

PROJECT STOP: CITY PARTNERSHIPS TO PREVENT OCEAN PLASTICS IN INDONESIA

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KEYWORDS

- ACTION-INNOVATION PARTNERSHIPS
- ZERO LEAKAGE SYSTEM
- INFORMAL SECTOR
- PLASTIC VALUE CHAIN

An estimated 80% of marine plastic litter comes from land-based sources, with 50% originating from just five Asian economies: China, Indonesia, the Philippines, Vietnam and Thailand¹. As economic growth has increased in these countries, so has plastic consumption, which has outpaced the development of effective solid waste management systems. That is why the first STOP city partnership was launched in 2018 in Muncar, a city of 130,000 residents in Banyuwangi Regency, East Java, Indonesia. The goal of Project STOP is to create an economically viable “zero leakage” system that involves state-based systems, communities and the informal sector, and that can be sustained through secure government revenues, household and business collection fees and valorization of waste.

Project STOP has three objectives: zero leakage of waste into the environment; increased resource efficiency and recycling of plastics; and benefits for the local community by creating new jobs in the waste management system and reducing the impacts of mismanaged waste on public health, tourism and fisheries.

Early insights from Project STOP’s scoping activities, system design and first six months of system change implementation are presented in three areas: 1) An integrated “value chain engineering” approach is key to system change, 2) Institutions, governance and community factors are critical, 3) Economic incentives are a great tool to develop recycling initiatives.

Action-innovation partnerships at the city level – Project STOP and many others – can provide much-needed insight into the challenges and potential solutions that could accelerate change toward a plastic system that works, and an environment free from plastic waste.

INTRODUCTION

Littering of plastics into natural ecosystems, particularly oceans, has fast emerged as an iconic environmental issue supported by increasing public and political momentum. Each year, 8 million tons of plastics enter the ocean¹, a visible symptom of our increasing use of “single-use” plastics and our failure to provide proper waste management systems for many communities across the developing world.

Project STOP is a new city partnership program that gets to the front line of the plastic leakage problem in Southeast Asia. The first STOP city partnership was launched in 2018 in Muncar, a city of 130,000 residents in Banyuwangi Regency, East Java, Indonesia. With minimal waste services in place, residents are forced to dump their waste directly into the environment. Muncar was chosen as the first

¹ Jenna R. Jambeck et al., “Plastic Waste Inputs from Land into the Ocean,” *Science* 347, no. 6223 (2015): 768–71, doi:10.1126/science.1260352.



Muncar community outreach



Polluted beach in Muncar

The goal of Project STOP is to create an economically viable “zero leakage” system that involves state-based systems, communities and the informal sector, and that can be sustained through secure government revenues, household collection fees and valorization of waste.

STOP location due to the seriousness of the challenge, coupled with strong leadership and environmental commitment at national, regency and local levels. According to a recent community survey, households here generate roughly 40 tons of waste per day, while 90% of the community is without waste services.

Through Project STOP, an increasing number of Muncar households and business are receiving waste collection and recycling processing, some for the first time.

Cleanup activities provide a short-term respite and opportunity for public engagement, but they have little sustainable impact on the plastic litter challenge. We must turn off the tap. Alongside “upstream” initiatives to eliminate unnecessary plastic use and improve product design, waste management and recycling solutions at the city or municipality level are critical in stemming the tide of plastic littering into nature.

This article provides some early insights from the scoping and implementation of this initiative.

PLASTIC LITTER IN INDONESIA: A SYSTEM FAILURE WITH ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES

Plastic is a remarkable material with highly valued properties that have made it central to modern life – it is durable, lightweight and often more affordable than alternative materials, with benefits for climate change mitigation and energy and water savings throughout their use phase.²

These properties come with a downside: its durability means that plastic can take hundreds of years to degrade in nature, its light weight means it is easily transported by wind and water, and its affordability means that the economics of recovering and recycling some single-use plastic items are challenging.

According to the UN, plastic waste costs a minimum of \$13 billion in damage to marine ecosystems worldwide. Unabated and increasing plastic leakage could force this number to climb higher, affecting lives and livelihoods dependent on critical industries including fishing and shipping.

