

DISCARDED

COMMUNITIES ON THE FRONTLINES
OF THE GLOBAL PLASTIC CRISIS

APRIL, 2019



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ON THE COVER: Villagers pick through plastic waste that was found contaminating imported paper for recycling. Sumengko Village near Gresik, Surabaya, Indonesia on 21st February, 2019. Photo Credit: Adam Dean



Plastic discarded by paper recycling factories piles up in Bangun, East Java, Indonesia. Ecoton, a GAIA partner organization in East Java, estimates that as much as 60–70 percent of the paper imported for recycling is contaminated with plastic waste. Photo courtesy of Fully Handoko/Ecoton.

EXECUTIVE SUMMARY

When China took action to protect its borders from foreign plastic pollution by effectively shutting its doors to plastic waste imports in the beginning of 2018, it threw the global plastic recycling industry into chaos.

Wealthy countries had grown accustomed to exporting their plastic problems, with little thought or effort to ensure that the plastic they were exporting got recycled and did not harm other countries. North Americans and Europeans exported not just their plastic waste, but the pollution that went with getting rid of it.

Last year China enacted a new policy, called National Sword, for economic and environmental reasons including pollution from importing and processing plastic waste.

By refusing to be the world's dumping ground, China's policy—and the fallout that resulted from it—revealed the true cost of rampant consumption, plastic production, and the problems and limitations of recycling as a solution to a world suffocating in its own plastic.

Plastic waste—and the environmental and health problems it causes—was diverted to other shores, stressing infrastructure and amplifying the problems of plastic pollution in lower-income countries awash in the trash of wealthy nations.

This report continues GAIA's research on the effects of China's National Sword policy and the broader implications of plastic pollution as the world attempts to adjust to a new landscape of global plastic recycling. As the crisis deepens, this report focuses on three countries in Southeast Asia, and particularly the stories of people

on the ground who have been thrust to the frontlines of the world's plastic problem.

After the ban came into effect, Malaysia took in more imported waste than any other nation.¹ Thailand had the largest percentage increase in plastic waste imports of any country in the world at over 1000 percent.² Indonesia's imports increased at the end of 2018 as Malaysia and Thailand began imposing their own restrictions.

Through the stories of the people dealing with plastic imports in their communities, this report uncovers the complex human dimensions of a global trade in turmoil, from grassroots organizations rising up against plastic pollution, to the challenges that lower-income country governments face in implementing new bans patterned after China's National Sword, the crime, threats, corruption that govern the waste trade, and the persistent economic incentives that allow for its proliferation.

The dangers faced by people working in the waste trade underline the ultimate truth about plastic waste: recycling is not enough.

The global plastic waste trade puts people and communities at risk, has long-term impacts on health and the environment, and enables the continued production of new plastics and its unchecked consumption.

It is treated as a solution to plastic waste, but in reality a scant 9 percent of the plastic the world has produced since 1950 has been recycled.³

As countries historically dependent on exporting plastic collected for recycling now move to improve domestic plastic recycling infrastructure, it is becoming abundantly clear that recycling alone will not be sufficient to absorb the ever-increasing amounts of single-use, no-value plastic being produced and placed on store shelves. This means that efforts to transform plastic recycling should be complemented by a large-scale transformation of production and consumption of plastic.

As plastic waste exports continue at somewhat declining rates, more countries are now in the crosshairs. People in receiving countries are angered by the uptick in trash burning, illegal disposal, and unregulated recycling

operations that have transformed whole villages into dumping grounds almost overnight.

The Malaysian government, after taking a stance of restricting plastic waste imports, is shouldering the burden of enforcement. They receive no tax revenue from the illegal plastic recycling operators but are the ones left with the cost of the clean-up, enforcement, and monitoring instead of the industries and countries most responsible for the problem in the first place. In Indonesia, a burgeoning waste trade is engulfing entire villages in plastic, and sparking conflict.

In Thailand, one farmer living down a dirt road from a plastic waste factory had a message for North Americans: "You are selfish."

Plastic pollution had made her ill and her water undrinkable. "Don't push the trash out of your country. It's your trash and you know it's toxic," she said. "Why do you dump your trash in Thailand?"



A waste picker burns imported plastic discarded from a paper recycling factory in Bangun, East Java, Indonesia. The plastic comes in bales of imported paper for recycling. Photo courtesy of Fully Handoko/Ecoton.

KEY FINDINGS

- **Global plastic trade and waste flows continue to be in flux** over a year after China instituted its new recyclables import policy. After China shut its borders, imports primarily from the United States and Europe were diverted to Southeast Asia, primarily Malaysia, as well as Thailand, Vietnam, and Taiwan.
- The impacts of the shift in plastic trade to Southeast Asian countries has been staggering—contaminated water supplies, crop death, respiratory illness from exposure to burning plastic, and the rise of organized crime abound in areas most exposed to the flood of new imports. **These countries and their people are shouldering the economic, social and environmental costs of that pollution, possibly for generations to come.**
- Thanks to strong grassroots movements fighting back against the plastic recycling trade's immediate impacts on health, the environment, and citizens' well-being, some of these **new national destinations for recycling exports have followed China's lead to institute bans and restrictions on plastic scrap imports.** After a dip following crackdowns in Malaysia, Thailand, and Taiwan, imports have begun rising again in the last quarter of 2018, suggesting challenges in enforcing respective country bans. Yet the patchwork nature of individual country bans means the **trade can move to other countries, restarting the cycle of imports, impacts, and bans.** Many governments struggle to adopt and enforce effective policies for reasons such as lack of personnel, information, or the involvement of criminal syndicates and corruption. The global plastic recycling market remains a dirty, polluting business in many ways, and needs a major overhaul.
- Despite well-meaning efforts to recycle, **consumers and municipal waste managers do not know where their recycling is going, or if it is being recycled at all.** These transparency issues and lack of an international regime governing the trade in plastic waste is leaving waste pickers at the bottom of the ladder to deal with the environmental pollution and health risks of consumers on the other side of the world.
- **The sheer amount of plastic collected for recycling, without having China to ship to, is causing a big problem for exporting countries.** Recyclables are being dumped in landfills, incinerated, or are piling up in ports with nowhere to go. Markets for plastic scrap are drying up, and costs of recycling for towns and cities are skyrocketing. Poor communities are being subjected to worse pollution from incinerators.
- More governments are passing regulations to reduce single-use plastic, as it becomes abundantly clear that the world cannot recycle its way out of plastic pollution. **In the transition away from single-use plastic through government regulation and other means, plastic recycling will have an important but limited role.**



Imported plastic waste discarded from paper recycling plants piles up in villages in Bangun, East Java, Indonesia. Photo courtesy of Fully Handoko/Ecoton.

CHAPTER 1: THE FLOOD



Imported plastic is seen discarded after an illegal recycling factory was shut down by government authorities in Kuala Langat, Malaysia. 24th January, 2019. Photo courtesy of Adam Dean.

For the people of Jenjarom, a provincial town near the western coast of Malaysia, the last months of 2017 seemed like a time of promise. Chinese businessmen, flush with cash, were flooding into the town, paying local landowners triple the market price for unproductive plots of land far into the fields. At night, the businessmen crowded into Kuala Langat's open-air restaurants, sitting in rickety plastic chairs, ordering platters of food and drinking beer into the night.

"Everyone was so happy," said Tan Ching Hin, a former village chief for Jenjarom. He was excited to see economic investment coming into their small town. When he asked the Chinese businessmen what they were doing, they answered obliquely: they were in the environment business.

It didn't take long for the people of Jenjarom to find out what that meant. By February 2018, plumes of smoke were rising in the horizon. The breeze carried the unmistakable smell of burning plastic. The fires would burn through the night. People woke up gasping and coughing in the choking, acrid air. Children and the elderly complained of itchy, red skin rashes.

Madam Chan, a dumpling seller, said the pollution became the talk of the town. She heard one farmer's prawns had all died; crops wilted in the fields of others. She and her friends worried that this new "environment business" was poisonous. They were scared to die, or worse. "If you don't die," she said, "it goes on and on and you have to go to the doctor and pay money."



A year ago, North Sumengko in East Java, Indonesia was a village of maize and rice fields. Today, there are piles of plastic waste, heaped into mounds two meters high in the middle of the road, collecting in slopes and valleys of front-yard scrap shops, scattered along the roadsides or smoldering in sprawling makeshift dumps among banana trees and soot-covered bamboo stands.

Picking through the heaps of plastic scrap has become a communal cottage industry. Men and women shaded under woven conical hats crouch around the rim of a hill of shredded plastic scrap. They sift through the strips of plastic, pulling out the last bits of recyclable material: empty St. Ives lotion bottles, crushed cans of Michelob Ultra or Arizona Sweet Tea. Some damp Gatorade labels cling to dingy, clear plastic bottles. They separate thick



A villager in Sumengko Village in East Java, Indonesia shows foreign currency from the US, UK and New Zealand that was found in plastic contamination of paper imported by a paper recycling company. 22nd February, 2019.

aluminum from thin and toss them into buckets to be picked up by the scrap haulers.

The trash that can't be recycled is gathered into a wheelbarrow and dumped into their backyards.

A few times a week, a moneychanger on a motorcycle rides up to the waste pickers to exchange any foreign currency they find, like treasure in the imported trash. It's a catalog of the countries sending plastic scrap to rural Indonesia: there are dollar bills from the United States, Canada, and Australia, riyals from Saudi Arabia, Korean won, and Russian rubles. Most of all, there are euros.

Places like this are at the end of the line of a multibillion-dollar global recycling industry that starts in the household and industrial waste bins of developed countries, like the United States and Germany. It ends in the yards of waste pickers, like the ones in North Sumengko, Indonesia, who are left to deal with the problem that wealthy countries have failed to solve—how to get rid of the heaps of unrecyclable, dirty plastic waste generated by modern consumption. For the most part, they do what's easiest: they burn it. It's also the most harmful to their health and the environment.



Lily binti Kamal's house is now in the shadow of a plastic recycling factory in Telok Gong, Malaysia. She grew up there and said that when she was a child, their house was surrounded by forests. The air was fresh and smelled of leaves and flowers. She used to fish in the creeks. There are no flowers now and the water is too polluted for her children to fish in, or even go outside; there are too many trucks from the plastic recycling factories rumbling through the neighborhood. Their roads are littered with flakes of plastic.

Lily Kamal looked down listlessly at her young daughter scooting her bike across three meters of floor in their living room. “I don’t want them here,” she said of the plastic recycling factories proliferating in Telok Gong.



In the village of Kok Hua Khao, in the agricultural province of Chacheongsao in Thailand, Phayao Charoonwong, 51, draws water from her well. It is cloudy and leaves the bucket with a coppery-red tinge. It smells unmistakably of trash. She's a potato farmer and has lived in the house and drank from her well for more than 20 years.

