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Supply chain collaboration as a facilitator of circular supply chain with logistics management in cement companies in Bangladesh

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Abstract

This thesis aims to explore the supply chain management activities applied to the circular supply chain sustainable logistics management in cement companies. In thesis, it is carried out to establish the value of a supply chain framework that is focusing on mostly manufacturing organizations centric and sustainable logistics. This study, author has tried to identify the challenges and opportunities faced by these companies and develop effective strategies to overcome these challenges and transition toward a more sustainable and circular supply chain model.

The research questions are aimed to investigate the current state of circular supply chain sustainable logistics management practices, analyzing the barriers and challenges faced by cement companies in Bangladesh. Moreover, it has also found insight and guidance for promoting sustainability through circular supply chain practices.

The author has applied the qualitative interview method in this study for conducting the research in improving the current model of circular supply chain activities of the employees of cement companies. Besides that, the author has conducted this interview method to recommend supply chain management insights by proposing and responding to a new correlation with the circular supply chain model. After the interview session, the author made another follow-up meeting with all the informants to discuss the summary of the findings from all the interviews. During this study, thematic analysis is also done with the findings of the interview session.

To consider the thematic analysis, author has done feedback on the interviews with cement Companies on their current working model. Here, the research has been suggesting the following interview responses along with feedback. To take place with different companies' employees, this study discovers several findings and related opportunities and challenges within the working situations.

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SCM = **Supply Chain Management (SCM)** refers to the organized management of all activities involved in the production and delivery of goods or services. The SCM activities are from the sourcing of raw materials to the final delivery to the end customer (Advanced Solutions International, Inc., n.d.).

CSCM = **Circular Supply Chain Management (CSCM)** refers to the application of circular economy principles in managing the flow of materials, products, and information throughout the supply chain (Farooque et al., 2019).

B2B = **Business to Business (B2B)** states to viable dealings and communications that take place between two or more businesses rather than a business and individual consumers (Tan, 2013).

SLM= **Sustainable logistics Management (SLM)** states to the practice of dealing the measure and storing of goods in a way that reduces environmentally friendly impact, encourages social duty, and make sure long-term economic sustainability (Grabara, 2013).

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1 Introduction

In this thesis, the author addressed a topic that has become more important from the past decades (Traditional Approach) to present times (Modern Approach). Traditional supply chain approach is focusing on production and provision whereas modern supply chain is focusing on the needs of customers and improves the value of the products. The thesis is about successful transformation from supply chain management to modern circular supply chain management. Supply chain management is involved with the sourcing, distributing, and arranging the organizational raw materials at lower prices whereas circular management involves the reuse, recycling, or repurposing of materials and products, aiming to minimize waste and reduce the environmental impact of the supply chain (Cooper et al., 1997). Besides that, this supply chain management involves estimating production and customer demand for decreasing lead times, enlightening agility, and fulfilling plans just in time at manufacturing businesses (Cooper et al., 1997.) On the other side, the thesis topic is circular supply chain management which is an application showing the repurposing of raw materials, waste materials, and production value by aiming to minimize waste and reduce the environmental impact of the overall supply chain.

This circular supply chain management is an approach that is based on the principles of the country's economy and prioritizes regenerative and restorative economic systems. Moreover, this thesis is showing the supply chain and circular supply chain management contribution to the reverse logistics processes such as products raw materials, materials collections processes like packaging and recycling which are key components of circular supply chains (Di Maria et al., 2022.) This study is about exploring the supply chain management connection with the circular supply chain theories with logistics management. This thesis is to find out the key challenges and opportunities in implementing circular supply chain and sustainable logistics management and develop effective strategies for companies to transition towards a more sustainable and circular supply chain model.

1.1 Aim/Objective

Circular supply chain sustainable logistics management is an important research topic because it addresses some of the most pressing environmental and social issues of our time. The traditional linear supply chain model, which involves extracting raw materials, manufacturing products,

and disposing of waste, is not sustainable in the long term (Korhonen et al. 2018.) This approach leads to resource depletion, pollution, and other negative impacts on the environment and society.

A circular supply chain model, on the other hand, aims to reduce waste and promote sustainability by closing the loop on the product lifecycle. This involves designing products for recyclability and reusability, minimizing waste and emissions throughout the supply chain, and using renewable energy and sustainable materials (Korhonen et al. 2018.) By adopting a circular supply chain model, companies can reduce their environmental footprint, improve their reputation with customers and stakeholders, and create new business opportunities (Kirchherr et al. 2017).

Sustainable logistics management is a critical aspect of circular supply chain management. Efficient transportation and distribution of goods play a crucial role in reducing waste and emissions, and optimizing resource use. By integrating sustainability into logistics operations, companies can reduce their carbon footprint, improve supply chain efficiency, and achieve cost savings (Klumpp, 2018). Therefore, research on “circular supply chain and logistics management” is crucial for promoting sustainability and environmental protection while ensuring economic growth and development.

1.2 Problem Statement

Despite the growing awareness of the negative environmental and social impacts of traditional linear supply chains, many companies continue to operate in a linear and unsustainable manner. The result is significant resource depletion, waste generation, and environmental degradation, exacerbated by resource-intensive logistics operations that contribute to greenhouse production (Butt et al, 2023). Therefore, the problem statement for this thesis is to develop efficient transitional plans for businesses to move toward a more sustainable and circular supply chain model by identifying the main challenges and opportunities in establishing circular supply chains and sustainable logistics management. Bangladesh Cement Industry is struggling to implement circular supply chain management in its businesses. Companies in Bangladesh are still not managing or have insufficient experience with significant resource reduction, waste generation and circulation, and environmental deprivation, which is exacerbated by resource setups for reusing.

1.3 Aim of the Thesis

This research aims to identify the key challenges and opportunities in implementing circular supply chain sustainable logistics management for companies and to develop effective strategies that can help them overcome these challenges and transition towards a more sustainable and circular supply chain model in Bangladesh. The objectives of this research are to:

- Investigate the current state of circular supply chain sustainable logistics management practices in companies and their impact on the environment and society.
- Analyze the barriers and challenges that companies face when implementing circular supply chain sustainable logistics management, including technological, economic, and regulatory factors.
- Provide insights and guidance for companies seeking to promote sustainability and environmental protection through circular supply chain sustainable logistics management.

By achieving these objectives, this research will help companies transition towards a more sustainable and circular supply chain model, thereby reducing resource depletion, waste generation, environmental degradation, and greenhouse gas emissions.

1.4 Research question

The cement industry in Bangladesh plays a vital role in the country's economic growth and development. However, the industry is also associated with significant environmental impacts, including resource depletion, greenhouse gas emissions, and waste generation. In light of these challenges, there is an increasing need to adopt sustainable practices, such as circular supply chain management (CSCM), to enhance the industry's sustainability and reduce its environmental footprint (Bocken et al., 2016).

The integration of circular supply chain practices into logistics management holds the potential to transform the cement industry in Bangladesh. By embracing circular economy principles, cement companies can minimize waste, optimize resource utilization, and create a closed-loop system that fosters sustainability. However, the implementation of circular supply chain practices in logistics management is not without its challenges.

This research seeks to address key questions surrounding the integration of circular supply chain practices into logistics management in cement companies in Bangladesh. The primary research question explores the methodologies and strategies for integrating circular supply chain practices to enhance sustainability and reduce environmental impacts. Additionally, the research aims to identify and understand the major barriers and challenges that cement companies face when implementing circular supply chain practices for sustainable logistics management in the context of Bangladesh. By addressing these challenges, the research seeks to propose effective strategies that can be employed to overcome these barriers and successfully integrate circular supply chain practices into logistics management in cement companies in Bangladesh.

Through an in-depth analysis of the cement industry in Bangladesh and a comprehensive examination of existing literature Bocken et al. (2016), this research aims to contribute valuable insights into the potential of circular supply chain practices for sustainable logistics management. The findings of this research will not only shed light on the opportunities and challenges within the industry but also provide practical strategies that can guide cement companies toward achieving sustainability goals and reducing their environmental impact.

1.5 Preliminary question

"How can circular supply chain practices be integrated into logistics management to enhance sustainability and reduce environmental impacts in the Cement Industry in Bangladesh?"

1.6 Research questions

RQ-1: What are the major barriers and challenges faced by cement companies in Bangladesh when implementing circular supply chain practices for sustainable logistics management?

RQ-2: What strategies can be employed to overcome these barriers and challenges to successfully integrate circular supply chain practices into logistics management in cement companies of Bangladesh?

These research questions provide a foundation for investigating the integration of circular supply chain practices into logistics management in the context of cement companies in Bangladesh. According to Bocken et al. (2016), the preliminary question focuses on the overall objec-

tive of enhancing sustainability and reducing environmental impacts through circular supply chain practices. It sets the broader context for exploring the specific challenges and strategies related to sustainable logistics management in the cement industry.

According to the Bocken et al. (2016), the supplementary questions research deeper into the specific barriers and challenges faced by cement companies in Bangladesh when implementing circular supply chain practices for sustainable logistics management. By identifying these obstacles, the research can uncover the unique context and factors that influence the adoption of circular practices in the industry. Furthermore, the supplementary questions seek to identify and propose strategies that can help overcome these barriers and challenges, enabling the successful integration of circular supply chain practices into logistics management in cement companies of Bangladesh.

By addressing these research questions, the thesis aims to contribute to the understanding and practical implementation of circular supply chain practices for sustainable logistics management in the cement industry of Bangladesh. The findings can help identify opportunities, strategies, and best practices that can be adopted by cement companies to enhance sustainability, reduce environmental impacts, and promote circularity in their supply chains.

2 Literature Review

The literature review provides a comprehensive analysis of existing research and scholarly works related to the integration of circular supply chain practices into logistics management in the context of the cement industry, with a specific focus on cement companies in Bangladesh. The subsequent focus of the literature review is on supply chain management with the facilitator of a circular supply chain with sustainable logistics management and its applications in overall supply chain management. It examines the principles, strategies, and approaches of the circular economy, highlighting its potential to decouple economic growth from environmental degradation. The review explores how circular supply chain practices, including green transportation, efficient supply chain optimization, and waste reduction, can contribute to sustainability and reduce environmental impacts in various industries.

According to Bangladesh Cement Manufacturers Association (BCMA) (n,d), a general overview of the supply chain management in the cement industry in Bangladesh. The primary raw materials for cement production are limestone, clay, and gypsum. These materials are usually sourced locally or imported. Limestone is often extracted from quarries near the cement plants. The cement manufacturing process involves crushing and grinding the raw materials, then heating them in a kiln at high temperatures to produce clinker. The clinker is mixed with gypsum to produce cement. This process requires efficient coordination to ensure a steady supply of raw materials and smooth operations. The demand for cement can be influenced by macroeconomic factors, seasonal variations, and changes in government policies related to construction and infrastructure development.

The cement industry in Bangladesh is ensuring consistent quality of cement throughout the supply chain is crucial for maintaining customer satisfaction and reputation but the challenges arises from after using resources are wastes. There is no plan to consumer these resources as recycling or reuse in further times (LightCastle Analytics Wing, 2020). The problem is in Bangladesh cement industry sustainable practices such as reducing energy consumption and minimizing environmental impact that is becoming more important in the cement industry.

2.1 Nature & Perspectives of Supply Chain Management

Supply chain management considers the coordination and optimization of all the business activities involved in the maintenance of the flow of goods, services, information, and finances from the initial sourcing of the business's raw materials. It is also involved in businesses with the delivery of the final products and services to customers. Here, the research is showing the complex discipline which is required with the multi-dimensional perspective to effectively manage operations. On the other hand, supply chain management is the business's support for the improvement of supply chain operations. Supply chain management is applying as End to End visibility which is helping to attain visibility across the entire businesses supply (Vlachos & Dyra, 2020). This supply chain management is broad and crucial in every stage of the business because it is involving with tracking and monitoring the supplier from the raw materials consumes to the customer's reach (Daneshjo & Kravec, 2015). Besides that it is playing a vital role in the businesses. In organizations, supply chain management is maintaining the fostering and strong relationship with the suppliers, distributors, logistic providers, and all other internal stakeholders. Moreover, the supply chain management is also maintaining the relationship with third party vendors so that the supplies and distributor's range and scope increased their performance stream. Supply chain management has a nature of integration model in the working systems, processes, and data across the different entities to help and support the business's operations streamlining and attain better coordination.

Supply chain management is implementing a demand-obsessed perspective which means bringing into line supply chain accomplishments with consumer petition arrangements. This involves estimating production and customer demands for decreasing lead times, enlightening agility, and fulfilling plans just in time at manufacturing businesses. On the other side, Supply chain management is implementing lean ideologies to improve inventory levels. Like risk management, Supply chain management has been facing many hazards as well as supplier distractions, usual production mischances, geopolitical issues, and market instability. Supply chain management has the risk management perspective that includes categorizing, measuring, and modifying threats proactively. This management consists of increasing contingency plans, differentiating suppliers, structuring forceful logistics set-ups, and leveraging equipment for an actual time observing and initial caution methods (Daneshjo & Kravec, 2015). Like sustainability nowadays, supply chain management has a nature and plan on the sustainability and ethical practices which are the serious concerns for related businesses. In businesses, supply chain management is needed to assess the environmental impact of their supply chain undertakings, implement

sustainable performances, make sure of fair labor circumstances, and encourage liable sourcing track down. Globally, customers and stakeholders have progressively assumed clearness and ethical behavior through supply chain activities. Supply chain management is placing the customer at the focal point of source by the supply chain activities that are very crucial for success. According to the research and findings of Daneshjo and Kravec (2015), supply chain practices help businesses to comprehend customer needs, inclinations, and opportunities.

2.1.1 Traditional Structure of Supply Chain Management

The traditional structure of supply chain management involves a linear movement of products from suppliers to companies, distributors, and lastly to consumers. Nevertheless, it is important to make up the communication that modern supply chains are attractive more than traditional supply chains complex and vibrant (Jimo et al., 2019). The traditional structure of Supply Chain Management is from the beginning of businesses until it is going for globalization along with technological innovations. This Traditional Structure of Supply Chain Management has managed the appearance of new supply chain models and methods to put up altering purchaser demands, market-changing aspects, and growth plans according to the industry developments.

The traditional structure of supply chain management normally consists of multiple objects and functions that are working together to coordinate the flow of goods, services, information, and finances. Even though the specific traditional structure of supply chain management and activities are structured may be different across industries and organizations. Here, the author found some of the key components mostly used in the traditional supply chain management structure such as:

The suppliers are the sources of raw materials, components, or services that are necessary for production. They play a critical role in the supply chain by providing the inputs required by manufacturers or service providers. The manufacturers are answerable for changing raw materials or components into finished products. They direct production developments, quality control, and association with organizations or industries operations. In some cases, in point and situations, the manufacturers may outsource the positive production activities to bond with the manufacturers along with the third-party suppliers. The distributors or else vendors act as intermediaries between manufacturers and retailers (Jimo et al., 2019.) They purchase products

in bulk from manufacturers and sell them to retailers or directly to customers. Distributors typically have a wide network and expertise in managing inventory, logistics, and order fulfillment.

The technical and sourcing information system is playing a crucial role in supply chain management by facilitating the flow of information among different entities. These systems enable the sharing of real-time data on demand, inventory levels, production status, shipments, and customer orders. They support decision-making, planning, and coordination across the supply chain. Besides that, the customers are the final consumers before end users of the products & services which are provided by the supply chain channels. Here, the supply chain uses the traditional strategy measuring the demands and preferences effort to the entire supply chain so that the market influence decisions connected to manufacturing, supply, and inventory management. On the other side, the retailers are the last links in the supply chain beforehand products reach the end consumers. Retailers are the (in traditional method) strategically term where they are selling products in a straight line to clients over and done with physical stores, online platforms, or else an arrangement individually (Jimo et al., 2019.) This traditional strategy of Supply Chain Management is focusing on inventory management, merchandising, sales, and customer service.

The supply chain management professionals are liable for supervision and organizing the numerous activities contained by the supply chain. The supply chain activities are managing relationships with dealers, companies, traders and logistics support suppliers. Their roles are involved with strategic planning along with market demand forecasting, obtaining, inventory controlling, logistics optimization, and endless perfection resourcefulness in supply management (Gebreyesus, 2016.) The transport and logistics support providers are in authority for the movement of imports through the supply chain. They are handling supply chain activities such as transport arrangement, freight management, warehousing, inventory control, customers order self-actualization, and the last moment of delivery.

2.1.2 Factors Influencing Supply Chain Management

According to the research and findings of Daneshjo and Kravec (2015), several factors are vastly influencing supply chain management in businesses. There many industries and organizations are influenced by supplier diversions, production quality assurance, and market instability. The only thing behind this effect is internationalization in businesses. With this factor of internation-

alization in businesses, supply chain management has developed more difficult interrelations with suppliers, distributors, and third parties' vendors. For this reason, businesses are sourcing materials and components from different countries, dealing with global suppliers, directing trade rules, and dealing with geographical issues. Those are vital reflections for supply chain management.

