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Challenges of Green Supply Chain Management in India: Insights from MSMEs in Greater Noida with a Focus on Health-Related Sectors.

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Abstract

Green Supply Chain Management (GSCM) is crucial in India to address environmental concerns, enhance resource efficiency, and meet evolving regulatory requirements. GSCM integrates sustainability practices throughout the supply chain, reducing waste, emissions, and energy consumption. It promotes responsible sourcing, green logistics, and sustainable manufacturing, aligning businesses with the imperative of environmental responsibility and competitiveness in a rapidly changing market. The research findings bring to light a multifaceted array of approaches and levels of commitment to ESG practices within these organizations located in Greater Noida. Most notably, a significant proportion of these companies have instated ESG policies, signifying a growing recognition of the imperative to not only consider governance but also environmental and social impacts. A prominent trend is the unwavering commitment to environmental sustainability. These companies actively reduce energy consumption, adopt renewable sources, and invest in energy-efficient technologies, highlighting their heightened awareness of climate change and the potential for cost savings. Conversely, the lack of green manufacturing and sustainable materials usage signifies areas for improvement, presenting opportunities to overhaul manufacturing processes and align with eco-friendly product demand. Varying employee engagement levels emphasize the need for uniform, comprehensive involvement programs. Employee participation remains a pivotal driver in successfully implementing ESG initiatives, necessitating robust programs to nurture an environmental responsibility culture.

Keywords: Green Supply Chain Management (GSCM), Sustainable Practices, Health-Related Sectors, Environmental Challenges, Waste Management, Eco-Friendly Practices, Regulatory Compliance.

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Introduction

In recent years, the concept of Green Supply Chain Management (GSCM) has gained considerable attention in the field of logistics and business operations. This paradigm shift in supply chain management emphasizes environmental sustainability, social responsibility, and economic viability, thereby transforming the traditional approach to supply chain operations. India, as one of the world's fastest-growing economies, is facing a unique set of challenges and opportunities in the context of GSCM. Mankar, et al. (2023). This introduction delves into the complexities of implementing GSCM practices in India and highlights the key challenges that businesses and policymakers must address to foster a sustainable future Dheeraj et al (1992).

India's remarkable economic growth, burgeoning middle class, and increasing consumer demand have propelled it into a prominent position in global supply chain networks. The significance of GSCM in India lies in its potential to reduce the environmental impact of these supply chains, thereby contributing to a more sustainable and eco-friendly economic growth trajectory. As the Indian government and businesses aim to balance economic development with ecological concerns, a green approach to supply chain management becomes imperative. Raman (2014), One of the foremost challenges in implementing GSCM in India is the complex and diverse nature of the supply chain landscape. India's supply chain ecosystem is a complex web of diverse industries, each with unique characteristics and challenges. This diversity extends from the agricultural sector to manufacturing, retail, and logistics, making it challenging to devise a one-size-fits-all approach to GSCM. Different industries require tailored strategies, and the coordination of these efforts is a formidable task Luthra et al (2013).

The lack of standardized regulations and enforcement mechanisms further exacerbates the challenges of GSCM in India. While there are some environmental regulations in place, the enforcement and implementation often fall short, leading to inconsistent adherence to green practices. This regulatory ambiguity and lax enforcement can hinder businesses from investing in sustainable supply chain practices, as they may perceive a lack of incentives or a level playing field. Inadequate infrastructure and technology pose another significant hurdle in India's pursuit of green supply chain management. Many areas in the country lack reliable transportation networks and digital infrastructure, which can affect the efficient flow of goods and information, making it challenging to optimize supply chains for sustainability. Soda et al. (2015), The adoption of eco-friendly transportation options, such as electric vehicles or the development of sustainable logistics hubs, is hampered by these infrastructural gaps. There is a shortage of professionals well-versed in sustainable supply chain practices, limiting the capacity of businesses to design, implement, and manage green initiatives. Education and training programs focused on GSCM are essential to address this gap and promote sustainability in Indian supply chains Sharma, H. (2022).

The question of cost-effectiveness and return on investment is often raised by businesses when considering GSCM practices. Implementing sustainable initiatives may require significant initial investments in new technologies, processes, and employee training. Businesses often grapple with the challenge of demonstrating the long-term economic benefits of these investments, especially in a competitive market where short-term profits tend to take precedence.

