distinct competitive advantages. Optimizing the use of critical resources and capabilities also enhances an organization's ability to obtain sustainable competitive advantages (Hart, 1995). The favorable economic and environmental benefits stakeholders experience, support the execution of these responsible business strategies and practices. Jayaram and Avittathur (2015) and Lee et al. (2017) concurred that ISO 14001 certification creates competitive advantages and increases profitability. Pollution prevention strategies generate cost reduction opportunities by minimizing emissions, effluents, and waste to reduce costs by using continuous improvement methods (Hart, 1995). Product and process innovations that are not easily reproducible create sustainable competitive advantages. Supplier strategies that increase profitability and reduce the carbon footprint optimizes the use of resources while creating sustainable competitive advantages by creating distinct organizational capabilities.

**Theme 2: Profit Increasing Strategies**

The second theme that emerged was strategies that increase profitability. Jaggernath (2015) and Verma et al. (2018) noted that socially responsible organizations might lessen their impact on the environment while controlling costs and increasing profitability. Table 2 is a display of how frequently cost reduction and profit-maximizing

tactics are used jointly by business leaders. The seven participants discussed how reductions in cost higher prices or product offerings increase profitability. In reviewing participants' responses, Table 3 is an illustration that all seven participants used both cost reduction and higher product pricing tactics to increase profitability.

Table 3

*Tactics used to Execute Profit Increasing Strategies*

| Strategy | Percentage of use by the company |
|---|---|
| Cost reduction initiatives | 100% |
| Higher product pricing | 100% |

**Cost reduction initiatives.** Reductions in costs contribute to increased profitability. P3 noted that energy from sustainable sources reduces costs. P7 added green initiatives as a labor-savings by reducing handling costs. P2 contributed that employee health and wellness initiatives promote safety and talent diversity while reducing costs by decreasing employee turnover. P1 also added that reductions in factory power consumption with energy-saving devices and environmentally friendly material handling equipment has reduced costs.

Green initiatives reduce material costs by lessening material consumption through reuse. P4 note that packaging material design has eliminated waste and customer returns by aligning supplier package quantities with customer order size quantities or parts orders. P7 stated, "Repetitive product containers and pallets are reused. Furthermore, "copper and stainless steel are reclaimed for recirculation." These findings align with the research performed by Verma et al. (2018) who postulated that the reuse of materials

helps to reduce material costs and consumption. Leaders may use cost reduction and environmental initiatives together successfully to satisfy stakeholders' requirements while creating competitive advantages.

**Higher product pricing.** Product price differentiation is the primary strategy used to increase profitability. P5 stated, "We give the customer what they want, a product that delivers value, and we charge a higher price." P6 added that branding their higher efficiency rated products enables them to command higher market prices. P5 stated, "Our product offerings are unique and different than what the marketplace has, so now I can price that completely different." In addition, P1 stated, "Continuous improvement through improved customer experience and corporate social responsibility, increases profitability." These findings confirm the research of Hong and Guo (2018) in that green design efforts contribute to an organization's ability to differentiate its business offerings thereby commanding higher prices. Business leaders may use higher product prices to increase profits.

**Alignment to the conceptual framework.** The research of Adebanjo et al. (2018) confirmed the finding regarding profit increasing strategies in that an organization's capacity to develop innovative capabilities should lead to creating competitive advantages by creating operational and environmental efficiencies while maintaining market competitiveness. Cost reductions achieved in an environmentally responsible manner create sustainable competitive advantages. Product stewardship enables a firm to reduce product lifecycle costs by introducing environmental concerns into the product design and development processes (Hart, 1995). The distinct capabilities

organizations create through innovative products and processes that favorably contribute to increasing profits while reducing the carbon footprint create competitive advantages.

**Theme 3: Governance Strategies**

The third theme that emerged was governance strategies that sponsor control plans that sustain economic, environmental, and social business strategies. Table 4 is a display of the tactics business leaders used to create support systems that sustain and verify the going concern for environmental and economic initiatives. Tactics provide actionable plans that business leaders may use to execute business strategies.

Table 4

*Tactics used to Execute Governance Strategies*

| Strategy | Percentage of use by the company |
|---|---|
| Organizational design | 100% |
| Third-party audits | 71% |
| Voice of the customer | 100% |

**Organizational design**. The organizational structure and reporting metrics drive desired behaviors that sustain economic and environmental efforts. P1 stated, "Task teams routinely evaluate the feasibility of and provide direction to the business, for sustainability opportunities not normally considered". P4 added that the organization realizes strong support from leadership and stakeholders to change the corporate culture.

