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Designing a Standard Operating Procedure for SROI Calculation at PT ASDP Indonesia Ferry (Persero)

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ABSTRACT

This study aims to develop a Standard Operating Procedure (SOP) and integrate Social Return on Investment (SROI) into tree planting Corporate Social Responsibility (CSR) program for PT ASDP Indonesia Ferry (Persero). SROI provides a framework for assessing the economic, social, and environmental value of the approach by linking activities to financial gains and carbon offset goals. The SOP outlines detailed guidelines for species selection, planting techniques, and maintenance, emphasizing compact planting areas to maximize efficiency and impacts. A comprehensive Monitoring, Reporting, and Verification (MRV) system, combined with stakeholder collaboration, is designed to enhance sustainability, ensure transparency, and support continuous improvement. These strategies ensure the harmonious achievement of social, economic, and environmental objectives.

KEYWORDS

Social return on investment
Standard operation procedure
Corporate social responsibility
State owned enterprises

INTRODUCTION

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, is a commitment to achieving peace and prosperity for people and the planet. At its core are the seventeen Sustainable Development Goals (SDGs), which underscore the urgent need for global cooperation and action from both developed and developing nations. The agenda emphasizes that tackling poverty and other forms of deprivation, addressing climate change, protecting oceans and forests, and fostering economic growth are interconnected goals. Key strategies include enhancing access to healthcare and education, reducing inequality, and promoting sustainable economic growth.

The Government of the Republic of Indonesia initiated the implementation of Corporate Social Responsibility (CSR) through Law No. 16 of 2016 concerning the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. This regulation demonstrates Indonesia's commitment to addressing climate change. Subsequently, in 2017, the President of the Republic of Indonesia issued Presidential Regulation No. 59 of 2017 on the Implementation of Achieving Sustainable Development Goals (SDGs), which encompass 17 goals accompanied by a

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National Action Plan and Regional Action Plan. These plans include five-year work programs and activities aimed at supporting the achievement of the SDGs at both regional and national levels. In the same year, the Financial Services Authority (OJK) introduced Regulation No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies. This regulation outlines three key requirements for publicly listed companies to support sustainable finance: (1) Sustainable Finance Action Plans, (2) Sustainability Reports, and (3) Fund Allocation for Social and Environmental Responsibility Activities.

Indonesia has experienced significant deforestation, largely driven by the palm oil sector and inadequate environmental controls. Between 2000 and 2016, approximately 13% of the nation's forest cover was lost, primarily due to the expansion of oil palm plantations aimed at meeting global demand for palm oil. This issue has been further exacerbated by local administrations, particularly in regions with decentralized governance, which have issued land conversion licenses for agricultural use, prioritizing economic development over environmental sustainability (Cisneros et al., 2021).

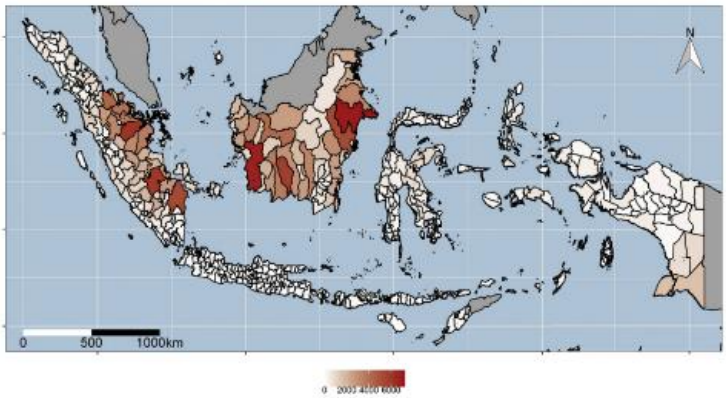


Figure 1. Total deforestation 2001–2016 per district (Cisneros et al., 2021)

Recent research using satellite data reveals that since 2001, over 700,000 hectares of Indonesian forests, including substantial areas of primary forest, have been cleared for mining activities. Between 2001 and 2023, mining operations—encompassing pits, processing facilities, tailings sites, and access roads—cleared an estimated 721,000 hectares (7,210 square kilometers) of forest. This includes approximately 150,000 hectares of primary forests, characterized by high carbon stocks, towering trees, and intact old-growth ecosystems (The Jakarta Post, 2024).

The Ministry of State-Owned Enterprises (SOE), responsible for managing government affairs related to State-Owned Enterprises, issued Regulation Number PER-05/MBU/04/2021 concerning the Corporate Social Responsibility (CSR) program of SOEs. This regulation was subsequently updated with the issuance of Regulation Number PER-1/MBU/03/2023, which addresses Special Assignments and CSR Programs of SOEs.

PT. ASDP Indonesia Ferry (Persero), as a State-Owned Enterprise, adheres to Regulation Number PER-1/MBU/03/2023, specifically Chapter III on CSR Programs, Article 12. This article mandates that SOEs implement CSR programs in accordance with the provisions set forth in the Ministerial Regulation. Additionally, the regulation emphasizes that CSR programs must follow principles such

as "measurable impact," which ensures that the programs contribute meaningfully and deliver tangible benefits that create value for both stakeholders and the company. The CSR programs are structured around key pillars, with the environment being one of the main pillars. This pillar focuses on the sustainable management of natural resources and the environment to support all forms of life.

Previous research combined the calculation of Social Return on Investment (SROI) with the PESTLE framework to evaluate the feasibility of implementing CSR programs (Saputro and Dwi, 2021). However, the study did not address how organizations could consistently conduct feasibility assessments internally, nor did it provide guidance or standards to ensure the evaluation process produces reliable and expected results. Additionally, prior research on Standard Operating Procedure (SOP) primarily focused on core company activities to reduce procedural deviations (Agustian and Hendri, 2022). As noted, CSR program implementation has now become mandatory for multinational and state-owned enterprises as stipulated by government regulations. To address this, the present study seeks to standardize the CSR program implementation process by developing a comprehensive SOP. The aim is to ensure CSR program outcomes are optimized, minimize internal fraud, and enhance the overall impact value received by the company.

