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Chapter 15

EXPLORING SUCCESSFUL CASES OF COMMUNITY PARTICIPATION IN WASTE MANAGEMENT AND UPCYCLING IN THAILAND

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Introduction

The amount of solid waste generated in Thailand in 2022 was 25.7 million tonnes (70,411 tonnes) per day. This is considered a serious issue since the amount of municipal waste in Thailand was the second highest compared to those produced by other ASEAN (Association of Southeast Asian Nations) countries (Environment, 2017). The amount of solid waste has increased by 3% compared with that in 2020 (Pollution Control Department, Pollution Control, 2022). Several factors, such as the lack of cooperation in waste sorting before disposal and limited knowledge of solid waste management within households, caused the mishandling of solid waste at the community level (Maschamadol, 2018). Due to increasing waste problems, the Thai government has acknowledged the importance of this issue and set the solid waste solution as a national agenda (Buranasingh, 2017). Although Thailand has various laws and regulations in relation to the waste-management process, which describe specific duties and responsibilities of local government organizations in regard to the collection, storing and transportation of waste (including exploitation of waste, such as electric power business and investment promotion), the lack of integration and participation of various sectors, especially at the earlier stages of the process (e.g., waste sorting), makes them less effective. Other strategies (e.g., encouraging people to reduce the amount of waste from their consumption and promoting environmentally-friendly packaging) have not been officially established – these include providing clearer knowledge on waste management to the general public (Mokhsart, 2022). At present, the 3Rs principle (Reduce, Reuse, Recycle) has been used as an operating framework for waste management, which can be divided into three phases: upstream (reduce), midstream (reuse), and destination (recycle). The aim is to reduce the amount of waste, promote waste segregation at source, create an efficient waste collection system, and properly dispose (Ministry of Interior, 2022).

The People's Constitution of 1997 stated in section 76 that: '*The state must encourage and support the participation of people in policy and political decision making, planning for economic, social and political development, including monitoring the use of state power at all levels.*' The constitution emphasized the importance of citizen participation, especially in the decentralization of power from the central state to local organizations elected by the people, including local communities. People in the community can participate in projects to solve their community problems and act in the majority of their daily lives economically, socially and culturally, which allows them to think about and make decisions regarding these issues. It is crucial that local people create a database of community information and analyse community needs to evaluate the value within the community context by themselves. Therefore, the self-reliant community plan preparation process was offered to community members, which aims to enable people in a community to have a chance to meet, talk, express their opinions and brainstorm ideas regarding problems and challenges facing their communities (Na Pomphet, 2007).

The idea of getting citizens involved in the problem-solving process is not new to Thailand. People in small communities have already been given the opportunity to participate in the consultation process on how to deal with serious matters, such as those related to drugs, economics, environment and infrastructure, welfare and social issues. In 2004, the *Handbook of Community Based Solid Waste Management* (CBM) was used to get people involved in the waste-management process at community level. This includes (i) recognizing waste problems in their areas; (ii) finding solutions; and (iii) deciding on waste-management methods that are suitable for their community. In this way, people can take action according to an agreed plan created by them. Waste management projects are still carried out at community level, such as waste banks, waste markets, waste donations, and composting from organic waste projects. (Pollution Control Department, Community Based Solid Waste Management, 2019).

This chapter aims to discuss the challenges and issues related to MSW (Municipal Solid Waste) management in Thailand, highlight the potential of upcycling as a solution, emphasize the importance of citizen participation in waste management, propose ways to improve waste-management practices at community level and emphasize the need for more effective and sustainable waste-management strategies. By incorporating upcycling and encouraging citizen involvement, the chapter seeks to promote a more holistic approach to waste management that empowers local communities and fosters responsible waste-handling practices.

Methods

This chapter presents a preliminary research study conducted as part of a doctoral research project, focusing on community participation, participatory design, and upcycling practices in waste management. The study followed a systematic

approach, beginning with an extensive literature review to explore existing knowledge on these topics within Thai small communities.

