



THE GLOBAL PLASTIC CRISIS

IIPHRP Global Public Health Case Competition | Fall 2019



All characters, organizations, and plots described within the case are fictional and bear no direct reflection to existing organizations or individuals. The case topic, however, is a true representation of circumstances in Malaysia. The case scenario is complex and does not necessarily have a correct or perfect solution, and thus encourages a judicious balance of creative yet perceptive approaches.

The authors have provided informative facts and figures within the case to help teams. The data provided are derived from independent sources, may have been adapted for use in this case, and are clearly cited such that teams can verify or contest the findings within their recommendations, if it is pertinent to do so. Teams are responsible for justifying the accuracy and validity of all data and calculations that are used in their presentations, as well as defending their assertions in front of a panel of knowledgeable judges representing different stakeholders.

The information and data given in the following text is meant as a suggestive guide but is not considered all-inclusive. Teams may choose any area(s) of approach that they deem impactful and feasible.

NARRATIVE

You work for the city council of a small town on the coast of Malaysia. Since China banned the import of “foreign garbage” in January 2018, your small town has been overtaken by more than 23,000 tons of plastic waste. Additionally, at least 10 illegal recycling plants have opened just outside of town in the last 6 months. These plants operate primarily at night, creating serious noise disruption and concern over air pollution and smell from burning plastic waste. Town residents complain of insomnia due to the noxious smell and are suffering from rashes, severe coughing, and other respiratory ailments.

The city council is highly motivated to shut down these illegal factories but does not have the resources to adequately and consistently police the area. Additionally, the town is left with all the plastic waste that has been previously dumped on town land without a way of properly disposing of it. Some residents have even found reasonable employment as waste pickers – individuals who help sort through the dumped waste and bring it to the plants for processing.

BACKGROUND INFORMATION ON MALAYSIA

Malaysia is located in Southeast Asia, the southernmost country on the Malay Peninsula, as well as one-third of the island shared with Borneo. Its closest neighbors include Indonesia, the Philippines, Thailand, and Cambodia. The population has an extremely uneven distribution with more than 80% of the total Malaysian population living near the coast on the Malay Peninsula (World Fact Book, 2019). The total population of Malaysia now exceeds 31 million people.

The population in Malaysia is ethnically diverse – 60% of the population identifies as Malay or other indigenous groups, 20% identifies as Chinese Malaysia, and more than 10% are other non-citizens. Religion is also highly diverse with significant portions of the population practicing Islam, Buddhism, Christianity, and Hinduism, as well as other religions (World Fact book, 2019). This diverse population has led to increasing tensions between ethnic groups, particularly the Malays and Chinese. These tensions have continued since May 13, 1969 when a Malay mob burned Chinese-owned shops in Kuala Lumpur, resulting in significant violence. However, anecdotal evidence suggests there is still a perceived wealth gap between Malays and Chinese that contributes to continuing ethnic tensions.

Malaysia was a colony of Great Britain until securing independence in 1957, which has influenced their current governmental structure. Malaysia is made up of 13 states and 1 federal territory. The federal government is a parliamentary democracy with a constitutional monarchy and the prime minister is the head of the government (CIA Fact Book, 2019). While the federal government has primary jurisdiction over country operations, the state governments also maintain some authority. State governments are frequently a mix of appointed or elected officials and hereditary leaders, called Sultans (Misachi, 2017). Within each state, local governments primarily provide services to the local population, including waste management operations (Misachi, 2017).

Economically, Malaysia is classified as upper-middle income, with a GDP of \$312 billion. Since the 1970s, their economy has moved aggressively toward the manufacturing and service sectors, with more than

50% of the population now working in the service industry (World Fact Book, 2019). In 2009, only 4% of the population lived below the poverty line (World Fact Book, 2019).

BACKGROUND INFORMATION ON RECYCLING

For decades, developed nations around the world have shipped their plastic waste around the world for processing. With the complexities and time required to effectively sort plastic recycling – often done by hand – Western nations are ill-equipped to process their waste on their own due to labor costs. As the use of single-use plastics has increased, it has been more economical to ship global waste to China and other nations than to attempt to process the waste at home (Parker, 2018). Unfortunately, the plastic recycling process is highly inefficient. In fact, in the last 25 years it is estimated that only 9% of global plastic waste has actually been recycled (See appendix 1, fig 2) (Brooks, Wang, and Jambeck, 2018; Ritchie and Roser, 2018). Since 1992, China has imported nearly 45% of the world’s plastic waste (70% when you include Hong Kong), which they used to become the leading manufacturer in cheap synthetic clothing and goods (Parker, 2018; de Freytas-Tamura, 2018).

