



Green pawn financing for MSMEs as an ESG-oriented transformation of pawnshop

Muhammad Rifky Apriansyah¹, Ahadina Hanifati Amimah¹, Aubry Fairuza Akifa Prabowo^{1,*}

¹ Department of International Relations, Faculty of Social and Political Sciences, Universitas Sebelas Maret, Surakarta, Central Java 57126, Indonesia.

*Correspondence: muhammad_rifky13@student.uns.ac.id

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ABSTRACT

Background: The transformation of the national financial sector following the implementation of Law No. 4/2023 and its derivative regulations, marks a new phase in strengthening the institutional role of Pegadaian as a key actor in microfinance in Indonesia. In the context of sustainability and ESG (Environmental, Social, and Governance), there is no pawn-based microfinance scheme that proactively targets green MSMEs, even though the potential and demand for green financial products continue to increase. **Methods:** This article aims to analyze the institutional feasibility and concept of Green Pawn Financing, which is a pawn financing scheme based on ESG principles, while identifying the potential and challenges of its implementation. This study uses a descriptive-analytical approach with a normative institutional review. Institutional innovation theory, sustainable regulatory frameworks, and green financial inclusion literature are used as the basis for analysis. **Findings:** The results of the study show that Pegadaian already has an adequate initial foundation through gold savings, electric vehicle loans, and a corporate ESG roadmap. However, the integration of ESG into pawn services is not yet systemic and does not explicitly target green MSMEs. This creates a strategic gap that "Green Pawn Financing" can fill by bridging national climate targets with micro-level operational realities within a conducive regulatory framework. **Conclusion:** The Green Pawn Financing concept offered includes interest and loan tenor incentives, light environmental audits based on emissions calculations, and the potential development of carbon pawn and sustainability certificate-based collateral. Regulatory-wise, this scheme is compatible with the national sustainability framework and has the potential to support green financing targets. **Novelty/Originality of this article:** This article contributes to positioning Green Pawn Financing as an instrument for domestic commodity-based (gold) micro green finance transition, which not only expands financial inclusion but also increases public trust in Pegadaian as a sustainable financial institution.

KEYWORDS: green pawn financing; ESG; green MSMEs; micro pawn; pawnshops; sustainable finance.

1. Introduction

Environmental protection issues have developed into a global concern aimed at minimizing negative impacts on the environment in order to support sustainable development. The transformation toward a sustainable financial system has become a global strategic agenda that significantly influences how financial institutions formulate policies, manage risks, and build long-term competitiveness (Sadriatwi & Sari, 2025). The concept of sustainable finance is introduced as an important instrument in supporting

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economic activities that generate positive impacts on the environment and society. Sustainable finance encompasses the integration of environmental, social, and governance aspects (Environmental, Social, and Governance/ESG) into financial decision-making processes. This approach does not only focus on the creation of economic value, but also on long-term responsibility for environmental and social sustainability, as well as future generations.

In this context, the banking industry plays a role as the primary provider of financing in the corporate world. Although banks do not directly cause environmental damage, the financing activities they undertake for various projects can contribute to adverse environmental impacts. This condition has encouraged the development of the concept of green banking, namely a banking approach that integrates environmental considerations into banking policies, products, and operations as part of efforts to support sustainable development (Romli & Zaputra, 2022; Bariyah et al., 2025). In line with these developments, empirically, the banking sector in various countries has shown a significant increase in the implementation of green banking practices, such as environmentally friendly financing, operational energy efficiency, and the strengthening of environmentally based risk management (Sadriatwi & Sari, 2025)

Nevertheless, the implementation of green banking to date has tended to focus on the corporate sector and large-scale projects, so that it has not yet optimally reached the Micro, Small, and Medium Enterprises (MSMEs) segment. Most MSMEs also face a major challenge in the form of limited access to capital. This condition becomes an obstacle to business development and the improvement of MSME actors' welfare. As an alternative solution, non-bank financial institutions such as pawnshops provide financing products that are relatively easy to access to help meet the capital needs of MSMEs and encourage the sustainability of their businesses (Nugroho et al., 2025). In line with these limitations, alternative financial instruments are needed that are more inclusive and adaptive to the characteristics of small-scale businesses. Therefore, the author proposes green pawning as an innovation in sustainable financing within pawnshop institutions that integrates environmental and social aspects into collateral-based financing services. Through this approach, pawnshop financing does not merely function as a short-term liquidity solution for MSMEs, but also becomes a channel for MSME participation in sustainable finance practices by encouraging the adoption of business activities that are more socially responsible and environmentally friendly.

Previous studies have shown that financial systems that emphasize sustainability principles are closely linked to improvements in environmental quality. Khan et al. (2022) show that the implementation of green banking such as green finance has had a positive impact on environmental quality in 26 Asian economies through the support of multilateral institutions such as the Asian Development Bank (ADB) and the Global Environment Facility (GEF) during the period 2011 to 2019. Investments in environmentally friendly projects in Asia have yielded positive results in maintaining environmental sustainability, as evidenced by a reduction in CO₂ emissions. These findings confirm that sustainable financial instruments serve as an effective policy mechanism in supporting environmental agendas at the macro and regional levels. In the context of Indonesia, the implementation of green finance has begun to be adopted by various institutions, including through a Corporate Social Responsibility (CSR) program called "The Gade Clean and Gold" managed by PT Pegadaian (Persero) with a focus on creating a sustainable green economy (Karnawijaya et al., 2021). The program prioritizes three pillars of benefits, namely the environmental pillar, the social pillar, and the economic pillar. In addition, literature on green banking activities shows that the banking sector contributes positively to the financing of ecological projects, increasing the competitiveness of the banking industry, and environmental preservation (Zhang et al., 2022). However, the study also identified a number of structural barriers, such as low customer awareness, high investment costs, technical limitations, and the quality of human resources, which hinder the optimal adoption of green banking. In line with these findings, Riananda & Fasa (2025) show that the application of green (ESG) principles can improve bank financial performance, as reflected in an increase in Return on Equality

