Case Study: Wangwa Community

LOCAL STRATEGIES TO EFFECTIVE PLASTIC WASTE MANAGEMENT MODELS

A. Introduction

In many developing nations, large populations and rapid urbanization overwhelm the local waste management infrastructure. Robust consumption, low waste collection rates and high littering trends produce substantial pollution both in the surrounding land and marine environments. For smaller communities in peri-urban areas, solid waste management can be an even more complex and multi-dimensional challenge, mainly because of their geographies, limited resources, and economic activities. For one such community in Thailand, this challenge was addressed by a combination of practical interventions, community involvement, sustainable systems and relevant partnerships. This case study demonstrates exemplary approaches to the way plastic is managed within the community which led to an increase in recycling and reduction in single-use plastic packaging while improving the health and wellbeing of the people.

B. The Challenge – Baseline scenario

Wangwa is in the Kleang District of Rayong, an industrial province on the eastern Gulf coast of Thailand, about 220 kilometers away from Bangkok. The province is part of the country's Eastern Economic Corridor (EEC), where both government and private sector's focus is to develop the eastern seaboard area into a vibrant economic hub for the Mekong region.

The community is situated in an agricultural zone of the province and has a coastal frontage. About 8.1 hectares in size, the new Wangwa community was established in 2011 and has a population of 522 households (2,100 persons), with many of the community population working in the factories in Rayong City, about 50 kilometres away.

In the community's early days, there was no waste management system in place. Families lived among piles of trash and filth and were at risk of catching diseases caused by the pollution that surrounded them. The local government had limited resources allocated to the community, with small garbage trucks doing once-weekly rounds to collect the garbage from the households. The services were clearly insufficient to keep pace with the population, which was rapidly growing as people moved to the area to live closer to the jobs in nearby Rayong City.

C. The Interventions (How was it done?)

It took some time before any clear and concerted action was established to address the critical waste issue. Through the crusade of some concerned residents, door-to-door visits were initiated in 2013, to solicit community members' support in addressing the mounting pollution crisis they themselves had created.

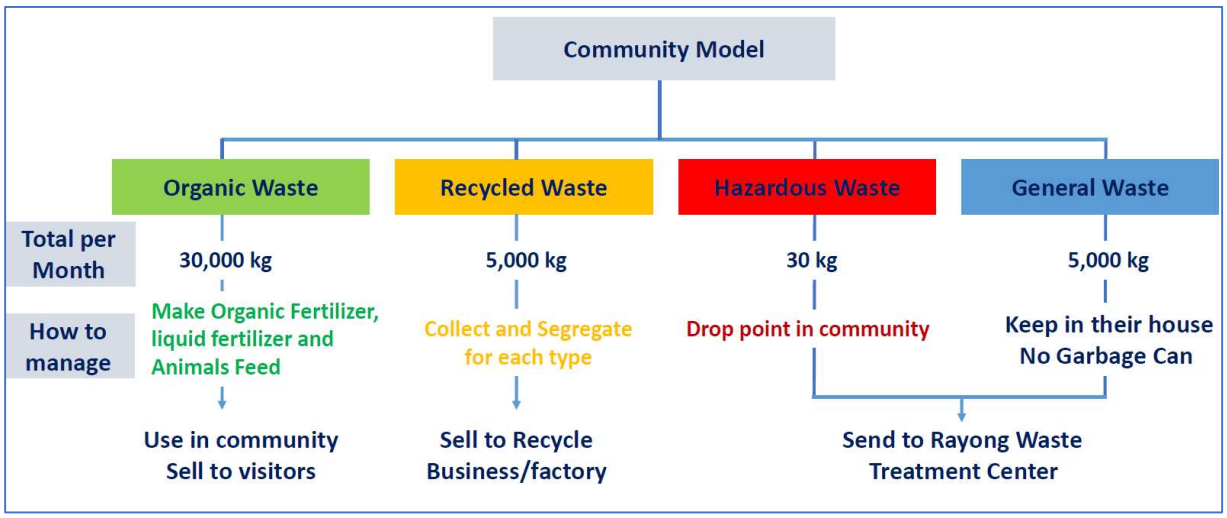
The Wangwa waste management model was established in 2013. Mr. Sayan Rungreaung, a local environmental advocate, led community committee members on a program to work with each household to segregate their organic waste. Through this effort, at least 18 tons of organic waste were collected monthly, which were used to feed animals or as fertilizer. A recycling bank and a community-led organic waste management system were fully implemented in 2015.

Soon after, the municipal government and some businesses with local presence also joined the effort, helping to provide facilities, equipment, and roads necessary to launch the community's recycling

initiative. In 2018, the community engaged with PPP Plastics[1] to further improve on the model which had now become integrated into the Wangwa community's way of life.

The already established community of practice in Wangwa allowed PPP Plastic to fast-track the development of a more effective local waste management system. It is this high degree of community involvement and commitment that formed the foundation of a system that was culturally appropriate, inclusive, sustainable, and transparent.