However, as of January 1, 2018, China has effectively banned the import of plastic recycling for processing from Western countries. China’s ban on plastic scraps that aren’t “99.5% pure” has essentially eliminated them as a dumping ground for the world’s waste (Parker, 2018). As a result, western countries are turning to countries like Indonesia, Thailand, Vietnam, and Malaysia as plastic waste processors, but these countries are running into capacity issues (de Freytas-Tamura, 2018). The disruption caused by this ban on imports will displace an estimated 111 million metric tons of plastic waste worldwide by 2030 (Brooks, Wang, and Jambeck, 2018). Since China stopped accepting plastic waste, Malaysia has become leading destination for waste from developed nations around the world (Parker, 2018).

The influx of global waste into Malaysia has had staggering consequences on many local communities. Jenjarom, a town of 30,000 residents, has been inundated with nearly 19,000 tons of plastic, due to its proximity to Port Klang, Malaysia’s largest port (Bendix, 2019; Tan, 2019). This issue has been exacerbated by many illegal recycling factories that have flooded the small town, many of which burn or bury their toxic plastic waste as it is cheaper than paying to dispose of it legally at designated waste centers (Tan, 2019). Unfortunately, many of these plastics contain carcinogens, such as mercury, dioxins, and polychlorinated biphenyls (PCBs), which are known to cause cancer in humans (Bendix, 2019; Tan, 2019). Residents of Jenjarom are already experiencing observable declines in their health, including rashes, severe coughing, and other respiratory ailments (Tan, 2019).

The improper disposal of waste in developing nations around the world is having a significant impact on air, water, and soil contamination. In many developing countries, open dumping and open burning of plastic waste is contributing to the spread of environmental contaminants and diseases. This impact is exceptionally significant in high population areas, such as city slums, where run-off from these dump sites is contaminating soil and groundwater (Ferronato and Torretta, 2019). Federal officials in Malaysia have been vocal in condemning the massive import of plastic goods – both legal and illegal - from developed countries. However, anecdotal evidence suggests that many government officials continue to receive payoffs from illegal import entities, creating a conflict of interest.

SUMMARY OF THE ISSUE

By June 2018, Malaysia had become the #1 importer of foreign plastic trash, but Malaysia's government is already making moves to ban low-grade plastics by imposing restrictions and shutting down illegal processing plants (Parker, 2018). The impact of the shift in global waste has been catastrophic to Malaysia's environment, health, and society at large (Saplakoglu, 2019). Plastic waste that arrives in Malaysia is often low-grade or too contaminated to recycle and ends up being illegally burned for disposal, which releases harmful environmental toxins into the air, soil, and water (Harris and Latiff, 2019).

In small towns and villages across Malaysia, land and water is being covered and contaminated in environmental pollutants, severely impacting residents' health. The federal government is attempting to curb and regulate the influx of global waste. However, illegal imports and unregulated factories continue to crop up across the country. To tackle this issue, Malaysia and other developing nations must both severely reduce the amount of waste coming into the country and find safe and cost-effective ways of disposing of the mountains of waste that are already there.

COMPLICATING ISSUES

- **International Relations:** You may live in a sovereign state, but much of this issue has been created by a worldwide recycling problem to which other countries contribute significantly. You will need to work with these countries while continuing to maintain positive relationships with their governments, societies, and corporate entities.
- **Malay-Chinese Relations:** Malaysia is still very sensitive to inter-ethnic sensitivities, particularly with the Chinese. Cultural evidence suggests much of this stems from the 1969 Sino-Malay sectarian violence that still haunts the country, as well as perceived wealth disparities between the Malays and Chinese (The Economist, 2017).
- **Illegal Operations:** Due to the continued value of producing recycled plastic pellets, the draw of setting up illegal recycling factories and cutting costs through illegal dumping and burning remains a significant barrier to the government's efforts to curb environmental contamination and plastic imports (Tan, 2019).
- **Political Corruption:** While government officials at all levels have been outspoken about the negative impacts the influx of recycling is having on Malaysia, many officials are receiving payoffs and bribes from illegal plastic importers to look the other way. These illegal recycling operations are frequently still being run by Chinese companies and anecdotal evidence has even linked these companies to the Chinese Mafia (Ananthalakshmi, 2018; Blake-Persen, 2018).
- **Occupational Health:** The use of informal and inexpensive labor in waste management systems in developing countries is unsustainable and creating a negative health impact on the larger population (see appendix1, figure 3). In many countries like Malaysia, waste pickers do not wear any safety equipment, such as facemasks, gloves, coveralls, or appropriate footwear and

may come into direct contact with hazardous waste at dump sites (Ferronato and Torretta, 2019). These safety issues, combined with the environmental factors of polluted atmosphere, high temperature, and exposure to hazardous chemicals, creates a highly dangerous and unhealthy work environment for households relying on waste picking as their main source of income (Jereme, Siwar, and Alam, 2015).

