

## A REVIEW ON PLASTIC POLICIES IN MALAYSIA AND JAPAN

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20<sup>th</sup> July 2019

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### **Abstract**

Plastics are available everywhere and affordable by many. Plastic products are abundant and used for various purposes in our daily lives. However, the utilisation of plastic has become overwhelmed that it affects marine lives due to anthropogenic activities by human and sooner or later it will affect human beings as well. Plastic products and the resulting wastes are receiving increasing priority for blueprint authors and other pertinent stakeholders in Malaysia and Japan. Malaysia, as the nation ready to forecast itself as a developing nation in Southeast Asia consists of various races living together within a nation thus have a unique cross-cultural lifestyle and plastic is used everywhere and even when buying some refreshment at a local street restaurant, the customer will be provided with plastic. Japan, a developed nation with its unique culture is high likely using plastic everywhere and plastic can be easily obtained when buying one small product at a local convenience store. After the utilisation of plastic, usually it will be thrown away as a garbage. The usage of plastic is becoming a very serious issue in the world right now. Malaysia and Japan handles waste management differently in accordance to each country's condition. In this study, the plastic policy in Malaysia and Japan will be reviewed. The findings from this study may improve advocacy in reducing utilisation of plastic products towards achieving Sustainable Development Goals (SDGs); SDG14: Life below water in tandem with SDG12: Responsible Consumption and Production of Sustainable Development Goals (SDGs), respectively.

**Keywords** - plastic, plastic policy, the plastic policy in Malaysia, plastic policy in Japan

## 2. Introduction

Member States of the United Nations adopt the Sustainable Development Goals (SDGs) in 2015, in which 17 goals are set to build a better place for people and our planet in the world by 2030. One of the 17 goals is goal number 14; Life Below Water. Goal 14 establishes the oceans, seas and marine resources for sustainable development to be conserved and used sustainably. Clean oceans and seas are vital to our survival. Human being lean on oceans and seas for food, energy and water. Ocean cover three quarters which is 70 percent of the Earth's surface, contain 97 percent of the Earth's water, and represent 99 percent of the living space on the planet by volume (United Nations, 2015). Over three billion people depend on marine and coastal biodiversity for their livelihoods. Oceans absorb about 30 percent of carbon dioxide produced by humans, buffering the impacts of global warming. Ocean serve as the world's largest source of protein, with more than 3 billion people depending on the oceans as their primary source of protein. (Division, 2019) According to the SDG14 target 14.1 by 2025 is to commence inhibit and notably lessen marine pollution of all kinds, specifically from land-based activities, including marine debris and nutrient pollution. Subsequently the indicator 14.1.1 of index of coastal eutrophication and floating plastic debris density. (United Nations, 2015). Another goal is goal number 12; Responsible Consumption and Production. According to the SDG12 target 12.5 generously lessen waste production through reduction, recycling, reuse and prevention by 2030. Subsequently the indicator 12.5.1 of national recycling rate and tons of material recycled to be increased. These two SDG goals can be achieved by tackling the problem of plastic. The term plastic originates from the Greek word "plastikos" which means ready to be formed or shaped. The utilization of plastic is complex: from packaging to the manufacturing of toys and straws, to plastic cutlery. In numerous nations, plastic materials are not appropriately discarded. Subsequently, the world's sea and land are pervaded with plastic pollution, spoken to by flotsam and jetsam. (Rudduck et al., 2017; Lebreton et al., 2018; Bond et al., 2018; Le Guern, 2018).

## 2. World plastic issue

First and foremost, it ought to be noticed that plastics are the most generally utilized disposable material on earth (de Scisciolo et al., 2016). They are nondegradable oil-based items that come up short on the capacity to disintegrate or mineralize at quantifiable rates (Leslie, 2015). Also, their decent variety, adaptability, moderately economical production procedures, solidness and down to earth applications are a portion of the purposes behind their essentialness in a few parts of present-day life (Monteiro et al., 2018; APME, 2014). Tragically, the present unsustainable use of numerous plastic products, combined with its exceptionally tough nature, produces generous amounts of waste with environmental and financial consequences (Debrot et al., 2013; Ryan et al., 2009). 80% of anthropogenic flotsam and jetsam littering the seas are plastics (Landon-Lane, 2018). In 2015, around 322 million tons of plastic were produced with more than 10 million tons being kept in the seas (Landon-Lane, 2018). As per Raynaud (2014), a 5% expansion in worldwide plastic generation is archived every year and this figure is anticipated to increment fundamentally soon. This underlies late projections of an expansion in marine plastic garbage (Van Sebille et al., 2015) since over 80% of plastic flotsam and jetsam are delivered presently. In the event that the momentum contamination rates are supported, the amount of plastic in the seas will outperform that of fish by 2050 (Simon and Schulte, 2017). The main issue with plastic is the single-use. Death to animals from swallowing plastic bags is higher than from diseases in most African countries (Bashir, 2013). Plastic waste, when broken down, can also affect hormone levels of animals when it pass through the food chain, which can eventually affect humans too (Musa et al., 2013).