Trees provide significant benefits to human well-being, including storing and sequestering greenhouse gases, filtering air pollutants, and producing wood, food, and other goods. However, these advantages are threatened by fires, pests, diseases, and climate change (Cavender et al., 2022). Approximately 45% of terrestrial organic carbon is stored in the biomass and soils of existing forests. Old-growth and regenerating forests absorb about 2 gigatonnes (Gt) of carbon annually, contributing to the global carbon sink. Research suggests that planting an additional 0.9 billion hectares of trees could sequester 205 Gt of carbon—equivalent to one-third of all anthropogenic emissions to date. At an absorption rate of 2 tons of carbon per hectare per year, realizing this potential would take over a century. To further reduce atmospheric CO_2 concentrations while preserving biodiversity, enhancing ecosystem services, and supporting regional economies, afforestation and reforestation are essential strategies (Waring et al., 2019).

Business issue

PT ASDP Indonesia Ferry (Persero), as a State-Owned Enterprise (SOE), is tasked with implementing CSR programs, including an annual tree planting initiative. This program requires significant budget allocation and involves extensive stakeholder coordination, often presenting logistical challenges. Additionally, the tree planting CSR program is implemented across all branches of PT ASDP Indonesia Ferry (Persero), further complicating its execution due to the scale and complexity of operations.

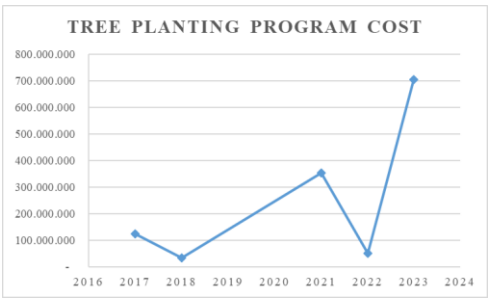


Figure 2. Cost of tree planting program for PT. ASDP Indonesia Ferry (persero) CSR program (Source: Author's analysis)

The lack of a Standard Operating Procedure (SOP) for the tree planting CSR program leads to varying interpretations regarding its technical implementation. One critical aspect is tree selection, as choosing the right species can significantly enhance the Social Return on Investment (SROI). A higher SROI value indicates a greater impact generated by the tree planting CSR program.

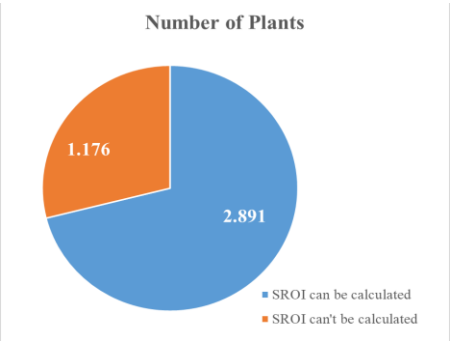


Figure 3. Number of plants in PT. ASDP Indonesia Ferry (Persero) CSR planting program (Source: Author's analysis)

In 2023, as part of its CSR initiatives, PT ASDP Indonesia Ferry (Persero) conducted a tree planting program involving 4,067 trees across all branches. The total cost of this CSR program amounted to Rp 471,150,000, charged to the CSR budget under the corporate secretary division. However, after calculating the SROI, only 2,891 trees, or 71% of the total planted, were assessable. This means that 29% of the planted trees, equivalent to approximately Rp 136,633,500, did not yield social benefits for the company and its stakeholders.

LITERATURE REVIEW

Tree Planting

Forest restoration efforts often fail in their rush to meet targets due to improper planting techniques, incorrect locations, and lack of local involvement. Successful reforestation initiatives require long-term maintenance by local communities and workers. Effective carbon sequestration depends on the strength of local institutions and social networks, which can be undermined by an overemphasis on

the mere act of planting trees (Fleischman et al., 2020). Ensuring sapling survival from the outset is critical for successful, cost-effective forestry projects. However, there is often insufficient attention given to sapling management during the planting phase or to the techniques employed in reforestation efforts. Key factors such as sapling vigor, soil moisture, transplant shock, and the care taken during planting all significantly influence sapling survival (Preece et al., 2023).

The following findings (Preece et al., 2023) can help increase plant survival rates:

a) Planting spacing and species combinations have minimal impact on survival rates. The poorer survival rate in monocultures is likely due to other factors.

b) Careful planting is essential to minimize root injury. Gently removing seedlings from planter tubes is crucial, as harsher planting methods are linked to lower sapling survival rates.

c) Grass competition must be avoided by removing grass before and for an adequate period after planting. However, there is no significant difference in survival rates between spraying herbicide along planting rows versus spraying over the entire area.

d) Before planting, the root bolus of saplings in nursery tubes should be thoroughly saturated with water. This ensures the sapling has sufficient moisture to avoid hydraulic failure. Additionally, planting with a planter spade to a minimum depth of 12 cm enhances the sapling's ability to access soil moisture, improving survival rates.

Natural forests, with their complex stand structures, accumulate carbon both below the surface and on the forest floor, storing more carbon than artificial forests. These characteristics take generations to develop. While secondary natural forests should be encouraged to regenerate, mature natural forests offer significant additional benefits and must be preserved. Planting trees on historically forested, high-productivity sites, often found in tropical or subtropical ecosystems, is expected to offset emissions most effectively. Using mixed species in planting initiatives tends to enhance productivity, reduce negative impacts, and improve biodiversity compared to monocultures. Three key factors determine the success of tree-planting efforts to establish new forests: (1) site selection, (2) species selection and site management, and (3) the final use of the wood generated (Waring et al., 2019).

Stakeholder mapping matrix

The power/interest matrix focuses on identifying stakeholders whose needs and expectations can influence the organization’s policies and priorities. It also helps identify stakeholders whose interests will be most impacted by the organization’s actions, those requiring ongoing involvement, and the prioritization of stakeholder interests to optimize resource utilization or leverage for maximum advantage (Yussif et al., 2023).

Social Return on Investment

The Social Return on Investment (SROI) concept was first developed by the Roberts Enterprise Development Fund in the United States as part of an effort to quantify and capture the value created by their employment services initiatives in San Francisco. The primary objective was to create a

financial method for calculating the benefits of work integration activities, which were often underreported. These figures could then be compared with program spending to generate a more accurate and comprehensive cost-benefit analysis. Over the past decade, the SROI Network, the Scottish government, and the New Economics Foundation (NEF, UK) have further expanded the approach in Europe (Brouwers et al., 2010).

