



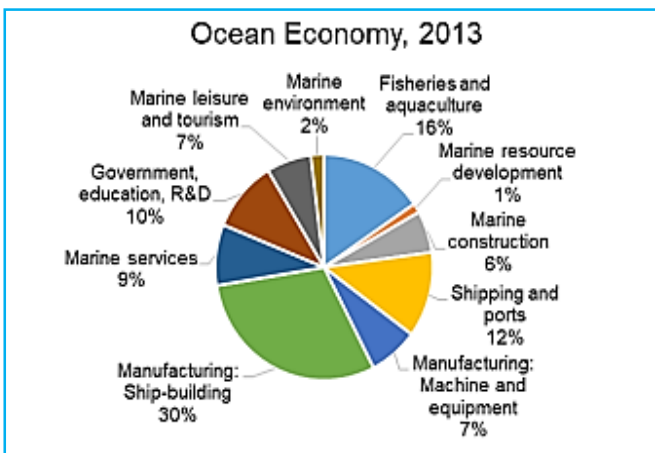
## Socio-economic profile

The Republic of Korea (South Korea) is in Eastern Asia, with the southern half of the Korean Peninsula bordering the Sea of Japan and the Yellow Sea. The country has a total surface area of 99,720 sq. km. The total population was 51.6 million in 2018, and more than 80% of the population live in urban areas. The Gross Domestic Product (GDP) at current prices in 2017 was US\$1,623 billion, with GDP per capita of US\$39,500. Over the past few decades, South Korea has transformed herself from an agrarian society to an industrial leader. The GDP composition by sector of origin in 2017 was: agriculture (2.2%), industry(39.3%), and services(58.3%).<sup>i</sup>

## Coastal and marine ecosystem and economy

The Republic of Korea is located at strategic location on Korea Strait. Approximately 3,000 islands lie off the western and southern coasts - mostly small and uninhabited. The coastline of South Korea stretches to 13,509 km.

As of 2015, 27.2% of the total population lived in coastal areas. The South Korean ocean (gross value added or GVA, in constant prices) in 2013 was US\$43.53 billion or 3.3% of the national GDP.<sup>ii</sup>



Depleting fisheries resources, habitat destruction, coastal development, pollution, marine debris are some of the major pressures to South Korea's coastal environment.

The government has established three major ecological networks in the Korean Peninsula - Baekdudaegan mountain range, demilitarized zone, and coastal and islands areas to restore damaged and disconnected habitat patches, conserve ecosystems and development of ecotourism.

## Plastics and plastic packaging Production and usage

According to the market research report by Statista 'Plastic waste in South Korea - Statistics and Facts'<sup>iii</sup> approximately 1.77 million metric tonnes of engineering plastic resin were produced in South Korea in 2018, which is an increase from 1.70 million metric tonnes in 2017.

The South Korea packaging market was valued at US\$6.30 billion in 2017.<sup>iv</sup> In terms of market size by packaging type, plastic packaging had the highest market share including plastic flexible packaging (11.6 trillion South Korean won) and plastic container (8.2 trillion South Korean won) followed by 14.7 trillion South Korean won by paper packaging.

South Korea has one of the highest plastic consumption per capita. According to a 2016 survey by Statistics Korea, the amount of plastic consumed per capita in South Korea was 98.2 kg, which is the most in the world - even more than the United States, with 97.7 kg per capita).<sup>v</sup>

According to the market research report by Statista in 2019, South Korean people consumed 23.5 billion single-use plastic items, which included; around 23.5 billion single-use plastic bags (per capita consumption: 460 single-use plastic bags) 4.9 billion PET bottles (per capita consumption: 96 PET bottles), and 3.3 billion plastic cups (per capita consumption: 65 plastic cups). Overall, single-use plastic consumption per capita in South Korea in 2019 amounted to around 11.5 kilograms.<sup>vi</sup>

In order to curb single-use plastic consumption, South Korea introduced a deposit policy for disposable cups in 2003. Cafes received a deposit for the disposable cups and returned it when the customer returned the cup. However, this policy was discontinued in 2008. A regulation that banned the use of disposable paper cups in restaurants, schools, hospitals, and dormitories as well as cafeterias was also discontinued that same year. Though the South Korean government eased related regulations, it prohibits the free distribution of disposable plastic bags. It has also introduced other frameworks to reduce plastic consumption.

