



# MARINE PLASTIC MANAGEMENT: THE GENDER DIMENSIONS

## Introduction

South East Asian countries are both significant producers of and impacted by marine plastic debris. Of the 10 river systems that carry 90 percent of the marine plastic into the ocean, eight are in Asia: the Yangtze, Indus, Yellow, Hai He, Ganges, Pearl, Amur and the Mekong.<sup>i</sup> Further, according to a 2010 estimate, six ASEAN member states are among the top 20 producers of marine plastic waste in the world: The Philippines is the third (with 0.28 to 0.75 million tonnes per year of marine plastic debris), followed by Vietnam in fourth place (with 0.28 to 0.73 million tonnes per year), Thailand in sixth (with 0.15 to 0.41 million tonnes per year), while Myanmar ranks seventeenth (with 0.07 to 0.18 million tonnes per year.<sup>ii</sup> The Asia-Pacific Economic Cooperation (APEC) estimated that marine debris cost the economies of countries in the region US\$10.8 billion in 2015, of which the tourism industry lost US\$6.41 billion, shipping and transport lost US\$2.94 billion, and fishing and aquaculture lost US\$1.47 billion.<sup>iii</sup>

Since the COVID-19 outbreak in January 2020, plastic pollution around the world has significantly increased with substantial demand for Personal Protective Equipment (PPE)<sup>iv</sup> which is made from polypropylene (PP), a single-use plastic is needed for face shields and masks. The magnitude of the increase in plastic waste due to the pandemic is still unknown but estimates suggest most of the global discharge into the ocean of hospital waste alone (72%) is from Asia.<sup>v</sup>

Increasingly, research notes that women and men experience rising plastic waste pollution differently and there is a need to better the gender dimensions of the plastic value chain.<sup>vi</sup> Overall, there is recognition that gender roles and responsibilities, as well as economic and social factors impact women and men's engagement in the plastic value chain.

The gendered division of labour, as well as gender stereotypes of what women and men ‘should do’, impact who in the home and the community is in charge of, and must contribute to, plastic waste management.<sup>vii</sup> However, evidence also suggests that livelihood options, access to resources, and differing levels of knowledge and information are influencing factors for who works in plastic production, and how women and men use, dispose of and recycle plastic as part of solid waste management.<sup>viii</sup> Women and men also contribute to and are impacted by marine plastic pollution differently. Due to their different roles and occupations for example in fisheries and tourism, marine plastic pollution impacts livelihoods and lives in differentiated ways.

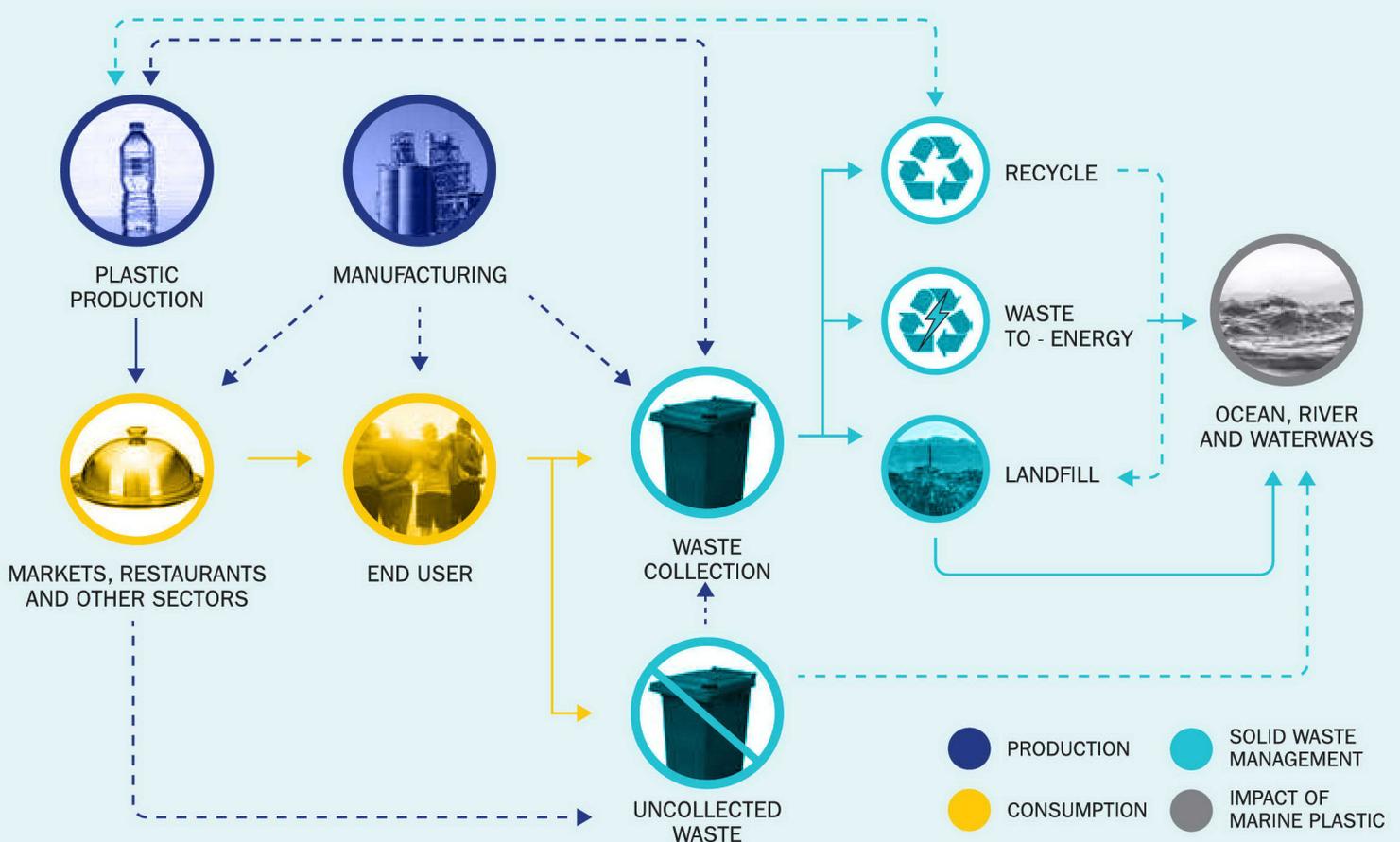
## The policy landscape of marine plastic management is emerging, as ASEAN countries recognise the need for policies and strategies to manage marine plastic waste.