The SROI Network outlines SROI as a framework comprising seven principles to ensure a thorough, transparent, and inclusive implementation or evaluation process. These principles are: involving stakeholders to consider their perspectives and contributions; understanding what changes by identifying and measuring tangible and intangible outcomes; valuing the things that matter by assigning significance to key outcomes; including only what is material to focus on relevant information for decision-making; avoiding unwarranted claims by relying on evidence and avoiding exaggeration; being transparent by clearly disclosing methods, assumptions, and results; and verifying the result to ensure accuracy and reliability through validation and independent review.

SIX sigma

Six Sigma is a systematic, highly focused approach that leverages proven quality principles and methodologies to achieve near-error-free business performance. Drawing on the work of numerous quality pioneers, Six Sigma integrates well-established concepts to enhance organizational efficiency. The Greek symbol σ (sigma) is used by statisticians to quantify the variability in a process. Organizational performance is assessed based on the sigma level of its business processes. Despite its name, the strength of Six Sigma lies not in sophisticated technology or statistical gimmicks but in the practical application of time-tested techniques. By certain measures, Six Sigma simplifies much of the complexity inherent in Total Quality Management (TQM). The implementation of lean Six Sigma typically follows one of two widely recognized methodologies: Define, Measure, Analyze, Improve, and Control (DMAIC) and Define, Measure, Analyze, Design, and Verify (DMADV).

The DMAIC methodology is utilized to minimize variation in existing processes, whereas the DMADV methodology is employed for designing new processes or systems. The DMAIC cycle is a widely adopted and crucial tool in lean Six Sigma, encompassing five interconnected phases that assist organizations in enhancing their processes (Sarwar, 2022). These tools are applied within the Define-Measure-Analyze-Improve-Control (DMAIC) framework, which offers a straightforward approach to performance optimization.

The DMAIC methodology can be summarized as follows:

- D (Define): Specify the goals of the improvement activity
- M (Measure): Assess the performance of the existing system
- A (Analyze): Examine the system to identify opportunities to bridge the gap between its current performance and the desired objectives
- I (Improve): Enhance the system to achieve the established goals
- C (Control): Monitor and regulate the new system to ensure sustained performance



Figure 4. Flowchart for lean six sigma (Sarwar, 2022)

Swimlane Diagram

Unlike other diagrams, swimlane diagrams represent user responsibilities within a modeled workflow, assign tasks to specific user groups, illustrate the task sequence, and include conditions to determine task priority when multiple tasks are available. These diagrams are widely regarded as effective tools for profiling a customer's business processes and organizational activities, thereby facilitating the validation process. By conceptualizing the business process as a series of sequential internal actions undertaken by an organization to deliver a valuable output, swimlane diagrams visually represent the steps that lead to business process models. These models enable the definition and analysis of business processes (Jeyaraj et al., 2014).

Cause and Effect Diagram

Any given problem may have numerous potential causes. Dr. Kaoru Ishikawa introduced a simple visual method to represent the causes of specific quality issues systematically. This approach organizes and visually displays a group's collective understanding of a problem, facilitating effective analysis and resolution. The Cause-and-Effect Diagram, also known as the Fishbone or Ishikawa Diagram, is one of the seven most widely recognized quality tools, providing a structured method to analyze causes and their resulting effects. This tool helps organizations identify, evaluate, and address quality-related issues (Deliou et al., 2023).

The Cause-and-Effect Diagram is straightforward to create, as outlined in the Six Sigma Handbook:

1. Draw a box on the far right of a large sheet of paper with a horizontal arrow pointing toward it. Inside the box, write a brief description of the problem to be resolved.
2. Above and below the horizontal line, write category names that serve as branches stemming from the main trunk.
3. Add specific causes for each category, representing them as smaller branches, twigs, or limbs connected to their respective categories.

ESG, Sustainability, and Corporate Social Responsibility

The term "Environmental, Social, and Governance" (ESG) has become a significant focus in contemporary discourse. This concept reflects a paradigm shift toward viewing businesses as integral to achieving broader developmental goals. During the 1990s, the United Nations (UN) began fostering public-private partnerships, marking a notable transformation in its engagement with the corporate sector, described as "a change of 180 degrees". Kofi Annan, then Secretary-General of the UN, played a pivotal role in shaping this initiative. Following discussions with leaders of the International Chamber of Commerce in 1998, Annan recognized the synergistic potential between the goals of the UN—promoting peace and development—and those of businesses, which focus on creating wealth and prosperity. He articulated this alignment, emphasizing the mutual support these objectives could provide.

ESG factors can assist decision-makers in understanding the nature, externalities, risks, and potential returns of investments. For instance, when considering investments in a sector subject to sustainability-driven regulatory oversight, awareness of ESG factors enables decision-makers to better assess the potential sustainability and long-term profitability of specific investments.

ESG is conceptually linked to CSR and sustainability, often regarded as a step toward creating a better world. ESG is considered a tool for enhancing investment analysis and aligning investors with societal goals, thereby generating broader social benefits. This perspective is supported by initiatives such as the UN Global Compact and the Principles for Responsible Investment, which emphasize the potential of ESG to promote social good.

People conflate ESG with CSR, as both are seen as a company's moral obligation to address environmental and social issues for the benefit of stakeholders, society, and the environment. In this context, ESG offers a quantifiable framework for evaluating CSR initiatives, while CSR embodies the values and priorities of stakeholders.

Some argue that the issues encompassed by ESG are essentially the same as those previously categorized under CSR, suggesting that ESG is merely a rebranding of CSR. Like CSR, ESG advocates for social consciousness in business and investment decisions by incorporating moral and ethical principles (Pollman et al., 2023).

Data Collection

A systematic approach was employed to gather relevant and accurate data on the mining services industry, utilizing various methods such as surveys, interviews, observations, and document

analysis. This study used both primary and secondary data collection techniques, which provided the necessary information for formulating effective problem-solving strategies. The research adopted a mixed-method approach, with primary data derived from in-depth interviews and secondary data sourced from company reports and historical data.

