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CSR Strategies to Reduce Environmental Impact in the Manufacturing Industry Sector

Supiati[1],Sultan Syah[2],Jacky Chin[3]
[1] Universitas Indonesia Timur, Indonesia
[2] Universitas Trunojoyo Madura, Indonesia
[3] Universitas Mercu Buana, Indonesia

Email: supiati016@gmail.com[1] sultanakuntan@gmail.com[2] Jacky. chin@mercubuana.ac.id [3]

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ABSTRACT
This study aims to explore the Corporate Social Responsibility (CSR) strategies implemented by manufacturing companies to reduce environmental impact. With increasing pressure from the public and government regulations, many manufacturing companies are starting to integrate sustainability policies in their operations. This study uses a qualitative approach through case studies on seven manufacturing companies operating in developing countries. The findings of the study show that these companies have implemented various environmentally friendly strategies, such as the use of renewable energy, energy efficiency, better waste management, and reduction of carbon emissions. However, the main challenges faced are the high initial investment costs, as well as differences in managerial commitments to sustainability. In addition, the study also identifies the importance of collaboration between the private sector and the government, especially in providing incentives and policies that support the adoption of environmentally friendly technologies. The study concludes that to achieve significant impact, companies must have a long-term commitment to sustainability, address technology access gaps, and strengthen cooperation with governments and other stakeholders. The implementation of an effective CSR strategy can not only reduce environmental impacts, but also increase the competitiveness of companies in a global market that increasingly prioritizes sustainability issues.
Keywords: : CSR, Industrial Manufactur, Invironment

INTRODUCTION

The manufacturing industry plays an important role in the global economy. This sector also contributes significantly to various environmental problems, such as air pollution, hazardous waste disposal, and overexploitation of natural resources (Gutti., 2022). This challenge is a major concern for governments, communities, and companies to find solutions that can minimize negative impacts on the environment. In this context, Corporate Social Responsibility (CSR) is an important strategy that can help the manufacturing sector reduce the environmental impact caused. CSR refers to the responsibility of a company to act ethically and contribute to the well-being of society as well as environmental sustainability, beyond simply pursuing financial gain (Torelli., 2021). In the manufacturing sector, CSR can be realized in various forms, such as reducing greenhouse gas emissions, managing waste that is more environmentally friendly, and using renewable energy. These strategies aim to maintain a balance between business needs and environmental protection. Many manufacturing companies have adopted CSR strategies to reduce their environmental impact. However, the implementation of CSR in this sector is still faced with various challenges. Many companies prioritize short-term profits over considering long-term impacts on the environment. Some companies even only apply CSR to aspects that are not directly related to their core operations,

such as social activities that do not significantly affect the management of natural resources or their production processes.

Companies in developing countries are often hampered by the high costs required to implement green technologies, as well as the lack of regulations that support sustainability (Chan., 2018). This has caused many companies operating in developing countries to find it difficult to implement effective CSR strategies in reducing environmental impact. Research examining the implementation of CSR in the manufacturing sector of developing countries and how these companies can adapt to these challenges is still rare, although the need for it is urgent (Grafland., 2024). In addition, previous research has also identified that successful CSR implementation is not only influenced by external regulations or market demands, but also by organizational culture and internal company commitments to sustainability. Many companies integrate CSR principles in their strategies as part of an organizational culture that supports long-term sustainability. Therefore, it is important to dig deeper into the factors that affect the success of CSR implementation, both from the internal side of the company and from external factors, such as government policies.

Eco-friendly technology and innovation in the production process have been a major concern in the manufacturing sector in recent years. The use of renewable energy, reduction of carbon emissions, and efficiency in the use of water and raw materials are the main focus of CSR policies that aim to reduce environmental impact (Niyommaneerat., 2023). However, the adoption of this technology in the manufacturing sector is still relatively slow, especially in countries with limited infrastructure and access to advanced technology. Therefore, it is important to explore how companies can adopt these technologies more quickly, especially in developing countries. One of the major challenges in the implementation of CSR in the manufacturing sector is the lack of collaboration between the public and private sectors. The government can play an important role in encouraging companies to invest in green technology by providing the right incentives and regulations. However, in many countries, existing regulations are still inadequate to encourage significant changes in corporate behavior. Therefore, it is important to explore the role of government policies and regulations that can accelerate the adoption of environment-based CSR.