When a local organization tested Charoonwong's water, it registered dangerous levels of heavy metals: zinc, iron, manganese, and lead.

Since the small recycling operation 100 meters from her house expanded overnight in the beginning of 2018, the water has become undrinkable. The dozen or so Cambodian laborers were replaced with a hundred Chinese workers, and what used to be one or two trucks coming every couple of days turned into ten lorries a day. In the daytime, they stripped wiring for copper, and at night they burned the plastic. Charoonwong says there was no way to escape the burning, acrid smell: it permeated her house and, on the worst nights, made her vomit. She's losing weight every month. She can't afford to go to the doctor so she doesn't know what it is, but in the last year since the plastic trash started coming in, she has dropped four and a half kilos.

“The people don’t have much money. We live off the earth. Now we can’t drink the water. We can’t eat from the land,” Charoonwong said. Charoonwong and other villagers have protested the factory more than half a

dozen times since the beginning of 2018. The factory has shut down a couple of times, but after a few weeks, they reopen again.

In the yard, there were piles of broken plastic, a jagged jigsaw puzzle of modern American life: car radios, convection ovens, table saws, routers, doorknobs, remote controls, a FastTrack from the California tollway system, and a Roomba, the robot vacuum cleaner. The label on a cracked shell of an IBM computer read “Produced in the USA.” There were tangled mountains of computer adapters and cell phone chargers, all with flat, two-pronged American plugs.

Charoonwong had a message for the Americans: “You are selfish.”

“Don’t push the trash out of your country. It’s your trash and you know it’s toxic,” Charoonwong said. “Why do you dump your trash in Thailand?”



Plastic waste at the Bantar Gabang waste dump, thought to be the largest in the world, in Bantar Gabang, Indonesia on 23rd January, 2019.

CHAPTER 2: CHINA SAYS NO TO “FOREIGN GARBAGE”



Imported plastic dumped after an illegal recycling factory was recently shut down by government authorities in Kuala Langat, Malaysia on 23rd January, 2019.
Photo courtesy of Adam Dean.

On January 1, 2018, China began enforcing a new policy to protect its borders from foreign pollution. Exporting countries had long relied on China as a main destination for their low-grade recyclables, and this bold new policy threw the global recycling industry into crisis.

Called “National Sword,” the policy banned the import of 24 kinds of waste, including various plastics,⁴ and enforced quality standards that exporting countries found nearly impossible to comply with⁵. This move drastically reduced imports of plastic scrap into China. From 2017 to 2018, China’s imports of plastic waste dropped 99.1 percent.⁶ According to Greenpeace East Asia’s analysis, Global plastic waste exports dropped by close to 50% by the end of 2018, in comparison with 2016 levels.⁷

For decades, China was the center of the global plastic waste trade, absorbing the pollution and filth of plastic imports and processing in exchange for the recycled material to feed its manufacturing industry. China shipped its manufactured goods to the United States

and Europe, and the cargo ships would come back with plastic scrap. North Americans and Europeans exported not just their waste, but also the pollution that went with getting rid of it. For wealthy nations—consuming and disposing at a faster rate than ever before—it was the perfect loop.

Low shipping and labor costs allowed plastic recycling exports to be profitable, and low or poorly-implemented local environmental standards for imports made it that much easier and cheaper for towns and cities in wealthy countries to unload their plastic waste into China.

While billed as an environmentally friendly alternative to landfill disposal, the global recycling trade can be a dirty business. In China, whole villages were engulfed in plastic and the contaminants associated with it—from non-recyclable trash to the harmful chemicals leached by certain plastics when processed by the informal sector. An army of waste pickers and their families lived among the piles of foreign trash, on the frontlines of the world’s rapidly-expanding plastic pollution problem.

Plastic waste by the ton was buried in landfills, heaped into open dumps, incinerated, or burned in the open.

The human and environmental toll came into sharp focus in a documentary in 2016, called “Plastic China,” by filmmaker Jiu-Liang Wang. “Plastic China” turned the world’s attention to the heart-wrenching story of an 11-year-old girl living and working among imported scrap plastic in the Chinese countryside, exposing the social and environmental cost of the plastic scrap industry.

The documentary is credited with prompting a reckoning in China of what it meant to be the world’s dump, at a time when Chinese domestic consumption was producing larger quantities of its own recyclable material.

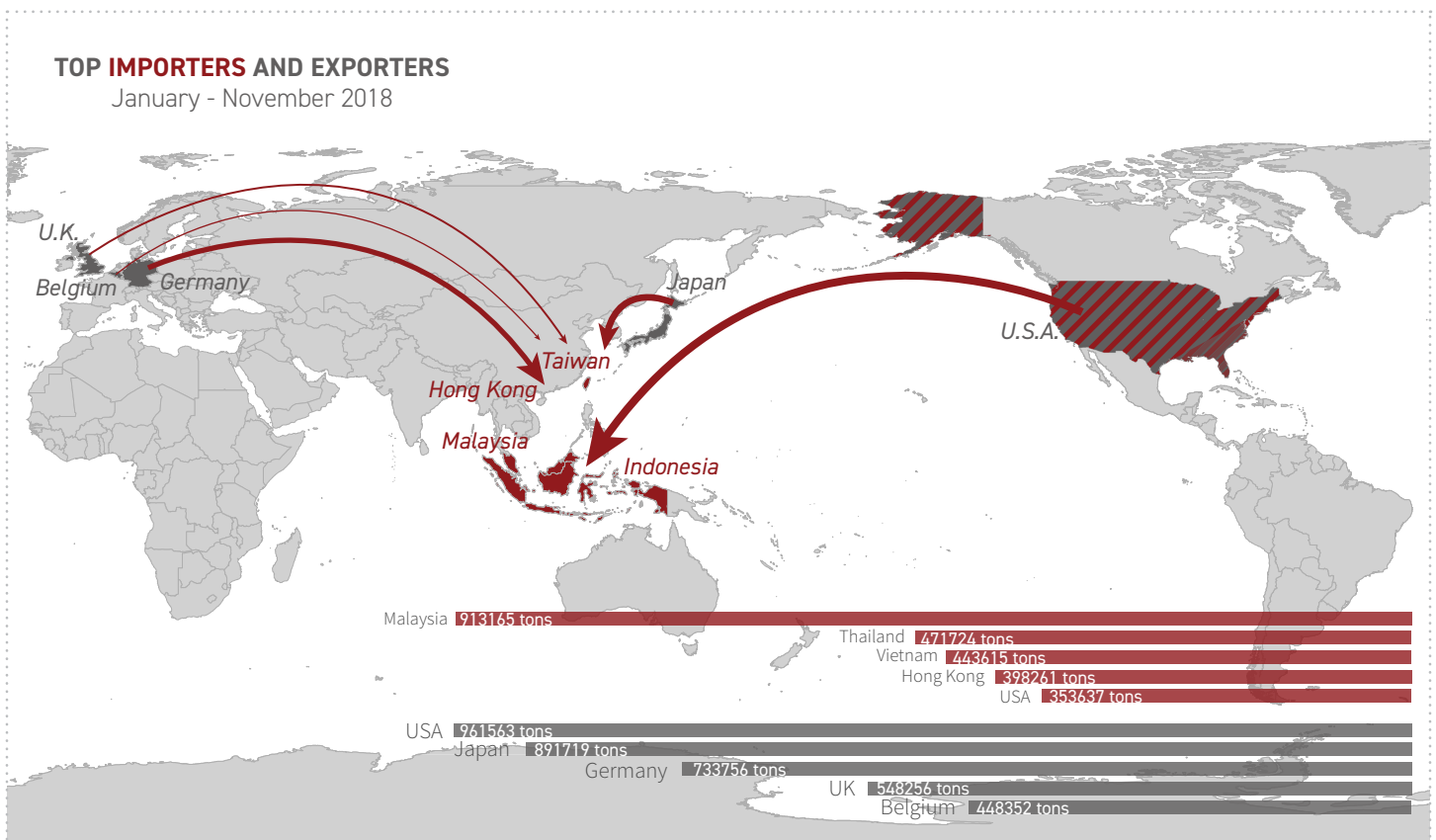
In July 2017, the Chinese government filed notice with the World Trade Organization that it would no longer accept “foreign garbage,” with some translations of the document noting that the government referred to the trash as “loathsome.”

In 2016 Chinese processors imported 51 percent of the world’s recycling, much of it from the United States and Europe. But China no longer wanted to pay the environmental price for the world’s rampant cycle of

consumption and disposal. Among the recyclable paper and plastics are oily pizza boxes, plastic-coated paper coffee cups, plastic bags, chips containers, cereal boxes, and candy wrappers—unrecyclable garbage that processors who buy recyclable scrap are now left to deal with.

The recycling industry braced themselves for the seismic change in the market flows of plastic scrap. The industry and infrastructure in China was so vast, some didn’t believe China would go through with the ban. Meanwhile, Chinese plastic scrap-processing businesses fanned out into Southeast Asia and elsewhere, scouting new countries—with amenable import policies and lax environmental standards—where they could set up operations.

On December 31, 2017, China indeed followed through with the ban. Scrap began piling up in towns and cities in the United States and Europe. Others diverted to Southeast Asia. As developed nations reeled from the effects of China’s ban—the lack of buyers and plummeting market prices for recyclables—and scrambled to adjust to the new regime, the new ports of call for global plastic scrap began to be subjected to the same burdens that led China to close its doors.



Data courtesy of Greenpeace East Asia, data visualization courtesy of Sarah Fitzgerald.



CHAPTER 3: RECYCLING IS NOT ENOUGH: EXISTENTIAL PROBLEMS WITHIN THE RECYCLING INDUSTRY

Processing site for imported plastic that was dumped there by a nearby paper recycling company whose imported paper was contaminated with plastic, in Bangun Village, near Gresik, Surabaya, Indonesia on 22nd February, 2019. Photo courtesy of Adam Dean.

THE CURSE OF “ASPIRATIONAL RECYCLING”

While China’s implementation of the National Sword policy banning plastic waste seemed abrupt to a world accustomed to shipping its trash to China, the conditions that prompted the policy had been festering for years.

North American and European households are notorious among plastic recyclers for practicing what those in the trade call “aspirational recycling”:⁸ throwing all sorts of plastic packaging, soiled paper, broken toys, plastic grocery bags, dirty to-go food containers, used diapers, and other trash into the recycling bin, in hopes that, because it made it into the bin, someone down the line will find a way to recycle it. In practice, aspirational recycling contaminates the recyclables. Plastic recyclers sort out the valuable recyclables from the trash as best they can, and send the lower-grade recyclables (often significantly contaminated with trash) for export. In this way the responsibility of getting rid of the contaminated waste is punted further down the global chain until it lands in the

backyards of the world’s poorest waste pickers. Because China previously accepted recycling contaminated with plastic waste and other non-recyclables and absorbed the negative effects, exporting countries sent their recycling overseas without knowing or caring whether it was recycled or not, what the environmental and health impacts were, or who was bearing the brunt of these effects. What mattered was that whatever they managed to export counted toward their recycling rates.