(ROE), a decrease in Non-Performing Loans (NPL), and a contribution to reducing carbon emissions. Marshella & Idrianita (2024) add that first mover banks in the application of ESG principles in Indonesia have gained easier access to sustainable financing sources and integrated support for MSMEs as part of their ESG strategy.

In addition to conventional banking, Islamic financial institutions have also begun to adopt ESG principles. Huddin et al. (2025) state that the integration of ESG values in Islamic financial institutions contributes to strengthening public trust and serves as a key foundation for maintaining long-term business sustainability, especially amid the dynamics of the digital market. On the other hand, pawnshops have a strategic position as microfinance institutions that are the primary choice for MSME players to obtain quick capital, while MSMEs themselves play a major role in Indonesia's GDP. Valdiansyah & Widiyati (2024) emphasize that the development of MSMEs through sustainable finance has great potential in supporting climate change mitigation and encouraging the strengthening of environmental, social, and governance (ESG) aspects. Duwina & Fasa (2025) mention that green banking in Indonesia has provided incentives in the form of loans with lower interest rates or special terms for MSMEs that implement environmentally friendly practices. These initiatives have proven to be effective in reducing operational costs and increasing MSME income.

Although the literature consistently shows the success of green finance and ESG in the banking sector, there is a significant gap in the context of non-bank financial institutions. To date, the implementation of green finance in Indonesia is still centered on banks and has not been systematically integrated into the financing models of institutions such as pawnshops, particularly in the form of pawn-based financing. Furthermore, there has been no study that explicitly discusses the integration of ESG principles into asset-based microfinance instruments targeting green MSMEs. Therefore, this study will fill this gap by proposing the concept of Green Pawn Financing as an alternative sustainable financing strategy that integrates ESG principles into pawn schemes, with MSMEs as the main target. This concept is expected to not only expand green financial inclusion in the non-bank sector but also strengthen the role of pawnshops as instruments of green microfinance transition in Indonesia.

2. Methods

2.1 Research type and approach

This study uses a qualitative approach, which focuses on exploring meaning, deep understanding, and contextual interpretation of complex and dynamic social phenomena. According to Creswell & Poth (2018), the qualitative approach allows researchers to explain social relations and institutional dynamics that cannot be measured numerically, but instead require exploration of the construction of meaning, normative intentions, and the logic of institutional actors' actions in specific contexts. Furthermore, a descriptive-analytical design was used, which aimed not only to describe the factual conditions and existing regulatory structures, but also to systematically analyze logical relationships, policy conflicts, and practical implications (Moleong, 2018). This approach was chosen due to the need to evaluate regulatory transformation after the implementation of Law Number 4 of 2023 (P2SK Law), particularly in the non-bank financial sector, which is under pressure to adopt sustainability (ESG) principles (JDIH, 2023). The focus is directed at normative-institutional policy analysis, using the Institutional Change (North, 1990) and Transaction Cost Economics (Williamson, 2000) theoretical frameworks, to understand how formal rules shape institutional incentives and encourage innovation in microfinance models, namely the Green Pawn Financing scheme at PT Pegadaian. The combination of qualitative and descriptive-analytical approaches enables the formulation of policy propositions that are not only contextual and applicable but also consistent with the legal architecture and institutional dynamics in Indonesia.

2.2 Conceptual framework

The conceptual framework in this study was developed through the integration of Institutional Innovation Theory (North, 1990) and the principles of sustainable finance as articulated in the Sustainable Finance Principles (UNEP FI, 2020). The main focus is to dissect the dynamics of institutional transformation in pawnshop services after financial sector reform. Referring to the New Institutional Economics perspective, the implementation of Law No. 4 of 2023 (P2SK Law) is positioned as an intervention at the institutional environment level, namely changes in formal rules that reconstruct the structural parameters of non-bank financial institutions (North, 1990). In this context, regulatory reform is analyzed as a creator of new incentives that can encourage ESG-based innovation, including microfinance models that are adaptive to the national green economy agenda. To examine institutional responses at the organizational level, the Transaction Cost Economics (TCE) approach is used. This approach aims to evaluate how PT Pegadaian reconstructs its governance structure, manages daily pawn service contracts, and mitigates new transaction costs arising from ESG verification requirements. In addition, strengthening private ordering mechanisms is identified as a key strategy to mitigate opportunism risks, particularly in the context of microfinance accountability (Williamson, 1985; 2000).