Primary Data

Primary data refers to the first and most direct records of a situation, serving as the foundation for understanding even the most basic phenomena and effectively communicating findings. This type of data provides valuable insights into nearly every aspect of life and the environment. However, the collection of primary data can be both time-consuming and impractical in certain situations. Conducting extensive surveys or research is costly, and while more data typically enhances reliability, access to the subject of investigation is not always possible. For example, many historical events lack tangible evidence, making direct data collection unfeasible (Walliman, 2021).

In-Depth Interviews

In-depth interviews are one of the most effective methods for collecting primary data. Unlike standard questionnaires or rating scales, in-depth interviews aim to obtain comprehensive insights into the interviewee's background and perspectives on a specific topic. A key advantage of in-depth interviews over other data collection techniques, such as surveys, is their flexibility and efficiency, enabling the discovery of richer and more detailed information. These interviews typically involve a small number of respondents and are characterized by open-ended, conversational interactions. To maximize the depth and quality of information obtained, the interviewer must first create a comfortable environment and then ask carefully designed questions. In-depth interviews are often employed to explore concepts for descriptive analysis and further research. Establishing a strong rapport with respondents is essential for gaining a thorough understanding of their viewpoints (Nayeem and Huma, 2017).

Secondary Data

Secondary data analysis involves utilizing existing research data to address questions or topics not covered in the original study. This type of data may include findings from large-scale surveys or data collected for individual research purposes. While the dissemination of large-scale survey results is generally agreed upon, less consensus exists regarding the secondary use of data from individual studies. The increasing adoption of new technologies has heightened ethical concerns surrounding the reuse of research data. Although these technologies have streamlined data sharing, collection, and storage, they have also raised new issues related to data security and confidentiality (Tripathy, 2013).

Mixed Methods

Integrating qualitative and quantitative data in research poses challenges due to the distinct nature of these data types—text and images for qualitative data, and numerical statistics for quantitative data. Mixed-methods research employs various strategies to combine these datasets effectively, including merging, connecting, or embedding them. Sequential approaches involve linking datasets across different research phases, such as using quantitative data to guide participant selection for qualitative follow-ups. Concurrent approaches, on the other hand, integrate insights by quantifying qualitative themes and combining them with descriptive quantitative findings. In some cases, one dataset takes precedence, while the other provides supplementary or contextual background without direct integration. Each approach seeks to harness the complementary strengths of both methodologies, thereby enhancing the depth and reliability of the research findings

RESEARCH METHOD

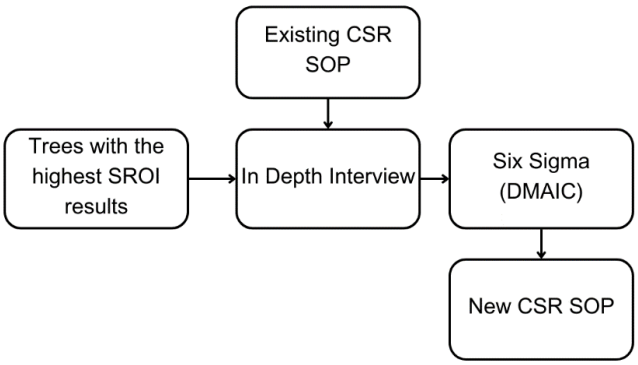


Figure 5. Flow of data analysis method
(Source: Author's analysis)

A combination of qualitative and quantitative methods was used in the data analysis process, as illustrated in the diagram, to improve the Corporate Social Responsibility (CSR) Standard Operating Procedure (SOP). An existing CSR SOP served as the starting point for the review process. In-depth interviews were conducted to gather qualitative data, which helped develop themes and insights into the current CSR activities from stakeholders. This approach facilitated understanding of the underlying motives and viewpoints of stakeholders and provided a rich contextual framework for further study.

Simultaneously, a Social Return on Investment (SROI) study was conducted to evaluate which projects or activities yielded the highest social returns in a quantifiable manner. SROI extends the scope of traditional financial accounting by considering the social and environmental impacts of CSR projects. The analysis, emphasizing the need to balance the interests of various stakeholders in corporate operations, identified the CSR initiatives with the most significant social impact, focusing on those with the highest SROI results.

The Six Sigma (DMAIC) technique was then applied to integrate the insights from the quantitative SROI study with the qualitative interview findings. Based on the principles of Total Quality Management (TQM), Six Sigma is a data-driven methodology aimed at systematically eliminating errors and inefficiencies. The DMAIC framework—Define, Measure, Analyze, Improve, and Control—provided a structured approach for determining areas where the CSR SOP required improvement. The result is the creation of a new CSR SOP, incorporating evidence-based enhancements from Six Sigma analysis, SROI findings, and stakeholder input. This updated SOP created a more strategic and effective CSR framework, balancing operational efficiency with social impact.

Research Design

The flowchart outlines a systematic process for addressing business problems, starting with the identification and description of the issue. A research question was developed to guide data collection, which was essential for understanding the scope and significance of the problem. The process included using a swimlane diagram to assign responsibilities and identify inefficiencies, conducting an SROI study to assess broader impacts, and applying Six Sigma's DMAIC methodology to analyze and improve the issue. Following data and process analysis, an SOP was created or revised to ensure consistency and sustain improvements. The final step involved drawing conclusions from the study and implementing the solutions to effectively resolve the business problem.

RESULTS

Impact Mapping

The SROI calculation history data (secondary data) of the tree planting CSR program from the previous year was used to determine which trees had the highest impact value. The impact value calculation was limited to trees that had been planted in the PT. ASDP Indonesia Ferry (Persero) branch, with the assumption that these trees were readily available, especially to remote branches. Based on the data and in-depth interviews conducted, several impact values were calculated. These included the impact value of wood, the impact value of fruit, and the impact value based on the amount of carbon absorption. The following is a sample procedure for calculating various impact categories in tree planting to explain the process of monetizing social impacts in the tree-planting CSR program.