### **3. Plastic issue in Malaysia**

Malaysia is a developing nation with increasing population from 25.7 million in 2009 to 30.1 million by the end of 2014. (D. Sheet and I, 2015). Malaysia is a worldwide player in the plastic business industry with around 1,300 plastic manufacturers. Starting in 2016, Malaysia's exports added up to RM30 billion which saw 2.26 million metric huge amounts of resin used to manufacture plastics. (MESTECC, 2018). The plastic carrier bags, or just known as plastic bags, is a mainstream method for conveying products when making any purchases in Malaysia. The retail business consistently use plastic bags as they are cheap, lightweight however sufficiently able to convey purchased things and clean when utilized the first time. (Jalil, Mian, & Rahman, 2013). Malaysians on average produce an estimate of 19,000 tonnes of solid waste annually and plastic waste represents 24% of total solid waste. items purchased. (Zaman, 2012). The Minister of Energy, Science, Technology, Environment and Climate Change of Malaysia, Mrs. Yeoh Bee Yin, said Malaysia and other developing countries especially in Southeast Asia are fast implementing similar rules after China implemented a ban to plastic waste import activities (The Independent, 2019).

### **4. Plastic issue in Japan**

In recent decades, the production of plastic has progressively moved to Asia. Japan representing 4–5% makers in 2015. (Plastics Europe, 2016, p. 13). Japan have issue with plastic. In a nation where hygiene neat packaging is very much emphasis to almost everything in order to set a good service. Japan is the world's No. 2 user of single-use plastic bundling per individual after the United States of America. Additionally, G-20 countries produce a large portion of the world's plastic waste. (United Nations Environment Programme, 2018) Each individual in Japan utilizes around 300 or 400 plastic bags a year, or in excess of 40 billion for the whole country. (Yamaguchi, BARREIRA & NUGA, 2019). At the 11th symposium in Osaka, the Kansai provincial union explained due to the results of researching plastic waste in Osaka Bay in which

approximately 3 million plastic bags and about 6.1 million plastic waste were sinking to the seabed. (INC., 2019). As indicated by a Japanese researcher, Shinsuke Iwasaki, sea flows can carry Japan's plastic waste similar to North America. A simulation directed to follow around 6,300 tons of plastic trash streaming into the ocean from real Japanese cities. The simulation demonstrates that the waste can arrive at the US west coast, Canada and Alaska. Plastic waste additionally floats to Southeast Asian nations, for example, the Philippines, and some is likewise washed shoreward in Japan. Plastic bags and containers are contaminating the seas and representing a genuine risk to environment as individuals ought to know that piece plastic created in Japan can influence nations in different pieces of the world. (Iwasaki, 2019).

### **5. Plastic policy and regulations in Malaysia**

Malaysia's effort to the attempt to diminish the utilization of plastic bags started when the Penang state in 2009 prohibited the utilization of plastic bags from shopping stores on Mondays. In 2010, Selangor state pursued to boycott the utilization of plastic bags for consumers on Saturdays. The Penang state government at last forces the restriction on the utilization of plastic bags on quickly. The Federal Government through the Ministry of Domestic Trade, Cooperative and Consumerism (MDTCC) in 2011 propelled "The No Plastic Bag Day" (NPBD) Campaign all through Malaysia for every Saturday. The goal is to diminish the utilization of plastic bags so as to lessen its damaging effect on the earth. All retail outlets, supermarkets, and hypermarkets pursued to force the boycott. They permitted the utilization of new plastic bags for wet markets, cafés and night markets for cleanliness purposes when conveying wet staple goods and food (Zen, Ahamad, and Omar, 2013). Zen, I. S., Ahamad, R., and Omar, W. (2013). The stores that do not provide the plastic bags urged customers to bring their own groceries bags, or they may purchase an eco-friendly bag. A few stores give paper bags or manufactured fibre groceries bags that can be reused on various occasions. They amplified the reduction of plastic bag usage with a charge or levy of MYR0.20 or 20 cents, which is