The literature review involved analysing scholarly articles, government reports, municipal reports and subdistrict official websites, primarily sourced from Thai Journals Online (ThaiJO) and official community-based resources. Key search terms included ‘Community participation in waste management’, ‘Community-driven upcycling in Thailand’, and ‘Challenges and opportunities in upcycling in Thai communities’. The literature review aimed to identify effective participatory strategies, community engagement models, and upcycling practices relevant to small Thai communities. The key findings highlighted existing strategies and best practices that Thai communities implement in waste management and upcycling, providing a foundation for further investigation.

To complement the literature review, the research incorporated exploratory case studies, utilizing secondary data from online sources, including municipal reports, government databases and community-driven initiatives. The case-study approach followed Yin’s (2017) framework for case-study research, allowing for an in-depth examination of how participatory design and upcycling are applied in different community settings. Table 15.1 summarizes the three key research areas

Table 15.1 Summary of key research areas and supporting literature

Research Area	Key Findings	Key References
Community participation in waste management	<p>Community-led waste management varies based on governance structures and available resources.</p> <p>Effective models integrate education, incentives, and local policies.</p> <p>Leadership engagement is crucial for long-term sustainability.</p> <p>Participation frameworks include structured models (decision-making, operations, evaluation and benefit-sharing).</p>	<p>Chainam & Bouphan (2022), Pollution Control Department (2019, 2022), Ministry of Interior (2022), DEQP (2023), Maschamadol (2018), Atthaporn et al. (2024)</p>
Community-driven upcycling in Thailand	<p>Co-design and participatory workshops are essential in community-led upcycling.</p> <p>Traditional handcrafting and cultural preservation play a major role in upcycling acceptance.</p> <p>Knowledge-sharing initiatives enhance upcycling adoption and local innovation.</p> <p>Economic incentives support the sustainability of upcycling projects.</p>	<p>Chiangka (2018), Nimthong et al. (2024), Yin (2017), Warin Chamrab Municipality (2018), Maschamadol (2018), Thanangngam Subdistrict Administration (2024), Phetthirasawat (2023)</p>
Challenges and opportunities in upcycling in Thai communities	<p>Lack of funding and limited training restrict upcycling scalability.</p> <p>Cultural heritage and locally sourced materials present untapped opportunities.</p> <p>Motivation and tangible benefits (economic and environmental) drive participation.</p> <p>Market demand and policy support influence long-term sustainability.</p>	<p>Limsomboon et al. (2024), DEQP (2023), UN Environment Programme (2017), Phetthirasawat (2023), Thungluknok Subdistrict Administration (2024)</p>

derived from the literature review, aligning with the case study findings. This categorization was developed based on existing frameworks in participatory design, waste management and community-based upcycling, ensuring a systematic approach to data analysis.

Results

The following sub-sections describe four case studies. Each case study begins with a summary of the key activities followed by key lessons learned. While three case studies involve direct upcycling practices, the second case study (Yommarat Village) is included to provide insights into community participation models, waste-separation strategies and behavioural engagement – critical foundations for successful upcycling initiatives. By understanding the challenges in fostering participation, particularly in the absence of upcycling, this case study highlights barriers that need to be addressed to implement community-driven circular economy models effectively.

Case Study 1: Tunglooknuk Sub District, Nakhon Pathom Province

In the Tunglooknuk sub-district, the 3Rs principle has been effectively implemented for waste management. Firstly, the community successfully raised awareness about waste reduction. Secondly, they improved recycling practices by increasing the number of bins and promoting waste sorting campaigns. This addressed improper waste disposal which is a significant contributor to household waste issues. Lastly, the community embraced upcycling design, creating valuable products from scrap materials, leading to additional income sources and job opportunities for residents. The combined efforts to reduce, reuse and recycle waste have made the waste-management approach in this community both sustainable and economically beneficial. Upcycling practices also support recycling activities as they encourage all waste to be sorted properly (Chiangka, 2018). The community participation activities of the Tunglooknuk sub-district can be grouped into four steps: (i) participation in decision-making, (ii) participation in operation, (iii) participation in receiving benefits, and (iv) participation in evaluation (Parepuno, 2018).