Objective-

RO1: Analyze the case study of the Greater Noida MSME to understand the specific challenges faced by this organization in implementing GSCM.

Literature Review

The challenges encountered in the implementation of Green Supply Chain Management (GSCM) in the context of India Micro, Small, and Medium Enterprises (MSMEs) are multifaceted and deserve thorough examination. The first and foremost challenge faced by these organizations is the cost associated with adopting green practices. Many perceive it as a

significant predicament, as transitioning to environmentally sustainable supply chain operations often necessitates investments in eco-friendly technologies, processes, and materials, which can strain the financial resources of MSMEs. Raman P (2014), Nayak, et al. (2021).

One of the intriguing aspects of GSCM is its nascent nature, which complicates the evaluation of its effectiveness. Unlike traditional business practices where quantifiable results are readily apparent, GSCM may not yield immediate, measurable data to gauge its impact on the value chain. This ambiguity can hinder organizations' confidence in the returns on investment and the potential benefits of adopting green supply chain practices. Mankar, et al. (2023). Additionally, the successful implementation of GSCM requires the integration of appropriate technologies, further adding to the complexity. To effectively align their operations with green principles, organizations must select and implement technologies that complement their sustainability objectives. (Raman, P. , 2014) This technological requirement necessitates careful planning and investment, which MSMEs may find daunting. Sharma H. (2022) Furthermore, the scarcity of green architects, consultants, developers, and contractors in the region poses a significant challenge. The dearth of experienced professionals specializing in green practices can deter organizations from embarking on their green supply chain journey, as they may lack the necessary expertise to guide them through the process Dheeraj et al (1992). An essential component of GSCM is the integration of recycling practices, which can transform waste into valuable raw materials for manufacturing. However, this poses another challenge for many organizations. The infrastructure and logistics required to effectively collect, process, and reintegrate recycled materials into the production process can be complex and resource-intensive. Luthra et al (2013). The fear of failure is a common apprehension shared by many organizations when considering the adoption of GSCM. The uncertainty surrounding whether green initiatives will lead to success or result in a significant failure can hinder their commitment to change. Zhu et al. (2008). This fear can be particularly pronounced in MSMEs, where the resources and resilience needed to weather potential setbacks may be limited Sharma H. , (2022). Moreover, a lack of awareness regarding the implementation process, regulations, and best practices further compounds the challenges. Organizations may find it difficult to navigate the intricacies of GSCM, including compliance with environmental regulations and industry standards, without proper guidance and knowledge. Bhattacharjee K., (2015). Crucially, top-level management's support and commitment are paramount in implementing GSCM initiatives. However, due to doubts about the concept and concerns over the initial investment, senior executives may be hesitant to fully endorse and drive the integration of green practices within their organizations. Soda et al. (2015), Given the intricate nature of supply chains, the reluctance of any stakeholder to embrace and participate in the design process and technology can have far-reaching consequences. Tonape, (2013).

Research Methodology

The research conducted for this paper adopted an inductive approach to gather data and insights. This approach involved a comprehensive exploration of the topic before collecting primary data. To begin with, a thorough review of the existing literature was carried out to gain a deep understanding of the subject matter. The objective was to identify common themes and patterns within the literature, which would then serve as the foundation for developing specific areas of interest. These areas of interest subsequently guided the formulation of the research questions Appendix A. Mankar et al (2023).

The research participants in this study represented a diverse group of individuals, including top-level managers, middle-level managers, and other staff members. These individuals were drawn from a variety of industries located in Greater Noida, India, and had experience and expertise in sustainability departments within their respective organizations.

To effectively capture the relevant information and insights from the participants, the study employed an interview-based research strategy. The research instrument used for data collection consisted of open-ended interview questions. These questions were designed to elicit detailed and comprehensive responses from the participants, allowing for a rich and nuanced understanding of their perspectives, experiences, and insights related to the topic of the research Labaran et al (2023).

After conducting the interviews and collecting the data, a systematic approach was taken to further enhance the analysis process. The data collected through interviews were transferred into a digital format, specifically using a Google Form. This transition to a digital platform facilitated data management, organization, and analysis. It allowed for efficient storage and retrieval of the collected data, enabling the research team to process the information effectively and derive meaningful conclusions from the dataset.

