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DEVELOPMENT OF MEDICINAL VEGETABLE CULTIVATION FOR FAMILY USE (TOSGA) IN REALIZING SUSTAINABLE AGRICULTURAL INNOVATION FOR WOMEN IN PENGABUAN VILLAGE, ABAB DISTRICT, PALI REGENCY, SOUTH SUMATRA

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Abstract

In Pengabuan Village, women dominate poverty. The vulnerability of this group is explained by the fact that they do not have enough training, experience, and a source of investment to put food on their table (to meet even basic family needs, including healthcare). This journal in this case study is the implementation of the Independent Agriculture for Empowerment Village Women ("PERMATA") program, which is initiated by PT Pertamina EP Adera Field at Pengabuan Village, Abab Districts, Penukal Abab Lematang Ilir (PALI), South Sumatera. Its purpose is to increase economic welfare as well as the health of society by growing Medicinal Family Vegetables (TOSGA). Under the theme of building an inclusive and sustainable economy, PERMATA, in its fourth year, will focus on product diversification from TOSGA-derived herbs and group capacity building, followed by institutional mentoring. The program has had far-reaching effects on economic, social, and environmental welfare. One initiative has seen a dramatic increase in the income of women's groups and made a real dent in greenhouse gas emission targets through straw waste alternative energy. The PERMATA program has increased community awareness and capabilities in managing the environment and the production of herbs as flora medicinal plants. Through sustainable agricultural innovation, the program also improved quality life criteria or indicators of life.

Keywords: *Economic Welfare, Public Health, TOSGA Cultivation, Herbal Product Diversification, Sustainable Agricultural Innovation*

INTRODUCTION

The involvement of Corporate Social Responsibility (CSR) in developing sustainable agriculture within communities undoubtedly impacts various aspects, including the economy, environment, and social spheres. CSR regulations in Indonesia are governed by Law Number 40 of 2007 on Investment and the Minister of State-Owned Enterprises Regulation Number Per-5/MBU/2007 on the Partnership Program of State-Owned Enterprises with Small Enterprises and Community Development Programs, specifically for state-owned companies. Furthermore, Corporate Environmental Social Responsibility

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(TJSL) is also stipulated in Law Number 40 of 2007 on Limited Liability Companies. Through these laws, all companies in Indonesia are obligated to implement TJSL towards the communities within their operational areas.

As a business entity operating in the oil and gas sector, PT Pertamina EP Adera Field is recognized as one of Indonesia's companies actively engaged in CSR programs, particularly in the areas surrounding its operations. CSR reflects a commitment to sustainable development that emphasizes a balance between economic and environmental considerations within the company's operational areas, particularly in Pengabuan Village. Pengabuan Village is classified as a priority area in the first ring of the company's operational area. According to the 2020 social mapping conducted by PT Pertamina EP Adera Field, Pengabuan Village was designated as a priority for community development programs due to its proximity to the company's operations and its direct impact on those operations.

Based on data gathered from the social mapping documents, most of Pengabuan Village's residents are farm laborers and farmers, with an average daily income of Rp45,000 to Rp70,000. The participation of women in the program was initially limited due to a lack of skills and business capital, preventing them from improving their living standards with weak social positions and no asset ownership; the poor, especially women in Pengabuan Village, face difficulties accessing decent employment. Additionally, the poverty faced by the community affects overall health quality, with many relying on over-the-counter medication due to the distance from healthcare facilities and limited knowledge of maintaining a clean lifestyle.

Recognizing these community challenges, PT Pertamina EP Adera Field developed the Independent Agriculture for Empowered Village Women Program (PERMATA), forming a group involving women in Pengabuan Village, namely the Selaras Alam Women Farmers Group. Initially, the activities conducted by Selaras Alam were similar to those of other Women Farmers Group. However, the involvement of PT Pertamina EP Adera Field introduced innovations to address economic, social, environmental, and health issues through the development of Medicinal Family Vegetables (TOSGA) and the diversification of its derivative products. The program's implementation generated social innovation by introducing new ideas and aiming for positive impacts on the community's quantity and quality of life. For social innovation to be accepted by the community in Pengabuan

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Village, Abab District, Penukal Abab Lematang Ilir Regency (PALI), it must be tailored to the community's potential, problems, and needs.

