

Integrated solid waste management good practices to prevent plastic marine litter in the East Asian Seas region



Mersing Islands, Malaysia

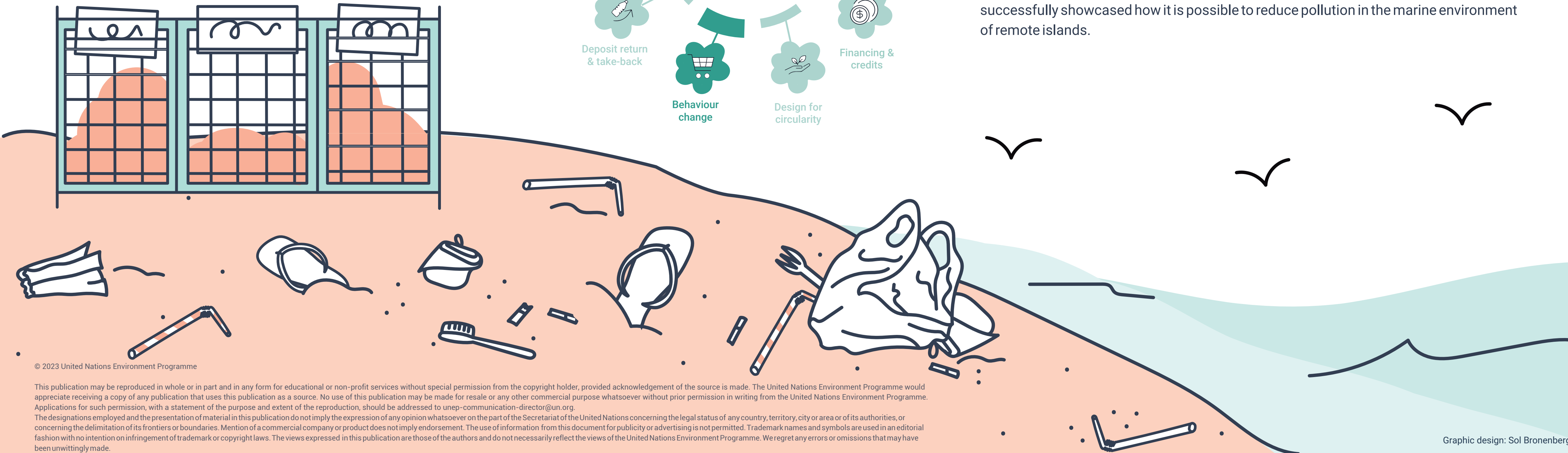
Community-based waste management



Project Overview:

With support from the US Environmental Protection Agency (USEPA), the Coordinating Body on the Seas of East Asia (COBSEA) piloted an integrated waste management system in the Mersing Islands in Malaysia in partnership with Reef Check Malaysia.

The pilot aimed to overcome the pollution challenges faced by small remote islands through capacity building, education, awareness raising, training, investment in essential infrastructure and equipment, and establishing long-term financial support for the transport of recyclables. The pilot established a differentiated household waste disposal system, a transfer station where waste is processed and a transportation system. It successfully showcased how it is possible to reduce pollution in the marine environment of remote islands.



