

Lesson learned on Waste Management with Co-productive Public Services in Community Learning Centers, Tha Muang District, Kanchanaburi, Thailand

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Abstract

Waste management at the community level is a crucial aspect linked to addressing waste issues at various levels—locally, provincially, nationally, and globally. However, effective implementation requires collaboration from various sectors within and outside the community. Collaborative efforts are essential to achieve maximum efficiency. The concept of co-production of public services is an idea that can be successfully applied to waste management. Lesson Learned from award-winning communities in waste management recognized by government agencies overseeing environmental issues, it is evident that the transformation of waste problems in communities is achievable, leading towards the goal of Zero Waste. These communities have successfully turned waste issues into opportunities for learning through community-based learning centers. In these award-winning communities, waste problems have been transformed into valuable lessons by establishing community-based learning centers that utilize the entire community as a learning hub for waste management. These community-based learning centers, totaling nine in number, each create unique lessons in waste management. They serve as community-based learning hubs, providing adaptable solutions that can be effectively applied to various areas. Each learning center contributes to the overall waste management goal but tailors its lessons to suit the specific needs of its community. This adaptability ensures that the lessons learned can be successfully implemented across different regions. The success of these community-based learning centers highlights the potential for a broader application of these waste management strategies, fostering sustainable practices and contributing to the global effort to address waste-related challenges.

Keywords: *Waste Management, Community Waste Management, Community Learning Center, Co-Production, Public Service.*

Introduction

In 2021, Thailand produced about 24.98 million tons of municipal solid waste, averaging 68,434 tons daily, with a waste generation rate of 1.03 kilograms per person per day. The reduction in waste generation compared to the previous year can be attributed to the prolonged impact of the COVID-19 pandemic. The Thai government's lockdown measures, including curfews from 10 p.m. to 4 a.m., along with the global COVID-19 situation, led to a decline in international tourist arrivals, despite efforts to boost tourism towards the end of the year. Despite the Ministry of Tourism and Sports' efforts to boost tourism in late 2021, as noted by the Ministry of Natural Resources and Environment, the ongoing pandemic led to a continued decline in foreign tourist numbers compared to previous years.

Additionally, lifestyle changes such as work-from-home arrangements, online learning, and home and community isolation have led to increased use of online services for shopping and food ordering. This shift has resulted in increased single-use plastic waste, especially from packaging, significantly raising the amount of plastic waste. The quantities and generation rates of plastic waste should be evaluated in relation to the

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registered population. The increased reliance on online services and the use of single-use plastics is intensifying the environmental challenge of plastic waste. Policymakers and communities need to address these trends and implement sustainable waste management practices to lessen the environmental impact.

In 2021, Kanchanaburi Province generated 435 tons of municipal solid waste daily. Of this, 403 tons per day had the potential for reuse, 150 tons were properly disposed of, and 296 tons were improperly disposed of. (Pollution Control Department, Ministry of Natural Resources and Environment, 2022, pp. 34).

As of September 8, 2022, according to the Community Solid Waste Management Information System of the Department of Pollution Control, it was found that waste management operations for municipal solid waste in Kanchanaburi Province involved a total of 52 disposal sites. Of these, 2 sites were categorized as proper waste disposal facilities, while 50 sites were deemed improper. The total estimated municipal solid waste generated in the province was approximately 450 tons per day. In Tha Muang district areas, there were 5 disposal sites, including the district Municipality sites and private company sites. The predominant waste disposal method was open dumping. It is important to note that the information provided is based on data available as of September 8, 2022, and the waste disposal practices may be subject to change.

This study will highlight lessons learned from the successful waste management system in Tha Muang district, which involves developing at least one exemplary waste management community in each locality of the local government organization. This aims to create a replicable model for other communities. Effective waste management in these areas is expected to bring direct benefits like reduced costs from waste separation, as decreased waste leads to lower separation expenses. Additionally, the economic value from waste management practices, such as recycling and proper handling, can turn waste into valuable resources, promoting both environmental sustainability and economic benefits for the community.