## Solid waste management

Domestic waste generation in South Korea has been decreasing since the enforcement of a volume-based garbage bag system and separate disposal of recyclables and food wastes. The per capita domestic waste generation decreased from 1.3 kg/person/day in 1994<sup>vii</sup> to 0.97 kg/person/day in 2015. This decrease in waste generation is linked to the country's volume based waste fee system pay-as-you-throw, which was introduced in 1995. With the introduction of this new system, the waste collection fee was replaced with the price of waste bags. People would place general waste up to the dotted line of bags purchased from designated stores and discarded in front of for the municipalities to collect these bags. The recyclables would be separated into paper, bottles, cans and plastics and then discarded. Large items like refrigerators and cabinets were collected after prior phone notification of the administrative organizations, where callers would give their address, name, type and size of waste.

In terms of waste treatment, the recycling rate has been greatly increased with a remarkable decrease in landfilling. There has also been a slight increase in incineration. In 2015, waste in South Korea was managed through recycling, landfilling and incineration. 84.8% of total solid waste generated in the country was recycled (with domestic waste recycling at 59.2%, business waste 78.2% and construction waste recycling at 97.6%), 9% was landfilling and 6.2% of waste incinerated.<sup>viii</sup>

Despite the overall decrease in waste, the proportion of plastic waste in South Korea is increasing. In 2017, around 4.3 million tonnes of commercial and industrial plastic waste were generated, followed by household plastic waste (3 million tonnes) and construction waste (658,000 tonnes).<sup>ix</sup> Nonetheless, the plastic waste recycling rate in South Korea in 2017 was 43.6%. This included both material recycling and energy recovery from plastic waste. There is an involvement of informal waste sector that collect recyclables. According to the Korea Institute for Health and Social Affairs, 4.4% of Koreans older than 65 collect recyclables from the streets to make a living. Similarly, data from the Korea Federation of Recycle Community indicates that there were at 1.7 million people in 2016 who collect recyclables to make a living.<sup>x</sup>

There were over 2,600 businesses engaging in recycling of plastics of various kinds in 2015, representing a 116% increase over that in 2003. The PET bottle recycling industry is dominated by top four recyclers taking up 85% of the overall market of PET bottle in 2016. The largest PET recycler had an annual capacity of 70,000 tonnes, representing about one-third of the PET bottles recycled under EPR Scheme. According to the Ministry of Environment, as much as 75% of the PET flakes produced there were subsequently exported to China for further processing, with just 25% for domestic consumption.<sup>xi</sup> After the waste import restriction by China, plastic recyclables were not collected in some places of South Korea in the early months of 2018, as some recyclers of plastic waste were unable to cope with the trade fluctuations. There was a backlog of un-exportable waste plastics, which generated garbage piles. In 2019, around 235 mountains of garbage were found, totalling 1.2 million tons.<sup>xii</sup>

## Marine litter status

The Government of South Korea has been implementing various activities related to marine debris management, categorized into five activities: 1) clean-up from port and harbors, 2) removal of seabed litter, 3) buyback program, 4) coastal clean-up after typhoon and flood, and 5) coastal clean-up programme.