- **Environmental Impacts:** Microplastics (plastic debris measuring less than 5 mm) are currently known to be one of the furthest reaching environmental contaminants. Most of these microplastics come from the breakdown of larger plastic items over time and have contaminated an estimated 83% of the world's tap water. Microplastics have been shown to be harmful to the health of both humans and animals, although the full affect is unknown. A recent study has shown that microplastics are being spread through the air, as well as water sources, leading to significant changes in environmental chemical compositions beyond those originally thought to be affected (Stack, 2019). Open dumping and burning of unwanted plastics has also contributed to a decline in air quality and an increase in environmental contaminants in Malaysia (Ferronato and Torretta, 2019). Microplastics are also making their way into the food chain and ultimately the human diet, although the impact of this is still largely unknown (Wright and Kelly, 2017).

CONCLUSION

Your city council has tasked you with outlining a proposal to send to the federal government to help tackle the local waste issue in your town. The proposal needs to detail steps to implement an action plan to slow (and ultimately stop) the influx of waste coming into town without negatively impacting other areas of Malaysia. You will also need to address how to eliminate the 23,000 tons of waste that has already been dumped in your town and how to police and eradicate illegal processing operations.

The federal government is currently soliciting similar proposals from other towns across the country. Accepted proposals will ideally include some resource and cost-sharing systems and will be translatable for use in other towns experiencing similar issues. They have also requested a detailed list of what resources – financial or other – would be needed to take action on your proposal and where you plan on finding these resources as neither the federal or local government anticipate providing enough financial resources to completely cover all expenses.

Your proposal should contain short-term solutions with immediate impact for towns in Malaysia, as well as potential long-term solutions so other developing nations do not become the next dumping ground.

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WRITING TEAM | Fall 2019

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APPENDIX A: Figures

Fig. 1. Estimated mass of global displaced plastic waste due to the new Chinese import ban based on cumulative imports of PE, PS, PVC, and other plastics into China