The dimension of sustainability is defined based on the Environmental, Social, and Governance (ESG) framework as stipulated in POJK No. 51/POJK.03/2017. This regulation requires all Financial Services Institutions (LJK) to not only prepare sustainability reports but also to substantively integrate ESG principles into product design and business strategies (OJK, 2017). To complement the conceptual framework, this study also refers to the OECD's SME Green Financing standards (2024) to evaluate the effectiveness of incentives such as interest rate reductions, tenor extensions, and environmentally friendly asset guarantee schemes. Through a synthesis of institutional innovation theory and international ESG standards, this framework aims to formulate a replicable, legal, and operational Green Pawn Financing model. Thus, Pegadaian is positioned not only as a provider of collateral-based financing, but also as a strategic entity in promoting ESG integration in the micro sector, as well as an active contributor to the achievement of Indonesia's net-zero emission targets.

2.3 Data sources

This study uses secondary data obtained through documentary research from authoritative sources, both national and international, to ensure the legal validity and scientific novelty of each finding. Primary data in the form of regulatory documents was collected directly from the Legal Documentation and Information Network (JDIH) owned by the Financial Services Authority (OJK), which is the official portal for financial sector regulations and policies. Through this platform, researchers obtained the latest legal documents that formed the basis for analysis covering three main regulations: Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector (P2SK Law) as the legal framework for macro-reform of the financial sector; POJK Number 39 of 2024 concerning the implementation of pawnbroking businesses, which redefines the business structure of PT Pegadaian; and POJK Number 17 of 2024, which provides legality for bullion business activities as entities supporting the gold-based financial system (JDIH, 2023; OJK, 2024b; OJK, 2024c). These three instruments serve as normative tools for assessing the legitimacy, incentives, and operational limits of Green Pawn Financing.

To support structural and operational analysis, this study utilizes secondary data, including regulatory documents, corporate sustainability reports, and publications from international and national institutions. This data is used to evaluate institutional readiness, the effectiveness of the legal framework, and the dynamics of green financing in the micro sector. All complementary academic literature was obtained through a systematic search of indexed scientific journals, covering the period 2016-2026 to ensure analytical relevance to

contemporary policy dynamics and financial innovation. The combination of legal, macroeconomic, and corporate report data enables a dialectical synthesis between legal norms and operational contexts, making the developed Green Pawn Financing model normative, applicable, tested, and compatible with the national sustainable finance architecture.

2.4 Data collection techniques

Data collection techniques in this study were carried out through documentation studies and systematic literature reviews to ensure the objectivity and depth of the information obtained. This process began with the identification of regulatory documents in digital legal databases, including the Financial Services Authority's Legal Documentation and Information Network (JDIH) and the State Secretariat, to obtain the original text of the P2SK Law and related POJK accurately. Academic literature searches were conducted systematically in relevant scientific publications, applying strict inclusion criteria. These criteria included journal articles published between 2016 and 2026, with thematic relevance to green finance innovation, and which had undergone a peer-review process to ensure bibliometric quality (Snyder, 2019).

The data corpus search was operationalized using a combination of specific keywords in Indonesian and English, namely: "green microfinance," "pawn financing," "ESG non-bank finance," and "green pawnshop innovation." Each source found was then evaluated in depth based on the credibility of the publisher and its relevance to the institutional architecture in Indonesia. The use of this systematic documentation technique enabled data triangulation between government regulatory mandates and international best practices in sustainable microfinance (OECD, 2024). Through this procedural process, the collected data was not only descriptive but also had the analytical depth necessary to formulate a draft Green Pawn Financing policy.

2.5 Analysis techniques

Data analysis in this study was conducted through a policy review, content analysis, and dialectical synthesis approach to evaluate the cohesion between the regulatory framework, institutional readiness, and the potential for green financing innovation. The policy review method was used to examine the consistency between regulations and assess the effectiveness of the legal instruments contained in Law No. 4 of 2023 (P2SK Law), POJK No. 39 of 2024, POJK No. 17 of 2024, and POJK No. 51/POJK.03/2017 in supporting the sustainable finance agenda (Dunn, 2017). Meanwhile, content analysis is applied to systematically identify narrative structures, key terms, and discursive patterns in legal documents and corporate reports (Krippendorff, 2018). The analysis procedure began with data reduction, namely the extraction of important elements from regulatory and corporate texts to be mapped based on thematic categories such as sustainability, ESG compliance, and financial inclusion. This stage is followed by triangulation of quantitative data from PT Pegadaian's Sustainability Report and OJK statistics to identify whether there is a gap between the macro strategic vision (regulator) and micro implementation readiness (institution).

This study employs a Dialectical Synthesis approach grounded in the Hegelian framework (Hegel, 1977) to reconcile the tension between sustainability policy idealism as the Thesis, represented by the ESG mandate under POJK 51/2017, and the Antithesis, defined by structural barriers constraining MSMEs' transition toward a green economy. According to the White Paper on Empowering Green MSMEs issued by the Ministry of National Development Planning/Bappenas (2025), these barriers include a projected green financing gap of IDR 2,400 trillion by 2026, low sustainability adoption among MSMEs, evidenced by less than 5% holding environmental certifications or using renewable energy, and limited access to green technology, markets, and ESG literacy. These conditions underscore the persistence of the antithesis and reveal the limitations of existing policy

frameworks in addressing MSME-level sustainability challenges. Through a process of dialectical negation, this study advances Green Pawn Financing as a Synthesis, conceptualized as an integrative and operational ESG-based microfinance model capable of supporting the green economic transition. This approach enables not only a legal and policy mapping exercise, but also a normative-structural analysis that informs institutional design and policy recommendations to strengthen Pegadaian's role within Indonesia's sustainable finance ecosystem.

