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Evaluating CSR Compliance and Its Reputational Impact: A Longitudinal Case Study of PT Vale Indonesia (2015–2024)

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Abstract: This study assesses the execution of Corporate Social Responsibility (CSR) at PT Vale Indonesia Tbk, emphasizing adherence to established policies and its influence on the company's reputation. Corporate Social Responsibility (CSR), designed to enhance societal and environmental value, is essential for fostering public trust and customer loyalty. The employed methodology is a descriptive technique utilizing secondary data gathered from annual reports, CSR documents, and literature reviews. The research findings reveal that PT Vale continuously executes CSR initiatives, despite a decline in the number of activities from 667 in 2015 to 82 in 2022. In 2022, the amount of CSR funds given out rose to USD 4.9 million. This shows that these programs are now more focused on quality than quantity. The company's reputation has gotten better, as shown by awards and public support, like the 2024 PROPER Emas. This report suggests that to make things more sustainable, we should make social impact projects better, use less energy, and move CSR programs online.

Introduction

Amid rising stakeholder expectations, corporate social responsibility (CSR) has become a pillar of governance and business strategy. CSR is not only related to compliance and impact mitigation, but also shapes corporate reputation, which directly influences public trust, customer loyalty, and global competitiveness. According to (Dmytriyev et al., 2021) Effective CSR strengthens trust and loyalty; the resulting reputation then supports the company's long-term performance.

Corporate Social Responsibility (CSR) programs are now increasingly being implemented in the industrial world. Companies are starting to respond to this concept as a form of corporate responsibility to society. The existence of companies in society can provide both positive and negative aspects. On the one hand, the company provides goods and services needed by the community, but on the other hand, the community will also get a bad impact from the company's activities(Tumbelaka et al., 2024).

Different departments within the company consider PT Vale Indonesia's core principle of "no business interruption" as essential to preserving employee safety and environmental sustainability in order to prevent interruptions in production activities. This value aligns with the company's operational objectives but does not always consider the social and cultural context of the surrounding communities. (Rismawati, 2015).

PT VALE, a prominent entity in the mining sector, has instituted numerous CSR initiatives to generate additional value for the local population and the environment. PT VALE's CSR initiatives encompass education, healthcare, and the economic development of the community. However, the successful implementation of CSR in accordance with the established criteria, along with its impact on the company's reputation. necessitates additional assessment (Fatima & Elbanna, 2023).

The implementation of CSR based on local wisdom is crucial to support the execution of programs that align with the conditions and characteristics of the local community. This has a lot to do with how businesses fulfill their social responsibilities to get support from the community and be effective. which ultimately impacts the company's reputation (Sahib et al and Rismawati., 2023).

The goal of PT VALE's Corporate Social Responsibility (CSR) program is to improve the lives of people in the communities where it works while reducing the negative effects of its business activities, such as harming the environment and causing social injustice.. The company strives to implement sustainable and ethical business practices. Therefore, it is essential to evaluate the extent to which PT VALE complies with its social responsibility obligations and how this compliance influences public perception and various stakeholders.

The proper application of CSR not only enhances the company's reputation but also generates new business prospects and improves competitiveness in the global market. The way PT VALE interacts with other groups, like government agencies, non-governmental organizations, and local communities, can also be affected by how well their CSR program works. The company needs to put sustainability principles that are in line with global development goals, like the Sustainable Development Goals (SDGs), at the top of its list of things to do. To make sure that the good things that CSR programs do last and help the community and the environment, they need to be checked on regularly. (Rodrigues et al., 2022).

You can tell how well CSR is working by looking at things like how many activities were done, how many people were helped, and how it affected the environment. The decrease in CSR activities over the past few years shows a shift from doing a lot of things to doing fewer things that have a bigger effect and meaning.(Wirba, 2024)(Halkos & Nomikos, 2021). As part of this change, it is important to find and study the factors that make CSR programs successful and the methods that companies use to measure their success.

The goal of PT Vale's corporate social responsibility program is to improve the quality of life of the surrounding community while minimizing negative operational impacts. In practice, PT Vale carries out educational initiatives (e.g. scholarships and school strengthening), health (basic nutrition and sanitation), economic empowerment (business training and cooperative strengthening), and environmental rehabilitation (land reclamation and endemic tree planting). Data from 2015–2024 show a shift from 667 PPM activities (2015) to 82 (2022), along with an increase in the allocation of CSR funds to USD 4.9 million, and a strengthening of reputation—reflected in the acquisition of the 2024 Gold PROPER—as an indication of the shift from a quantity to quality approach to impact quality

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Departing from this context, this study aims to evaluate the compliance and effectiveness of CSR implementation at PT Vale and its longitudinal impact on corporate reputation, with an emphasis on the role of local wisdom in strengthening social acceptance. The expected contributions are: (i) to provide empirical evidence for mining companies regarding a more focused and impactful CSR design; (ii) to enrich academic discourse on the CSR–reputation nexus in the extractive sector; and (iii) to support the achievement of the Sustainable Development Goals (SDGs)—particularly SDG 8, 12, 13, 16, and 17. Ultimately, this research analyzes how PT Vale's CSR implementation influences its reputation, while also offering practical insights for mining companies in building sustainable relationships with stakeholders.

1. Corporate Social Responsibility (CSR) Theory (Carroll, 1991)

Corporate Social Responsibility (CSR) is a way to think about how businesses affect society as a whole. Carroll came up with the idea in 1991.It underscores that corporations are accountable not only to their shareholders but also to the wider society in which they function (Omidvar et al., 2025). Carroll's idea breaks down four levels of responsibility that businesses must meet in order to be considered socially responsible:

a. Fiscal Accountability

Making money is the most important thing for any business because it is what keeps it going and helps it grow.The most important duty of a business is to be economically responsible.Carroll argues that businesses must continuously produce goods and services with market value while ensuring the sustainability of their profits. Profitability lets businesses keep running, hire people, pay taxes, and help the economy grow. For a company to be able to keep its other CSR promises, it needs to do well economically. (Pouresmaieli et al., 2024)(Carroll, 2021). This duty is about the company keeping its basic financial promises and making sure it will be around for a long time.

b. Legal obligation

Carroll says that the second level of obligation is following the law. In this case, businesses must follow all rules and regulations that apply to their operations. Legal compliance means that the business follows the rules set by the government and other regulatory bodies. This means following rules about the environment and workers' rights.anti-corruption laws, laws that protect consumers, and tax limits, to name a few (Gawusu et al.2022). Carroll says that following the law is not only the right thing to do, but also the right thing to do because laws are the basic rules that all businesses should follow in any society.

c. Ethical Responsibility

Businesses are expected to comply with legal requirements and operate in an ethical manner. Ethical responsibility refers to the actions taken by businesses to meet social standards that are not explicitly stated in the regulations of each company. A company can choose to support fair trade, promote diversity and inclusion, or make sure that child labor is not used in its supply chain (Kandpal et al., 2024). An ethical business is one that does the right thing even when it doesn't have to and is honest in all of its dealings.

d. Philanthropic Responsibility

Philanthropic responsibility is one part of Carroll's CSR pyramid. It is based on voluntary values that aim to improve the well-being of society. There is no law or moral code that says businesses must do this; they do it in a responsible way to help communities. You can be charitable in a lot of different ways, like donating money to a charity, sponsoring a business, getting employees involved, and working on other community development projects. It shows that a company cares about social issues beyond what it has to do for business or the law.(Silva Junior et al., 2022)(Knott & Wilson, 2024). Companies can improve their reputations and gain the trust of important groups like customers, employees, and the general public by doing good things for others.