RECYCLING VS. GARBAGE

In addition to the contamination issue, the bales of mixed plastic “recyclables” North Americans and Europeans were shipping to China were low-quality, low-value and hard to recycle, due to varieties in plastic resin types, use of colorants, additives, and fillers in plastic production, and the complexity of products and packaging which are made of one or more types of polymers or combined with other materials.⁹

Plastic is labeled with a number from 1–7 according to Resin Identification Codes (RIC). The strongest recycling markets are for those numbered 1 and 2, and to a lesser extent, number 5. Number 1 is polyethylene terephthalate, or PET: things like clear plastic water bottles or color-sorted plastic soda bottles. High-density polyethylene, or HDPE, is stamped with the number 2, and includes milk jugs, detergent, and oil bottles. Number 5 plastic is polypropylene, or PP, a tough, lightweight plastic used to make things like buckets, the plastic liners inside cereal boxes, yogurt containers, and plastic bottle tops. The rest of the plastic, more difficult and expensive to sort and process in the United States, is frequently exported to other countries, often in mixed bales of numbers 3, 4, 6, and 7 plastics. These plastics, some of which are known to contain toxic additives, are some of what China previously accepted indiscriminately, and are now likely to end up in countries like Malaysia, Indonesia and Thailand.

Number 3 plastic, polyvinyl chloride or PVC, is used to make toys, cooking oil bottles, clear plastic wrapping, and a myriad of other household goods, and is known for leaching phthalates, lead, and other toxic additives. Number 4 plastic, low-density polyethylene (LDPE), is used to make things like plastic grocery bags, squeezable bottles, and some clothing. Number 6 plastic, polystyrene, is lightweight, spongy, and structurally weak—it breaks up into pieces and scatters into the environment. It's known to leach styrene, a possible carcinogen, and other chemicals associated with reproductive system disruption. Number 7 is a category of plastic that serves as a catchall term for material that is nearly all non-recyclable. Number 7 plastic includes material known to leach hormone disrupting chemicals like bisphenol A (BPA), used for disposable food containers. Even when plastic was recycled despite all the barriers listed above, each cycle of the recycling process shortens the length of polymer chains, resulting in a decrease in quality and eventually disposal of the material.¹⁰

Waste pickers in lower-income countries on the frontlines of recycling do not have the resources to process plastic waste imports cleanly and safely. They are left to handle the rejects from the formal, well-regulated, and well-resourced recycling industry in exporting countries, with very little equipment or worker protections. The fallout of China's National Sword policy shows that much of what is considered "plastic recycling" in theory was something entirely different in practice: wealthy countries exported

their waste management costs to lower-income countries, with devastating impacts on their environment and the health of their people.

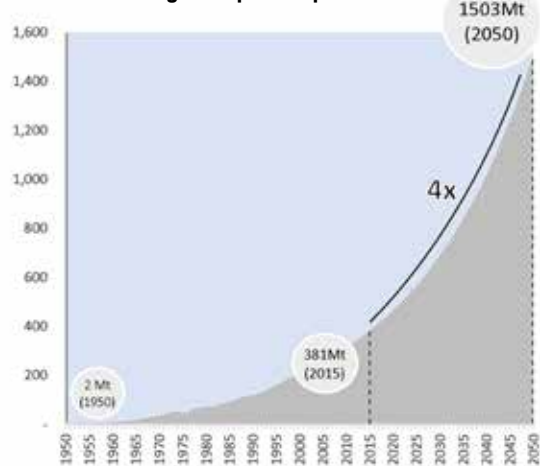
DROWNING IN PLASTIC

Provided that plastic waste is sorted and aggregated into defined streams for recycling, it must have market value in order to be effectively recycled. Plastic recycling is highly susceptible to external economic factors, such as low price of oil and gas and global market fluctuations.¹¹

Simply put, the glut of cheap fossil fuels has sparked a meteoric rise in virgin plastic production, and it is killing the recycling market.

The North American fracking boom has contributed to low natural gas prices, and manufacturing companies, now with access to cheap source material to make new plastics, are doing just that—rather than recycling, they are adding to the volume of plastic on earth. Global

Evolution of annual global plastic production



annual plastic production increased from 2 million tons in 1950 to 381 million tons in 2015: 2.5 times the compound annual growth rate of the global gross domestic product for that period.¹²

Future plastic production is behind fossil fuel companies' growth: by 2050, it is estimated that the total volume of plastic ever produced will reach 34,000 million tons (Mt)—over four times what has been produced so far, representing 20% of all oil production and 15% of our total carbon budget.¹³ In the US, 264 new plastics-related facilities and expansions are currently planned to use gas from the shale fracking boom.¹⁴

Overproduction of virgin plastic leads to low market prices for recycled plastic, particularly because prices do not factor in the externalities of plastic production, such as climate impacts from greenhouse gas emissions and pollution from oil and gas extraction. Speaking at a Plastics Recycling conference in 2016, Tison Keel, a senior director at IHS Chemical, said he had “bad news” for the audience of recyclers: PET plastic markets were “vastly over-supplied,” and “the price pressure on recycle[d material] is going to be sustained and the commitment of your customers to sustainability is going to be tested over the next three to four years.”¹⁵ This virgin plastic is being pumped into single-use plastic products, mostly by a small handful of multinational corporations. A constant increase in these companies’ use of flexible and multi-layered packaging has been adding challenges to collection, separation, and recycling.¹⁶

Rather than allowing corporations to produce plastic packaging without heed to the crisis of plastic pollution or its health and environmental impacts, organizations are pushing for genuine corporate accountability. The companies manufacturing plastic pollution should be central to taking responsibility for it. In 239 cleanups in 42 countries across the world during 2018, partner organizations and volunteers of the Break Free From Plastic movement tallied the brands behind the plastic pollution they found across the world. Coca-Cola, PepsiCo and Nestlé were the top three polluters, accounting for 14 percent of the plastic pollution collected in the cleanups worldwide. The rest of the top ten were made up of Danone, Mondelez International, Procter and Gamble, Unilever, Perfetti van Melle, Mars Incorporated, and Colgate-Palmolive.¹⁷

A perhaps unintended but critical outcome of China’s National Sword policy is a greater understanding that recycling is not a solution to plastic pollution. Recycling pledges by companies do little to decrease the amount of plastic in the world, or the negative environmental and health effects of plastic pollution, particularly in the face of the data showing that only 9% of the world’s plastic produced since 1950 has been recycled. Instead, it is imperative that we tackle the plastic pollution issue at the source, by reducing fossil fuel extraction and rethinking our plastic production and consumption patterns. The solution to plastic pollution and its effects on people and the environment around the world isn’t improved waste management, nor finding new ways to recycle. It is producing less plastic.

THE FALLOUT

Exporting plastic pollution is the dark side of recycling by wealthy nations, and has enabled the current industry model to encourage ever-increasing consumption without concern for the consequences.

However, serious impacts are beginning to be felt in wealthy countries: plastic waste is piling up in ports and warehouses, dumped into landfills, or burned in incinerators. The market for plastic scrap has plummeted. Some towns and cities across the United States have curtailed their recycling programs, particularly collection of 3-7 plastics.¹⁸

Denied an overseas dumping ground after China’s ban, Philadelphia, Pennsylvania, has been sending 200 tons of recycling a day to an incinerator, according to a report by *The Guardian*.¹⁹ Ramped-up activity at the incinerator in Chester, 27 kilometers south of Philadelphia, has spurred concerns about dangerous dioxins being released into their air, leaving the citizens with a feeling of frustration and anger that echoes that in importing countries.

“People in Chester feel hopeless—all they want is for their kids to get out, escape. Why should we be expendable? Why should this place have to be burdened by people’s trash and shit?” Chester resident and community activist Zulene Mayfield told *The Guardian*.

Oregon had a law against dumping recyclables in landfills. But that law was made possible by the fact that the state had previously exported much of its recycling to China. After the ban, Oregon issued special permits to circumvent the law, and thousands of tons of recyclables have ended up in landfills.²⁰

A recycling company in Westborough, Massachusetts, has reported stockpiling recyclables as a stop-gap response to having nowhere to send it. Ben Harvey told *The New York Times*²¹ that 6000 tons of paper and cardboard were piling up in his warehouse. “It’s really impacted our day-to-day operations,” Harvey said. “It’s stifling me.”

The trash and recycling of North Americans, Germans, Australians, and Koreans—people who have long depended on lower-income countries to absorb their consumer plastic pollution—are searching for new ports in which to dump their waste.

CHAPTER 4: MALAYSIA



Imported plastic is seen discarded in an illegal recycling factory that was recently shut down by government authorities in Kuala Langat, Malaysia on 23rd January, 2019. Photo courtesy of Adam Dean.

PLASTIC SCRAP FLOODS MALAYSIA: “YOU ASK PEOPLE TO DIE, WHILE YOU GO TO HEAVEN, AND WE GO TO HELL.”

After China closed its doors to recycling imports, cargo ships laden with tons of plastic scrap from the United States and Europe were diverted to the port of Klang on the western coast of Malaysia.

From January to November of 2018, Malaysia was the top importer of plastic scrap, receiving 15.7% of total plastic exports from the top exporting countries. In 2017 the Ecology Center, a hauler in Berkeley, California, placed a GPS tracker in a bale of mixed #1-#7 non-bottle plastic recyclables to find out what happened to these low-grade materials they picked up from households in Berkeley. After curbside recycling is delivered to a sorting facility, the opacity of the global recycling market means there’s no way for most haulers or sorters, or the households they get the recycling from, to know what really happens to their mixed plastic. It is absorbed by a complicated web of brokers and middle men, and often that means ending up in countries on the other side of the world.

The tracker landed in the Arab-Malaysian Industrial Park, south of the Malaysian capital, Kuala Lumpur. It’s a nondescript collection of warehouses, including a cluster of plastic waste recycling facilities. Trucks, some piled with local plastic scrap, others with imported baled plastic or in shipping cargo containers, rumble into the plastic recycling factories.²²

Licensed plastic recycling companies sort out and process high quality, often industrial-grade plastic. The plastic is melted down and turned into pellets, which are then sold to manufacturers in China, Japan, and other countries, which use the material to make new plastic products, from milk jugs and water bottles to motorcycle bodies and plastic industrial components.