3. Results and Discussion

3.1 Business transformation of Pegadaian's in ESG

From a regulatory perspective, the implementation of sustainable finance in Indonesia has obtained a binding normative framework through Financial Services Authority Regulation (Peraturan Otoritas Jasa Keuangan/POJK) Number 51/POJK.03/2017 concerning the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies. This regulation is essentially directed at supporting stable, inclusive, and sustainable national economic growth by positioning the balance of economic, social, and environmental aspects as a prerequisite for development. To realize this development direction, a financial system is required that is capable of preventing financing or investment practices in business activities that: excessively use resources, increase social inequality, and cause environmental damage. In other words, the financial system is positioned as a controlling instrument so that economic activities do not generate significant negative externalities (OJK, 2017). In line with this, the financial system needs to adopt sustainability principles that are capable of creating economic, social, and ecological value within organizational models, processes, and practices, both at the policy level and in business decision-making, in order to maintain financial system stability and long-term business success, while continuing to contribute to intergenerational sustainable development goals (OJK, 2017). OJK's commitment is embodied in the Sustainable Finance Roadmap, which directs Financial Services Institutions (LJK), issuers, and public companies to contribute to ESG principles. In its implementation, this commitment provides examples of aligned programs and activities, such as renewable energy financing, energy efficiency, sustainable agriculture and fisheries, green buildings, and environmentally friendly tourism (OJK, 2017).

As reported on Pegadaian's official website, this is reflected in Pegadaian's commitment to implementing Environmental, Social, and Governance (ESG) principles as part of the company's sustainable finance strategy, including, among others: the Sustainability Committee, which was established as a coordination guideline for ESG programs, with roles in formulating ESG objectives and implementation, developing a sustainability program roadmap, and assisting the Board of Directors in monitoring and evaluating implementation; the affirmation of the vision "The Leader in the Gold Ecosystem & Accelerator of Financial Inclusion for Sustainable Future," with a mission to deliver optimal benefits to society, expand MSME services, and provide service excellence; in the environmental dimension, Pegadaian presents a range of initiatives covering energy efficiency, waste management, carbon emissions, renewable energy, water conservation, as well as sustainable environmental programs and targets; in the social dimension, Pegadaian places a focus on employee welfare, occupational health and safety (OHS), gender equality, community training, educational and social support, and contributions to the SDGs; and in the governance dimension, Pegadaian emphasizes a focus on corporate governance, business ethics, internal audit, anti-fraud policies, information disclosure, and risk management systems.

3.2 Green paw financing scheme design: Integration of ESG parameters in micro pawn instruments

The Green Pawn Financing scheme is designed as a form of hybrid institutional innovation that reconstructs the incentive structure of micro pawn based on Environmental, Social, and Governance (ESG) principles. Referring to the theory of New Institutional Economics (North, 1990), this design does not change the substance of pawn services as asset-based finance but adds a sustainability evaluative dimension to encourage MSMEs to engage in the green economy transition without increasing bureaucratic burdens and transaction costs (Williamson, 2000). Structurally, this scheme includes four main components.

3.2.1 Customer categorization and adaptive ESG assessment

The customer categorization and adaptive Environmental, Social, and Governance (ESG) assessment components form the initial foundation of the Green Pawn Financing design as a sustainability-based microfinance instrument. This strategy is designed to address the limitations of MSME access to formal environmental assessments while progressively expanding green financial inclusion. Based on the Indonesian Sustainable Finance Taxonomy (TKBI), customers are classified into three main categories: Green, Transition, and General. The Green category includes MSMEs that have adopted substantive sustainable practices, such as the use of renewable energy, environmentally friendly procurement, or official environmental certification. The Transition category is intended for businesses that do not yet meet technical standards but have demonstrated potential for change, for example through energy efficiency, low-carbon raw material substitution, or production waste reduction. Meanwhile, the General category refers to conventional customers who are not yet involved in the green agenda but are still given access to basic financing with general parameters (OJK, 2024a).

To prevent greenwashing, impact washing, and social washing practices, ESG assessments are conducted by internalizing the Essential Criteria (EC) as stated in the TKBI. These provisions include the Do No Significant Harm (DNSH) principle, which requires that contributions to one environmental goal do not undermine other goals; Remedial Measures to Transition (RMT), which requires MSMEs to develop concrete improvement plans within five years if negative impacts are indicated; and Social Aspect (SA), which emphasizes compliance with human rights and decent working conditions (OJK, 2024a). The ESG assessment mechanism is implemented through a light approach (ESG Light-Assessment) based on direct observation and self-assessment, tailored to the managerial capacity of MSMEs. Assessments are conducted by appraisers at Pegadaian outlets through visual verification and the completion of a standardized ESG questionnaire, without the burden of a professional audit. This approach reduces administrative barriers while increasing service speed, maintaining the principle of efficiency characteristic of micro pawn systems (Williamson, 2000).