There is a factor of customers' demand which is a main driver of supply chain accomplishments. Here, the demand is fluctuating according to the demand patterns, seasonality, and changes in purchaser inclinations those are directly impacting supply chain planning, production, inventory management, and logistics. In case of logistics and transportation, these factors are serious concerns for supply chain management. These factors are vital for the businesses such as transport costs, lead times, organizational arrangement, mode of transport, warehousing, and distribution set-ups openly have an impact on the flow of merchandise and the overall awareness of the supply chain (Daneshjo & Kravec, 2015).

On the other side, effective inventory management is another crucial factor for matching supply and demand. These are needed for reducing costs and confirming product obtainability. These are the factors influencing the businesses' operations and sustainability such as lead time inconsistency, manufacture volume, transport costs, stock-outs, and undesirability among inventory assessments and approaches. There are many variable factors included such as environmental and ecological sustainability, social obligation, and agreement with code of practice that have turned out to be important concerns in supply chain management. In the system of government, businesses need to report problems interconnected to raw materials used in the operations, ethical sourcing, waste management, employment conditions, and governing obedience to meet stakeholder opportunities (Daneshjo & Kravec, 2015). This is the reason the cost management risk is raised, and cost optimization is a key independent factor in supply chain management. These are variable matters such as raw material costs, employment costs, transport costs, exchange vacillations, and financial prudence of scale affect the cost arrangement of the supply chain management in businesses. Additionally, the research shows that a supply chain management actions plan can be a way of balancing cost minimization with better product & service quality which is a nonstop challenge for supply chain activities.

2.1.3 Scopes of Supply Chain Management

The supply chain management opportunity is demonstrated by the wide-ranging nature of the restraint, covering numerous utilities and developments complicated in the management of the

flow of products and merchandising services and material from corner to corner adopted by the supply chain. The operational supply chain management needs a holistic method that fit building more scopes to attain operational proficiency, cost optimization, purchaser contentment, and sustainable implements (Gebreyesus, 2016). In concern of sustainability and corporate social responsibilities, supply chain management more and more consists of such sustainability and corporate social responsibility (CSR) ethics.

This scope consists of making sure ethical track down; encouraging fair employment performs, enhancing environmentally friendly impressions, dealing with waste and productions, and accepting sustainable packing and transport run through. On the other hand, supply chain analytics emphasizes using data and analytics tools to get an advantage in businesses and sustainable insights and make knowledgeable resolutions as well as improving supply chain actions (Gebreyesus, 2016).

2.1.4 Key Criteria for a Good Strategy of Supply Chain Management

Supply chain management is driving the business strategies forward to achieving organizational objectives. In the effective business assessment, the business strategy begins with the core strategic visions which are laid down by the framework for the businesses. Before the business's strategy setups businesses are defined as what business is, what it has done what it doesn’t do. Moreover, it is also consisted of the basis of market gaps where innovations, services, and quality are the leading edges for focusing on the other businesses functioning (Gebreyesus, 2016).

Primary Level Strategy	Advantages for Sourcing	Competition basis Strategy	Key Contributors for supply Chain Management
Costs	The cost efficiency is made by the cost reduction operations	Lower pricing is the competition basis analysis	Supply chain activities are helping to source the lower costs infrastructure.
Innovations	The advantages are sourced from the Brand and Unique technological using in the operations	The desirable and innovative products are competitive advantages	Supply chain activities are determined the Market volume, time and size.
Services	The superior services are also the advantages from the sourcing	The service competition based strategy is to analyze the customer's specific needs.	The key contributors are the packaging and designing as based on the customers preferences.
Quality	The quality is made the advantages by the safest, most reliable product sourcing.	The products are as based on the competitive advantages is counting on the preferences.	Supply chain activities are needed to apply in excellent way to ensure the quality concerns.

Table 1: Good Strategies of Supply Chain Management (Gebreyesus, 2016).

As per this thesis, a good business strategy is very important according to the supply chain perspective. Different network structures, processes, information, systems, and skills enable businesses to gain a competitive advantage. Here, if the costs of source products are not showing the competitive advantage and efficient operations, the business's strategy is not good and effective as per supply chain management concepts. In Bangladesh, there is a lack of communication and collaboration among supply chain stakeholders such as manufacturers, suppliers, and retailers, which can lead to inefficiencies, misaligned expectations, and delays. The Bangladesh

cement industry lacks knowledge of the circular supply chain approach. According to LightCastle Analytics Wing, (2020), the cement industry in Bangladesh is using third-party circular supply chain practices due to the unavailability of raw materials, lack of control over waste management, lack of sustainable environment, less recycling of resources, and so on, which is a traditional approach.

2.2 What is circular supply chain management

Circular supply chain management involves the reuse, recycling, or repurposing of materials and products, aiming to minimize waste and reduce the environmental impact of the supply chain (Ellen MacArthur Foundation, n.d.). This approach is based on the principles of the circular economy, which prioritizes regenerative and restorative economic systems (Kirchherr et al., 2017.) Reverse logistics processes, such as product and material collection and recycling, are key components of circular supply chains. Effective communication and collaboration among supply chain stakeholders are also crucial for the success of circular supply chain management (Kirchherr et al., 2017.)

2.2.1 Definition and principles of circular supply chain management

Circular supply chain management is an approach to managing supply chains that incorporates circular economy principles. It involves the redesign of supply chain processes and systems to reduce waste, increase resource efficiency, and promote sustainable consumption and production patterns. CSCM aims to create closed-loop systems where materials and products are reused or recycled, and waste is minimized or eliminated. This requires collaboration and coordination among supply chain partners, from suppliers to customers (Kirchherr et al., 2018). CSCM plays a crucial role in achieving sustainability by addressing the environmental and social challenges associated with traditional linear supply chain models. The integration of circular economy principles into supply chain management practices offers numerous benefits for businesses and the environment.

One of the key advantages of CSCM is its ability to reduce waste and minimize resource depletion. In a linear supply chain, resources are extracted, transformed into products, and eventually discarded as waste. In contrast, CSCM focuses on optimizing the use of resources by implementing strategies such as recycling, remanufacturing, and refurbishing (Werner-Lewandowska & Golinska-Dawson, 2021). By designing products with a longer lifespan, incorporating recycled materials, and creating closed-loop systems, companies can reduce the amount of waste generated and conserve valuable resources. This approach not only minimizes the environmental impact associated with resource extraction but also helps mitigating the risks of resource scarcity and price volatility.

Moreover, CSCM can lead to significant cost reductions and increased operational efficiency. By implementing circular practices such as reverse logistics, companies can recapture value from end-of-life products and materials. Through processes such as product take-back, remanufacturing, and refurbishment, companies can extend the life cycle of products, reduce production costs, and lower the need for raw material acquisition (Shamsuddoha, 2015). Additionally, CSCM encourages better inventory management, optimized transportation, and improved energy efficiency, resulting in overall cost savings throughout the supply chain (Shamsuddoha, 2015.)

In addition to environmental benefits and cost savings statement of Shamsuddoha (2015), CSCM can improve relationships with stakeholders and enhance brand reputation. Consumers are increasingly concerned about the environmental and social impact of the products they purchase. By adopting CSCM practices and transparently communicating these efforts, companies can demonstrate their commitment to sustainability and appeal to environmentally conscious consumers. CSCM can also contribute to social sustainability by ensuring fair labor practices, promoting inclusivity, and supporting local communities. By fostering positive relationships with stakeholders, companies can enhance their brand reputation, attract new customers, and strengthen their position in the market.

Lastly, CSCM is instrumental in achieving sustainability goals by addressing environmental and social challenges associated with traditional linear supply chain models. Through the integration of circular economy principles, businesses can reduce waste, increase resource efficiency, and create new business opportunities. CSCM not only benefits the environment by minimizing resource depletion and pollution but also offers cost savings, enhances stakeholder relationships, and improves brand reputation. By adopting CSCM, companies can position themselves as leaders in sustainability and contribute to the transition towards a more circular and sustainable

economy. Bangladesh cement industry has different stakeholders in the supply chain such as manufacturers, suppliers, and retailers. The cement industry in Bangladesh involves a complex supply chain with various stakeholders who collaborate to ensure the production, distribution, and consumption of cement products. According to the context of the cement industry's problems in Bangladesh, the gap can be closed by stakeholders who collaborate with raw material suppliers, cement manufacturers, and so on by creating a logistics process, for example.

2.2.2 Definition and principles of sustainable logistics management

Sustainable logistics management refers to the efficient and effective coordination of transportation, storage, and distribution activities that minimize negative environmental impacts while enhancing social and economic sustainability. It involves integrating environmentally responsible practices, such as reducing carbon emissions, minimizing waste, and using renewable energy, into all stages of the logistics process. The principles of sustainable logistics management include reducing resource consumption, reducing pollution and waste, promoting sustainable transportation, fostering social responsibility, and ensuring the efficient use of resources (Grabara, 2013). The adoption of circular supply chain models can lead to cost savings, reduced environmental impact, and improved social outcomes (Ellen MacArthur Foundation, n.d.). Sustainable logistics management plays a critical role in enabling circular supply chains (Gualandris & Kalchschmidt, 2020). Implementing circular economy principles in logistics can lead to significant cost savings (European Commission, 2018). Research in this area can inform the development of policies and frameworks that promote sustainable and circular supply chain management (Gualandris & Kalchschmidt, 2020).

2.2.3 Importance of Circular Supply Chain & sustainable logistics management

Circular supply chain management aims to minimize waste and reduce the environmental impact of the supply chain by reusing, recycling, or repurposing materials and products (Ellen MacArthur Foundation, n.d.). This approach is based on the principles of the circular economy, which prioritizes regenerative and restorative economic systems (Kirchherr et al., 2017.) Reverse logistics processes, such as the collection and recycling of products and materials, play a crucial role in enabling circular supply chains. Effective communication and collaboration among supply chain stakeholders, including suppliers, manufacturers, retailers, and consumers, are es-

sential for the success of circular supply chain management (Kirchherr et al., 2017.) Circular supply chain management is a critical component of sustainable business practices, as it involves reducing waste and maximizing the use of resources throughout the supply chain (Jimo et al., 2019.) By adopting circular supply chain management practices, companies can reduce their environmental impact, improve their resource efficiency, and create new business opportunities.

According to a report by the Ellen MacArthur Foundation, a circular economy approach that emphasizes circular supply chain management practices can lead to significant economic and environmental benefits, such as reducing material costs by up to 50% and reducing greenhouse gas emissions by up to 45% (Ellen MacArthur Foundation, n.d.). Furthermore, by promoting a circular economy approach, companies can strengthen their brand reputation and enhance their competitive advantage, as consumers increasingly demand that companies operate more sustainably. The circular economy is an economic model that aims to minimize waste and maximize resource efficiency by keeping materials and products in use for as long as possible. It is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. In a circular economy, products and materials are reused, repaired, or recycled, and waste is minimized or eliminated. This requires a shift from the traditional linear model of "take, make, dispose" to a circular model of "reduce, reuse, recycle" (Genovese et al., 2017)

Circular supply chain management practices are gaining momentum in certain industries, including fashion and electronics, but many companies still prioritize traditional linear supply chain models over sustainability (Ellen MacArthur Foundation, n.d.). The lack of standards and metrics for circular supply chain management practices makes it difficult to measure progress and compare performance across companies and industries (Ellen MacArthur Foundation, 2020). Despite these challenges, the European Union's Circular Economy Package and various company initiatives promote circular supply chain practices. Companies are partnering with stakeholders to improve their sustainability and promote circular practices (Daneshjo & Kravec, 2015).

2.2.4 Importance of sustainable logistics management for businesses and the environment

Sustainable logistics management refers to the integration of environmentally friendly practices into the management of logistics operations. It involves making conscious decisions to reduce

the environmental impact of transportation, warehousing, and supply chain activities while still ensuring operational efficiency and profitability (Genovese et al., 2017). The importance of sustainable logistics management has grown significantly in recent years as businesses face increasing pressure to address environmental concerns and meet the expectations of environmentally conscious consumers.

Figure 1: Sustainable logistics management for businesses and the environment (Grabara, 2013).

A study conducted by Grabara (2013) emphasized the benefits of adopting sustainable logistics practices for businesses. Companies that embraced green procurement, which involves sourcing products and services from environmentally responsible suppliers, and green transportation, which focuses on reducing fuel consumption and emissions in transportation operations, experienced notable advantages. These sustainable logistics practices led to cost savings and operational efficiencies, resulting in lower logistics costs. By optimizing transportation routes, reducing energy consumption, and implementing environmentally-friendly packaging, companies could reduce their carbon footprint and minimize waste generation. In addition to the financial benefits, companies also achieved higher levels of customer satisfaction by demonstrating their commitment to sustainability.

The research conducted by Kim and Kim (2018) highlighted “positive perception of consumers toward companies that adopt sustainable practices”. Consumers are increasingly concerned about the environmental impact of their purchasing decisions and are more likely to support companies that demonstrate a commitment to sustainability. By implementing sustainable lo-

gistics management practices, businesses can differentiate themselves from their competitors and enhance their brand reputation. This positive perception can lead to increased customer loyalty and a higher likelihood of consumers choosing their products over alternatives.

By expanding on sustainable logistics management, businesses can unlock numerous opportunities. Firstly, adopting sustainable practices can result in long-term cost savings through reduced energy consumption, optimized transportation routes, and improved resource management. This cost efficiency can improve the overall profitability of the business. Secondly, integrating sustainability into logistics operations can enhance operational efficiencies by streamlining processes, reducing waste, and promoting innovation. Sustainable logistics practices often involve optimizing supply chain networks, implementing lean principles, and adopting technologies that improve visibility and traceability (Grabara, 2013). These improvements can lead to better inventory management, reduced lead times, and increased responsiveness to customer demands.

Furthermore, sustainable logistics management can provide a competitive advantage in the market. As consumers become more environmentally conscious, businesses that prioritize sustainability can attract a larger customer base. Sustainable practices can become a key differentiator; allowing businesses to stand out and build brand loyalty (Grabara, 2013.) Additionally, companies that implement sustainable logistics practices may also benefit from government incentives, certifications, and partnerships with sustainability-focused organizations.

Lastly, sustainable logistics management is crucial for businesses to address environmental concerns while maintaining profitability. Studies have shown that implementing sustainable logistics practices can lead to cost savings, operational efficiencies, and higher customer satisfaction (Grabara, 2013.) Furthermore, consumers are more likely to support companies that demonstrate a commitment to sustainability, creating a competitive advantage. By embracing sustainable logistics management, businesses can reduce their environmental impact, improve their bottom line, and contribute to a more sustainable future.

2.2.5 The prominence of the circular economy for sustainable development

The circular economy is a concept that aims to redefine the traditional linear economic model of "take-make-dispose" into a regenerative system where resources are used more efficiently, waste is minimized, and materials are kept in circulation for as long as possible (Genovese et al.,

2017). This approach is crucial for sustainable development as it offers a viable solution to the pressing environmental and social challenges we face today.

One of the primary benefits of the circular economy is its ability to decouple economic growth from environmental degradation. In the linear economy, the production and consumption of goods lead to significant resource extraction, waste generation, and pollution. In contrast, the circular economy seeks to break this link by promoting the efficient use of resources, reducing waste, and minimizing environmental impacts (Genovese et al., 2017.) By embracing circular practices, businesses can reduce their reliance on virgin resources, decrease their carbon emissions, and mitigate the depletion of natural resources.

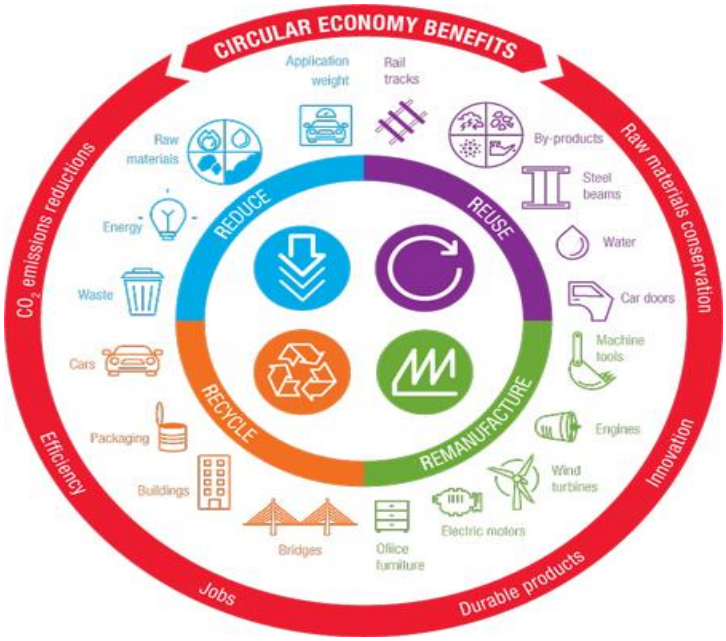

Figure 2: Circular economy (Grabara, 2013).

According to circular economy benefits mind-map, reducing waste is a important code of the circular economy. Through strategies such as recycling, reusing, and remanufacturing, materials can be kept in use for longer periods, avoiding their premature disposal. This not only minimizes the burden on landfills but also conserves resources that would otherwise be used to produce new materials (Grabara, 2013). By implementing effective waste management systems and investing in recycling infrastructure, the circular economy can help combat pollution and contribute to a cleaner environment.