Application of Carroll's CSR Framework

Businesses like PT Vale use Carroll's CSR framework to evaluate and report on their work in social responsibility. PT Vale's sustainability reports explain how the company plans to deal with these four aspects of Corporate Social Responsibility (CSR). PT Vale gives an economic guarantee that its mining operations will be profitable. The company follows all mining laws in its home country and around the world. PT Vale promises to be honest in its business dealings, treat all of its workers fairly, and keep the communities where it works safe. The company puts money into social and environmental projects to make life better for people in the area.(Muhammad et al., 2024).

Carroll's theory divides corporate social responsibility (CSR) into four groups, which helps businesses figure out how to talk about and evaluate their contributions to the public good.It stresses how important it is to have a bigger view of corporate responsibility that goes beyond just making money and following the law. This view includes moral issues and voluntary contributions to society (Silva Junior et al., 2022). Using this idea can help companies come up with a CSR strategy that meets social expectations and helps the business last for a long time. "Evaluating CSR strategies is a way to find out how well a company's CSR efforts are helping it reach its sustainable development goals. This helps companies figure out what works and what requires improvement(Rismawati., 2023).

The ASEAN Corporate Governance Scorecard (ACGS) and other corporate governance frameworks are very important for making sure that businesses are clear and responsible. This is especially true for CSR programs, where stakeholders' demands for businesses to be ethical and environmentally friendly are becoming more and more important in how companies act and how the public sees them (Caronge et al., 2023)

2. Triple Bottom Line Theory (Elkington, 1997)

Changes the way businesses measure their success by going beyond traditional profit-based metrics. Elkington's method makes it clear that a company's success should be measured not just by how much money it makes, but also by how it affects people and the environment. The three main parts of the Triple Bottom Line (TBL) are people, the environment, and making money. Using real and open CSR helps the company's reputation and builds trust among stakeholders.(Aisyah Nur and Rismawati, 2024).

a. People: The Social Impact

The People part of TBL shows how socially responsible the company is, especially how it affects the communities where it does business. One part of this is looking at how business practices affect different groups of people, such as workers, customers, suppliers, and the community as a whole. A company that puts the social bottom line first wants to do things like treat workers fairly, respect human rights, help the community, and make the world a better place. This could include creating jobs and making sure everyone has a fair chance., providing quality healthcare or educational initiatives, or endorsing local social entrepreneurs (Aich et al., 2021). The fundamental principle is that corporations need to

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enhance the communities they impact, promoting goodwill and social advancement, rather than solely extracting revenue for shareholders.

b. Planet: Environmental Impact and Protection

The Planet dimension looks at how the business impacts the environment. It knows that businesses need to hurt the environment less and is making plans to protect and save natural resources for future generations. This includes a number of actions, such as cutting down on waste, using renewable energy sources, cutting down on carbon emissions, and making sure that raw materials are bought in a way that is good for the environment.It has programs that teach people how to take better care of the environment by designing products in new ways.manufacturing methods, and the adoption of circular economy ideas (Liute & De Giacomo, 2022)(Deberdt & Billon, 2023). The main idea is that businesses should help the environment by leaving as little of an impact on it as possible and trying to make the world a better place overall.

c. Profit: Economic Performance and Sustainability

The Profit part makes sure that businesses can stay in business and make money. The People and Planet parts deal with social and environmental issues. The Triple Bottom Line makes it clear that making money should not come at the expense of meeting social and environmental obligations, even though economic performance is still an important measure.This implies that enterprises ought to prioritize long-term profitability over immediate benefits (Verwaal et al., 2022)(Dmytriyev et al., 2021). Companies can make sure that growth doesn't hurt people or the environment by including ethical, social, and environmental factors in their business plans

Measuring CSR Indicators

1. The Triple Bottom Line approach helps businesses think about how they affect all three pillars in a careful way. Here are some important numbers that show how responsible a company is socially
2. Beneficiary count: This is the total number of people or groups who benefit from the business's charitable work, which could include projects for health care, education, or community development.
3. CSR Funds: The money that a business sets aside to support social and environmental projects: This includes giving money, making investments, and helping with projects that help the environment.
4. Greenhouse Gas (GGH) Emissions: A big part of being environmentally responsible is reducing carbon emissions from business activities.
5. Reclamation Land Extent: This is the amount of land that has been restored or rehabilitated, especially in industries like agriculture or mining where reclamation is important for protecting the environment.

Importance in Business Strategy

The Triple Bottom Line method helps businesses meet the growing global demand for sustainability by making sure their operations are in line with that demand and by keeping track of and reporting on their performance in a thorough way. When companies follow TBL rules, they usually get better at getting into new markets, keeping customers, and building their reputation. This is because investors, consumers, and government agencies care more about being socially and environmentally responsible. Using TBL in business strategy can also lower costs by making resources work better and more creatively. and a more dedicated staff (Dmytriyev et al., 2021)(An et al., 2021).

In the end, baseline theory changes how businesses see their place in society. It makes it clear that they shouldn't put people or the environment at risk to make money. It promotes a balance between economic growth, social welfare, and protecting the environment. This gives businesses a way to grow in a responsible, long-lasting, and meaningful way.

3. Stakeholder Theory (freeman, 1984)

Stakeholder theory was first put forward by R. Edward Freeman in 1984. It is an important part of business ethics and corporate social responsibility (CSR). Stakeholder Theory says that businesses have more responsibilities than the traditional view that says a company's main goal is to make as much money as possible for its shareholders. This theory says that businesses should think about and balance the needs of everyone who is affected by their work, not just shareholders.The stakeholders are a wide range of people and groups who care about what the business does and how it does it (Awa et al., 2024)(Pokhrel, 2024).

Stakeholders typically include:

1. The Local Community: Businesses have an effect on the communities where they work, both directly and indirectly. The way the company hires people, how it affects the environment, and the work it does for charity may have an effect on people who live nearby. Companies need to understand that they have a part to play in making these communities better places to live and work. They need to make sure that their operations help local development and don't hurt the quality of life in the community (Brandl et al., 2022).
2. The Government: Local, national, and international governments are very important for keeping an eye on business laws. They make rules and laws that businesses have to follow, like rules about taxes, workers' rights, and protecting the environment. People expect businesses to be open, follow the law, and work with the government to achieve goals that benefit society, such as improving the economy and public health, and environmental sustainability (M. Liu et al., 2025).

