

# The Social Innovation Model of the Bengkel EduPreneur Berdikari by PT Pertamina Patra Niaga Integrated Terminal Semarang

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## ABSTRACT

The Bengkel EduPreneur Berdikari Program is a social innovation model developed by PT Pertamina Patra Niaga Integrated Terminal Semarang to improve the quality of life of coastal communities in Mangunharjo Village. This program targets vulnerable groups such as the poor, women, the elderly, marginalized groups, and victims of tidal flooding, through an educational and entrepreneurial approach based on environmentally friendly workshops. The innovations carried out include the use of solar energy, processing motorcycle wash waste (aqua cycle), the development of noiseless fishing boat exhausts from scrap waste, and the production of eco-cleaning kits from mangrove waste. This program not only contributes to increasing community income but also has an impact on reducing greenhouse gas emissions and reducing environmental pollution. Through an empowerment-based strategy and the transfer of the company's core competencies, this program demonstrates integrative success in addressing economic, social, and environmental issues in a sustainable manner.

**Keywords:** welfare, CSR, social innovation, community development, social program

## INTRODUCTION

According to data from the Central Statistics Agency (BPS) in 2023, the number of unemployed people in Semarang City reached 55,656 (Badan Pusat Statistik Kota Semarang, 2024). Unemployment in Semarang City, particularly in coastal areas such as Mangunharjo Village, is a serious challenge with widespread social and economic impacts. This phenomenon is particularly prevalent among young people, who should be agents of social change. Lack of skills and access to applied education are key factors preventing them from entering the formal workforce. Consequently, many are trapped in a cycle of long-term unemployment, which increases the risk of crime and economic dependency.

The high unemployment rate reflects poverty, a structural problem plaguing the coastal communities of Mangunharjo (Subarsono et al., 2025). According to the 2021 Integrated Social Welfare Data (DTKS), 342 residents of Mangunharjo Village are classified as poor (Pratomo et al., 2022). This situation is exacerbated by limited access to adequate livelihoods and limited productive assets such as business capital and skills training. Poverty not only impacts the economic sector but also hinders access to education, healthcare, and social participation (Amri & Sihotang, 2023). This demands innovative and

sustainable approaches that can directly empower communities to escape poverty and improve their quality of life (del Arco et al., 2021).

One of the contributing factors to poverty in Mangunharjo Village is low levels of access to and participation in education. A total of 2,283 residents, or approximately 31.4% of the total population, are recorded as having no or not yet attended school (Kelurahan Mangunharjo, 2024b). This condition reflects the low level of community education. This low level of educational participation is caused by various factors, including economic constraints that encourage people to work at an early age, limited financial capacity to finance education, and a low awareness of the importance of education for the future (Meşe & Sevilen, 2021).

Environmentally, Mangunharjo Village is one of the coastal areas on the North Coast of Java, located in the urban area of Semarang. Bordering the Java Sea, Mangunharjo Village has a coastal area in the most critical condition compared to other areas in Semarang City (Setyaningsih et al., 2023). This is due to the accumulation of waste and slum areas that potentially threaten public health and the environment. The high volume of organic waste is also caused by the 46.19 hectares of mangrove forest, which contributes to the shedding of dry mangrove leaves. As a result, many mangrove leaves have fallen, been scattered throughout the community, or even simply flooded in coastal areas, causing the environment to become squalid.

Therefore, an innovative program is needed that not only addresses a single aspect of the problem but also integrates issues of unemployment, poverty, low education, and environmental damage (Rashid, 2019). The Bengkel EduPreneur Berdikari Program, initiated by PT Pertamina Patra Niaga Integrated Terminal Semarang, presents a strategic response to this complexity. Through skills development and the utilization of environmentally friendly waste, this program offers solutions for

coastal communities to increase their capacity, access economic opportunities, and build ecological awareness. Therefore, this paper seeks to examine in depth how the Bengkel EduPreneur Berdikari Program can address social, economic, and environmental issues in the coastal area of Mangunharjo Village.

