

**KEMALA PERTIWI: EFFORTS TO IMPROVE THE WELFARE  
OF THE BETUNG BARAT VILLAGE COMMUNITY,  
ABAB DISTRICT, PENUKAL ABAB LEMATANG ILIR REGENCY,  
SOUTH SUMATRA THROUGH THE MANAGEMENT  
OF ORGANIC WASTE**

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**Abstract**

*The waste management practices in Betung Barat Village were previously poorly managed. Waste was merely piled up around homes, in water channels, or burned. These methods have proven to harm the environment, resulting in air pollution. This environmental contamination also negatively impacted public health due to water sources being polluted by waste, contributing to cases of stunting among children in the village. PT Pertamina EP Raja Tempirai implemented the Sustainable Waste Management Group Program in synergy with PHE Raja Tempirai (Kemala Pertiwi) to address this issue. This program aims to integrate waste management with health initiatives, thereby providing economic benefits to the community of Betung Barat Village, Abab District, Penukal Abab Lematang Ilir Regency (PALI), South Sumatra Province. The program involves forming community groups, training sessions, and developing local tourism as part of efforts to empower and improve the community's welfare. The key activities of the Kemala Pertiwi program include maggot cultivation, freshwater fish farming, organic vegetable farming, and preventing stunting by utilizing the produce from these activities as a healthy food source.*

**Keywords:** Waste Management, Stunting, Maggot Cultivation, Freshwater Fish Farming, Organic Vegetable Farming

## 1. INTRODUCTION

Population growth in a region can have negative impacts, one of which is environmental degradation due to the accumulation of waste. The amount of waste generated increases in tandem with community activities. As the population grows, their activities and consumption patterns intensify, producing a higher volume of waste. According to data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK) in 2022, based on inputs from 202 regencies/cities across Indonesia, the national waste accumulation reached 21.1 million tons. Of this total waste production, 65.71% (13.9 million tons) was managed, while the remaining 34.29% (7.2 million tons) was not adequately managed. Indonesia's low percentage of waste management services is rooted in misconceptions about waste.

To this day, the perception of waste among Indonesians remains limited to something no longer applicable and must be discarded (Rafi & Perkasa, 2023). Many still dispose of waste in water channels or burn their household waste. This unmanaged waste becomes a problem when the amount of waste continues to increase without proper management. The environment becomes polluted, water and soil sources are contaminated, it becomes a breeding ground for disease, and it clogs water channels, leading to flooding during the rainy season. Additionally, waste can mar the beauty of an

area, produce foul odors, and emit methane gas, a greenhouse gas that contributes to global warming. Burning waste also produces carbon dioxide, which pollutes the air and poses a risk of respiratory issues. These conditions are prevalent across many regions in Indonesia, including Betung Barat Village.

Betung Barat Village is located within the administrative area of Abab District, Penukal Abab Lematang Ilir (PALI) Regency, South Sumatra Province. According to social mapping conducted in 2022, Betung Barat Village is a densely populated area with 556 families, of which 180 families, or 32.37%, are classified as underprivileged. The economy of Betung Barat Village relies on the plantation, livestock, and trade sectors.

Betung Barat Village still needs an integrated waste management system. The community still disposes of organic waste in their backyard gardens and water channels; some even resort to burning it. This behavior is detrimental as it can contaminate groundwater and water sources, increasing the likelihood of disease transmission through water and soil contamination. An unhygienic environment can directly contaminate food or food sources in the residential area, impacting the nutritional quality of children and pregnant women in Betung Barat Village. Consequently, there are numerous cases of stunted growth among young children in this village. This situation is influenced by the community's disregard for cleanliness and health factors.

In response to these conditions, in 2023, PT Pertamina EP Raja Tempirai developed a community development program to address the environmental and health issues in Betung Barat Village while respecting local wisdom. This program, named the Sustainable Waste Management Group in synergy with PHE Raja Tempirai (Kemala Pertiwi), replicates the Kompas Lestari program initiated by PT Pertamina Ogan Komering Field. Like the Kompas Lestari program, the scope of activities in the Kemala Pertiwi program focuses on waste management, from the supply chain process to the sustainable utilization of organic waste. In addition to preserving the environment and promoting health, the Kemala Pertiwi program also aims to enhance the community's economy through sustainable organic waste management.