The challenge with plastic scrap lies with the significant quantities from plastic exports that cannot be recycled because the bale is contaminated with non-recyclable plastic or plastic that is too expensive to recycle, or because sorting and separating recyclable components are too labor-intensive and in many cases environmentally destructive.



Small and medium-sized, unlicensed, and unregulated recycling plants sprouted up across the countryside surrounding Port Klang—Jenjarom, Kuala Langat, Telok Gong in Selangor—to attempt to capture value from the flood of plastic scrap.

In Pulau Indah, Klang, a compound of two-storey shophouses with blown out glass windows and unpainted cement walls appeared abandoned. Plastic scrap filled the ground floors, spilling out into the empty roads. Mangy dogs wandered around, sniffing at the scrap.

From among the pile of plastic scrap comes the methodical hammering of half a dozen men and women crouched into the specialized, painstaking work of breaking down plastic components into recyclable parts. There are heaps of routers labeled AT&T and D-Link, fax machines, office telephones, remote controls, and water meters from the Toronto hydroelectric system. Workers tossed shattered black plastic into piles, twisted off tiny metal screws, peeled stickers from the water meters, separated clear plastic from opaque, polypropylene from high-density polyethylene, banged off anything that wasn't useful, and piled it into a sack to be sold as plastic fuel for cement factories.

The boss, a gregarious Malaysian businessman named Vincent Lee, said that after China's ban, there was a spike in illegal recycling operations in Malaysia. "You see the factory for sale, for rent," Lee said, "behind the doors are the illegal Chinese factories."

Lee said the United States only wants to deal with good quality plastic, the rest is exported to places like Malaysia. And he has become an expert on the afterlives of the contents of the recycling bins on the other side of the world. The biggest business is electronic products, Lee explains. They pay you to dispose. "Because in America you can't get rid of the waste, in Malaysia you can." They melt it down and turn it into bricks, roads, and plastic pellets—an industry that's much rarer in the United States.

Lee raves about printer cartridges, "Cartridges, I love cartridges!" At his factory in Borneo, they're melted into resin, extruded into long black strings, then chopped into pellets. "They sell for the highest price," Lee said. They make Sprite and 7-Up bottles into rolls of thin green plastic, and white bottles into polyester.

Lee estimates that 80 percent of the scrap he acquires is usable. Twenty percent is not, things like the stickers

DOWNCYCLING IN ASIAN COUNTRIES

Struggling with an ever-staggering amount of plastic waste, most of which is not being recycled, some countries have explored less conventional forms of plastic recycling. These include "plastic-to-road" or "Plasphalt" as well as "plastic-to-brick" and other building materials or furniture made from plastic waste. India has been leading the way, introducing a regulation to make the use of plastic waste in road construction mandatory.²³ As of 2018, almost 10,000 km of roads have been paved in India using plastic waste, such as water bottles, single-use bags, and food wrappers.²⁴ In Indonesia, the government announced plans to use a similar technique to build roads in Bali, Jakarta and other cities in 2017.²⁵ Behind these recycling efforts is Dow Chemical, a major producer of plastics and associated chemicals, which launched several plastic-to-road pilot programs in India and Indonesia in 2017.²⁶

Consumer goods corporations are also investing in various downcycling practices. In the Philippines, Nestle collaborates with the Philippine Plastics Industry Association (PPIA) to produce bricks using multi-layered single-use plastic waste in four cities²⁷, and in Mexico, Procter & Gamble is using diapers to produce roof tiles and upholstery filling.²⁸ The consequences of these practices are unknown, and little research has been done on their environmental or health impacts. However, there are known risks associated with hazardous chemicals potentially leaching into the ecosystem when exposed to heat, light, and water, and the shedding of microplastics, which attract pollutants like polychlorinated biphenyls (PCBs). If this happens, water sources used for drinking and fishing and soil used for farming could be contaminated.

from the Canadian water meters, which he sells to cement factories and boilers to burn as fuel, where dangerous dioxins are likely released into the air.

Lee doesn't buy the really dirty scrap, the stuff that's contaminated with household trash, or things like nylon fishing nets, cable ties, string netting, plastic bags, and engine parts. They need to be washed and the wastewater filtered. He points to the operation in the neighboring warehouse, owned by Wong Kok She. "He's a genius. He takes everything, there's rubbish everywhere but he makes his money," Lee said.

Wong's employees were hunched over the excruciating work of prying metal nuts embedded into plastic, extracting the last bits of value from trash. The profit margins are tiny, but Wong is dedicated. He picks up a piece of molded black plastic. "This one will spend 1,000 years in the landfill and it still won't degrade," Wong said. "I feel sorry for it to be ending up in the landfill."

Lee said that after China shut down plastic scrap imports, his business partner, sensing an opportunity, traveled to the United States for due diligence to look into opening a recycling factory nearer to where the imports originated. His partner came back convinced

that recycling on US soil wasn't a viable business. "Americans don't have the expertise," Lee said, for sifting out the last bits of recycling from consumer products. The second reason was what he called "the environmental issue."

Environmental protection regulations make it unprofitable for recycling factories to process plastic scrap on North American soil. But even as Americans legislate the protection of their own environment, they continue to use, dispose of, and export plastics they've deemed too toxic to countries like Malaysia, leaving others to suffer the consequences of American consumerism.

Lee marvels at the hypocrisy. "So selfish," he said. "You ask people to die, while you go to heaven, and we go to hell."

PARTICULAR HEALTH RISKS ASSOCIATED WITH E-WASTE RECYCLING

People working in the informal recycling sector are exposed to significant health risks when they process e-waste, which involves primitive recycling techniques such as burning the plastic housing of electronic equipment, circuit boards and PVC-coated wires or extracting metals in toxic acid baths.²⁹ Hazardous substances emitted by burning plastic casings include dioxin, brominated flame retardants, lead, cadmium, chromium, and polychlorinated biphenyls (PCBs), which may affect the reproductive system, immune system, and cause cancers. Exposure is through accumulation of chemicals in soil, water and food as well as direct contact or inhalation of the fumes.³⁰ In addition to dioxins and furans, brominated flame retardants (BFRs), man-made chemicals that are commonly used in a wide variety of products including electrical and electronic devices, are of particularly grave concern. These chemicals are known to cause developmental effects, endocrine disruption, immunotoxicity, and (for some PBDE congeners) possibly cancer risks.³¹ Like PCBs, BFRs persist in the air, soil, and water, entering the food chain and find their way into human fatty tissue, blood, breast milk and even human fetuses.



Imported plastic cases from electronic products mostly originating in USA, Canada and China are seen at an illegal recycling factory near Klang, Malaysia on 21st January, 2019.

GRASSROOTS ACTION: “WE HAD TO DO IT OURSELVES”

In the town of Jenjarom, in the Kuala Langat district 25 kilometers south of Port Klang, Tan Ching Hin, a prominent citizen, fielded increasing complaints about the new businesses opened by the Chinese mainlanders. They had arrived in Jenjarom at the end of 2017, in the months after China announced their ban on plastic scrap.

A friend of his, Tiger Lim, owner of a plantation downstream from one of the new recycling factories, said the fruits on his palms rotted before they ripened, ruining his harvest. Lim said the two crocodiles that lived in the river disappeared, chased away by the toxic runoff from the factory.

Others complained about respiratory problems and skin rashes. Mothers worried about their children, the elderly coughed all night. For months, people walked around town with their eyes itching. Everyone complained about the smell.

“You taste it in your mouth, you smell it,” said Daniel Tay, who works at the local school.

Tan wrote a letter to the district council about the pollution, but didn’t get a response. “We had to do it ourselves,” he said.

The illegal factories were hard to find, set up by design in remote fields around Jenjarom. To gather information, Tan said he went to wakes, eavesdropping into conversations, in case some of the gathered mourners lived near a factory and were complaining about the smell of burning trash. He interrogated the local property agents who helped the Chinese businessmen find lots to rent. If he found a promising lead, Tan saved the location on Google maps. In the first report, he identified 20 factories operating without licenses. When he presented his findings to the district council, they asked him if he didn’t have something better to do.

As the support for his quest grew, more volunteers joined his cause. By July 2018, he had formed a group dedicated to trying to shut down illegal, unregulated plastic recycling factories, called Kuala Langat Environmental Protection Action Group. They held a fundraiser and began flying drones over the illegal factories as proof of their activities, identifying 38 plastic scrap factories operating in the district, only one of which was licensed.

On August 2, 2018, after receiving a letter from the group with their findings, an enforcement team consisting of officials from the local government, immigration, the environment department, the fire brigade, and police raided eight illegal factories, cutting

HUMAN HEALTH IMPACTS OF OPEN BURNING

Burning plastic in the open results in direct emissions of pollutants, including dioxins, furans, mercury and Polychlorinated Biphenyls (PCBs) into the air.³² Especially with polyvinyl chloride (PVC) contributing to high emissions of dioxin, the practice of plastic burning can pose a serious health threat such as reproductive and developmental problems, damage to the immune system, hormonal disorders, and cancers.³³

After the combustion is over, high concentrations of toxic substances can remain in the residual ash. Dioxins, for example, have been detected in residual ash, in correlation with the amount of chlorine-containing plastic burned.³⁴ Once leached in the form of ash, dioxins further persist in the environment, affecting nearby plants and animals and accumulating in human bodies.³⁵ Other pollutants such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs) have also been reported to remain in the residual ash.³⁶

Acknowledging these environmental health risks of open burning of waste, including plastics, UNEP’s guideline on Article 5 and Annex C of the Stockholm Convention on POPs, advises to cease open and other uncontrolled burning of wastes, defining open burning as an environmentally unacceptable process that generates toxic chemicals (subparagraph (f) of Annex C, Part V, section A).

off their water and electricity supplies and arresting 13 migrant laborers.

It was a moment of triumph for Tan Ching Hin and the Kuala Langat Environmental Protection Action Group. Tan said that within two weeks, those factories had left. For nearly a year they had endured the daily smell of burning plastic, and that raid was the first of several that would sharply curb illegal plastic recycling factories in their district.

Tan still drives around Kuala Langat, staying vigilant, keeping an eye out for new factories that might have sprouted up. One afternoon in January, he frantically told his driver to do a u-turn. He had spotted some new aluminum fencing and what looked like industrial bales just visible over the top. They pulled over and he squeezed through the gate, shooing away a few barking dogs in the yard. He inspected the industrial sacks. It appeared to be an unmanned cement factory, not plastic scrap this time.

In October 2018, the Malaysian government announced a permanent ban on importing plastic waste by 2021, and imports to Malaysia dropped steeply.

Still, Tan worries that if they don't stay vigilant, the illegal plastic factories will come back.



ENFORCEMENT: "A HEAVY BURDEN"

Ng Sze Han, State Executive Councillor of Selangor, where Kuala Langat is located, says the proliferation of illegal plastic factories is a significant stress on state coffers.