comparable to USD0.06 for plastic bag mentioned by a retail location consumer. The utilization of the environment tax as a disincentive to prevent certain conduct that may prompt environmental deterioration. The tax collection cash is either directed to philanthropy (Hong, 2011) or the stores used to actualize environmental preservation exercises. Malaysia first implemented the ban on plastic straws started with Selangor state. The Selangor state government implemented a ban on plastic straws starting July 1<sup>st</sup> 2019. The objective of the ban implementation is to get rid of single-use plastics, which contaminate the oceans and jeopardize marine life. The chairman of State Government, Green Technology and Consumer Affairs, Science, Technology and Environment Committee, Hee Loy Sian, stated that Selangor would restrain eateries from perpetually supplying customers with single-use plastic drinking straws (Rajendra, 2019). Starting January 1<sup>st</sup> 2019, Malaysia imposed the plastic straw ban, however, the ban of plastic straws utilisation is not targeted at public but aimed at traders and operators of food outlets who are license holders at the same instant, non-plastic straws are provided as a substitute. The advocacy campaigns on the damaging impacts of utilising the conventional plastic straws will be held throughout 2019 until it will fully impose countrywide ban on plastic straws in January 1<sup>st</sup> 2020. However, according to the Federal Territories Ministry Secretary-General, Datuk Seri Adnan Md Ikhsan, handicapped and sick people will be given an exemption because plastics straws is a necessities in their everyday lives. ("Straws ban for traders and food outlet operators - Federal Territories Ministry", 2019). In October 2018, Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC) Malaysia launched a blueprint of effort towards reducing the usage of plastic straws called "Roadmap towards zero single-use plastic 2018-2030". The vision of this Roadmap is to take a staged, proof-based and all-encompassing methodology by including all partners in mutually tending to single-use plastics pollution in Malaysia. This Roadmap is visualized to send activities that can avoid the present direction to an increasingly feasible pathway towards a cleaner

and more healthier environment by 2030. The Roadmap will be executed from 2018 paving the way to 2030 with a presumption that every single important stakeholder will assume their jobs adequately to guarantee the goals of this guide are met. The roadmap divided into 3 phases. Phase 1 is starting from 2018 until 2021. In short, starting 2019, Malaysia is going to practice the 'No straw by default' in which straw will only be given by request. (Ministry Of Energy, Science, Technology, Environment & Climate Change (MESTECC), Malaysia, 2018). According to the Minister of Energy, Science, Technology, Environment & Climate Change (MESTECC), Malaysia, the pollution charge would be forced on plastic carrier bags by means of the local council for hypermarkets, huge retailers, and chain stores and cafés. The roadmap will likewise inevitably observe the execution of a circular economy for recycling just as position Malaysia as a pioneer in biodegradable technology and industry in the region. The federal government will give the states the freedom to do this in light of the fact that the awareness level is distinctive in each state. Likewise in 2018, SIRIM Berhad, previously known as the Standard and Industrial Research Institute of Malaysia, is a corporate association possessed completely by the Malaysian Government, under the Minister of Finance Incorporated would likewise draw up standards on what includes biodegradable plastic. The Malaysian government had frozen the issuance of licenses to set up plastic waste recycling manufacturing plants in Malaysia and restricted the import of such materials. (Channel New Asia, 2018).

## **6. Plastic policy and regulations in Japan**

In Japan, no bans are set up on single-use plastic yet, however because of an extremely successful waste management framework and a high level of social cognizance, the nation represents generally restricted spillages of single-use plastics in the environment. (United Nations Environment Programme, 2018). Even though there are no blueprint and policy to ban plastic yet in, Japan have taken several great initiatives to help combat plastic pollution. Japan launched "Osaka Blue Ocean Vision" a global vision as an initiative and

the main goal is by 2050 to diminish pollution by marine plastic litter to zero. Also, Japan addresses the plastic issue in Osaka on 28<sup>th</sup> until 29<sup>th</sup> June 2019 at G20 Summit on Financial Markets and the World Economy. Also, Japan underwrite the G20 Implementation Framework for Actions on Marine Plastic Litter. (Ministry of Foreign Affairs of Japan, 2019). A campaign was propelled to nullify the free dissemination of plastic shopping bags at groceries stores and different shops in Toyama prefecture. The extent of customers in Toyama prefecture that use and bring their own groceries bags increments from 10 to 20 per cent up to 95 per cent since the campaign began in 2008. (The Japan Times, 2019). Furthermore, The Ministry of the Environment of Japan is running the Plastic Smart Campaign so as to support and further grow such activities.