This program established four foster groups: the GEN SMART (Healthy and Smart Generation) Group, the Maggot Cultivation Group, the Fishing Tourism and Freshwater Fish Farming Group, and the Organic Vegetable Farming Group. Each group focuses on activities aligned with the program's vision and mission. This paper will elaborate on the activities in the second year of the Kemala Pertiwi program, particularly enhancing group capabilities through training. The training provided includes the development of sustainable local fishing tourism and stunting prevention activities.

## **2. LITERATURE REVIEW**

One technique for managing organic waste is bioconversion. According to Mujahid et al. (2017), bioconversion is a process that involves the breakdown of organic waste through fermentation and decomposition facilitated by bacteria, fungi, and insect larvae from the families *Calliphoridae*, *Muscidae*, and *Stratiomyidae*. This decomposition process occurs anaerobically. The decomposition is aided by certain insect larvae, such as *Hermetia illucens*, commonly known as the Black Soldier Fly (BSF), which presents an effective alternative for waste management as it does not spread disease and offers additional benefits, such as enhancing the local economy.

The Black Soldier Fly (BSF) is a species of fly belonging to the order Diptera and the family Stratiomyidae. According to Čičková et al. (2015), the Black Soldier Fly is an insect native to the Americas but has spread almost worldwide, particularly in subtropical and tropical regions, including Indonesia. In the Black Soldier Fly's life cycle, the larval stage is called "maggot." The maggot of the Black Soldier Fly has a wrinkled body surface, an orange-colored head, lacks hooks, and a flat, boat-shaped body with hair and pores along its length (Fahmi, 2018). Organic waste processing can be used as an alternative to producing livestock feed as a source of animal protein. Maggots or Black Soldier Fly larvae can convert organic waste into protein and fat while reducing the mass of organic waste by 50% to 60% (Oktanella et al., 2021). Additionally, maggots or Black Soldier Fly larvae can be used as animal feed (Salman et al., 2020).

### **3. RESEARCH METHODS**

Based on the Kemala Pertiwi roadmap, in its second year, PT Pertamina EP Raja Tempirai Field focused on strengthening institutional structures and enhancing group facilities through various training programs. These included training on maggot cultivation, freshwater fish farming, and organic vegetable farming. Another essential activity of the Kemala Pertiwi program was the development of local tourism around the village's reservoir and stunting prevention initiatives. All of these activities were meticulously planned and phased to align with the program's vision and mission, which aims to improve the welfare and health of the community through sustainable organic waste management.

The first step in planning these activities was conducting social mapping. This process was essential for understanding the problems, needs, and potential of the local area and its community. The community was also actively involved in providing input and considerations for the program plans through forum group discussions (FGD), which were attended by other stakeholders as well. The outcomes of this planning process were mutually agreed upon and formalized in the Strategic Plan (*Renstra*) and Work Plan (*Renja*) documents. During the implementation phase, the community played an active role in carrying out the program. Monitoring and evaluation were conducted to ensure the sustainability of these initiatives. Third parties were involved in maintaining objectivity through assessments like the Community Satisfaction Index (IKM) and the Social Return on Investment (SROI) analysis. Additionally, the Kemala Pertiwi program collaborated with the Village-Owned Enterprise (BUMDes) of Betung Barat to support its execution.

## **4. RESULTS AND DISCUSSION**

### **4.1. Implementation**

After conducting problem mapping and forum group discussions, PT Pertamina EP Raja Tempirai Field, a business entity operating in the Betung Barat Village area, concluded that the community's awareness and knowledge of waste management and cleanliness were still low. Therefore, education and capacity building for the community were identified as essential solutions. These solutions were implemented through the Kemala Pertiwi program, which has several objectives:

1. Managing organic waste generated from household activities.
2. Reducing waste accumulation at the village level contributes to waste reduction in the PALI Regency.
3. Creating new job opportunities for economically vulnerable community members.
4. Developing new products that can be directly utilized or have economic value.
5. Promoting Clean and Healthy Living Behavior (PHBS) among the surrounding community.
6. Reducing the prevalence of stunting through activities such as providing complementary foods for breastfeeding mothers (MPASI).

At the initial stage of program implementation, Pertamina established several foster groups, each with activities tailored to the program's objectives:

- a) Maggot Cultivation Group: Focused on achieving sustainable household organic waste management.
- b) Tourism Awareness Group (*Pokdarwis*) for Fishing and Freshwater Fish Farming: Aimed at creating new job opportunities for the local community.
- c) Organic Vegetable Farming Group: Focused on food security and creating products that can be directly utilized.
- d) GEN SMART (Healthy and Smart Generation) Group: Aimed at promoting PHBS and preventing stunting.