According to Grabara (2013), another aspect of the circular economy is increasing resource efficiency. This involves designing products with durability, reparability, and recyclability in mind, as

well as optimizing production processes to minimize waste and energy consumption. By adopting these practices, businesses can reduce costs associated with raw material acquisition and waste disposal, leading to improved profitability. Furthermore, resource efficiency can drive innovation, as companies are incentivized to develop new technologies and business models that maximize the value extracted from resources while minimizing environmental impacts.

The circular economy also promotes sustainable consumption and production patterns. Encouraging consumers are about to choose products and services that are more durable, repairable, and reusable, shifts the focus from a throwaway culture to one of long-term value. This change in mindset fosters responsible consumption habits, reduces the demand for new products, and encourages the adoption of circular business models (Amiri et al., 2022). By aligning consumption with the principles of sustainability, the circular economy can help addressing issues such as overconsumption, waste generation, and the depletion of finite resources.

From an economic perspective, the circular economy offers numerous opportunities for businesses. By adopting circular practices, companies can optimize their supply chains, reduce costs associated with resource extraction and waste management, and enhance their resilience to resource price volatility (Amiri et al., 2022). Moreover, the circular economy can stimulate innovation and create new job opportunities in sectors such as recycling, remanufacturing, and repair services. It also opens new markets for products and services that cater to the growing demand for sustainable alternatives.

Lastly, the circular economy is essential for sustainable development as it provides a framework to decouple economic growth from environmental degradation. By reducing waste, increasing resource efficiency, and promoting sustainable consumption and production patterns, the circular economy addresses a wide range of environmental and social challenges. It offers economic benefits for businesses, including cost savings, innovation opportunities, and the creation of new markets and jobs. Embracing the circular economy is crucial for achieving a more sustainable and inclusive future for both the environment and society.

2.2.6 Development of strategies to improve circular supply chain management

To improve circular supply chain management, companies can adopt several strategies that focus on reducing waste, maximizing the use of resources, and promoting collaboration and innovation across the supply chain. Some of these strategies include:

- Designing products for circularity, such as by using recyclable or biodegradable materials and designing for disassembly (Kirchherr et al., 2017).

- Developing new business models that prioritize circularity, such as product-service systems and closed-loop supply chains (Ghisellini et al., 2016).

- Engaging with stakeholders across the supply chain to promote collaboration and knowledge sharing, such as by establishing circular supply chain networks (Boons et al., 2013).

- Investing in new technologies to enable circular practices, such as recycling and remanufacturing technologies (Bocken et al., 2016).

- Implementing circular performance metrics and reporting frameworks to track progress and measure the effectiveness of circular strategies.

By adopting these strategies, companies can improve the sustainability of their operations, reduce waste, and create new opportunities for innovation and collaboration across the supply chain.

2.2.7 Potential impact of circular supply chain management on environmental sustainability

Circular supply chain management can have a significant positive impact on the environment by reducing waste and promoting resource efficiency. According to Ghisellini et al. (2016), circular supply chains can help to conserve natural resources and reduce greenhouse gas emissions. The study by the Ellen MacArthur Foundation (n.d.) found that transitioning to a circular economy could reduce carbon dioxide emissions by 48%, primary material consumption by 40%, and water consumption by 50%. Circular supply chain management can also reduce the environmental impact of waste disposal by keeping materials and products in use for longer, reducing the amount of waste that ends up in landfills or incinerators, which can release harmful pollutants into the environment (Ghisellini et al., 2016). Moreover, circular supply chain management can also create economic benefits. According to Kirchherr et al. (2017), it can reduce costs and create new business opportunities. For instance, by designing products for reuse and recycling, companies can save on material costs and reduce the need for new raw materials, which can also improve supply chain resilience (Kirchherr et al., 2017). This study aims to contribute to the

existing literature on sustainable logistics management and circular economy by identifying gaps and challenges in circular supply chain management, developing strategies to improve circular supply chain management, and examining the potential impact of circular supply chain management on environmental sustainability.

2.2.8 Identification of gaps and challenges in circular supply chain management

Circular supply chain management presents several challenges and gaps that need to be addressed to promote the adoption of circular practices across industries. Some of the key challenges and gaps include:

- Lack of collaboration and knowledge sharing between stakeholders in the supply chain (Boons et al., 2013).
- Limited availability of data and metrics to measure circular supply chain performance hinders effective decision-making.
- Insufficient regulatory frameworks and policies to support the adoption of circular practices (Ghisellini et al., 2016).
- Limited availability of suitable technologies to enable circular practices, such as recycling and remanufacturing technologies (Bocken et al., 2016).
- Limited consumer awareness and demand for circular products and services, hindering market uptake (Ghisellini et al., 2016).

Addressing these challenges and gaps will require a concerted effort from stakeholders across the supply chain, including governments, businesses, and consumers, to promote collaboration, innovation, and knowledge sharing.

2.3 Examples of circular supply chain management practices

After introducing CSCM earlier, here some examples of it as follows:

a) Closed-loop supply chains: Companies can implement closed-loop supply chains where materials and products are reused or recycled. For example, the clothing company Patagonia has developed a program where it collects used clothing from customers and recycles it into new products (Wang & Dai, 2018).

b) Product life extension: Companies can extend the life of products through repair, refurbishment, and remanufacturing. For example, the printer manufacturer HP has developed a program where it collects used printers, refurbishes them, and sells them as new (Hossain & Roy, 2016).

c) Collaboration and partnerships: CSCM require collaboration and partnerships among supply chain partners. For example, the furniture retailer IKEA has partnered with social enterprises and waste management companies to promote circularity in its supply chain (IKEA, 2021).

2.4 Examples of sustainable logistics management practices

Nowadays following SLM Practices are getting popularity in all over the world.

a) Green transportation: Companies can adopt various strategies to reduce their carbon footprint in productions. One approach is to switch to alternative resources such as cement bags, raw chemical substances etc. it is from renewable sources such as plant-based materials or algae, offer a more sustainable alternative to traditional remains resources (Werner-Lewandowska & Golinska-Dawson, 2021).

b) Efficient supply chain: Optimizing the supply chain is another crucial aspect of sustainable logistics management. Companies can implement various strategies to enhance efficiency, reduce costs, and minimize waste and emissions (Jimo et al., 2019). By utilizing advanced route planning of supply chain, companies can identify the most efficient routes, reduce costs, and minimize resources consumption.

c) Waste reduction: there is a closed-loop system is an effective approach to reducing waste in logistics operations. Instead of discarding waste, companies can design their supply chain to enable the reuse or recycling of materials (Jimo et al., 2019.) This can involve collaborating with suppliers to implement take-back programs or establishing partnerships with recycling facilities.

By adopting alternative resources planning, it can be optimizing the supply chain operations, and implementing closed-loop systems. Companies can make the position themselves as leaders in sustainability and attract environmentally conscious consumers (Jimo et al., 2019.)

2.5 Examples of circular economy practices

CSCM also creates new business opportunities and fosters innovation. By adopting circular economy principles, companies can explore new revenue streams through the development of circular business models. Circular economy practices may involve offering product-as-a-service models, leasing or rental arrangements, or developing take-back programs. The shift from a transactional model to a more service-oriented approach not only generates additional revenue but also promotes customer engagement and loyalty (Werner-Lewandowska & Golinska-Dawson, 2021).

a) Product design for circularity: Companies can design products that are durable, repairable, and recyclable. For example, the shoe company Adidas has developed a running shoe made from 100% recycled materials that can be fully recycled at the end of its life (Amiri et al., 2022).

b) Closed-loop systems: Companies can implement closed-loop systems where waste is reused or recycled instead of discarded. For example, the carpet manufacturer Interface has developed a program where it collects used carpet tiles and recycles them into new carpet tiles (Shamsuddoha, 2015).

c) Sharing platforms: Sharing platforms, such as car-sharing services and tool libraries, enable the sharing of resources and can help reduce waste and consumption. For example, the car-sharing service allows people to rent cars by the hour, reducing the need for car (Shamsuddoha, 2015).

2.6 Identification of barriers to implement circular supply chain management

According to a study by Wang & Dai, (2018), implementing circular supply chain management (CSCM) can be challenging due to a range of barriers that companies may face. These barriers can include a lack of awareness and understanding of CSCM principles or the benefits of circu-

larity, resistance to change, a lack of collaboration and coordination among supply chain partners, and limited availability of resources and technologies.

a) Lack of awareness and understanding: Companies may not be familiar with CSCM principles or may not fully understand the benefits of circularity.

b) Resistance to change: CSCM requires significant changes to supply chain processes and systems, which can be difficult for companies to implement.

c) Lack of collaboration and coordination: CSCM requires collaboration and coordination among supply chain partners, which can be difficult to achieve if there is a lack of trust or willingness to cooperate.

d) Limited availability of resources and technologies: Implementing CSCM may require significant investments in new technologies, which may not be readily available or affordable for some companies.

However, the authors argue that by addressing these barriers and adopting circular supply chain practices, companies can achieve a range of benefits, including reduced costs, increased efficiency, and improved environmental sustainability.

2.7 Strategies to overcome the challenges of circular supply chain management

To overcome these challenges, companies can adopt a range of strategies, including:

a) Educating stakeholders: Companies can raise awareness and understanding of CSCM principles and benefits among stakeholders, including suppliers, customers, and employees (Evangelista et al., 2017).

b) Building partnerships and collaboration: Companies can work with supply chain partners to build trust, foster collaboration, and develop shared goals and objectives (Evangelista et al., 2017).

c) Investing in new technologies: Companies can invest in new technologies and processes to enable circularity, such as 3D printing, product life extension, and closed-loop systems (Patagonia, 2020).

d) Setting targets and measuring progress: Companies can set targets for CSCM adoption and track progress toward achieving these goals, which can help build momentum and generate buy-in (Patagonia, 2020).

2.8 Opportunities for businesses in adopting circular supply chain management practices

According to Nuruzzaman (2015), Adopting CSCM practices can provide a range of opportunities for businesses, including:

a) Cost savings: CSCM can help companies reduce costs by improving resource efficiency, reducing waste, and lowering operational expenses.

b) New revenue streams: CSCM can create new revenue streams by enabling companies to monetize waste streams and create new products and services.

c) Enhanced brand reputation: Adopting CSCM can enhance a company's brand reputation by demonstrating a commitment to sustainability and circularity.

d) Improved stakeholder relationships: CSCM can improve relationships with stakeholders by fostering collaboration and partnership, which can lead to new business opportunities and increased customer loyalty.

There has been a growing body of research on circular supply chain management (CSCM) and sustainable logistics management (SLM) in recent years (Nuruzzaman, 2015). This research has explored a range of topics, including the principles and practices of CSCM and SLM, the challenges and opportunities associated with their implementation, and the environmental and economic impacts of adopting circular and sustainable approaches to supply chain management and logistics.

2.9 Summary of key findings and contributions of the previous research

Some key findings and contributions from previous research on CSCM and SLM include:

Environmental and economic reproductions: CSCM and SLM can help companies reduce environmental impacts and improve economic performance by increasing resource efficiency, reducing waste, and improving stakeholder relationships (Aloini et al., 2015).

Collaboration and Coordination of supply chain partners: Adoption of CSCM and SLM requires collaboration and coordination among supply chain partners, as well as investment in new technologies and processes.

CSCM and SLM connection in businesses: Companies that adopt CSCM and SLM practices can achieve significant cost savings and create new revenue streams, while also enhancing their brand reputation and improving stakeholder relationships (Aloini et al., 2015).

Social and Ethical implications: There is a need for more research on the social and ethical implications of CSCM and SLM, as well as the potential for these approaches to promote social and environmental justice.

Overall, previous research has highlighted the potential benefits of adopting circular and sustainable approaches to supply chain management and logistics, while also identifying the challenges and barriers that companies may face in implementing these practices.

Finally in the literature review, SCM to CSCM allows for a wide-ranging exploration of the perspectives and experiences of stakeholders involved in circular supply chain and sustainable logistics management. These techniques provided the opportunity to dig deeply into the subject matter, gaining rich insights and a holistic understanding of the challenges and opportunities faced by stakeholders. The above authors show their research was well-suited for this study on supply chain management, circular supply chain, and sustainable logistics management (Aloini et al., 2015). Moreover, the SCM provides flexibility as it allows for adjustments in the supply process based on emerging themes and insights. The Circular Supply Chain nature is enabled in the manufacturing units by exploring and refining developing concepts and theories, ensuring that the study captures the multifaceted aspects of sustainable logistics management within a circular supply chain framework.

Lastly, the entire above research are showing an understanding of the supply chain management and support to go for the circular supply chain logistics management in the companies. There are so many barriers and challenges found in the study. Bangladesh's cement industry has not yet applied the circular supply chain practices. They are only using third-party supply chain logistics management. There are some implementations shown in this study such as making

similar cement industry-based raw materials suppliers, manufacturers using reusable resources, wastes regenerations, wastes distributors & retailers, and circular supply chain technological practices in the companies.

3 Research Methodology

The research methodology consists of the way of data collection and data analysis. This methodology is evaluating the data reliability and credibility. Here, the study is contained research design by using the research Interview techniques and thematic research methods (Gammelgaard & Flint, 2012). In this chapter, author describes the research design, approaches and methods for the rationality flows so that data collection processes can be identified.

3.1 Research Design

In this overall research, the entire strategy is referred to as the research design to utilize the research's logical and succinct plan. The research is made up in according to tackle research questions through data collection, analysis, interpretation, and discussions. While the research objectives of this thesis are set, the author has taken another important step which is about analysis of articles as best-suited research design.

In the entire thesis, the research methodologies are secondary data sources analysis, interview-based data analysis, and thematic data analysis (Braun & Clarke, 2012).

To consider the research technique qualitative, this study was made to follow the trial research design in interview techniques where the research aims are justified in a new position.

3.2 Research Approach

For this study on the supply chain to circular supply chain along with sustainable logistics management in Bangladeshi cement companies, a purposive sampling strategy was employed. The interviewees consisted of respondents from selected cement manufacturing companies in Bangladesh who work in the supply chain management and logistics departments. Seven respondents participated in the interviews.

Data for this study was gathered through semi-structured interviews. An interview guide was created with open-ended questions to investigate the strategies and challenges associated with circular supply chain practices and sustainable logistics management in the Bangladeshi cement

industry (Gammelgaard & Flint, 2012). The interviews were conducted over the phone, or via internet contact, based on the preferences of the participants.

The interviews were audio-recorded and transcribed verbatim. Thematic analysis was applied to the transcripts to identify important themes and patterns within the data. The sample size of seven respondents was adequate to achieve data saturation because these respondents are representing the cement industry supply chain professionals in Bangladesh. Seven respondents were enough for gathering information to address the study objectives.

The challenges are in data collection and included difficulty in recruiting participants and scheduling interviews due to the busy nature of the cement industry. Additionally, some participants had reservations about sharing sensitive information related to circular supply chain practices and sustainable logistics management. To address these challenges, the researcher emphasized the confidentiality and anonymity of the participants, clearly explaining the purpose and goals of the study, and offer non-financial incentives (recognition) to encourage participation (Govindan et al., 2015).

To minimize researcher bias, the researcher practiced reflexivity and was aware of their preconceptions and assumptions. They will strive to maintain objectivity and neutrality throughout the data-gathering process.

Lastly, this study on circular supply chain and sustainable logistics management in Bangladeshi cement companies employed a purposive sampling strategy, with seven respondents from selected companies participating in semi-structured interviews (Braun & Clarke, 2012). Through thematic analysis of the interview data, the study aims to gain insights into the strategies and challenges associated with circular supply chain practices and sustainable logistics management in the Bangladeshi cement industry (Govindan et al., 2015). The researcher will address challenges such as recruitment and participant openness while minimizing researcher bias to ensure the accuracy and credibility of the findings.

3.3 Research Method

For this study, the research method is qualitative. This study uses abductive analysis as for the research technique in terms of qualitative research method. The qualitative research is a research method that aims for capturing and analyzing non-numerical data such as narratives,

interviews, observations, secondary sources documents as supporting materials to cover the uncover research insights about the research topic. The qualitative research often applied inductive research approach which is for developing research theories and concepts based on the data collection not about to prove the hypotheses (Braun et al., 2012). Here in this research segment, author has applied abductive research method which is combined with inductive and deductive reasoning to perform in this study. This research method is the best suited for this research topic. For the reason of that this study enables the exploration of the current theories and collecting the new data to create a new theory and explanation. This study covered the published materials for supply chain collaboration as a facilitator of circular supply chain with logistics management if the inductive approach applied in the sole methodology. On the other side, the deductive research approach is restricted to the study for evaluating the research with fresh concepts and information. According to Braun et al. (2012), abductive research is enabling the researcher to observe and formulate an explanation. By this research technique and reasoning, the research process is flexible and allows the researcher to make the research questions and data collection process clear throughout the investigation times.