The Wangwa Model



The Wangwa community model. Source: PPP, 2020

The Wangwa community model puts the onus of segregation at the household level: households segregate their waste into four streams - organic waste, recyclable waste, hazardous waste and general waste.

Monthly waste collection is about 40,000 kilograms, where 75 per cent is organic waste, with the rest as recyclable and general waste. Plastics constitute most of the non-organic waste (2,000 kilograms per month). The community, working closely with the municipality and with PPP Plastics, manages the collection of data, with processes in place to measure the waste volumes.

- Organic waste is collected daily by youth volunteers from each household and brought to the organic waste management facility located in the community, where it is processed to make organic fertilizer, liquid fertilizer and animal feed.

  The monthly average of about 30,000 kilograms of organic waste can be processed into 12,000 kilograms of biological fertilizer and 3,000 kilograms of animal feed from food waste, 500 kilograms of organic fertilizer, 150 kilograms of fertilizer from earthworms, and 250 liters of liquid fertilizer. The products are used by the community or are sold to visitors.

[1] The Private Partnership for Sustainable Plastics and Waste Management (PPP Plastics) was launched in 2018 and is composed of more than 20 public and private organizations and civil society organizations committed to sustainably addressing plastic waste. Dow, SCG and PTT Global Chemical lead the PPP's plastic waste management initiative in Wangwa which highlights the circular economy concept and undertakes to educate the general public on waste segregation with the goal of achieving 100% recycling by 2027 and to decrease ocean waste by half by 2027 in Thailand.

- Recyclable waste is collected by households and sold to the Recycle Storage Area every month. Elderly volunteers sort the items, and segregate and clean about 5,000 kilograms of plastic and plastic bottles, aluminum, and paper every month. These post-consumer items are sold to recycling businesses and factories requiring recycled materials or upcycled within the community into products for sale to businesses and consumers.

- General and hazardous wastes (batteries, lighting, aerosols cans, etc.) are collected from the households every Tuesday by local waste services or can be dropped off by households at designated points in the community. These are segregated and then brought to the Provincial Waste Treatment Center located in Rayong City.

The Wangwa model for managing the waste is supported by infrastructure located in 800 square meters of common public space. The local government provided the land, and seed money from various partners and by PPP Plastics was made available to add or upgrade facilities for processing the organic waste into animal feed and fertilizer; a storage facility for plastic and recyclable materials; and a learning center for the community. A team of community members, supported by volunteers, runs and manages the entire set-up.

- A team of 13 people manages the different fertilizer stations. Another team of 10 people manages the recycled materials. These are locals who have been trained through years of experience and through continuous learning with experts and by community volunteers who are paid or given incentives for their work.

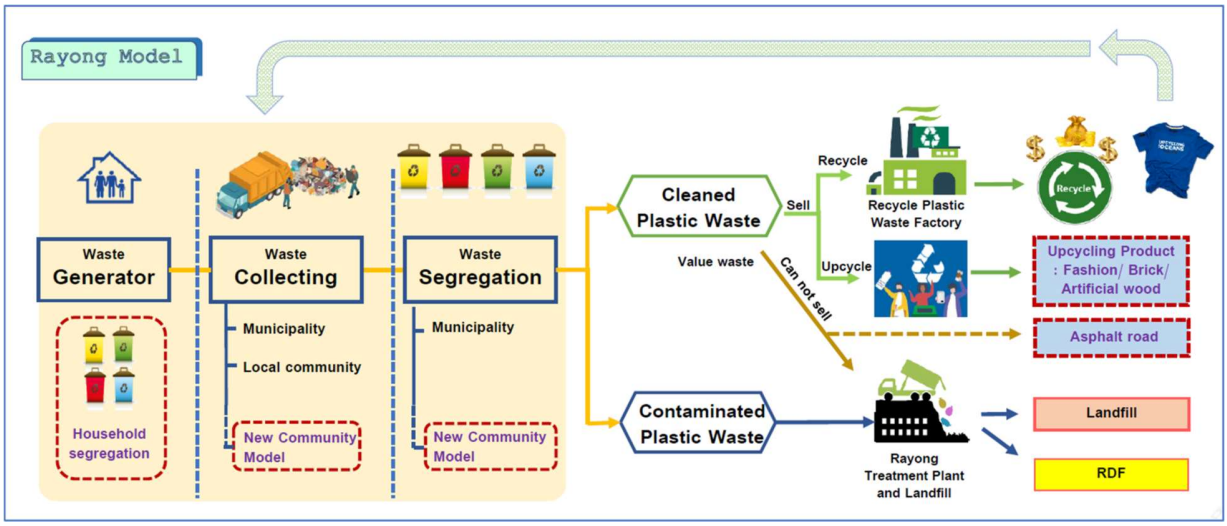
- The Learning Center in Wangwa is a venue for holding workshops and training in organic waste management, fertilizer production, and recycling and processing plastic into new products. It has become a tourist attraction and a learning center for the province as well. Last year for example, almost 15,000 visitors from nearby communities and even from the northern and southern parts of Thailand went to the Learning Center to attend workshops.