This study aims to identify various CSR strategies that can be implemented in the manufacturing sector to effectively reduce environmental impacts. The main focus of the study is manufacturing companies in developing countries, where the challenges related to cost and access to environmentally friendly technologies are greater. This study also aims to identify factors that affect the effectiveness of CSR implementation, both from the internal side of the company and existing government policies. By examining various CSR strategies that can be implemented in the manufacturing sector, this research is expected to contribute to the development of more effective and relevant sustainability policies. The results of this study are expected to not only provide benefits for companies in reducing their environmental impact, but also help improve their competitiveness in a global market that increasingly demands companies to act more responsibly towards the environment.

METHODS

This study uses a qualitative approach with a case study design to analyze Corporate Social Responsibility (CSR) strategies in the manufacturing industry sector to reduce environmental impacts. This approach allows researchers to delve deeply into the various factors that affect the implementation of CSR and its impact on the environment. The main source of data is obtained from in-depth interviews with corporate stakeholders, such as CSR managers, heads of environmental departments, and teams involved in the company's sustainability policy. In addition, focus group discussions (FGD) with employees were also conducted to explore views from the internal side regarding the implementation of CSR policies. Secondary data is obtained from the analysis of company documents, such as

sustainability reports and internal policies related to environmental impact management. The study will involve 5-7 manufacturing companies operating in developing countries and implementing CSR strategies based on reducing environmental impact. The collected data will be analyzed using thematic analysis techniques, where interviews and FGDs will be transcribed and coded to identify key themes related to CSR policies. The results of the analysis will be compared between companies to identify similarities and differences in the implementation of CSR strategies, as well as to find best practices that can be adopted by other companies. Data triangulation will be carried out to ensure the validity of the findings by comparing the results of interviews, FGDs, and document analysis. This research is expected to contribute to developing more effective and relevant CSR strategies, as well as provide insights for companies and policymakers in improving the implementation of CSR in the manufacturing sector to achieve better environmental sustainability.

RESULTS AND DISCUSSION

This study aims to identify and analyze the Corporate Social Responsibility (CSR) strategies implemented by manufacturing companies to reduce environmental impacts (Bux., 2020). Through an analysis of seven manufacturing companies operating in developing countries, it was found that almost all companies involved in this study have adopted CSR policies that focus on reducing environmental impact. The strategies implemented by these companies involve various measures, including the use of environmentally friendly technologies, waste management, energy efficiency, and efforts to reduce carbon emissions. This shows that manufacturing companies are increasingly aware of the importance of sustainability and their role in reducing negative impacts on the environment. One of the most common strategies implemented by these companies is the use of renewable energy, which is a key focus in efforts to reduce environmental impact. Some companies have invested in solar panel technology and wind power plants to reduce their reliance on fossil energy that has the potential to damage the environment (Jacobson., 2021). In addition, there are also companies that are trying to optimize the use of machines and equipment that are more efficient in consuming energy. This aims to lower overall energy consumption, which in turn reduces carbon emissions and operational costs associated with conventional energy use. Waste management is also a major concern, with many companies implementing recycling systems and efforts to reduce the use of raw materials that are not environmentally friendly.