By employing this research methodology, the study aimed to gain valuable insights into the challenges and opportunities associated with sustainability and green supply chain management within the context of Greater Noida, India. The inductive approach, combined with open-ended interviews and digital data management, ensured a robust and comprehensive exploration of the research topic, providing a foundation for a thorough analysis and meaningful conclusions in the subsequent phases of the research. Sharma, H. , (2022).

Application of Proposed Methodology

The data for the research is collected from the five manufacturing MSME, located in Greater Noida, here we are doing case analysis of the three company about the responses received by them.

Figure 1: Green Supply Chain Factors

Case analysis:

1. Summary of ABC Company:

ABC, located in Greater Noida, is led by a male director with 21 years of experience in the field of Distribution and System Integration. The company has been in operation for 10 years and falls into the category of small to medium-sized enterprises. Regarding their environmental, social, and governance (ESG) practices, ABC Company has a written ESG policy in place. However, they do not currently track and report on their ESG performance. Additionally, the company does not have a specific plan to reduce its environmental impact at this time. On the positive side, ABC Company uses renewable energy sources, showing a commitment to sustainable energy. They are also committed to reducing their energy

consumption. While they haven't invested in energy-efficient technologies yet, their use of renewable energy sources is a step in the right direction. ABC Company does not have a green manufacturing program, nor do they use sustainable materials in their products. They do not emphasize minimizing waste and pollution from their manufacturing operations. Employee training on green practices is not provided, and there are no rewards for implementing green practices in the workplace. Although the company does not have a waste management plan, they do recycle or compost their waste. ABC Company has incurred costs associated with implementing green practices, but they do not believe that these costs are outweighed by the benefits. Lastly, when it comes to future investments in green practices, the company is not currently willing to allocate additional resources to further their sustainability efforts.

2. Summary of XYZ Company:

XYZ, located in Greater Noida, is led by a male director with an impressive 30 years of experience in the field. The company primarily operates in the packaging industry and has been in business for 25 years. In terms of annual turnover, XYZ falls into a category of medium to large-sized enterprises. XYZ Company has a written ESG policy in place, indicating their commitment to environmental, social, and governance practices. When it comes to reducing their environmental impact, XYZ Company does not have a specific plan in place at the moment. Nevertheless, they demonstrate a strong commitment to sustainability by using renewable energy sources. Additionally, they are actively working to reduce their energy consumption, which is a significant step toward greener operations.. In terms of green manufacturing, XYZ Company does not have a program in place and does not use sustainable materials in their products. However, they are taking measures to minimize waste and pollution from their manufacturing operations.

XYZ Company is proactive in promoting green practices among their employees. They provide training to their staff on these practices and even reward employees for implementing them in the workplace. The company has a waste management plan, further demonstrating their commitment to reducing waste. XYZ Company actively minimizes waste generation and goes a step further by recycling or composting their waste. XYZ Company acknowledges incurring costs associated with implementing green practices. Importantly, they believe that the benefits outweigh the costs, showing a strong commitment to sustainability.

3. Summary of BCD Company:

BCD, located in Greater Noida, is managed by a male manager with 25 years of experience in the field of Electrical Component Manufacturing. The company has been in operation for 15 years and operates in the electrical manufacturing sector. BCD Company demonstrates a strong commitment to environmental, social, and governance (ESG) practices. They have a written ESG policy in place and actively track and report on their ESG performance, showcasing their dedication to transparency and accountability.

In terms of reducing their environmental impact, BCD has a clear plan in place and actively works to implement green practices. They use renewable energy sources, signifying their commitment to sustainable energy. Additionally, the company actively strives to reduce their energy consumption, which is a substantial step toward more environmentally responsible operations. BCD has invested in energy-efficient technologies, further enhancing their green initiatives. BCD Company excels in green manufacturing by having a program in place and using sustainable materials in their products. They are also committed to minimizing waste and pollution from their manufacturing operations. Employee engagement in green practices is a priority for BCD. They provide training to their employees on these practices, and employees are rewarded for implementing green initiatives in the workplace. BCD Company has a well-structured waste management plan and actively minimizes waste generation. They also go a step further by recycling or composting their waste, showcasing a comprehensive approach to waste reduction and sustainability. BCD acknowledges incurring costs associated with

implementing green practices but strongly believes that the benefits outweigh these costs, underlining their dedication to sustainability.