## **MATERIALS & METHODS**

This research is a qualitative case study approach, aimed at gaining a deeper understanding of the implementation of the Berdikari EduPreneur Workshop Program and its impact on coastal communities in Mangunharjo Village. This study focuses on analyzing social innovations implemented by PT. Pertamina Patra Niaga Terminal Terpadu Semarang to empower vulnerable groups.

The population of this study was the Mangunharjo Village community involved in the Berdikari EduPreneur Workshop Program, including members of the EduPreneur Workshop Group and the Mina Mangun Sari Group. The research subjects covered various aspects of the program, such as skills training, environmentally friendly product innovation, and the resulting economic and social impacts.

The data analysis technique used in this study was descriptive qualitative analysis, where data obtained from interviews, observations, and documentation were analyzed to identify key themes related to the program's success. The data was organized and structured into relevant categories, facilitating conclusions.

Data collection techniques include in-depth interviews with program participants, direct observation of activities at the EduPreneur Workshop, and the collection of program-related documents, such as activity reports and statistical data. Interviews will be conducted using a semi-structured questionnaire to obtain comprehensive information regarding participants' experiences and perspectives on the program. Observations will be conducted to directly observe the training process and the

innovations implemented, while documents will be used to support the data obtained from the interviews and observations.

## RESULT & DISCUSSION

### Implemented Social Innovation

The Bengkel EduPreneur Berdikari Program is a social innovation program for community empowerment implemented by PT Pertamina Patra Niaga Integrated Terminal Semarang. This program has been running since 2021 and is in line with the program roadmap, which targets self-reliance by 2025. These programs are expected to comprehensively address the economic, social, environmental, and educational challenges faced by the surrounding community. This program was developed through synergy between two community groups: the Bengkel EduPreneur Group and the Mina Mangun Sari Group. The Bengkel EduPreneur operates a motorcycle repair shop with an environmentally friendly concept.

The eco-friendly workshop exists in response to current climate change. The workshop uses solar panels to power the workshop, reducing greenhouse gas emissions and promoting energy efficiency. The Bengkel EduPreneur also implements a reuse concept for watering plants. This program offers motorcycle repair and welding services, spare parts and lubricants, and provides motorcycle washing services using environmentally friendly products. The presence of environmentally friendly workshop innovations develops solar panels as a source of electricity with a reduction in emissions of 0.664 tons of CO<sub>2</sub>e, energy savings (absolute) of 2.989 GJ and energy efficiency savings of Rp1,055,738.

As part of its eco-friendly innovation program, the Bengkel EduPreneur Berdikari Program has successfully developed a noiseless exhaust for fishing boats, which has been implemented since 2023. This innovation provides a solution to the problems of noise and air pollution often caused by the use of conventional boat exhausts (Imarhiagbe et al., 2024). The

noiseless exhaust is designed with tested noise levels and meets the maximum working environment threshold standards as stipulated in the Decree of the Minister of Environment, KEP-48/MENLH/11/1996. This technology has a positive impact on the health and comfort of fishermen at sea, as the engine noise is quieter and does not disrupt the marine ecosystem (Adeniran-Obey, 2024).

The noiseless exhaust is manufactured using non-B3 solid waste from the company, namely iron scrap. This innovation not only addresses environmental needs but also contributes to material recycling practices. During 2023, this program successfully utilized 0.238 tons of scrap, increasing to 0.266 tons in 2024. This waste utilization demonstrates the company's life cycle assessment (LCA) approach, where every innovation is directed at reducing environmental impacts from upstream to downstream production. This also reinforces PT Pertamina Patra Niaga Integrated Terminal Semarang's commitment to sustainable waste management.

A motorcycle wash wastewater treatment program also features an innovative aqua cycle with a reuse concept for watering plants (Afzal et al., 2024). This filtered water has a safer content, proven by laboratory tests (PT Sucofindo Semarang Branch). This program has resulted in water efficiency of 9,433 m<sup>3</sup>, thereby reducing groundwater use in the surrounding area. This initiative aligns with Pertamina IT Semarang's commitment to supporting the achievement of the Sustainable Development Goals (SDGs), specifically goals 6 (clean water and adequate sanitation), 7 (affordable and clean energy), and 13 (addressing climate change). The Bengkel EduPreneur Berdikari, part of Pertamina's community empowerment program, is also expected to raise public awareness of environmentally friendly technologies while opening up sustainable business opportunities.