In June 2019, the Association of Southeast Asian Nations (ASEAN) Member States committed to improving the management of marine plastic by signing the Bangkok Declaration on Combating Marine Debris in the ASEAN region.

ASEAN also established the 2021 ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States.<sup>ix</sup> National policies and strategies are expected to follow but are still in the early phases of development and it is unknown yet how the gender dimensions of the plastic value chain will inform policy and programme development.

The purpose of this knowledge brief is to explore the gender dimensions of four stages of the marine plastic management value chain; production, consumption, solid waste management and marine plastic debris (see Figure 1). The brief draws out key findings from a six-country study including Cambodia, Laos PDR, Myanmar, Philippines, Thailand and Viet Nam and contributes to the emerging evidence base on the role of gender in marine plastic management. The brief targets practitioners and policy makers working to promote gender responsive marine plastic management policies, strategies and programmes in East Asia and the Pacific.

**Figure 1: Four Stages of Marine Plastics Value Chain Covered in this Study**



## Production

Plastic production is a significant industry in some Asian economies and demand continues to grow.<sup>x</sup> In 2017, Thailand's plastic production was 8.5 million tons and consumption was pegged at 4.4 million tons.<sup>xi</sup> Coinciding with the increasing demand for plastic products in the country and the region, Thailand's petrochemical industry has become the second largest producing in Southeast Asia.<sup>xii</sup> In 2018, Thailand produced 11.8 million tons of petrochemical products, including plastic resins, and the plastics industry contributed 1,100 billion Thai baht (US\$36.9 billion) to the national economy, representing 6.71 percent of Thailand's GDP.<sup>xiii</sup> In the Philippines, plastics were the fifth largest import and as of March 2019, worth US\$235.04 million, an increase of 14.2 percent over the previous year.<sup>xiv</sup> Total plastic production in 2019 in the Philippines was estimated at 2,592,000 tons.<sup>xv</sup> In 2019 in Myanmar there were about 6,000 plastic factories<sup>xiv</sup> and the plastics market is expected to register a compounded annual growth rate of 6.25% during the period 2020–2025 with greater demand specifically from packaging and medical sectors.<sup>xvii</sup>

Despite the significant increase in demand and production of plastic, **emerging evidence notes that in Asia, women own fewer and smaller plastic production enterprises than men.** For example, in terms of business ownership of plastic enterprises in Myanmar, 22% of manufacturing enterprises are female-owned, and 6% are managed by women.<sup>xviii</sup> When broken up by firm size, we see that women's ownership decreases as firm size increases. Women own 23% of micro firms, 21% of small companies, and 13% of medium and large enterprises.<sup>xix</sup> However, the reverse is true for women in management positions: 3% of micro, 10% of small, and 28% of medium and large companies are managed by women in Myanmar.<sup>xx</sup> More evidence is needed to explain why women own fewer and smaller plastic production companies.