Results & Discussion

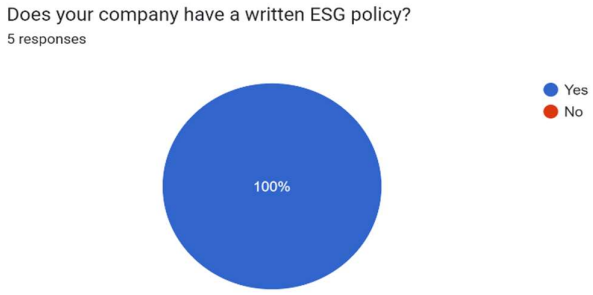
The outcomes from the research conducted in the Greater Noida MSME was In terms of their commitment to Environmental, Social, and Governance (ESG) practices, it is apparent that a majority of these companies have implemented an ESG policy. However, the extent to which they track and report on their ESG performance varies, with some actively doing so and others not. This variance suggests a mixed approach to transparency and accountability in sustainability efforts. One noticeable trend is that most companies appear dedicated to reducing their environmental impact through the use of renewable energy sources and actively working towards energy consumption reduction. However, the adoption of energy-efficient technologies is not uniform, with some investing in them and others not. This discrepancy highlights the varying levels of commitment to energy efficiency across the sampled companies.

On the topic of green manufacturing, the responses indicate that only one company in this sample has a green manufacturing program in place and uses sustainable materials in its products. This suggests that sustainability practices in manufacturing are not yet widespread among the sampled companies, leaving room for improvement in this area. Waste management practices show a more positive trend, as most of the companies have a waste management plan, minimize waste generation, and engage in recycling or composting. This is an encouraging sign as waste reduction and recycling are integral aspects of sustainable practices.

In terms of training and employee engagement, the data suggests a mix of approaches. Some companies provide training on green practices and encourage employees to adopt these practices in the workplace, while others do not. Similarly, employee rewards for green initiatives are implemented by some but not by all, underscoring varying levels of commitment to employee engagement in sustainability efforts.

Costs associated with implementing green practices are incurred by most companies, but the belief in the benefits outweighing these costs is not consistent across the sample. Some are confident in the positive cost-benefit balance, while others may need more convincing. Lastly, the willingness to invest more in green practices in the future is not uniform, with some companies showing a strong commitment to furthering their sustainability efforts and others less enthusiastic about future investments in sustainability. The data collected by us is transferred into the google form to easy and better understanding or analysis of the outcome we got from our survey form and attached pie charts of each question will elaborate of how company are having interest or not.

We found following that few company are aware of the Green Practices but are not willing to invest in that, because the benefits are less are compare to cost occurred in the implicating of the Green Practices at workplace. Notably, the majority of the surveyed companies have implemented ESG policies, underscoring a growing awareness of the importance of incorporating environmental and social considerations alongside governance. However, the extent to which these policies are actively monitored and reported varies, indicating room for enhancing transparency and accountability.



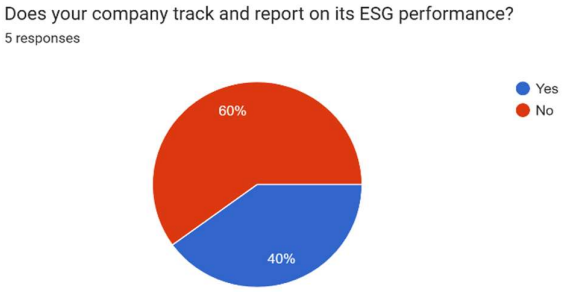


Figure 2: ESG Written Policy

Figure 3: Track of ESG Policy

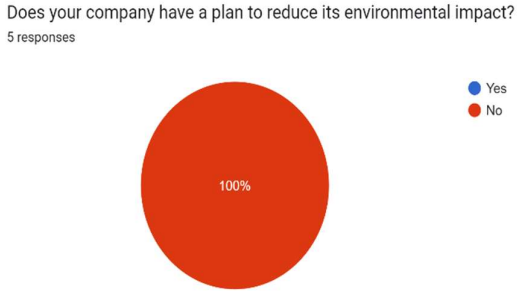
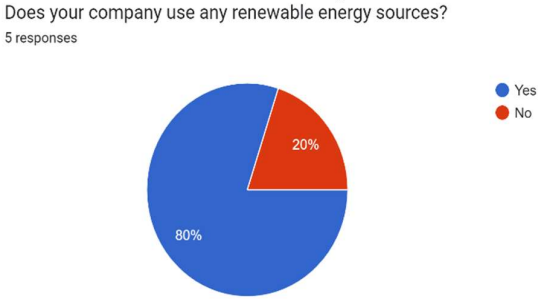