In this research, author has used 3 types of research strategies as

1. Secondary research viewpoints (Articles)

2. Qualitative Research (Interviews data Collection processes)

3. Thematic data analysis (Interviews as Action Oriented research)

The first strategy is used in the thesis for an in-depth investigation to find out the rich data segments and different opinions of others. In this strategy, there are several articles and case studies used in the literature-based research knowledge performances (Gebreyesus, 2016).

The second strategy is qualitative research which is used in the thesis as an interview-based data collection process. In this research strategy, the research technique is applied to the 7 respondents by using the team meeting interview data (Braun et al., 2012). This strategy is helped and supported as an experimental research strategy where data findings were cause and effect relationship between the respondents.

In the last research strategy, author has gone through another interview-based research technique where the thematic data model is applied. The best matching strategy for this research is thematic data plans as before transcript based (Braun et al., 2012). In this research strategy, the

technique was for thematic-transcript-based data interviews part where respondents were responding to different steps for the data justifications by providing different strengths and advantages of supply chain management as a facilitator circular supply chain.

3.4 Data Collection

For this thesis, the research methodology is Data collected through semi-structured interviews. In the entire research method interview guide was created with open-ended questions to investigate the strategies and challenges associated with circular supply chain practices and sustainable logistics management in the Bangladeshi cement industry. The research method interviews were conducted over the phone, or via internet contact, based on the preferences of the participants (Gammelgaard & Flint, 2012).

The interviews were conducted in the past tense, and each participant was asked a series of open-ended questions to explore their experiences, perspectives, and strategies related to the circular supply chain and sustainable logistics management in the cement industry (Gebreyesus, 2016). The interviews were audio-recorded to ensure accurate data capture. The participants were encouraged to provide detailed and thoughtful responses, which were transcribed verbatim after the interviews.

Data for this study on circular supply chain and sustainable logistics management in Bangladeshi cement companies were gathered through semi-structured interviews. An interview guide with open-ended questions was created to explore the practices and challenges associated with circular supply chains and sustainable logistics management in the cement industry.

The same interview guide was utilized for each of the seven respondents who were purposively selected from selected cement manufacturing companies in Bangladesh. The participants were employees working in the supply chain management and logistics departments in predefined sec.

The interviews were conducted through the teams meeting with the participants. The interviews were designed to gather insights into the participants' experiences, perspectives, and strategies related to circular supply chain and sustainable logistics management.

During the interviews, the participants were encouraged to provide detailed and thoughtful responses to the interview questions (Gammelgaard & Flint, 2012). Their responses were audio-recorded to ensure accurate data capture.

After the interviews, the audio recordings were transcribed verbatim. Thematic analysis was then applied to the transcripts to identify recurring themes and patterns related to circular supply chain practices and sustainable logistics management in Bangladeshi cement companies (Gammelgaard & Flint, 2012).

This data collection approach allowed for a comprehensive exploration of the participants' perspectives and experiences in the context of circular supply chain and sustainable logistics management. The use of semi-structured interviews provided flexibility to delve deeper into specific areas of interest while allowing participants to express their views freely (Gebreyesus, 2016).

In general, the data collection process involved engaging with the selected respondents, conducting in-depth interviews, and analyzing the transcribed data to uncover valuable insights into the circular supply chain and sustainable logistics management practices within the Bangladeshi cement industry (Braun & Clarke, 2012).

3.5 Data analysis

Data for this study on circular supply chain and sustainable logistics management in Bangladeshi cement companies were collected through semi-structured interviews. The sample consisted of seven purposively selected participants who were employees working in the supply chain management and logistics departments of selected cement manufacturing companies in Bangladesh.

Thematic analysis was employed to analyze the data collected in this study. Thematic analysis is a suitable method for qualitative data analysis as it allows for the identification of patterns, themes, and categories within the data. The analysis process involved transcribing the interviews and reviewing the data to identify recurring themes and patterns that emerged. Based on the research questions and the identified patterns, the data were then coded into categories and subcategories. This coding procedure facilitated the systematic sorting of data segments into relevant themes and sub-themes (Braun & Clarke, 2012). Thematic analysis was informal

for this study as it allowed for a comprehensive exploration of the experiences and perspectives of participants regarding circular supply chains and sustainable logistics management in the Bangladeshi cement industry. It enabled the researcher to identify and investigate recurring themes related to the efficiency of manufacturing-based units in Bangladesh and the satisfaction of their customers.

By employing thematic analysis, the researcher was able to gain a deeper understanding of the key factors, challenges, and opportunities associated with circular supply chain practices and sustainable logistics management in the context of the Bangladeshi cement industry. The systematic and methodical approach of thematic analysis ensured the credibility and accuracy of the results, enhancing the reliability of the study findings (Braun & Clarke, 2012).

The data collected through semi-structured interviews with participants from selected cement manufacturing companies were analyzed using thematic analysis. This approach enabled the identification of meaningful themes and categories within the data, providing valuable insights into the circular supply chain and sustainable logistics management in the Bangladeshi cement industry.

3.6 Ethical considerations

During this study on circular supply chains and sustainable logistics management in Bangladeshi cement companies, several ethical considerations were taken into account to ensure the protection and well-being of the participants and to uphold the principles of research ethics (Govindan et al., 2015).

Informed Consent: Before participating in the study, all participants were provided with detailed information about the purpose, nature, and procedures of the research. They were informed of their rights as participants, including the voluntary nature of their participation and their right to withdraw at any time without penalty (Govindan et al., 2015). Informed consent was obtained from each participant before conducting the interviews.

Confidentiality and Anonymity: To maintain the confidentiality and anonymity of the participants, all data collected during the study were kept strictly confidential. Participants' identities were protected by assigning them unique codes or pseudonyms instead of using their real

names in the research materials (Kannan, 2015). Only the researcher had access to the raw data, and any identifying information was securely stored and kept separate from the research findings.

Privacy and Data Protection: The researcher ensured that participants' privacy was respected throughout the study. The audio recordings of the interviews were securely stored and accessible only to the researcher. Any digital files containing sensitive data were protected by password encryption and stored in a secure location. When reporting the findings, the researcher used aggregated and de-identified data to maintain confidentiality.

Ethical Dilemma: During the data collection process, an ethical dilemma arose when one of the participants expressed concerns about revealing certain proprietary information related to their company's supply chain practices. The participant worried that disclosing this information could potentially harm their organization's competitiveness in the industry.

Resolution of Ethical Dilemma: To address this ethical dilemma, the researcher reassured the participant that all data collected would be treated with the utmost confidentiality and used only for research purposes. The researcher emphasized that the research findings would be reported in an aggregated and anonym manner, without identifying specific companies or individuals (Gammelgaard & Flint, 2012). By clearly communicating the measures taken to protect the participant's confidentiality and emphasizing the overall benefits of the study, the researcher was able to alleviate the participant's concerns and obtain their continued participation.

This study on circular supply chains and sustainable logistics management in Bangladeshi cement companies was conducted with careful attention to ethical considerations. Informed consent, confidentiality, privacy, and data protection measures were implemented to safeguard the rights and well-being of the participants (Gammelgaard & Flint, 2012). By addressing ethical dilemmas transparently and responsibly, the researcher ensured the ethical integrity of the study.

3.7 Data analysis process

The data collected in this thesis on circular supply chain and sustainable logistics management in Bangladeshi cement companies were analyzed using thematic analysis (Gammelgaard & Flint,

2012). Thematic analysis is a systematic approach to identifying patterns, themes, and categories within qualitative data.

Familiarization with the data: The researcher first became familiar with the data by reviewing the transcriptions of the interviews. This involved reading and re-reading the interview transcripts to gain a comprehensive understanding of the content.

Generating initial codes: The researcher identified meaningful segments of the data and assigned initial codes to capture the key ideas, concepts, or patterns related to the thesis topic. Codes were created based on the research questions and relevant aspects of circular supply chain and sustainable logistics management in the cement industry.

Example: Codes related to circular supply chains might include "recycling practices," "remanufacturing strategies," or "closed-loop systems." Codes related to sustainable logistics management might include "carbon footprint reduction," "green transportation," or "energy-efficient operations" (Gammelgaard & Flint, 2012).

Searching for themes: The next step involved searching for themes within the coded data. The researcher looked for patterns, connections, and recurring ideas across the interviews that reflected the central topics of the thesis.

Example: Themes related to the circular supply chain could be "waste reduction and recycling," "circular economy practices," or "reverse logistics." Themes related to sustainable logistics management could include "green transportation strategies," "optimization of logistics operations," or "environmental impact assessment."

Reviewing and refining themes: The researcher reviewed and refined the identified themes, ensuring that they accurately represented the data and were relevant to the thesis topic. Themes were compared, and adjustments were made as necessary to ensure consistency and coherence.

Defining sub-themes: Within each main theme, the researcher identified sub-themes or subcategories that captured more specific aspects of the data. Sub-themes provided a deeper understanding of the topics under investigation (Gammelgaard & Flint, 2012).

Example: Sub-themes under the main theme of "waste reduction and recycling" could include "waste segregation practices," "partnerships with recycling facilities," or "innovative recycling technologies."

Mapping and organizing themes: The researcher created a thematic map or matrix to visually represent the relationships between the themes and sub-themes. This helped in organizing the data and identifying connections and patterns across different interviews and participants.

Interpretation and analysis: The final stage involved interpreting the themes and sub-themes concerning the research questions and the broader context of circular supply chain and sustainable logistics management in the Bangladeshi cement industry (Gammelgaard & Flint, 2012). The researcher analyzed the data within each theme, drawing on relevant quotes and examples to support the interpretation.

Reporting the findings: According to Gammelgaard & Flint (2012), the findings were reported in the thesis, using narrative descriptions, supporting quotes, and thematic summaries. The researcher presented a comprehensive analysis of the themes, providing insights into the key aspects of circular supply chain and sustainable logistics management in the context of Bangladeshi cement companies.

Through the process of thematic analysis, the researcher gained a deeper understanding of the experiences, perspectives, and practices related to circular supply chains and sustainable logistics management in the cement industry. The identified themes provided a framework for discussing and interpreting the data, contributing to the overall findings and conclusions of the thesis.

3.8 Credibility and Reliability

According to Gunasekaran & Irani (2014), validity and reliability are essential considerations in research to ensure the accuracy and credibility of the findings. In this thesis on circular supply chain and sustainable logistics management in Bangladeshi cement companies, measures were taken to enhance the validity and reliability of the study.

To enhance the credibility of the study, several steps were taken. Firstly, the research questions were carefully formulated to address the key aspects of circular supply chain and sustainable logistics management in the cement industry. The questions were designed to capture the relevant variables and provide meaningful insights into the topic.

Additionally, the selection of the sample was crucial for enhancing credibility. Purposive sampling was employed, specifically targeting individuals from selected cement manufacturing

companies in Bangladesh who worked in the supply chain management and logistics departments (Gunasekaran & Irani, 2014). This ensured that the participants had relevant knowledge and experience related to the thesis topic.

According to Gebreyesus (2016), during data collection, efforts were made to establish rapport with the participants and create a conductive environment for open and honest responses. The researcher also employed probing techniques to gather in-depth information and validate the responses provided by the participants.

To ensure reliability in data collection, the same interview guide was used for each participant. This standardized approach helped to maintain consistency across interviews, ensuring that all participants were asked similar questions and provided with equal opportunities to share their perspectives.

Transparency and detailed documentation of the research process, including the data analysis procedures, contributed to the reliability of the study. Thematic analysis was chosen as the data analysis method, which provided a systematic and replicable approach to identifying themes and patterns within the data (Braun & Clarke, 2012).

During the study, some credibility and reliability issues were encountered. One of the main challenges was related to the representativeness of the sample (Gunasekaran & Irani, 2014). While efforts were made to select participants from diverse cement manufacturing companies in Bangladesh. The manufacturing companies are chosen because manufacturing companies are mostly using raw materials by sourcing it, resources intensive purchase from third parties. It is important to acknowledge that the findings may not be generalizable to the entire industry. However, the focus was on gaining in-depth insights from the selected participants rather than aiming for statistical generalizability.

Another potential credibility issue was researcher bias. To address this, the researcher-maintained reflexivity throughout the research process, acknowledging personal biases and preconceptions. Steps were taken to ensure objectivity and neutrality in data collection, analysis, and interpretation.

Reliability could be affected by potential variations in participant responses. The participant's interview was made in English language. So, it has no issues on interpretation of the themes during data analysis (Gunasekaran & Irani, 2014).

Despite the potential credibility and reliability challenges, the researcher took appropriate measures to enhance the credibility and reliability of the study. By clearly documenting the research process, maintaining transparency, and employing rigorous data analysis techniques, the study aimed to provide credible and meaningful insights into the circular supply chain and sustainable logistics management in the context of Bangladeshi cement companies.

4 Data Analysis and Technique

To determine the results, author has evaluated the data systematically. This made sure that the data that was produced was suitable, understandable, and significant. As indicated by Braun & Clarke, (2012), qualitative data is different from quantitative data in that it can come from a variety of sources, including words, images, and documents. Techniques for thematic data analysis have been extensively used in this work. The method's theoretical adaptability sets theme analysis apart from other methods for analyzing qualitative data (Braun & Clarke, 2012). Additionally, they point out that theme analysis is effective when examining a variety of qualitative data, including media, transcripts, focus groups, interviews, and more. The interviews for this study were initially done using teams video conferencing technology to avoid bias, such as emotions, from being unclear throughout the encounter. The analysis of the theme data comes next. The third and final step is to highlight the key aspects of the information from the interview data. After that, the entire thematic data analysis was completed.

4.1 Qualitative Data Analysis Techniques

In the present study, which explores circular supply chain sustainable logistics management in cement companies in Bangladesh, thematic analysis is the chosen qualitative data analysis technique. The thematic analysis involves several stages, including familiarization with the data, coding, category formation, topic review, theme definition, and naming. This method is employed to analyze the interview responses obtained from the qualitative data (Braun & Clarke, 2012).

The five types of qualitative data analysis techniques mentioned earlier grounded theory, narrative analysis; discourse analysis, framework analysis, and content analysis apply to various research contexts (Braun & Clarke, 2012). However, for the specific research focus on circular supply chain sustainable logistics management in cement companies in Bangladesh, thematic analysis is deemed most suitable.

The thematic analysis allows for a comprehensive exploration of the data collected from interviews with stakeholders in cement companies. It enables the identification and analysis of key themes and patterns related to circular supply chain practices and sustainable logistics management (Braun & Clarke, 2012). By using this approach, the study aims to gain a deeper under-

standing of the challenges and opportunities associated with implementing circular supply chain practices in the cement industry in Bangladesh.

Through thematic analysis, the researcher can identify recurring themes related to sustainable logistics management, such as waste reduction, energy efficiency, and reverse logistics. Additionally, it facilitates the examination of factors influencing the adoption and implementation of circular supply chain practices, including technological advancements, regulatory frameworks, and stakeholder collaboration (Braun & Clarke, 2012). By analyzing the qualitative data systematically and rigorously, the study aims to generate valuable insights and practical recommendations for cement companies in Bangladesh to enhance their circular supply chain practices and achieve sustainable logistics management.

Overall, thematic analysis aligns with the research objective of exploring circular supply chain sustainable logistics management in cement companies in Bangladesh. It offers a robust approach to analyzing the qualitative data collected from interviews, thereby contributing to a comprehensive understanding of the topic and addressing the research questions of the study.

4.2 Thematic analysis

The thematic analysis first step is to become familiar with the data by reading and rereading the interview transcripts. This helps in gaining a comprehensive understanding of the information gathered. The next step is coding, where the data is divided into meaningful segments and assigned codes (Meyer, 2001; Kvale, 2007). In this study, codes were assigned to text passages that were relevant to the research topic, such as those discussing the challenges and opportunities in implementing circular supply chain sustainable logistics management in cement companies.

Once coding is complete, the categories are developed by organizing and grouping similar codes. The categories are then further refined to form themes. These themes represent the underlying patterns and concepts within the data. The themes are identified and given names that accurately capture their content and meaning.

Themes	Categories	Codes
Understanding circular supply chain practices be facilitated by the Supply chain management (Vlachos & Dyra, 2020; & Daneshjo & Kravec, 2015).	Benefits of stronger collaborations, Challenges of supply & production function	• Circular supply chain practices • Waste reduction, recycling, financial impact, collaboration, regulatory compliance, technology, consumer demand.
To find out circular supply chain practices for enhancing sustainability (Horbach et al., 2011; & Ghisellini et al., 2016).	Planning of Repurposing & Renovation	• Circular supply chain practices • Role of partnerships and collaboration • Measurement of environmental impact • Influence of regulatory frameworks • Economic benefits • Innovative technologies
To evaluate the implementation circular supply chain from Supply chain management (Gebreyesus, 2016; Kirchherr et al., 2017).	Collaboration and Partnerships in implementing circular supply chain	• Implementation to raw material sections • Supporting Statement of Employees • Adequacy of support statement • Changes in Circular supply chain
To measure the barriers and overcome strategies of circular supply chain for sustainability (Boons et al., 2013; Bocken et al., 2016; & Ghisellini et al., 2016).	Limited collaborations are less Flow of good within the companies	• Long term implications • Recommendations for Employees • Recommendations for Cement Companies

Table 2: Thematic Analysis of Interview (Self-Elaborations)

The thematic analysis offers several advantages in this study. It allows for a thorough exploration and in-depth assessment of the collected data from professionals working in the supply chain management and logistics departments of cement companies in Bangladesh. By identifying common patterns and themes across the dataset, thematic analysis helps in gaining insights into the challenges and opportunities in implementing circular supply chain sustainable logistics management in the cement industry (Self-Elaborations).