Gender gaps also exist in plastic production workplaces, with **fewer women in technical roles in plastic production than men.** Women tend to hold lower skilled jobs than men, which is similar to other manufacturing industries in the region. In the private sector in Thailand, almost all positions requiring a chemical engineer or polymer scientists are occupied by men<sup>xxi</sup>, and human resource departments reported being unable to find qualified women for such positions.<sup>xxii</sup>

While women make up 30–40% of science, technology, engineering and mathematics (STEM) graduates in Lao PDR, the Philippines, Thailand, and Vietnam, few are retained in research jobs in the plastics industry,<sup>xxiii</sup> especially in polymer science.<sup>xxiv</sup>

**Sex segregation is apparent in employment within plastic production factories and those industries that use plastic as a raw material; women tend to be in lower skilled roles and with lower pay compared to men.** Gender differentiated patterns of employment vary across Asian countries. In the Philippines men dominate plastic production,<sup>xxv</sup> while in Viet Nam women dominate.<sup>xxvi</sup> As for employees in the rubber and plastics sector in Myanmar, female workers make up almost half the workforce (48.1 percent).<sup>xxvii</sup> Among the industries that use plastic as a raw material in Myanmar, the manufacturing of automobile parts is male dominated, while the manufacturing of toys and other electronics, garments, plastic furniture, and plastic fashion accessories is female dominated.<sup>xxviii</sup> Women tend to dominate industries that involve repetitive tasks for what is seen as “nimble fingers”<sup>xxix</sup>, and work on assembly lines. All of which often pay less. A study on gender in the plastic production sector in Viet Nam from 2003 showed that women in plastic production are paid as low as 68% of what men are paid.<sup>xxx</sup> Further studies are needed to understand what existing skill development trainings are available to women in plastic production and how to support women's vertical movement into managerial and leadership roles in plastic production.

**Health implications of plastic production are significant, affect women and men differently, and requires further investigation.** The nature of occupational exposure in the plastics industry places both male and female workers at high risk. A review of the literature on toxicology, industrial hygiene, and epidemiology explores the occupational hazards associated with plastics for male and female workers,<sup>xxxi</sup> with findings noting that workers are exposed to mammary carcinogens and endocrine disrupting chemicals, as well as a work environment that is contaminated by dust and fumes.



The body burden (accumulation of synthetic chemicals stored in the human body at detectable levels) of such workers far exceeds that found in the general public.<sup>xxxii</sup> Although both women and men are at risk, the ways in which they are exposed to plastic and their occupational hazards differ. Women and men work in different positions and sectors in the plastics industry, where women are concentrated in lower paid positions and are more likely to be in hazardous work environments than male counterparts.<sup>xxxiii</sup>

**UNEP (2016) noted that health impacts due to chronic exposure to plastics and industrial chemicals are gender-differentiated and it is important to ensure that various types of risks facing both women and men are taken into considerations when addressing safety in the workplace.**

## Consumption

Half of the world's plastic packaging is food packaging (bottles, jars, etc.).<sup>xxxiv</sup> Food packaged in plastic is not only easier to carry, but also has a longer shelf life and is easier to transport.<sup>xxxv</sup> Sachets, which are not recyclable, are among the most common pieces of plastic waste in developing nations. Single use plastics, such as cutlery for serving and eating food, are also very popular in Asia; half of plastic waste in Myanmar is comprised of single-use plastic.<sup>xxxvi</sup> This contributes significantly to marine plastic pollution.

### **Consumption of plastic food packaging is gendered.**

Women dominate wet markets as vendors, and work in cafés and eateries where large volumes of plastic are consumed.<sup>xxxvii</sup> Women also make up a large share of food and street vendors in Asia. In Cambodia, 76.9% of street vendors are women<sup>xxxviii</sup> while micro businesses with one to two staff account for 93.3% of the total number of street businesses.<sup>xxxix</sup> The use of plastic for food packaging has eased workloads and reduced costs for food and street vendors. Single-use plastic in particular has made it more hygienic and easier for both buyers and sellers of food (see Box 1),<sup>xi</sup> allowing the high share of women vendors to benefit.

### **Box 1: Plastic consumption: Cambodia's café culture**

Cambodia's café culture is a ubiquitous user of plastic due to the immense volume of coffee consumed across the country. From street vendors to local café chains, the plastic used and waste generated is staggering. A popular local coffee chain uses 8,000 plastic cups/day, while an international chain uses an estimated 44,000 cups every day in Cambodia alone. Street vendors also account for a large portion of plastic consumption in Cambodia, given their accessibility and cheaper prices. Small businesses in Cambodia cannot always afford suitable alternatives, and plastic products are often cheaper.

Source: Vantha and Himel 2020.