Figure 4: Reduce Environmental Impact Plan

Interpreation: From the Figure 2, 3, and 4 we can interpret that the companies have written ESG Policies but three company had only trak of ESG policy and no company had plan to reduce its environmental impact.



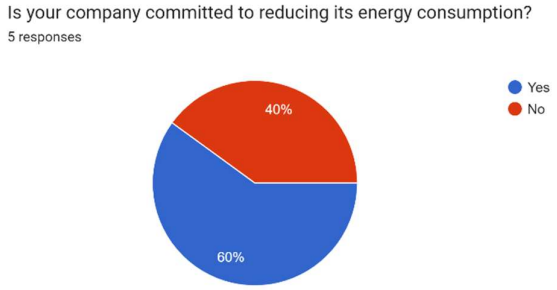


Figure 5: Renewable Energy Use

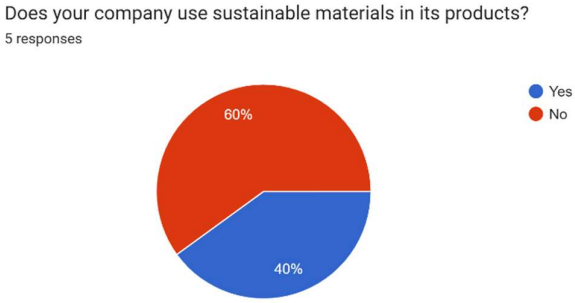
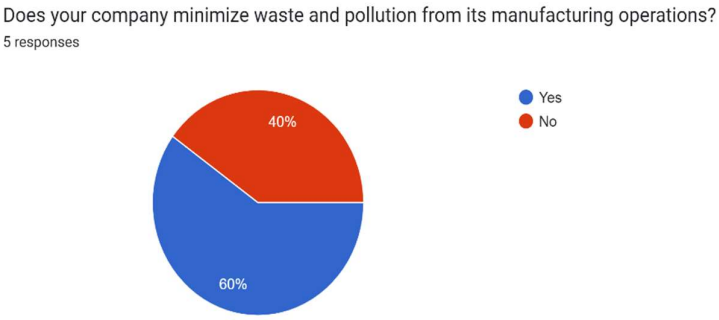
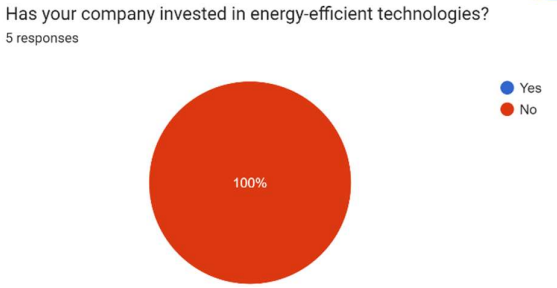


Figure 6: Reducing Energy Consumption





Interpreation: From the Figure 5, 6, and 7 we can interpret that the four companies are using renewable energy resources but three company had focus on reduction of enegry consumpation and no company had invested into Energy Efficient Techonologies.

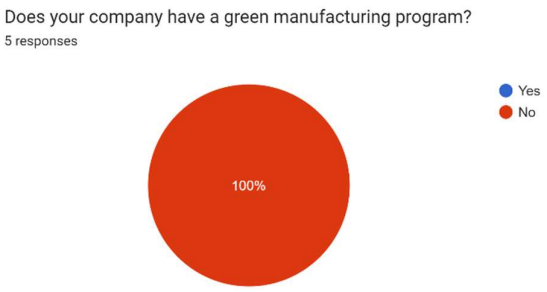


Figure 8: Green Manufacturing
Figure 9: Sustainable Material Use

Figure 10: Minizing Waste and Pollution

Interpreation: From the Figure 8, 9, and 10 we can interpret that the no companies are using Green Manufacturing and two company had focus on using of sustainable material in product and three company had focus into Minizing Waste and Pollution from Manufacturing Operations.