As per Mr. Yoshiaki Harada, Minister of the Environment of Japan, the nation has been endeavouring incredible endeavours over numerous years in the advancement of substitutes for plastics. Japan has a colossal number of scientists, local governments, and organizations that can offer help to other developing nations so as to handle marine pollution. There are a few instances of public-private innovation in the nation to manage the issue of plastics and ocean pollution. (Plastics Smart, 2019). Examples of innovative approaches are introduction of new biodegradable material. Firstly by Kaneko corporation which introduces biobased polymers poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (PHBH) as food packaging materials. ("KANEKA Biodegradable Polymer PHBH™ | United Nations Industrial Development Organization", 2019). Secondly, Mitsubishi Chemical Corporation introduces plant-derived biodegradable plastic (BioPBS). The application of BioPBS are straw, cup and cutleries. ("Mitsubishi Chemical to start the sales of Paper Cups made from biodegradable plastic", 2019). Secondly, the innovative approach is by using alternative product instead of plastic. "Silbio Barrier" the environmentally-friendly paper-based barrier material developed by Japanese company, Oji Holdings Corporation, only use materials that are affirmed by the US Food and Drug Administration (FDA) to be utilized in products that come into contact with

food. ("Sample Provision of SILBIO BARRIER, Paper Material with Barrier Properties, Commences", 2019). Another alternative of plastic straw is wooden straws called "AQURAS". "AQURAS" was developed by Japan's homebuilder company, Aqua Home Co.. The company will start creating wooden straws utilizing timber from trees felled in the heavy downpour and avalanches that hit zones of western Japan in July 2018. It additionally plans to utilize a lot of timber from timberland diminishing around the nation. While paper straws, which are alternative of plastic straws, before long go delicate absorbing a beverage, the wooden straw does not retain fluid and furthermore has a hotter look and feel than paper. ("Tokyo homebuilder launches mass production of environmental friendly wooden straws - The Mainichi", 2018). Next innovative approach to reduce utilisation of plastics is taken by beverage manufacturer, Asahi Soft Drinks Co., Ltd. Asahi Soft Drinks Co., Ltd release the "label-less bottle" in which to reduce the utilisation of roll labels on PET bottles. This ingenuity help to lessen the plastic utilisation for labels by 90%. (ASAHI GROUP HOLDINGS, 2019). Moreover, to handle the issue of marine plastics contamination, the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) has been building up a framework to semi-automatically investigate marine microplastics utilizing a hyperspectral camera imaging innovation. This innovation is utilized to proficiently and rapidly identify the types, shapes, and different properties of microplastics. JAMSTEC has likewise created and propelled the world's first "Deep-sea Debris" that has been ordering data of marine (remote ocean) trash on the pictures gathered by remote ocean examine submersibles including "Shinkai 6500" for more than 30 years. The database has been utilized for instruction, media, and logical research. (JAMSTEC, 2019). Other innovative approach is taken is in Kanagawa prefecture by establishing a marine waste collection and disposal system collaboratively managed by the prefectural government and fishery operators. Kagawa Prefecture, in a joint effort with national and metropolitan governments, and the Kagawa Prefecture Fisheries Cooperative Association has structured and actualized a framework to gather

and discard ocean bottom waste. One characterizing normal for this framework is that all districts in the prefecture take an interest, including those found inland. Before, there was no convention for the gathering and transfer of ocean bottom waste. Therefore, trash separated by fisherman came back to the ocean. Anyway, this framework can be connected as a chance to expel waste from the ocean bottom. (Env.go.jp, 2019)

## 7. Conclusion

Even though Malaysia produced a blueprint and ban policy on plastic straw and single-use plastic, the public requires education and advocacy as awareness is still lacking among the communities. There are huge opportunities for improvement following awareness creation efforts by relevant Ministries and stakeholders involved. As for Japan, plastic ban is not yet adopted. There are many initiatives and research to help overcome the plastic issues in Japan but the nation remains the 2<sup>nd</sup> largest single-use plastic user in the world after United States of America. In a nutshell, the issue with plastic is the single-use. Nonetheless, to conquer this pressing issue it ought be the obligation of every stakeholders from government, business industry player to the society.