Each year, local government organizations are required to allocate a considerable budget for waste disposal, often amounting to millions of baht. However, implementing waste separation practices can lead to a reduction in the annual expenditure for waste disposal. One effective approach is to engage in waste segregation. Through waste segregation, materials that can be recycled or repurposed can generate income for local residents or communities. The quantity of waste sent for disposal will consequently decrease, resulting in a corresponding reduction in waste disposal costs. This not only promotes more sustainable waste management but also has the potential to create economic opportunities for local residents.

The main issue in overall waste management in Tha Muang district is the "insufficient waste disposal area" which is not adequate for the amount of waste generated in the area. There are two locations where local government organizations dispose of waste: the military area in the Kaeng Sian area and the private sector waste disposal site. These areas are not sufficient to accommodate the future increase in waste generation. This problem is a significant concern, as if not addressed promptly, it could have severe consequences for the local environment.

Transporting waste from local government organizations to the Kaeng Sian area, which is a military-controlled area requiring permission, and managing waste at the private sector disposal site must be done effectively. Otherwise, various chemicals from the waste may be washed into rivers during rainfall and seep into the groundwater, ultimately impacting the lifestyle and health of the local population with the "hidden waste problem" from external areas that bring in waste, increasing the overall waste volume.

The "high budgetary constraints in waste management" pose another challenge. Local government organizations must allocate a substantial budget for waste management, including collection and disposal, which is relatively high. Each organization has to budget several million baht for waste management operations, with some requiring as much as 8 million baht. This financial burden makes it challenging for effective waste management practices.

Methodology

This research employed an area-based approach with a mixed methods design, incorporating participatory

action research and surveys. It examined the waste management situation, community needs, environmental awareness, attitudes of community members, and the level of volunteerism among volunteer workers and related government officials.

Result and Discussion

Lessons learned of waste management in Tha Muang district, Kanchanaburi, Thailand were showed as followed

The Reduced Fees for Waste Collection and the Conscientiousness in Waste Separation

Local government organizations typically charge a waste collection service fee of around 20-30 baht per household per month. This may lead the public to believe that they have already paid for waste collection services. The responsibility for waste separation should ideally be managed by the local government organization, and there may be a perception among the public that if they already separate their waste, why does it get combined at the waste collection point instead of being sorted separately from the beginning to the end?

The government's operations in waste collection and fee collection create a sense of familiarity and the perception that the public is a service user who pays fees regularly. The responsibility of waste separation should be that of the government, fostering an incorrect mindset and awareness. Waste separation should begin at the household level before being deposited in the waste bins provided by the local government organization. The local government organization must communicate and establish guidelines for waste separation in the area. Communication can occur during community meetings to emphasize and highlight the importance of waste separation before disposal. It should also underscore the benefits of waste separation, such as income from selling separated recyclables, reduced waste volume, and decreased waste management costs.

"...This is where the villagers benefit. The benefits will come back to the villagers. The issue is how to communicate with them and make them aware of what sells and what doesn't. Like in Wangsala, every Friday there is separation. In there, we write: 'How much is the price for this plastic lid? How much for plastic bottles? How much for aluminum cans? Aluminum beer cans have a different price.' If they know, they won't be taken advantage of by those who come to buy. Once separated, it's not just two baht. Aluminum is thirty baht. Like that..."

State agencies may contribute to supporting the separation process, such as creating informative flyers or providing mesh bags for sorting. Collaborative efforts can help reduce the overall amount of waste.

Wang Sala Municipal Administrative Organization's Community Waste Management Prototype

Wang Sala Subdistrict Municipality is a local government organization that has been awarded the first prize in the nationwide competition "Waste-Free Community" by the Ministry of Interior of Thailand. The ongoing initiative begins with household waste management. The municipality distributes waste bins, with 20 bins per cluster, and promotes recycling activities by producing blue mesh bags distributed to households, providing each with three bags. Specific locations for installing bins that accommodate hazardous and infectious waste are designated, with one installation point per village.

In addition, there is also a make and off-season offering of robes and other needs for monks' activity in the community. This activity is linked to religious events, starting with the candle procession ceremony during the Buddhist Lent Retreat. There is a procession carrying the robe, and recycled waste, sorted in advance, is included in the procession. After the procession, the recycled waste is sold to recyclers, and the proceeds are donated to the local temple for religious and community activities in the village.