From Brooks, Wang, and Jambeck, 2018

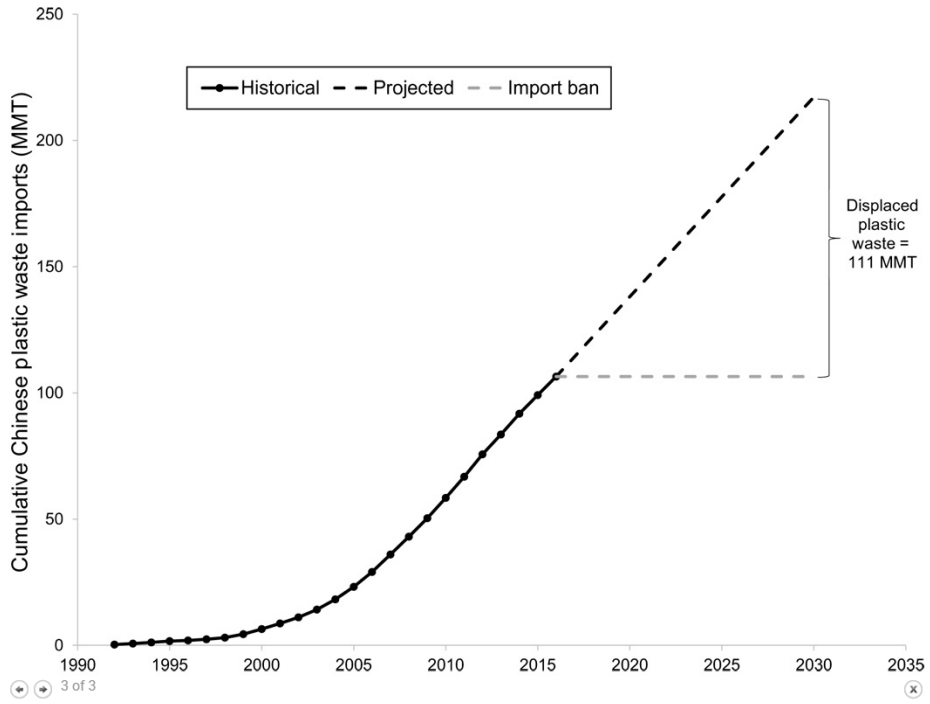


Fig 2: Global plastic waste by disposal method
 From Ritchie and Roser, 2018

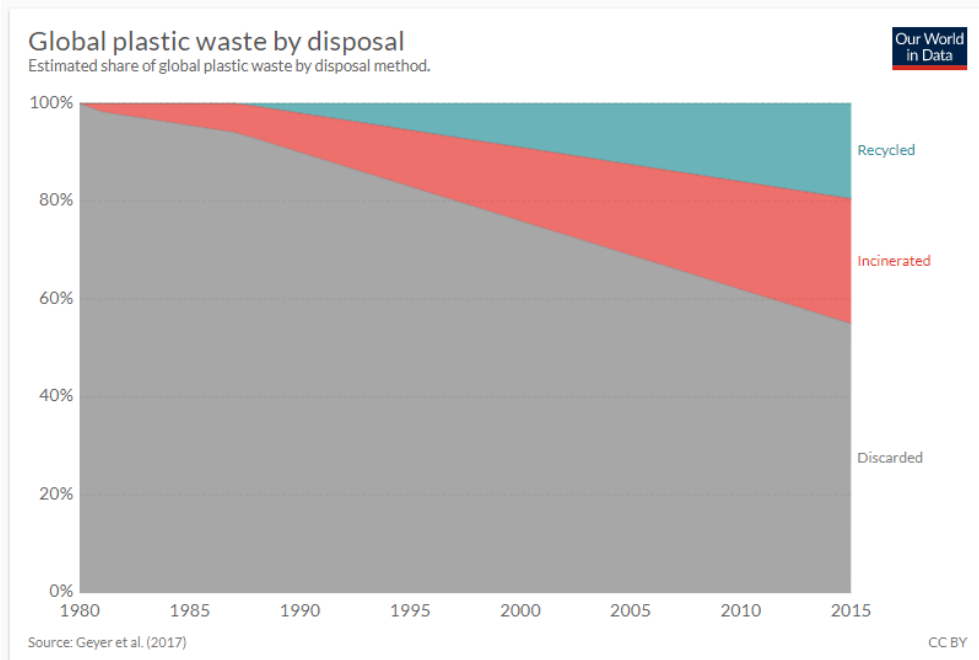
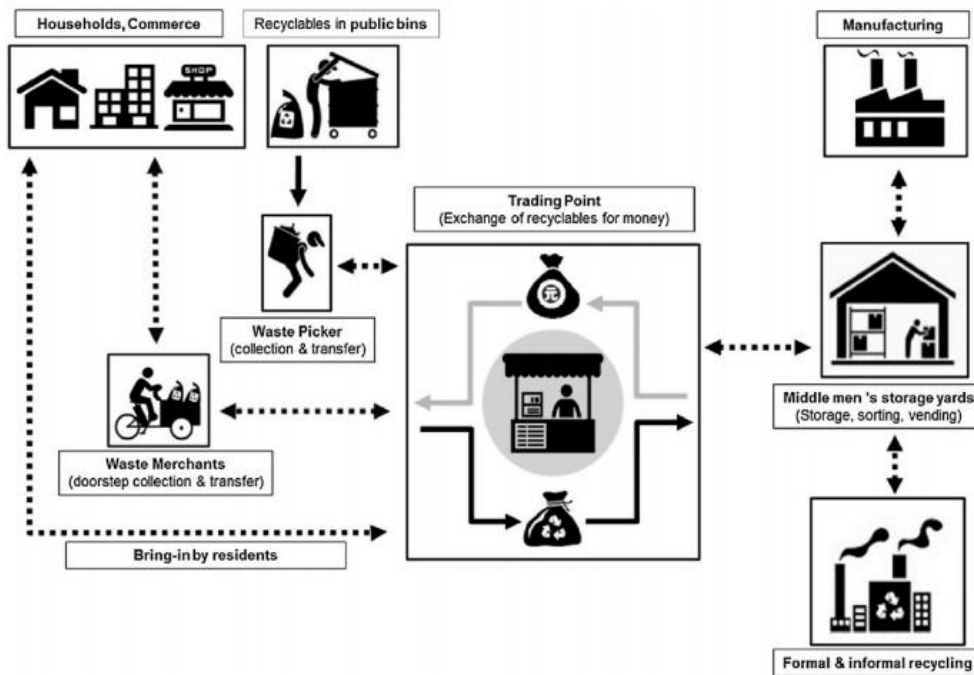


Fig 3. Informal recycling chain in China, schematically depicted
 From Ferronato and Torretta, 2019



TEAM NAME:				
JUDGE NAME:	Needs Improvement	Satisfactory	Exceeds Expectations	Outstanding
Case Analysis: Demonstrates understanding of all pertinent background information.	1	2	3	4
Case Solution: Utilizes interdisciplinary methodology with creative and innovative thinking.	1	2	3	4
Defense of Intervention: Demonstrates logic and organization of information; intervention is feasible and based on case analysis.	1	2	3	4
Potential for Impact: Solution is sustainable, resilient, prepared for community capacity-building	1	2	3	4
Research Best Practices: Team had enhanced analysis with a significant number of high quality external sources.	1	2	3	4
Teamwork: great team rapport; presented analysis as a unified voice	1	2	3	4
Presentation Quality: Communicated clearly and concisely; visual aid enhanced presentation experience. Did not deviate from presentation	1	2	3	4
Questions & Answers: Responded appropriately to questions	1	2	3	4
Total				