In 2009, the Ministry of Land, Transport, and Maritime Affairs (MLTM) launched a coastal clean-up programme with a budget of approximately US\$9 million to clean the marine environment, improve public awareness, and create jobs in the public sector. This coastal clean-up programme by the central government coordinated various coastal clean-up activities conducted by local governments. From April-July 2009, the Korea Ocean Environment Management Corporation (KOEM) implemented this coastal clean-up program. The litter collected from the coastline was made up of: Styrofoam (32%), waste fishing nets (16%), plastic (14%), and other (12%). Among the debris, some types, such as Styrofoam, plastic, and derelict fishing nets, seem to originate from fishery-related activities.<sup>xiii</sup>

In another study conducted in 2013, a total of 752 items (12.2 kg) of debris found on six beaches of Korea, consisted of 6.9 kg of fiber and fabric, 4.3 kg of hard plastic, 0.3 kg Styrofoam, 0.46 kg of film, other foam (other than Styrofoam) was 0.056 kg, and 0.2 kg of other polymers. 56% of all the collected debris appeared to be ocean-based and 44% was land-based.

Korea's marine invertebrates are contaminated with microplastics. Korea Institute of Ocean Science and Technology revealed that 135 out of 139 marine invertebrates in the Korean waters have digested microplastics, with eight kinds of plastic fragments on average were found in each.<sup>xiv</sup>

Marine plastic pollution is in increasing trend. In 2019, around 24.6 thousand pieces of waste were found in the coastal areas in South Korea and about 80% almost 2.7 tonnes of them were plastic waste.<sup>xv</sup> Marine litter collected during the International Coastal Clean-up also suggests that plastics dominates the marine debris (Table 1).

## Action on marine litter: Key stakeholders

### Government

The Ministry of Environment (MOE) is responsible for the policy and legal framework for waste management at the central level. It implements and revises waste-related legislation; develops, co-ordinates, enforces and monitors the national waste management plans; and conducts waste-related statistical surveys that inform the development and implementation of national waste policies. The MOE works closely with other ministries, including the Ministry of Health and Welfare on medical waste; the Ministry of Trade, Industry and Energy (MOTIE) on control of transboundary movements of hazardous waste; the Ministry of Land, Infrastructure and Transport on construction waste; and the Ministries of Agriculture, Food, and Rural Affairs and of Health and Welfare on food waste. The MOE also oversees management of rivers and estuaries and in charge of preventing waste from entering the sea by collecting and managing waste in collaboration with other stakeholders.

The Ministry of Land, Transport and Maritime Affairs (MLTM), which replaced the Ministry of Maritime Affairs and Fisheries is the sole governmental institution responsible for marine affairs. The MLTM is responsible for the overall supervision and protection of the marine and coastal environment including the management of marine litter.

Other Ministries and/or business functions consolidated to this MLTM include the Ministry of Construction and Transportation, Ministry of Maritime Affairs and Fisheries' Ocean Logistic, Port and Sea Environment, Ministry of Government Administration and Home Affairs' Land Register Business. Korea Coast Guard (KCG) is responsible for the enforcement of marine related laws and regulations, including waste discharge from ships at sea.

The local governments in collaboration with MLTM also share the responsibility for the protection of the coastal zone and the general management of waste including marine litter. Director, Global Environment and Science Division, the Ministry of Foreign Affairs, Republic of Korea serves as the national focal point for the Coordinating Body on the Seas of East Asia (COBSEA) Secretariat.

## Private sector

Private companies are involved in waste disposal, treatment and recycling. Municipalities (cities and counties) are responsible for the collection, transport and management of municipal waste, including the separate collection of recyclable waste and the establishment of drop-off recycling centres within easy reach. Waste collection is carried out directly or outsourced to a private company. Municipalities set tariffs for waste collection and collect recycling and waste disposal charges. Some disposal sites are run by private operators. The Sudokwon Landfill in Incheon, near Seoul, has been run since 2000 by a public-private partnership, the Sudokwon Landfill Site Management Corporation, affiliated with the MOE, which replaced the municipal operator. Most hazardous waste landfills are owned and managed by the private sector. Various associations operate in the waste management and recycling sector, such as, Korea Waste Association, Korean Packaging Recycling Cooperatives etc. With the country's Extended Producer Responsibility (EPR) measures, private businesses are involved in fostering waste management and recycling sector. The government also engages private sector in coastal clean ups. Since July 2018, the Ministry of Oceans and Fisheries of Korea has been holding the third Friday of every month as 'Coastal Clean-up day' inviting the public and multi-stakeholders - such as oil companies, local fishermen and local governments - to participate. Korean government signed up a MOU with Lotte, one of the biggest beverage companies in Korea to join the International Coastal clean-up activity and co-hosted the marine plastic litter up-cycling event.