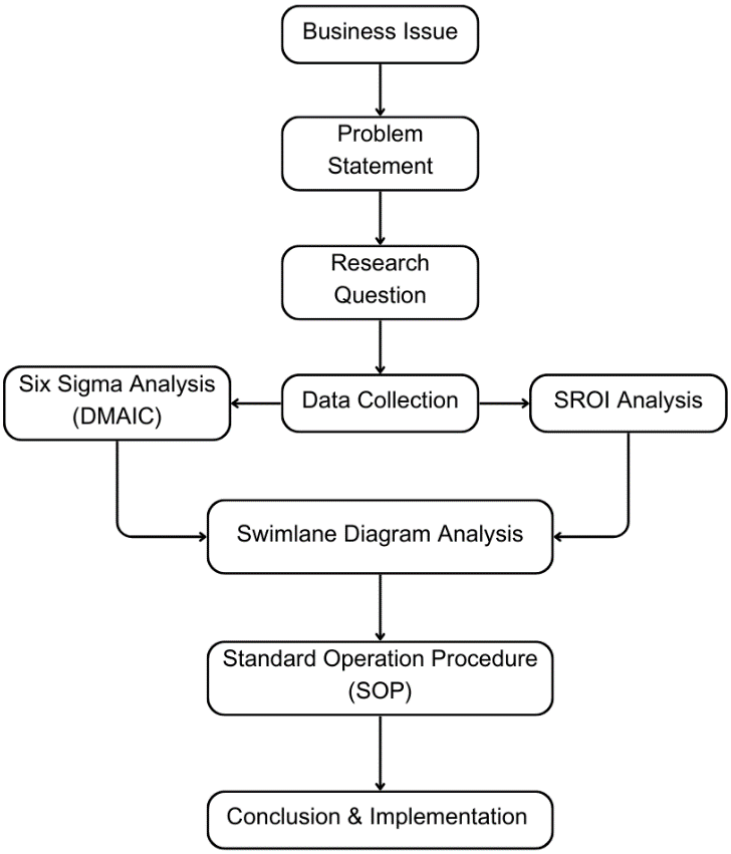


Figure 6. Research Design Diagram
(Source: Author's analysis)

Table 1. Impact mapping (outcome)

Name of Plant	Impact Category	Calculation Formula	Monetization	Resource
Example: Rambutan	Wood	The additional volume of timber per year (M^3) is multiplied by the number of years the wood will be harvested.	Total volume of wood (M^3) multiplied by the price of wood per cubic meter multiplied by the number of trees.	Secondary data and in-depth interview
	Fruit	The amount of fruit production per tree per year (Kg) multiplied by the number of productive years before the tree is cut down for wood harvesting.	Total fruit production per tree per year (Kg) multiplied by harvest price multiplied by the number of trees	
	Carbon Absorption	The amount of carbon absorbed per tree per year (T) is multiplied by the number of years before the tree is cut down for wood harvesting.	Total carbon absorbed per tree per year (T) multiplied by carbon price multiplied by the number of trees.	
		Total Impact Value	Total impact value of wood plus total impact value of fruit plus total impact value of carbon absorption	

Impact Value Comparison

Based on the company's historical data and in-depth interviews, this study compared several tree species with the aim of identifying which tree species produced the highest impact value.

Table 2. Impact value comparison for each category

Impact Value Comparison			
No	Impact Value Category	Plant Name	Impact Value (Rp)
1	Wood	Mango	862,495
2		Rambutan	339,607
3		Sengon Laut	299,478
4		Jackfruit	293,488
5		Trambesi	287,498
6	Fruit	Durian	13,440,000
7		Breadfruit	5,040,000
8		Sawo	3,360,000
9		Mango	2,520,000
10		Avocado	2,240,000
11	Carbon Absorption	Sengon Laut	14,527
12		Trambesi	6,973
13		Seulanga (Kenanga)	3,922
14		Jackfruit	3,559
15		Breadfruit	2,615

Table 2 provides insights based on the historical data of the SROI calculation. According to this data, all tree species analyzed were planted at a uniform size, with a trunk diameter of 10 cm and a height of 10 cm. The SROI assessment and in-depth interviews revealed that the calculations assume all trees were planted for a duration of seven years. Variations in the productive age of each tree species significantly influence the amount of fruit produced. Additionally, differences in tree species impact both the growth of timber and the amount of carbon sequestration. Table 3 further identifies which tree species generate the highest impact value across various impact categories.

Table 3. Tree with maximum impact value

No	Plant Name	Impact Value of Wood (Rp)	Impact Value of Fruit (Rp)	Impact Value of Carbon Absorption (Rp)	Total Impact Value (Rp)
1	Durian	215,624	13,440,000	2,092	13,657,716
2	Breadfruit	107,812	5,040,000	2,615	5,150,427
3	Sawo	113,202	3,360,000	1,830	3,475,033
4	Mango	862,495	2,520,000	2,615	3,385,110
5	Avocado	134,166	2,240,000	814	2,374,979
6	Starfruit	14,375	2,240,000	697	2,255,072
7	Longan	117,395	1,512,000	814	1,630,209

This calculation identifies which tree species yield the highest total impact value, enabling PT. ASDP Indonesia Ferry (Persero) to select tree species that optimize SROI outcomes. By prioritizing tree species with the highest total impact value for inclusion in the CSR tree planting program, the company can maximize the overall impact of its initiatives. Table 3 indicates that durian trees are the most effective in achieving the highest total impact value.

Six Sigma: Define, Measure, Analyze, Improve, Control

Define: Updated Stakeholders Mapping

Based on the analysis of stakeholder mapping, the study identified and assigned specific tasks to each key stakeholder involved in the tree-planting CSR program.

Table 4. Important stakeholders of the tree-planting CSR program

No	Stakeholder	Role
1	Head Office of PT. ASDP Indonesia Ferry (Persero)	Issuing the SOP for the tree planting CSR program, drafting CSR tree planting activities, allocating costs associated with the CSR program, and monitoring and evaluating the implementation of the tree planting CSR program.
2	Branch Office of PT. ASDP Indonesia Ferry (Persero)	Executing tree-planting CSR activities, coordinating with stakeholders and local residents on the implementation of the tree-planting CSR program, documenting and reporting on the implemented tree-planting CSR activities, and collaborating with local residents regarding the maintenance process and the evaluation of outcomes from the program.
3	Local Community	Conducting the tree-planting CSR program, maintaining and documenting the results of the program, and leveraging the outcomes of the tree-planting CSR initiatives for purposes that generate additional benefits, such as investments and educational activities.