### **Gendered household responsibilities influence plastic consumption in the home.**

Retail activities (both consumer and wholesale) have been identified as the largest source of low value plastic waste generated by households in the region. An average urban resident in Cambodia is estimated to use 2,000 plastic bags per year, with 10 million plastic bags consumed in Phnom Penh every day.<sup>xii</sup> An estimated annual household plastic packaging consumption of the Philippines is 1,281,000 tons, with a per capita rate of 12.40 kg.<sup>xiii</sup> While gendered plastic consumption patterns have not been explored, existing research has shown women make 85 percent of family shopping decisions.<sup>xiiii</sup> An average of 2,700 bags a year are consumed by a Cambodian housewife shopping for her family at wet markets alone.<sup>xiv</sup>

In concert with this, research from Viet Nam notes that it is women in the home that initiate and actively participate in plastic reduction activities. This includes changing shopping habits, using environmentally friendly bags instead of plastic bags, mobilizing children and relatives to practice collecting, classifying, and reusing waste at the source; this has led to reducing the amount of plastic waste discharged into the environment as well as the burden of collecting, classifying, and disposing of plastic waste in the next stages of the waste chain.<sup>xv</sup> An example of a women-led initiative from Laos PDR in Box 2 demonstrates the influential role women can play in supporting changing plastic consumption patterns.

## Box 2 – Women-led social enterprise to reduce the consumption of plastic straws

Arounthay Khounghakoune, working with the ethnic Khmu people, developed a way to use the local bamboo to make reusable straws (World Bank 2019a). Bamboo Lao is a social enterprise founded in 2017 that aims to offer reusable and environmentally-friendly bamboo straws in all hospitality businesses in Lao PDR to radically decrease the consumption of single-use plastic straws. Using resources available in rural areas, including minimal electricity, old and broken barrels, as well as locally available bamboo, this project supports disadvantaged groups to develop new livelihoods. Villagers, mostly women, are trained in processing bamboo to produce re-usable straws, as well as how to market these straws through social media and during exhibitions. As of early 2021, the enterprise has produced more than 80,000 reusable bamboo straws displacing an estimated 5 million single-use plastic straws. It has conducted training free of cost and purchased bamboo straws for sale in the city. It has also developed other bamboo utensils for sale using indigenous bamboo varieties and a proprietary natural treatment process. Ms. Arounthay Khounghakoune identified several options for increasing future growth:

- Conduct research into other species of bamboo and other natural products
- Invest in raising awareness about sustainable harvesting of bamboo
- Reduce cost and paperwork associated with export of such produce to other countries
- Raise awareness about the importance of environmentally friendly products
- Raise awareness among users about the hygiene and safety of recyclable materials compared to plastic
- Support small village-based training and investment in the production of eco-friendly products
- Support large investments in the marketing of eco-friendly products

Source: Meet the Innovators Battling Plastic Waste in Laos: Arounthay Khounghakoune [online]. Feature Story, World Bank, May 31, 2019.

## Solid Waste Management

Solid waste management (SWM) in Asia is an increasing priority, with rapidly growing urban centres and population growth. An estimated 55–60% of global plastic waste leakage comes from five developing economies: China, Indonesia, the Philippines, Thailand, and Viet Nam.<sup>xvii</sup> Governments across the region are developing SWM policies and programmes, including the popular 3Rs program – Reduce, Reuse and Recycle – particularly as plastic pollution continues to grow. SWM is also of critical importance to mitigating marine plastic debris as households contribute significantly to waste leakage into waterways and oceans.

**At the household level, women are dominant plastic waste managers.** In the home, women often manage household waste as part of their unpaid domestic work, as it is seen as an extension of their care responsibilities.<sup>xviii</sup> Therefore, SWM programs and policies have to date targeted women. This has included 3R programs in Da Nang, Viet Nam<sup>xviii</sup> as well as sorting household waste initiatives in Yangon Myanmar,<sup>xix</sup> both with mixed results.

The burden of household waste management can be even heavier for poor women in parts of Asia, where waste removal fees are incurred. For example, in Lao PDR, research has shown that the way waste collection fees are gathered has a large impact in terms of who has access to waste management services; that is, poor women and men who cannot afford waste management services must shoulder the work themselves.

**Sex segregation exists in employment in solid waste management** at the municipal or district level. For example, in the formal sphere of waste collection in Yangon and Mandalay City in Myanmar, men are employed in jobs with monthly salaries and job security, while women are employed in large numbers as casual laborers with lower wages. Men are employed as truck drivers and helpers to load garbage into trucks, women are employed as sweepers.<sup>ii</sup> Specifically, in January 2021 in the Mandalay City Development Committee for waste management women comprised around 63% and men 37%, where men are paid the minimum wage of MMK 150,000 (US\$102) per month as truck drivers and women workers are paid around MMK 4,000–6,000 (US\$2.7–4.1) per day as street sweepers.<sup>iii</sup>