   Local partners and non-governmental organizations (NGOs) often support issues like protecting the environment, human rights, and corporate responsibility. Businesses that work with these groups and local partners show that they care about doing the right thing and helping their communities. Working with NGOs can help businesses be more socially responsible and improve their public image.(W. Liu & Heugens, 2024)(Harrison, 2021).
3. Workers and Contractors: Workers are important stakeholders because their health and safety have a direct effect on the business's output, performance, and reputation. An accountable company gives its workers fair pay, safe working conditions, chances to grow, and a balance between work and life. Contractors and suppliers are often part of the company's supply chain, are stakeholders and merit equitable treatment and respect (Omar et al., 2023)(Yan et al., 2022).
4. The Environment: Businesses and society as a whole have made protecting the environment their top priority. People are expecting businesses to waste less, protect natural resources, use methods that are good for the environment, and have less of an impact on the environment. This duty not only helps the environment, but it also meets the needs of customers and regulators as they grow.for goods and services that are good for the environment (Baratta et al., 2023)(Fatimah et al., 2023).

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To make sure their businesses last a long time, companies need to use Stakeholder Theory in their decision-making and corporate governance. Instead of seeing their relationship with stakeholders as a transaction, companies that take this view see it as a dynamic, ongoing exchange that carefully weighs and balances the needs, expectations, and interests of all parties. This means that companies need to take a broad view of CSR, measuring success not just by how much money they make but also by how they help society and the economy, and the environment (Kavadis & Thomsen, 2023).

Stakeholder Theory also says that businesses should talk to stakeholders and ask for their thoughts and opinions ahead of time to make sure that their plans meet the needs of the public. When organizations make decisions with the needs of their stakeholders in mind, they can earn loyalty, trust, and a good name. This gives you an advantage over your competitors. lowering risks and promoting long-term business growth(Dmytriyev et al., 2021).

This is why CSR strategies that are based on Stakeholder Theory put making shared value ahead of reducing harm. This makes sure that everyone who has a stake in the business gets fair and lasting benefits from its activities. When companies think this way, they see their jobs as part of a bigger system where what they do affects the health of others and what others do affects their health. This leads to a more honest and open way of doing business that will be good for the company and for society as a whole in the long run

The idea of legitimacy comes from the fact that organizations are part of a social structure and don't stand alone. They need to make sure that their actions are in line with the law and social norms in order to get support from important groups like the general public, government agencies, non-governmental organizations (NGOs), and other social institutions.

4. Legitimacy Theory

According to legitimacy theory, businesses engage in corporate social responsibility, or CSR, in order to gain and maintain the social legitimacy that is essential to their continued existence and prosperity. According to this theory, legitimacy is the general belief that a business is acting appropriately. desirable, or acceptable within the context of societal norms and values (Islam et al., 2020).

The idea of legitimacy is based on the idea that organizations are part of a social structure and don't exist on their own. They need to make sure that their actions are in line with social norms and the law if they want to get support from important groups like the general public, government agencies, non-governmental organizations (NGOs), and other social institutions. If a business doesn't follow the law or goes against social norms, it could lose its legitimacy. This could hurt its reputation, public trust, and, in the end, its ability to do business (Mbunge et al., 2021).

A company can only be credible in terms of corporate social responsibility (CSR) if it chooses to do things that aren't just about making money. The fact that these programs focus on moral, social, and environmental issues shows that the company wants to make the world a better place (Risi et al., 2023).

One of the main ideas behind legitimacy theory is that companies are always under pressure from outside groups like society and government. The media, public scrutiny, changes in the law, or changes in what consumers want can all put pressure on businesses. Companies often use corporate social responsibility (CSR) programs to show that they are responsible and to reassure stakeholders that they are following socially acceptable standards.

Reports on sustainability are crucial to this communication process. These reports are used by businesses as an open and responsible way to showcase their CSR efforts and achievements. By publishing these reports, businesses aim to maintain their credibility by highlighting their compliance with environmental laws, moral business practices, and contributions to the well-being of society.The reports offer a medium for corporations to address issues, rectify unfavorable impressions, and reaffirm their dedication to long-term sustainability (Ivic et al., 2021).

These reports are also a way for companies to deal with problems outside of the company and shape public opinion and build goodwill. CSR initiatives that are well-written in sustainability reports can help a business improve its brand image, relationships with stakeholders, and edge over the competition in the market.

Legitimacy theory says that CSR is a key way for businesses to stay socially legitimate, especially when they are being pressured by outside forces. Companies can get people to support them by putting CSR policies in place and making them clear in sustainability reports.fit in with what people believe in, and in the end, make sure their long-term success and viability (Akhter et al., 2023)(Zhang et al., 2024).

5. Sustainable Development Theory

The Brundtland Report (1987) talks about sustainable development, which is making progress that meets the needs of the current generation while also making sure that future generations can meet their own needs. This word was very important for making policies and plans to control global development by putting together a full picture that included environmental, social, and economic factors. The Brundtland Commission, led by former Norwegian Prime Minister Gro Harlem Brundtland, defined sustainable development as "development that meets the needs of the present without putting future generations' ability to meet their own needs at risk (Islam et al., 2020)(Wang et al., 2023)."

For development to be sustainable, there must be a balance between three important pillars: economic growth, social inclusion, and environmental protection. It recognizes that long-term economic growth cannot come at the expense of the environment or people's well-being. The study stressed that traditional models of economic growth often ignore environmental sustainability, which leads to the loss of biodiversity, the depletion of natural resources, and climate change, so jeopardizing future economic and social progress (Hariram et al., 2023)(Jabeen & Khan, 2022).

Sustainable development is more than just not hurting the environment; it also includes the idea of regenerative development. Not only should development programs reduce the harm they do to the environment, but they should also help by restoring ecosystems, promoting social justice, and making communities stronger.

Corporate Social Responsibility (CSR) is now a key part of efforts to promote sustainable development because people see businesses as being responsible to the community and the environment as a whole. Corporate Social Responsibility (CSR) means that a company is committed to doing business in a way that is good for the environment, society, and the economy. It goes beyond the company's goal of making the most money by taking into account the needs of many different groups, such as employees, customers, communities, and the environment., into decision-making processes (Aagaard, 2022).

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Corporate Social Responsibility (CSR) is an important tool for achieving sustainable development because it makes sure that companies' actions are in line with the goals of society as a whole. Companies that use CSR programs might try to be more environmentally friendly, support fair labor practices, help local communities, and promise to be a good business. These steps not only make society healthier, but they also make the company more likely to survive in the all the time by lowering the risks of social unrest, environmental damage, and government demands.In response to the increasing need for environmental stewardship, businesses may adopt sustainable practices such as minimizing greenhouse gas emissions, utilizing renewable resources, and fostering circular economies. Likewise, CSR projects may encompass endeavors to mitigate poverty, enhance education, and promote diversity by tackling social disparities.

In this context, CSR functions as a mechanism for companies to evolve from conventional profitcentric models to those that foster long-term value creation for shareholders, society, and the environment alike. By emphasizing sustainable development, enterprises can augment their competitive edge, foster robust partnerships with stakeholders, and advance the overarching objective of attaining global sustainability.

There is a strong link between corporate social responsibility (CSR) and sustainable development. At both the business and societal levels, CSR is a big part of promoting sustainability. As issues like climate change, lack of resources, and social inequality get worse around the world, businesses that follow the rules of sustainable development will have a better chance of doing well in a world that is changing quickly (Aslaksen et al., 2021).