This study initially placed the local community in the quadrant with low power and low interest. However, based on primary data obtained, it was found that the local community plays a significant role in the tree-planting CSR program. This includes partnering with PT ASDP Indonesia Ferry (Persero) to carry out activities, maintain the planted trees, and record the outcomes of the planting efforts. Therefore, this study recommended revising the placement of the local community in the stakeholder mapping matrix to a new position in the low-power but high-interest quadrant. This adjustment enables PT ASDP Indonesia Ferry (Persero) to recognize the competence of the local community as a valuable partner, fostering collaboration to enhance the SROI value.



Figure 7. Updated stakeholder mapping matrix
(Source: Author's analysis)

Measure: Swimlane Analysis

This study performed a swimlane analysis to identify the responsibilities of each section at PT ASDP Indonesia Ferry (Persero) head office, branches, and the local community. This analysis was conducted to streamline the process of defining the main tasks and functions for each stakeholder within the SOP. The objective was to ensure that every stakeholder had clearly defined roles and responsibilities, thereby enhancing the efficiency and effectiveness of the tree-planting CSR program.

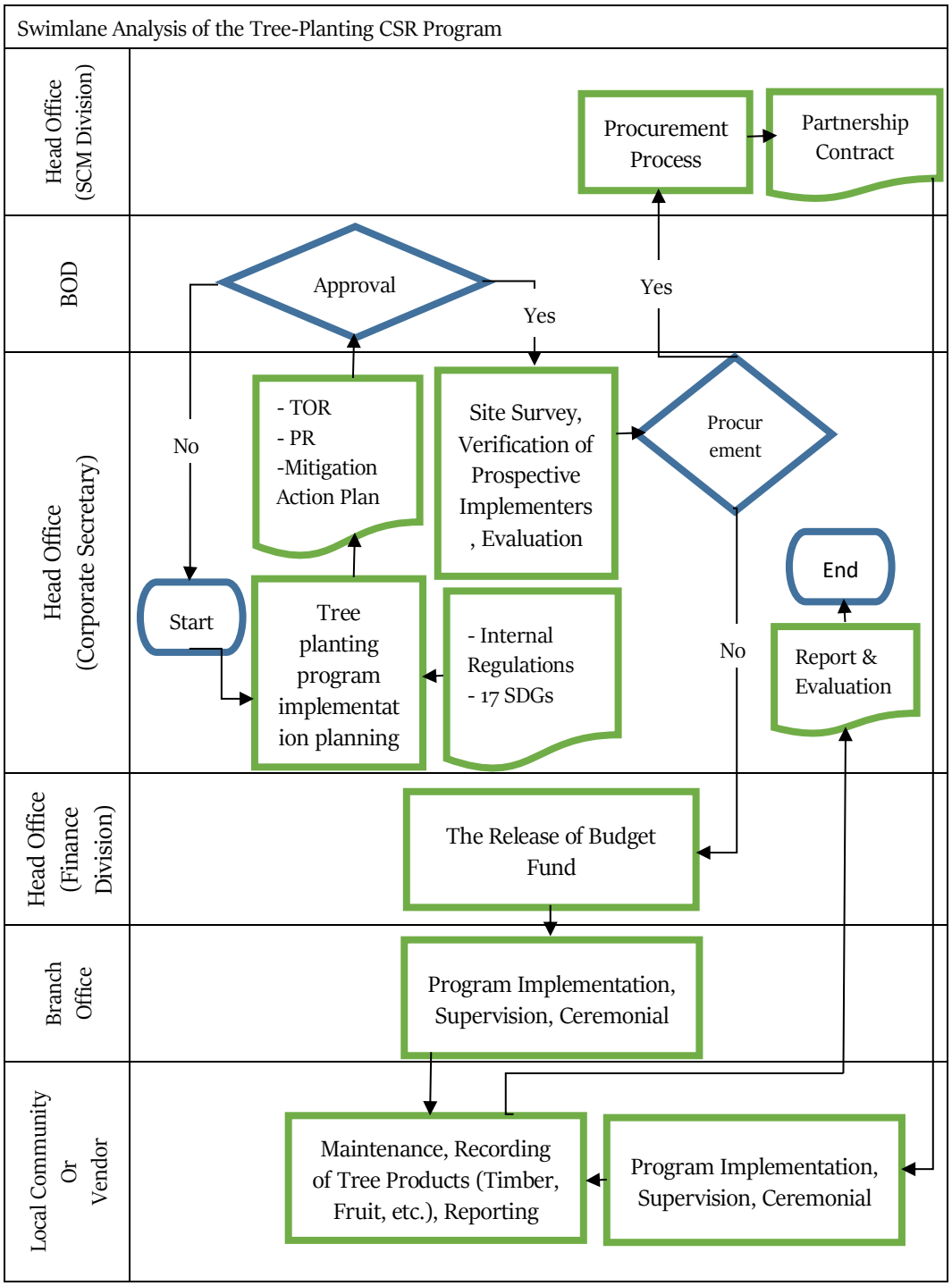


Figure 8. Swimlane analysis
(Source: Author's analysis)

Analyze: Fishbone Diagram

As outlined in the previous section, this study conducted a cause-and-effect analysis to identify the underlying issues. The analysis categorized the causes of the problem into five (5) distinct factors to provide a structured explanation of the contributing elements. This approach allowed the researcher to pinpoint the primary cause of the problem effectively.