Although I did not pose questions regarding industry certification questions to participants, organizational documents reported that 42% of the organization's sites were ISO 14001 certified or compliant, with plans in place to get an additional 19% certified

by the end of 2020. Organizations that are ISO 14001 certified have experienced increases in business growth, gain international recognition, and achieve competitive advantages by improving economic and environmental performance, which enables sustainable growth (Verma et al., 2018). ISO 14001 is a means for leaders to invigorate supply chain alignment by establishing standard environmental management practices that may be leveraged to develop long-term environmental and economic strategies. Figure 2 relates how the layers and boundaries of organizational and interorganizational hierarchy align with the appropriate level of governance for sustainable supply chains. Business leaders may use this information to rive the right tactics and strategies at each layer in their supply chains.

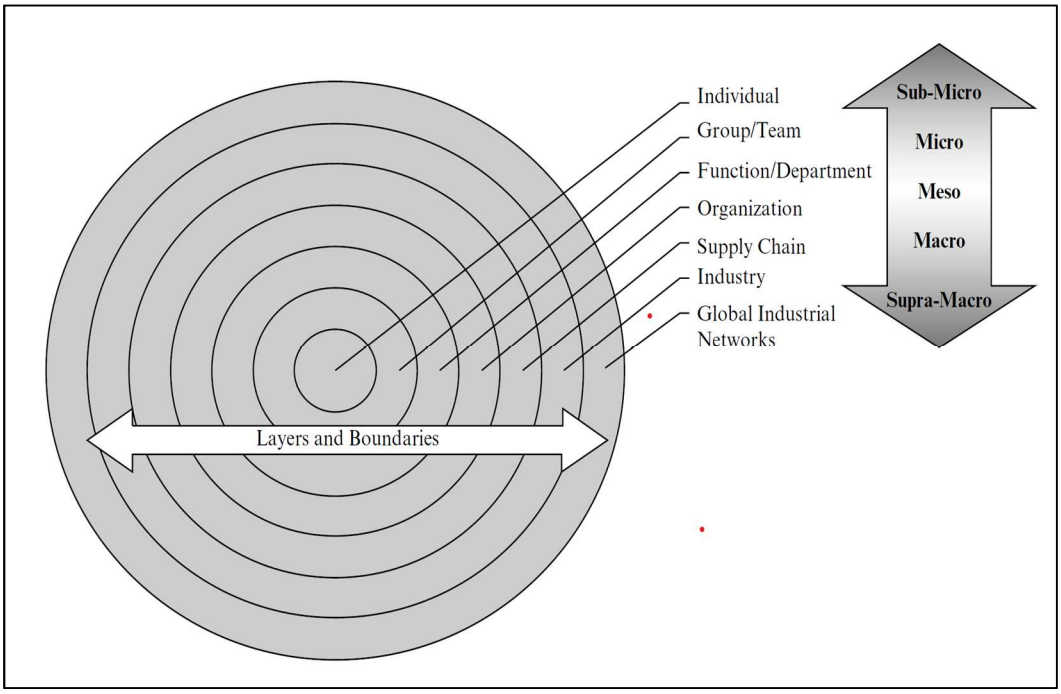


*Figure 2.* A hierarchal perspective of sustainable supply chains.

*Note*. From: "*Handbook on the Sustainable Supply Chain*." by Sarkis (2019, p. 5).

**Third-party audits**. Third-party audits are a means to increase the credibility and validity of economic and environmental initiatives by introducing an unbiased qualification process. P3 stated the auditing agencies facilitate in "Baselining the organization's current position, and assist in gaining visibility on the organization's sustainable footprint." P6 noted that a critical element for success is having the right metrics in place then translate those metrics into actionable business strategies. Matthews et al. (2015) and Quesado et al. (2018) agreed that the use of the balanced scorecard (BSC) is an effective means to coordinate people and encourage their motivation by creating a tactical focus and vision, which aligns with strategic goals and objectives of the organization. P4 noted that the sustainability report and audits enable business leaders to incorporate strategies across geographical boundaries."

**Voice of the customer.** The voice of the customer is the customer's feedback that supports continuous improvement and increases the customer value proposition of product and service offerings. P5 noted that the voice of the customer feedback is built into their business strategies. P5 further added, the organization "makes more money by giving the customer what they want, and the organization reduces costs to be compliant with legacy business practices." P1 stated, "Global strategies look to improve the customer experience in a socially responsible manner." Yan et al. (2016) and Dai et al. (2017) agreed that green process improvements contribute to efficiencies that increase profitability and customer satisfaction through improved performance. Incorporating customer feedback into economic and environmental continuous improvement efforts increases profitability and customer satisfaction while reducing the carbon footprint.

**Alignment to the conceptual framework.** Organizational design and the voice of the customer combined with economic, social, and environmental business strategies create competitive advantages. The three components of NRBV, (a) pollution prevention, (b) product stewardship, and (c) sustainable development, when integrated create successful GSCM strategies. Optimizing the use of critical resources and capabilities also enhances an organization's ability to obtain sustainable competitive advantages (Hart, 1995). NRBV theorists emphasized the benefit of leveraging intra- and interorganizational resources and capabilities in resource-constrained situations (Hart, 1995). The NRBV conceptual framework provides the archetype business leaders may use to optimize resources and align strategies with tactics to increase profitability while reducing the carbon footprint.