- Elderly community volunteers sort the recyclable materials and are provided monetary incentives for their participation.

- The incentives are derived from the income generated from the whole project: from sales of fertilizer, from recyclable materials to recycling businesses, and from workshops and visitor sales. This income also supports a community fund to use for the senior members of the community (logistics costs to hospitals), scholarship for the kids, and free WIFI for the 500 households, and even neighborhood security.

Wangwa waste management facility. Source: PPP, 2020

Waste that are sold in Wangwa but cannot be converted to fertilizer or recycled, is sent to the Rayong Waste Treatment Center and Landfill, an integrated system that has the capacity to handle 1,000 tons of waste a day. This provincial waste treatment center services Rayong's 68 municipalities and 600 communities, in addition to a few other neighbouring provinces.



The Wangwa community model. Source: PPP, 2020

D. The Wangwa Model

Self-sustaining circular system. The model for sustainable waste management in Wangwa promotes material reuse, recycling, and transformation into new products, creating a circular economy

that curbs waste entering the environment. This is driven by a community that is involved, understands the need to sort waste at source, and possesses the right knowledge.

Sorting out the organic waste and segregating *in situ* has also allowed Wangwa to send "higher quality" waste to the Rayong Treatment Center and Landfill. This supports the Rayong provincial targets for better management of the landfill, given the limited land area and the breakdown in waste processing equipment that result from unsorted, contaminated waste. A working model like Wangwa's can be adopted and scaled, especially in communities where no segregation is taking place, not only to optimize investments in infrastructure (minimizing machine breakdowns) but also to prolong landfill life with lesser waste volumes.

Appropriate technology and local capacity. The waste management system should be affordable and simple, and something a community can handle. Easy, accessible innovation and technology can be sustained over longer periods of time. With support and seed money, communities can start with the basic organic waste treatment stations and proceed step by step. The main investment from local governments would be the common space allocation for the collection of organic waste. Good management and efficient technology that matches local capacity further enables the system.

Community commitment and partnerships. Big investment is not the key success factor. More crucial is a committed community leadership supported by its members, with a successful network of local authorities and related businesses united to collaborate on improving waste management and reducing plastic waste.

Partnership with the PPP Plastics has greatly supported the community and provides further opportunities for scale, and for transferring learning and experiences to other communities in Rayong and the rest of Thailand.

Enhanced community knowledge. Continuous efforts to educate and raise awareness among the constituents, especially the younger generation, on the management and sorting of waste including plastics are entrenched in the community of practice. Responsible consumption patterns are promoted among community members, encouraging them to segregate waste at home.

Income for the community. Recycling plastics and processing organic waste have brought economic benefits to the community. 30,000 kilograms of organic waste per month are processed into fertilizer that is sold to visitors and are used for community tree planting and gardening activities. This translates to a monthly income of about THB 21,600 (or USD680). These proceeds are ploughed back into the community and used for scholarships and for provision of free public WiFi. The income from sorting and selling recyclables range from THB12,000 to 15,000 THB per month.

Community behaviour that is predisposed towards managing waste at source resulted from first-hand experience of living with garbage and filth in the streets. This behaviour was further encouraged by a system that empowered the community to act and enjoy the direct benefits of their efforts.

Measurable impacts. *Higher quality recyclables:* Segregating organic waste from the other waste streams minimizes contamination and improves the quality of recyclable items such as plastic bottles, aluminum cans, etc. The Wangwa waste management system has resulted in an increase in the recycling rate of the community from zero, since the community's establishment.

Reduced waste volumes to landfills: A reduction in the waste volumes, from 60,000 kilograms in 2015 (before starting this project) to 5,000 kilograms (2019) of contaminated waste a month has resulted from the higher take-up by the community of waste management procedures. By 2019, plastic waste sent to the landfills decreased by 20 per cent and the community is aiming for zero-waste by 2022.

Quotes from the Interview:

"Wangwa's local approach started because they faced the problem: the community could no longer live with the bad odor and garbage on their streets.

The work starts with the community. It has to be done day-by-day until it becomes a habit for the community.

They (community) must start with themselves – and then other outside partners can support.

Facilities to manage the waste can't be built in one to two months. That's impossible. Partners like PPP Plastics need to expand things, to help set up the system and the infra that reflects the community context. But the community should grow together with any infra and system.

If the infrastructure is developed too fast while the people don't have real or good understanding about running the system and the operation of the waste management center, then those infra will just (be) empty in the next several months.

The key point of this success story is the PROFIT SHARING. Unlike other communities, Wangwa can run it effectively because it not only pays money to people, but also thinks of other indirect benefits. This scheme can be shared, and a step-by-step profit-sharing process developed to be used as a model by other communities.

The community leadership and the system are very important. It is the community that should run things themselves. Organizations can support with knowledge and networks and markets, help to improve efficiency and more effective means to do things, to fill in the gaps. But the community has to do the outreach and education, raising their children to observe community practices."