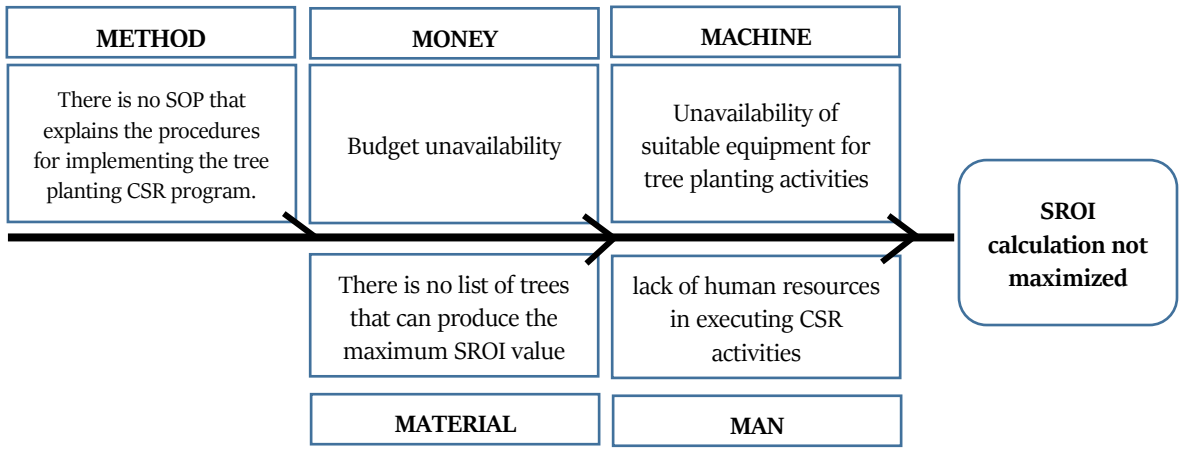


Figure 9. Cause and effect diagram (fishbone)
(Source: Author's analysis)

Based on the data obtained, the primary reasons for the suboptimal SROI value are attributed to the following two factors:

1. Absence of a Standard Operating Procedure (SOP) for Implementing the Tree Planting Corporate Social Responsibility (CSR) Program

This issue is critical as an SOP provides precise, detailed, and standardized guidelines for task execution. Without an SOP, operational inconsistencies can lead to inefficiencies and suboptimal outcomes. Such inconsistencies directly impact the effectiveness of the tree-planting CSR program and, consequently, the SROI.

2. Lack of a Comprehensive List of Trees with Maximum Social Return on Investment (SROI) Value

The absence of a well-researched and documented list of tree species that yield the highest SROI indicates a non-optimal tree selection process. Planting unsuitable tree species may result in fewer environmental and social benefits, undermining the potential advantages of CSR initiatives. This misalignment significantly reduces the overall SROI.

Improve: Brainstorming

This study then utilized data obtained from in-depth interviews as a foundation for brainstorming sessions. The goal of these sessions was to generate effective solutions to the identified problems. The in-depth interviews were conducted with stakeholders, decision-makers, and practitioners to ensure the information collected was valid, relevant, and aligned with the conditions being addressed.

The researcher summarized key quotes from all stakeholders, including experts on SROI, to inform the development of the SOP for the tree-planting CSR program. It aims to ensure that the program generates maximum SROI value while also mitigating the company's business risks.

Table 5. Brainstorming results

No	Key Question	Findings
1.	Is the tree planting program in accordance with the company's CSR target or strategy?	• The business first became aware of SROI in 2023, but it did not begin implementing it at that time. The tree planting initiative during this period primarily focused on carbon offsetting from operational activities, such as ship crossings, and was largely a partnership with the SEO program. • In 2024, the SROI calculation process was initiated, but program planning and objectives had yet to be integrated into it. Based on recent observations, the company plans to set specific SROI targets for 2025 and align tree-planting campaigns with these goals. • The company is open to incorporating an economic benefit component into the tree planting initiative, potentially balancing efforts with a 70-30% or 80-20% ratio between environmental and economic objectives. Moving forward, the primary focus will still be on carbon offsetting.
2.	Are the results of the SROI assessment of the tree planting program maximum and satisfactory?	• In line with its overarching objective, the company's CSR goal for the year focused exclusively on tree planting. However, the current strategy, which emphasizes meeting numerical targets over effectiveness, has not been successful in selecting appropriate plant species, such as *gentjah entog* coconuts. • The feedback received is greatly appreciated and will be used to refine the goals and strategies for the tree planting initiative in 2025, ensuring improved outcomes.
3.	Has the SOP for the implementation of CSR programs been used as a guide for making CSR tree planting programs?	• To date, there is no specific SOP governing the tree-planting CSR program. • The tree-planting CSR program was initially intended solely for greening the port or protecting land assets. • Neither the head office nor the branch offices were initially informed about the calculation of SROI for CSR programs.
4.	Has the SOP for the implementation of the company's CSR program accommodated tree planting that maximizes the SROI value?	• The existing SOPs do not effectively maximize the calculation of SROI for the CSR programs being implemented. • SROI calculations have only been introduced following the change in nomenclature to the Social and Environmental Responsibility Section (*Tanggung Jawab Sosial dan Lingkungan*) within SOEs. • There is no data available regarding tree species that can maximize the SROI, leaving the implementers of the tree-planting CSR program without guidance on which trees can yield the highest benefits for the company.
5.	Has the SOP for the implementation of the CSR program been applied?	• SOPs related to the implementation of the CSR program have been established; however, they are not specific to the tree planting initiative, nor do they guide the maximization of SROI calculations. • The current SOPs do not outline the processes for monitoring and calculating SROI, nor do they address target outcomes or mitigate the business risks faced by the company. • Since the existing SOPs do not specifically aim to maximize SROI calculations, the CSR program is limited to fulfilling budgetary obligations without proper planning.

Table 5. Brainstorming results (continued)

No	Key Question	Findings
6.	How to maximize the SROI value of the tree-planting CSR program?	• Maximizing the calculation of SROI can be achieved through a well-structured plan, which includes identifying land suitability, selecting land appropriate for planting species that promote accelerated growth, and modeling tree species that can yield the highest SROI.
7.	Which impact value is more important: wood, fruit, or carbon sequestration?	• The most crucial aspect of implementing the CSR program is assessing the impact of its results. In the case of the tree-planting CSR program, the resulting impacts can include economic benefits across several dimensions, such as the fruit produced, timber from the trees, carbon sequestration, and plant products like leather from clove plants or sap from rubber trees. Before program implementation, it is essential to calculate the most optimal combination of these factors. This can be achieved through modeling the SROI calculation for various tree species.
8.	What improvements can companies make to maximize the SROI value of the tree-planting CSR program?	• The company needs to design specific milestones or risk mitigation strategies rather than dispersing them across various branches of the tree-planting CSR program. Focusing on one or a few key areas, such as funding for suitable planting land and limited access to facilitate supervision, can help streamline the process. This approach would also support impact result calculations, reduce human resource requirements, and align with the principles of Monitoring, Reporting, and Verification (MRV). Additionally, the tree-planting CSR program can be executed through cooperation with land concession holders, such as Perum Perhutani, or landowners like farmers. This collaboration can help design the project cycle to increase the success rate, create long-term and broader impacts, and provide more leverage.