The initial investment cost for green technology remains a major challenge in the implementation of effective CSR policies. Based on the findings of the study, almost all companies admit that the cost required to adopt eco-friendly technology can be very high. However, they realize that this investment will provide long-term benefits, both in terms of operational cost savings and improved the company's reputation in the eyes of consumers who are increasingly concerned about sustainability issues. However, some companies still feel burdened with large startup costs, which hinders them from implementing the technology optimally. The commitment of top management to sustainability and environmental impact reduction also plays an important role in the successful implementation of CSR strategies (Bhardwaj., 2016). The results of the study show that companies that have strong support from top management tend to be more successful in designing and implementing policies that focus on sustainability. Some companies even have dedicated teams responsible for monitoring and evaluating environmental impacts on an ongoing basis. They also regularly hold training and educational programs for employees on the importance of sustainability and how employees can contribute to these efforts. This creates a culture that supports sustainability within the company, which ultimately encourages the implementation of more effective CSR policies.

Companies that have CSR policies, but do not show a strong commitment to sustainability. Some of them focus more on fulfilling regulatory obligations without any real efforts to significantly reduce environmental impacts. This phenomenon indicates that although

companies adopt CSR policies as part of their strategies, their implementation is often partial and not optimal. This shows the importance of the role of management in creating policies that are not only symbolic, but also have a real impact on the environment (Rodrigue., 2023). The study also found that collaboration with governments and other stakeholders is an important factor that encourages companies to invest resources in environmentally friendly technologies. Some of the companies involved in the study revealed that incentives from governments, such as subsidies for green technologies or tax breaks for companies that meet certain sustainability standards, are the main drivers for implementing more ambitious policies. These policies not only help companies in reducing initial investment costs, but also create a supportive climate for companies to innovate and implement more progressive sustainability solutions.

Access to more efficient technology is also a factor that differentiates the success of CSR implementation between large companies and small or medium-sized companies (Ortiz *et al*., 2018). Although eco-friendly technologies are readily available, not all companies have the same access to them, especially small and medium-sized companies that often lack financial and technical resources. Large companies are usually faster in adopting green technology because they have more adequate financial capacity and human resources. This creates a gap in the implementation of CSR strategies, where large companies are superior in terms of sustainability compared to smaller companies. Some companies that successfully implement eco-friendly technology report that they experience significant operational cost savings in the long run. More efficient technology in the use of energy and raw materials not only reduces costs, but also improves the company's image in the eyes of consumers who are increasingly concerned about environmental issues. Sustainability is not only an internal issue of the company, but also an important factor in market competition. Consumers who are increasingly aware of the importance of sustainability tend to choose products from companies that have proven to care about environmental impact, which can ultimately provide a competitive advantage for the company.

However, to achieve a significant impact, companies need to address some of the key challenges that exist, especially related to costs and managerial commitments. CSR policies that are only implemented as a form of regulatory obligation or for short-term goals will not have a meaningful impact on the environment. For this reason, the company needs to have a further vision ahead, which focuses on sustainability and ensures that the CSR policy is applied consistently across the company's entire line of operations, from production to distribution. This requires a strong commitment from all levels of management to achieve this. Overall, although many manufacturing companies have adopted various CSR strategies to reduce their environmental impact, the challenges faced remain significant. In order for CSR strategies to be more effective, closer collaboration between the private sector and the government is needed**.** Governments can play an important role in providing incentives that can encourage companies to invest in green technologies, as well as create policies that support sustainability. In addition, it is important to pay attention to the factor of access to technology so that small and medium-sized companies can also participate in sustainability efforts. With good cooperation between the private sector and the government, as well as a strong commitment from the company's management, it is hoped that CSR strategies in the manufacturing sector can make a significant contribution to reducing environmental impacts globally.

Corporate *Social Responsibility* (CSR) strategies are increasingly important to be implemented in the manufacturing sector in line with increasing pressure to maintain environmental sustainability (Shahzad *et al*., 2020). Many manufacturing companies have taken concrete steps to reduce the environmental impact of their production activities. One of the main approaches found in this study is the use of renewable energy as an alternative to fossil energy (Chudy *et al*., 2022). Some companies that are transitioning to renewable energy, such as solar and wind, have shown a reduction in carbon emissions by up to 20% in the first two years of implementation. This shows that with the right investments, companies can reduce

their carbon footprint and contribute to the reduction of air pollution. In addition to the use of renewable energy, waste management and recycling programs have also proven to be effective in reducing environmental impacts in the manufacturing sector. Companies that implement a structured waste management system are able to reduce the amount of waste that ends up in landfills (landfills) by up to 30%. The process of recycling raw materials in production also reduces the need for new materials by up to 15%, which reduces the exploitation of natural resources as well as production costs. Thus, this strategy not only benefits the environment but also provides economic benefits.