In January 2019, Ng was touring factories the state had shut down in the last six months to monitor progress on the cleanup. The authorities confiscated the machines, and there were no workers to be found. But the trash was still there.

"It is very disturbing," Ng said. "This is a heavy burden to the state government as well as the local government." They receive no tax revenue from the illegal operators but are left with the cost and the responsibility of enforcement and monitoring. Ng said his officers are working overtime on weekends and public holidays, just to deal with these illegal plastic waste recycling operations.



Workers recycle imported plastic in a legal plastic recycling factory in Klang, Malaysia on 23rd January, 2019.

In June, the state government started receiving complaints about burning plastic and growing mountains of trash. It took two months for the officers to locate and identify 104 illegal operators, most of which only opened after the China ban. Trash was moving very quickly, he said. Rent tripled and the stench and pollution in the river quickly followed. The environment department is now checking the water and soil regularly for contamination.

In one of the sites Ng visited, there were flattened United States Postal Service crates, “Made in USA” Fiji water bottles, containers from stuffing mushrooms grown in the USA and packed in Avondale, Pennsylvania, bottles from a North American Bottling Company in Plano, Texas, orange juice containers distributed from Cincinnati, Ohio, and a plastic bag from Stater Bros. Market, a Central California grocery chain promising to bring the flavors of the world to its shoppers.

Months after they closed down the factory, the trash mixed in with the recycling continued to fester.

“Please take your rubbish back!” Ng said.

Ng’s next stop was a plastic recycling factory at the end of the dirt road. It was shut down in late 2018, then set on fire. Mountains of plastic waste, many with French and German labels, were covered in soot and muddy water. The landowner’s son was on-site, surveying the mountain of trash that had accumulated outside the burnt out building: 4,000 tons of plastic that he now had to find a way to dispose of. He says he and his father never inspected their tenant’s activities. As long as the rent showed up in their bank account, they asked no questions. Now the tenants were nowhere to be found. He didn’t know they were importing trash onto his land.

Ng Sze Han bends down and picks up the nearest scraps of plastic from the ground. One was a torn package of German hazelnut wafers; the other was cat food packaging from Spain. He toes a few more scraps: a jug of Coop milk emblazoned with the Union Jack, and an empty packet of French shredded emmental. “This is definitely imported rubbish,” he said.

Imported plastic is seen discarded in an illegal recycling factory that was recently shut down by gov.t authorities in Kuala Langat, Malaysia on 23rd January, 2019.



INTENTIONS AND CHALLENGES

The Malaysian government sees China's ban as an opportunity.

"We are serious in becoming a huge player for this, the industry players," said Harris Idaham Rashid, Special Officer to the Minister of Housing and Local Government. However, unregulated trade has meant that rather than benefiting from the global recycling market, they were instead taking in trash and plastic pollution. "Our country was basically a dumping ground for first world nations and we wanted to put a stop to it," Idaham said.

Despite the economic opportunity Malaysia has identified in importing regulated plastic scrap, specifically, homogeneous industrial waste, Idaham said, "Plastic waste is not subject to receiving country assent," unlike hazardous waste. By international law, recipient countries have to be notified of imports of hazardous waste, but not plastic waste.

Idaham concedes that Malaysia faces complex efforts in enforcing their laws on the types of plastic scrap that can be imported into the country, including corruption in Malaysian customs, but enforcement in global trade requires a global effort.

"Rich countries want to ship out their rubbish, there is a reason why they are pushing over here," Idaham said. "We don't want it."

MALAYSIA TAKES ACTION

Yeo Bee Yin, the Malaysian Minister for Energy, Science, Technology, Environment and Climate Change, has mobilised national resources aggressively to stem the flow of contaminated plastic recycling arriving in her country. In a statement to local press³⁷ in February 2019, Malaysia said that the government had shut down 139 plastic recycling factories since July 2018, 109 of which were illegal factories and the rest did not comply with environmental regulations.

Some 44 of the companies will be charged with offenses against Malaysia's Environmental Quality Act 1974, with fines totaling 3 million ringgit, or about US\$740,000.

"Although we have met the target, we will not stop. Enforcement operations will be amplified," Yeo said during the press conference.

However, a report in March by *The Straits Times*³⁸ suggests that illegal recyclers continue to find ways around the ban, moving away from the areas around Port Klang, where enforcement efforts are currently concentrated. Half an hour from Penang port, north of Klang, local reporters found an illegal plastic dump they estimated to be the size of six football fields, with plastic scrap piled two stories high. Trucks arrived with fresh loads of trash, and black smoke from open burning rose over the dump.



Imported plastic cases from electronic products mostly originating in USA, Canada and China are seen at an illegal recycling factory near Klang, Malaysia on 21st January, 2019.

CHAPTER 5: THAILAND



"IT'S TOXIC TRASH AND WE ARE LIVING HERE"

When China instituted their new policy, Thailand saw the largest percentage increase of foreign waste imports from the previous year, at over 1000 percent. Much of the imported trash was absorbed into the country's waste and recycling infrastructure, exacerbating existing issues of a mostly unregulated, and sometimes violent, industry.

Sarayoot Sonraksa is a shrimp farmer and a former biochemist. The community asks him for help when they are having trouble with water, electricity, or local disputes. They also complain about illegal dumping, the choking smell from burning plastic, or their fields singed and barren from industrial waste dumping. He says dealing with the waste industry is the most dangerous thing he has to do.

Sonraksa has received three direct threats from the mafia, two in 2015 and one in 2018. They were serious enough that he's gone into hiding. Dr. Somnuck, a researcher who focuses on plastic waste, was run off an illegal dumpsite by men in a van, who were brandishing guns.

The threats haven't stopped Sonraksa or Dr. Somnuck. But in 2013, an environmental activist named Prajob Nao-opas³⁹ was assassinated for protesting against illegal dumping, so the possibility that one of these gangs will make good on their threats is always in the backs of their minds.

Imported plastic waste enters Thailand by way of the deep water port of Laem Chabang. Police and customs authorities have apprehended shipping containers packed with plastic scrap contaminated with waste at Laem Chabang, though others have made their way into Thailand's dumps, processing plants, and recycling factories.

As Dr. Somnuck drove from the clean industrial parks and tidy warehouses near Laem Chabang where licensed processing facilities operate, to Chachoengsao, the broad, paved highways gave way to narrow roads with ragged edges flanked with farmland; there were fewer cement houses and more made from corrugated metal, hammocks hung from trees and waterwheels spun in shallow fish ponds.

He explained that at each step in the global chain of the



recycling industry, each player—from sophisticated waste management facilities in the United States and other wealthy countries, to the licensed factories getting the first take of imported plastic scrap—skimmed off what was valuable to them, and passed ever-less valuable, more difficult-to-process waste to the next facility.

The lowest-grade waste is taken to places like the village of Kok Hua Khao in Chachoengsao.

An agricultural district adjacent to Bangkok and within trucking distance of Laem Chabang Port, Chachoengsao is accessible to the sources of plastic waste but far enough away that enforcement becomes lax. Sayaroot Sonraksa, the activist and shrimp farmer, said recycling factories have operated here with little oversight for years. He has encountered instances of workers melting plastic without respirators, toxic liquids being poured into farmlands, and trash burned at night.

Sonraksa said he has snuck into one dump to inspect the activities. “The moment I stepped in, I felt bad.” After he went home and took a shower, “I could still taste the chemicals in my mouth.”

He points out that the chemicals are still in their groundwater: “we also have fish farms, shrimp farms, and it’s going to the U.S.”

“We’re leaving the burden of disease to future generations,” Dr. Somnuck said. “It’s not happening now, but it will affect people later.” He lists off some of the health effects of plastic waste: miscarriages, infertility, premature delivery. Toxins can accumulate in the respiratory systems, or there can be chromosomal effects in the tissue of humans or fish.

Driving through the village, Sayaroot Sonraksa and Dr. Somnuck point out signs of plastic pollution. A spot where waste was buried, a cluster of homes where three or four people have complained of respiratory issues.

Kuchon Umsawat, 49, says his land is fed by a stream that runs next to the plastic recycling factory. Last year, one of his fishponds turned a startling shade of bright orange. He took a bamboo pole and stirred the water; it was thick and murky. When he had it tested, it was contaminated with 14 kinds of heavy metals and other pollutants.



“The vegetables didn’t survive,” Umsawat said. The fruit trees are still there—tamarind, bananas, oranges, rose apples, and pomelos. He said he wouldn’t dare to eat them, or even sell them. He estimates that because of the plastic pollution he makes 100,000 Thai baht less per year, or about US\$3,000. He can no longer water the grass, which means he doesn’t have enough hay to sell or feed to his cows. He has to buy water from a local dealer so his cows can drink. The costs add up, and he’s had to sell two of his six cows because he couldn’t afford the water.

He was shocked to learn that the trash came from America. “It makes no sense,” he said. “How did it end up here?”

“It’s toxic trash and we are living here,” Umsawat said. “It’s very bad they are doing this to Thailand.”

“If Thai people knew before we wouldn’t want to accept it,” Suthep Bhummin, the local village leader said. “Even the domestic trash is a burden for us.”



THE LIVES OF WASTE PICKERS

Waste pickers are workers in the informal economy who recover recyclable materials from waste, and are in many ways on the frontlines of the plastic pollution crisis. In parts of the global south they often collect materials for recycling that would otherwise be dumped, burned, or released into the open environment, and therefore serve a critical role in building towards a circular economy. Waste picking can be a dangerous business. Waste pickers often live on or near dumpsites, and risk health problems from handling contaminated scrap, air emissions from open burning, and disease from flies, rats, and other vermin.

Because waste pickers are not formal workers recognized by their local municipalities, they do not earn a decent and reliable salary or receive benefits, and are not subject to worker protections. However, waste pickers in many regions and countries around the world have organized to advocate for better labor conditions and recognition from local governmental institutions. For example, the cooperative SWaCH in Pune, India, succeeded in gaining formal employment for over 3,541 waste pickers to date and provide door-to-door collection for over 800,000 households daily.⁴³

CHAPTER 6: INDONESIA



Waste pickers collect plastic from amongst recycle domestic Indonesian waste in the Bantar Gabang dump, thought to be the largest in the world, in Bantar Gabang, Indonesia on 23rd January, 2019. The plastic recycling factories surrounding the dump used to recycle imported plastics too but in 2018 the imported plastics were banned here and recycled in Surabaya and Karawang. Photo courtesy of Adam Dean.

TREASURE IN THE TRASH

To the villagers of North Somengko, it seems the world is coming to them. Dollar bills, Kuwaiti riyals, Australian dollars, euros most of all, it's treasure for them in the piles of trash. In one particular heap, a Capri Sun, Finnish dish soap, Whiskas, Craisins, Cheez Its, and Hershey's chocolate peek out from amongst the rubbish.