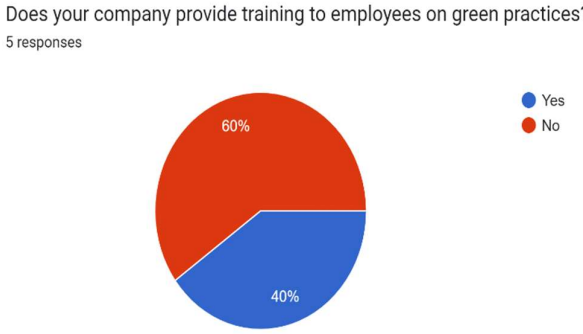


Figure 11: Training on Green Practices

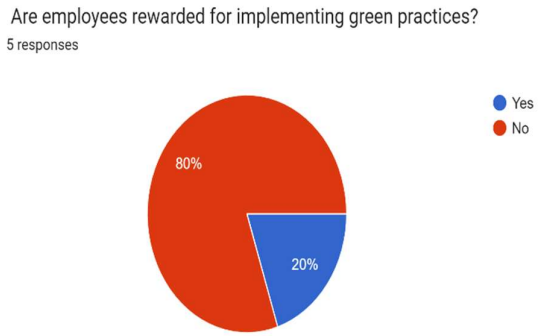
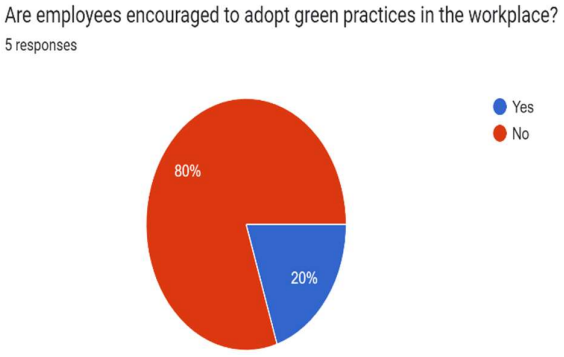


Figure 12: Adopt Green Practices

Figure 13: Adopt Green Practices

Interpreation: From the Figure 11, 12, and 13 we can interpret that the two companies are Training on Green Practices to Employees and one company had focus on Adopt Green Pratices in workplace and one company is implementing green practices



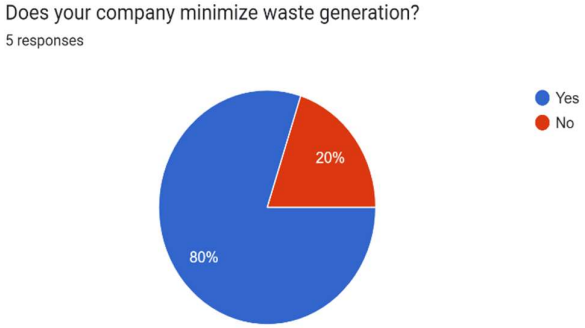
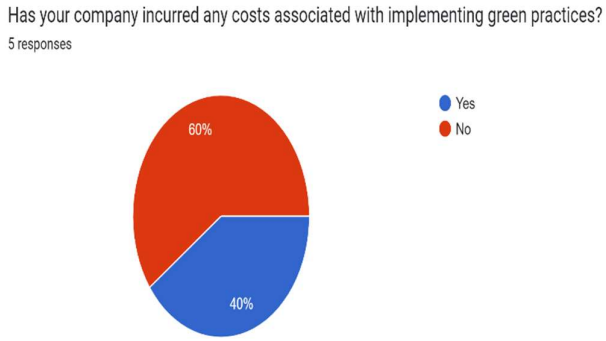


Figure 14: Waste Management Plan

Figure 15: Minize Waste generation

Figure 16: Recycle its Waste

Interpreation: From the Figure 14, 15, and 16 we can interpret that the four companies have waste management plan and four company had focus on Minize Waste generation and all company are working on recycle or compost its waste.