## Policy frameworks on MSW and marine litter

### Global frameworks on marine litter

#### International Agreement: The 1972 Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (London Convention)

On 21 December 1993, South Korea acceded to the London Convention. The London Convention promotes the control of all sources of marine pollution and takes practicable steps to prevent pollution. Article IV Number 1(a) of the Convention states: 'The dumping of wastes or other matter listed in Annex I is prohibited'. Paragraph 4 of Annex I specifies persistent plastics and other synthetic materials (e.g. nettings and ropes), which might float or remain in suspension in the sea in a manner that could interfere with fishing, navigation, or other legitimate uses of the sea. Paragraph 11(d) of Annex I calls for the maximum removal of materials capable of creating floating debris or contributing to marine pollution from vessels and platforms or other man-made structures at sea. These provisions indicate that the Convention is still generally applied to discharges from land-based and not sea-based litter. Therefore, broader interpretation is needed to cover all sources of marine debris.

#### International Convention for the Prevention of Pollution from Ships (MARPOL)

South Korea is a party to MARPOL since 1997. MARPOL is the key international agreement to prevent marine environment pollution caused by ships' operational and unintended activities. Annex V, enforced since 31 December 1988, specifically addresses the issue of plastic dumping from ships: 'The disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products which may contain toxic or heavy metal residues, is prohibited'. Besides prohibition of plastic waste disposal, Regulation 3 number 2 of the Convention also calls for stricter regulations on mixed garbage discharge.

#### Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Ban Amendment

South Korea is a party to the Basel Convention (Date of Accession 28 February 1994). To combat illegal waste traffic, in collaboration with Korea Customs Service, the physical inspection of export goods is conducted to verify if they are the items that have been appropriately permitted by MoE and real time information on import/export goods is shared through a computer network. The Basel Convention was designed to eliminate the risks from transboundary movements of hazardous and other wastes. In its initial version, the Convention covered several categories of waste, including wastes collected from households, but did not include the movement of solid plastic waste (including scrap plastic of non-halogenated polymers and co-polymers, cured waste resins or condensation products, and fluorinated polymer wastes) as listed in B3010 of Annex IX. In 1995, the Ban Amendment was adopted by the third meeting of the Conference of the Parties. South Korea has also ratified the Basel Convention Ban Amendment on 24 October 2005.

## Regional frameworks on marine litter

South Korea is one of the four member States (Korea, Japan, China, Russia) of the [Northwest Pacific Action Plan \(NOWPAP\)](#) one of UNEP's regional sea programmes. These member states share marine litter data and discuss how to tackle marine litter problem in Northwest Pacific region.

South Korea is also a member country of the [Coordinating Body on the Seas of East Asia \(COBSEA\)](#). COBSEA is one of 18 Regional Seas programmes for the sustainable management and use of the marine and coastal environment. The East Asian Seas Action Plan brings together nine countries - Cambodia, People's Republic of China, Indonesia, Republic of Korea, Malaysia, the Philippines, Thailand, Singapore and Vietnam - in development and protection of the marine environment and coastal areas through addressing land-based marine pollution; strengthening marine and coastal planning and management; and sharing marine environmental management experiences and policies towards strengthened regional governance.

## National policy frameworks on municipal (plastic) waste management

The "Waste Control Act" (1986) is the umbrella act that guides South Korea's waste management. Before this law, waste management policies were managed under a bifurcated system involving domestic waste and industrial waste under the "Refuse Cleaning Act" and the "Environment Conservation Act". One the Act came into effect, a set of policies and systems were announced. Some of the important ones are:

Korea is one of the first countries in Asia to implement the [Extended Producer Responsibility \(EPR\)](#) System in waste management sector.