The eco-cleaning kit is a social innovation developed by the Mina Mangun Sari group

within the Bengkel EduPreneur Berdikari Program. This product is made from mangrove leaf waste that was previously burned by the community and polluted the environment. Before the Bengkel EduPreneur Berdikari program, the community simply burned mangrove leaf waste, considered an effective way to reduce waste volume. After the program's implementation, the waste was processed into motorcycle shampoo, body soap, and body polish. This innovation not only reduces pollution but also creates economic value for the community. Economically, the Mina Mangun Sari group experienced an increase in income of Rp687,000 per month after producing and selling eco-cleaning kits.

The eco-cleaning kits are sold at a more affordable price than other products on the market (Makhitha, 2021). This demonstrates the successful direct impact on the well-being of vulnerable women within the group (Fassnacht et al., 2022). These products have undergone laboratory testing and meet Indonesian National Standards (SNI). This initiative raises public awareness of the importance of environmental protection while empowering women through a green economy. The total amount of mangrove leaf waste utilized reached 0.510 tons by 2024.

The Bengkel EduPreneur Berdikari program presents an automotive learning center as the first community-based technical training center in Semarang. This facility provides automotive training, welding, fieldwork practice, and assistance with job applications and interviews. This learning center is the only automotive workshop training center in Semarang and has received recognition from the Semarang City Fisheries Office. By 2024, 50 participants have been trained, some of whom have entered the workforce, including at PT Zurich and Motorcycle Custom Shop Kaligawe. Skills certificates are issued by LPK Sinar Nusantara, the official partner of the program.

This training has proven to be a real solution for coastal communities previously unemployed or even involved in criminal activity. This learning center also opens access to skills for previously unskilled youth who are now ready to work. With a practical and collaborative curriculum, this facility strengthens the foundation of social change through vocational education (Hiim, 2023). The impact is not only on individuals, but also on families and surrounding communities who are beginning to see education as a means of social mobility. From an economic perspective, the Bengkel EduPreneur group recorded an increase in members' income of Rp1,638,000 per month. Group members also act as training mentors, demonstrating their transformation from beneficiaries to agents of change (Doten-Snitker et al., 2021).

In 2022, a group fostered by the Bengkel EduPreneur Berdikari successfully created an innovation aimed at empowering communities through an appropriate technology approach in Semarang City. This innovation, a fish-calling device with a weighted pendulum, was designed to help fishermen increase their catch. The successful development of this product was bolstered by the issuance of a patent from the Directorate General of Intellectual Property, Ministry of Law and Human Rights of the Republic of Indonesia. The innovation was officially registered under Patent Number IDS000008980, granted on October 9, 2024, in recognition of the tool's authenticity and benefits.

The Bengkel EduPreneur Berdikari program also empowers women's groups, particularly the Mina Mangun Sari Group, a group of 14 women from underprivileged communities in Mangunharjo Village. This group successfully developed and produced an eco-cleaning kit consisting of motorcycle shampoo, body polish, and body wash. This product has also supplied the Bengkel EduPreneur with motorcycle shampoo and body polish to support its motorcycle washing service. The price offered is also

more affordable than the price of the Community Development Program Social Innovation Report 21 motorcycle shampoo and motorcycle body polish sold on the market. In addition, the motorcycle shampoo product has also had laboratory test results that comply with the Indonesian National Standard (SNI). Before the Bengkel EduPreneur Berdikari Program, mangrove leaf waste in the surrounding area was burned by the community to reduce the volume of waste. After the program was running, the waste was processed into economically valuable products such as eco cleaning kits. This encouraged increased environmental awareness and reduced the practice of burning mangrove waste, along with the increased production of eco cleaning kits by the community.

### **Social and Economic Transformation**

The Bengkel EduPreneur Berdikari has become a vehicle for social and economic transformation. This social innovation, implemented by PT Pertamina Patra Niaga Integrated Terminal Semarang, has transformed the lives of members of the Bengkel EduPreneur Group and the Mina Mangun Sari Group, who are the poor, women, elderly, victims of tidal flooding, and marginalized groups (Kelurahan Mangunharjo, 2024a). As a vulnerable group, the visible benefit of the social innovation, the EduPreneur Workshop program, is the increased income of the empowered community. Previously, the average income was Rp 638,200 per month. After becoming members of the Bengkel EduPreneur group, their monthly income tended to increase to Rp 1,638,000 per month. This income has significantly improved their families' economic conditions.