However, it is important to note that thematic analysis is a subjective process, and the themes identified may be influenced by the researcher's own biases and assumptions (Braun & Clarke, 2012). The thematic analysis was employed in this study on circular supply chain sustainable logistics management in cement companies in Bangladesh to analyze the qualitative interview

data from professionals in the supply chain management and logistics departments. This approach facilitated a comprehensive understanding of the research topic and provided valuable insights into the challenges and opportunities in implementing sustainable logistics practices in the cement industry.

4.3 Interview Guide

During the interview, the interviewer frequently refers to an interview guide, which comprises a list of questions and subjects to be discussed. It is used as a reference tool but is not always adhered to. According to Gammelgaard and Flint (2012), deviating from the manual is encouraged, and additional inquiries based on unexpected but pertinent subjects are permitted.

As the interview's major subject, the participants must be questioned regarding their personal experiences. To ease the participants into the interview, start with straightforward, factual questions (Gammelgaard & Flint, 2012). But it's vital to refrain from becoming too intimate because that can make the participants feel uncomfortable.

A critical component of the interview process is timing. The fluency and level of competence of the participants influence the length of the interviews in this study. As a result, it's crucial to give the most pressing questions a top priority.

4.4 Population and Sample Size

In this study on circular supply chain sustainable logistics management in cement companies in Bangladesh, the interviews were conducted with seven professionals from the supply chain management and logistics departments of several cement companies.

The sample for this study was drawn through purposeful sampling, specifically targeting professionals working in the supply chain management and logistics departments of cement companies in Bangladesh. These individuals formed the population under examination, representing the context of the research topic.

Determining the sample size in qualitative research does not follow a standard formula (Gammelgaard & Flint, 2012). However, based on the research objectives and available resources, a

sample size of seven professionals was considered appropriate for this study. The selection of respondents was carried out by the researcher, ensuring representation from various cement companies in Bangladesh to gather diverse perspectives on circular supply chain sustainable logistics management.

During the interviews, attention was given to the participants' levels of fluency and knowledge, adjusting the length and focus of the discussions accordingly. An interview guide was utilized as a reference tool, containing a list of relevant questions and research topics related to circular supply chain sustainable logistics management in cement companies.

The interview sessions typically lasted max 30 minutes, ensuring a balance between gathering comprehensive insights and respecting the participants' time. The questions posed to the participants aimed to explore their experiences and perspectives regarding the challenges and opportunities associated with implementing circular supply chain sustainable logistics management in cement companies (Gammelgaard & Flint, 2012).

Overall, this research aimed to investigate and understand the current state of circular supply chain sustainable logistics management in the context of cement companies in Bangladesh. The insights gained from the interviews were analyzed using thematic analysis to identify key themes and patterns relevant to the research topic.

4.5 Interview Transcriptions

Due to the author's inability to travel abroad for this study, the interviews were performed via online audio-conferencing technology (Microsoft teams). The duration of each interview was max. 30 minutes, and all replies (participants) gave their permission before the interviews were recorded. The participants were given numerical pseudonyms to protect their anonymity, and information regarding them and their workplaces was suppressed. Accurate transcription of the interview data is one of the most important jobs before data analysis, according to Kvale and Flick (2009). Even though there are no internationally recognized standards for transcription, it must be done properly to address many challenging features, like transferring spoken words into written form. The last step is data analysis, which comes after transcription (Meyer, 2001; Kvale, 2007). The max 30-minute interview sessions were conducted following the thesis subject, and theme analysis was used to examine the transcribed data.

4.6 Respondents

The respondents in this thesis topic on circular supply chain sustainable logistics management in cement companies in Bangladesh were professionals from the supply chain management and logistics departments of several cement companies (Mentzer et al., 2001). These individuals were selected purposefully to represent the population under examination.

The sample consisted of seven respondents who were actively involved in the day-to-day operations and decision-making processes related to supply chain management and logistics in the cement industry. They were chosen based on their expertise and experience in managing the logistics aspects of cement production, distribution, and transportation (Mentzer et al., 2001).

The respondents possessed in-depth knowledge and insights into the challenges and opportunities associated with implementing sustainable logistics practices within the context of circular supply chains. Their roles involved coordinating and optimizing the movement of raw materials, intermediate products and finished cement goods throughout the supply chain (Mentzer et al., 2001).

As professionals in the field, they were well-positioned to provide valuable perspectives on the current practices, barriers, and potential strategies for improving sustainability and efficiency in the logistics management of cement companies in Bangladesh (Lee & Fernando, 2015).

The inclusion of respondents from various cement companies ensured a diverse range of perspectives and experiences, enriching the qualitative data collected for the study. Their insights and experiences were crucial in understanding the specific dynamics and challenges of implementing circular supply chain sustainable logistics management within the cement industry in Bangladesh.

By gathering information and viewpoints from these respondents, the study aimed to gain a comprehensive understanding of the current state of sustainable logistics practices in cement companies and identify strategies to enhance sustainability and reduce environmental impacts within the circular supply chain framework.

Respondent	Gender	Country	Industry	Durations	Department
1	Female	Bangladesh	Cement	25 Minutes	Supply Chain
2	Male	Bangladesh	Cement	27 Minutes	Supply Chain
3	Female	Bangladesh	Cement	30 Minutes	Supply Chain
4	Male	Bangladesh	Cement	26 Minutes	Supply Chain
5	Male	Bangladesh	Cement	29 Minutes	Logistics
6	Female	Bangladesh	Cement	25 Minutes	Logistics
7	Male	Bangladesh	Cement	26 Minutes	Logistics

Table 3: Interview Respondents (Self-Oriented)

The above table is showing the interview consisted of seven respondents who were actively involved in the everyday research processes and research decision-making processes linked to supply chain management and logistics in the cement industry. They were selected based on their knowledge and involvement in working the logistics characteristics of cement production, delivery, and transference (Mentzer et al., 2001.) The respondents influenced considered information and visions into the challenges and opportunities related with executing sustainable logistics observes within the framework of circular supply chains. They are involved in organizing and improving the movement of raw materials, intermediate products, and finished cement belongings throughout the supply chain.

5 Discussion of findings

This study presents the findings of a thematic analysis conducted to explore the integration of circular supply chain practices into logistics management for enhanced sustainability and reduced environmental impacts in cement companies in Bangladesh. The analysis provides insights into the adoption of reverse logistics, the importance of collaboration and partnerships, as well as the barriers, challenges, and strategies associated with implementing circular supply chain sustainable logistics management. The results highlight the significance of optimizing resource utilization, overcoming technological, economic, and regulatory challenges, and implementing strategies such as investment in technology, collaboration, and knowledge sharing. These findings offer valuable guidance for policymakers, industry practitioners, and other stakeholders seeking to promote sustainable practices and drive the transition towards a more circular and environmentally responsible supply chain in the cement industry. Furthermore, suggestions for future research are provided to encourage further exploration of the identified strategies and their effectiveness in real-world settings, as well as potential applications in other industries and contexts.

5.1 Findings of Results & Interpretation

In the cement industry of Bangladesh, the supply chain collaborations as a facilitator of Circular supply chain with logistics management. There has been a thematic demonstration of the Circular supply chain management that aims to minimize waste and reduce the social, environmental, financial impact of the supply chain by reusing recycling, or repurposing materials and products. The theme is based on the 7 respondents of the circular economy which highlights recovering and uplifting circular supply chain systems. There are numerous theses on supply chain management and its collaborations. But this thesis on supply chain collaborations as a facilitator of Circular supply chain with logistics management isn’t done before or related to any existing theses in context of Bangladesh Market.

The most important theme is to “find out Circular supply chain practices for enhancing sustainability”. The theme was agreed and respondent by the 3 people for the best-suited research support. The idea suggests moving the circular supply chain condition better by reducing waste & by reusing recycling, or repurposing materials and products.

In the 3rd most mentioned theme is about the "implementation circular supply chain from Supply chain management". Here, seven of the respondents mentioned planning properly the products before production. Their statement was about sometimes it can't make enough resources but at that time they can adapt the fostering collaboration and partnership and enhancing the SLM more. By implementing strategies such as investment in technology, collaboration, and knowledge sharing, cement companies can overcome these challenges and transition towards more sustainable and circular supply chain models.

The research is also revealed other recurring themes and questions advantages and disadvantages as short term and long-term impact in the cement industry. In terms of supply chain management, the last theme 1 respondent made up a response about circular supply chain is an application of Supply chain management where the flow of goods and materials within company maintain mostly by the supply chain. Here, circular supply chain can be used the overcome strategy from the barriers by using the SLM long term implications in the cement companies.

In last overall, the results standing and demonstrate that the integration of circular supply chain practices into logistics management can enhance sustainability and reduce environmental impacts in cement companies in Bangladesh. The thematic analysis highlights the importance of circular supply chain is facilitating by the supply chain management because of the logistics collaboration and partnerships, while also acknowledging the challenges related to technology, economics, and regulations.

1. How circular supply chain practices be facilitated by the Supply chain management

According to respondent 03,

"…to some extent, I think supply has the vast amount practical context like planning, sourcing, manufacturing, delivery and returns. Each of this context is supporting Circular supply chain is about recycling and reusing concern so that the waste management is controlled by the cement industry. In Cement companies, the most recyclable product is Cement bags. So, Cement companies can establish logistics processes, companies can manage product returns, promote recycling initiatives, and reduce the overall environmental impact of their operations".

The interviewers revealed the adoption of stronger collaborations. The reason was mentioned so that products like Cement bags logistics processes, companies can manage product returns, promote recycling initiatives, and reduce the overall environmental impact of their operations.it is a crucial aspect of facilitating the circular supply chain by the logistic performs but it will be

the efficient systems for collecting and processing used cement products, recycling materials, and minimizing waste generation by *SLM practices in terms of Sourcing & Returns*.

2. How circular supply chain practices helped for enhancing sustainability

According to respondents 06,

"…..between various SLM Elements, the circular supply chain practices are getting in support by the SLM practices in terms of Planning and regenerating. SLM is keeping raw materials used after the product life cycle where circular supply chain getting involved to reduces toxicity from products and making the effective end of life resources management. In this way, the products are available for reusable and recycle process for enhancing the sustainability in the future".

The interviewer's response showed the importance of Planning of Repurposing & Renovated in circular supply chain for enhancing the sustainability controlling. In Cement companies, it can engage of planning with suppliers, distributors, and customers to optimize their supply chain operations. By development plan of Repurposing & Renovated, Cement companies can share resources, knowledge, and best practices, leading to more sustainable logistics management practices. This plan can also help address resource optimization, waste reduction, and the development of innovative solutions.

3. In what way the implementation of circular supply chain from Supply chain management?

According to respondent 2,

"…..several implementation processes. I think the implementation can be possible by using the supply chain management aspect in the circular supply chain. I can assume the implementation ways like reduce costs and expenses in product raw materials, reduce toxicity, use design in products by measuring the reusability".

The interviewer has responded in this theme by drawing the common supply chain management practices. The respondent focused on the changes on supply chain management as an alternative in product design, processes, logistics, and systematic change on materials. The cement company employees believe that the product design needs to be suitable. It can reduce costs and make the products' external materials reusable.

4. What are the possible barriers and overcoming strategies of circular supply chain for sustainability?

According to Respondent 1,

"…. Barrier for limited collaborations and coordination's and overcome strategies value propositions to stakeholder for collaborations. The employee promotes by giving the response on collaborations are among more stakeholders".

The interviewer showed response on this theme by making and discussion on collaborate with technology providers, industry associations, and government agencies to explore funding opportunities and supportive policies. Additionally, companies can engage in knowledge-sharing and capacity-building initiatives to enhance their understanding of circular supply chain concepts and develop the necessary skills and competencies. To overcome the barrier, the interviewer suggested offering more value propositions to stakeholder so that other cement or other industry based companies can focus on the align with circular supply chain principles.

5.2 Discussion of thematic analysis

The findings and results of the thematic analysis on the topic of circular supply chain sustainable logistics management in cement companies in Bangladesh revealed several important insights.

Theme-1: Understanding circular supply chain practices are facilitated by the Supply chain management.

The very first insight to understand the circular supply chain practices are facilitated by the Supply chain management. This CSCM is facilitating by the SLM regulatory body as like valuable guidance for policymakers, industry experts, and other stakeholders to promote to control the waste management and drive the transition towards a more circular and environmentally responsible supply chain in the cement sector.

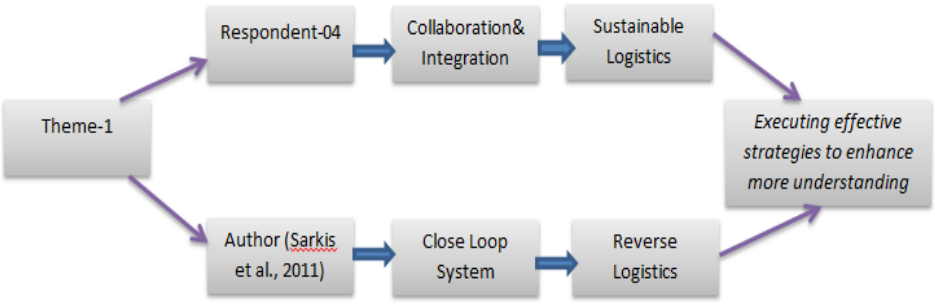

Figure 3 CSCM practices are facilitated by the SCM (Respondent-04 & Sarkis et al., 2011).

According to Respondent 04,

"…emphasize the importance of adopting circular supply chain practices, understanding SLM more deeply, and executing effective strategies to enhance sustainability and reduce environmental impacts in the logistics management of cement companies in Bangladesh".

Firstly, in terms of integrating circular supply chain getting the facilitating by using the supply chain management practices along with logistics management to enhance sustainability and reduce environmental impacts, the analysis highlighted the significance of optimizing resource utilization. This includes efficient inventory management, waste reduction and recycling, and the implementation of reverse logistics to facilitate the return and reuse of materials. By effectively managing resources throughout the supply chain, cement companies can minimize waste, conserve resources, and reduce their environmental footprint.

According to Sarkis et al. (2011), by integrating circular principles into supply chain management practices, organizations can enhance their sustainability performance, reduce waste generation, improve resource efficiency, and create a more resilient and environmentally friendly supply chain. This approach is almost close statement with this respondent 04. Supply chain management plays a crucial role in facilitating and implementing circular supply chain practices. Supply chain management encompasses the coordination and optimization of various activities involved in the flow of goods, services, information, and resources from suppliers to end consumers (Sarkis et al., 2011.) It involves the integration of processes, functions, and stakeholders across the entire supply chain network.

Theme-2: To find out circular supply chain practices for enhancing sustainability.

The result of this theme is about the circular supply chain practices for enhancing sustainability. The very first companies need to get the importance of Planning of Repurposing & Renovated in circular supply chain for enhancing the sustainability controlling. In Cement companies, it can engage of planning with suppliers, distributors, and customers to optimize their supply chain operations.

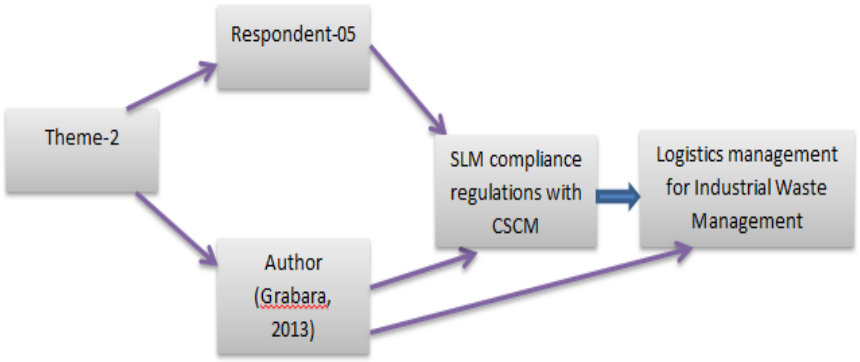

Figure 4 CSCM Sustainability (Respondent-05 & Grabara, 2013).

According to Respondent 5,

"….circular supply chain can practice the logistics management for the sustainability. This practice is encompassed industrial limitations such as the need for advanced products tracking and products traceability systems, as well as cost-effective considerations, such as the initial investment required for infrastructure and technology upgrades".

Because of the enhancing the sustainability to CSCM in terms of SLM compliance with environmental regulations, and the need for stakeholder collaboration were also identified as responsibilities & tasks.

A study conducted by Grabara (2013), author give emphasis to the circular supply chain can practice the logistics management for the sustainability for businesses. These sustainable logistics practices led to cost savings and operational efficiencies, resulting in lower logistics costs. By improving products tracking and products traceability systems, it helps to minimize the cost as for cost effective consideration and minimize waste generation. The author Grabara found in addition to the financial benefits, companies also achieved higher levels of customer satisfaction by demonstrating their commitment to sustainability.