The municipality of Wang Sala has initiated a community participation project to collectively plant trees to mitigate global warming in the area. There is also a carbon credit program in place, although the amount generated may not be substantial. The community has received support for these activities from local private

sector entities, which contributes both funding and trees. Additionally, local government organizations in the area provide support.

The study also reveals that waste management in the municipality of Wang Sala serves as a model for waste management integrated into the local community's way of life. The application of waste management practices has become a norm in the daily lives of the residents. It is a lifestyle embraced by the villagers, making it easy to engage the community in becoming a network for waste management in their area.

“Think Together, Act Together”: a crucial guideline for community waste management and waste separation, drawing lessons from “Ban Hua Phong community” along with the 9 learning bases of Community learning centers.

Community participation, along with involvement from various sectors, starts with mobilizing a brainstorming session that includes the community, private sector, government, and local authorities to address shared waste issues. The goal is to explore collaborative waste management approaches. The "Think Together, Act Together" approach encourages broader participation, bringing in community members who haven't yet been involved to join the collective effort in managing waste. In addition, the community has established mutual agreements for waste management and reducing the overall waste quantity. The set agreements include the following:

- Every household must reduce or eliminate the use of foam and plastic bags.
- Every household is required to bring cloth bags or baskets when shopping at stores or markets.
- Every household must properly segregate waste into four categories.
- Hazardous and infectious waste must be deposited at the community's designated collection point by each household.
- Every household should reduce or eliminate the practice of burning waste.
- Every household is responsible for managing organic waste within the household, such as food scraps, branches, and leaves, in an appropriate manner.

Waste separation begins at the source, with the categorization of waste into different types: organic waste, recyclables, and infectious waste. These separated waste materials are then utilized to generate benefits, forming the stations for community learning center in waste management. There are a total of 9 learning bases:

- *3Rs Assistant Learning Base:* Transforming waste into learning station by utilizing discarded materials to create value or generate benefits, such as the production of bio-fermentation water, composting, and modifying reusable materials to maximize benefits within the community.
- *Grandma - Grandchildren without Waste Learning Base:* Establishing a foundation for passing on the transmission of knowledge from the elderly generation to the younger generation, emphasizing the importance of waste separation. Additionally, there is a significant activity called 'Joyful Recycle.' It is an activity that encourages community members to participate in waste separation. Students from various schools in the Wang Sala come together to learn about different types of waste, how to manage them, and, most importantly, to take this knowledge back to share with friends and family. This activity aims to instill awareness in children and youth simultaneously.
- *Following the Earthworm's Path Learning Base:* Due to the extensive use of chemical substances in agriculture in the area, particularly chemical fertilizers, there has been a significant effort to reduce the reliance on chemical inputs in farming. In areas where cattle farming are prevalent, vermin

culture has been employed as a method to diminish the use of chemical fertilizers. This involves using earthworm castings, obtained from the cultivation of earthworms, as an organic fertilizer for agricultural purposes. The aim is to reduce the quantity of chemical fertilizers utilized in farming practices.

- *Energy from Waste Learning Base:* Renewable Energy Hub' is a learning foundation that encompasses various aspects of energy management, including the utilization of natural materials. For instance, farmers collect and repurpose natural materials such as branches and leaves, which are typically pruned and discarded, to produce biofuel. Additionally, in the Tha Muang district, several Chinese restaurant operators generate a significant amount of used wood. This used wood is reclaimed and converted into charcoal. Furthermore, the charcoal production process also yields wood vinegar, creating a holistic approach to sustainable energy practices.
- *Green Shop House Learning Base:* The 'Green Stores' initiative aims to engage small local businesses in community waste management. Currently, six community stores are participating in this program. In this learning foundation's activity, customers accumulate points when they make purchases without using plastic bags. To qualify, customers must bring their baskets or cloth bags for their purchases. Green Stores then reward customers with points that can be accumulated for future use as discounts or for redeeming items in subsequent transactions. This learning foundation contributes to reducing the use of plastic bags in the community.
- *House for Rent Learning Base:* The learning foundation related to the waste management system of rental homes in the community addresses the challenge of waste management in areas where people gather in large numbers. Renters often lack awareness of waste management issues, leading to the indiscriminate disposal of waste in communal bins without proper segregation. Without effective management, improper waste disposal occurs, including the disposal of food waste into drainage systems. Recycling bins are also misused, as food waste is deposited, causing decay and unpleasant odors. Those who are responsible for sorting recyclables often end up dealing with decomposed and odorous waste, making waste management more challenging.