As countries like Malaysia and Thailand tightened their laws around importing plastic waste and increased enforcement, the Indonesian government has yet to take action against the incoming scourge of plastic waste, and financial insecurity in the country has created an opening for the informal plastic waste industry.

Like the poor villages of China before it, middlemen and brokers are exploiting poverty in rural Indonesia, offering money in exchange for environmental pollution. Families are asked to choose between the immediacy of work and the abstraction of harm they can't see.

They're farmers, laborers, construction workers—Indonesia's most insecure, lowest wage workforce. The money they make sifting through the plastic waste for

recycling and treasure is easy money to supplement what little they make in other jobs.

In Indonesia, imported plastic waste comes mixed in with paper and cardboard recycling. Ecoton, a GAIA partner organization in East Java, estimates that as much as 60–70 percent of the imported paper recycling is contaminated with plastic waste. The districts around paper recycling factories in Indonesia are surrounded by a corresponding plastic industry to process the contamination.

The paper companies separate, wash and strip the plastic, load it into trucks and dump it in surrounding villages, where middlemen—widely referred to in East Java as the mafia—find communities of low-wage workers who are willing to sift through the plastic waste.

The mafia tells them that the plastic waste dumped into their cassava fields or on their front yards is an opportunity for them, a good job. In exchange for sifting out the last bits of recyclable plastic and metal from trash, they can keep whatever they find.

Their only payment is in whatever treasure they can find in the trash.



Usman, 45, who was sitting under the shade of a banana tree with a few friends, said that the dump trucks started coming to these fields about two months before. There's one delivery in the morning and another in the afternoon. Sometimes, it's one truck, or as many as eight in a day. There are about 40 people who work these dumps, but if it's a really big delivery, as many as 200 people can come from the surrounding neighborhoods to sift through the plastic scrap.

In two months, he's found about \$100 among the trash, though the money changer who comes to collect their foreign currency gives him about 7000 Indonesian rupiah for each US dollar, half the global market exchange rate.

"We're satisfied with the money we earn from this job," Usman said, "If there's no dumping here then there's no job, we need this to make money."

The moneychanger, a man who introduced himself as Alec before speeding off on his motorcycle, said that he circulated in 15 different villages in the districts of Gresik and Surabaya, in East Java.

CONFLICT IN THE VILLAGE

Anam, 48, who raises long-eared goats in North Somengko, has watched with dismay the daily deliveries of plastic waste coming to his village. It started in July 2018, and every day for the last several months his neighbors have been burning the trash that they cannot recycle.

The town's cobbled alleys snake between simple cement houses. Dump trucks unload plastic trash into the middle of the road, or fill the yards of waste pickers. Villagers gather around the plastic waste to spend the day sifting high-density polyethylene (HDPE) from regular polyethylene, chatting with one another, and combing the trash for foreign cash.

Toddlers play with stuffed animals pulled from the trash. One man pushes a wheelbarrow from the pile and into the communal back field of a cluster of houses. The ground is soft and raised with a thick layer of damp plastic. At the edges, perpetual fires burn, thick smoke rising, coating the rooftops, trees, and plants with a dusting of black ash.



Anam, 48, feeds his goats in Sumengko Village where he lives and is full of plastic recyclers who burn waste plastic, near Gresik, Surabaya, Indonesia on 21st February, 2019.

The neighborhood is divided between those with new front-yard plastic recycling businesses, and people like Anam, who feel powerless to stop it. He has complained to the village chief, but still the plastic waste kept coming.

Anam reminded his neighbors that there are children breathing in the smoke. When the rain comes, he's concerned about the chemicals from the plastics leaching into the soil. No one is sick yet, he said to them, but maybe later. It did not go well. "They hate me," Anam said. They accused him of being jealous and trying to kill their business.

"If I open my mouth, there will be a riot," he said. "So I just keep it shut."

Sitting on his front porch, Anam looks out into the treetops and blue sky streaked with smoke from the burning trash fires, at the streets and his neighbors' yard now piled with trash, and thinks about how different his village has become in just one year. He's seen birds dying and the wind blowing smoke into the houses.

Anam is faced with the tension of the recycling industry and the environment: "They're only looking at the benefit, but not concerning themselves with the effect."

"PLEASE TELL THE UNITED NATIONS"

Didek Heriyanto, known as Polo Hari, is the elected village chief of North Sumengko. He has spoken to Anam and others in the village who complained about the growing problem of plastic pollution.

In August 2018, he sent a letter of objection to the provincial government of Gresik, complaining about the mafia, the smell, and the water contamination. He collected signatures of the people in the village demanding action.

He is still waiting.

Meanwhile, he says the mafia has intimidated him, delivered verbal threats. They told him, "don't disturb this business of ours." He blames the mafia for creating conflict in the village by taking advantage of the economic situation of the poorer villagers.

He does not blame the village waste pickers; he wants the government to do something about what

he considers hazardous waste. He believes the paper companies who are importing the plastic waste into Gresik should accept responsibility for disposing of the waste, rather than dumping into his village, leaving the people with no choice but to burn it.

Polo Hari would like to stop the industry. "It's not fair, it's outrageous," Polo Hari said. "I must protect my people, if I let this happen, I am useless."

The plastic waste picking industry has only been in his part of Indonesia for less than a year. He's very worried that it will get bigger. As it expands, he's concerned the health problems will get worse, as well as the environmental contamination. But to stop it, he says he is up against forces more powerful than he is. The police and the government back up the plastic scrapping businesses. "That's why people like me can't do anything."

Polo Hari does not know who else to turn to. He feels that the Indonesian government is complicit in a form of oppression being imposed on his people that he likens to colonization.



Didik poses for a portrait outside a relatives home, in Sumengko Village, near Gresik, Surabaya, Indonesia on 21st February, 2019.

***“Please tell the United Nations,” he said.
“I just want to be healthy, my people
and my country.”***

A CAUTIONARY TALE: “I JUST COULDN’T TAKE IT ANY MORE.”

The plastic scrapping industry in North Sumengko may be new—operations at the paper company have expanded since China’s ban—but in the next village, they have been processing plastics for a decade. Polo Hari worries that the problems there will be the future of North Sumengko.

Most of the houses in South Sumengko are filled with plastic scrap, some of it sorted, others piled into heaps, for burning.

Polo Hari’s cousin, Suri, 50, lives in South Sumengko. Her next door neighbors are plastic waste pickers, and that afternoon, a pile of plastic was burning next to the road in front of their house.



Suri, 50, who has suffered health problems related to plastic waste burning sits outside her home in Sumengko Village, near Gresik, Surabaya, Indonesia on 21st February, 2019.

Suri says her headaches are getting worse, and it’s getting harder to breathe. Her skin is breaking out in itchy rashes. In the last year, she’s been to the hospital three times. “I just couldn’t take it anymore,” Suri said. The first time the doctors thought she was suffering a heart attack. They did a cardiogram, but the results came back fine, “but I could not breathe,” she said. They put her on an oxygen tank and let her breathe through a nebulizer. For the first time in months, she said, she felt comfort.

Suri said her health problems often have her thinking about her nephew. He was ten years old when he died suddenly four years ago. The doctors did not give an explanation, but Suri’s family think it might have been a tumor or cancer. Another relative died of a heart attack and respiratory problems. The air at the time they died was so dark and smoky, Suri said. She believes it was the burning trash that killed them.

DANGERS OF INCINERATION

Waste incineration releases a range of pollutants to the air, water, and soil, such as carbon monoxide, acidic gases (NO_x, SO₂, and HCl), acidic particles, certain metals (cadmium, lead, mercury, chromium, arsenic, and beryllium), dioxins and furans, polychlorinated biphenyls (PCBs), and polyaromatic hydrocarbons (PAHs). Direct and indirect exposure to such substances, including through inhalation of contaminated air, direct contact with contaminated soil or water, or ingestion of toxins that enter the food chain, can have adverse health impacts affecting the neurological, immune, reproductive, and endocrine systems. In addition to air emissions, pollutants captured by air filtering devices remain concentrated in ash, slag, or waste water after incineration, and leach into the environment through various pathways including open yards, ash landfills, or use in cement or soil amendments.⁴⁰



POTENTIAL POLLUTANTS GENERATED FROM BURNING OF PLASTICS

CARBON MONOXIDE

Causes dizziness, headaches and slowed reflexes. Affects mental function, visual acuity and alertness. Reacts with other pollutants in the air to form ground level ozone.



POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Cancer causing agent in most animal species including mammals, fish and birds.



PARTICULATE MATTER (PM)

A complex mixture of extremely small particles and liquid droplets. Causes irritation of respiratory tract, aggravated asthma, contributes to chronic obstructive pulmonary disease.



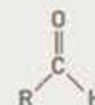
DIOXINS AND FURANS

May cause cancer; causes growth defects; affects DNA; affects immune and reproductive systems.



VOLATILE ORGANIC COMPOUNDS (VOCs)

May cause problems ranging from cancer risks to nervous disorders, respiratory irritation/illness, chronic lung disease. Contributes to low level ozone (smog).



ALDEHYDES

Toxic chemicals that result from the combustion of hydrocarbons. An animal carcinogen. Causes eye and respiratory illness and headaches.



Source: Saskatchewan Ministry of Environment (<http://www.sask20.ca/PDF/epb433.pdf>)

* Modern air pollution control devices can capture and concentrate some of the pollutants in the incinerators. However, they neither prevent captured pollutants from being released into the environment in the form of ash, slag, or sludge, nor can they capture many hazardous emissions such as ultra-fine particles. - GAIA (2012), Incinerators: Myths vs. Facts about "Waste to Energy"

WHY INDONESIA MAY BECOME THE NEXT CHINA

In 2010, the journalist Adam Minter gained entrance to Wen'an County in China, then the global center of plastic recycling. In his book, *Junkyard Planet*,⁴¹ Minter described the process that transformed Wen'an from a bucolic pocket of eastern China to what he calls an environmental "dead zone."⁴²

The process was accidental, Minter wrote, with one resident telling another about the money to be made in sifting through trash. The government did not step in to stop it, and incrementally, Wen'an county became the heart of the global plastic waste trade.

Minter writes: "With money on their minds and increasingly flowing into their pockets, the town's leaders turned their backs on the obvious negative effects of becoming a place where other people dump their trash—even if the trash has value."

In 2011, the Chinese government shut down the plastic scrap trade in Wen'an by introducing new environmental regulations. The trade scattered to different parts of the country.

The same pattern of economic incentives and government complicity or inattention is playing out in Indonesian villages suddenly on the receiving end of plastic scrap that used to go to China.

In East Java, Nama Poniman, a local official in Sumengko, issued permits for plastic recyclers affiliated with the paper factories to truck plastic waste to the yards of the village waste pickers.