The first key lesson (Lesson 1) learned was *clear communication regarding the roles and responsibilities of people in the community in each step of participation*. The Thungluknok sub-district administrative organization divided community participation activities into four steps to make them easier for people to participate in and provided clear guidelines for each step. The organization invited members of the community to analyse, search and define problems on waste issues themselves. After that, related agencies (both in the public and private sectors) provided further information to help people make decisions, which led to the selection of suitable activities and the elimination of inappropriate ones. Community members were encouraged to share knowledge regarding waste management. In this way, they would be able to comment on waste-management targets/objectives and provide

recommendations for appropriate operations. The advantages of participatory activities were clearly communicated to community members (Limsomboon, Likitpanyarat, & Srisawang, 2024). For example, carrying out activities together gave people a chance to get to know each other and learn how to work collaboratively. These participatory activities enabled people to take positive action to address the root cause of the problems (improper disposal of household waste) and improve their quality of life. Other members of the community also acknowledged their contributions. Furthermore, these participatory activities encouraged community members to express their opinions and give suggestions on how to improve the operations regarding waste management in the government sector (Figure 15.1). The methods of encouraging people in the community to participate included organizing training/seminars and enabling community leaders to take charge of solid waste-management activities. By participating in decision-making, operation and evaluation, all members received benefits from these positive actions together (Thungluknok Subdistrict Administration, 2024).

The second key lesson (Lesson 2) was that *the activities aimed at creating upcycled products should align with the cultural and lifestyle aspects of individuals to effectively motivate their participation in waste management*. Recognizing the significance of community members' culture, lifestyle, values, local customs, and attitudes is crucial when designing activities that cater to their needs and preferences. The small rural community has a strong familiarity with traditional handcrafting techniques, which they utilize to create various everyday items such as Thai bath towels, clothing, and home decor (Phetthirasawat, 2023). These handcrafted products hold significant cultural and practical value for the community, representing a tangible connection to their heritage and way of life. The transmission of handcraft techniques across generations has played a significant role in preserving cultural roots within each locality, encompassing narratives, processes, patterns, and heritage techniques. This approach acknowledges the significance of considering the socio-cultural context in which individuals operate. By incorporating elements that reflect their values, aesthetics, and preferences, they create a sense of familiarity and relevance. The Thungluknok community, for example, initiated an upcycling activity involving the manual weaving of UHT beverage boxes into baskets, which served as functional containers for individuals to carry items when visiting temples or markets. In order to foster engagement and



Figure 15.1 The community agencies consistently organize educational activities to promote household waste separation within the community (Tunglooknuk, 2016).

active involvement in waste-management practices, it is crucial to ensure that the activities related to the creation of upcycled products resonate with the cultural values and lifestyle choices of the target audience. By tailoring these activities to align with people's cultural backgrounds, traditions and daily routines, we can enhance their motivation to participate in waste-management initiatives.

Case study 2: Yommarat Village, Tha Nang Ngam Subdistrict, Phitsanulok Province

The 3R principle guided the waste-management activities implemented in the Yommarat village. The primary objective of these activities was to address the specific waste-related concerns and requirements of the local population. The key issue identified within the community was the inadequate disposal of waste, characterized by practices such as waste burning and improper disposal of garbage outside designated areas, leading to detrimental environmental pollution. The study focused on helping people in the community understand the guidelines so that they could dispose of household waste more efficiently. The local organization started by providing basic knowledge about waste sorting to encourage people to separate waste and manage each type of waste properly. In addition, the local organization followed the community participatory model proposed by the workshop to solve community problems by listening to people's opinions and suggestions regarding waste management (Figure 15.2). The community participatory model on waste management at Ban Yommarat can be grouped into three steps: (i) participation in the planning process, (ii) participation in the operations of waste-management activities, and (iii) participation in the evaluation process. According to the evaluation of the planning process, six key considerations were identified, namely: budget saving, ease of implementation, availability of materials in the community, possibility, participation of people in the community, and benefits for residents (Thanangngam Subdistrict Administration Organization, 2024).