In this learning foundation's waste management initiative, the community installs iron grates called 'Blessing Grates' in front of rental homes. These grates serve as a separation point for recyclables such as glass bottles, plastic bottles, and aluminum cans. These grates are not limited to specific rental areas but are distributed along village paths. In addition to the grates, there are 'Blessing Bins' where residents can deposit sellable recyclables. The income generated from selling recyclables is used for community activities, fostering a sense of communal responsibility for waste management. Both the grates and bins are collected every Friday to be sold to recycling centers in the next cycle.

In addition, the waste generated by rental homes is predominantly wet waste, including food scraps and wastewater. The management of wet waste involves creating drainage channels and designated disposal areas. Wastewater is treated before being discharged into public drains, using bio-fermentation water added to the drainage channels. Additionally, this treated water can be utilized for watering plants. The active involvement of rental homeowners plays a crucial role in addressing waste management issues in rental areas. This includes creating motivation for tenants to reduce rent costs when waste management is effectively handled. Collaborative rules and guidelines are established among the rental community to collectively address waste management challenges within the rental premises.

In addition, the community has implemented the creation of 'Blessing Bins' for residents who wish to donate recyclables. These bins are used to collect recyclables for sorting and selling, with collection taking place every Friday. Another project is the 'Friday (Happiness) with Merit' initiative. Furthermore, to address the management of wet waste in rental areas, such as food scraps and wastewater, the community has installed grates to filter and capture food scraps before they enter the drainage system behind the rental units. Additionally, there is a system to manage wastewater discharged from each rental unit, utilizing fermented waterborne bacteria for biological treatment. This process ensures that the water released is

environmentally friendly and can be used for watering plants and trees in the rental area.

Moreover, rental property owners actively collaborate to support tenants who effectively manage their waste by offering rent reductions. This serves as motivation for tenants to engage and participate in waste management efforts in the rental community. Overall, these initiatives aim to create incentives for tenants to pay attention to and actively participate in waste management within the rental area.

- *Monks' Help Learning Base:* The 'Monk's Assistance' is a cultural and religious activity where monks play a role in seeking cooperation from devotees to reduce the use of plastic bags when offering alms to monks in the morning. Typically, during the almsgiving ceremony, devotees use two layers of plastic bags—one for rice and another to wrap around the plastic bag handle, which is then used for curry. This practice results in a significant and unnecessary use of plastic bags. Therefore, there is a request for cooperation to reduce the use of plastic bags by folding them without the need for additional layers. Monks act as intermediaries in requesting this cooperation.

This significant activity emphasizes reducing the use of plastic bags is the 'Blessing Activity.' In this activity, participants are encouraged to use separate bags exclusively for offering food to monks during religious ceremonies. Specifically, they are instructed to use a bag solely for the rice without the need for an additional plastic bag handle. This is because, during the almsgiving procession, monks have carts to carry their alms bowls. After placing the food into the alms bowl, participants can transfer it directly to the cart without the use of a plastic bag. In the community, there are approximately 200 households. If each household reduces the use of plastic bags for wrapping food, the reduction could amount to hundreds of bags per day for the entire community.

- *Biogas Digester Learning Base:* The learning base "Biogas Digester" is a learning resource closely related to the sustainable energy base. A biogas digester is a system that utilizes the fermentation of animal manure, specifically from cows and buffaloes, to produce biogas. This biogas can be used as a cooking fuel in households, providing a cost-effective and environmentally friendly energy source. It is an efficient way to make use of abundant animal waste in the area, promoting both financial savings and the sustainable utilization of resources.
- *Deliciously Loving the World Learning Base:* It serves as a learning resource for Southern Thai curry restaurants that practice efficient food waste management. Leftover food is repurposed to feed fish, ducks, chickens, geese, and goats. Additionally, the organic waste is used to produce compost, benefiting plant growth and enhancing the overall environment. The restaurant also sells eggs, ensuring they are free from chemical contaminants since the ducks and chickens are raised on the food remnants. The principles of managing food waste align with the philosophy of a sustainable economy. This learning base, focusing on waste management practices, attracts regular external visits and serves as an example of waste management in line with the community's way of life. The utilization of food scraps to feed animals and produce organic compost creates a toxin-free environment, contributing to the overall health and well-being of the community members.

