

SEKOP SENI Program: Zero Waste Social Innovation for Vulnerable Community Empowerment in Suntenjaya Village, North Bandung, Indonesia

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ABSTRACT : North Bandung is a region with abundant natural resources but faces socio-economic and environmental challenges, including poverty, unemployment, vulnerability of marginalized groups, and ecological degradation due to unsustainable resource management. In response, PT Pertamina Patra Niaga AFT Husein Sastranegara initiated the SEKOP SENI (Sentra Kopi Sejahterakan Petani) program in Suntenjaya Village. The program aims to empower the community through coffee-based economic activities, social capacity building, and the application of zero waste principles and environmental conservation. A qualitative case study approach was employed, with data collected through observation, semi-structured interviews, focus group discussions, and document review, then analyzed thematically using the Miles and Huberman model. The findings show that socially, SEKOP SENI strengthens community cohesion, enhances youth participation, and improves nutrition for vulnerable groups. Economically, it increases farmers' income from IDR 0–250,000 to IDR 1,750,000 per month, develops coffee-based MSMEs, and enhances energy efficiency through biogas. Environmentally, the program implements zero waste by converting livestock waste into energy and fertilizer, utilizing coffee husks as cascara, and practicing coffee-saninten agroforestry. Overall, SEKOP SENI demonstrates that CSR can be an innovative tool for sustainable development, effectively integrating social, economic, and environmental benefits, while contributing to the achievement of the Sustainable Development Goals (SDGs).

Keywords: CSR, community empowerment, coffee, zero waste, agroforestry.

1. INTRODUCTION

The North Bandung region serves a vital ecological function as a water catchment area, an urban buffer zone, and a conservation space for local ecosystems. However, over the past two decades, this area has faced severe pressures due to land-use changes, urbanization, and natural resource exploitation. Data from the West Java Regional Development Planning Agency (Bappeda) indicates that between 2010 and 2020, green land in North Bandung decreased by up to 18%, primarily due to conversion into residential areas and intensive agriculture (Bappeda Jabar, 2021). This condition has exacerbated ecological disaster risks, such as floods, droughts, and landslides, which frequently occur during the rainy season.

In addition to ecological issues, social problems are a major concern. According to data from the West Bandung Regency Statistics Agency (BPS, 2022), the poverty rate in the North Bandung area remains around 11.3%, with an open unemployment rate of 8.5%. Vulnerable groups, including the elderly, pregnant women, and marginalized populations such as former street gangs, face limited access to employment and social services.

These conditions highlight that even ecologically and economically promising areas still experience fundamental social issues requiring urgent attention.

To address these challenges, both local and central governments have implemented several initiatives. Among them is the Citarum Harum Program, launched in 2018, aiming to improve water quality, conserve land, and manage waste in West Java, including North Bandung. Additionally, the West Java provincial government introduced the Desa Juara Program, which promotes village economic empowerment by developing local potentials, including agriculture and eco-tourism (Pemprov Jabar, 2021). Nevertheless, government programs still face limitations in funding, institutional capacity, and sustainability, highlighting the need for interventions from other sectors, particularly the private sector.

Within sustainable development, the private sector plays a strategic role through Corporate Social Responsibility (CSR). CSR has evolved from a legal obligation under Indonesia's Limited Liability Company Law No. 40 of 2007 into a strategy for creating shared value for both communities and the environment (Porter & Kramer, 2011). This approach emphasizes that corporate success is closely tied to the welfare of surrounding communities. Many Indonesian companies have developed CSR programs integrating social, economic, and environmental dimensions, addressing structural issues such as unemployment, poverty, and environmental degradation through sustainable empowerment approaches.

Conceptually, CSR functions as a social development instrument linking business interests with community needs. According to Carroll (1999), CSR encompasses four main dimensions: economic, legal, ethical, and philanthropic responsibilities. Effective CSR in community development should move beyond charity-based approaches toward empowerment-based models that enhance local self-reliance. Through collaboration with local communities, CSR can transform waste into resources, expand economic access, and strengthen environmental awareness.