Innovation in products and production processes that are more environmentally friendly is an important step in CSR in the manufacturing sector. Some companies are turning to naturally biodegradable materials and production processes that produce low emissions (Hilson., 2022). These innovations help reduce the environmental impact of the final product and strengthen the company's reputation in the eyes of consumers. Consumers tend to choose products that have minimal environmental impact, so this strategy also helps to increase the competitiveness of companies. In addition to technical measures, education and training for employees is an important aspect of the CSR strategy. Companies that consistently provide training on sustainability and environmental awareness to employees find that employees become more concerned and actively participate in environmentally friendly practices. Employees who have a deep understanding of environmental impact are also more likely to adopt energy-saving and waste management practices in the workplace, thus supporting the company's sustainability goals. Collaboration between the company and the government and local communities is an effective CSR strategy (Boadi *et al*., 2018). Many manufacturing companies form partnerships with local governments and communities to carry out projects such as reforestation, water conservation, and upgrading recycling facilities in the neighborhood. This partnership not only has a positive impact on the environment, but also strengthens the social relationship between the company and the community, ultimately improving the company's image as an entity that cares about the sustainability and well-being of local communities.

Another benefit of implementing CSR in the manufacturing sector is the improvement of the company's reputation. In an era where consumers are increasingly aware of environmental issues, companies that show a commitment to sustainability tend to get more appreciation from the public. This good reputation also opens up opportunities for cooperation with partners who share the same vision, expanding the company's reach and providing a substantial competitive advantage. However, the implementation of CSR strategies is not without challenges. Some companies face the constraint of high initial costs for investments in renewable energy or recycling technologies. In addition, long-term commitments and internal support from all levels of the company are needed to ensure the sustainability of this initiative. However, the results of this study show that companies that invest in CSR ultimately get economic benefits that are equal to or even greater than the costs incurred.

In addition to environmental and economic benefits, the implementation of CSR strategies in the manufacturing sector also brings great social benefits. For example, through training that increases employee awareness, the company contributes to the formation of environmentally conscious behavior in the community. When employees bring eco-friendly practices from the workplace to their homes or communities, these positive impacts can multiply outside of the company's environment. The implementation of CSR strategies also provides opportunities to strengthen innovation in business. By focusing on sustainability, companies can look for new ways to produce and distribute products that are more efficient and environmentally friendly. This innovation not only reduces the negative impact on the environment, but also creates products that are more in line with the needs of modern consumers who are increasingly concerned about the environment. Overall, the implementation of CSR strategies in the manufacturing sector has proven to be effective in reducing

environmental impact while increasing the company's competitiveness. Through the use of renewable energy, waste management, product innovation, employee education, and collaboration with governments and communities, companies can achieve broader sustainability goals. These results show that social responsibility is not only an obligation, but also a business strategy that provides long-term benefits, both for the company and the environment.

CONCLUSION

The Corporate Social Responsibility (CSR) strategy implemented by manufacturing companies to reduce environmental impact shows an important role in creating sustainability. Companies have adopted various policies, such as the use of renewable energy, efficient waste management, and carbon emission reduction. However, the main challenges faced are the high initial investment costs and the difference in the level of managerial commitment to sustainability. Collaboration between the private sector and the government, with adequate incentive support, is essential to encourage the implementation of environmentally friendly technologies. In addition, the gap in access to technology between large and small companies needs to be considered so that all companies can contribute to sustainability efforts. Overall, while challenges remain, CSR strategies can have a positive impact on the environment and improve the company's competitiveness in the market, provided there is a strong commitment from all parties involved.

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