The Bengkel EduPreneur Berdikari program has also successfully empowered 14 women in the Mina Mangun Sari Group. Through the Mina Mangun Sari Group, the women are empowered to process mangrove leaf waste into environmentally friendly soap products. Nine women in the Mina Mangun

Sari Group are classified as vulnerable or poor. Previously, they were housewives with limited access to employment and relied solely on the income of the head of the household to meet their daily needs. The empowerment program within the Mina Mangun Sari Group provides opportunities and employment for these women.

This program also benefits the elderly. Seniors, a vulnerable group, have the opportunity to join the Mina Mangun Sari Group. Despite their advanced age, seniors in the Mina Mangun Sari Group can still participate in work and earn sufficient income for their daily needs. Furthermore, for communities affected by tidal flooding in the Mangunharjo area, unpredictable tidal flooding can disrupt community activities, including daily work. Therefore, the presence of the Bengkel EduPreneur allows residents to continue working during tidal flooding. This is also supported by the Bengkel EduPreneur's location in an area unaffected by tidal flooding.

The Bengkel EduPreneur's innovation has also successfully transformed the lives of Mangunharjo residents who were formerly thugs. Those who initially sought a living through unscrupulous means such as extortion and other criminal activities have now found decent employment by joining the Bengkel EduPreneur. Employment at the Bengkel EduPreneur has helped improve their economic well-being and reduced crime in the Mangunharjo area. Thus, the presence of the Bengkel EduPreneur contributes to reducing unemployment rates and providing decent employment opportunities.

### **Institutionalization and Independence Strategy**

The Mangunharjo Village community has demonstrated empowerment initiatives through the development of the Bengkel EduPreneur Berdikari program. This program serves not only as a place for repairing and producing technical equipment, but has also developed into a pioneering innovation in community-based

workshops. These workshops position themselves as a means of sharing knowledge from group members with the community on a sustainable basis (Kohsaka & Rogel, 2019).

Activities initiated within the Bengkel EduPreneur Berdikari include automotive skills training, welding, boat repair, and motorcycle washing services. All activities are designed to enhance individual capabilities, encourage collaboration among participants, and generate innovative solutions.

Furthermore, the Bengkel EduPreneur Berdikari has a significant social impact, particularly in developing the character of a creative, innovative, and entrepreneurial young generation. These workshops also serve as a space capable of creating new economic opportunities by increasing human resource capacity at the local level. Thus, the Bengkel EduPreneur Berdikari significantly contributes to strengthening community economic resilience and expanding access to non-formal education.

PT Pertamina Patra Niaga Integrated Terminal Semarang has demonstrated a strong commitment to supporting community development through the Bengkel EduPreneur Berdikari program. This program is designed to integrate education and entrepreneurship through training for the younger generation, particularly in the Mangunharjo Village area, so they can create business opportunities while making a positive contribution to the surrounding environment. The goal is to create independent business opportunities while encouraging contributions to the social and economic environment of the surrounding community.

Muhammad Yasin, as a local hero, plays a crucial role in improving the community's standard of living by strengthening the capacity of group members. His role is inseparable from the support of PT Pertamina Patra Niaga Integrated Terminal Semarang, which provides training and mentoring. The training covers various

aspects of entrepreneurship, such as business management, digital marketing, and product development. This has helped Muhammad Yasin develop and increase his confidence in managing the Bengkel EduPreneur and coordinating its members.

The Bengkel EduPreneur Berdikari program has successfully encouraged all group members to earn income through workshop activities and the production of eco-cleaning kits. This additional income has a direct impact on improving the well-being of each member's family and contributes to reducing the economic disparity among group members. Furthermore, the individuals formed in this program are vulnerable communities with diverse family backgrounds. Consequently, there is a gap in the well-being of individual group members.