Theme-3: To evaluate the implementation circular supply chain from Supply chain management

In this theme, the result is showing proactive measures about the implementation circular supply chain from Supply chain management. The cement companies can be adopting innovative technologies, exploring partnerships with suppliers and customers, and engaging with regulatory authorities to advocate for supportive policies.

According to respondents 7,

".....several implementation ways can be used by Cement companies when implementing circular supply chain sustainable logistics management. These implementation ways include technological constraints, economic considerations, and regulatory factors. Instead of disposing of used products or components, remanufacturing involves restoring them to a like-new condition. This process reduces the need for extracting new raw materials and decreases energy consumption. Remanufactured products can be sold or used as replacement parts. Technological challenges may involve the need for advanced tracking systems, data analytics, and automation to optimize supply chain processes. I think implementation way considerations may include the costs associated with implementing sustainable practices and the potential need for investment in new technologies or infrastructure. I think there is another implementation way that is regulatory factors can include compliance with environmental regulations and policies related to waste management and emissions reduction".

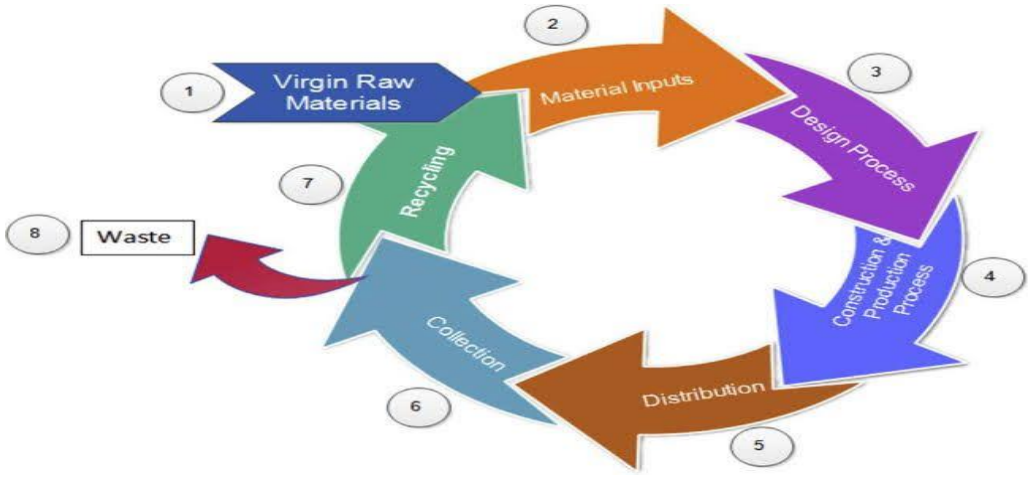

Figure 5 Implementation CSCM from SCM (Respondent 7 & Ellen MacArthur Foundation, n.d.)

The Circular supply chains that are aiming to make best use of resource efficiency and minimize waste by promoting the reuse, recycling, and regeneration of materials, can play a significant role in achieving sustainability goals. The implementation efficient systems are for the collection, sorting, used products, components, and packaging materials back into the supply chain. This involves activities such as product take-back programs, recycling initiatives, and remanufacturing processes.

According to *Ellen MacArthur Foundation (n.d.)* article, there has been a demonstration for the Circular supply chain management that aims to minimize waste and reduce the environmental impact of the supply chain by reusing, recycling, or repurposing materials and products. This approach is almost close statement with this respondent by saying of the principles of the circular economy which prioritizes regenerative and restorative economic systems. In the overall judgments by *respondent 07 & Ellen MacArthur Foundation*, it is about going to agree with this article approach for the best suited research support. The reason is that author thinks using this approach is helping moving the economy condition better and reduces the waste by reusing, recycling, or repurposing materials and products.

Theme-4: To measure the barriers and overcome strategies of circular supply chain for sustainability

According to Respondent 06,

"….revealed several strategies are that can be employed to overcome the identified barriers and challenges. These strategies include investing in sustainable infrastructure and technologies, fostering collaboration and knowledge sharing among supply chain stakeholders, and promoting sustainability-oriented training and education….."

On the other hand, there are several barriers that organizations may face when implementing circular supply chain practices. For overcoming from those barriers, the circular supply chain as facilitator required to bring the awareness by campaigns, education, and training programs to familiarize stakeholders with circular economy principles and demonstrate the value of adopting circular practices. Additionally, adopting circular supply chain principles and practices, such as product life extension, remanufacturing, and closed-loop systems, can significantly contribute to achieving a more sustainable and circular supply chain in the cement industry.

6 Conclusion, Limitations, and Recommendations

Lastly, this study explored the concept of circular supply chain sustainable logistics management in cement companies in Bangladesh. Through thematic analysis of the data, valuable insights and findings were obtained regarding the integration of circular practices, the barriers and challenges faced, and the strategies that can be employed to enhance sustainability and reduce environmental impacts.

6.1 Conclusion

In the entire thesis research, there are several suggested practical approaches and plans mentioned to obtain supply chain management as a facilitator of the circular supply chain. Supply chain management can help by its different dimensions to control the circular supply chain processes, maintenance program, and technical arrangement. There can be future research made on “Supply chain management is an application/tool/tackle-kit to the circular supply chain management”.

The preliminary question shows circular supply chain practices be integrated into logistics management to enhance sustainability and reduce environmental impacts. The analysis highlighted the importance of optimizing resource utilization and implementing efficient inventory management, waste reduction, and reverse logistics practices. These actions can significantly contribute to minimizing waste generation, conserving resources, and reducing the environmental footprint of cement companies and enhance sustainability of cement companies.

The supplementary first question shows “specific barriers and challenges faced by cement companies in Bangladesh when implementing circular supply chain practices for sustainable logistics management’. However, there are various barriers and challenges in implementing circular supply chain sustainable logistics management such as technological limitations, economic considerations, and regulatory factors.

The supplementary second question shows “overcome these barriers and challenges to successfully integrate circular supply chain practices into logistics management in cement companies of Bangladesh”. The overcoming strategies from these challenges require proactive measures such

as investing in sustainable infrastructure and technologies, fostering collaboration among stakeholders, and advocating for supportive policies.

The findings of this study provide valuable insights for cement companies, policymakers, and industry practitioners to drive the transition toward a more sustainable and circular supply chain model. By adopting the identified strategies, cement companies can enhance their environmental performance, achieve cost savings, and contribute to the overall sustainability goals of the industry.

It is important to acknowledge the gaps of this study. The research was conducted with a limited sample size and focused on cement companies in Bangladesh. Therefore, the generalizability of the findings to other industries and regions may vary. Future research could expand the scope by including a larger sample size and considering different contexts to further explore and extend the findings.

Lastly, this study contributes to the growing body of knowledge on circular supply chain sustainable logistics management. The insights gained from this research provide a foundation for sustainable practices in the cement industry and pave the way for future research and practical initiatives aimed at creating a more sustainable and circular supply chain in Bangladesh and beyond. By embracing circularity and sustainability principles, cement companies can make significant strides toward a greener and more environmentally responsible future.

6.2 Limitations

The study conducted on the topic of circular supply chain sustainable logistics management in cement companies in Bangladesh has provided valuable insights and findings. However, it is important to acknowledge the limitations of this research:

Firstly, the sample size of the study was limited, consisting of a specific number of respondents from selected cement companies. This restricted sample may not fully capture the diversity and complexities present in the entire cement industry in Bangladesh. Therefore, caution should be exercised when attempting to generalize the findings to the entire industry.

Secondly, the geographic scope of the research was focused solely on cement companies in Bangladesh. The findings may be influenced by the unique characteristics and contextual factors

of the country, including regulatory frameworks, market conditions, and infrastructure. As a result, the generalizability of the findings to other geographical regions may be limited.

The research gap identified in the thesis topic of circular supply chain and sustainable logistics management in Bangladeshi cement companies is the limited understanding of the specific challenges and opportunities faced by the cement industry in implementing circular supply chain practices and achieving sustainable logistics management.

While there is growing recognition of the importance of circular economy principles and sustainable practices in various industries, there is a lack of research focused specifically on the cement industry in Bangladesh (Boons et al., 2013). The unique characteristics and complexities of the cement sector, such as its resource-intensive nature, supply chain dynamics, and environmental impact, require tailored approaches to achieve circularity and sustainability.

The existing literature on circular supply chains and sustainable logistics management primarily focuses on broader conceptual frameworks and case studies from other industries, such as manufacturing or consumer goods. However, the cement industry has its own set of challenges and opportunities that necessitate a more context-specific understanding.

Resolution Strategy:

To address the research gap, the thesis undertook a qualitative research design, utilizing semi-structured interviews with individuals working in the supply chain management and logistics departments of selected cement manufacturing companies in Bangladesh (Daneshjo & Kravec, 2015). By directly engaging with industry professionals and stakeholders, the study aimed to gain insights into the unique challenges faced by the cement industry in adopting circular supply chain practices and achieving sustainable logistics management.

The research approach also allowed for an exploration of the perspectives and experiences of these professionals, providing valuable qualitative data to identify key factors influencing circularity and sustainability in the industry. By utilizing thematic analysis, the study aimed to uncover patterns, themes, and insights that could inform strategies and practices for cement companies to enhance their circular supply chain and sustainable logistics management efforts.

Future Work:

While this thesis contributes to filling the research gap in the context of circular supply chain and sustainable logistics management in Bangladeshi cement companies, there are opportunities for future research to expand on this topic. Some potential areas for further investigation include:

Quantitative research: Future studies could employ quantitative research methods to gather empirical data and conduct statistical analyses to validate and generalize the findings from this qualitative study (Clarke, 2012). This could involve interviews or quantitative assessments of the environmental and economic impacts of circular supply chain practices in the cement industry.

Comparative analysis: A comparative analysis could be conducted to explore the differences and similarities in circular supply chain and sustainable logistics management practices across different industries within Bangladesh or across different countries. This could provide insights into industry-specific challenges and best practices.

Longitudinal studies: Longitudinal studies tracking the progress of cement companies in implementing circular supply chain practices and sustainable logistics management over time could shed light on the effectiveness and challenges of these initiatives. This could also identify barriers and success factors that emerge during the implementation journey.

Furthermore, the data collection method employed in the study relied primarily on qualitative data obtained through interviews. While this approach allowed for in-depth exploration of the research topic, it also has inherent limitations. The subjective nature of qualitative data and the potential for researcher bias may have influenced the findings. Therefore, the interpretation and generalizability of the results should be approached with caution. Overall, by addressing the research gap and providing valuable insights into circular supply chains and sustainable logistics management in Bangladeshi cement companies, this thesis sets the stage for future research to further explore and advance sustainable practices in the cement industry.

Future research in this area could focus on evaluating the actual implementation and effectiveness of the identified strategies in real-world settings. Additionally, conducting comparative studies across different cement companies in Bangladesh or exploring the applicability of the findings in other industries and contexts could further enhance our understanding of circular supply chain sustainable logistics management. Moreover, investigating the role of digital tech-

nologies, such as block chain and artificial intelligence, in facilitating circularity and sustainability in supply chains would be a promising avenue for future research.

Despite these limitations, the study provides valuable insights into the challenges and opportunities in implementing circular supply chain sustainable logistics management in cement companies in Bangladesh. Future research should aim to address these limitations by expanding the sample size, considering a broader geographic scope, and utilizing a mix of qualitative and quantitative data collection methods.

6.3 Recommendations

Based on the findings and conclusions of the study on circular supply chain sustainable logistics management in cement companies in Bangladesh, the following recommendations can be made:

According to the aims to reduce waste and promote sustainability by closing the loop on the product lifecycle, Cement companies should focus on establishing and emphasizing product design that allows for easy disassembly, repair, and recycling. For reusing the materials cement companies can use materials recyclable, renewable, or decomposable. Moreover, cement companies can consider incorporating concepts like frame-to-frame design and extended producer responsibility so that materials are found resourceful systems for collecting, restoring, and remanufacturing products at the end of their lifecycle. On the other side, cement companies can implement recycling and reusing materials as processes for exact opposite logistics as well as product take-back packages, recycling edges, and waste reduction schemes.

For this thesis's aim and objectives, the findings are in terms of fostering collaboration with suppliers, customers, and other stakeholders to develop shared sustainability goals. Engage suppliers that align with circular economy principles and encourage them to adopt sustainable practices. Establish partnerships for resource sharing, such as sharing transportation or storage facilities.

Enhance collaboration and partnerships: Cement companies should focus on establishing strong collaborations and partnerships with key stakeholders such as suppliers, customers, and regulatory bodies. By working together, they can develop a coordinated and integrated approach to

circular supply chain management. This collaboration will facilitate the sharing of knowledge, resources, and best practices, ultimately leading to improved sustainability and efficiency in logistics operations.

Invest in technology and innovation: Cement companies should prioritize investment in advanced technologies and innovative solutions that can support sustainable logistics management. This includes adopting digital platforms for supply chain visibility, implementing automation and robotics for improved efficiency, and exploring renewable energy sources to reduce environmental impacts. Embracing technological advancements will enable companies to optimize their operations and minimize waste generation throughout the supply chain.

Promote employee training and awareness: Cement companies must invest in employee training and awareness programs to ensure a smooth transition to circular supply chain practices. Employees at all levels should be educated about the importance of sustainability and provided with the necessary knowledge and skills to implement sustainable logistics strategies. Training programs can cover topics such as waste reduction, recycling, energy efficiency, and green transportation options.

Collaborate with regulatory bodies: Cement companies should actively engage with regulatory bodies and participate in discussions and initiatives related to sustainability and circular economy practices. By aligning their operations with regulatory requirements and industry standards, companies can demonstrate their commitment to sustainable logistics management and contribute to the overall development of the industry.

Monitor and evaluate performance: Cement companies should establish robust monitoring and evaluation systems to track their progress in implementing circular supply chain practices. Key performance indicators (KPIs) should be defined and regularly measured to assess the effectiveness of sustainability initiatives. This data can then be used to identify areas for improvement and guide future decision-making processes.

Continued research and knowledge sharing: The study highlights the need for continued research on circular supply chain sustainable logistics management in the cement industry. Further studies can explore specific challenges and opportunities, evaluate the long-term impacts of implemented strategies, and identify emerging trends and best practices. Sharing knowledge and experiences through industry conferences, publications, and collaborative platforms will foster a culture of learning and enable the industry to collectively drive toward a more sustainable future.

Overall, by implementing these recommendations, cement companies in Bangladesh can make significant progress towards achieving circular supply chain sustainable logistics management. These measures will not only enhance their environmental performance but also contribute to the overall social and economic sustainability of the industry.

7 Reference

Advanced Solutions International, Inc. (n.d.). *SCM Definitions and Glossary of Terms*. CSCMP. Retrieved from https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx

Aloini, D., Dulmin, R., Mininno, V., & Ponticelli, S. (2015). *Key antecedents and practices for Supply Chain Management Adoption in project contexts.* International Journal of Project Management, 33(6), 1301–1316. https://doi.org/10.1016/j.ijproman.2015.03.013

Amiri, M. S., Hashemi-Tabatabaei, M., Ghahremanloo, M., Keshavarz-Ghorabaee, M., Zavadskas, E. K., & Salimi-Zavieh, S. G. (2022). Evaluating barriers and challenges of circular supply chains using a decision-making model based on rough sets. International Journal of Environmental Science and Technology, 19(8), 7275–7296. https://doi.org/10.1007/s13762-021-03899-7

Asgari, B., & Hoque , M. A. (2017). *A System Dynamics Approach to Supply Chain Performance Analysis of the Ready-Made-Garment Industry in Bangladesh*. https://doi.org/https://www.researchgate.net/publication/321361831_A_system_dynamics_approach_to_supply_chain_performance_analysis_of_the_ready-made-garment_industry_in_Bangladesh

Bangladesh Cement Manufacturers Association (BCMA). (n.d.). *Cement Industry: Bangladesh cement manufacturers association (BCMA)*. Cement Industry | Bangladesh Cement Manufacturers Association (BCMA). http://www.bcma.com.bd/cement-industry

Bocken, N., De Pauw, I., Bakker, C., & Van Der Grinten, B. (2016). *Product design and business model strategies for a circular economy.* Journal of Industrial and Production Engineering, 33(5), 308–320. https://doi.org/10.1080/21681015.2016.1172124

Boons, F., & Lüdeke-Freund, F. (2013). *Business models for sustainable innovation: state-of-the-art and steps towards a research agenda.* Journal of Cleaner Production, 45, 9–19. https://doi.org/10.1016/j.jclepro.2012.07.007

Brandenburg, M., Govindan, K., Sarkis, J., & Seuring, S. (2014). *Quantitative models for Sustainable Supply Chain Management: Developments and directions.* European Journal of Operational Research, 233(2), 299–312. https://doi.org/10.1016/j.ejor.2013.09.032

Braun, V. & Clarke, V. (2012) Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds), APA handbook of research methods in psychology, Vol. 2: Research designs: Quantitative, qualitative, neuropsychological, and biological (pp. 57-71). Washington, DC: American Psychological Association.