These four groups work synergistically to address the community's issues. Like the Kompas Lestari program, Kemala Pertiwi applies the principle of sustainability, creating a value chain that simultaneously reaches three target sectors: the broader community, pregnant and nursing mothers, and the company. The Kemala Pertiwi program flow is as follows:

1. Waste Collection: Waste is collected from households and the PT Pertamina EP Raja Tempirai Field environment.
2. Organic Waste Utilization: Household and company organic waste is gathered at the Waste Bank and then used by the Maggot Cultivation Group as maggot feed. The harvested maggots are processed into fish pellets for freshwater fish farming and managed by the Tourism Awareness Group (*Pokdarwis*).
3. Fish Farming and Vegetable Cultivation: The Organic Vegetable Farming Group uses fish pond water as liquid organic fertilizer for organic vegetable farming.
4. Food Security and Stunting Prevention: The harvested organic vegetables and freshwater fish are then utilized by the GEN SMART Group as nutritious food for pregnant women, nursing mothers, and children to prevent stunting. Some of the organic vegetables and fish produced can also be sold.
5. Waste Recycling: Waste from vegetables, fruits, and fish products is reprocessed as maggot feed.

As mentioned, the four foster groups under the Kemala Pertiwi program will receive education and capacity-building activities. Some of the activities conducted in 2023 include:

1. Maggot Cultivation Training

Maggot cultivation is a core activity of the Kemala Pertiwi program. Several reasons justify the effectiveness of maggots in addressing organic waste issues. First,

maggots can be used in composting as they consume food scraps, agricultural waste, and other organic materials, which are the primary sources of waste accumulation in Betung Barat Village. Second, maggots can quickly convert organic waste into fertilizer and control fly populations, which are sources of disease transmission.

The maggot cultivation training covers various aspects of practical maggot breeding and management. Training topics include understanding maggot characteristics, preparing breeding media, feeding methods, managing temperature and humidity, separating and harvesting, and utilizing the resulting maggots. This training aims to enable community groups to independently manage maggot cultivation for economic and sustainable waste management purposes.

## 2. Freshwater Fish Farming Training and Development of Fishing Tourism

Freshwater fish farming holds significant potential for food, livelihood, and economic development in rural areas. The farming process is relatively easy and familiar to Betung Barat Village residents. Certain types of freshwater fish can adapt to various environmental conditions. The village reservoir is used as the site for these activities.

The freshwater fish farming training conducted by PT Pertamina EP Raja Tempirai Field includes several aspects, such as maintaining water quality (monitoring temperature, pH levels, dissolved oxygen, ammonia, nitrite, and nitrate content), selecting and breeding fish (choosing suitable fish species, selecting high-quality seeds, and fish breeding techniques), maintenance, fish feeding, disease management, pest control, growth monitoring, and harvest management.

The village reservoir is also managed by the Tourism Awareness Group (*Pokdarwis*) as a recreational area involving the local community. The reservoir has fishing facilities, entertainment venues (water games and a cultural performance stage), and retail areas where processed freshwater fish products are sold. Besides improving the local community's welfare, freshwater fish farming aims to enhance food security by providing nutritious food at affordable prices.

## 3. Stunting Prevention Activities

Stunting is a longstanding issue that can diminish the quality of human resource development. This condition is influenced by the community's clean and healthy living behavior, including environmental sanitation management and providing nutritious food for children.

The stunting prevention activities projected in the Kemala Pertiwi program target Posyandu (integrated health post) cadres in managing monthly Posyandu activities. Concrete actions taken by PT Pertamina EP Raja Tempirai Field and Posyandu cadres include capacity building for cadres, stunting prevention awareness campaigns, training on making MPASI (complementary foods for breastfeeding mothers), utilizing organic vegetables as healthy food for children, and using freshwater fish as additional food (PMT) in Posyandu activities.

## 4.2. Impact of Implementation

The Sustainable Waste Management Group Synergy Program PHE Raja Tempirai (Kemala Pertiwi), as outlined above, has brought significant benefits to both the foster groups' members and the broader community of Betung Barat Village. Kemala Pertiwi is an initiative designed to address waste management issues. Improper waste management

can create a domino effect, leading to various problems, including public health issues. This section will detail the economic, environmental, social, and well-being benefits derived from the program.