Control: Standard Operation Procedure of Csr Program through Partnership

The data collected implied that the tree-planting CSR program is more effectively implemented through collaboration with other parties, given the limited human resources at PT ASDP Indonesia Ferry (Persero). Additionally, better planning prior to implementation is essential to maximize and predict the SROI generated by the program. Therefore, this study proposed a procedure for implementing the tree-planting CSR program that can optimize SROI, with the aim of making the procedure flow clearer and easier for users to understand.

DISCUSSION

By integrating a structured Standard Operating Procedure (SOP) with Social Return on Investment (SROI), this research advances the tree-planting CSR initiatives. Unlike previous studies, the methodology emphasizes robust monitoring systems (MRV), species selection based on both economic potential and carbon absorption, and small planting areas usage. While SROI is often used to measure societal impact, this study introduces a dual-benefit model that connects it to tangible business outcomes such as carbon credits and financial gains. The gaps in scalability, resource efficiency, and stakeholder engagement identified in earlier research are addressed through the structured SOP and expanded SROI integration.

The findings have significant implications for business operations. This model presents an efficient approach for companies to achieve both financial and environmental returns by aligning

CSR activities with measurable carbon offset and economic goals. By emphasizing cooperation with regional stakeholders, the model enhances program sustainability and strengthens brand reputation. Furthermore, the replicable framework supports Environmental, Social, and Governance (ESG) standards, ensuring scalability across different regions. This approach serves as a practical and impactful solution for modern companies committed to social responsibility and sustainability.

CONCLUSION

To enhance the tree-planting CSR program, several suggestions are proposed. First, the creation of comprehensive and standardized Standard Operating Procedures (SOPs) will guide the selection, planting, and maintenance of trees, ensuring consistency and effectiveness across all branches. Additionally, integrating Social Return on Investment (SROI) metrics into the program is crucial; using modeling tools to define clear SROI targets will align the tree planting initiatives with both economic and carbon offset goals. Focusing on compact planting areas will allow for better monitoring, higher success rates, and easier management. Furthermore, adopting robust Monitoring, Reporting, and Verification (MRV) systems will ensure transparency, track progress, and support continuous improvement. Enhancing stakeholder collaboration is also important; working with local communities, non-governmental organizations, and entities like Perhutani will help secure land, ensure the sustainability of the program, and promote community involvement. Finally, selecting tree species that provide both significant carbon sequestration and economic benefits will help achieve a balance between financial and environmental impacts.

MANAGERIAL IMPLICATION

The tree-planting CSR program faces several challenges, including unclear Standard Operating Procedures (SOPs), poor plant selection, and a lack of alignment with Social Return on Investment (SROI) objectives. To address these issues, several remedies are proposed. First, comprehensive SOPs should be created to provide clear instructions on selecting the appropriate tree species, planting techniques, and locations, aiming to optimize both carbon offset and return on investment. These procedures should align with the Sustainable Development Goals (SDGs) and consider economic impacts, such as prioritizing fast-growing trees with high carbon absorption rates. Second, increasing monitoring and coordination is essential; branches should receive explicit guidance from headquarters regarding tree species and planting techniques. Furthermore, implementing Monitoring, Reporting, and Verification (MRV) principles for centralized tracking will enhance accountability and transparency. Third, setting clear SROI objectives is critical; defining targets in terms of both economic contributions and carbon offsets, supported by modeling and feasibility studies, will maximize the program's impact. Lastly, focusing planting efforts on compact, strategic areas will improve success rates and simplify monitoring processes.

This research is designed to be specifically applicable to certain companies, as previously detailed, or to SOE companies in general. However, the findings and recommendations outlined above can serve as key considerations for other companies aiming to implement tree-planting CSR programs that maximize the SROI. For instance, impact value data for each tree can be utilized to estimate the potential impact value generated per tree. This can be achieved through the use of tools such as the following example table, which provides a structured approach to estimating and analyzing these values effectively.

Table 5. Impact Value Illustration for Each Tree

No	Plant Name	Impact Value (Rp)	Amount Of Tree	Seedling Price Estimation (Rp)	Total Seedling Price Estimation (Rp)	Total Impact Value Estimation (Rp)
1	Durian	13,657,716	500	80,000	40,000,000	6,828,857,873
2	Breadfruit	5,150,427	500	50,000	25,000,000	2,575,213,417
3	Sawo	3,475,033	500	45,000	22,500,000	1,737,516,474
4	Mango	3,385,110	500	60,000	30,000,000	1,692,555,067
5	Avocado	2,374,979	500	70,000	35,000,000	1,187,489,727
6	Starfruit	2,255,072	500	50,000	25,000,000	1,127,536,118
7	Longan	1,630,209	500	120,000	60,000,000	815,104,357

LIMITATION AND FUTURE RESEARCH

Research Scope And Limitation

The scope of this research is limited to the creation of a Standard Operating Procedure (SOP) for the tree-planting Corporate Social Responsibility (CSR) program, specifically intended for use by the Corporate Secretary Division at PT ASDP Indonesia Ferry (Persero). This SOP serves as a reference for planning, implementing, and evaluating the tree-planting CSR program. Additionally, the study focuses on tree species that are readily available to both the head office and branch offices, as observed in past purchases made for tree planting initiatives in previous years. These species were selected for their accessibility and relevance to the existing CSR programs.

Future Research

Future research directions offer a structured approach for businesses to improve their tree-planting CSR programs while supporting broader sustainability goals. These areas may also be explored in subsequent studies. One potential avenue is the optimization of species selection, focusing on trees that can provide substantial economic benefits and enhance carbon absorption across various soil and climate conditions. Another opportunity lies in integrating technology, such as drones, GIS, or AI, for more accurate carbon measurement, growth tracking, and site selection. The impact of compact planting areas, compared to scattered planting efforts, could also be explored to determine its effectiveness in both operational and ecological terms. Lastly, research into community engagement models can offer valuable insights into how involving local communities in tree-planting initiatives can improve the sustainability and social impact of such programs.

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