Similar patterns of employment can be found in the Philippines.<sup>liii</sup> Gender stereotypes and social norms influencing the appropriate type of work for women and men are contributing factors to the sex segregation in SWM jobs.<sup>liv</sup> However, in some instances discriminatory laws prevent women from accessing certain jobs in waste management. In Thailand, a law stipulates the maximum load that women and men can carry at one time—for women this is 25 kg, while for men it is 55 kg—resulting in women hired mainly for sweeping and cleaning positions.<sup>lv</sup> A key concern with this is the lack of access to decent and equal wages and remuneration for work of the same value for women in the SWM sector.<sup>lvi</sup>

**Informal waste management is often dominated by women** in Asia, where low wages and perilous conditions and safety are a concern. In Viet Nam, 65% of informal waste collectors are women.<sup>lvii</sup> In one southern Thailand municipality however, a study of temporary waste pickers showed that around 75% are men and 25% are women.<sup>lviii</sup> The study found that these temporary waste pickers earn very low wages, at THB 7,500 (US\$241) per month on average, which is below the minimum wage. In the capital of Laos PDR, informal waste collectors tend to be mostly older women who are unable to find other sources of livelihood and collect trash using a push-cart; the income of these women is dwindling because of changes in the structure of the recycling business as well as intense competition.<sup>lix</sup> Often women work as waste collectors either by themselves or with family members, including children in Laos PDR, therefore adequate working conditions, health and safety concerns and other social safety nets are not readily available to them. COVID-19 and the increase in hospital and medical waste is further exacerbating risks for these vulnerable workers across the region. Improper disposal of PPE, including masks, puts waste collectors at risk as they usually lack protective equipment while sorting and collecting recyclables from mixed garbage.<sup>lx</sup>

Asian countries are at different phases of establishing a recycling industry. Myanmar's plastic recycling industry is still in its infancy, however since China banned the import of plastic waste in January 2018, Myanmar's plastic waste has to be processed within the country or sold to new destinations.<sup>lxi</sup>

Yangon's recycling industry has approximately 6,000 workers, including garbage collectors, small junk shop owners, large junk shops, pre-processors, and recyclers.<sup>lxii</sup> Of these businesses, 78 percent are owned by men, while almost 70 percent of the daily wage workers are women.<sup>lxiii</sup>

However, in Viet Nam, with currently more than 2,000 small-scale enterprises and a high industrial growth rate, plastic recycling constitutes a very promising industry and a number of programmes are underway to empower women as entrepreneurs in plastic waste management (See Box 3). It is estimated that the recycled plastics industry in Viet Nam will grow at an annual rate of 8.7 percent between 2019–2024, which is higher than the GDP growth rate of 7.1%.<sup>lxiv</sup> Regarding household solid waste, most Vietnamese families have a habit of segregating recyclable garbage such as plastics, paper, and metal to sell to informal garbage collectors, called scarp collectors. Scrap collectors collect and buy plastic waste as well as recyclable materials from households and streets, before this waste is collected by an environmental service company and sell the scrap to recycling facilities. In the early 2000s, in Hanoi alone, there were about 6,000 scrap collectors, more than 90% of whom were women, mostly non-residents aged 25–40 years.<sup>lxv</sup>

Research notes that **recycling has gendered implications**, including working conditions and gender-based segregation of women employed in recycling businesses (for example junk shops, scrap buyers, recycling factories) where working conditions are poor or non-existent, and women tend to be concentrated in work that is exposed directly to waste.<sup>lxvi</sup> This research also found that in the household, recycling programmes can increase in women's unpaid workload in order to segregate and manage community-based recycling. Solid waste management as a whole presents significant opportunities in the region for increasing women's access to formal employment and narrowing existing gender gaps in recycling. The process of developing and implementing solid waste management policies and programmes can also create a platform for increasing women's voice, participation and role in decision making on waste management.

### Box 3: Women as solid waste entrepreneurs in Viet Nam

Empowering women as solid waste management entrepreneurs and protecting women workers is one of the keys to success in plastic waste management. A report by the Center for Environment and Community Research (CECR 2019), Women Empowerment in Plastic Waste Management, presented the results of a field survey on women’s roles in waste management and their contribution to plastic waste management in Da Nang, analyzing the relationship between plastic waste and gender roles in Vietnam. The report recommended that although Vietnam needs to strengthen its legislative and implementation frameworks to reduce and manage its plastic waste, empowering women is one of the keys to success. The report recommends developing financial tools such as a revolving fund for working capital or loans to encourage women’s participation in the waste management chain, leveraging extended producer responsibility (EPR) to support women’s entrepreneurship and young women’s start-ups, as well as to help waste collectors and sorters to improve their income and living conditions. The report also recommends the implementation of rights-based social protection policies to ensure access to information, good working conditions, and health and social insurance for informal street collectors, pickers, and landfill scavengers.