He says he is concerned about the pollution caused by the plastic waste, and that, "Personally, I am disturbed by the air pollution."

However, he adds that he is equally concerned about the problem of joblessness in the area. "It is difficult to shut down," Poniman said, defending the paper recycling factories importing plastic scrap into Sumengko. "The cooperation between the company and the people is good."

He says that once his term of office is finished, he is considering entering the recycling industry himself.

Poniman is one among many Indonesian government officials swayed into supporting the plastic waste trade. In November 2018, in a move that runs counter to the trend in Malaysia and Thailand, the Indonesian minister of industry, Airlangga Hartarto, sent a letter to the environment minister requesting that they lift the existing (but largely unenforced) ban on importing plastic.

There are important differences between China and Indonesia, chief among them is the lack of an in-country manufacturing and export industry on the scale of China. However, the story of Wen'an is instructive. As plastic waste searches for the paths of least resistance, countries like Indonesia, where workers are choosing between poverty or the environment, is a prime new dumping ground for the dirty plastic recycling trade.

THE RECYCLING KING OF BANGUN

Like Wen'an County in China, Bangun in East Java runs on plastic.

There is plastic climbing up the walls of the village's cement houses. It tumbles out of corrugated tin warehouses. The rain drips from the edges of plastic packaging like flower petals into little rivulets tracing their way through the pathways carved into the mountains of scrap, piled higher than the rooftops. In some places the trash is thick on the ground; in others, it is raked thin, to dry under the sun. Chickens wander through, pecking at grubs among the fields of trash.

Colorful houses sit in valleys of rolling hills of plastic waste. From overhead the town looks like a sea of mottled plastic scrap—there is more plastic than anything else.

Yoga Deo Wahyu Andreansyah, 42, a wiry, self-possessed man, says no one in Indonesia is better at sorting plastic scrap than the people of Bangun. From where he stands, it's plastic as far as the eye can see, and it all belongs to him.

Wahyu walks through piles of meticulously sorted trash. It may all look the same to the unprofessional eye, he says, but it is all different. And to scrape the last of the value from the plastic scrap it must be separated exactly. He pulls a bag from a pile: PE, he explains, stretches when pulled. PP bags are more brittle, they rip, he said, as he tugged at the edges. HDPE and HD are thicker. EVA is the stretchiest, like cling film.

Wahyu also knows their afterlives. Milk jugs become to-go containers, clear PET water bottles become more water bottles. Hard black plastic can be turned into the motorcycle he has sitting in the yard. The trash with no value—metallized chips packaging, candy wrappers and zip lock bags—he collects into bales and sends it to tofu factories that burn it as fuel.

Since January 2018, Wahyu said more of the plastic scrap coming into Bangun is imported. He can tell by the brands on the plastic, and it contains a higher proportion of recyclable material. He is happy because there is more money in it. But Wahyu has been in this business for 15 years, and as much as the plastic scrapping industry has given him, he also knows what it has cost him.

He has watched the industry in Bangun expand, from one factory, to nearly the whole town awash in plastic waste. “It was fresh here before but not anymore. There’s no escaping the smell,” he said, “like soda, bleach and chemicals.”

“When you breathe a lot your body becomes slower. If it’s too much it breaks your lungs. But not suddenly,” Wahyu said. “Slowly.”

There is another health effect Wahyu is concerned with. “My wife miscarried twice because she was working here,” he said. After years of disappointment, he took some of his earnings from the business and paid 70 million rupiah for in-vitro fertilization, and he and his wife were able to have a baby, who is now three years old. “It’s bad for the mother,” Wahyu said of the plastic that surrounds them. He’s aware of the health problems in the lungs, and he’s afraid in the long term there will be even more problems.

To reconcile his daily actions with grim long-term realities, he does what people across the world are doing, from the yards of Bangun to North American consumers belling up to juice bars in California. He is employing a combination of denial, short-term thinking, and healthy eating: Wahyu said, every day, he drinks an herbal tonic of turmeric, ginseng, honey, and free-range eggs that he believes will fend off the health consequences from plastic.

“We become immune to it when you are here for a long time,” Wahyu said. “You become numb.” It sounds like

he is trying to convince himself.

Wahyu says the well water in Bangun is yellow, contaminated from the plastic, so the paper mill, where much of their plastic comes from, provides water from a deep well. When it rains, the smell is worse.

Most people in Bangun work in the plastic scrap industry, he said. “But no one protests the conditions, even though they all know.”



Mr Yoga, (left) poses for a portrait with his wife and daughter amongst imported plastic waste at his recycling factory in Bangun Village, near Gresik, Surabaya, Indonesia on 22nd February, 2019.

END OF THE LINE: PLASTIC FUEL

Bangun isn't the final stop for the plastic waste. As two dump trucks pull into Wahyu's yard, another leaves, stacked with plastics that cannot be recycled because they are soiled, too expensive to recycle, or are simply non-recyclable, like potato chip bags, plastic food packaging, or bubble wrap.

They are bound for East Java's local tofu factories in Kelangan Teropodo, a town less than an hour's drive from Wahyu's plastic scrap empire.

At one of the tofu factories, clouds of steam engulf the laborers, who are draining soy milk in silken sheets, forming the tofu in rectangular wooden molds, or packing the stiff squares into plastic bags for sale.

In the back, candy wrappers litter the floor like dead leaves. Plastic trash, the kind sifted out by the waste pickers in Sumengko and Bangun, is shoveled into a makeshift metal furnace and burned as fuel. Smoke billowed from the chimney.

KARAWANG: DANGER OF THE UNREGULATED INDUSTRY SPREADING

In July 2018, Ade Junedi, 42, found himself without a job. Junedi looked out into the 0.4 hectare of field in front of his house and was contemplating turning it into a fish farm when a representative of a nearby paper company offered to pay him to dump plastic waste into his yard.

Junedi accepted. One dump truck after another began emptying plastic into his yard—imported scrap. The pile grew, and the paper company representative told him to “just get rid of it.”

Junedi had heard that plastic recycling could be sold, so he began sorting. He started with just he and his wife, sorting plastic from aluminum, PP from HDPE, trash from cash. Before long Junedi was hiring employees. When his neighbors complained, he built a fence to hide the trash, but invited them to inspect the site itself.

Plastic waste, he was told, is not classified as hazardous waste. He tells his neighbors the same thing. He says he is happy to spread the wealth, and some of the neighbors who



Goldman Prize Winner and GAIA partner Prigi Arisandi of the Brantas River Coalition. Wastewater from the plastic and paper recycling factories around Surabaya, Indonesia are polluting the river, which supplies drinking water to 5 million people in the area. Photo courtesy of Ecoton.

initially complained have now joined him in the scrap business themselves.

Junedi became an evangelist for the riches to be found in plastic scrap, and in the process is creating a new industry in Karawang, 80 kilometers east of the Indonesian capital, Jakarta. He says that in his district, there are now ten front-yard scrap shops, and their main problem now is that the industry in Karawang has proliferated so much that there is not enough scrap for all the new businesses.

“It’s fast money,” Junedi said. He points to the Elf truck parked in his yard, “I never could have imagined I would own something like that.” Junedi says he used to earn 30 million rupiah, or about US\$2,100, in one year. Since he started in the plastic scrapping industry he now earns that in a month.

Junedi is a modest man, hardworking, and well-liked by his employees. One of them, Sugiharso, a wiry

65-year-old man, sat among the plastic waste with his two-year-old son in his arms. Sugiharso used to work as a laborer unloading trucks at a warehouse. He left the job when he heard there was now money in waste picking at the plastic scrap businesses.

“This is nicer work,” he says. He is not making more money, but the job is more relaxing. He can spend time with his son, and his wife now works by his side. With the extra income, they have more money for the children’s schooling, and can afford a few small luxuries, like tea and snacks in the afternoon.

In Karawang, economic opportunism, poverty, lax import controls and limited environmental oversight are converging to create the conditions for a new plastic scrap industry. Ade Junedi and the other plastic recyclers and waste pickers of Karawang may not see the hazards of the industry now, but like Bangun and China before them, it’s only a matter of time before taking in the world’s trash loses its sheen.



As workers makes tofu in a factory where they use cheap imported waste plastic to heat the boilers in the manufacturing process, near Gresik, Surabaya, Indonesia on 22nd February, 2019.





CHAPTER 7: FOLLOWING IN CHINA'S FOOTSTEPS

Workers recycle domestic Indonesian plastic in factories near the Bantar Gabang waste dump, thought to be the largest in the world, in Bantar Gabang, Indonesia on 23rd January, 2019. The factories here used to recycle imported plastics too but in 2018 the imported plastics were banned here and recycled in Surabaya and Karawang.

NEW DESTINATIONS BEGIN IMPOSING BANS

Malaysia, which became the biggest plastic scrap importer in the first few months of 2018, instituted its first temporary ban in July 2018. Over the next several months, the government found its footing as communities in Malaysia protested the same environmental and health effects that led China to ban plastic scrap.

By October 2018, the Minister of Housing and Local Government, Zuraida Kamaruddin, announced a permanent ban on plastic waste within three years and stopped issuing new permits.⁴⁴ Enforcement operations accelerated, closing down plastic recycling factories—many of which had partnered with the Chinese scrap business.

“I hate seeing my country as the dumpsite for the developed world,” Yeo Bee Yin, Malaysia’s environment minister posted on her Facebook page, going on to lead an aggressive government push to crack down on illegal plastic recyclers and violators of Malaysia’s environmental laws.

The shift in plastic waste imports spurred other countries in the region to enact bans and restrictions. In July 2018, Vietnam⁴⁵ said it would stop issuing new licenses for waste imports and crack down on illegal shipments of paper, plastic and metal.

As the environmental impacts deepened in Thailand, grassroots organizations and environmental groups demanded that the government revoke an order allowing plastic recycling factories, much of them processing hazardous e-waste, to operate in agricultural areas. The government responded with highly publicized raids of plastic recycling factories followed up by a strongly-worded announcement from the Deputy Prime Minister Prawit Wongsuwan, that the government was moving toward a ban on e-waste.⁴⁶ By August 2018, Thailand⁴⁷ announced that it will ban imports of 432 types of scrap electronics that will take effect within 6 months, following it up with a plan to ban imports of plastic waste within two years.

In October 2018, Taiwan countered the rise in plastic scrap imports with regulations sharply limiting the types of plastic scrap allowed into the country.⁴⁸

In March 2019, India followed suit announcing that it will ban scrap plastic imports, “In order to strengthen the implementation of environmentally sound management of hazardous waste in the country.”⁴⁹

BEYOND SOUTHEAST ASIA

Following the bans and restrictions in Malaysia, Thailand, Taiwan, Vietnam, and India, imports to those countries dropped, according to research by Greenpeace East Asia.⁶⁷ However, the patchwork nature of individual country bans means that plastic waste flows shifted to other countries, including Indonesia and Turkey.