In addition, this scheme mainstreams the principles of the Circular Economy (EO4) as part of the normalization of sustainability practices. MSMEs are encouraged to shift from a linear economy to a model that extends the product life cycle, such as product-as-a-service, repair, reuse, and recycling practices. TKBI emphasizes that reducing the consumption of new raw materials and managing waste are key indicators of credible green financing (OJK, 2024a). With this framework, Pegadaian not only performs a financial intermediation function but also encourages changes in microeconomic behavior towards an inclusive and measurable green transition

3.2.2 Financial incentive scheme: Green tiering mechanism

Within the framework of Green Pawn Financing, a financial incentive scheme has been developed through a Green Tiering Mechanism based on customer classification according

to the Indonesian Sustainable Finance Taxonomy (TKBI): Green, Transition, and General (OJK, 2024a). This mechanism serves as an economic instrument that encourages behavioral transformation among customers, particularly MSMEs, to adopt environmentally friendly production and consumption practices. Unlike conventional pawn schemes, which are uniform in terms of interest rates and loan values, this approach applies distinctions based on customer classification according to the Indonesian Sustainable Finance Taxonomy (TKBI): Green, Transition, and General (OJK, 2024a).

Table 1. Tiered incentive scheme of green pawn financing for MSME customers based on ESG adoption level

Customer category	ESG criteria/ definition	Interest rate incentive	LTV ratio	Loan tenor	Additional support	Theoretical basis
Green	MSMEs that have significantly adopted ESG practices (e.g., renewable energy use, low-carbon raw materials, environmental certification)	Green Interest Discount: reduction up to 20% from basic micro pawn rate	Up to 95%	Extended tenor as reward	Maximum financial incentives as recognition of contribution to green transition	Monetary incentives post-energy transition as key lever for widespread adoption of environmentally friendly technologies in non-corporate sector (Liu et al., 2023)
Transition	MSMEs showing intent and potential toward sustainability but not yet fully meeting technical standards	Moderate discount interest rate	Limited increase	Standard	Operational support for productive financing (clean energy, raw material substitution); Transformational Insurance model for R&D or new technology adoption cost compensation upon innovation failure	Differential incentives for partial adopters (Annicchiarico & Di Dio, 2015); insurance-backed innovation risk buffer (Liu et al., 2023; Wang et al., 2017)
General	MSMEs without a commitment to sustainable practices	Standard/normal interest rate (no discount)	Standard/normal LTV	Standard	Access to standard micro pawn loans; structural incentives for future behavioral transition	Prevention of financial exclusion while creating pathways for progressive ESG behavioral transiti

Note: LTV = loan-to-value ratio; MSMEs = micro, small, and medium-sized enterprises; ESG = environmental, social, and governance. Incentive tiers are structured progressively: the Green category receives the highest incentives, the Transition category receives limited incentives, and the General category receives the lowest incentives, so that ESG values can be integrated into microfinance products while maintaining financial inclusion.

Green category customers, namely MSMEs that have significantly adopted ESG practices, such as the use of renewable energy, low-carbon raw materials, or have been environmentally certified, are entitled to a Green Interest Discount, which is an interest rate reduction of up to 20% from the basic micro pawn rate. They also gain access to an increased loan-to-value (LTV) ratio of up to 95% and an extension of the loan tenor as a form of reward for their contribution to the green transition. This policy is consistent with the findings of Liu et al. (2023), which state that the provision of monetary incentives after

a successful energy transition is a key lever in encouraging the widespread adoption of environmentally friendly technologies in the non-corporate sector.

Transition category customers, namely MSMEs that show intent and potential towards sustainability but do not yet fully meet technical standards, also receive differential incentives in the form of moderate discount interest rates, limited LTV increases, and operational support for financing productive needs such as clean energy or raw material substitution (Annicchiarico & Di Dio, 2015). Furthermore, this scheme is designed to be compatible with the Transformational Insurance model, a risk mitigation policy for Transition category customers who want to experiment with green innovations but face technological or market uncertainties. If these innovative efforts fail, Pegadaian can partner with guaranteed institutions to provide compensation for R&D or new technology adoption costs, in line with the concept of insurance-backed innovation risk buffer (Liu et al., 2023; Wang et al., 2017). Through this approach, Green Pawn Financing provides cheap capital also acts as a systemic protector against transition failure risks, which have been a major obstacle to ESG adoption by MSMEs.

General category customers, namely those who do not yet have a commitment to sustainable practices, still have access to micro pawn loans with standard parameters, but with normal interest rates and LTV. This position is important to prevent financial exclusion, while providing structural incentives for future behavioral transition. By structuring a tiered incentive flow, where the Green category receives maximum incentives, Transition receives limited incentives, and General receives minimum incentives. In conclusion, this incentive scheme internalizes ESG values into microfinance products also establishes relevant, measurable, and progressive incentives oriented toward long-term ecological transition.

3.2.3 Digitalization of collateral and asset accountability

The digitalization of collateral and asset accountability in Green Pawn Financing is aimed at reducing transaction costs and expanding ESG-based microfinance inclusion. Within the framework of New Institutional Economics, transaction costs are systemic barriers that arise from verification, coordination, and high uncertainty in traditional financial systems (Williamson, 2000). This particularly impacts conventional micro pawn services, which tend to rely on physical interactions, manual verification, and analog documents, which are disproportionate to the capacity of MSMEs in the informal sector. Digitalization is a transformative solution to streamline processes without compromising credibility or compliance with ESG principles.

First, collateral digitization is carried out through online collateral appraisal and submission, where Pegadaian provides a digital platform through its official app and website to enable MSMEs to apply for loans without having to visit an outlet in person. This system calculates the initial estimated value of collateral based on historical market price data, asset type, and transaction history, which are integrated into the company's internal database. This technology supports the expansion of service coverage to disadvantaged and remote areas through the long-tail effect, which has been empirically proven to be able to reach ultra-micro businesses that are not served by conventional financing systems (Du et al., 2024; Jun & Ran, 2024).