A relevant CSR example is the SEKOP SENI (Sentra Kopi Sejahterakan Petani) initiative implemented by PT Pertamina Patra Niaga AFT Husein Sastranegara in Suntenjaya Village, Lembang District, West Bandung Regency. The program addresses socio-economic and ecological challenges while fulfilling corporate social responsibilities in operational areas. Suntenjaya Village is known for its coffee production and dairy farming; however, these potentials have not been fully optimized. Local residents face poverty, limited access to health and education, and ecological vulnerability due to unsustainable resource management.

Located in the hilly terrain of North Bandung with a population of approximately 11,000 (BPS KBB, 2022), Suntenjaya Village was selected for the SEKOP SENI program, which integrates coffee cultivation, livestock management, and environmental education with zero-waste principles. Launched in 2020, the program engages farmers' groups, village youth, and vulnerable populations through training, product innovation, and conservation strategies. The objective is to improve the welfare of vulnerable groups, including the elderly, pregnant women, and former street gang members, while preserving the environment.

Evidence shows that after the program's implementation, coffee farmers' incomes increased from IDR 0–250,000 to an average of IDR 1,750,000 per month. Livestock waste was converted into biogas, reducing household energy costs by up to IDR 100,000 per month. SEKOP SENI represents a social innovation program that combines social, economic, and environmental dimensions. Socially, it enhances community capacity through conservation education and nutrition distribution for vulnerable groups. Economically, value-added coffee products expand market access and strengthen the village identity as a coffee center. Environmentally, zero-waste and agroforestry practices improve soil quality, reduce pollution, and maintain ecosystem balance. Thus, SEKOP SENI demonstrates how CSR can serve as a sustainable development instrument, balancing corporate interests with community needs. This study aims to identify the impacts of SEKOP SENI on social, economic, and environmental aspects, focusing on how CSR interventions through social innovation can address community vulnerability while maintaining ecological sustainability.

Previous studies indicate that CSR has multidimensional impacts. For example, Wibisono (2007) found that CSR expands economic access for rural communities through MSMEs. Astuti and Hadi (2017) reported that zero-waste initiatives in Yogyakarta reduced household waste by 40% through community education. Wulandari and

Inoue (2018) in Lampung demonstrated that agroforestry increases farmers' income while conserving the environment. These findings align with SEKOP SENI's focus on multi-stakeholder collaboration, zero-waste principles, and community capacity building, highlighting the study's academic and practical relevance in strengthening the literature on CSR's role in sustainable development.

2. RESEARCH METHODOLOGY

This study aims to describe the impacts of the SEKOP SENI Program (Sentra Kopi Sejahterakan Petani) on social, economic, and environmental aspects in Suntenjaya Village, North Bandung. The research objectives stem from the need to understand how a CSR initiative by PT Pertamina Patra Niaga AFT Husein Sastranegara can improve the welfare of vulnerable groups, expand economic opportunities for the community, and simultaneously maintain environmental sustainability through zero-waste and agroforestry approaches.

The study employs a qualitative descriptive approach using a case study method. This approach was chosen because the phenomenon under investigation is closely linked to a complex social context, requiring in-depth data exploration to obtain a comprehensive understanding. As Moleong (2005) suggests, qualitative research allows researchers to understand the meanings behind community experiences, while Miles and Huberman (1994) emphasize that case studies provide space for comprehensive contextual analysis.

The data sources consist of primary and secondary data. Primary data were collected through field observations, semi-structured interviews, and focus group discussions (FGDs). Participatory observation was conducted to directly observe program implementation, community group dynamics, and tangible impacts of the CSR initiative. Semi-structured interviews were held with key informants, including representatives from PT Pertamina Patra Niaga AFT Husein Sastranegara as program implementers, officials from Suntenjaya Village, and beneficiary community groups such as coffee farmers, village youth, the elderly, pregnant women, and former street gang members. Semi-structured interviews were chosen for their flexibility in eliciting in-depth information while maintaining the research framework. Additionally, FGDs were conducted to capture collective community perspectives on social, economic, and environmental changes after the program's implementation. Secondary data were obtained from the internal CSR SEKOP SENI reports, official publications from West Bandung Regency Statistics Agency (BPS), local government planning documents, and relevant academic literature on CSR, zero waste, and agroforestry. Secondary data served to strengthen field findings and provide comparative references with similar practices in other contexts.