This comparative review aims to improve the conceptual framework and show how each theoretical perspective relates to sustainability-oriented CSR by bringing together important CSR theories and their links to important Sustainable Development Goals (SDGs):

Table1: Comparative Summary of CSR Theories and Linkages to SDGs

Theory	Core Focus	Relevance to CSR Practices	Linkage to SDGs
Carroll's CSR Pyramid	Economic,Legal, Ethichal, andPhilantropic responsibility	Emphasizes a multi-level foundation for corporate conduct	SDG 8 (Decent Work), SDG 16 (Institutions)
Triple Bottom Line (TBL)	People, Planet, Profit – sustainability beyond financial metrics	Encourages balance of social, environmental, and economic impact	SDG 12 (Responsible Consumption), SDG 13 (Climate Action)
Stakeholder Theory	Businesses must consider interests of all affected stakeholders	Promotes inclusive CSR engagement across stakeholder groups	SDG 17 (Partnerships), SDG 10 (Reduced Inequalities)
Legitimacy Theory	Organizations seek legitimacy through alignment with societal norms	CSR as a tool to build trust and maintain social license	SDG 11 (Sustainable Communities), SDG 16
Sustainable Development	Meeting present needs without Compromising future generations	CSR aligned with longterm environmental and social goals	All 17 SDGs, esp. SDG 7, 13, 15

This framework for comparison connects theoretical ideas with global standards for sustainability. It also strengthens the idea that PT Vale's CSR practices fit with certain SDG goals

Research Method

This study used a quantitative-descriptive method to look at how well PT Vale Indonesia Tbk. followed Corporate Social Responsibility (CSR) rules and what the long-term effects were. The focus is on evaluating the influence of CSR initiatives on corporate reputation through social and environmental performance metrics (Hardiningsih et al., 2024).

This research employs secondary data obtained from PT Vale Indonesia's annual reports, sustainability reports, CSR program documents, and pertinent government publications covering the period from 2015 to 2024. The ten-year period was chosen so that a longitudinal study could be done and changes over time and new trends in corporate social responsibility (CSR) could be looked at implementation (Indonesia, 2023)(Muhammad et al., 2024).

The unit of analysis focuses on corporate social responsibility (CSR) initiatives and performance metrics at the organizational level. This includes the number of CSR projects (Community Development and Empowerment/PPM), the amount of money given out for CSR (in USD), the number of people who benefit from the program, and the amount of greenhouse gases (GHG) released. Using energy; Land reclamation (in hectares): The effect of CSR programs on business reputation measures like awards, trust from stakeholders, and outside evaluations of sustainability.

We look at the data using a mix of:

1. Trend analysis helps us understand how the direction of CSR implementation has changed and what patterns have stayed the same over the past ten years.
2. Use simple linear regression to see how CSR investments, like money spent, affect results, like getting more recognition for your reputation or helping more people.
3. A Pearson correlation study to see how strong and in what direction the links are between CSR program variables and environmental performance indicators, such as GHG intensity and energy use.

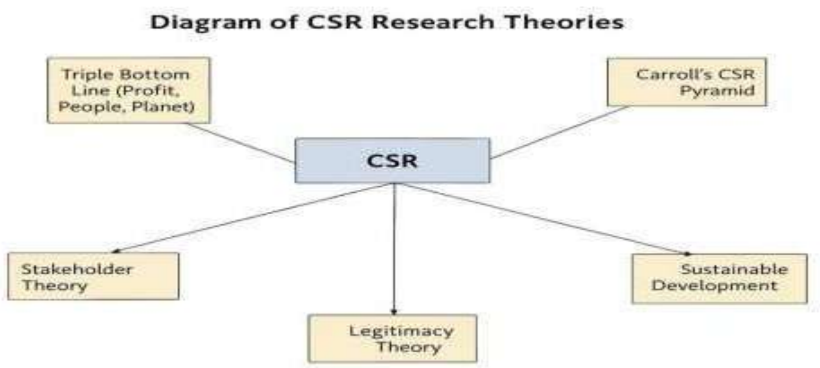

Figure 1. Conceptual Framework

Result and Discussion

This section looks at and judges the real-world data from PT Vale Indonesia's CSR reports, environmental disclosures, and sustainability statistics from 2015 to 2024. The

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purpose of this study is to look into the trends, patterns, and links between key performance indicators that have to do with community development, environmental stewardship, and business reputation (Muhammad et al., 2024)(Machanguana & Dias Sardinha, 2021).The data encompass various aspects of CSR performance, including the quantity of Community Development and Empowerment (PPM) programs, total CSR fund allocation (in million USD), number of individual beneficiaries, greenhouse gas (GHG) emissions (in tons CO_2 equivalent), energy consumption (in gigajoules), land reclamation efforts (in hectares), and the number of trees planted. These indicators were chosen to show both the social and environmental aspects of corporate responsibility, in line with SDG and sustainability reporting standards(Muhammad et al., 2024).

The table below shows a summary of different CSR indicators over the past ten years. This information will be used for trend analysis, correlation, and regression testing.

Table 2: Table Path Coefficients

Year	Ppm program (number of activity)	PPM fun (million Usd)	Beneficiarie (individual)	GHG emissions (TON Co2 eq)	Energi (GJ)	Lan reclamation (Ha)	Number of Trees planted
2015	667	4.2	40,295	859,406	28,552,292	74,09	-
2016	292	3.4	35,517	944,094	26,525,186	51,04	158,213
2017	285	2.2	12,386	1,188,674	26,409,890	57,54	184,508
2018	20	3.0	32,720	2,082,580	25,904,448	93,31	78,400
2019	47	3.4	38,000	1,909,279	22,958,664	81,09	79,372
2020	28	4.1	21,000	2,157,208	30,628,679	176,24	104,333
2021	54	2.6	43,205	1,971,075	28,551,417	283,74	219,595
2022	82	4.9	15,540	1,748,552	26,956,105	295,43	179,993
2023	164	3.7	61,598	2,032,313	30,974,879	224,40	171,702
2024	-	-	-	2,135,742	32,225,296	178,90	139,151

Key Components Analyzed:

1. Number of Community Development and Empowerment Programs (PPM)
   PT Vale Indonesia Tbk runs a lot of PPM programs all the time to make life better for people in the areas where the company works.
   Analysis: There were 667 activities in 2015, which was the most. This shows that the program was getting bigger very quickly. After that, the number of programs slowly dropped, and by 2022 there were only 82 left. This is probably because people started to care more about how well something worked than how many there were, then saw an increase of 164 programs in 2023.

Table 3. PT Vale Indonesia Tbk runs a lot of PPM programs

Year	He number of programs PPM
2015	667 program
2016	292 program
2017	285 program
2018	20 program
2019	47 program
2020	28 program
2021	54 program
2022	82 program
2023	164 program

2. Amount of Funds Disbursed:
   PT Vale gives money directly to different areas for CSR, such as education, health, infrastructure, and helping people become more financially independent.

