

Mini-guide

Waste collection and pre-treatment in Kendari, Indonesia by Naturevolution

Documentation of a plastic recycling initiative in Indonesia



Key learning points :

- Explore Indonesia's unique waste collection system: the "Bank Sampah"
- Understand a combined shredding and washing process specific to Indonesia
- Benefit from feedback on a project combining an economic and community approach



- PLASTIC

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Contributions to this mini-guide are welcome \rightarrow please send an e-mail to <u>thibault@plasticodyssey.org</u>

1. Alarming background to plastic pollution in Indonesia

The Plastic Odyssey expedition recently docked in Kendari, marking its second stopover in Indonesia after Ambon. During our stay, we met the dedicated Naturevolution team, in particular waste management experts Helmi and Setiawan.



Setting up Naturevolution in Kendari

In 2018, Naturevolution Indonesia was confronted with a worrying reality when it set up operations in southeast Sulawesi: ubiquitous plastic pollution, both on land and at sea. Plastics litter villages, streets, embankments and rivers, and often end up in the sea, under sandbanks and in coral reefs. Residents frequently burn their garbage in their gardens. Collection services are virtually non-existent, and plastic is never recycled.



In Indonesia, despite several laws governing waste

management and recycling since 2008, their application remains uneven from region to region. In Sulawesi Tenggara, there is little education on the risks associated with plastic and waste sorting. The local government has not put in place the necessary resources for prevention, plastic waste reduction, waste collection and sorting. Plastic is everywhere and has become part of the scenery, leaving communities powerless to deal with the situation.





Aerial view of plastic pollution in Kendari Bay / Plastic pollution on the banks of Kendari Bay

Local commitment: the story of Setiawan Purnomo

Faced with this alarming situation, the Naturevolution Indonesia association has undertaken actions to raise awareness, clean up and set up a plastic waste recycling chain. In 2018, Naturevolution met Setiawan Purnomo, a former Java businessman specializing in plastic recycling. Based in Kendari, capital of Southeast Sulawesi province, Setiawan quickly became aware of the lack of plastic waste processing in the region and began raising awareness among the local population and collecting waste by scooter.



In collaboration with Naturevolution, Setiawan contributed his expertise in waste sorting and management. It established a link with the Office of the Environment and Forestry (DLHK) and secured a workshop on the landfill site to store, recycle and resell the plastic waste collected. In 2019, Naturevolution financed a truck to enable larger quantities of waste to be transported, and in 2021 Setiawan was officially employed by Naturevolution Indonesia as project manager for the Waste Management program.



Since 2023, the Setiawan team has grown with the hiring of Helmi, who assists in the field and manages the association's communications. In 2024, a new recruit, Sri, joined the team to take charge of awareness-raising and education, enabling the program to develop further and reach a wider audience.

Naturevolution Indonesia, thanks to the commitment

of Setiawan and his team, continues to fight plastic pollution in Sulawesi, bringing hope and solutions to a crucial environmental issue.



2. Waste collection and sorting, an organization unique to Indonesia

The Bank Sampah

In Indonesia, plastic collection and recycling is mainly organized around centers called Bank Sampah. These centers enable local residents to exchange plastics for a fee. This organization is encouraged by the government and is part of the national waste treatment plan. Every month, the city of Kendari rewards 5 Bank Sampahs with 1,000,000 rupiahs (\$60).



Example of a Bank Sampah run by widows in Kendari

Naturevolution's Bank Sampah network enables fishermen and households to exchange their plastic waste for cash. To date, 50 collection sites have been set up in Kendari, 30 of which are in operation, mobilizing 3,000 collectors, including 1,000 fishermen, collecting over 80 tonnes of plastic waste annually. The waste is bought back by the Bank Sampahs at 1,000 rupiahs per kilogram (\$0.06/kg), providing an additional income for many local residents.





Waste brought in by a fisherwoman / Weighing waste in front of Bank Sampah

Helmi and Setiawan then buy this waste at 1,500 rupiahs per kilogram (\$0.09/kg) for mixed rigid plastics and 4,500 rupiahs (\$0.27/kg) for PET bottles (without labels and caps) and transport it in their pick-up truck, capable of loading up to 500 kg of waste. For their journeys, Setiawan consumes around 10 liters of petrol per day (10,000 rupiahs/l (\$0.61/l)).



Naturevolution Pickup / Loading waste

PET, which needs to be delivered in bales to buyers in Surabaya, is resold to local entrepreneurs capable of baling it, enabling them to sell PET at 7,500 rupiahs per kilogram (\$0.46/kg). Rigid plastics are sorted, crushed, washed and dried (see following sections) and sold for between 5,000 and 10,000 rupiahs/kg, depending on their type and whether they have been sorted by color.



Diagram of the Kendari plastic waste value chain

In 2023, over 80T of plastic waste will be collected in Bank Sampah and managed by Naturevolution on Kendari.

Different Bank Sampah models driven by social impact

The Kendari Bajo: Plastic fishermen

Settled along the banks of the Kendari River in the fishing village of Tetoaha, the Bajo, once known as the people of the sea, bear witness to their new reality. Plastic collection is now their main source of income. Every morning, they set out to collect plastic waste in the water and on the shore. Unlike fishing, this activity offers a guaranteed daily catch.





Traditional fishing pirogue / Pirogue loaded with waste collected in the estuary

Traditional fishing, on the other hand, has become uncertain. The fish only come out at a specific time, and a good catch is never guaranteed. For the Bajo, adapting to this new form of subsistence is a necessity imposed by the pollution of their environment.