The third key lesson (Lesson 3) was from *the local organization focused on the promotion of waste-separation practices by providing explicit guidelines for each specific type of waste management*. The sorting of waste serves as the initial and crucial step in community-led waste-management initiatives. Differentiating waste types is facilitated by the implementation of a four-colour system: green bins



Figure 15.2 Tha Nang Ngam Subdistrict Administrative Organization's meeting to address waste management, seeking participation from the local community (Tha Nang Ngam, 2023).

for compostable waste, yellow bins for recyclable waste, blue bins for general municipal waste, and red bins for hazardous waste (DEQP, 2023). To assist community members in comprehending the various waste categories, the local organization in Yommarat Village facilitated a range of activities. For instance, they conducted workshops on transforming compostable waste into fertilizers and biofertilizers, which not only helped villagers reduce the expense of purchasing compost but also contributed to the generation of income for families by encouraging the separation and sale of recyclable waste to recycling centres (Figure 15.3) (Nimthong, Sinchao, Patthamasonti, Sirinakhon, & Faiyue, 2024).

The fourth lesson (Lesson 4) was that *the presentation of the benefits arising from community activities in waste management is imperative to foster active participation and engagement among individuals*. Although six key considerations were identified at the planning stage, the local organization did not integrate them into waste-management activities. They struggled to involve people in participatory activities, particularly regarding benefits for local residents. While Yommarat Village did not incorporate upcycling, its community engagement strategies and waste-separation efforts are valuable for understanding the broader context of participatory waste management. The challenges in participation observed here, particularly the lack of perceived benefits, highlight a key issue that can also hinder upcycling adoption in similar communities. Addressing these barriers through clear communication, incentives and structured participation models could improve future upcycling initiatives by ensuring communities are aware of the direct benefits. This case study provides a critical contrast to the more successful upcycling-driven participation seen in other cases, reinforcing the importance of engagement at all stages of sustainable waste-management projects. Since the ‘participation in receiving benefits’ was not clearly communicated, this case ultimately demonstrated only three stages of community participation. Motivation plays a pivotal role in influencing individuals to take action, and external motivation is closely tied to the anticipation of rewards and reciprocal benefits (Assegaff, Kurniabudi, & Fernando, 2016). Therefore, greater emphasis on the



Figure 15.3 Tha Nang Ngam Subdistrict Administrative Organization, in collaboration with the Children’s Centre, organized an activity to make fertilizer from wet waste (Tha Nang Ngam, 2023).

'participation in receiving benefits' could have enhanced awareness of the advantages of community-led waste management. In this case, benefits could have included reducing household costs by producing compost, generating income through the sale of recyclable waste and improving quality of life by reducing local pollution and waste accumulation.

Case Study 3: Waeng Yai Sub District, Khon Kaen Province

The local organization in the Waeng Yai sub-district adopted the 3Rs as the guiding principle for waste management, aligning with the community participation guidelines provided by the Thai government (Atthaporn, Kittikronwaranon, Tarasi, & Yolai, 2024). Central to their approach was the cultivation of a sense of community belonging and active engagement in operational responsibilities throughout the waste-management process, encompassing six stages: (i) participation in defining the problem, (ii) planning and decision-making, (iii) operation; (iv) receiving benefits; (v) evaluation; and (vi) responsibility. Since the local organization concentrated on managing and reducing waste, five additional key areas were set as main targets: (i) reducing the amount of solid waste generation; (ii) solid waste sorting; (iii) solid waste collection; (iv) solid waste collection and transportation; and (v) solid waste disposal (Chainam & Bouphan, 2022).

The fifth lesson learned (Lesson 5) is *the importance of utilizing design knowledge within waste-management workshops to develop a diverse range of innovative waste-management approaches*. Despite the clear definition of the five targets, the specific plans pertaining to the application of the

3Rs remain unclear. However, it was observed that the integration of design knowledge and skills could significantly enhance waste-management practices, particularly in the context of reuse. This involves the transformation of discarded materials into valuable products, which presents opportunities for community members to participate and receive associated benefits actively. At the Waeng Yai sub-district, creative approaches to waste management were employed, such as the hand weaving of bags and hats using coffee packaging by an elder group, the utilization of vinyl banners to create aprons, the repurposing of refill bags from detergent and fabric softeners into bags, and the conversion of discarded rice cookers into biomass stoves (Figure 15.4) (Warin Chamrab, 2018).



Figure 15.4 Waengyai villagers participate in training on waste processing design and knowledge exchange with the Warin Chamrab Group (Warin Chamrab, 2018).