## Marine Plastic Debris

Marine plastic debris is an increasing concern globally. The economic value of the adverse impact of marine plastics on fisheries, tourism, and biodiversity around the world has been estimated at US\$13 billion a year.<sup>lxviii</sup>

In Asia, the fishing and tourism industries are significant economic engines that provide livelihoods and food security to millions of people. The economic impact to coastal communities in particular is concerning and immediate policy action is needed. Table 1 presents the top 10 marine plastic waste items across six Asian countries.

**Table 1: Top 10 marine plastic waste items**

Cambodia	Laos PDR	Myanmar	Philippines	Thailand	Viet Nam
Plastic lids	Food containers including fast food containers	Small plastic bags and packages	Food wrappers	Other plastic bags	Plastic fragments (mainly from plastic bags) (LDPE)
Plastic forks	Straws and stirrers	Crisps and sweet/candy wrappers/packages	Cigarette butts	Plastic beverage bottles	Fishing gear 1: rope, net pieces, lures, lines, hard plastic floats
Cigarette buds	Bottles	String and cord (less than 1cm)	Plastic bottle caps	Food wrappers (candy, chips, etc.)	Fishing gear 2: expanded polystyrene buoys, floats
Plastic bottle caps	Bags and shopping bags including pieces	Styrofoam (food and other)	Plastic beverage bottles	Plastic grocery bags	Plastic bag size 1 (0–5kg) 5. Styrofoam food containers 6. Hard plastic fragments (HDPE)
Food wrappers (candy, chips, etc.)	Cups and cup lids	Plastic pieces <50 cm	Straws, stirrers	Plastic bottle caps	Styrofoam food containers 6. Hard plastic fragments (HDPE)
Plastic grocery bags	Cleaner bottles and containers	Straw cutlery, trays	Other plastic bags	Plastic takeaway containers	Hard plastic fragments (HDPE)
Plastic cups, plates	Crates and containers/ baskets	Medical waste	Plastic takeaway containers	Straws, stirrers	Straws
Straws, stirrers	Strings and cords (less than 1 cm diameter)	Caps/lids	Plastic grocery bags	Plastic cups, plates	Other food wrappers
Other plastic bags	Foam packaging/ insulation/polyurethane	Furnishings	Plastic lids	Cigarette butts	Other plastics
Plastic beverage bottles	Covers/ packaging	Fertilizer bags	Plastic cups, plates	Plastic lids	Crisp/sweet packages

Source: Ocean Conservancy 2019; World Bank 2020, 2021; Osaka Blue Ocean Vision, 2021; Ocean Conservancy 2020

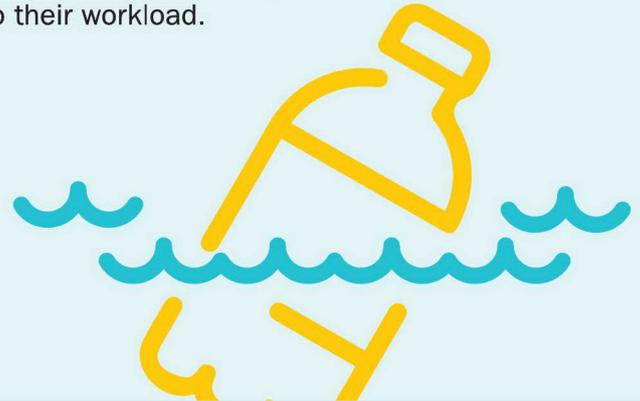
Similar to plastic production, consumption and SWM, marine plastic debris management is gendered. Examining two industries highly impacted by marine plastics, fisheries and tourism, can provide insights on how gender equality issues can influence and are impacted by marine plastic debris.

### **The gendered impact of marine plastics on fisheries**

Asia Pacific Economic Commission estimated that marine debris costs the fishing and aquaculture industry in the region US\$1.47 billion in 2015.<sup>lxxix</sup> Although only 10% of marine plastics come from fishery-related activities (including lost and discarded fishing nets and traps), fisheries are greatly affected by marine plastic debris, as are coastal communities.<sup>lxx</sup>

The impact of marine debris is different for women and men as they have distinct roles in fisheries.

Considerable research into the gender-based division of labour in fishing communities' note men more often engage in commercial off-shore fishing, while women usually engage in small-scale, near-shore or on-shore fishing (see Box 4).<sup>lxxi</sup> Women also dominate activities that support fishing for example in Thailand, such as mending and repairing fishing equipment, sorting fish landed by fishing boats, and processing and marketing fish.<sup>lxxii</sup> In many countries in Asia, women may fish informally for profit, and subsistence fishing and food security for the family also contribute to their workload.