Second, asset accountability is maintained through the integration of a management information system based on historical loan data and customer risk profiles. This process records asset history, transaction frequency, payment delays, and ownership history, which serves as a digital asset ledger for ESG-based microfinance. This system not only supports the principle of fair access to finance for MSME players who do not yet have a formal credit track record but also serves as a basis for evaluation for sustainability-based customer classification (Du et al., 2024). This approach enables a more objective analysis of the performance and credibility of micro-businesses, reducing dependence on conventional assessments that tend to be discriminatory towards the informal sector (Jun & Ran, 2024).

Third, digital identification and collateral validation are carried out through multi-layered verification based on a digital checklist designed with a sector-agnostic approach. Each MSME is required to complete an online form that includes quantitative and qualitative parameters related to the origin of raw materials, energy consumption, waste management, and asset ownership status. This form is processed through a binary scoring logic system, which utilizes the decision tree principle to systematically and efficiently classify the environmental and social impact of collateral assets. This approach has proven effective in reducing evaluation bias and accelerating the ESG-based financing eligibility validation process without the need for external audit involvement (Wati et al., 2024). In addition, this system adopts the adaptive principles of an MSME-based environmental screening model developed within the framework of inclusive digital finance (Du et al., 2024), enabling sustainability reporting to be carried out in proportion to the managerial capacity of micro-businesses. With this digital system, Pegadaian not only reduces transaction costs that have limited the speed and accuracy of microfinance, but also builds a data-based accountability system that is in line with the principles of transparency and traceability in sustainable finance architecture (Williamson, 2000; OJK, 2024a).

3.2.4 Sustainable assistance and integrated impact monitoring

Sustainable Assistance and Integrated Impact Monitoring are strategic instruments for mitigating the risk of transition failure at the micro level. The importance of this component is based on empirical data showing that the adoption of green practices in the MSME sector in Indonesia is currently still below 5% (Ministry of National Development Planning/Bappenas, 2025). In facing these challenges, PT Pegadaian can optimize its widespread physical outlet network as a center for micro ESG literacy. The transformation of the role of appraisers is a key factor in this component; appraisers no longer function merely as evaluators of the economic value of collateral assets, but also act as technical advisors. Appraisers are equipped with the competence to assist Transition category customers in identifying opportunities for energy efficiency, substitution of environmentally friendly raw materials, and standardization of waste management in accordance with the Indonesian Sustainable Finance Taxonomy (TKBI) (Financial Services Authority, 2024a). Through face-to-face interactions at physical outlets, the psychological and administrative barriers of MSMEs to sustainability issues can be reduced, thereby narrowing the gap between government macro policies and operational realities in the field.

If, during the periodic evaluation process, there is a deviation in the use of funds or a discrepancy with the agreed transition plan, the system will automatically trigger remedial measures. The low-interest incentive status can be temporarily suspended and returned to the standard rate until the customer takes adequate corrective action. Enforcement of this rule is a form of strengthening the governance structure that aims to minimize the risk of opportunism in microfinance contracts (Williamson, 1985; 2000). Thus, this scheme is not only supportive, but also educational and disciplinary, which will ultimately strengthen the institutional structure of green pawn services. All monitoring data is then compiled in a sustainability repository to be reported in Pegadaian's annual Sustainability Report. This data integration will strengthen the company's ESG score and reinforce the institution's position as a catalyst for green microfinance in the transition to a low-carbon economy. With an educational, disciplinary, and measurable approach, Pegadaian not only improves the effectiveness of the financing scheme but also accelerates the achievement of national net-zero emission targets in an institutional and integrated manner. The implementation of the Green Pawn Financing scheme represents a concrete step in mainstreaming sustainability in the microfinance sector in Indonesia. By integrating these four components, this scheme not only strengthens governance structures and equitable access but also paves the way for measurable and accountable green financial inclusion.

3.3 Institutional and regulatory implications

The implementation of Green Pawn Financing is based on significant institutional and regulatory implications, as it acts as a bridge between the global green transition agenda and the domestic microfinance system. This innovation requires systemic reforms that go beyond product development, by encouraging cross-authority integration and the harmonization of operational norms that support sustainable green financial inclusion (North, 1990). Normatively, this scheme consolidates two key regulations from the Financial Services Authority (OJK). First, POJK No. 51/POJK.03/2017 on Sustainable Finance provides a legal basis for the integration of ESG aspects into financial products and services, requiring financial services institutions (LJK) to internalize sustainability dimensions into their business strategies and financing processes (OJK, 2017). Second, POJK No. 39/2024 on the Implementation of Pawnbroking Strengthens the aspects of governance, risk management, and accountability in micro pawn services, thereby strengthening the institutional structure in adopting green innovation without sacrificing institutional stability (OJK, 2024b). The synergy of these two regulations forms a strategic and operational corridor that enables Pegadaian to reposition itself as a credible green microfinance catalyst (Williamson, 2000).