The Kemala Pertiwi program has generated additional income for the community, mainly through fishing tourism and household-level freshwater fish farming. The cultivation of organic vegetables and freshwater fish has also provided economic benefits to the community by making plant-based and animal-based protein sources more affordable. This cost reduction is especially beneficial for preparing complementary foods (MPASI) as part of stunting prevention efforts.

The program has also improved environmental quality. One such example is the successful implementation of household organic waste absorption through maggot cultivation. On average, 0.12 tons of waste (both organic and non-organic) are processed daily, equivalent to a reduction in carbon emissions by 0.013 tons of CO<sub>2</sub>e per day. Additionally, organic vegetable farming has enriched the village soil by reducing chemical fertilizers and transitioning to organic fertilizers that restore soil nutrients.

Socially, the Kemala Pertiwi program has raised awareness about the importance of proper waste management. Where waste was previously discarded carelessly or burned, the community now understands the significance of correct waste processing. The program has also contributed to reducing unemployment by managing the village reservoir as a tourist site. Moreover, members of the foster groups have gained new skills through training in maggot cultivation and freshwater fish farming, such as maintaining water quality, selecting fish seeds, breeding techniques, and more. The program has fostered social cohesion among the Village-Owned Enterprise (BUMDesa) administrators, foster group members, Posyandu cadres, and the general community through collaborative activities.

The community has also experienced an improvement in well-being, thanks to organic vegetable and freshwater fish farming, which produce supplementary food (PMT) for toddlers distributed through regular Posyandu activities. The community has also directly benefited from concrete efforts to prevent stunting through the Kemala Pertiwi program and the GEN SMART Group.

Overall, the Kemala Pertiwi program has had a far-reaching positive impact on Betung Barat Village, contributing to economic improvement, environmental preservation, social development, and enhanced community well-being.

## **5. CONCLUSION**

The Kemala Pertiwi Program has successfully addressed environmental and health issues through sustainable organic waste management, providing significant ecological and economic benefits to the community of Betung Barat Village. Additionally, the program has played a crucial role in preventing stunting by producing healthy and nutritious food through local cultivation efforts. Furthermore, the Kemala Pertiwi Program has succeeded in raising community awareness about the importance of waste management, improving environmental quality, and enhancing social cohesion among the residents. Overall, the program has substantially improved the quality of life and well-being of the Betung Barat Village community.

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## REFERENCES

- Čičková, H., Newton, G. L., Lacy, R. C., & Kozánek, M. (2015). The use of fly larvae for organic waste treatment. *Waste Management*, 35, 68–80.
- Fahmi, R. M. (2018). Maggot: Pakan Ikan Protein Tinggi dan Biomesin Pengolah Sampah Organik. *Jakarta: Penebar Swadaya*.
- Kementerian Lingkungan Hidup dan Kehutanan (KLHK). (2022). *Jumlah Timbunan Sampah Nasional*. Sistem Informasi Pengelolaan Sampah Nasional (SIPSN). <https://sipsn.menlhk.go.id/sipsn/>
- Mujahid, M., Amin, A. A., Hariyadi, H., & Fahmi, M. R. (2017). Oil palm empty bunches bioconversion using *Trichoderma* sp. and black soldier fly larvae as poultry feed composition. *Jurnal Ilmu Produksi Dan Teknologi Hasil Peternakan*, 5(1), 5–10.
- Oktanella, Y., Mukti, R. S., Widyana, A. R., & Hadiprawoto, A. L. (2021). Optimalisasi Metode Pembudidayaan Manggot Black Soldier Fly di Desa Tambakasri Kecamatan Tajinan. *Journal of Innovation and Applied Technology*, 7(2), 1277–1282.
- Rafi, P., & Perkasa, M. N. (2023). Dampak Kerusakan terhadap Lingkungan yang Disebabkan oleh Sampah Plastik Berdasarkan Tinjauan UU No. 18 tahun 2008. *Jurnal Multidisiplin Indonesia*, 2(7), 1420–1425.
- Salman, S. S., Ukhrowi, L. M., & Azim, M. T. (2020). Budidaya maggot lalat BSF sebagai pakan ternak. *Jurnal Karya Pengabdian*, 2(1), 1–6.

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