Table 4. CSR of PT Vale

Year	Funds are Distributed (USD Juta)
2015	4,2 juta
2016	3,4 juta
2017	2,2 juta
2018	3,0 juta
2019	3,4 juta
2020	4,1 juta
2021	2,6 juta
2022	4,9 juta
2023	3,7 juta

Analysis: Despite the number of programs going down, there was a big increase in 2022, reaching USD 4.9 million, the highest amount during the whole period. This means that the programs that were put in place in 2022 were more useful or strategic, and they probably had a bigger effect on quality.

3. Number of Beneficiaries
   The number of people who directly benefit from Vale's corporate social responsibility (CSR) programs.
   Analysis: The program helped the most people in 2015, when more than 40,000 people got help. The number of beneficiaries may have gone down in the years that followed, but the targeting strategy may have become more focused and specific to meet the needs of the community.

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Table 5. Number of beneficiaries from Vale's corporate social responsibility

Year	Beneficiary(Individual)
2015	40.295
2016	35.517
2017	12.386
2018	32.720
2019	38.000
2020	21.000
2021	43.205
2022	15.540
2023	61.598

4. Greenhouse Gas (GHG) Emissions Total GHG Emissions (Scope 1 and 2)

Table 6. Greenhouse Gas (GHG) Emissions Total GHG Emissions

Year	Total GHG Emissions (Ton CO_2 eq)	Emission eq/Ton Ni)	Intensity(Ton	CO_2
2015	859.406	10,59	10,59	
2016	944,094	12,17	12,17	
2017	1,188,674	15,47	15,47	
2018	2,082,580	28,75	28,75	
2019	1,909,279	26,36	26,36	
2020	2,157,208	29,78	29,78	
2021	1,971,075	27,21	27,21	
2022	1,748,552	19,10	29,10	
2023	2,032,313	28,73	28,73	
2024	2.135.742	29,95	29,54	

Analysis: Greenhouse gas (GHG) emissions have experienced a sharp increase since 2020, primarily due to production expansion. The amount of greenhouse gases emitted per ton of nickel has stayed about the same, around 30 tons of CO_2 per ton of nickel. This shows how hard it is to be more efficient with emissions while making more.

5. Energy Consumption

Table 7. Energy Consumption

Year	Total Energy (GJ)	Energy Intensity(GJ/Ton Ni)
2015	28,552,292	351,7
2016	26.525.186	341,9
2017	26.409.890	343,8
2018	25,904,448	357,6
2019	22,958,664	317,0
2020	30,628,679	422,8
2021	28,551,417	394,2
2022	26,956,105	448,6
2023	30,974,879	437,9
2024	32,225,296	445,7

Analysis: Since 2022, energy use has gone up along with production. The energy intensity has gone up, which means that there is more energy needed for each ton of nickel. This could be because the ore is wetter or of lower quality, as the 2024 report 6 says.

6. Reclamation and Land Rehabilitation

Table 8. Reclamation and Land Rehabilitation

Year	Rehabilitated Land (Ha)	Number of Trees Planted	Endemic TREE
2015	74,09	-	–
2016	51,04	158,213	–
2017	57,54	184,508	–
2018	93,32	78,400	
2019	81,09	79,372	
2020	176,24	104,333	
2021	283,74	219.595	22.206
2022	295,43	179.933	17.631
2023	224,40	171.702	14.441
2024	178,90	67.903	13.457 (±)

Analysis: In 2022, the most land was reclaimed, but by 2024, it had dropped to 178.90 hectares. This drop happened because operations weren't going well and there was a lot of rain, which made the ore wet. The number of trees planted also went down, but the promise to plant only native species stayed the same to protect biodiversity.

7. B3 for getting rid of trash.

Table 9. B3 for getting rid of trash

Year	Waste B3 (Ton)	Waste Utilization(Ton)
2022	13.792	–
2023	2.041	–
2024	2.407	1.453

Analysis:The amount of hazardous waste (B3) increased again in 2024 after a sharp decline in 2023. However, the reutilization of 1,453 tons of hazardous waste indicates that the circular economy approach is beginning to be implemented.

CSR Compliance Evaluation and Reporting Standards

PT Vale Indonesia does a great job of following both national and international rules when it comes to evaluating and reporting on its Corporate Social Responsibility (CSR) activities. By following the Global Reporting Initiative (GRI) G4 Core criteria, the organization makes sure that its sustainability disclosures are consistent, clear, and easy to compare. This makes sure that performance metrics and activities related to corporate social responsibility are shown in a way that is clear and easy to compare. PT Vale also makes sure that its CSR strategy follows international moral rules, like the United Nations Global Compact (UNGC) principles and the ISO 26000 guidelines for social responsibility. This shows that the

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company is serious about protecting human rights, workers' rights, the environment, and long-term growth, as well as fighting corruption (Rathobei et al., 2024).

PT Vale follows the laws and rules set by the Indonesian government. They also choose to follow global rules. This means following Law No. 4 of 2009, which says that mining companies have to take care of the environment and the people around them when they mine minerals and coal. The company follows its Work Contracts (Kontrak Karya) and any changes to them, as well as the specific rules for community development that the Ministry of Energy and Mineral Resources has set out. and giving people power in the mining sector (Muhammad et al., 2024).

PT Vale is a good company that cares about doing the right thing, protecting the environment, and making sure the communities where it works are healthy in the long term. This is clear from its dedication to both national and international legal systems at the same time.

CSR Impact Evaluation

A. Social Impact

PT Vale Indonesia's CSR programs have made a real difference in society, especially in the areas of health and giving people more power in their communities. One big success is that some of the communities that have been helped now have fewer people who are malnourished. This is because there are specific programs for nutrition, sanitation, and the health of mothers and children. The group has come up with a participatory development model in which people don't just get charity; they also help plan, carry out, and evaluate CSR programs. This all-encompassing plan has made the program more relevant, given it more local ownership, and made it more likely to last for a long time. PT Vale has also helped the social capital of nearby communities by training and supporting local leaders and institutions. The CSR program is in line with the Sustainable Development Goals (SDGs), especially SDG 3 (Good Health and Well-Being) and SDG 17 (Partnerships for the Goals). The rise in civic engagement and the better basic health metrics show this. These results show that the company is committed to mining methods that are good for society as a whole.(Muhammad et al., 2024).

B. Economic Impact

PT Vale's CSR programs have a clear effect on the economy because they help local businesses that make money become more profitable and help local economic institutions come back to life. Sales have gone up by 10% to 20% for small businesses in villages that PT Vale helps, especially those that process food, make crafts, and farm on a small scale. These changes are the result of large programs that offer financial help, business training, and make it easier for people to enter the market. Village cooperatives (koperasi) have also seen a big rise in their activities. These groups have been very important for helping people save money, get loans, and grow the economy. This CSR-driven economic boost helps poor people in rural areas while also making communities stronger and giving people more control over their money. These successes support SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth) and show how well-planned business programs can help the local economy grow (Espinoza-Figueroa et al., 2025)("Green Energy Technol.," 2006). PT Vale's dedication to inclusive growth enhances its social license to operate in mineral-rich yet economically fragile areas.