From an institutional perspective, the success of the scheme is largely determined by collaboration between strategic actors. OJK and Bank Indonesia play a role in formulating the Indonesian Sustainable Finance Taxonomy (TKBI) and policy incentives such as relaxing the Loan-to-Value (LTV) ratio for green assets. Local governments (Pemda) have an important role in curating local ESG-oriented MSMEs, through data integration and regional assistance programs (Ministry of National Development Planning/Bappenas, 2025). In addition, the involvement of external green certification institutions in the assessment process strengthens the validity of customer classification and mitigates the risk of greenwashing. The structural implication of this synergy is the strengthening of broader green financial inclusion. Pegadaian is strategically positioned to reach the unbankable segment in the informal sector that was previously marginalized by formal ESG financing schemes. With an efficient and adaptive governance-based design, Green Pawn Financing is an institutional platform that promotes a systemic, inclusive, and standardized green transition at the micro level (Williamson, 2000). Furthermore, this regulation is an important foundation in Pegadaian's governance, so that the implementation of Green Pawn Financing has the opportunity to become an adaptive and innovative strategy for MSME players to develop their businesses.

3.4 Potential and challenges of implementing green pawn financing

Indonesia, as a significant contributor to global greenhouse gas emissions, has demonstrated its commitment through the ratification of the Paris Agreement (Renata et al., 2024), which aims to limit the global average temperature increase to well below 2°C and pursue efforts toward 1.5°C above pre-industrial levels (UNFCCC, 2025). This commitment has the potential to transform economic and financial instruments that reach the micro-level actors, particularly MSMEs, and supports the achievement of SDGs 13 on climate action (United Nations, 2022). Green Pawn Financing integrates ESG principles into pawn-based financing as an operational mechanism linking global climate commitments with domestic financing practices. By targeting MSMEs through emission-reducing incentives rather than large-scale financing, this scheme promotes climate mitigation with relatively low credit risk, thereby supporting Indonesia's 2030 climate targets while strengthening the sustainability of the national financial system.

Pawnshops in Indonesia exhibit a relatively high level of institutional readiness in implementing Good Corporate Governance (GCG), as reflected in the consistent application of transparency, accountability, responsibility, independence, and fairness. Transparency has been operationalized through open communication channels, including official websites, social media platforms, contact centers, and whistleblowing systems that function

as mechanisms of internal and external oversight (Huddin et al., 2025). PT Pegadaian's achievement of the *Most Trusted Company* award, with a Corporate Governance Perception Index (CGPI) score of 88.74, further indicates strong accountability and sound corporate management practices (Khairurizqi, 2024). In the context of Green Pawn Financing, this governance performance carries strategic significance, as ESG-based financing requires robust risk management, reliable reporting systems, and effective supervision to mitigate greenwashing risks. Moreover, Pegadaian's ongoing commitment to regulatory compliance, business ethics, social responsibility, professional independence, and equitable stakeholder treatment provides a governance foundation that supports the gradual and measurable implementation of sustainable financing initiatives (Khairurizqi, 2024).

Furthermore, the strengthening of GCG at Pegadaian has developed towards the adoption of an ESG framework. In terms of the environment, Pegadaian is committed to energy efficiency, carbon emission management, and setting sustainable environmental targets. Meanwhile, on the social aspect, Pegadaian maintains the welfare of all stakeholders, gender equality, educational and social support, and contributes to the SDGs. Pegadaian also focuses on corporate governance, business ethics, information disclosure, and risk management systems (Pegadaian, 2026). This institutional commitment provides a foundation for developing green criteria within pawn-based financing assessments and enables Green Pawn Financing to be more explicitly targeted toward green MSMEs in line with sustainable development goals. The integration of GCG and ESG frameworks within Pegadaian's operations allows the incorporation of tailored incentives, environmental screening, and evaluation mechanisms that reflect MSME characteristics. Pegadaian's strong governance performance and high public trust underscore the potential of Green Pawn Financing to broaden MSMEs' access to sustainable and credible financing that integrates environmental and social priorities.

Micro, small, and medium enterprises (MSMEs) play a central role in Indonesia's economy due to their high adaptability to market dynamics and their substantial contribution to national GDP (Arianto & Rani, 2024). According to the Ministry of Cooperatives and SMEs, MSMEs absorb approximately 123.3 thousand workers and account for 60.5% of Indonesia's GDP (Tambunan, 2023). Despite this dominance, MSMEs remain vulnerable to limited access to sustainable financing. The growth of People's Business Credit (KUR), which reached 16.25% in 2020 and 8.16% in 2021, indicates a strong demand for financing incentives to support business expansion and long-term viability. However, prevailing conventional financing schemes largely overlook environmental considerations, leaving the potential role of MSMEs in the transition toward a green economy underutilized. In this context, Green Pawn Financing emerges as a relevant alternative by enabling MSMEs to access financing while aligning business activities with green industry standards. Empirical evidence shows that green innovation adoption can reduce production costs by up to 30% and increase consumer demand for environmentally friendly products by up to 70% (Farhani et al., 2025), while also improving resource efficiency, waste reduction, human capital quality, and market competitiveness (Fathihani et al., 2024). Beyond functioning as a financing instrument, Green Pawn Financing operates as a policy mechanism that incentivizes sustainable MSME behavior with relatively low credit risk, positioning Pegadaian as a strategic non-bank actor in advancing green financial inclusion beyond the traditional banking sector.