In Indonesia, the challenge is acute: current estimates show that only 45-60% of Indonesia’s urban solid waste is collected, with significant variation in performance

² Reference: TruCost: <https://plastics.americanchemistry.com/Study-from-Trucost-Finds-Plastics-Reduce-Environmental-Costs/>



Muncar community outreach beach cleanup

among cities.³ As a result, leakage – largely a result of poor waste management systems – contributes to reduced tourism and fishing productivity, which are both lifelines to the Indonesian economy. In 2017 travel and tourism in Indonesia, for example, directly accounted for 3.7% of total employment and 5.8% of GDP.⁴

In response, the Indonesian government announced a bold commitment to reduce Indonesia’s ocean plastic levels by 70% by 2025, creating a National Marine Debris Action Plan. Delivery of its commitment relies on a rapid acceleration of waste management systems at the city level, combined with system-level policy, innovation and circular material design approaches.

SYSTEM SOLUTIONS TO PREVENT PLASTIC LITTERING

Reduction or elimination of unnecessary and avoidable plastic use must play a key role in reducing plastic litter. Alongside these solutions, there is a need to rapidly accelerate efficient waste collection and recycling systems in high leakage markets, while considering the local context, particularly the informal waste collection and trading economy that provides many livelihoods.

Innovation, design and “learning by doing” are critical for both upstream and downstream system solutions

– including new materials, new products and business models, new behavior change approaches, financing and design of collection systems and integration of informal waste collectors, and re-processing technologies that can extract more value from plastic waste.

FRONT LINE ACTION-INNOVATION PARTNERSHIPS AT THE CITY LEVEL: PROJECT STOP

Project STOP was founded in mid-2017 by Borealis and SYSTEMIQ. The project establishes city partnerships to design and implement low-cost waste management systems with strong institutions and long-term financial viability, effective waste collection and sorting services, community behavior change campaigns and new waste management infrastructure. The STOP team uses a “system-enabler” approach to support cities with co-investment, technical expertise, project management and assisted implementation, skills transfer and support with recycling/valorization options.

Project STOP has three objectives:

1. Zero leakage of waste into the environment.
2. Increased resource efficiency and recycling of plastics.
3. Benefits for the local community by creating new jobs in the waste management system and reducing the impacts of mismanaged waste on public health, tourism and fisheries.

³ Indonesia Marine Debris, Hotspot Rapid Assessment, April 2018, World Bank Group, Kementerian Koordinator Bidang Kemaritiman, Embassy of Denmark, Royal Norwegian Embassy

⁴ Travel & Tourism Economic Impact 2018 Indonesia, World Travel and Tourism Council



Waste collection

EARLY INSIGHTS FROM PROJECT STOP

Early insights from our scoping activities, system design and the first six months of system change implementation are presented in three areas:

1. CIRCULAR ECONOMY SOLUTIONS REQUIRE “VALUE CHAIN ENGINEERING”

The greatest paradox of Project STOP scoping studies comes from meeting recycling companies or investors crying out for plastic feedstock, while also seeing the flows and accumulations of plastic waste in the environment and hearing the concerns of government officials over dwindling capacity at landfill sites. This is symptomatic of a broken value chain where single interventions in one part of the system have a low chance of success.

Serious efforts to close the loop and build a circular plastics economy in high leakage markets must take an integrated value chain approach, for example:

- Integrating waste collection improvements with sorting, logistics, waste processing and recycling systems (and vice versa) to valorize waste, provide secure feedstock supply to enable recycling investments, and remove the strong disincentive to collecting waste felt by local agencies with constrained landfill capacity.
- Informing and engaging producers of plastic products (e.g., packaged goods companies) to design materials and products for ease of collection and sorting and higher recyclability in the after-use systems in high leakage markets as well as in developed markets.
- Engaging the informal waste collection and trading system as well as state-based or community waste

management systems, in order to recognize that the waste system will continue to be a hybrid model and seek to protect and improve livelihoods, worker rights and working conditions in the informal waste economy.

- Integrating the approach to plastic waste – around 14% of the waste stream – with other waste stream components, particularly organic materials that are costly to collect and process. In some locations, for example lower density areas, it may be preferable to focus on plastic waste collection with local treatment of biodegradable waste. In high density areas this may not be feasible or supported by communities and government decision-makers, so an adaptive and locally driven approach is likely to be required.

2. WE IGNORE THE ECOLOGY OF WASTE – INSTITUTIONS, GOVERNANCE AND COMMUNITY SYSTEMS – AT OUR PERIL

In Indonesia, waste management is decentralized to the city or regency level, with many accountabilities further delegated down to sub-district, village and neighborhood level. For example, land and approvals for waste management sites typically require approval at the village level, and household collection services are typically managed at the neighborhood level. Extreme decentralization is a challenge to rapid system change and replication of good practices.