### **Box 4. Gender roles in fisheries in the Philippines**

Both women and men are involved in fisheries in the Philippines, with more than 60 percent of the population living along the coastline and fisheries sector employing about 1.95 million workers (BFAR 2020). Fishing households are among the poorest communities in the Philippines, and women-headed households are among the most marginalized (UNEP and GWA 2019). Women have long been involved in subsistence fishing, especially reef gleaning, while men are more involved in gear-based activities. However, women's contribution to securing food and nutrition for coastal communities tends to be undocumented, undervalued, and even ignored (De Guzman 2019). Plastic pollution is one of the causes of degradation of coastal ecosystems, which impoverishes fishing communities. Other issues, such as the depletion of fish stock due to water pollution and overfishing, high population densities in coastal areas, and climate-change related problems also affect the income of fisherfolk, but plastic pollution definitely exacerbates the situation (UNEP and GWA 2019).

Near-shore habitats including beaches, mangroves, estuaries, and intertidal zones are used largely by women in fishing communities,<sup>lxxiii</sup> and marine plastic litter in such spaces creates major problems for women's income, as it harms the seafood by causing disease, reduces their catch, and causes economic loss.<sup>lxxiv</sup> The build-up of plastic debris in coastal zones is often more extreme and different in character from open-sea plastic pollution and has a more intense impact on near-shore fishing.<sup>lxxv</sup> However, men who tend to fish in deep waters, have also faced decreases in fish catches and consequent decreases in income due to marine plastic debris. The impact of men's reduction in fish catches can impact financial resources at the household level, which evidence suggests puts additional pressure on women to increase their income and seek other forms of income generation.<sup>lxxvi</sup>

Different roles and spaces result in differing impacts of marine plastic debris for women and men, and more research is needed to understand how the increase in marine plastic pollution is threatening the livelihoods of women and men employed in the fisheries sector and the impacts on food security, often a role which falls to women. Dependency and growth of the fisheries sector in the Asian region also means marine coastal management is increasingly becoming a priority for governments. Evidence from marine fisheries notes that policies, projects and initiatives that have successfully integrated a gender perspective in a wide range of contexts have led to more effective ocean management.<sup>lxxvii</sup> More research and affirmative action is needed to ensure gender perspectives and gender equality issues are considered in coastal management initiatives.

**Tourism and the gendered impact of marine plastic waste** Another sector that contributes to and is significantly affected by marine plastic debris is the tourism industry. Tourism has been reported to increase the amount of waste by up to one-third during peak seasons in some regions around the world.<sup>lxxxiii</sup> In terms of the impact of marine litter on tourism, reports from Bali in Indonesia note a decrease in the number of tourists due to an increase in marine plastic debris.<sup>lxxxix</sup> In South Korea, lost tourism revenue due to marine debris flowing from the Nakdong River to Geoje Island in July 2011 was estimated to be around US\$29–37 million.<sup>lxxx</sup>

The tourism sector is an important source of employment in Asia, particularly for women.<sup>lxxxvi</sup> In Cambodia, the Philippines, Thailand, and Viet Nam, the proportion of women employed in tourism is higher than men.<sup>lxxxii</sup> This includes airlines, hotels, travel agencies, and transport companies. In Myanmar, the tourism sector provides 5.9% of the women's total employment and 4.7% of men's total employment.<sup>lxxxiii</sup> Whereas in the Philippines, tourism accounts for 6.4% of the total female employment and there are twice as many women as men in this sector.<sup>lxxxiv</sup> More than half of the tourism businesses in Thailand and the Philippines are operated by women.<sup>lxxxv</sup> In addition to such formal businesses, a large number of women also make a living through retail trade connected to the tourism sector, often in the form of micro-enterprises, for example selling traditional handicrafts and others to tourists.

Tourism is also a significant source of informal employment for women, which also likely to be affected if tourism flows change due to marine pollution. Around 70% of women in the tourism sector in Viet Nam are in informal jobs which lack employment benefits and social security.<sup>lxxxvi</sup> There are more women entrepreneurs in tourism than in other sectors of the economy, mainly due to lower entry barriers, although women's enterprises are generally small or micro in size. Changes to tourism flows have significant impacts on both women's informal and formal employment; this has as seen by the impact of the COVID-19 pandemic and travel restrictions on tourism businesses.<sup>lxxxvii</sup> These changing tourism flows are likely to continue, as the world moves through and beyond the COVID-19 pandemic and as medical waste, including millions of masks, become a more common feature of marine pollution.