Case Study 4: Wiang Phrao Sub District, Chiang Mai Province

Chiang Mai province followed the National Master Plan regarding waste management by applying the 3Rs principle and the Community Solid Waste-Management Action Plan. Both plans required cooperation from communities and local governments to move towards a zero-waste community. In line with these plans, the local organization incorporated research findings from academic and researcher-led studies on community participation in waste management. By leveraging these insights, they adapted their waste-management processes and developed activities tailored to suit the specific needs and characteristics of their local communities. The solid waste-management process, guided by community participation, encompasses seven strategies aimed at encouraging active engagement within the activities. These strategies include:

- (a) raising awareness among community members to foster their participation in waste-management efforts;
- (b) developing and enhancing the capacity of community leaders to effectively address solid waste challenges;
- (c) addressing waste issues by categorizing specific target groups within the community;
- (d) community participation process involving community members and local agencies in the area;
- (e) implementing a system for monitoring, corrective measures, and inspections;
- (f) promoting the roles and responsibilities of local agencies in waste management; and
- (g) creating incentives and inspiration to stimulate behavioural changes among community members.

These activities are connected to the process of community participation, which can be divided into four steps: (i) the planning and decision-making stage, (ii) operational activities, (iii) receiving the benefits, and (iv) the evaluation process (Wiang Phrao Municipality, 2023).

The sixth lesson (Lesson 6) was that *preparing and enhancing the capacity of design skills is an integral part of the activities related to participation in the operational aspects of waste management*. The local organization implemented activities aimed at developing and enhancing the capacity of community leaders, including village headmen, headman's assistants, municipal council members, village committees, volunteers, health volunteers, the heads of the elderly and housewives. The activities involved conducting training workshops to address solid waste problems. The workshops focused on educating participants about upcycling and adding value to products through the cultivation of creative-thinking skills. Interested individuals and organizations were invited to participate in these workshops, which aimed to promote waste transformation. The creative activities specifically targeted the participation of community leaders, members, and local agencies within the area. This led to the establishment of a sub-district action group responsible for organizing various projects and activities in the

community. These initiatives facilitated the implementation of waste-management practices, such as the conversion of organic waste into fertilizer or bio-fertilizer, the repurposing of scrap materials from packaging into home-decor items, and the processing of agricultural waste into rice straw papers.

The seventh lesson (Lesson 7) was that *the presentation of the benefits derived from participating in waste-management activities assumes a significant role in motivating individuals engaged in activities*. The local organization in Wiang Phrao incentivizes good behaviour in waste sorting and acknowledges outstanding waste-management practices at the sub-district level through the provision of awards. This initiative is aimed at motivating individuals to enhance their awareness of waste-sorting practices. Additionally, by highlighting the benefits of effective waste management and showcasing innovative approaches to waste reduction, inspiration is generated among individuals to adopt creative waste management strategies. There is a strong emphasis on presenting the benefits resulting from participation in waste-management activities, as this serves as a crucial motivator for individuals involved in these activities. By highlighting the positive outcomes, individuals are more motivated and actively participate in waste-management efforts. These benefits encompass various aspects, including environmental improvements, pollution reduction, enhanced public health, economic opportunities through waste recycling and upcycling, as well as an overall enhancement in the quality of life for community members.

Discussion and Conclusion

These four case studies demonstrate how community participation models and the 3Rs principle (Reduce, Reuse, Recycle) were adapted to the distinct contexts of small communities in Thailand. Each case study highlights tailored waste-management practices accompanied by community participation frameworks aimed at fostering collaboration between individuals and local organizations to promote sustainable waste management. Across the case studies, community participation was found to follow three to six sequential stages depending on the local context, including: (i) problem identification and planning, (ii) operational activities, (iii) evaluation, and (iv) participation in receiving benefits. These participation models provided valuable insights into how community members were engaged in different stages of waste-management initiatives.

Notably, while three case studies incorporated direct upcycling activities, the second case study (Yommarat Village) contributed alternative insights into the challenges of community engagement in waste-separation practices. This case also underscored the critical importance of clearly communicating the benefits of participation, a factor that significantly influenced motivation and engagement levels.