Given the economic and health challenges faced by women in Penguin Village, the PERMATA program developed alternative solutions by teaching the community to cultivate TOSGA and raising awareness and knowledge on processing it into herbal products such as Simplicia, powders, instant granules, and herbal drinks. The program aims to assess how PERMATA can enhance the capacity, skills, and independence of Pengabuan Village residents, particularly women, to improve family economic welfare and health quality.

LITERATURE REVIEW

Crop Rotation

Soil serves as a growth medium for plants and microbes. Microbes play a crucial role as decomposers, maintaining soil quality and supporting the balance of the ecosystem. However, pathogens in the soil can lead to soil degradation and plant diseases. Farmers typically address plant diseases caused by pathogens and pests in conventional agriculture by relying on chemical pesticides. However, prolonged use of pesticides can damage soil nutrients. Therefore, environmentally friendly methods for managing soil pathogens, including crop rotation, are needed.

Crop rotation is an agricultural practice believed to help maintain the soil's organic matter content, particularly in reducing diseases caused by biotrophic soil-borne pathogens, especially those with low saprophytic survival ability (Bailey & Duczek, 1996). This method also increases the soil's microbial population. By utilizing different types of crops, crop rotation can also improve soil nutrient content (Carrera et al., 2007). These nutrients are essential for the survival of plants, thus enhancing crop production.

Crop rotation also creates an unsuitable environment for the growth of pathogens and pests by using non-host plants, thereby reducing pathogen populations. Crop rotation has been proven to contribute significantly to crop yields, maintain soil quality, control diseases, pests, weeds, and insects, enhance soil biota nutrition, increase organic matter levels, reduce soil erosion, improve soil nutrient structure, contribute nitrogen from leguminous plants (Gupta & Sivasithamparam, 2007), and induce endophytic bacteria that suppress pathogenic bacteria (Sturz et al., 2000). Although this technique requires considerable time, crop rotation results are highly satisfactory, helping restore soil nutrients damaged by previous agricultural practices.

Bioenergy from Straw Waste

Rice is a staple food consumed by many countries, especially in Asia. In pursuing food security, rice production has increased sharply over the years, with demand projected to rise by 28% by 2050 as the global population grows. This increase in rice production will also increase straw waste in the fields. Traditionally, farmers manage the accumulation of straw waste by burning it, primarily due to a need for more awareness about beneficial and environmentally friendly waste management practices.

With growing awareness of global environmental issues, such as climate change and the depletion of fossil fuel reserves, there is a shift towards alternative energy sources, or what we refer to as renewable energy. Renewable energy can reduce dependence on fossil fuels, contributing to mitigating greenhouse gas (GHG) emissions (Musa et al., 2018). Biomass is one of the most sustainable and cost-effective renewable energy sources. Biomass can be converted into biomethane gas, which has the potential to replace natural gas.

Agricultural waste, such as straw, is an example of biomass that can be utilized as a source of bioenergy. The processing of straw for bioenergy purposes has recently gained significant interest. Besides reducing waste without adding pollution, straw processing can also be transformed into a bioenergy resource. Straw has the potential to become an essential energy source for various sectors. It can be converted into heat, steam, methanol, ethanol, biodiesel, and raw materials (Carvalho et al., 2018; Ramos et al., 2022). Two primary technologies for converting straw into bioenergy are thermochemical conversion (combustion, gasification, pyrolysis) and biological conversion (fermentation and anaerobic processes). The products of these conversion processes can then be utilized as sources of mechanical energy or even electricity.

RESEARCH METHODS

This research employs a qualitative descriptive method, a research approach aimed at describing problem-solving based on the results of interviews, observations, and literature data (Creswell, 2015). Qualitative research aims to explain phenomena occurring within the community by collecting comprehensive and detailed data, thereby enabling the acquisition of more accurate information (Moleong, 2018). Data collection techniques were conducted through in-depth interviews, Focus Group Discussions (FGD), and observations of Selaras Alam Women Farmers Group members. The program is in Pengabuan Village, Abab District, Penukal Abab Lematang Ilir Regency (PALI), South Sumatra Province. This

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research also utilizes secondary data from the Permata Program Implementation data, including implementation reports, monitoring and evaluation reports, Social Mapping Document studies, Sustainable Development Goals (SDGs) assessments, and related journals and studies, thereby enriching the data.

RESULTS AND DISCUSSION

Planning

The PERMATA program began with the implementation of a social mapping study. Social mapping is an effort to identify and understand the social structure, the relationships between institutions, and the strategic roles of stakeholders within a specific social environment. This social mapping study was conducted within the company's operational areas, including its first ring, with the goal of identifying the community's basic needs, assessing available resources and social capital, and pinpointing issues and potentials that can be developed.