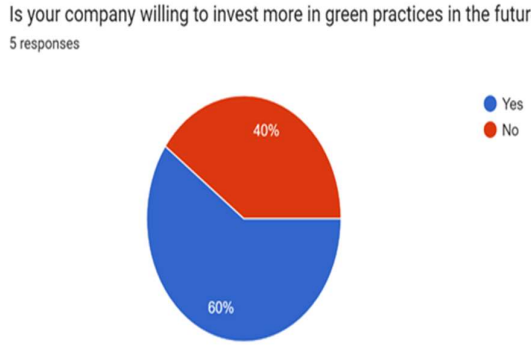


Figure 17: Cost for Green Practices in Green

Figure 18: Willing Invest

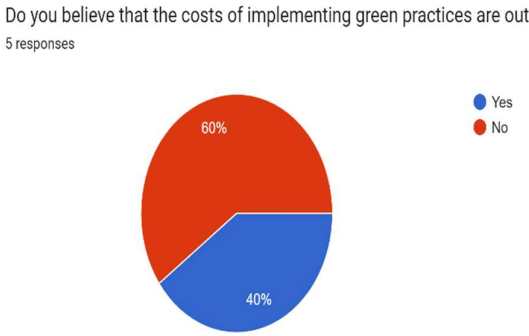


Figure 19: Benefits of Green

Interpreation: From the Figure 17, 18, and 19 we can interpret that the two companies have incurred some cost with implementing green and three company are willingly to invest in Green Practices and two company believe that cost will benefit them.

It is evident that there is a growing awareness and commitment to ESG practices among these companies, with the majority having established ESG policies. However, there is room for improvement in terms of the active monitoring and reporting of these policies to enhance transparency and accountability.

A significant positive trend observed is the dedication to environmental sustainability. Companies are actively taking measures to reduce energy consumption, adopt renewable energy sources, and invest in energy-efficient technologies. This demonstrates a heightened awareness of the urgency to combat climate change and reduce carbon footprints. On the flip side, there is an underrepresentation of green manufacturing programs and sustainable materials, indicating areas where companies can enhance their sustainability efforts. The study also highlights variations in employee engagement levels, emphasizing the importance of consistent and comprehensive programs to foster a culture of environmental responsibility within the organizations. Company should agile themselves to recent trends i.e. Green Supply Chain Practices for the environment, and social purposes and also have a competitive edge among competitors.

Managerial Implications

To drive the transition towards sustainability and green practices in the manufacturing industries Micro, Small, and Medium Enterprises (MSMEs), several managerial implications emerge from the research findings. These implications offer valuable guidance for managers seeking to embrace the recent trend of sustainability:

One crucial insight is the need for tailored sustainability strategies. The research reveals that sustainability approaches should be customized to suit the unique characteristics of each business. Managers should draw inspiration from the variations observed and develop Environmental, Social, and Governance (ESG) policies and green practices that align with their specific industry and operational context. This tailored approach ensures that sustainability initiatives are not only practical but also highly effective, addressing the specific challenges and opportunities within their domain. Investing in green technologies emerges as another vital managerial implication. Companies that have already invested in energy-efficient technologies demonstrate their commitment to reducing environmental impact. Managers should consider the adoption of such technologies as a strategic move to enhance energy efficiency, reduce operational costs, and ultimately improve the environmental footprint of their operations. This not only benefits the environment but also has a positive impact on the company's bottom line.

Employee engagement stands out as a critical factor in driving sustainability initiatives. The varying approaches to employee involvement in green practices underscore the influential role of leadership in fostering a culture of sustainability. Managers should recognize the

significance of providing training and incentives to encourage employees to embrace green practices in their daily work. Employee participation is a fundamental driver in successfully implementing sustainability initiatives and embedding a culture of environmental responsibility within the organization. Effective waste management and recycling also emerge as a key managerial implication. The majority of the companies in the study have already embraced waste management and recycling practices. This highlights the importance of comprehensive waste reduction and recycling programs. Managers can build on this trend by optimizing waste management practices, reducing waste generation, and exploring innovative recycling solutions, further contributing to environmental sustainability.