During the planning phase, several strategies were identified. Lesson 1 highlights the importance of clear communication of roles and responsibilities in participatory processes, echoing recommendations by DEQP (2023), which stress that transparent

communication fosters trust and long-term commitment to community waste-management projects. Lesson 3 similarly aligns with Warin Chamrab Municipality (2018), which advocates for easy-to-follow guidelines in waste sorting and recycling as key factors in promoting participation. Lessons 4 and 7 both demonstrate that highlighting the tangible benefits of participation such as cost savings, income generation from recyclable sales, or environmental improvements, is key to motivating individuals. In addition, Lesson 8 (from the overall analysis) emphasizes the value of segmenting community members based on their roles to foster better collaboration and ownership of activities.

In the operational phase, the literature underscores the value of linking waste-management activities to local cultural practices. Lesson 2 demonstrates that aligning upcycling activities with community lifestyle and traditions increases participation, which is consistent with Phetthirasawat (2023) who discusses how traditional craftsmanship can be leveraged to strengthen community ownership in upcycling initiatives. Upcycling workshops were identified as a critical mechanism for enhancing community engagement and promoting creative reuse (Nimthong, Sinchao, Patthamasonti, Sirinakhon, & Faiyue, 2024). Lesson 5 points to the value of integrating design knowledge into waste-management workshops to spark creativity and expand reuse opportunities. Similarly, Lesson 6 underscores that building local capacity in design skills is essential to sustaining long-term community engagement in upcycling and waste reduction.

This chapter has identified both exemplary waste-management practices and areas for improvement across the case studies. A recurring theme is the need to more clearly integrate the ‘participation in receiving benefits’ step within community participation models, as observed in Yommarat Village and other settings where engagement was weaker. This reinforces Maschamadol’s (2018) argument that perceived benefits are a key driver of community involvement in public initiatives (Maschamadol, 2018).

Finally, this research suggests that future studies should further investigate motivational factors that drive community participation in creative waste-management practices, such as upcycling. Understanding the interplay between cultural context, economic incentives, and community leadership could contribute to the development of more effective participatory models for small communities. Doing so would advance sustainable waste-management practices, both within Thailand and potentially in other similar socio-cultural contexts.

While this study provides insights into participatory waste management and upcycling in small Thai communities, several limitations must be acknowledged. First, the research is based on four case studies, which, while varied, may not fully represent the diversity of rural communities across Thailand or other ASEAN countries. Second, one case study (Yommarat Village) lacked upcycling activities, limiting the study’s direct exploration of participatory upcycling in that specific context. Additionally, some findings were derived from secondary data sources, which may limit the depth of contextual understanding.

Future research should focus on applying these findings in a broader range of communities, including urban or peri-urban settings, to test the adaptability

Table 15.2 Summary of key lessons from the four case studies

No.	Case Study	Location	Lesson
1	Case Study 1	Tunglooknuk Sub District, Nakhon Pathom Province	Lesson 1: Clear communication of roles and responsibilities within the participation process. Lesson 2: Aligning upcycling and waste-management activities with community culture and lifestyle to enhance participation.
2	Case Study 2	Yommarat Village, Tha Nang Ngam Subdistrict, Phitsanulok Province	Lesson 3: Providing explicit waste-separation guidelines to encourage initial participation in waste management. Lesson 4: Communicating tangible benefits of participation to foster motivation and engagement.
3	Case Study 3	Waeng Yai Sub District, Khon Kaen Province	Lesson 5: Integrating design knowledge into workshops to enhance creative reuse and innovation.
4	Case Study 4	Wiang Phrao Sub District, Chiang Mai Province	Lesson 6: Capacity-building through training workshops focused on creative thinking and upcycling. Lesson 7: Using external incentives and recognition (e.g., awards) to stimulate and sustain community participation.

of the participation models identified. In particular, further investigation into motivational factors such as incentives, cultural drivers and perceived benefits, could help refine strategies to enhance participation in community-led upcycling projects. Developing a comprehensive participatory design framework tailored for rural upcycling initiatives would also provide practical value for policymakers and local organizations aiming to improve sustainable waste management outcomes.

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