## Applications to Professional Practice

The strategies and tactics outlined in this study offer information business leaders may use to increase profitability. Wei et al. (2016) and Shafique et al. (2017) both postulated that GSCM practices contribute to cost reduction and environmental and social benefits. Organizational goals and objectives that increase profits while operating in an environmentally and socially responsible manner create competitive advantages. The profit-maximizing results associated with environmental initiatives are compelling. The ability to offer higher efficiency products at a higher price provides evidence that profits may increase through other than cost reduction efforts and thus creates competitive advantages. Cost reductions that reduce the consumption of natural resources are good

for both business in the environment. Business leaders might apply the findings of this study to implement profit increasing strategies that are good or the environment.

Business leaders may use strategies and tactics that lessen the burden on the environment to produce favorable economic results which may increase profitability. Understanding which metrics to use to measure results is sometimes a challenge for business leaders. The life-cycle assessment (LCA) is a useful tool for evaluating the environmental impact or carbon footprint of products and processes (Carola et al., 2018). The LCA tool and the balanced scorecard are a means of information for business leaders to develop plans to launch effective green supply chain management strategies in their organizations. Business leaders use the BSC approach to help meet stakeholders' expectations, and help to articulate and communicate strategic objectives and while evaluating the effectiveness of their implementation (Quesado et al., 2018). Carola et al. (2018) agreed with Egilmez et al. (2017), noting that the use of LCA helps to assess the environmental impact of an organization's products and processes. Integrating economic, environmental and social concerns into business strategies and practices promotes the corporate social responsibility of an organization. Corporate social responsibility refers to how organizations integrate social and environmental concerns in their business operations while meeting the objectives and values of stakeholders and society (Reddy & Kala, 2018).

Governance strategies monitor and control the business strategies and tactics of an organization. The organizational structure and design of an organization may influence the determination and effectiveness of its business strategies and tactics. Liston-heyes

and Vazquez Brust (2016) noted that stakeholder pressures can positively influence environmental attitudes; it is up to business leaders to effectively execute strategies and tactics that deliver favorable financial results while in a responsible manner. Leaders may reduce employee safety risks and business leaders might apply the findings of this study to implement governance strategies that sustain the economic, environmental, and social initiatives to create sustainable competitive advantages for their organizations.

## Implications for Social Change

The implications for social change include the potential to preserve finite natural resources for future generations and reduce the carbon footprint of manufacturing organizations. Effective environmental management strategies incorporate environmental concerns into business strategies that meet stakeholder requirements. The research of Shah et al. (2016) and Yang (2017) concurred that green practices and technologies favorably contribute to both economic and environmental organizational performance. Business leaders may use this information to optimize internal and external resources that are good for the environment and create sustainable competitive advantages for their stakeholders.

Profit increasing strategies that incorporate environmental and social concerns reinforce the need to launch more initiatives that deliver favorable results. Corporate social responsibility efforts depend on tangible and intangible returns that satisfy stakeholder concerns to keep them sustainable. Organizational leaders facilitate and adopt GSCM as an innovative strategy for higher profits and in turn help society and economy (Verma et al., 2018). Business leaders may use this information to create

socially responsible organizations with environmentally conscious corporate cultures to produce sustainable competitive advantages.

Governance strategies may stimulate organizations to launch more corporate citizenship endeavors to give back to their communities. Measuring environmental impact enables business leaders to put policies in place that lessen the impact on the environment and improve corporate social responsibility. Relating the intangible and tangible results of corporate citizenship activities to financial statements may justify the value of these efforts. Business leaders may use this information to increase the net worth of their organizations by engaging in more efforts that promote the corporate social responsibility of their organizations by giving back to their communities.

## Recommendations for Action

The purpose of this qualitative single case study was to explore successful green supply chain strategies that increase profitability while reducing the carbon footprint. I recommend business leaders collaborate with their suppliers and customers to optimize green supply chain strategies that increase profitability while reducing the carbon footprint. Business leaders use various strategies to promote the environmental, economic, and corporate social responsibility dimensions of their organizations. Successful environmental strategies deliver favorable financial results that prompt stakeholders to lunch more environmental initiatives.

I recommend business leaders use environmental management strategies to improve sustainability. Tactics, such as product and process efficiencies and social stewardship, delivered favorable financial and carbon footprint reduction results to their

stakeholders. Social stewardship enabled the organization to give back to their communities across regional boundaries. I further recommend instituting employee reward and recognition programs of environmentally related continuous improvement opportunities that delivered significant returns. Reward and recognition programs will improve sustainability and increase employee engagement.