Data collection combined several techniques, including participatory observation, semi-structured interviews, documentation studies, and FGDs. Participatory observation offered insight into real-world dynamics, such as how farmers manage coffee production, convert livestock waste into biogas, and engage children in conservation education. Interviews explored informants' perceptions, experiences, and reflections on program impacts, while documentation provided supplementary information from official reports and available literature. FGDs validated findings and allowed examination of group discussion dynamics among beneficiaries. Data analysis followed thematic analysis based on Miles and Huberman's (1994) framework. The first stage, data reduction, involved filtering and focusing on information relevant to the research objectives. The second stage, data display, involved organizing interview, observation, and documentation results into narratives, tables, and visualizations to facilitate interpretation. The final stage, drawing conclusions, identified key patterns and themes linked to CSR theory, social innovation, zero waste, and agroforestry. To ensure data validity, the study employed triangulation of sources and methods by comparing information from multiple informants, data collection techniques, and supporting documents.

This methodological approach is expected to provide a deeper understanding of SEKOP SENI's contribution to sustainable development across social, economic, and environmental dimensions, as well as serve as a foundation for developing replicable program models in other regions with similar conditions.

3. RESULTS AND DISCUSSION

Overview of the SEKOP SENI Program (Sentra Kopi Sejahterakan Petani)

The SEKOP SENI Program (Sentra Kopi Sejahterakan Petani) is a Corporate Social Responsibility (CSR) initiative by PT Pertamina Patra Niaga AFT Husein Sastranegara implemented in Suntenjaya Village, Lembang District, West Bandung Regency. The program was primarily designed to improve community welfare, particularly for vulnerable groups, through economic empowerment based on coffee cultivation and livestock farming, while simultaneously applying zero-waste principles and environmental conservation.

Suntenjaya Village, located in North Bandung, has significant potential in agriculture, especially Arabica coffee, as well as dairy farming. However, this potential was previously underutilized. Communities typically sold raw coffee beans at low prices, and livestock waste often caused environmental pollution. These issues were exacerbated by social vulnerability, including high poverty rates, limited economic access for the elderly and pregnant women, and the involvement of former street gang members in unemployment cycles. This situation illustrates that even resource-rich villages face serious welfare challenges.

SEKOP SENI emerges as a social innovation program integrating economic, social, and environmental aspects. Economically, it provides training in coffee cultivation, post-harvest techniques, and the development of value-added products such as coffee powder, green beans, cold brew, and cascara. This capacity-building effort has increased farmers' monthly income from IDR 0–250,000 to an average of IDR 1,750,000.

Environmentally, the program adopts zero-waste principles by converting livestock waste into biogas as an alternative energy source. Biogas utilization reduces household energy costs by approximately IDR 100,000 per month while mitigating potential air and water pollution. Additionally, the program implements coffee-saninten agroforestry, combining coffee cultivation with Saninten trees (*Castanopsis argentea*) as shade plants. This practice improves soil quality, maintains moisture, and reduces landslide risks in hilly areas.

Figure. 1: The implementation of coffee-saninten agroforestry in Suntenjaya Village



Socially, the program prioritizes vulnerable groups. Local dairy milk is distributed to the elderly and pregnant women, improving their nutritional intake. Children participate in environmental conservation education through participatory learning, games, and planting activities, with pre-test scores increasing from 51.5 to 93.5 post-test. Village youth are engaged in digital marketing of coffee products, fostering local development actors and reducing youth migration.

Conceptually, SEKOP SENI functions not only as an economic empowerment initiative but also as a community-based social innovation model combining sustainability with circular economy principles. All resources are managed for added value, and waste is transformed into useful products, exemplifying how corporate CSR can drive socio-economic transformation while conserving the environment.