Even with these challenges, Project STOP has built positive community momentum in three key areas:

- Establishing and training community businesses (known as BUMDES in Indonesia) to operate community waste management facilities and trade recyclables.



Muncar collection team

- Building confidence and momentum by taking community leaders on a “good practice waste management tour” to see effective circular waste management systems in other parts of Indonesia.
- Engaging community institutions – particularly women’s associations, fishing associations and religious leaders – and involving them in communication campaigns, house-to-house community engagement activities and beach clean-ups.

A financing breakthrough is needed to accelerate plastic waste recovery and recycling in high leakage markets

3. MONEY TALKS

Money talks in a very visible way in Indonesia. Within a reasonable distance of a plastics recycling hub, plastic bottles are very hard to find in the waste stream or in waste accumulation hotspots. They are far too valuable for that – at an estimated value of \$350 per ton, these plastic items are highly sought after by informal waste collectors, waste banks and traders. Flexible and multi-layer plastics command a lower price, are harder to collect and are more prone to contamination. However, economic incentives to sustainably increase the price of lower value plastics (e.g., through price support for recyclers, waste collectors, traders, waste banks and state-run waste sorting facilities) could be a key tool to increase their collection through informal, state-based and hybrid systems.

The goal of Project STOP is to create an economically viable “zero leakage” system that involves state-based systems, communities and the informal sector, and that can be sustained through secure government revenues, household collection fees, industry contribution and valorization of waste. Cherry-picking of high value plastics into the informal economy is a fact of life and increases the economic pressure on waste systems. While it is too early to publish findings on waste system economics in Muncar, we can safely say that financing city waste management systems and plastic waste recovery through the informal

waste economy (in Muncar and other cities in Indonesia and across the region) is a central issue for solving the plastic litter crisis.

A financing breakthrough is needed to accelerate plastic waste recovery and recycling in high leakage markets. This could take many forms, for example:

- Designing an effective extended producer responsibility (EPR) system to enable industry financing of recovery and recycling through state-based and informal systems.
- Guaranteeing a high and stable price for post-consumer recycled plastic to pull material through the system.
- Deploying new processing technology that can derive more value from waste (and pay more for feedstock).
- Driving a product and packaging design revolution that transforms after-use value of plastic materials for recyclers.

Building convergence, support and momentum behind these strategies requires data and proof points from the front line. This will be one objective for Project STOP as we aim to drive direct impact on plastic leakage and also collaborate with others to extract the key learnings for replicating, scale-up and acceleration of zero-leakage systems and the enabling policies and actions required to achieve this.

CONCLUSION

Action-innovation partnerships at the city level – including Project STOP and others – can provide much-needed insight into the challenges and potential solutions that could accelerate change toward a plastic system that works, and an environment free from plastic waste. To learn more about Project STOP, please visit www.stopoceanplastics.com.

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Project STOP - The City of Muncar

The first Project STOP city partnership is in Muncar, a coastal fishing community in Banyuwangi, Indonesia. With minimal waste services in place, the majority of citizens are forced to dump their waste directly into the environment.

Muncar, home to more than 130,000 people, was chosen as the first STOP location due to the seriousness of the challenge, coupled with strong leadership and environmental commitment at national, regency and local levels.

CHALLENGE

A coastal city, home to

130,000
PEOPLE

MUNCAR

Households generate roughly

40
TONS

OF WASTE PER DAY

90%
OF THE COMMUNITY
is without
waste services



SO FAR, PROJECT STOP HAS

CALLED ON

+12
INTERNATIONAL
SOLID WASTE EXPERTS
to design the system

REMOVED

+70
TONS
OF MATERIAL
from the local beaches,
of which **< 25% was plastic**

UPGRADED

1
WASTE PROCESSING
FACILITY
which could process waste from
more than half of Muncar's population

SORTED

14
GRADES
OF PLASTIC / **5**
GRADES
OF PAPER
along with scrap metals
and glass

USED

BIOCONVERSION
through producing black soldier
fly larvae and composting organic
waste, thus maximizing the value
of the waste stream

PREVENTED

22.5
TONS OF PLASTIC
(91.9 tons of waste) from entering into
the environment through introducing door-
to-door collection and hotspot cleanups

GOAL BY END-2020

130,000

PEOPLE
served with formalized
waste collection



100+

NEW JOBS
created



1,000
TONS/YEAR

PERMANENT
REDUCTION OF OCEAN
PLASTIC LEAKAGE