The Bengkel EduPreneur is the only workshop in Semarang City that provides community-based training, partnering with the Semarang City Manpower and Transmigration Office. This program creates a learning center as an innovation to enhance participants' capabilities. This learning center concept can provide significant benefits in increasing learning effectiveness and fostering an entrepreneurial spirit.

The Bengkel EduPreneur Berdikari program has proven effective in fostering the transformation of new institutional systems. The Kemijen Village Government has demonstrated a strong commitment to the sustainability of this program through various forms of support, including group mentoring and expanding inter-community collaboration networks. This collaboration forms the basis for strengthening local institutions that have previously been underserved.

As a first step, the company, along with the Kemijen Village Government, identified problems through mapping, specifically related to unemployment in the East Semarang District. The identification process involved village officials to explore the root causes, characteristics, and impacts

of unemployment. This effort provided a more comprehensive picture for the company in designing relevant and contextual interventions (Atkins et al., 2017). The local government's continued commitment is also demonstrated by its support for the replication of community knowledge and skills development activities in the two-wheeled automotive sector. This replication follows up on the results of comparative studies conducted by community groups benefiting from the program and is one step towards promoting economic independence in other regions.

### **Sustainability Compass Impact Analysis**

Welfare is another benefit experienced by the group and community following the presence of the Bengkel EduPreneur. These welfare benefits include increased knowledge of conventional and fuel injection systems, CVT maintenance, braking systems, and standard motorcycle repairs. This increased knowledge of workshop systems is demonstrated by a comparison of pre-test and post-test scores administered to 10 members of the Bengkel EduPreneur group. Eight of the ten members experienced an increase in understanding, as indicated by an increase in their post-test scores; one member's score remained unchanged between the pre-test and post-test; and one member's score decreased.

Furthermore, welfare benefits were also experienced by the Mina Mangun Sari group. Following the training program on mangrove leaf waste utilization, the Mina Mangun Sari group gained increased knowledge on how to process mangrove leaf waste into motorcycle shampoo, body soap, and motorcycle polish. This increased knowledge of leaf waste utilization is demonstrated by a comparison of pre-test and post-test scores administered to 14 members of the Mina Mangun Sari group (Langsdorf et al., 2021). Twelve of the fourteen members experienced an increase in understanding as indicated by an increase in scores during the post-test and two other

members obtained scores that remained the same or did not change between the pre-test and post-test (Singh-Phulgenda et al., 2023). The Bengkel EduPreneur Berdikari Program has proven successful in encouraging communities to use natural resources efficiently. One concrete example of this efficiency is the installation of solar cells at the Bengkel EduPreneur, which has significantly reduced greenhouse gas emissions compared to using conventional PLN electricity. Furthermore, the use of motorized boats in coastal areas has environmental impacts, primarily in the form of noise pollution and greenhouse gas emissions. One of the main sources of these impacts is the engine exhaust system, which produces noise and exhaust gases. To address this issue, the Bengkel EduPreneur Program, initiated by PT Pertamina Patra Niaga Integrated Terminal Semarang, has implemented an innovation by modifying boat exhausts to make them noiseless. By 2023, 17 exhausts had been modified and installed on local fishing boats.

PT Pertamina Patra Niaga Integrated Terminal Semarang, through the Bengkel EduPreneur Program, has initiated the use of non-hazardous and hazardous solid waste, specifically scrub, to modify boat exhausts to be more environmentally friendly. One goal is to reduce noise pollution generated by fishing boat engines in coastal areas (Sinworn & Viriyawattana, 2024). This non-B3 waste is used as raw material for the manufacture of noiseless exhausts. By 2023, the total scrub used in this program reached 0.098 tons. This initiative demonstrates efforts to integrate circular economy principles. Furthermore, sustainable innovation is also carried out by utilizing mangrove waste as raw material for making laundry soap, which requires approximately 3 kilograms of mangroves to produce one liter of soap (Atmanto, 2024). To date, the company has produced 170 liters of laundry soap, which is equivalent to the use of 0.510 tons of mangroves. This innovation has proven effective in reducing the volume of non-B3 solid waste (non-

hazardous and toxic materials) produced by the company.