Based on the above discussion, this section outlines the long-term work plan to be pursued over five (5) years. This plan includes stages such as assessment and planning, capacity building, improvement, assessment for improvement, evaluation, and exit preparation. The year 2024 marks the fourth year of the community empowerment program implementation by PT Pertamina EP Adera Field. As the program approaches its exit phase in 2025, it is expected that the Selaras Alam Women Farmers Group will be able to independently apply the knowledge they have acquired and sustain the ongoing programs.

The PERMATA program initiated by PT Pertamina EP Adera Field includes a series of activities that were structured based on the initial "Need Assessment" conducted through Focus Group Discussions (FGD) utilizing a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) to determine the steps and strategies for the future sustainability of the program. The discussions resulted in recommendations for activities and training sessions to be carried out over the next year, including assistance with obtaining distribution permits from the Food and Drug Supervisory Agency (BPOM), eco brick training to reduce the potential for household plastic waste, training in product packaging and repackaging, submission for halal product assurance (JPH), garden and land management training, entrepreneurship and marketing training via online marketplaces, construction of a production house by BPOM standards, and program monitoring and evaluation.

Implementation

Following the "Need Assessment," issues were mapped out, which served as a reference for determining the work plan for the Permata program in 2024. The critical activities planned are as follows:

1. Institutional Entrepreneurship Training

One of the reasons for the low sales of herbal products is the limited marketing strategies of the Selaras Alam Women Farmers Group (KWT). The group relies primarily on Facebook to sell products to close contacts and participates in small business exhibitions to introduce its herbal products to the broader public. Unfortunately, these efforts have not significantly contributed to sales. To address this challenge, Pertamina EP Adera Field provides group assistance, including training to enhance members' abilities to identify opportunities for selling products and marketing through online marketplaces. The training includes guidance on finding the right marketplace for their products and creating engaging marketing content to attract customers.

2. Capacity Building Training

Another shortfall in KWT Selaras Alam's marketing strategy is the lack of necessary certifications, such as BPOM (Food and Drug Supervisory Agency) and Halal Product Assurance (JPH), and the use of simple packaging, which fails to attract new customers. In response, the company is assisting in obtaining Halal certification for their herbal products. Currently, KWT Selaras Alam has successfully obtained JPH certification for several products, including instant ginger, kopi rindu, instant centella asiatica, instant curcuma, instant dayak onion, rosella syrup, instant turmeric, rosella flower tisane, moringa leaf tisane, dayak onion tisane, butterfly pea flower tisane, and dayak onion powder.

In addition to JPH certification, the company is enhancing its capacity for BPOM certification. This includes training on BPOM licensing procedures, production workflows, and the use of equipment by BPOM standards. The company collaborates with the South Sumatra BPOM Office to provide this support. The company also assists with repackaging herbal products to make them more appealing. Besides marketing strategy training, the company offers ecobrick training, teaching the group how to create alternative bricks made from plastic bottles and household waste, helping reduce household plastic waste.

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3. Construction of a Production House

As part of the BPOM licensing process, KWT Selaras Alam must have a production house to manufacture TOSGA derivative products. Therefore, Pertamina EP Adera Field is constructing a production house with facilities and equipment that meet BPOM standards. This will ensure the high and consistent quality of the herbal products produced.

4. Construction of a Grain Dryer House

Traditionally, the drying of TOSGA rhizomes by KWT Selaras Alam has been done manually by sun-drying them on house terraces or rooftops. This method makes the drying process heavily dependent on the weather, posing difficulties during the rainy season as it takes longer to reduce the moisture content in the rhizomes. To overcome this challenge, Pertamina EP Adera Field is constructing a grain dryer house, where straw waste is converted into bioenergy to power the facility. This dryer house reduces the moisture content in the dried rhizomes to 10-11%, making the processing of TOSGA into herbal products more optimal. Using straw waste is part of Pertamina EP Adera Field's intervention to manage the leftover straw from the Serut Satu Farmer Group, a company-supported partner engaged in organic rice cultivation.