Supportive Factors for Effective Waste Management in an Area

Community Collaboration in Waste Management and Building a Sustainable Community: Creating participation requires the involvement of people in the community in every step of the process, from brainstorming and planning to implementation, Creating rules and agreements for collaborative waste management within the community. Crucially, there must be shared benefits that individuals in the community can recognize. Sustainable waste management begins with community leaders initiating the search for common ground. Starting with individuals who may have more time, such as retirees or those currently unemployed, to participate in activities can be a starting point. Gradually expanding involvement and drawing in other villagers will help create a network or group for ongoing waste management efforts.

Leaders in the community must be willing to sacrifice to lead the community in solving problems. A leader

needs courage to lead because it is not an easy task to accomplish quickly but requires continuous effort and relies on perseverance in the work. Additionally, community participation is essential. Furthermore, leaders must engage in building accurate knowledge and understanding of waste management for the residents.

Private sector support in the area, as exemplified in Ban Hua Phon, Wang Sala Subdistrict, is notably clear. SCGP Company has become a key supporter, leading various community activities and earning recognition and awards. The support takes various forms, including financial contributions, knowledge sharing, provision of materials and equipment, and acting as mentors for community leaders and elders in delivering presentations and lectures. SCGP's involvement in the community has been diverse, extending beyond mere financial aid. The company has played a role as a mentor to community leaders and elders, serving as guest speakers to share knowledge in public forums, and supporting the community in becoming exemplary in waste management. This comprehensive support has resulted in successful initiatives and national-level recognition. The support from the private sector is crucial, as studies indicate that areas outside the direct influence of private companies often lack initiative in waste management. Additionally, private enterprises involved in purchasing recyclables play a significant role. Some businesses offer higher prices for recyclables than market rates to support various community activities. For example, purchasing plastic bottles for recycling into threads used in textile production is one such initiative. In summary, private sector involvement, such as that of SCGP, has proven instrumental in driving successful waste management initiatives within the community. Financial support, knowledge transfer, and active participation as mentors contribute to the overall success of these initiatives, providing a model for other communities to follow.

Support from local government organizations in the area, with the involvement of personnel from these organizations, plays a crucial role in providing knowledge to the community, especially to health officials, volunteer health workers, and neighboring local government organizations. These entities can act as mentors to support other local government organizations in driving waste management activities. An exemplary model of a waste-free community is found in Ban Hua Phong, where external organizations have visited for observational studies. The collaborative network of local government organizations has been instrumental in promoting waste management initiatives. Another motivating factor is the community-wide village cleanliness competition, which catalyzes local government organizations and community leaders to accelerate waste management efforts. Furthermore, neighboring local government organizations can take on the role of mentors to assist other local government organizations in implementing effective waste management activities. The success of Ban Hua Phong Village serves as a benchmark for waste-free communities, inspiring other local government organizations to initiate similar programs. Additionally, the collaborative efforts of local government organizations have opened up opportunities for generating income through the exhibition and distribution of locally produced goods. When study groups visit Ban Hua Phong Village to learn from their experiences, it not only enhances knowledge sharing but also contributes to the economic growth of the community by showcasing and selling local products. In summary, the support and collaboration among local government organizations, community leaders, and external entities have created a network that promotes knowledge exchange, accelerates waste management activities, and generates income for communities. The success of Ban Hua Phong Village demonstrates the positive impact of such initiatives and encourages other local government organizations to replicate and adapt similar models.

Linking the outcomes of waste management to the generation of income for the residents and participating communities. The transformation of waste into income for the villagers is a significant motivating factor for their involvement in the community waste management network. Waste segregation to enhance the value for sale is one strategy, such as separating plastic bottles for supply to manufacturers producing yarn for weaving textiles and creating religious garlands, thereby increasing the economic benefits for the community.