C. Impact on Company Reputation

PT Vale Indonesia has effectively utilized its CSR initiatives to enhance its corporate reputation at both local and national tiers. The group has received many awards for its commitment to transparency, good governance, and protecting the environment. Local governments and the wellknown Sustainable Business Awards (SBA) from PwC, IBCSD, and Global Initiatives are among the awards PT Vale has won for its ongoing work in social and environmental areas. The company has also earned the trust of important outside groups, such as the media, regulators, and NGOs, who see it as a model for mining practices that are good for the environment (Camba et al., 2022)(Muhammad et al., 2024). Having a better reputation has real benefits, like stakeholders trusting you more and the process of renewing and keeping operational permits going faster. People in the area and investors are more confident, which has led to stable operations and the creation of long-term value. These results show that CSR can be both a moral obligation and a way to improve your reputation when done strategically, as SDG 16 (Peace, Justice, and Strong Institutions) says.

Land Reclamation and Trees Planted

The map depicts the trend of land reclamation (in hectares) alongside the quantity of trees planted by PT Vale Indonesia from 2015 to 2024. Land reclamation activities saw a notable escalation commencing in 2020, reaching a zenith in 2022 at approximately 300 hectares, subsequently experiencing a progressive decrease until 2024. The most trees were planted in 2021, with more than 219,000. It had dropped to about 67,000 by 2024. This drop could mean that the company's environmental rehabilitation efforts are getting better or that they are changing their strategy. Both sets of numbers show how committed PT Vale is to protecting the environment (Hapich and Onopriienko2024)(Mohi Ud Din et al., 2025).

Result and Discussion

1.Social CSR Program Performance

How well the social CSR program works PT Vale has run hundreds of Community Development and Empowerment (PPM) programs every year, with the most in 2015 (667 programs). There are fewer programs now than there used to be, but in 2022, they gave out a lot more money (USD 4.9 million). This shows that the focus has shifted from how many programs there are to how good they are. The number of people who have benefited has changed over time, but it has been more than 15,000 on average each year. But the results of the regression show that the amount of money and the number of people who benefit are not statistically significant, which means that other factors are affecting how well the program works (Bittner et al., 2023)(Namikawa et al., 2025).

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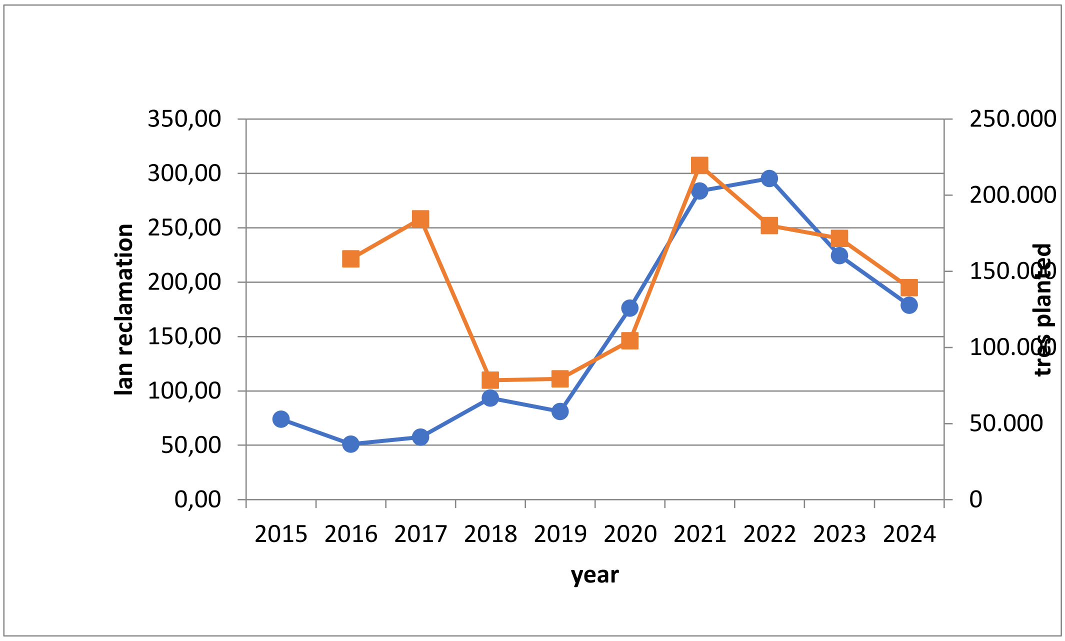

Figure 2. Land Reclamation and tres planted

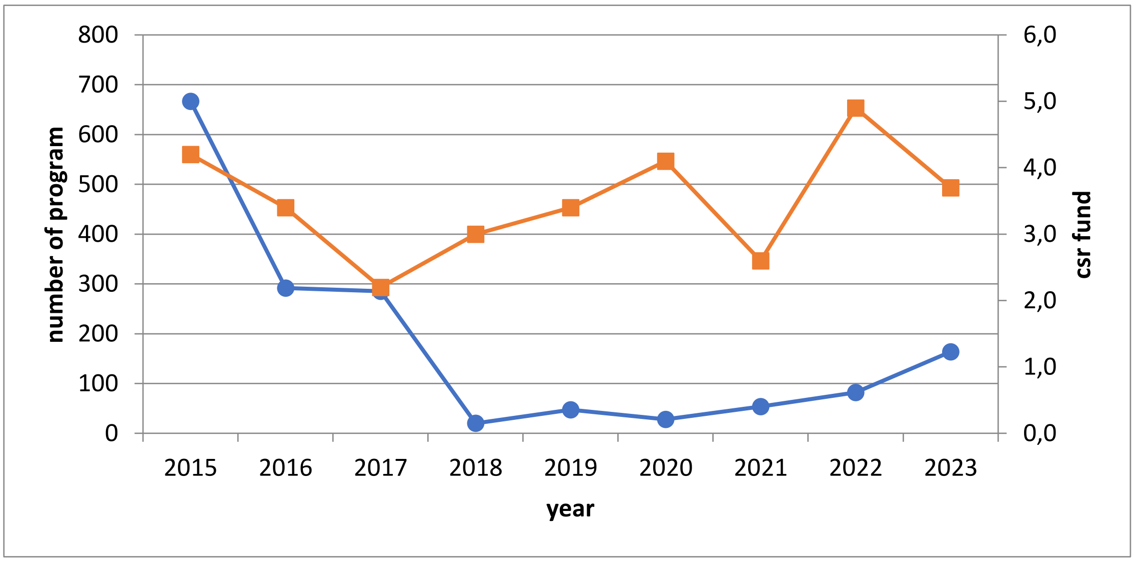

Figure 3. CSR Program and Fund Allocation (2015-2024)