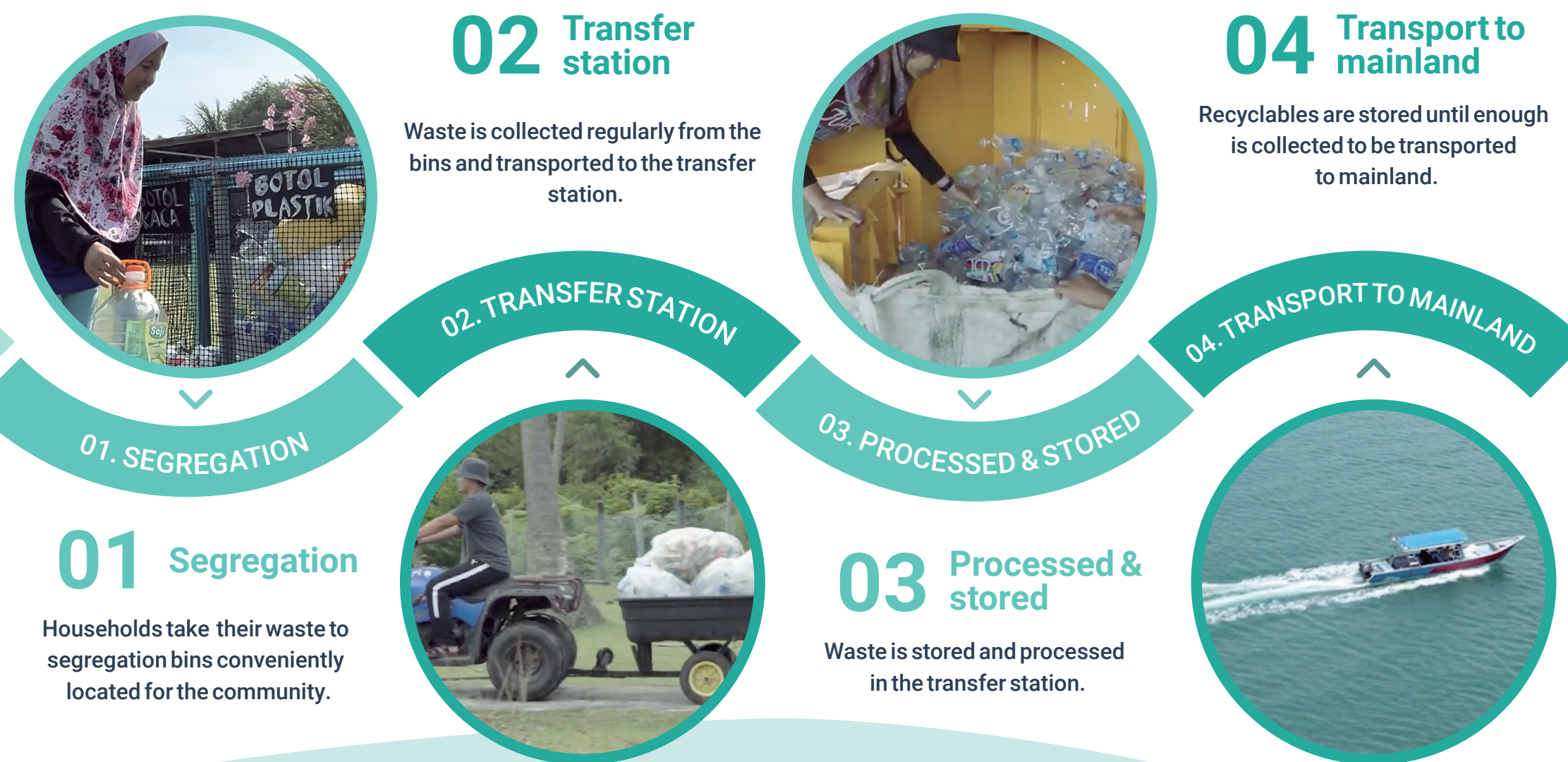
The situation in the Mersing Islands, Malaysia:

The Mersing Island archipelago is situated off the east coast of Peninsular Malaysia. The project was implemented on four of the inhabited islands, with 515 inhabitants and 22 tourist resorts.

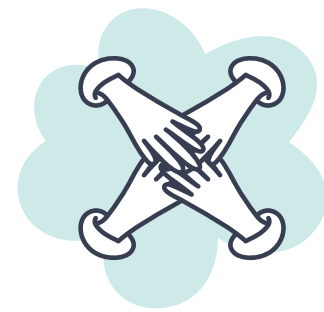
The Mersing Island archipelago features pristine and biologically diverse environments. The islands' economies are primarily based on tourism and fishing, with the leading tourism destinations being Besar, Sibul and Tinggi.

Each island has a hybrid solar/diesel generator, while resorts have their own electricity generator. Fresh water is obtained from sources on the island. There is no integrated sewage treatment, with most households and resorts relying on simple septic tanks or soakaway systems. There is no municipal waste management service. There are no public transport services.

Five islands are inhabited (only four are within this project's scope), all with populations under 200 people. The combination of small local populations and distance from the mainland has resulted in a situation where the local council cannot provide waste management. Domestic and resort trash is therefore mainly disposed of locally, resulting in some ending up in the ocean, adding to the broader marine debris problem.



Case description:



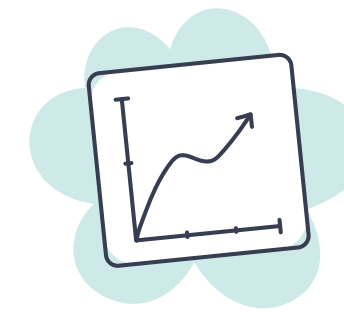
Work in communities

Reef Check Malaysia (RCM) deployed a team on the islands for several months. The team worked with village leaders to implement awareness-raising activities and helped to gain government approval for the establishment of the waste segregation system. The RCM team visited all households to explain the new bin system and the segregation process. Team members also participated in the community WhatsApp group where additional information and encouraging posts were shared.