Introduced in 2003 the EPR system obliges manufacturers and importers to recycle a certain amount of their products. At the time of introduction, only 15 products were subject to the policy, and by 2008, the list of applicable items had been expanded to include 24 items (4 packaging materials and 20 products). As of 2013, the items covered by the scheme include ten electronic products defined by Article 8 of the presidential decree of the “Act on Resource Recirculation of Electrical and Electronic Waste and End of Life Vehicles”, as well as tires, lubricant, batteries, and fluorescent lamps, Styrofoam float, and packaging materials (metal can, glass bottle, carton pack, PET bottle, synthetic resin packaging material) that are used to pack food and beverages, agricultural products, marine products, livestock products, cleansers, medicines and cosmetics, etc.) defined by Article 18 of the presidential decree of the “Act on the Promotion of Saving and Recycling of Resources”. A mandatory recycling ratio for each EPR product category is announced every year by the Ministry of Environment.

South Korea is also spearheading the Circular Economy in Waste Sector. The [Framework Act on Resource Circulation](#) has been enforced since 29 January 2018. According to the article 11 and article 12 of this Act, the minister of the Ministry of Environment should establish the Master Plan for Resource Circulation every 10 years, for enforcement. The Master Plan should present mid to long-term policy goals such as the efficient use of resources, the prevention of waste generation, and the promotion of use of recycled resources, etc. Based on the article 14 of this Act, the minister of the Ministry of Environment should set mid to long-term target values per stage for final disposal rate, circulated use (actual recycling) rate, and energy recovery rate, and promote measures for their accomplishment.

South Korea also introduced the Master Plan for Resource Circulation for Achieving Circular Economy, September, 2018 that encourages businesses to voluntarily recirculate resources and to reduce waste generation, and the landfill/incineration levy that is imposed when recyclables go to landfills or incineration facilities by the enactment of The Framework Act on Resource Recirculation and Master Plan for Resource Circulation for Achieving Circular Economy.

## National policy frameworks on marine litter

South Korea has a strong national frameworks for managing marine pollution, including plastic debris. The [Republic of Korea, Marine Environment Management Act \(MEMA\)](#) came into force in January 2008 after the revision of Marine Pollution Prevention Act. In accordance with Section 1, Article 24, 'Marine Environment Management Act', the Ministry of Ocean and Fisheries of Korea (MOF) establishes 'National Marine Litter Management Plan' every 5 years to effectively collect and dispose the waste entering the ocean. Based on MEMA, since January 2009, a Marine Litter Management Plan (the Plan) is developed and implemented every 5 years. The Plan aims at establishing an advanced national marine litter management system and has four strategies: (1) preventing litter from entering seas; (2) strengthening the removal and treatment capacity; (3) improving management system; and (4) encouraging public participation while promoting international cooperation. The 3rd National Marine Litter Management Plan (2019–2023) was established in December, 2018 to tackle down the marine litter issue with more improved and enhanced marine litter policies than previous two national plans, and it consists of various policies ranging from collection of marine litter and risk assessment and research on micro-plastic.

Republic of Korea has established a [Comprehensive Plan on Marine Litter Reduction](#). The main purpose of the plan is to reduce marine plastic litter by half by 2030 through the introduction of the life-cycle management system of marine plastic litter, enhanced marine plastic litter management infrastructure and promoting wide public participation and so on. The plan will be implemented through the close cooperation between the Ministry of Ocean and Fisheries of Korea (MOF), the Ministry of Environment of Korea (MOE), the Ministry of Food and Drug Safety of Korea. The plan is in line with 'G20 Action Plan on Marine Litter' which was adopted at G20 Hamburg Summit in 2017 and it will further improve Korea's commitment on reducing marine plastic.

## Fiscal incentives

The total annual government expenditure for waste management in South Korea amounts to about 350 billion won (or US\$310 million).<sup>xviii</sup> The Republic of Korea uses various fiscal incentives and disincentives to reduce (plastic) waste and increase recycling and resource circulation.<sup>xix</sup> One of the first economic instruments introduced is the 'Volume-based waste fee system' through differentiated charging system based on the waste generated (volume-based for general domestic waste) and (weight based- for food waste), i.e., less the waste generated lesser waste fee.