Creating an environmental conservation consciousness for children and students in the community is a pathway toward fostering understanding and environmental awareness among parents and families. The primary actor in this initiative is the school. In turn, parents should serve as positive role models in waste management practices for their children.

Convening a community meeting that involves stakeholders from both the private sector and local government organizations, district health officials, and community leaders, to provide knowledge and emphasize the consistent identification and solutions for waste management issues in the area.

Promoting various activities through public relations to ensure community awareness, participation, and the development of communication media, including online learning materials, for children, youth, and residents. This enables easy and widespread access to information and learning resources on waste management.

Effective waste management relies on social capital of community cooperation. People in the community need to view waste management as a shared issue, even if it's not in their immediate vicinity. Waste affects the whole community, so everyone must actively work together to address it. This sets the stage for effective use of social funds. Identifying and empowering leaders is key to initiating and guiding efforts. Small groups of leaders can drive the process, gradually attracting more community members and forming larger, organized groups. The elderly are a valuable asset for waste management, as they often have more free time and should be actively involved in these activities. Establishing partnerships with senior citizen clubs is key to successful community waste management, as their involvement significantly enhances these initiatives. In conclusion, community collaboration, strong leadership, and the involvement of diverse groups, including the elderly, are vital for successful waste management initiatives.

Constraints and Obstacles in Waste Management in the Area

The lack of awareness about waste issues leads to a failure in household waste separation. The starting point for effective waste management is the separation of waste at its source. However, due to the absence of waste bins in front of some houses, waste is often dumped in piles along the roadside, making collection and management significantly more challenging.

The challenges of waste management in the area include the presence of an informal population and urban expansion. The majority of the informal population resides in rental rooms, and worker camps, leading to a substantial increase in the volume of waste. However, the budget allocated by the central government is based on the registered population, not accounting for the informal population. The lifestyle of the informal population, who typically work in the area, involves leaving for work in the morning and returning in the evening, leaving little time for waste separation. As a result, waste is often disposed of without sorting. Instilling a sense of responsibility for waste separation becomes challenging given these circumstances.

The urban expansion has led to the creation of additional allocated villages and an increase in households in the area. The quantity of waste has consequently risen in tandem with the growing number of households. However, the number of waste management personnel and collection vehicles remains the same. Due to the lifestyle of the residents in the allocated villages, who typically leave for work in the morning and return in the evening, their participation in waste management is limited. The social capital within the community is low, and there is a lack of uniformity among residents. In contrast, rural communities outside the allocated villages tend to exhibit more mutual support, cooperation, and assistance. Collaborative efforts in waste management are therefore more easily achieved in these rural communities compared to the allocated villages.

The disposal of waste from outside the community into the village overwhelms the waste management capacity. Even passersby on the main road through Tha Muang district tend to litter on both sides of the road, leading to an excessive amount of waste beyond the capacity for proper collection and disposal.

The rejection of constructing/installing community waste incinerators hinders the availability of space for such facilities in the area. If implemented, the waste incineration process could potentially transform the waste into energy for community use. However, a detailed feasibility study may be required to assess the cost-effectiveness of establishing a community waste-to-energy plant before proceeding.

The local government's waste collection personnel, affected by COVID-19, have faced insufficient workforce during certain periods. In the execution of their duties, these personnel are required to handle both general waste and infectious waste, including personal protective equipment (PPE), and ATK testing kits, without proper separation from regular waste. This situation has led to multiple instances of COVID-19 infections among the personnel.

The structure of local government organizations that have and do not have dedicated public health departments directly responsible for waste management and public health varies. Small-sized local government organizations without public health departments often lack direct responsibility for waste management. In the Tha Muang district area, there are only two local government organizations with public health departments: the municipality of Wang Sala and the municipality of Tha Muang. Having such organizational structures would significantly enhance the efficiency of waste management operations. An exemplary case is the Wang Sala municipality, which received an award for being a national model community for waste-free living. On the other hand, the Tha Muang municipality serves as a model for expanding waste management practices in the future. Local government organizations without dedicated public health departments often delegate waste management responsibilities to the maintenance department or similar entities.