Funding

With support from the US Environmental Protection Agency (USEPA), the Coordinating Body on the Seas of East Asia (COBSEA) partnered with RCM to implement the pilot. These funds supported various project elements, including project management, stakeholder engagement and seed funding. The funds were used to construct a waste transfer station on Sibu Island, which was equipped with waste handling, sorting, and storage facilities. Additionally, a baling machine was installed to effectively compact plastic waste, reducing its volume for easier transportation to the mainland. Transportation of waste off the island involves considerable costs that cannot be absorbed internally. Initially, seed funding supported the pilot project for the first eight months. Subsequently, RCM secured funding from MISC Berhad, Malaysian energy shipping company,, ensuring continued support.



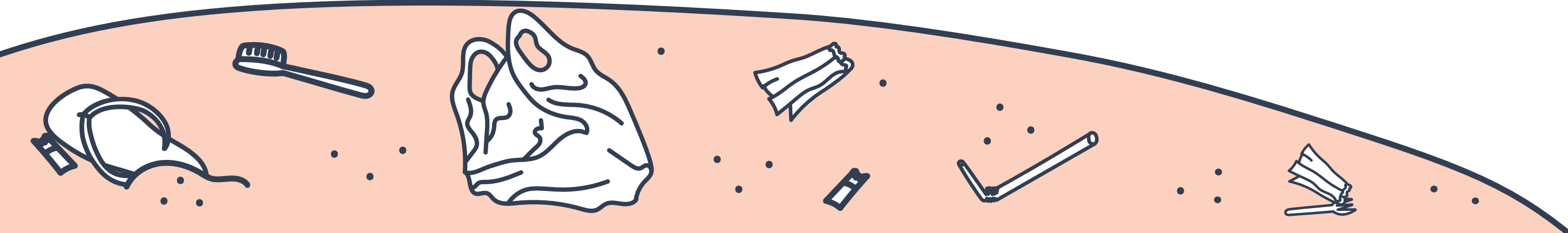
Long term sustainability, transparency & traceability

To ensure the project's long-term sustainability, a viable funding mechanism was essential. During the pilot phase, RCM explored three funding options. They engaged with the municipal government to consider public funding or the implementation of a waste management fund fee charged to tourists. Simultaneously, RCM reached out to local resorts, inviting them to contribute funds for the transportation of recyclables. From 2024 onwards, RCM anticipates that some resorts will contribute to transportation expenses. Additionally, resort operators have expressed interest in bringing their guests on tours to the station. This presents a potential opportunity to raise additional funds for the station, providing a valuable source of income to support its operation.



Expansion

RCM has plans to replicate the successful pilot project at two additional islands in the next two years, making slight modifications to suit the local situations and needs of each island. Currently, RCM is able to send plastic bottles and cans for recycling, but glass is not accepted by the recycling company. To address this, RCM is considering acquiring a glass crusher and has applied for several grants to fund the purchase. In order to maintain a presence on the island, RCM is engaging in discussions with the local school. The aim is to collaborate and utilize the school space for hands-on activities that organize recycling-related initiatives involving the students at the station.



Achievements (Oct 2017 – Dec 2019):



New bin system

521kg of trash, including recyclables, were disposed of in the new bin system. Out of this, 81kg plastic bottles and 20kg of cans were sent to mainland to be recycled.



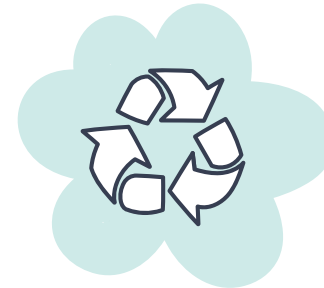
Beach clean-ups

654kg of trash, including recyclables, were collected in two beach clean-ups. 172kg of plastic bottles and 27kg of cans were sent to be recycled.



Local cleanliness

The cleanliness of local village and beach areas has improved through reducing the amount of discarded plastic in the environment. This is relevant to sustain tourism activities which are important to the islands' economy.