Water resource efficiency efforts are also implemented through the Bengkel EduPreneur Berdikari program, which focuses on recycling wastewater from motorcycle washing activities. The wastewater is filtered through a 220-liter reservoir. To date, approximately 70% of the used water from motorcycle washing activities has been collected and filtered, then used for watering plants around the program area. Water use efficiency through this method reached 9,433 m<sup>3</sup> in 2023. The Bengkel EduPreneur Berdikari program, run by PT Pertamina Patra Niaga IT Semarang, has proven effective in increasing social cohesion within the target community groups, namely the Bengkel EduPreneur Group and the Mina Mangun Sari Group. Group cohesion is fostered through joint activities such as regular deliberations, mutual cooperation, group social gatherings (arisan), and knowledge transfer among members and with the community outside the group (Fitriyah & Lawang, 2024). These shared activities foster a sense of togetherness, solidarity, and ownership of the program, thereby strengthening the group's internal social network.

In addition to reducing the welfare gap among group members, the implementation of the Bengkel EduPreneur Berdikari program has also successfully prevented marginalization. The Bengkel EduPreneur Berdikari program has successfully increased the knowledge and skills capabilities of group members, reduced the family welfare gap, and prevented vulnerable communities from being marginalized. This program also increases group cohesion through deliberation activities, division of responsibilities, sharing of income, and routine activities such as social gatherings (arisan), tahlilan (religious gatherings), mutual cooperation (gotong royong), and joint workshop activities, thus managing conflict.

In addition to providing direct benefits to the Bengkel EduPreneur group, this

program has also become a center of excellence that is replicated by other groups through knowledge sharing. One example is the Mina Mangun Sari group, which utilizes motorcycle wash wastewater from the Aqua Cycle innovation for greening and produces eco-friendly soap for the wider community. This program has also inspired the formation of new groups, such as the Kemijen Motorcycle Workshop, demonstrating the widespread impact of social innovation in the surrounding community.

The program has also successfully expanded collaboration with various external stakeholders, including the Semarang City Manpower Office, the Semarang City Fisheries Office, sub-district governments, vocational training institutions, the private sector, and universities. This collaboration includes joint training, skills certification, policy advocacy, facility provision, and local economic empowerment. This collaboration supports the sustainable capacity building of the fostered groups, while strengthening their position within the community and business ecosystem.

The Bengkel EduPreneur Berdikari successfully increased its revenue to Rp1,638,000 through various services, such as motorcycle servicing, oil and spare parts sales, welding services, and motorcycle washing. This achievement has also positively impacted several members who were previously unemployed or without permanent employment, as the workshop's revenue now serves as their primary source of income to meet their daily needs (Shengyao et al., 2024).

The Mina Mangun Sari group, whose members are mostly housewives, recorded an increase in income of Rp687,000. This increase was achieved through the sale of various eco-cleaning kits they produce independently. These products include motorcycle shampoo, body soap, and body polish, all made from environmentally friendly materials readily available locally.

## CONCLUSION

The Bengkel EduPreneur (Education & Entrepreneur) Berdikari Program is a social innovation promoted by PT Pertamina Patra Niaga Integrated Terminal Semarang. Through this program, residents of Mangunharjo Village acquire workshop skills aimed at supporting sustainability and community empowerment. The synergy between the Bengkel EduPreneur Group and the Mina Mangun Sari Group aligns with efforts to achieve a sustainable environment through environmentally friendly innovations. The Bengkel EduPreneur is supported by environmentally friendly technologies such as solar panels, noiseless exhausts, eco-friendly motorcycle washes, and innovative aqua cycles. Meanwhile, the Mina Mangun Sari Group processes local resources into eco-cleaning kits, organic waste into valuable products, and utilizes motorcycle wash wastewater to reduce groundwater use and prevent land subsidence.

This flagship program has a sustainability compass for coastal communities, particularly in Mangunharjo Village. The sustainability compass encompasses wellbeing, society, economy, and nature. The program has successfully increased human resource capacity, improved the economy and community welfare, and positively impacted the environment. Thus, the Bengkel EduPreneur innovation has become concrete evidence of PT Pertamina Patra Niaga Integrated Terminal Semarang in supporting environmental sustainability and community welfare.

### **Declaration by Authors**

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