Furthermore, after steep drops after the bans, data in the last quarter of 2018 suggests that imports in Malaysia, Thailand, and Taiwan are beginning to tick up again. Maintaining the bans in the absence of international regulation in the plastic waste trade requires vigilant enforcement.



Workers recycle plastic in factories near the Bantar Gabang waste dump in Indonesia on 23 January, 2019.

TIMELINE OF BANS/RESTRICTIONS

July 2017	China sends notice to the World Trade Organization that it will crack down on plastic scrap imports ⁵⁰
January 2018	“National Sword” takes effect. China begins enforcing plastic scrap restrictions ⁵¹
March 2018	China announces that it will impose a more rigorous contamination standard for imports of 0.05%, down from 1.5% ⁵²
April 2018	Thailand imposes a temporary ban on plastic scrap ⁵³
May 2018	Thailand lifts temporary ban on plastic scrap ⁵⁴ Malaysia temporarily stops issuing permits to import plastic scrap ⁵⁵
June 2018	Malaysia resumes issuing plastic scrap permits ⁵⁶
July 2018	Vietnam says it will stop issuing new licenses for waste imports and crack down on illegal shipments of paper, plastic and metal ⁵⁷
July 2018	China announces ⁵⁸ that it will ban all imports of “solid waste” by the end of 2019 ⁵⁹
August 2018	Malaysia announces three-month freeze on issuing plastic waste permit ⁶⁰ Thailand announces an e-waste ban: it will ban imports of 432 types of scrap electronics and will take effect within 6 months ⁶¹
October 2018	Malaysia announces that it will take steps to limit the import of plastic waste and phase out imports of other types of plastic scrap (including “clean” plastic) within 3 years ⁶² Thailand announces that it will permanently ban plastic imports by 2021 ⁶³
November 2018	Indonesian Industry Minister sends a letter to environment minister requesting that they lift the ban on importing plastic. Indonesia currently has a blanket ban on importing waste but not definitive rule on recyclable plastic, as well as lax customs inspections so plastic waste enters with shipments marked as recycling, or as mixed paper recycling ⁶⁴
March 2019	India announces that it will ban all plastic scrap imports ⁶⁵
April 2019	Vietnamese officials announce that they will bar all imports of plastic scrap by 2025 ⁶⁶



CHAPTER 8: TURNING CRISIS INTO OPPORTUNITY

Members of the Rethink Plastic Alliance under the banner of the Break Free From Plastic movement urge European Union politicians to fight the plastic dragon by adopting strong single-use plastic legislation on 26 November, 2018. Photo courtesy of the Rethink Plastic Alliance

Recognizing the significant systemic flaws in their recycling systems, some plastic waste exporters are beginning to make incremental changes to both improve domestic recycling and phase out problematic products and packaging.

In the U.S., which is dependent on exporting high amounts of plastic waste, recyclers are responding to the public's growing demand for plastic reduction. In a San Francisco Chronicle opinion titled "It's time to cut use of plastics," the Chief Executive Officer of Recology, a major U.S. waste and recycling company, called on the plastic industry and the state of California to reduce plastic use, explaining that even before China's actions, "we always struggled with what to do with many of the polymers that are being introduced into the waste stream."⁶⁸

Investment in domestic plastic recycling infrastructure is also expanding. Waste Management, the U.S.'s largest recycling company, invested \$110 million on recycling infrastructure in 2018, and other companies have made similar investments in sophisticated sorting technology to cut down on contamination.⁶⁹ In addition to improving sorting infrastructure, the industry has also seen investments in plastic recycling facilities that would

reduce the amount of plastic being sent overseas. For example, New Jersey-based company GDB International Inc. was among many others exporting the plastics it collected to China, but in the wake of China's new policy the company has decided to build processing systems to recycle plastic domestically.⁷⁰

While improving domestic recycling infrastructure in exporting countries is a necessary step forward, it has become abundantly clear that recycling alone will not be sufficient to absorb the ever-increasing amounts of single-use, low-value plastic on the market. Cities, states, and even entire countries are stepping up to enact policies that get to the heart of the problem: the proliferation of plastic.

The European Union has also taken bold steps to reduce waste in the region. Just last month the European Parliament passed and rubber-stamped the Single-Use Plastic Directive, which would place bans on some of the most problematic single-use plastics, including plates, cutlery, and expanded polystyrene food containers and beverage cups. The legislation also mandates that producers are financially responsible for the clean-up of certain wasteful products.⁷¹

The urgency of the plastic pollution crisis has sparked a surge of proposed reduction legislation in cities across the U.S. There are currently 14 states considering 27 comprehensive single-use plastic bans,⁷² in places like Hawaii, Vermont, and Rhode Island; 19 states are considering 65 plastic bag bans or fees;⁷³ 20 states are considering 36 policies mandating straws upon request;⁷⁴ and 12 states are considering 35 pieces of legislation aimed at banning polystyrene.⁷⁵ Currently the state of California is considering the boldest form of plastic reduction legislation in the country to date: a “Circular Economy” bill that would phase out single-use plastics by 2030.⁷⁶

THE FUTURE OF ZERO WASTE: “REJECTING THROW-AWAY CULTURE”

On a soggy winter afternoon in January 2019, local school children, teachers, and zero waste advocates gathered at the steps of city hall in Berkeley, California, to call for their representatives to pass a historic piece of legislation that would be a giant step forward for reducing plastic waste in the city. The Disposable Free

Dining ordinance mandates reusable foodware at restaurants for dining in, cutting the use of disposable utensils, plates, and cups, and slaps a 25 cent surcharge on disposable to-go containers, which must be certified compostable.

While some cities are wringing their hands helplessly in the face of China’s policy, community advocates in the city of Berkeley saw the ban as an opportunity to take action to reduce single-use plastic. Thanks to their efforts, the Disposable Free Dining ordinance passed unanimously in the city council, and implementation has already begun. In a recent opinion piece in the *Los Angeles Times*, one of the ordinance’s chief architects, Martin Bourque of the Ecology Center, and Annie Leonard, Executive Director of Greenpeace USA, wrote, “The ordinance does not simply ban plastic foodware, leaving businesses to replace it with other throwaway materials: It rejects throwaway culture altogether.”⁷⁷ Bourque and others hope that this ordinance will be replicated in more and more places, as communities around the world lift up their voices to demand a future where nothing, and no one, is disposable.



City Council Member Sophie Hahn takes the podium next to Ecology Center Executive Director Martin Bourque at a press conference on the Berkeley Disposable Free Dining Ordinance on January 22, 2019.

RECOMMENDATIONS

The plastic waste problem is complex, dynamic, and changing rapidly. Many actors can take important steps to safeguard human health and the environment, including the following actions:

- **Governments should take collective action through the United Nations and binding international agreements** to address the production, export, recycling, and disposal of plastic. One important element of this would be requiring plastic waste exporters to seek prior informed consent from countries receiving their exported waste. This will significantly enhance recipient countries' ability to enforce their policies and legislation on the management of plastic waste. Important upstream measures, including a phase-out of problematic single-use plastic products and packaging, an end to exports of plastic waste to lower-income countries, and the global implementation of Extended Producer Responsibility,⁷⁸ have also been proposed. Negotiations on some of these measures under the Basel Convention and the United Nations Environment Assembly are ongoing and need support from national governments, industry and civil society alike.
- **Developing countries should impose bans on importing plastic waste** to prevent the dumping of waste from high-income countries on poor and under-resourced communities. To be effective, legislation on bans needs to be accompanied by robust, adequately resourced monitoring and enforcement measures.
- The private sector, having created the plastic problem, is in the best position to quickly address it. **Redesigning products, packaging, and delivery systems to eliminate the use of single-use plastic products and packaging is the ultimate solution to plastic pollution.** Companies must reduce both production and post-consumer waste and take financial responsibility for managing post-consumer waste that cannot be avoided, including existing plastic waste.
- **Local and national governments must prioritize source reduction** through bans on problematic plastic products and packaging and by mandating Extended Producer Responsibility. Banning toxic additives that undermine safe recycling and requiring the increased use of post-consumer plastic in recycling can help facilitate the collection and recycling of existing plastic. However, because plastic recycling does not happen in a closed loop, and plastic is rapidly downcycled to zero utility, these are primarily interim measures.
- **Governments should make rights for waste pickers and recycling workers central to system reform.** The economic incentives to accept plastic waste are a pervasive force that speaks to a larger failure to address poverty and ensure decent livelihoods for everyone. No one should have to endanger their health or environment for the ability to earn a living. Waste management reforms must incorporate worker leadership throughout the planning and implementation process.⁷⁹
- **Governments must prohibit the burning of plastic**, whether in the open, in waste incinerators, in cement kilns, in plastic-to-fuel operations, in makeshift furnaces as fuel, or in landfill fires. Shutting off the plastic waste trade by itself is insufficient if poor and marginalized communities continue to host polluting disposal technologies.
- **Exporting countries must take responsibility for their plastic reduction and recycling domestically.** Investment in domestic recycling infrastructure should achieve high environmental and social outcomes and prevent further exports. However, plastic recycling should not be used as justification for further single-use plastic production but as a pathway towards zero waste.

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 78. For Extended Producer Responsibility to drive real change, it must prioritize upstream provisions for product redesign. These include transparent and public reporting of feedstocks used and impacts; waste prevention at source through alternative delivery systems or materials substitution; requirements for longevity, reusability, repairability, recyclability and non-toxicity; and reuse targets, among others. For a real incentive to change, EPR schemes should distinguish individual producers, penalizing those who resist change and acknowledging those who redesign to reduce waste. In all cases, producers should cover the costs but the public should have ultimate oversight of collection and treatment systems.
 79. Economic development plans should focus on building strong local economies with more opportunities for local, sustainable, dignified, and safer jobs in collection, recovery, composting, recycling and repurpose. These programs should allow worker leadership in recycling system transitions: waste pickers and informal recyclers must have the power to improve materials management and to be integrated in the change to new systems and business models (e.g. specific material bans or establishing new delivery systems as alternatives to plastic packaging), with training for new roles. Waste pickers and waste workers must also be given the opportunity to represent themselves in local and national policy spaces to advocate for themselves.

DISCARDED

Communities on the Frontlines of the Global Plastic Crisis

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GAIA is a global network of more than 800 grassroots groups, NGOs, and individuals. We envision a just, Zero Waste world built on respect for ecological limits and community rights, where people are free from the burden of toxic pollution, and resources are sustainably conserved, not burned or dumped. We work to catalyze a global shift towards environmental justice by strengthening grassroots social movements that advance solutions to waste and pollution.

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