Although Green Pawn Financing has strategic potential in expanding sustainable financing in the micro-business sector, its implementation faces a number of challenges. The first challenge relates to the limited capacity and green literacy of MSME players. Many MSME actors do not yet understand the concept of green business, have difficulty accessing environmentally friendly financing, and receive uneven incentives from local governments (Buwono, 2025). This condition shows that the transition to green MSMEs requires not only financial product innovation, but also conducive policies and increased capacity for business actors. The next challenge relates to limited access to capital and the asset structure of MSMEs. One of the main requirements for realizing environmentally friendly MSMEs is easy access to financing and supportive government policies. However, many

MSMEs face difficulties in obtaining capital and have limited assets to develop their products (Fauziah et al., 2025). This situation hinders the implementation of Green Pawn Financing because the pawn scheme is designed to guarantee the security of financing. On the other hand, green MSMEs do not have sufficient assets to meet the requirements for formal financing. Integrating environmental and social indicators into pawn-based financing presents notable operational challenges. The implementation of Green Pawn Financing requires robust support systems to ensure consistent administrative and operational management; however, current frameworks remain predominantly compliance-oriented rather than impact-based, thereby elevating the risk of greenwashing. Additional barriers arise from procedural complexity, including lengthy application processes, stringent administrative requirements, and high collateral thresholds, which continue to limit MSMEs' access to formal and sustainability-oriented financing schemes (Hakim et al., 2024).

Moreover, the implementation of Green Pawn Financing is influenced by broader shifts in consumption and production patterns associated with the transition to a green economy. Such transformations demand behavioral changes among both producers and consumers, yet Indonesia continues to face institutional weaknesses and coordination challenges among key actors (Auliya & Nurhadi, 2023; Rany et al., 2020). Given that the effectiveness of Green Pawn Financing depends on systematic and cross-sectoral collaboration to align financial, environmental, and development objectives, these constraints must be addressed to ensure that the scheme remains inclusive and accessible to diverse MSME groups.

4. Conclusions

Green Pawn Financing is a relevant and adaptable regulatory alternative solution for expanding the reach of sustainable financing in the MSME sector in Indonesia. Financial sector reforms following the implementation of Law No. 4 of 2023, reinforced by POJK 51/2017, POJK 17/2024, and POJK 39/2024, have created a legal and institutional framework that enables financial institutions to integrate Environmental, Social, and Governance (ESG) principles. The integration of ESG principles into pawn-based sustainable financing instruments can maintain the inclusive and efficient aspects of microfinance. Findings show that Pegadaian already has a solid foundation through strengthened governance, corporate ESG adoption, and experience in gold-based asset management, but the integration of ESG into pawn services has not explicitly focused on green MSMEs. The Green Pawn Financing concept bridges the gap between the macro green finance agenda and the operational realities of micro, small, and medium enterprises (MSMEs). This concept provides a solution that can support the Indonesian government in achieving the global agenda on climate change through adaptive ESG assessments, gradual incentive schemes, digitalization of collateral, as well as mentoring and impact monitoring. The scheme was adopted to uphold the principles of transparency, accountability, responsibility, independence, and fairness, which strengthen public trust, especially among MSME players, and encourage the development of green MSMEs without high risks. However, the implementation of Green Pawn Financing requires readiness in terms of policy, infrastructure, and systematic, effective, and measurable financing. ESG infrastructure readiness, increased green financial literacy, and strengthened cross-actor synergies are factors in the success of this concept. Thus, Green Pawn Financing can be positioned as a micro-level green finance transition instrument that expands sustainable finance outreach, enables MSMEs to develop environmentally responsible products, and strengthens Pegadaian's strategic role. Pegadaian's contribution is crucial as a non-bank actor in supporting the national green economic transition agenda in a measurable and long-term manner.

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During the preparation of this manuscript, the author(s) used MyBib to generate and manage reference formatting to minimize human error. Consensus was employed to identify and screen relevant peer-reviewed journal articles aligned with the topic of discussion. Grammarly was used to improve grammatical accuracy, clarity, and academic tone. After using these tools, the author(s) carefully reviewed and edited the manuscript and took full responsibility for the content of the publication.

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Biographies of Authors

Muhammad Rifky Apriansyah, Department of International Relations, Faculty of Social and Political Sciences, Universitas Sebelas Maret, Surakarta, Central Java 57126, Indonesia.

- Email: muhammad_rifky13@student.uns.ac.id
- ORCID: 0009-0007-0337-5026
- Web of Science ResearcherID: PGT-3114-2026
- Scopus Author ID: N/A
- Homepage: N/A

Ahadina Hanifati Amimah, is an undergraduate student of International Relations at Universitas Sebelas Maret (UNS), Indonesia. In addition to being active in campus activities, she is also enthusiastic about academic research focusing on international political economy, public policy analysis, and international cooperation.

- Email: ahadinahanifati@student.uns.ac.id
- ORCID: 0009-0008-1695-8914
- Web of Science ResearcherID: PGT-3140-2026
- Scopus Author ID: N/A
- Homepage: N/A

Aubry Fairuza Akifa Prabowo, is an undergraduate student of International Relations at Universitas Sebelas Maret (UNS), Indonesia. She has a strong academic interest in international geopolitics, global governance, and contemporary international issues.

- Email: aubryyfaivy@student.uns.ac.id
- ORCID: 0009-0005-3947-4697
- Web of Science ResearcherID: PGT-3162-2026
- Scopus Author ID: N/A
- Homepage: N/A