Braun, V., & Clarke, V. (2012). *Thematic analysis*. ResearchGate. https://www.researchgate.net/publication/269930410_Thematic_analysis

Brockhaus, S., Kersten, W., & Knemeyer, A. M. (2013). *Where Do We Go From Here? Progressing Sustainability Implementation Efforts Across Supply Chains.* Journal of Business Logistics, 34(2), 167–182. https://doi.org/10.1111/jbl.12017

Butt, A. S., Ali, I., & Govindan, K. (2023). *The role of reverse logistics in a circular economy for achieving sustainable development goals: a multiple case study of retail firms*. Production Planning & Control, 1–13. https://doi.org/10.1080/09537287.2023.2197851

Campbell, S., Greenwood, M., Prior, S. L., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). *Purposive sampling: complex or simple? Research case examples*. Journal of Research in Nursing, 25(8), 652–661. https://doi.org/10.1177/1744987120927206

Chen, D. (2009). *Innovation of Tourism Supply Chain Management.* 2009 International Conference on Management of E-Commerce and e-Government. https://doi.org/10.1109/icmecg.2009.79

Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1997). *Supply Chain Management: More than a new name for Logistics.* The International Journal of Logistics Management, 8(1), 1–14. https://doi.org/10.1108/09574099710805556

Daneshjo, N., & Kravec, M. (2015). *PERSPECTIVES ON SUPPLY CHAIN MANAGEMENT*. INTERNATIONAL JOURNAL OF INTERDISCIPLINARITY IN THEORY AND PRACTICE ITPB - NR.: 6, YEAR: 2015 – (ISSN 2344 - 2409). https://doi.org/https://www.researchgate.net/publication/276271196_PERSPECTIVES_ON_SUPPLY_CHAIN_MANAGEMENT

De Almeida, M. M. K., Marins, F. a. S., Salgado, A. M. P., Santos, F. a. M., & Da Silva, S. G. (2017). *The importance of trust and collaboration between companies to mitigate the bullwhip effect in supply chain management*. Journal of SCM, 39(2), 201. https://doi.org/10.4025/actascitechnol.v39i2.29648

Dey, A., LaGuardia, P., & Srinivasan, M. (2011). *Building Sustainability in Logistics Operations: A research agenda.* Management Research Review, 34(11), 1237–1259. https://doi.org/10.1108/01409171111178774

Di Maria, E., De Marchi, V., & Galeazzo, A. (2022). *Industry 4.0 technologies and circular economy: The mediating role of supply chain integration.* Industry 4.0, 31(2), 619–632. https://doi.org/10.1002/bse.2940

Dubey, R., Gunasekaran, A., Papadopoulos, T., Childe, S. J., Shibin, K. T., & Wamba, S. F. (2017). *Sustainable Supply Chain Management: Framework and further research directions*. Journal of Cleaner Production, 142, 1119–1130. https://doi.org/10.1016/j.jclepro.2016.03.117

ELLEN MACARTHUR FOUNDATION. (n.d.). *The circular economy in detail. How to Build a Circular Economy*. https://ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive Amazon. (2023). *Transportation*. Sustainability (US). https://sustainability.aboutamazon.com/environment/transportation Van Boerdonk, P., Krikke,

Esfahbodi, A., Zhang, Y., Watson, G. and Zhang, T. (2017), *"Governance pressures and performance outcomes of sustainable supply chain management – an empirical analysis of UK manufacturing industry".* Journal of Cleaner Production, Vol. 155 No. 2, pp. 66-78.

Evangelista, P., Colicchia, C., & Creazza, A. (2017). *Is environmental sustainability a strategic priority for logistics service providers?* Journal of Environmental Management, 198, 353–362. https://doi.org/10.1016/j.jenvman.2017.04.096

Fahimnia, B., Sarkis, J. and Davarzani, H. (2015). *'Green supply chain management: a review and bibliometric analysis.* International Journal of Production Economics, April, Vol. 162, pp.101–114, https://doi.org/10.1016/j.ijpe.2015.01.003.

Farooque, M., Zhang, A., Thürer, M., Qu, T., & Huisingh, D. (2019). *Circular supply chain management: A definition and structured literature review.* Journal of Cleaner Production, 228, 882–900. https://doi.org/10.1016/j.jclepro.2019.04.303

Farooque, M., Zhang, A., Thürer, M., Qu, T., & Huisingh, D. (2019). Circular supply chain management: A definition and structured literature review. Journal of Cleaner Production, 228, 882–900. https://doi.org/10.1016/j.jclepro.2019.04.303

Franco, N. G., Almeida, M. A., & Calili, R. F. (2021). *A strategic measurement framework to monitor and evaluate circularity performance in organizations from a transition per-*

spective. Sustainable Production and Consumption, 27, 1165–1182. https://doi.org/10.1016/j.spc.2021.02.017

Gammelgaard, B., & Flint, D. J. (2012). *Qualitative research in logistics and supply chain management: beyond the justification for using qualitative methods.* International Journal of Physical Distribution & Logistics Management, 42(8/9). https://doi.org/10.1108/ijpdlm.2012.00542haa.001

Gebreyesus, N. (2016). *A Thesis submitted: For Partial Fulfillment of the Requirements for a Master of Arts in Logistics and Supply Chain Management.* http://etd.aau.edu.et/. http://etd.aau.edu.et/bitstream/handle/123456789/6698/Natnael%20gebreyesus.pdf?sequence=1&isAllowed=y

Genovese, A., Acquaye, A., Figueroa, A., & Koh, S. L. (2017). *Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications*. Omega, 66, 344–357. https://doi.org/10.1016/j.omega.2015.05.015

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). *A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems.* Journal of Cleaner Production, 114, 11–32. https://doi.org/10.1016/j.jclepro.2015.09.007

Gong, M., Gao, Y., Koh, L., Sutcliffe, C., & Cullen, J. B. (2019). *The role of customer awareness in promoting firm sustainability and sustainable supply chain management.* International Journal of Production Economics, 217, 88–96. https://doi.org/10.1016/j.ijpe.2019.01.033

Govindan, K., Soleimani, H., & Kannan, D. (2015). *Reverse logistics and closed-loop supply chain: A comprehensive review to explore the future.* European Journal of Operational Research, 240(3), 603–626. https://doi.org/10.1016/j.ejor.2014.07.012

Grabara, J. (2013). SUSTAINABLE LOGISTICS MANAGEMENT. ResearchGate. Retrieved from https://www.researchgate.net/publication/266854152_SUSTAINABLE_LOGISTICS_MANAGEMENT

Gualandris, J., & Kalchschmidt, M. G. M. (2016). *Developing environmental and social performance: the role of suppliers' sustainability and buyer-supplier trust.* International Journal of Production Research, 54(8), 2470–2486. https://doi.org/10.1080/00207543.2015.1106018

Gunasekaran, A., & Irani, Z. (2014). *Sustainable Operations Management: Design, Modeling, and Analysis.* Journal of the Operational Research Society, 65(6), 801–805. https://doi.org/10.1057/jors.2014.26

H., & Lambrechts, W. (2021). *New business models in the circular economy: A multiple case study into touchpoints creating customer values in health care*. Journal of Cleaner Production, 282, 125375. https://doi.org/10.1016/j.jclepro.2020.125375

Haque, M., & Islam, R. (2018). *Impact of supply chain collaboration and knowledge sharing on organizational outcomes in the pharmaceutical industry of Bangladesh*. Journal of Global Operations and Strategic Sourcing, 11(3), 301–320. https://doi.org/10.1108/jgoss-02-2018-0007

Horbach, J., Rammer, C., & Rennings, K. (2011). *Determinants of Eco-innovations by Type of Environmental Impact: The Role of Regulatory Push/Pull, Technology Push and Market Pull*. Social Science Research Network. https://doi.org/10.2139/ssrn.1805765

Hossain, M.U. and Roy, I. (2016). *Supply Chain Management for Sustainable RMG Growth in Bangladesh.* International Journal of Science and Research (IJSR), 5(4), 1242–1248. https://doi.org/10.21275/v5i4.nov162740

IKEA, & Ellen MacArthur Foundation. (2020). *Ikea and Ellen MacArthur Foundation enter a strategic partnership to accelerate the circular economy transition*. https://about.ikea.com/en/newsroom/2020/06/01/ikea-and-ellen-macarthur-foundation-enter-strategic-partnership-to-accelerate-the-circular-economy-transition

Jimo, A., Braziotis, C., Rogers, H., & Pawar, K. S. (2019). *Traditional vs Additive Manufacturing Supply Chain Configurations: A Comparative Study*. Procedia Manufacturing, 39, 765–774. https://doi.org/10.1016/j.promfg.2020.01.432

Katiyar, R., Meena, P.P.L., Barua, M.K., Tibrewala, R. and Kumar, G. (2018) *'Impact of sustainability and manufacturing practices on supply chain performance: findings from an emerging economy'*. International Journal of Production Economics, March, Vol. 197, pp.303–316, https://doi.org/10.1016/j.ijpe.2017.12.007.

Kim, H., & Lee, C. (2018). *The Effects of Customer Perception and Participation in Sustainable Supply Chain Management: A Smartphone Industry Study*. Sustainability, 10(7), 2271. https://doi.org/10.3390/su10072271

Kirchherr, J., Reike, D., & Hekkert, M. P. (2017). *Conceptualizing the circular economy: An analysis of 114 definitions.* Resources Conservation and Recycling, 127, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Klumpp, M. (2018). *How to Achieve Supply Chain Sustainability Efficiently?* Taming the Triple Bottom Line Split Business Cycle. Sustainability, 10(2), 397. https://doi.org/10.3390/su10020397

Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). C*ircular Economy: The Concept and its Limitations*. Ecological Economics, 143, 37–46. https://doi.org/10.1016/j.ecolecon.2017.06.041

Lee, H. K., & Fernando, Y. (2015). *The antecedents and outcomes of the Medical Tourism Supply Chain*. Tourism Management, 46, 148–157. https://doi.org/10.1016/j.tourman.2014.06.014

LightCastle Analytics Wing. (2020, July 26). *Bangladesh cement industry: Optimistic despite challenges.* LightCastle Partners. https://www.lightcastlebd.com/insights/2020/10/bangladesh-cement-industry-optimistic-despite-challenges/

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). *Defining Supply Chain Management*. Journal of Business Logistics, 22(2), 1–25. https://doi.org/10.1002/j.2158-1592.2001.tb00001.x

Mohsin, A. K. M., Tushar, H., Hossain, S. M., Chisty, K. K. S., Iqbal, M., Kamruzzaman, M., & Rahman, S. (2022). *Green logistics and environment, economic growth in the context of the Belt and Road Initiative*. Heliyon, 8(6), e09641. https://doi.org/10.1016/j.heliyon.2022.e09641

Nuruzzaman, M. (2015). *Improving competitiveness in manufacturing-wholesaling-retailing supply chains.* Advances in Business Marketing and Purchasing, 221–457. https://doi.org/10.1108/s1069-096420150000022016

Patagonia. (2020). *Closing the loop - a report on Patagonia's common threads garment recycling program.* Patagonia50. https://www.patagonia.com/stories/closing-the-loop-a-report-on-patagonias-common-threads-garment-recycling-program/story-19961.html

Qaiser, F.H., Ahmed, K., Sykora, M., Choudhary, A. and Simpson, M. (2017) '*Decision support systems for sustainable logistics: a review & bibliometric analysis'*. Industrial Management and Data Systems, Vol. 117, No. 7, pp.1376–1388, DOI: 10.1108/IMDS-09-2016-0410.

Reporter, G. S. (2011, May 26). *InterfaceFLOR - closing the loop in the manufacturing process*. The Guardian. https://www.theguardian.com/sustainable-business/closing-loop-manufacturing-process-reduce-waste

Roblek, V., Meško, M., & Podbregar, I. (2021*). Impact of Car Sharing on Urban Sustainability*. Sustainability, 13(2), 905. https://doi.org/10.3390/su13020905

Sarkis, J., Zhu, Q., & Lai, K. (2011). *An organizational theoretic review of supply chain management literature.* International Journal of Production Economics, 130(1), 1–15. https://doi.org/10.1016/j.ijpe.2010.11.010

Sehnem, S., Jabbour, C. J. C., Pereira, S., & De Sousa Jabbour, A. B. L. (2019). *Improving sustainable supply chains performance through operational excellence: circular economy approach.* Supply Chain Performance, 149, 236–248. https://doi.org/10.1016/j.resconrec.2019.05.021

Shamsuddoha, M. (2015). *Integrated Supply Chain Model for Sustainable Manufacturing: A system dynamics approach.* Advances in Business Marketing and Purchasing, 155–399. https://doi.org/10.1108/s1069-09642015000022b003

Sustainability & Compliance Center. (n.d.). *Do you design products with durability (incl. extended product life, repairability, or upgradability) in mind?* Sustainability & Compliance Center. https://sustainability.ext.hp.com/en/support/solutions/articles/35000064496-do-you-design-products-with-durability-incl-extended-product-life-repairability-or-upgradability-

Tan, H. (2013). Research and Design on B2B E-Commerce Supply Chain Management System. Applied Mechanics and Materials. https://doi.org/10.4028/www.scientific.net/amm.380-384.4771

Tang, C. S., & Zhou, S. (2012). *Research advances in environmentally and socially sustainable operations.* European Journal of Operational Research, 223(3), 585–594. https://doi.org/10.1016/j.ejor.2012.07.030

Vlachos, I., & Dyra, S. C. (2020). *Theorizing coordination, collaboration, and integration in multi-sourcing triads (B3B triads)*. Supply Chain Management: An International Journal, 25(3), 285–300. https://doi.org/10.1108/scm-01-2019-0006

Walmart. (n.d.). *Product Supply Chain Sustainability*. 2022 ESG. https://corporate.walmart.com/esgreport/environmental/product-supply-chains-sustainability-overview

Wang, J., & Dai, J. (2018). *Sustainable Supply Chain Management Practices and Performance.* Industrial Management & Data Systems, 118(1), 2–21. https://doi.org/10.1108/imds-12-2016-0540 Nestlé Global. (2023). *What is Nestlé doing to tackle plastic packaging waste?* Nestlé Global. https://www.nestle.com/ask-nestle/environment/answers/tackling-packaging-waste-plastic-bottles

Werner-Lewandowska, K., & Golinska-Dawson, P. (2021). *Sustainable Logistics Management Maturity—The Theoretical Assessment Framework and Empirical Results from Poland.* Sustainability, 13(9), 5102. https://doi.org/10.3390/su13095102

Wichaisri, S., & Sopadang, A. (2017). *Trends and future directions in sustainable development*. Sustainable Development, 26(1), 1–17. https://doi.org/10.1002/sd.1687

8 Appendices

8.1 Appendices 1 (Interview Questions)

Circular Supply Chain Practices

How does your company define circular supply chain practices?

What motivated your company to adopt circular supply chain practices?

Can you provide any examples of successful circular supply chain initiatives that your company has implemented?

How do you measure the success of your circular supply chain practices, and what metrics do you use to track progress?

How do your circular supply chain practices align with your company's overall sustainability goals and objectives?

How do you measure the environmental impact of your circular supply chain practices, and what tools or methods do you use to track and analyze this impact?

What do you consider to be the key success factors for implementing circular supply chain practices?

Sustainable Logistics Management

Can you describe any challenges your company has faced in adopting sustainable logistics management practices?

How have you addressed those challenges, and what strategies have been effective in overcoming them?

What sustainable logistics management practices do you think have the most significant impact on reducing environmental impact?

What metrics does your company use to measure the success of sustainable logistics management practices?

What role do partnerships and collaboration play in promoting sustainable logistics management practices?

How do you measure the environmental impact of your logistics operations, and what tools or methods do you use to track and analyze this impact?

Challenges and Opportunities:

How do regulatory frameworks influence your company's approach to circular supply chain and sustainable logistics management practices?

What are the potential economic benefits of adopting a circular supply chain and sustainable logistics management practices?

Can you describe any innovative technologies that can support circular supply chains and sustainable logistics management practices?

What role do consumers play in driving companies to adopt circular supply chains and sustainable logistics management practices?

How can circular supply chains and sustainable logistics management practices contribute to building more resilient supply chains?

How do you see circular supply chains and sustainable logistics management practices evolving in the future?

Are there any areas where you believe more research is needed to support the adoption of circular supply chains and sustainable logistics management practices?

Collected Responses:

Metrics for successful circular supply chain practices	Respondents
Amount of generated waste	7
% of recycled materials used in production	6
Conserving energy and resources	7
Carbon emission	7
resource utilization	6

Table 4: Metrics for successful circular supply chain practices.