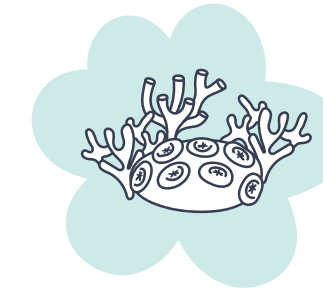
Increased awareness

There is an increased understanding and awareness of the impact of human waste. This caused a shift towards more sustainable practices for residents in general and for tourism operators.



Livelihoods of workers improved

Workers involved in the creation of the waste sorting facility improved their income. Waste collectors and processors are being paid for their contributions, improving their livelihoods.



Reduction in pollution

Expected reduction in pollution of marine environments, including coral reefs, seagrass beds and mangroves in the long term, thereby protecting ecosystems and potentially reducing plastic entering the food chain.



Overcoming challenges:



Community

The project had to be implemented in a very short timeline, and depended heavily on the community for the construction of a waste transfer station, the deployment of bins and assistance in gaining land-use permits for the transfer station. Good stakeholder relationships, together with effective planning of project activities, were key to reducing logistical challenges.



Flexible planning

Supply chain disruptions related to COVID-19 caused delays to the delivery of key equipment. However, flexible project design allowed us to implement other components while waiting for the equipment to be delivered.



High transportation costs

Between August 2022 and March 2023, RCM sent 81kg of plastic bottles and 20kg of cans (not including recyclables collected in beach cleanups) to a recycling company on the mainland. For this amount of recyclables, RCM received RM 50.20.

However, the organization spent RM 200 (USD 43.56) for the boat and land transfer to get the recyclables to mainland, making it financially unsustainable. The same issue occurred when transferring recyclables from the cleanups.

The current plan is to store and send recyclables out in larger quantities, so at least the difference between sales and logistics costs are lower. In the long term, RCM will attempt to convince resorts or the government to fund the transportation of recyclables. There are three resort operators who are interested, but RCM is still devising a suitable financing system (e.g. flat rate monthly contribution vs fees by weight).

Key success factors:

► Community participation

The local village chief became a champion of the pilot and ensured local and governmental permits were expedited. RCM's meaningful engagement with communities allowed for adaptability, flexibility and sustainability of the project. The community was involved in every step of the pilot, participating in environmental education and recycling initiatives. Waste collectors and processors were paid for their contributions, improving their livelihoods.

► Market for recycling

Before the pilot started, a plastic recycling market was found on the mainland.

► Financing mechanism

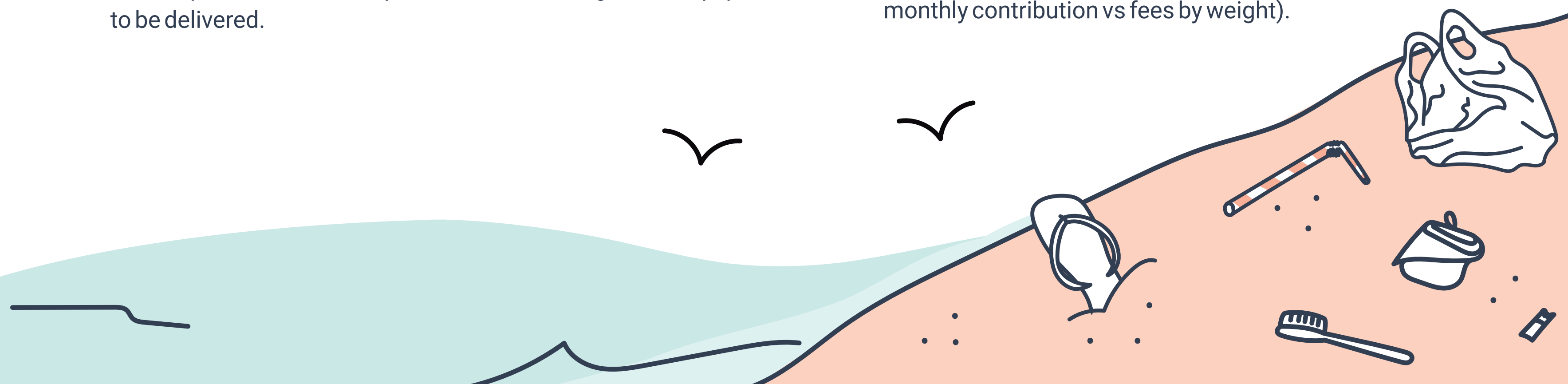
Seed funding was received to set up the project and investigate a long term financial mechanism to make the project sustainable.