## 8. References

- Division, U. (2019). — SDG Indicators. Retrieved 21 July 2019, from <https://unstats.un.org/sdgs/report/2019/goal-14/Nations>, U. (2015). Goal 14 ∴ Sustainable Development Knowledge Platform. Retrieved 22 July 2019, from <https://sustainabledevelopment.un.org/sdg14>
- United Nations Environment Programme. (2018). *SINGLE-USE PLASTICS: A Roadmap for Sustainability* (pp. 10-35). Retrieved from [https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic\\_sustainability.pdf?isAllowed=y&sequence=1](https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf?isAllowed=y&sequence=1)
- O. Rudduck, J. Lavers, A. Fischer, S. Stuckenbrock, P. Sharp, R. Banati Inter-annual variation in the density of anthropogenic debris in the Tasman Sea *Mar. Pollut. Bull.*, 15 (2017), pp. 51-55
- D. Feldman, Polymer history, *Des. Monomers Polym.*, 11 (2008), pp. 1-15
- T. de Scisciolo, E.N. Mijts, T. Becker, M.B. Eppinga Beach debris on Aruba, Southern Caribbean: attribution to local land-based and distal marine-based sources *Mar. Pollut. Bull.*, 106 (2016), pp. 49-57
- H. Leslie, Plastic in Cosmetics: Are We Polluting the Environment Through Our Personal Care?: Plastic Ingredients That Contribute to Marine Microplastic Litter, (2015)
- R.C. Monteiro, J.A.I. do Sul, M.F. Costa Plastic pollution in islands of the Atlantic Ocean *Environ. Pollut.*, 238 (2018), pp. 103-110
- P.G. Ryan, C.J. Moore, J.A. van Franeker, C.L. Moloney Monitoring the abundance of plastic debris in the marine environment *Philos. Trans. R. Soc. B Biol. Sci.*, 364 (2009), pp. 1999-2012
- A.O. Debrot, J. van Rijn, P.S. Bron, R. de León. A baseline assessment of beach debris and tar contamination in Bonaire, Southeastern Caribbean *Mar. Pollut. Bull.*, 71 (2013), pp. 325-329
- M. Landon-Lane Corporate social responsibility in marine plastic debris governance *Mar. Pollut. Bull.*, 127 (2018), pp. 310-319
- J. Raynaud Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry UNEP (2014)
- E. Van Sebille, C. Wilcox, L. Lebreton, N. Maximenko, B.D. Hardesty, J.A. van Franeker, M. Eriksen, D. Siegel, F. Galgani, K.L. Law A global inventory of small floating plastic debris *Environ. Res. Lett.*, 10 (2015), p. 124006
- N. Simon, M.L. Schulte, Stopping global plastic pollution: the case for an international convention *Ecology Publication Series*, vol. 43 (2017)
- Bashir, N. H. H. (2013). Plastic problem in Africa. *The Japanese Journal of Veterinary Research*, 61 Suppl, S1–11. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/23631147>
- Jalil, M. A., Mian, M. N., & Rahman, M. K. (2013). Using plastic bags and its damaging impact on environment and agriculture: An alternative proposal. *International Journal of Learning & Development*, 3(4), 1–14. doi:10.5296/ijld.v3i4.4137.
- D. Sheet and I. Map, “Population Reference Bureau,” (2015) pp. 10-11.
- (Zen, Ahamad, & Omar, 2013). Zen, I. S., Ahamad, R., & Omar, W. (2013). No plastic bag campaign day in Malaysia and the policy implication. *Environment, Development and Sustainability*, 15(5), 1259–1269. doi:10.1007/s10668-013-9437-1.
- Musa, H., Hayes, C., Bradley, M., Clayson, A., & Gillibrand, G. (2013). Measures Aimed at Reducing Plastic Carrier Bag Use: A Consumer Behaviour Focused Study. *Natural Environment*, 1(1), 17. doi: 10.12966/ne.06.02.2013
- Zaman, M. D. K. (2012). Environmental ethical commitment (EEC): Factors that affect Malaysian business corporations. *Journal of ASIAN Behavioural Studies*, 2(7).
- Hong, L. C. (2011). Environmental tax laws in Malaysia today. *Malaysian Accountancy Research and Education (MAREF) Review*, 1(2), 9–10.