In the context of sustainable development, SEKOP SENI aligns with the **Sustainable Development Goals (SDGs)**, particularly:

1. **No Poverty (SDG 1)** through increased community income,
2. **Decent Work and Economic Growth (SDG 8)** through coffee-based business creation,
3. **Responsible Consumption and Production (SDG 12)** through zero-waste implementation, and
4. **Life on Land (SDG 15)** through agroforestry conservation.

Thus, SEKOP SENI serves as a transformative CSR model that extends beyond philanthropic aid, focusing on community empowerment to foster independence, productivity, and competitiveness.

Social Impacts

One of the main achievements of the SEKOP SENI Program is its contribution to improving social life in Suntenjaya Village. The program was intentionally designed not only to generate economic benefits but also to address social vulnerabilities affecting the village. Key focus groups include the elderly, pregnant women, children, and marginalized individuals such as former street gang members.

First, the program successfully addresses the nutritional needs of vulnerable groups through the distribution of locally produced dairy milk, providing access to essential protein that was previously difficult to obtain. This initiative enhances nutrition while strengthening social solidarity. Elderly residents report improved stamina, and pregnant women experience better fetal weight gain, demonstrating how local economic empowerment via dairy processing contributes to health improvements.

Second, environmental education for children significantly increased environmental knowledge and awareness. Participatory methods, including games, group discussions, and tree planting, resulted in pre-test scores rising from 51.5 to 93.5 post-test. This indicates that participatory education effectively cultivates environmentally conscious youth.

Third, the program promotes youth engagement in creative coffee-based economic activities. Youth are involved not only in production but also in digital marketing, using social media, e-commerce platforms, and branding strategies to increase the visibility of Suntenjaya coffee. This involvement provides local employment opportunities, reducing urban migration and reinforcing community cohesion.

Fourth, marginalized groups, including former street gang members, are reintegrated through participation in productive activities such as coffee cultivation, biogas production, and processing value-added products. This engagement helps them establish a new social identity as productive community members and reduces the risk of returning to negative behaviors, strengthening social cohesion and minimizing potential conflict.

Moreover, the program enhances solidarity and community identity. Collective initiatives, such as forming cooperatives and collaborative businesses, encourage participatory and self-reliant community development. Marketing Suntenjaya coffee at fairs, cafés, and digital platforms fosters local pride and a sense of ownership, motivating cooperative efforts to sustain program benefits.

Conceptually, these social impacts align with community empowerment frameworks (Mardikanto, 2015) and participatory development principles (Chambers, 1997), emphasizing active involvement of the community in shaping change. SEKOP SENI transforms vulnerable groups from passive recipients to active contributors to local development, demonstrating the capacity of socially innovative CSR to drive community transformation.

Economic Impacts

The most notable economic impact of SEKOP SENI is the increased income and economic capacity of Suntenjaya's coffee farmers. Prior to program intervention, farmers sold raw coffee beans at low prices, averaging IDR 0–250,000 per month. Traditional production methods left them vulnerable to market fluctuations, low product competitiveness, and weak bargaining positions.

Through SEKOP SENI, comprehensive training was provided in coffee cultivation, post-harvest processing, roasting, packaging, and marketing. Farmers now produce value-added products, including coffee powder, green beans, cold brew, and cascara made from coffee husks. Product diversification has opened new markets

and strengthened the local identity of Suntenjaya coffee, resulting in an average monthly income increase to IDR 1,750,000.

The program also promotes the creation of coffee-based micro, small, and medium enterprises (MSMEs). Farmers now engage in market-oriented businesses, selling products locally, in cafés, at exhibitions, and online. This transition marks a shift from subsistence to market-based economies, empowering villagers as producers and entrepreneurs.

Livestock waste utilization for biogas further contributes economically. Households save approximately IDR 100,000 per month on energy costs, while biogas slurry is used as organic fertilizer, reducing dependency on costly chemical fertilizers.