A similar differentiated charge system is also practiced under the EPR system. Packaging producers of ten different types of plastic packaging need to pay the Korean Packaging Recycling Cooperatives for the collection and recycling of used packaging at prescribed rates, ranging from 65 won to 883 won per kg. KPRC will then use the money to hire recyclers in the downstream to meet the targeted recycling rate for plastic packaging imposed by the government. Under the new EPR system, manufacturers of colored packaging, especially opaque varieties, are required to pay higher financial contributions as clear ones are preferred in the recycled materials market and have the highest material value.

These measures are the latest in South Korea's fight against plastic waste to meet nation's ambitious plan to cut plastic waste by 50% and increase the recycling rate from 34% to 70% by 2030. For those plastic products outside the scope of EPR, producers are charged an advance disposal fee reflecting the product's estimated disposal cost. These include more difficult to recycle (e.g. PVC pipes, plastic toys, kitchenware or plastic containers used for holding toxic materials).

Producers can be exempted from such fees if they enter into a voluntary recycling agreement with the Ministry of Environment and meet the required targets. Korean government also provides financial support to the private sector in assisting the growth of waste recycling industry. The MOE has allocated a total of 103.6 billion won (around US\$94.18 million) in 2016 with an interest rate of 1.51% for a maximum period of 10 years for the waste recycling investment activities. It is anticipated that this initiative will help to create new jobs and promote the use of recycled products. In order to increase the use of recycled products, the national and local governments and government-related public institutes must purchase some portion of environmentally-friendly products (including recycled products) in accordance with the Act on the Encouragement of Purchase of Environment-Friendly Products.

The government also provides long-term loans with a low interest rate to small and medium-sized recycling companies for the development of Volume Based Waste Fee bag.

## Conclusions

South Korea has a well-developed policy framework promoting an integrated approach to waste and material management, building on the principle of the pay-as-you-throw, 3Rs and EPR, to moving towards resource circulation and circular economy.

Nevertheless, the country needs to step up its game to catch up with its steadily increasing municipal and marine plastic waste. South Korea is one of the biggest producers and consumers of single-use plastic packaging items in the world.

The government has also vowed reduce plastic waste by 30% in 2022 and by 50% by 2030, and achieving a recycling rate of 70%, up from the current 34%, by 2030.

This requires stronger regulations and drastic actions bringing fundamental changes upstream at plastic production stage as well as tackling the throw-away culture and downstream waste management and recycling.

**Table 1: International coastal clean-up efforts and marine litter items (number) found in South Korea<sup>vii</sup>**

Country / location						People	KG	KM of coast	Total items collected
South Korea						4,276	152,052	82.4	75,530
Cigarette butts	Food wrappers (candy etc.)	Straws stirrers	Plastic forks Knives spoons	Plastic beverage bottles	Plastic bottle caps	Plastic grocery bags	Other plastic bags	Plastic lids	Plastic cups plates
7,906	2,974	2,392	1,280	4,218	2,946	274	6,652	1,449	1,696