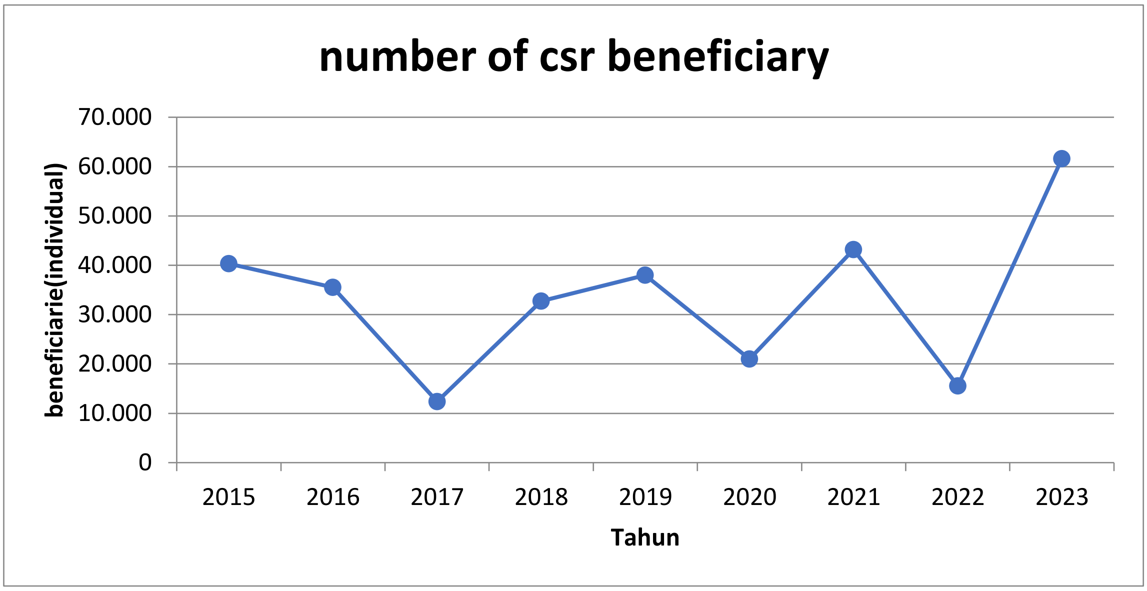

Figure 4. Number of CSR Beneficiarie

The figure reached over 40,000 individuals in 2015, thereafter experiencing a steep decrease to around 12,000 in 2017. Despite a subsequent steady increase, the value remained much beneath the starting level. This tendency, juxtaposed with the decline in CSR programs yet an increase in funding, suggests a strategy shift by PT Vale Indonesia from a comprehensive approach to a more concentrated, high-impact mode (B, 2022)(Boakye Dankwah et al., 2024)l. The results indicate a transition towards quality rather than quantity, emphasizing more customized, transformative activities designed to generate profound, enduring advantages for targeted areas.

1. Environmental Performance: GHG emissions have nearly doubled since 2015, in line with increased production. However, emission intensity remains controlled, indicating the effectiveness of energy efficiency strategies and emission management. Energy use has also continued to rise, but more than 30% of the energy comes from renewable sources, such as hydroelectric power and biomass. Land reclamation programs and tree planting activities continue, although the land area decreased in 2024. The planting of endemic tree species demonstrates a genuine effort in biodiversity conservation

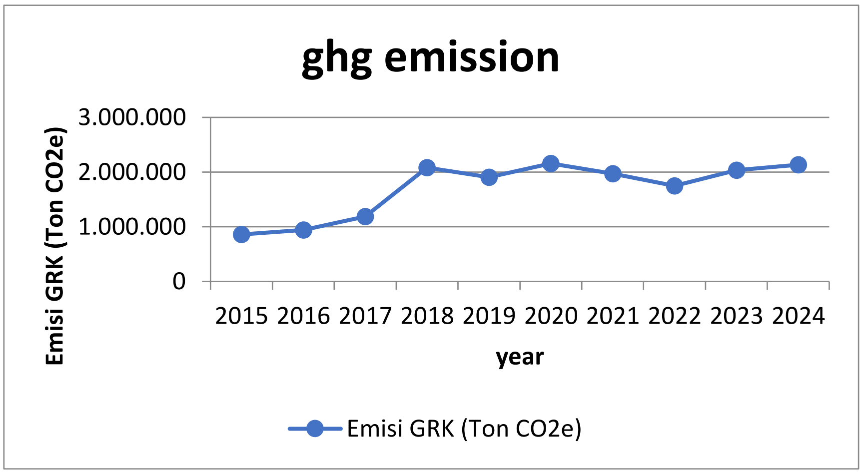

Figure 5. GHG Emissions Trend

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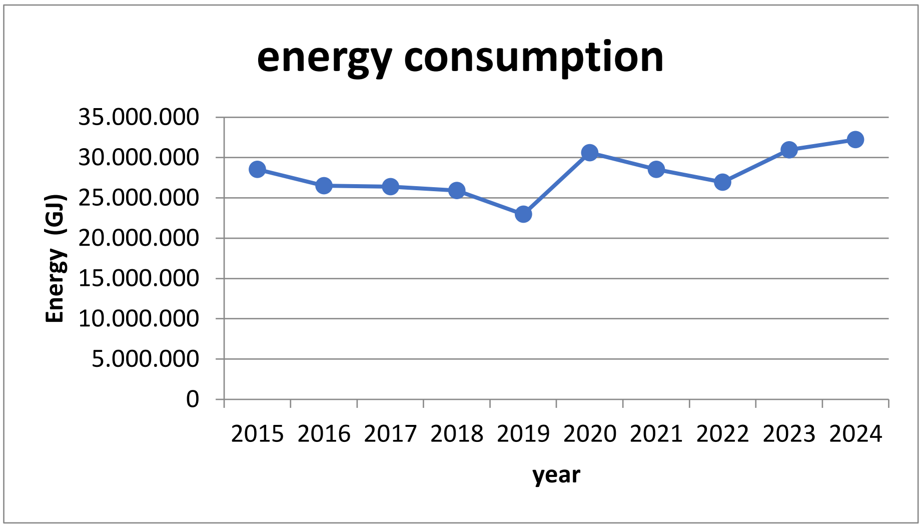

Figure 6. Energy Consumption

The trajectory in environmental performance indicates a dynamic correlation between greenhouse gas (GHG) emissions and energy consumption from 2015 to 2024. The first picture shows that greenhouse gas emissions rose quickly starting in 2018 and reached about 2.7 million tons of CO_2 equivalent in 2021. This big rise happened at the same time as a time when production was going up. The company's overall emissions have gone up, but the intensity of those emissions has stayed pretty much the same. This shows that the energy-saving programs, better technology, and better ways of doing things that have been put in place in the last few years have worked. A modest reduction in emissions over 2022–2023 suggests enhanced operational management, notwithstanding a tiny increase noted in 2024 (Xu et al., 2023)(Wei et al., 2022).

Simultaneously, energy consumption patterns indicate a steady rise since 2018, with energy usage surpassing 31 million gigajoules (GJ) by 2024. After a drop in 2016, energy demand slowly rose again, especially after 2020. This was a sign of more industrial activity and capacity. Even though this number is going up, more than 30% of the energy used today comes from renewable sources like hydroelectric and biomass. This makes industry less carbon-intensive overall. The two patterns show that PT Vale Indonesia is growing while also making sure that its basic operations are good for the environment. The company's use of intensity controls, a higher percentage of renewable energy, and reforestation programs like reclamation and tree-planting show that it is committed to sustainable mining. The company is serious about mining in a way that doesn't hurt the environment because of these programs.