Some business leaders successfully used profit increasing strategies to substantiate the value of environmental and social stewardship initiatives. Cost reduction and higher product prices contributed to increasing profit margins. Increasing profits may result in the stakeholders launching more environmental initiatives thereby creating sustainable competitive advantages. I recommend business leaders use profit increasing strategies to reduce the carbon footprint while creating sustainable competitive advantages for their stakeholders.

I intend to contribute to the body of knowledge by publishing scholarly literature in the areas of sustainable supply chain management. I intend to publish two articles to submit for publication in the following peer-reviewed journals before the end of 2020: (a) *Journal of Supply Chain Management,* (b) *Journal of Purchasing and Supply Management,* and (c) *American Journal of Supply Chain Inventory*. I have identified two supply chain conferences that I will submit a presentation for the opportunity to present at the conference. I will submit a proposal to present my research at the Institute of Supply Chain Management and the Project Management Institute.

## Recommendations for Further Research

The research scoped to include seven business leaders from one organization operating in Massachusetts was a limitation of this study. Future researchers may expand the scope to include other industries and other regions. Research in the service industry may uncover new findings that compare to the findings and recommendations of this study that will contribute to the body of knowledge. Research conducted in other regions may discover nuances to the findings and recommendations of this study that business leaders of global manufacturing corporations may apply to their organizations on a global scale.

I recommend a mixed-method study that combines a qualitative method with a quantitative method related to how much the green supply chain management strategies used in this study increase profitability and reduce the carbon footprint. A mixed-method study would be a means to provide the results from one method to reinforce the results of the other method and further substantiate how product and process efficiencies, cost reduction initiatives, and higher product pricing, deliver favorable economic and environmental results to business leaders. I also recommend further research into how much organizational design, third-party audits, and voice of the customer improve sustainability.

## Reflections

I have 25 years of supply chain management experience with 17 of the 25 years in a Fortune 100 company. My experience includes tactical and strategic purchasing, manufacturing and supplier repositions, and leadership roles as Plant Manager and

Director of Supply Chain. I am Project Manager Professional and Six Sigma Green Belt and Lean certified. The doctor of business administration program helped me improve my scholarly writing and research skills that I plan to leverage with my experience will help me contribute to the existing body of knowledge.

I used member checking, data triangulation, and reflexivity to reduce researcher bias. The notes I took after each interview enabled me to better understand how I could ask probing questions in a way that did not let my preconceptions distort the data collection process. The responses from business leaders from different functions helped me to improve my critical thinking skills.

## Conclusion

Business leaders optimize the use of resources to create competitive advantages for their organizations. The lack of green supply chain strategies sub optimizes the use of resources that business leaders use to meet their financial goals and objectives and which are good for the environment. The purpose of this qualitative single case study was to explore successful green supply chain strategies that increase profitability while reducing the carbon footprint. The research question that guided this study is: What strategies do supply chain leaders in the manufacturing industry use to optimize green supply chain management practices to increase profitability while reducing the carbon footprint?

Utilizing the NRBV to ground my study, I collected data using seven open-ended questions during semistructured interviews related to the research question. I stratified data to identify emergent strategies from the triangulated data. The three emergent strategies discovered were (a) environmental management strategies, (b) profit-increasing

strategies, and (c) governance strategies. The implications for social change include the potential to preserve finite natural resources for future generations and reduce the carbon footprint of manufacturing organizations. Business leaders may use these strategies to increase profitability while reducing the carbon footprint.

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## Appendix A: Interview Questions

I will ask all participants the following interview questions:

1. What green supply chain management practices are you currently using?
2. Why do you consider these green supply chain management practices successful?
3. How are successful green supply chain management practices incorporated into your organization's business strategies?
4. How can your position best influence changes to current supply chain management strategies to optimize financial performance?
5. Which green supply chain management practices, other than those that deliver cost reductions, do you recommend using that will increase profitability?
6. What changes do you recommend making that would optimize green supply chain strategies within your organization to increase profitability?
7. What additional comments do you have that relate to the successful strategies and implementation processes your organization has developed to optimize green supply chain management strategies?

# Appendix B: Interview Protocol

I. Introduce myself to the participant.

II. Restate confidentiality of the study and review the in the Consent Form and answer any questions or concerns the participants may have. Remind participants there will be no compensation, and participation is completely voluntary.

III. Video conferencing will be used to conduct the interview, with the audio portion being recorded only.

IV. Follow the procedure to introduce the participant with pseudonym/coded identification; document the date and time.

V. Begin the interview with question #1; follow through to the final interview question.

VI. Follow up with additional questions.

VII. End interview session; discuss member-checking with the participant.

VIII. Thank the participant(s) for their part in the study. Reiterate contact information for follow up questions and concerns from participants.

IX. End protocol.