► Body of knowledge and experience

This pilot replicated a system similar to one that RCM had already implemented in the Tioman Islands, Malaysia. This allowed RCM to use its previous experience to ensure the pilot's success. A body of knowledge on local stakeholders had also already been developed, including a consultation process. This further helped to ease communication and acceptance of the project. A project team was already in place, with good relationships with stakeholders. This made the communication of the goals of the project more manageable.

► Cost efficiency and sustainability

The system implemented is simple, easy to understand and does not require expensive tools or machinery. This also means that the machinery can be easily fixed and maintained. The tourism industry relies on the ocean and environment to be clean, thus stakeholders are willing to contribute to the long-term sustainability of the pilot.



What do you need to replicate this practice?

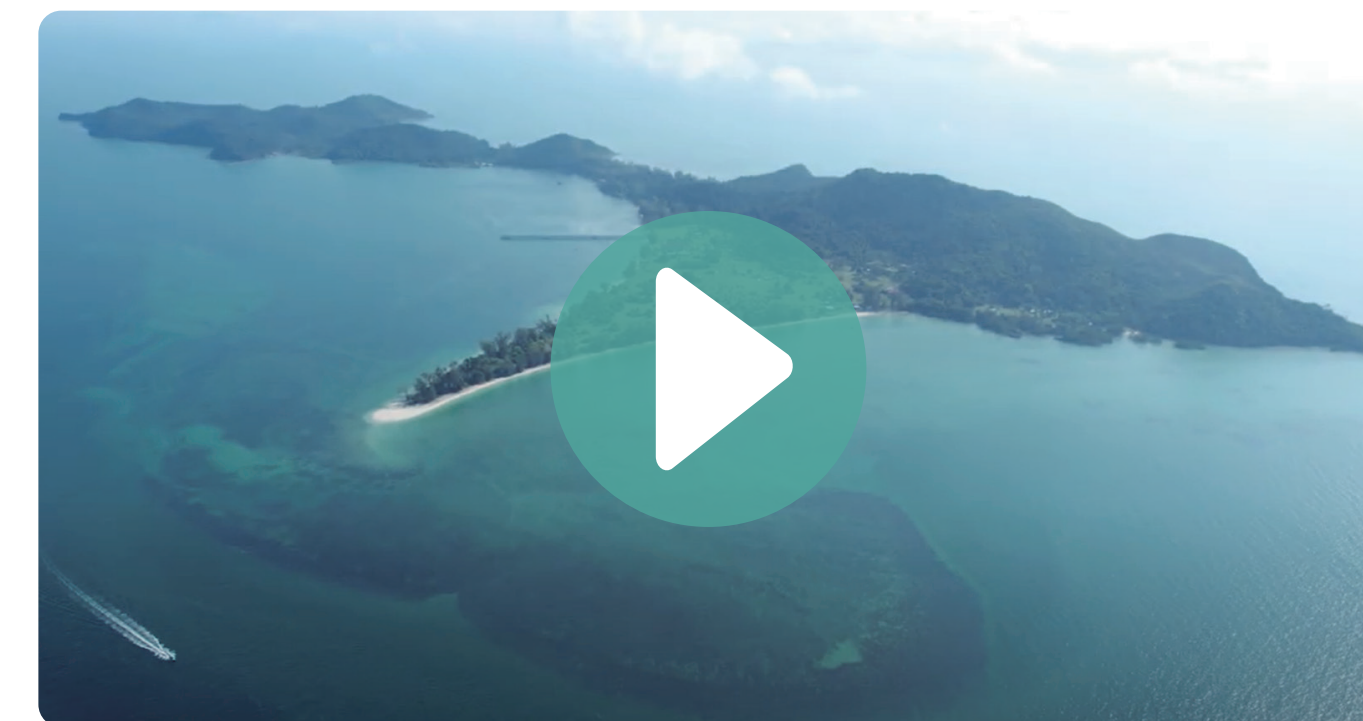
- 01** Seed funding to set up partnerships and infrastructure in the community for the sorting and disposal of waste, building a transfer station and buying materials and machinery.
- 02** Establishing strong stakeholder relationships before starting the design and implementation of the project.
- 03** Existing recycling infrastructure or a recycling company willing to buy household recyclables.
- 04** Access to tourism operators to support the transport of recyclables in the long term.
- 05** Establish a local office while implementing the project to ensure it is well received by the community.

Videos showcasing the pilot

English



Bahasa Malay



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