- RAJENDRA, E. (2019). Ban on plastic straws in Selangor eateries from July 1. Retrieved 5 August 2019, from <https://www.thestar.com.my/metro/metro-news/2019/05/18/ban-on-plastic-straws-in-selangor-eateries-from-july-1#7Ifjc3RBZh11V9bR.99>
- Straws ban for traders and food outlet operators - Federal Territories Ministry. (2019). Retrieved 5 August 2019, from <http://www.bernama.com/en/news.php?id=1644981>
- The Independent. (2019). *Malaysia 'will send plastic waste back to UK' to avoid becoming 'dumping ground'*. [online] Available at: <https://www.independent.co.uk/news/world/asia/malaysia-plastic-waste-uk-us-australia-pollution-environment-a8932741.html> [Accessed 11 Aug. 2019].
- Channel New Asia. (2018). *Malaysia to abolish single-use plastics by 2030, introduce plastic bag charge* Read more at <https://www.channelnewsasia.com/news/asia/malaysia-abolish-single-use-plastics-2030-plastic-bag-charge-10753114>. Retrieved from <https://www.channelnewsasia.com/news/asia/malaysia-abolish-single-use-plastics-2030-plastic-bag-charge-10753114>
- Yamaguchi, M., BARREIRA, A., & NUGA, H. (2019). Japan, a Big Plastic User, Fights Waste Ahead of the G-20 Summit. *TIME*. Retrieved from <https://time.com/5614452/plastic-waste-japan-environment-packaging-recycling/>
- INC., S. (2019). 衝撃...レジ袋・プラごみ、大阪湾に「900万枚」沈んでいる. [online] 産経ニュース. Available at: <https://www.sankei.com/west/news/190612/wst1906120024-n1.html> [Accessed 11 Aug. 2019].
- Iwasaki, S. (2019). [online] Japanbullet.com. Available at: <https://www.japanbullet.com/news/researcher-japans-plastic-garbage-can-reach-us> [Accessed 11 Aug. 2019].
- MINISTRY OF ENERGY, SCIENCE, TECHNOLOGY, ENVIRONMENT & CLIMATE CHANGE (MESTECC), MALAYSIA. (2018). *MALAYSIA'S ROADMAP TOWARDS ZERO SINGLE-USE PLASTICS 2018-2030 Towards a sustainable future* (pp. 6-8). Putrajaya: MINISTRY OF ENERGY, SCIENCE, TECHNOLOGY, ENVIRONMENT & CLIMATE CHANGE (MESTECC).
- Ministry of Foreign Affairs of Japan. (2019). *G20 Implementation Framework for Actions on Marine Plastic Litter* (pp. 1-4). Tokyo: Ministry of Foreign Affairs of Japan.
- The Japan Times. (2019). *Japanese government paper calls for review of handling of plastics*. Retrieved from <https://www.japantimes.co.jp/news/2019/06/07/national/japanese-government-paper-calls-review-handling-plastics/#.XU2pXZMzab8>
- Plastics Smart. (2019). *Marine Plastics x Innovation* (pp. 1-13). Tokyo: Ministry of the Environment of Japan.
- KANEKA Biodegradable Polymer PHBH™ | United Nations Industrial Development Organization. (2019). Retrieved 9 August 2019, from [http://www.unido.or.jp/en/technology\\_db/5277/](http://www.unido.or.jp/en/technology_db/5277/)
- Mitsubishi Chemical to start the sales of Paper Cups made from biodegradable plastic. (2019). Retrieved 9 August 2019, from <https://www.plasticsinsight.com/mitsubishi-chemical-to-start-the-sales-of-paper-cups-made-from-biodegradable-plastic/>
- Sample Provision of SILBIO BARRIER, Paper Material with Barrier Properties, Commences. (2019). Retrieved 10 August 2019, from <https://www.ojiholdings.co.jp/Portals/0/resources/content/files/english/ir/news/2019/CePPHy9.pdf>
- Tokyo homebuilder launches mass production of environmental friendly wooden straws - The Mainichi. (2018). Retrieved 10 August 2019, from <https://mainichi.jp/english/articles/20181208/p2a/00m/0na/026000c>
- Env.go.jp. (2019). [online] Available at: [http://www.env.go.jp/earth/20190613brochure\\_english.pdf](http://www.env.go.jp/earth/20190613brochure_english.pdf) [Accessed 10 Aug. 2019].
- ASAHI GROUP HOLDINGS. (2019). *Eco-Friendly Products | ASAHI GROUP HOLDINGS*. [online] Available at: <https://www.asahigroup-holdings.com/en/csr/environment/ecoproducts.html> [Accessed 11 Aug. 2019].
- Japan Agency for Marine-Earth Science and Technology (JAMSTEC) (2019). *Technology development for monitoring marine microplastic pollution*. [online] Available at: <http://www.jamstec.go.jp/microplastic/e/> [Accessed 11 Aug. 2019].