Additionally, SEKOP SENI strengthens the agricultural value chain. Farmers participate in production, post-harvest processing, distribution, and marketing, consistent with Prahalad's (2004) framework, highlighting opportunities for economically marginalized communities to contribute to local development when provided access to technology, markets, and innovation. Youth engagement in digital marketing expands market reach and creates employment opportunities, reducing local unemployment and enhancing rural economic resilience. Conceptually, these economic impacts reflect circular economy principles (Ghisellini et al., 2016), optimizing resource use, minimizing waste, and maximizing added value. SEKOP SENI demonstrates that coffee and livestock waste can generate revenue while empowering local human capital, creating a sustainable production cycle that benefits the community economically, socially, and environmentally.

Environmental Impacts

Beyond social and economic contributions, SEKOP SENI has significantly improved the environmental condition in Suntenjaya. The program addresses ecological sustainability alongside community welfare. North Bandung has faced environmental pressures from land conversion, intensive farming, and unmanaged waste disposal. The zero-waste approach offers an innovative solution that transforms community resource and environmental management paradigms.

The first environmental impact is the conversion of livestock waste into biogas. Previously, cattle manure was disposed of improperly, polluting water and air. Biogas technology now provides renewable energy, reducing reliance on LPG or firewood, saving households approximately IDR 100,000 per month, and decreasing potential environmental contamination. Residual slurry serves as organic fertilizer, replacing chemical fertilizers that could degrade soil fertility.

Second, the program implements coffee-saninten agroforestry for environmental conservation. Saninten (*Castanopsis argentea*), an endemic tree species, stabilizes soil, improves groundwater quality, and reduces landslide risk. Integrating coffee with saninten creates a balanced ecosystem. Field observations indicate more stable soil in agroforestry areas compared to monoculture plots. Shade provided by saninten enhances soil moisture and coffee bean quality.

Third, environmental awareness among children and the broader community has improved. Participatory conservation education increased children's knowledge scores from 51.5 to 93.5, fostering environmental stewardship and long-term sustainable resource management.

Fourth, coffee husks are transformed into value-added products, such as cascara tea, reducing organic waste and environmental pollution. This approach aligns with circular economy principles, turning waste into a valuable resource (Ghisellini et al., 2016).

Overall, SEKOP SENI's environmental impacts include: (1) zero-waste waste management through biogas and cascara, (2) ecological conservation via coffee-saninten agroforestry, and (3) increased environmental awareness. These results demonstrate that CSR designed with a social innovation approach not only addresses community economic and social needs but also contributes substantially to environmental sustainability.

Figure .2: The process of producing biogas from livestock manure.



4. CONCLUSION

The SEKOP SENI Program (Sentra Kopi Sejahterakan Petani), initiated by PT Pertamina Patra Niaga AFT Husein Sastranegara in Suntenjaya Village, North Bandung, has proven to be a tangible example of CSR-based social innovation, delivering multidimensional impacts across social, economic, and environmental aspects. Socially, the program has strengthened community cohesion through the empowerment of vulnerable groups, improved nutrition for the elderly and pregnant women, environmental conservation education for children, engagement of youth in digital marketing, and the reintegration of marginalized groups. Economically, the program has increased coffee farmers' income from an average of IDR 0–250,000 to IDR 1,750,000 per month, facilitated product diversification with added value, stimulated the growth of micro, small, and medium enterprises (MSMEs), expanded market access, and generated cost efficiencies through biogas utilization. Environmentally, the program applies zero-waste principles by converting livestock waste into energy and organic fertilizer, processing coffee husks into cascara, and implementing ecological conservation through coffee-saninten agroforestry, which has been proven to improve soil quality and reduce landslide risk.

Overall, the SEKOP SENI Program functions not only as a CSR intervention but also as a sustainable development model aligned with the Sustainable Development Goals (SDGs), particularly in eradicating poverty, creating decent work, promoting sustainable consumption and production, and preserving terrestrial ecosystems. The program demonstrates that collaboration between the private sector, government, and communities can achieve resilient socio-economic transformation while maintaining ecological integrity. These findings underscore the importance of replicating similar programs in other regions with comparable socio-ecological characteristics, positioning CSR-based social innovation as a strategic instrument for achieving sustainable well-being.

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