Furthermore, the varying perspectives on cost-benefit analysis underline the importance of managers conducting rigorous assessments of the economic aspects of sustainability initiatives. A thorough cost-benefit analysis is crucial for demonstrating the long-term advantages of green practices, which, in turn, helps secure support for future investments in sustainability. Lastly, managers should pay close attention to the differing levels of commitment to future sustainability investments. Companies that are willing to invest more in green practices signal a forward-thinking approach. Recognizing the potential benefits, both in terms of environmental impact and economic returns, can guide managers in making informed decisions about future sustainability investments that align with the company's long-term objectives and values.

Conclusion

The responses from these five companies in Greater Noida, India, offer valuable insights into the diverse landscape of Environmental, Social, and Governance (ESG) practices in different industries. While each company is unique in its approach, some common trends and opportunities emerge from the data.

First and foremost, it is heartening to observe that the majority of these companies have taken the step of implementing an ESG policy. This indicates a growing awareness of the need for businesses to consider their environmental and social impacts and integrate governance practices that uphold ethical standards. However, the varying levels of commitment to tracking and reporting on ESG performance highlight a potential area for improvement. Enhanced transparency and accountability in ESG reporting can help companies showcase their sustainability efforts and outcomes, thereby building trust with stakeholders. One notable trend is the commitment to environmental sustainability, particularly in reducing energy consumption and harnessing renewable energy sources. This demonstrates a recognition of the urgency to combat climate change and reduce carbon footprints. The investment in energy-efficient technologies is another promising sign of dedication to energy efficiency. On the other hand, the limited presence of green manufacturing programs and the use of sustainable materials in products indicate that there is significant room for improvement in the manufacturing sector. Companies should explore opportunities to green their production processes, reduce waste, and source sustainable materials to align with evolving consumer preferences for eco-friendly products. The commitment to waste management, recycling, and composting is a notable highlight. Effective waste management is an essential component of ESG practices, and the majority of these companies are actively engaged in minimizing waste generation and responsible disposal. This reflects an understanding of the importance of circular economy principles in reducing environmental impact. In the realm of employee engagement, the varied approaches to training and rewarding green practices underline the need for consistent and comprehensive programs to encourage sustainability in the workplace. Employee involvement is a key driver in successfully implementing ESG initiatives. While costs associated with implementing green practices are a concern for some, it's heartening to

see that others believe the benefits outweigh the costs. This highlights the potential long-term gains of sustainability efforts, both in terms of environmental impact and economic benefits.

Limitations & Future Scope

Limitations of the study include the small sample size and a focus on a single geographic location. Future research could expand the study to a broader and more diverse set of companies in different regions to validate the findings. Additionally, a longitudinal study could provide insights into the evolution of sustainability practices over time. Exploring the role of government policies and incentives in shaping corporate sustainability initiatives would also be valuable. Finally, a deeper analysis of the economic implications of green practices could provide a more comprehensive understanding of their benefits.

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Appendix A
Questionnaire Survey
Company Name:
Location:
Gender:
Designation:
Years of Experience:
Nature of Business:
Firm Age:
Firm Size (Annual Turnover):
ESG

1. Does your company have a written ESG policy? (Yes/No)
2. Does your company track and report on its ESG performance? (Yes/No)
3. Does your company have a plan to reduce its environmental impact? (Yes/No)

Green Energy

4. Does your company use any renewable energy sources? (Yes/No)
5. Is your company committed to reducing its energy consumption? (Yes/No)
6. Has your company invested in energy-efficient technologies? (Yes/No)

Green Practices in Manufacturing

7. Does your company have a green manufacturing program? (Yes/No)
8. Does your company use sustainable materials in its products? (Yes/No)
9. Does your company minimize waste and pollution from its manufacturing operations? (Yes/No)

Training of Employees on Green Practices

10. Does your company provide training to employees on green practices? (Yes/No)
11. Are employees encouraged to adopt green practices in the workplace? (Yes/No)
12. Are employees rewarded for implementing green practices? (Yes/No)

Waste Management

13. Does your company have a waste management plan? (Yes/No)
14. Does your company minimize waste generation? (Yes/No)
15. Does your company recycle or compost its waste? (Yes/No)

Cost

16. Has your company incurred any costs associated with implementing green practices? (Yes/No)
17. Do you believe that the costs of implementing green practices are outweighed by the benefits? (Yes/No)
18. Is your company willing to invest more in green practices in the future? (Yes/No)