The factional division within the community hinders cooperation among conflicting groups. The group advocating for community waste management is often perceived as benefiting from their advocacy, gaining recognition and praise from external organizations. On the contrary, the opposing group may refrain from participating to avoid promoting the achievements of the other faction. This division creates a challenging environment where collaboration becomes difficult due to the perceived competition and contrasting objectives between the groups.

The generation gap in rural households, typically consisting of two generations—elderly grandparents (grandpa, grandma) and grandchildren—create challenges for active participation in waste management activities. However, Hua Pong village has found a way to bridge this gap by utilizing the available space. They have initiated an activity called 'Grandchild-Grandparent Garbage-Free' that involves both generations in waste management. While other areas still face obstacles in waste management, Hua Pong village has successfully engaged both the elderly and younger generations in a joint effort.

Waste Is Money: Managing Waste towards Generating Income and Community Welfare for the People in the Community

In the community, a welfare fund has been established using funds generated from the sale of waste within the community. Residents donate waste to the “Ta-krang Boon” (Waste bin for recyclable waste donation) where the waste is sorted and then sold to private enterprises. The proceeds from selling recyclable waste contribute to the community welfare fund. The sources of waste include donations from residents to the “Ta-krang Boon”, direct sales by residents to the waste group, and the sale of sorted and recyclable waste to waste-buying businesses. When waste is sorted and sold separately, it gains higher value compared to bulk sales. Targeted community members include those in need of additional income, and the initiative also helps marginalized individuals generate income. Some households place valuable recyclables such as glass and plastic bottles, and paper in designated areas in front of their homes. Alternatively, these items are collected and sold by groups to support the less fortunate. Additionally, waste sorting provides a source of income for community members, improving their financial well-being. The income generated from selling sorted waste contributes to the community welfare fund, ensuring ongoing support. Effectively managing waste issues requires considering the income generated for those involved in waste separation activities and other initiatives. Private enterprises, such as Wongpanit Company, play a crucial role in purchasing recyclable waste, contributing to sustainable waste management efforts.

In addition to sorting and selling waste to waste-buying businesses, waste management initiatives have created direct income for both individual residents and community welfare groups. For example, vermiculture, the cultivation of earthworms, produces high-value vermicompost that is in demand in the market. Additionally, the production of organic fertilizer through microbial fermentation is another avenue for income generation from waste management.

The practice of vermiculture not only generates income but also provides farmers with valuable organic fertilizer. This approach contributes to reducing expenses for farmers who can use organic fertilizer in their agricultural activities. Moreover, it has positive health effects on farmers. Health assessments of community members who have adopted organic fertilizers show improvements, with a notable absence of chemical residues in their bloodstreams compared to the period when chemical fertilizers were used in agriculture. By embracing organic and sustainable waste management practices, the community not only generates income but also promotes a healthier lifestyle for its residents.

Summary and Proposals for Waste Management Solutions

In conclusion, the community has implemented various initiatives to manage waste effectively, including establishing community learning centers for waste management, sorting and selling recyclables, vermiculture, and organic fertilizer production. These practices not only generate income but also contribute to a healthier environment and improved well-being for community members. Building networks and collaboration with external entities, including businesses, NGOs, and government agencies, to facilitate the distribution and sale of transformed products is quite important for waste management. Besides, Capacity building and providing training for community members is crucial for them to be involved in waste management initiatives. This includes skills development in product design, marketing, and business management to enhance the quality and marketability of the transformed products. In addition, increasing awareness within the community and beyond about the benefits of recycled products and the importance of supporting local initiatives is also essential for waste management. Education campaigns can create a demand for environmentally friendly products and encourage responsible consumer behavior. By implementing these proposals, the community can overcome the challenges in waste management and create a sustainable system that not only addresses environmental concerns but also generates income and enhances the overall well-being of its residents.

Acknowledgements

The authors would like to express our sincere appreciation to Mahidol University with grant number MU-MiniRC09/2565 for their financial support of this research project. Furthermore, we would like to acknowledge to local community of Tha Muang district for their valuable information and warmly support.

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