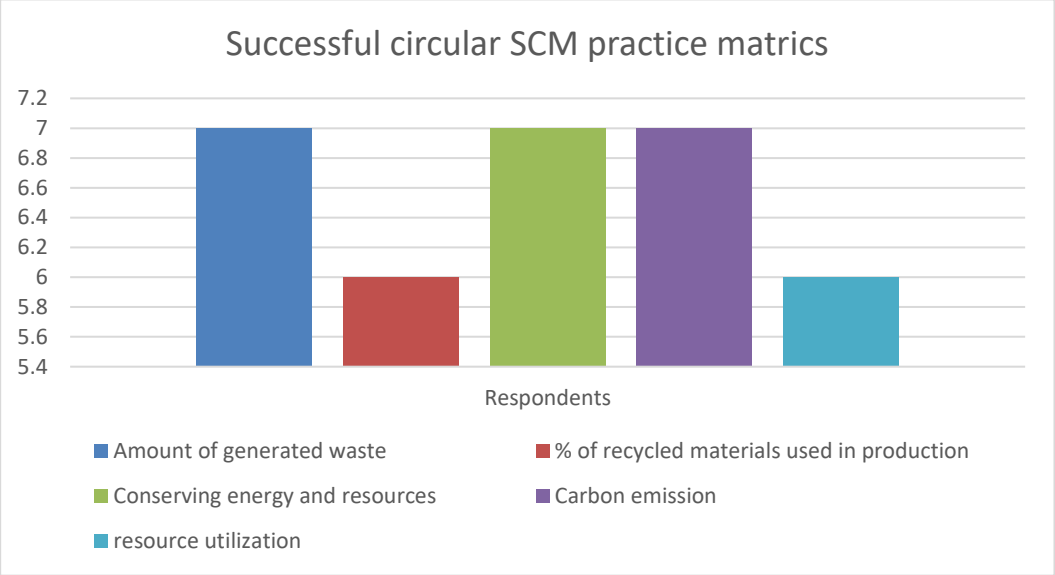

Figure 6: Successful circular SCM practices

Measurement of environmental impact	Respondents
Life cycle assessment	7
Carbon footprint analysis	5
Environmental impact assessment	6
Waste diversion rate	3
Energy consumption rate	4
water use rate	2

Table 5: Measurement of Environmental Impact

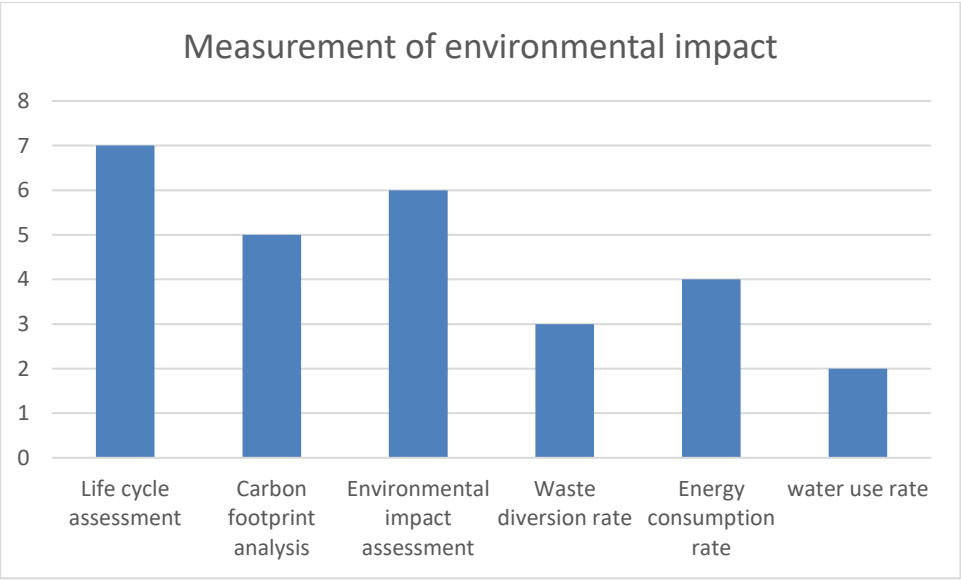

Figure 7: Measurement of Environmental Impact

Key success factor implementing successful SCM	Respondents
Strong leadership	6
Commitment from management	7
Collaboration with supplier and customer	7
Investment in technology	7
Monitoring and evaluation of performance	5

Table 6: Key success factors implementing successful SCM.

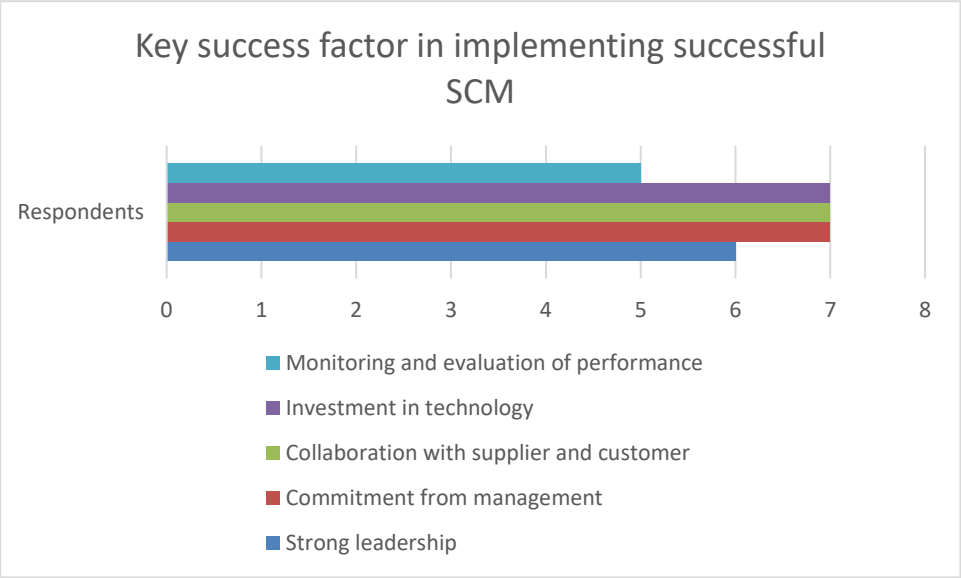

Figure 8: Key success factor implementing successful SCM.

Strategies to overcome supply chain practices	Respondents
Route optimization	7
Alternative fuels	6
Packaging optimization	7
Waste reduction and recycling	7
Energy efficiency	7

Table 7: Strategies to overcome SCM practices.

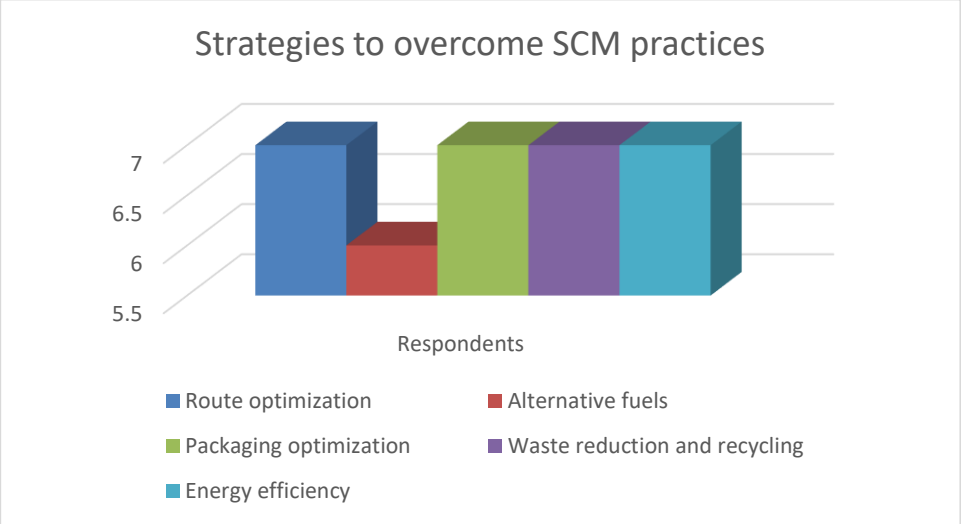

Figure 9: Strategies to overcome SCM practices.

Strategies to meet regulatory standards	Respondents
Monitoring and reporting	7
Training and Education	7
Technology and infrastructure	7
Collaboration and advocacy	6

Table 8: Strategies to meet regulatory standards.

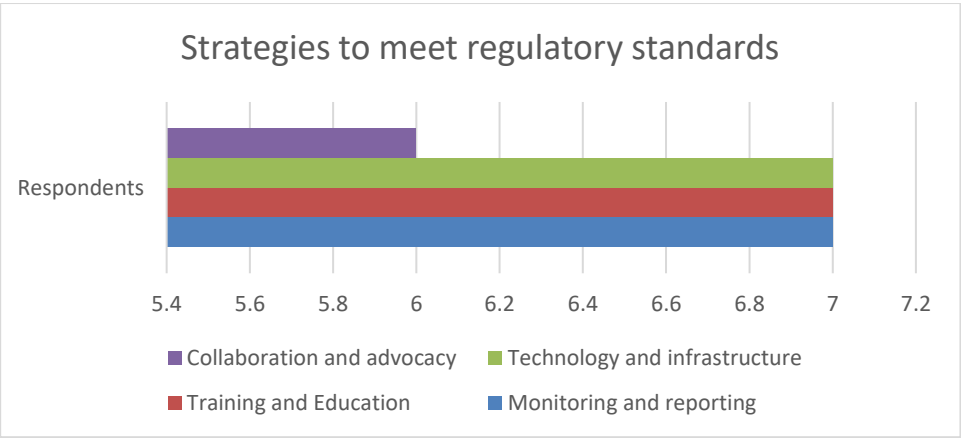

Figure 10: Strategies to meet regulatory standards.

Metrics for successful sustainable logistics mgt practices	Respondents
Fuel consumption	7
Emissions output	6
waste reduction	7
Financial impact	6

Table 9: Metrics for sustainable logistics practices.

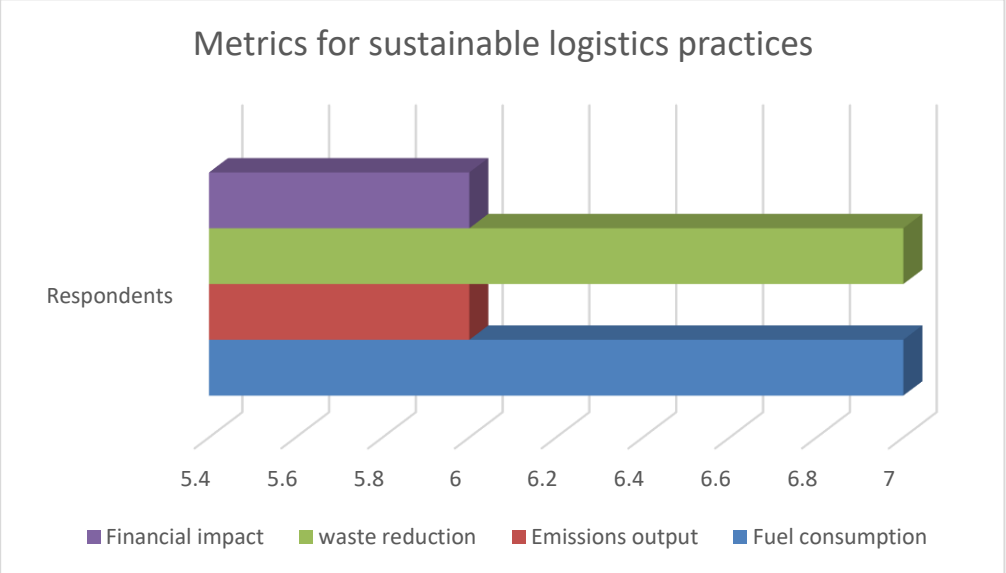

Figure 11: Metrics for sustainable logistics practices.

Best practices for sustainable logistics management	Respondents
Collaborative planning	7
Supplier engagement	7
NGO partnership	4
Government advocacy	5

Table 10: Best practices for sustainable management practices.

Figure 12: Best practices for sustainable management practices.

8.2 Appendices 2 (Thematic Analysis)

Code	Theme	Review of Potential Theme	Define and Name of the Themes	Report
Circular supply chain practices, waste reduction, recycling, financial impact, collaboration, regulatory compliance, technology, consumer demand.	Theme-1: Understanding circular supply chain practices be facilitated by the Supply chain management.	Supply chain practices, Circular supply chain waste reduction, recycling, financial impact, collaboration, regulatory compliance, technology, consumer demand.	Focuses on the reuse, recycling, and repurposing of materials and products throughout the supply chain.	The analysis of the provided six main themes related to circular supply chain and sustainable logistics management practices: Circular supply chain practices, Environmental impact measurement and analysis, Sustainable logistics management practices, Regulatory compliance and standards, Collaboration and partnerships for sustainability, and Consumer influence on sustainable practices. These themes highlight the importance of implementing circular supply chain practices, measuring and tracking environmental impact, adopting sustainable logistics initiatives, complying with regulations, collaborating with stakeholders, and responding to consumer demands for sustainability. The analysis provides insights into specific practices, challenges, metrics, and strategies employed by the logistics professional to promote sustainability and meet regulatory standards.

Code	Theme	Review of Potential Theme	Define and Name of the Themes	Report
Circular supply chain practices Role of partnerships and collaboration Measurement of environmental impact Influence of regulatory frameworks	Theme-2: To find out circular supply chain practices for enhancing sustainability.	Circular supply chain practices and examples of successful initiatives implemented by the company	Circular supply chain practices by the concept of designing supply chain processes	The Company's motivation for adopting Circular supply chain practices is driven by the recognition of sustainability's importance. The interviewee provides examples of successful initiatives implemented, such as using recycled packaging materials and implementing a closed-loop system for pallets. The company measures the success of its circular supply chain practices using various metrics, including the percentage of recycled materials in packaging, waste reduction, and the number of refurbished products.
Definition of circular supply chain practices Sustainable logistics practices with significant environmental impact Role of partnerships and collaboration Environmental impact of logistics operations Economic benefits of circular supply chain supporting circular supply chain and sustainable logistics	Theme-2: To find out circular supply chain practices for enhancing sustainability.	Circular Supply chain Sustainable logistics practices	Sustainable logistics practices with significant environmental impact Partnerships, Collaboration, and Consumer Influence	the analysis is provided valuable insights into the company's approach to sustainability and its efforts to reduce waste, optimize operations, and enhance environmental responsibility. The analysis highlights the importance of collaboration, the role of consumers in driving sustainable practices, and the potential economic benefits associated with circular supply chain and sustainable logistics management. It also emphasizes the need for innovative technologies, adherence to regulatory frameworks, and the continuous improvement and adaptation required to achieve a more sustainable future.
Implementation to raw material sections Supporting Statement of Employees Adequacy of support statement Changes in Circular supply chain	Theme-3: To evaluate the implementation circular supply chain from Supply chain management	Innovative technologies supporting circular supply chain and sustainable logistics	Future evolution of circular supply chain and sustainable logistics	The report reveals several key themes related to circular supply chain and sustainable logistics management practices. These themes include the definition and motivation behind adopting circular supply chain practices, successful initiatives implemented by the company, measurement of success and environmental impact, key success factors, challenges faced, and strategies employed. Additionally, the analysis covers sustainable logistics practices with significant environmental impact, the role of partnerships, collaboration, and consumer influence, measurement of environmental impact of logistics operations, influence of regulatory frameworks, economic benefits, innovative technologies, building resilient supply chains, future evolution and research needs, as well as the company's commitment to sustainability.
Long term implications Recommendations for EmployeesRecommendations for Cement Companies	Theme-4: To measure the barriers and overcome strategies of circular supply chain for sustainability	Circular Supply Chain Practices Challenges and Strategies for Adopting Sustainable Logistics Practices	Successful Circular Supply Chain Initiatives Practices for Challenges and Strategies for Adopting Sustainable Logistics Practices	The report would provide an organized and thematic overview of the interview, highlighting key points and insights related to circular supply chain and sustainable logistics management practices.

Code	Theme	Review of Potential Theme	Define and Name of the Themes	Report
Implementation to raw material sections Supporting Statement of Employees Adequacy of support statement Changes in Circular supply chain	Theme-3: To evaluate the implementation circular supply chain from Supply chain management	Innovative technologies supporting circular supply chain and sustainable logistics	Future evolution of circular supply chain and sustainable logistics	The report is revealed ten key themes related to circular supply chain practices and sustainable logistics management. These themes include circular supply chain practices, environmental impact measurement, sustainable logistics practices, metrics for measuring success, collaboration and partnerships, regulatory frameworks, economic benefits, consumer influence, resilient supply chains, and future evolution and research. Each theme encompasses various subtopics and concepts discussed in the interview, providing a comprehensive understanding of the interviewee's insights and experiences in the logistics industry.
Circular supply chain practices, waste reduction, recycling, financial impact, collaboration, regulatory compliance, technology, consumer demand.	Theme-1: Understanding circular supply chain practices be facilitated by the Supply chain management.	Supply chain practices, Circular supply chain waste reduction, recycling, financial impact, collaboration, regulatory compliance, technology, consumer demand.	Focuses on the reuse, recycling, and repurposing of materials and products throughout the supply chain.	the significance of circular supply chain practices and sustainable logistics management in the cement industry. The thematic analysis reveals several key areas such as motivations for adoption, successful initiatives, measurement metrics, challenges, strategies, partnerships, regulatory frameworks, economic benefits, technologies, consumer demand, resilience, future prospects, research needs, and the company's approach and plans. This analysis provides valuable insights for further research and implementation of sustainable practices in the cement industry and beyond.