Evidence on the role women and men play in the plastic waste value chain is increasing, and women are being seen as key stakeholders' marine plastic management. A recent report by UNEP points out the potential role that women can play as champions to address marine plastic litter and recommends that governments and businesses use human rights instruments to mitigate the impact of plastic waste, while also empowering women to take a leading role.<sup>lxxxviii</sup> In another paper, Walschot uses a feminist perspective to analyze the growing environmental insecurity caused by marine plastic pollution and recommends that in order to strengthen international legal and policy frameworks regarding the reduction of plastic waste, it is important to recognize that both men and women have an active role to play in the solutions implemented.<sup>lxxxix</sup>

## Recommendations

Tackling marine plastic pollution in Asia requires a holistic approach including both public and private sectors, investors, communities and individuals. This brief presents evidence of how gender roles and responsibilities, the gender division of labour and gender inequalities in women's access to decent work and resources influence and are impacted by the plastic value chain. Gender responsive marine plastic management has the potential to challenge gender stereotypes and provide opportunities for formalising women's work in waste management and promoting women into decision making and leadership roles in the fight to reverse marine plastic pollution. However, in order to realise these results, a number of overarching themes need to be addresses across the value chain.

There is a need to **improve the evidence base of the linkages between gender and marine plastic management**. This means the collection, use and analysis of sex and age disaggregated data and gender assessments of the four phases of the plastic value chain should be prioritised. For example, understanding how gender and gender inequality impacts women and men's involvement in plastic production and their consumption patterns can support informed decision-making, for example on strategies for reducing single use plastic.

Secondly, **women's participation and representation in decision-making need to be addressed in all areas of plastic waste management.** SWM is an important area for the Asian region, where household waste leakage must be curbed and where women already do and can be further supported to take on leadership roles. Disaggregated data of existing household waste management practices, women and men's access to waste management services as well as opportunities and barriers for women and men's employment in solid waste management is needed.

Thirdly, **women's access to formal employment and skill development in waste management should be prioritised.** Existing informal jobs in waste management for women in unequal and can result in unsafe working conditions for women and sometimes children. Women are also often in lower skilled/unskilled jobs, with little opportunity for skills development or to move up to managerial roles. The adoption of decent work conditions and equal pay for work of equal value as well as offering trainings and incentives for skill development should be prioritised across the plastic value chain.

The following entry points according to the value chain have been developed and recommended below. These require contextualisation into local contexts.

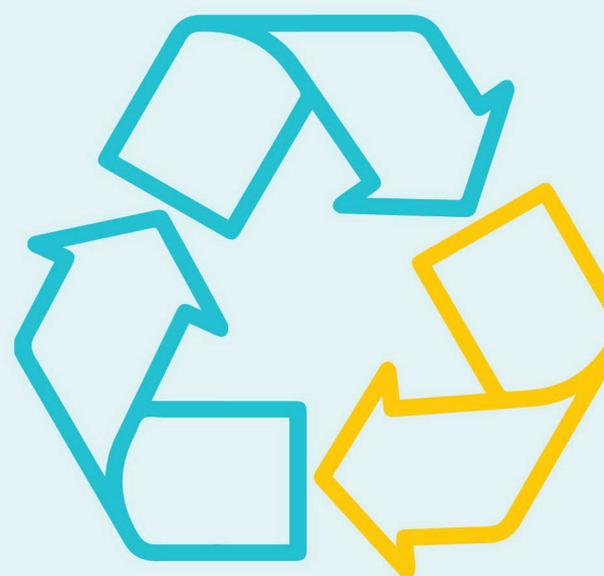
**Plastic Production Equal employment opportunities for women and men in safe workplaces in the growing plastic production sector should be prioritised.** This includes access to finance for start-ups for women, increased attention to safe working conditions in manufacturing and incentives for women and men to move towards more sustainable plastic production enterprises. Initiatives to increase the participation of women in STEM and research and development in the plastics sector is another way to address existing inequalities in women's access to decision making and senior and technical roles in plastic production.

**Plastic Consumption Promoting gender analysis of plastic consumption patterns** across multiple sectors can generate context relevant information. This can be used to inform campaigns aimed to curb consumption and steer buyers towards more sustainable options.

Gender inclusive consultations and gender responsive product designs are also needed to ensure plastic alternatives are designed to meet the demands of both sellers (in the case of the Asia region, particularly food and street vendors) and buyers' needs and priorities.

**Solid Waste Management** To ensure those most involved in and impacted by solid waste management have a voice in the design and implementation of policies and programmes, **gender inclusive design processes** should be promoted. This means recognising women's role in solid waste management at household and community level and designing programmes which meet the needs of women and men, and which can challenge gender stereotypes about women's responsibility for waste management. This also means **promoting women's equal access to solid waste management employment opportunities and ensuring equal pay for work of equal value and opportunities** for skill development and access to leadership roles in the sector.

**Marine Plastic Debris Leveraging women's role in tourism jobs and promoting women as agents of change** can support the increased awareness of the impacts of plastic pollution on the tourism industry and identify strategies to reduce tourism plastic waste impacts on the environment. Given the interlinkages between fisheries and tourism in marine coastal management and the critical role marine ecosystems play in food security and livelihoods for women and communities, policies, programmes and **initiatives can be a catalyst for mutually beneficial solutions for marine plastic management and promoting gender equality.**



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