The two patterns show that PT Vale Indonesia is growing while also making sure that its basic operations are environmentally friendly. The company's commitment to sustainable mining operations is shown by its use of intensity controls, a higher percentage of renewable energy, and reforestation programs like reclamation and tree-planting. These programs show that the company is serious about mining in a way that doesn't harm the environment.

2. Governance and Theoretical Integration

PT Vale Indonesia is very dedicated to following internationally recognized standards for corporate governance, such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the International Council on Mining and Metals

(ICMM), and the Task Force on Climate-related Financial Disclosures (TCFD). The company has improved its governance because it received the highest PROPER rating, moving from "blue" in 2020 to "gold" in 2024. This means that it is following better environmental and social standards than what is required.(Ardillah, 2023)(Hasanah et al., 2022). Grievance channels, ESG-oriented supply chain audits, and proactive transparency measures all show how responsible and responsive the company is to its stakeholders.

PT Vale's CSR and environmental plans work better because of this strong governance system. The company has made a lot of progress in a number of areas since 2015, such as changing its CSR programs from quantity-focused to quality-focused, increasing funding for CSR, decreasing emission intensity while increasing production levels, using more renewable energy, and continuing land reclamation and biodiversity projects (Ahmad et al., 2024).

These patterns not only work in real life, but they also back up the connections made in theory. The company's growing CSR strategy is based on the main ideas of Stakeholder Theory, which says that businesses should meet the needs and expectations of many groups of stakeholders, not just shareholders (Awa et al.2024). Concurrently, the observable endeavors to fulfill societal and environmental standards align with Legitimacy Theory, illustrating how corporations sustain societal endorsement through transparent and accountable behavior. Consequently, governance, impact, and strategy are amalgamated into a cohesive sustainability story.

Trend Visualization and Theoretical Integration

This study utilizes longitudinal analysis and trend visualizations (line and bar charts) to demonstrate the evolution of CSR implementation, as recommended for the final design. The number of CSR programs dropped sharply from 667 in 2015 to 82 in 2022. However, the amount of money spent on CSR rose from USD 2.2 million in 201. The number of CSR programs dropped sharply from 667 in 2015 to 82 in 2022. However, the amount of money spent on CSR rose from $2.2 million in 2017 to $4.9 million in 2022. This inverse link shows a change in strategy: moving from CSR programs that focus on quantity to fewer programs that are more meaningful and responsive to stakeholders. The focus has shifted to quality, value generation, and sustainable community results—consistent with Stakeholder Theory's assertion that firms must respond to the changing demands of their social context (Arhinful et al., 2025)(By-nc, 2021).

Furthermore, enhancements in environmental performance—such as peak land reclamation in 2022 and augmented planting of indigenous trees—underscore the company's dedication to ecological responsibility. These activities not only satisfy regulatory requirements but also bolster business legitimacy among regulators, local communities, and environmental NGOs. According to Legitimacy Theory, CSR serves as a means to sustain the organization's social license to exist amid increasing ecological consciousness.

Contribution to Innovation and Scholarship

The number of CSR programs dropped sharply from 667 in 2015 to 82 in 2022. However, the amount of money spent on CSR rose from USD 2.2 million in 201. This study is unique because it gives a long-term, data-driven look at CSR practices in the Indonesian mining sector, which is not well covered in the current literature. This study looks at data from 2015 to 2024 to improve our understanding of how long-term CSR commitments affect the environment and stakeholder trust, and reputational performance (Hendratama & Huang, 2021).

This study employs quantitative trend analysis, regression, and correlation to delineate the relationship between CSR investments and measurable social-environmental outcomes, in contrast to prior research that utilized cross-sectional or qualitative methodologies. The results emphasize the necessity of integrating CSR into long-term company strategy, particularly in resource-intensive sectors like mining, where public scrutiny and stakeholder expectations are notably elevated (Du et al., 2023)(Saeed & Sroufe, 2021). This integrative paradigm enhances existing CSR discourse and offers a reproducible model for assessing the legitimacy-building role of CSR in different emerging economies.

Conclusion

This study offers a longitudinal examination of Corporate Social Responsibility (CSR) execution by PT Vale Indonesia over a decade (2015–2024), utilizing secondary data from sustainability reports, regulatory disclosures, and performance metrics. The number of CSR programs dropped sharply from 667 in 2015 to 82 in 2022. However, the amount of money spent on CSR rose from USD 2.2 million in 201. The results show that the company's CSR strategy has changed from one that focuses on quantity to one that focuses on quality. This is shown by a big drop in the number of programs and an increase in financing and results that are important to stakeholders. This change shows that PT Vale is committed to making a bigger impact with fewer focused and innovative efforts.

From an environmental perspective, despite the rise in overall greenhouse gas emissions and energy consumption, the corporation effectively reduced its emission intensity by enhancing efficiency and increasing its dependence on renewable energy. Land reclamation and treeplanting initiatives, especially those emphasizing indigenous species, exemplify ecological stewardship. The report reveals that PT Vale's CSR initiatives have favorably impacted social and economic outcomes, such as enhanced community health metrics, elevated micro-enterprise revenue, and higher community engagement. Furthermore, the company's continual acknowledgment via awards and its elevated PROPER rating signify an improved business reputation and validity.

The research theoretically supports both Stakeholder Theory and Legitimacy Theory, indicating that ongoing CSR involvement bolsters stakeholder trust and institutional legitimacy. The study methodologically enhances CSR literature by providing a longitudinal and integrated approach that incorporates trend analysis, correlation, and regression. The results show how important it is for companies to make CSR a part of their long-term operations, especially in sectors that have a big effect. This analysis could be improved by looking at case studies or looking into mediating variables like governance, innovation, or social capital in future research.

Recommendations

1. Develop an Integrated CSR Digital Dashboard

Vale should put money into a CSR management platform that works in real time and is based on data. This dashboard should combine planning for programs, mapping stakeholders, keeping track of budgets, and monitoring results. Adding tools like GRI APIs, ESG data visualizations, or interactive SDG alignment modules could make things more clear and accountable.

2. Design Multidimensional Impact Measurement Tools

Make tools for measuring multidimensional impact.Instead of just looking at traditional output indicators like the number of beneficiaries, create impact metrics that show how society is changing, like empowerment indexes, poverty reduction scores, or changes in social capital. These tools would help make evaluations of CSR effectiveness more meaningful.

3. Strengthen Post-Mining Sustainability Programs

Reclamation programs should be able to change as needed because of the environmental problems we've had in the last few years, like land saturation and heavy rain. PT Vale could work with biodiversity NGOs to restore ecosystems, use nature-based solutions, and expand its rehabilitation work to include buffer zones.

4. Enhance Green Innovation to Manage Emissions

The company should use more clean technologies, integrate more renewable energy, and use more circular economy practices in its operations to deal with rising GHG emissions. Joining national programs to cut carbon emissions or setting Science-Based Targets (SBTs) could help you meet your goals and improve your reputation.

5. Foster Stakeholder Co-Creation in CSR Design

Work with local communities, academic partners, and NGOs to co-design CSR initiatives so that they are relevant to the situation and encourage long-term collaboration. This participatory approach is in line with SDG 17 (Partnerships for the Goals) and makes people feel more responsible for the results of development.

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