Unloading collection bags

Bank Sampahs operate on a community-based model that is not always limited to simply redistributing waste collection revenues to the collectors. Initiatives also aim to support social projects that benefit the community as a whole.

Financing education	Village electricity supply
In conjunction with the university and schools in certain villages, local residents bring collected plastics to Bank Sampah to finance children's school fees. The money collected through Naturevolution's waste buy-back scheme is set aside and used to buy school supplies and support young people's schooling.	Bank Sampah also helps finance community electricity bills. In exchange for plastic waste, residents receive credits that help pay for essential services, ensuring a constant power supply for the village.

Funds for community needs	Initiatives run by widowed women
Revenues generated by plastics collection go into community funds to meet urgent needs such as medical care, local infrastructure repairs or other priority issues identified by the community.	Some Bank Sampahs are run by widowed women, providing a stable source of income and strengthening their role in society. These initiatives encourage women's economic empowerment while promoting sustainable waste management.



Muliati and Nurjanah, widows running a collection center

These Bank Sampahs demonstrate how effective waste management can not only improve the local environment, but also stimulate economic development and strengthen community cohesion.

The local residents who bring waste to the Bank Sampah do a cursory sorting during their collection, which does not focus on waste of value to the Kendari ecosystem. They concentrate on PET bottles and rigid PP and HDPE plastics.

Bank Sampah workers then sort the waste brought in and mix it by type: PET HDPE PP. Bottle caps and labels, for example, are separated. As no additional operations are required, the bottles are bought back at a higher price by Setiawan, at 4500 rupias/kg.



Separating labels and caps from bottles

Once transported to Naturevolution's TPST premises, located next to the municipal landfill site. The waste is sorted and pre-cut by two women, who use machetes and cutters to remove the labels.

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Naturevolution TPST workshop

In three days, they can process a ton of plastic. Where we usually classify plastics into 7 families, this team distinguishes up to 50 different types, identifying up to 10 types of polypropylene by sight and sound alone.



Cutting waste with a machete

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4. 2-in-1 shredding and washing - a typical Indonesian process

The combined grinding and washing process is typical of Indonesia. Water is circulated in a closed cycle and continuously fed back to the top of the hopper via a 250 W pump. Despite the frequent dirtiness of the processed waste, the output chips are well cleaned. The water in the one-cubic-meter tank, circulating in a closed loop, is renewed every 3 tons of shredded plastic. The rags shown in the photos help ensure a watertight seal in the cutting chamber.



Thermal shredder / Water circuit shredder

The shredder blades, which wear more quickly with HDPE, have to be sharpened daily, compared with every three days for PP. To sharpen the blades, they simply use a portable grinder. The screen grid has 16mm diameter holes, which means that the grinder is not clogged despite its low power.

The Setiawan crusher is powered by a combustion engine, as access to electricity is limited in this area. He runs his 17hp diesel engine slightly below full speed. Here, too, he notes the differences between grinding PP (5 liters of diesel to grind 2T) and HDPE (5 liters of diesel to grind 1T).



The shredded material is then sold for between 5,000 and 10,000 rupiahs per kilogram, with the price doubling for waste sorted by color. Setiawan can load its van with 1 to 1.5 tons of shredded material and ship it to Surabaya. Transport costs amount to 10-12 million rupiahs, with fees of 1.5 million for loading and 1 million for unloading. Small big bags, often bought second-hand, cost 1,000 rupiahs per bag.



Red PP grit

4. Raise Awareness

Naturevolution pursues a holistic approach through four main strands: Bank Sampah, recycling, education and cleanups.

Naturevolution is actively involved in educating local communities and children, devoting over 500 hours to these activities. In 2023, 5,598 adults and 1,056 children were made aware of environmental issues, mainly plastic pollution. Interventions often begin with an assessment of participants' knowledge of plastic, followed by discussions on pollution and the organization of cleanups. The final step in taking action is the creation of Bank Sampah, although the communities' primary motivation for this system remains economic rather than environmental.

In 2023, the organization organized 34 cleanup days, mobilizing 2,213 locals for a total of 159 hours of work. These efforts resulted in the collection of 21 tonnes of waste, a third of which was recycled and reclaimed. A highlight was a major cleanup involving 2,000 participants, resulting in the collection of 20 tonnes of waste in a single day, in addition to the 21 tonnes collected throughout the year. In addition to these cleanups, Naturevolution also intends to communicate more photos and videos of the impacts of plastic pollution in order to gain greater impact.



Photos with the community of a collection center, with the hand sign "Tiga R".

In Indonesia, a distinctive sign, the "Tiga R" hand sign, is used for group photos. This simple gesture arouses enthusiasm and reinforces the feeling of belonging to a community committed to protecting the environment.



5. Conclusion

We were impressed by the recycling solutions in Indonesia, in particular the Bank Sampah collection points and the water-supplied shredder, set up by Naturevolution thanks to the commitment of Setiawan and Helmi. Even after travelling three quarters of the world, we're still discovering ingenious systems.

It is important to underline the considerable effort required to collect plastic waste, despite its presence in large but scattered quantities in the environment. More than 3,000 collectors devote their time to this task, while a four-person team rounds the collection points and pre-treats the material to obtain a clean shred.

Naturevolution's holistic approach, which actively involves local communities, is particularly well suited to tackling this complex problem.

Plastic Odyssey's visit to Kendari offered a valuable insight into local waste management and recycling efforts, and we look forward to the next stages of this adventure.



It's now up to you to take this knowledge and apply it to the environment around you.