5. Garden and Land Management Training

Proper garden and land management is essential to address the declining soil fertility in the fields. One effective garden management technique is crop rotation, where different types of TOSGA are planted immediately after each harvest. This method is considered effective in improving soil fertility, as the soil benefits from the varied nutrients different plants provide. Consequently, the soil becomes more resistant to pathogens that can cause plant diseases. Another goal of this land management strategy is to prevent gaps between harvests, ensuring a continuous supply of raw materials for processing TOSGA into herbal products.

Impact of Program Implementation

The Independent Agriculture Program for Empowered Village Women (PERMATA) has significantly benefited the members of the Selaras Alam Women Farmers Group and the broader community in Pengabuan Village. This section will detail the program's economic, social, environmental, and well-being impacts. The program, implemented in Pengabuan Village has benefited 28 individuals.

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Economic Impact:

The most tangible impact experienced by the members of Selaras Alam Women Farmers Group is a substantial increase in income, from Rp450,000 per month to Rp3,456,874 per month. This economic benefit stems from two sources: the sale of organic vegetables, which generates Rp1,106,874 per month, and the sale of herbal products, which brings in Rp2,350,000 per month. The program has not only enhanced household income but also improved the economic resilience of the participating women.

Environmental Impact:

The program has positively influenced the local environment. One key initiative is using a dry house powered by alternative energy derived from straw waste, which is used to dry TOSGA rhizomes. This innovation addresses the challenge of product diversification, which previously depended heavily on weather conditions. Using straw waste, the program has contributed to reducing greenhouse gas emissions by 157.04 kgCO2 equivalent per month. It has generated 274.5 kWh of energy per month, replacing traditional electricity sources for the dry house.

Social Impact:

Socially, the program has successfully altered community habits and enhanced knowledge related to clean living practices. Additionally, straw waste, which was previously burned, is now repurposed as an alternative energy source. This shift improves environmental outcomes and fosters a more sustainable community. The program's impact extends to improving social cohesion and empowering women within the village.

Well-being:

The program has also contributed to the overall well-being of the community. The skills gained in processing TOSGA into derivative products, such as Simplicia, powders, instant granules, and herbal drinks, have positively affected the health and economic status of the group and the broader community in Pengabuan Village. Currently, products made by KWT Selaras Alam are certified with NIB (Business Identification Number) and P-IRT (Home et al.), and 12 products have obtained Halal certification (JPH).

Moreover, independently producing herbal products for family health offers an alternative treatment solution, which is especially important given the limited access to healthcare facilities in Pengabuan Village. KWT Selaras Alam also supplies products like moringa leaf pudding, moringa leaf porridge, and rosella syrup to elderly and toddler health

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centers (Posyandu et al.) monthly. Additionally, organic vegetables harvested by the group are used to prepare nutritious meals for mothers and children during Posyandu activities.

Overall, the Permata program has enhanced economic opportunities and environmental sustainability, as well as improved health outcomes and social cohesion in Pengabuan Village.

Achievement

PT Pertamina EP Adera Field has conducted a Community Satisfaction Index (IKM) survey among the members of KWT Selaras Alam, resulting in an impressive score of 94.2% (categorized as very good), indicating that the women's group, as direct beneficiaries, has significantly benefited from the program's implementation. The program has been widely publicized through several publications, including an ISBN-registered book titled "Innovation in Agriculture for the Welfare of the PALI and West Prabumulih Communities" with ISBN 978-623-88706-0-8 in 2022 and another ISBN-registered book titled "Sharing Inspiration for a Better Future" with ISBN 978-623-955016-3-1.

The PERMATA program has also received several accolades from various institutions, including the "Sustainable Village Development" award and the "CSR Award" (Silver category) in 2024, presented by the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration of the Republic of Indonesia (KDPDTT). Additionally, in 2024, the program was honored with an award from the Indonesia Social Responsibility Award.

CONCLUSIONS

The Independent Agriculture Program for Empowered Village Women (PERMATA), initiated by PT Pertamina EP Adera Field, has successfully delivered significant positive impacts to the community of Pengabuan Village, particularly benefiting women. This program has enhanced economic well-being by increasing income through the cultivation of TOSGA and improved environmental quality by utilizing straw waste as an alternative energy source. The program's focus on building the capacity and skills of women in managing medicinal plants and producing derivative products has also contributed to the community's overall health. Increased group income, reduced greenhouse gas emissions, and recognition through various certifications and awards evidence the success of this program. Thus, the PERMATA program demonstrates that well-targeted CSR interventions, grounded in local needs, can serve as an effective and sustainable model for community empowerment.

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