## References

- i. Central Intelligence Agency (CIA). The World Factbook- South Korea. <https://www.cia.gov/library/publications/the-world-factbook/geos/ks.html>
- ii. Partnerships in Environmental Management for the Seas of East Asia (PEMSEA). (2018). State of Oceans and Coasts - CAMBODIA. <http://pemsea.org/publications/reports/state-oceans-and-coasts-ro-korea>
- iii. So, W. Plastic waste in South Korea - Statistics & Facts. statista.com. (23 March 2020). <https://www.statista.com/topics/6010/plastic-waste-in-south-korea/>
- iv. Modor Intelligence. (2020). South Korea Plastic Packaging Market - Segmented by Type (Rigid, Flexible), Product (Bottles, Cans, Jars, Pouches), End User, and Region - Growth, Trends and Forecast (2020 - 2025). <https://www.mordorintelligence.com/industry-reports/south-korea-plastic-packaging-market>
- v. The Kyunghyang Shinmun. South Korea Is One of the Biggest Consumers of Disposable Products: Are We Going to Stay That Way? (5 April 2018). [http://english.khan.co.kr/khan\\_art\\_view.html?code=790101&artid=201804051842377&medid=enkh#csidx7ec2c152953abfebf5f6b4be097dc68%20](http://english.khan.co.kr/khan_art_view.html?code=790101&artid=201804051842377&medid=enkh#csidx7ec2c152953abfebf5f6b4be097dc68%20)
- vi. So, W. Plastic waste in South Korea - Statistics & Facts. statista.com. (23 March 2020). <https://www.statista.com/topics/6010/plastic-waste-in-south-korea/>
- vii. Ministry of Environment, Republic of Korea (2015). <http://eng.me.go.kr/eng/file/readDownloadFile.do?fileId=115224&fileSeq=1&openYn=Y>
- viii. United Nations Centre for Regional Development (UNCRD). Country Report and Country Presentation - Republic of Korea. 9th 3R Forum in Asia and the Pacific. 4-6 March 2019. Bangkok <https://www.uncrd.or.jp/content/documents/7395Country%20presentation-Korea.pdf>
- ix. So, W. Plastic waste in South Korea - Statistics & Facts. statista.com. (23 March 2020). <https://www.statista.com/topics/6010/plastic-waste-in-south-korea/>
- x. Korea Jun Gang Daily. Inside the chaos of Korea's plastic waste crisis. (6 April 2018). <http://koreajoongangdaily.joins.com/news/article/article.aspx?aid=3046555>
- xi. Research Office Legislative Council Secretariat. Fact Sheet- Management of plastic waste in selected places. <https://www.legco.gov.hk/research-publications/english/1819fs01-management-of-plastic-waste-in-selected-places-20181010-e.pdf>
- xii. Hyun-ju., O. South Korea's war on plastic gains momentum. The Korea Herald. (21 July 2019). <http://www.koreaherald.com/view.php?ud=20190721000041>
- xiii. Han, S-G., Kim, H-K., Kim, S-D., Noh, H-J. South Korea Coastal Cleanup Program for Marine Litter. pp.9-15.. In Morishige, C. (ed.). 2010. Marine Debris Prevention Projects and Activities in the Republic of Korea and United States: A compilation of project summary reports. NOAA Technical Memorandum NOS-OR&R-36.
- xiv. Jang, Y.C. et.al. (2014). Sources of Plastic Marine Debris on Beaches of Korea: More from the Ocean than the Land. Ocean Sci. J. (2014) 49(2):151-162. <http://dx.doi.org/10.1007/s12601-014-0015-8>
- xv. Su-hyun, S. Plastics may be on your plate. The Korea Herald. (8 June 2018). <http://www.koreaherald.com/view.php?ud=20180608000550>
- xvi. So, W. Plastic waste in South Korea - Statistics & Facts. statista.com. (23 March 2020). <https://www.statista.com/topics/6010/plastic-waste-in-south-korea/>
- xvii. Ocean Conservancy. (2019). International Coastal Cleanup 2018 Report. <https://oceanconservancy.org/wp-content/uploads/2019/09/Final-2019-ICC-Report.pdf>
- xviii. United Nations Centre for Regional Development (UNCRD). Country Report- Republic of Korea. 9th 3R Forum in Asia and the Pacific. 4-6 March 2019. Bangkok [https://www.uncrd.or.jp/content/documents/7374Korea\\_Country%20Report+Front%20page.pdf](https://www.uncrd.or.jp/content/documents/7374Korea_Country%20Report+Front%20page.pdf)
- xix. Research Office Legislative Council Secretariat. Fact Sheet- Management of plastic waste in selected places. <https://www.legco.gov.hk/research-publications/english/1819fs01-management-of-plastic-waste-in-selected-places-20181010>