

SECTION 5 – DOMESTIC POLICIES AND REGULATORY APPROACHES AND OBSTACLES

1. SCOPE OF ANALYSIS

This section considers four global reports that were commissioned by the United Nations on policy and regulatory examples and obstacles to combatting pollution from plastics. The purpose of these reports was to consider the findings and make recommendations of particular relevance to Southeast and East Asia that may be used towards the development of responses to pollution from marine plastics. The reports that have been reviewed below focus on marine plastic litter or plastic waste globally and in Southeast Asia. They therefore overlap in scope, despite each having a different framing. The first three reports are global in scope, whereas the fourth report focuses specifically on plastic in Southeast and East Asia.

First, the 2016 UNEP Report on ‘Marine Litter Legislation: A Toolkit for Policymakers’. It is referred to below as UNEP Toolkit for Policymakers (available: http://wedocs.unep.org/bitstream/handle/20.500.11822/8630/-Marine_litter_legislation_A_policy_toolkit_for_policymakers-2016marine_litter_legislation.pdf.pdf?sequence=2&isAllowed=y). It focuses on regulatory approaches taken to combat pollution from marine litter at international and domestic levels, with a particular focus on issues that are later expanded on by the remaining three reports referred to. These issues include: plastic bags and other single-use plastic items; biodegradability; taxes and levies; EPR; as well as waste management approaches for land-based and sea-based sources of marine litter, including the management of marine litter in the marine environment and removal efforts.

Second, the 2018 UNEP Report on ‘Single-Use Plastics: A Roadmap to Sustainability’. It is referred to below as UNEP Roadmap to Sustainability (available: <https://www.unenvironment.org/resources/report/single-use-plastics-roadmap-sustainability>). This report focuses on plastic bags and foamed plastic products considered as problematic single-use plastics. It expands on the earlier 2016 report by suggesting steps that may be considered to minimize their production and therefore their disposal. The report presented case studies from around the world, and provided a summary of countries that have introduced regulations on plastic bags and styrofoam products, including ASEAN+ 3 countries, with China featured in the case studies.

Third, the 2019 GPML-UNEP Report on ‘Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations’. It is referred to below as the Report on Legal Limits on Single-Use Plastics (available: <http://wedocs.unep.org/handle/20.500.11822/27113>). This report provides a global overview of national laws and regulations on bans and restrictions, taxes and levies, waste management measures, and alternative products limiting the manufacture, import, sale, use and disposal of selected single-use plastic products and microplastics which have been found to substantially contribute to marine litter. This study covered 192 countries, including all ASEAN+3 countries, and spanned a six-month period from March to August 2018. It focused on three types of plastic items (i.e. plastic bags, other single-use plastics, and microbeads). It considered regulations at three particular stages in the life cycle of plastic from fabrication to waste (i.e. market entry regulation, retail distribution regulation, and post-use or disposal regulation).

Fourth, the UNEP-GA Circular 2019 report on ‘The Role of Packaging Regulations and Standards in Driving the Circular Economy’ which focuses on the ASEAN. It is referred to below as the Report on the Role of Packaging Regulations and Standards (available: http://sos2019.sea-circular.org/wp-content/uploads/2019/11/FINAL_THE-ROLE-OF-PACKAGING-REGULATIONS-AND-STANDARDS-IN-DRIVING-THE-CIRCULAR-ECONOMY.pdf.) This report reviews packaging policies and interventions for combating plastic wastes in the ASEAN region, based on adaptation of best practices from the European Union and Japan, together with reviews of existing laws and policies in ASEAN countries.

The findings and points made in these reports have been compiled and integrated below in the context of plastic pollution of the coastal and marine environment in ASEAN+3. It includes prior analysis of the status of research and priorities of intergovernmental bodies. This integration is to better inform the steps that may be considered by regional bodies at this stage to combat marine plastic pollution.

The discussion of the findings and recommendations are structured below. It concentrates first on regulatory approaches to plastic bags, single use plastics and packaging in general, prior to focusing on specific issues and challenges: upstream source restrictions, biodegradable products and recycling content as well as microbeads. Pollution of the marine environment from plastic nurdles is highlighted in the first report only and not discussed in the others and especially not in the context of ASEAN+3. Microplastocs therefore not discussed in this section. However, the review of research on marine plastic pollution in ASEAN+3 highlights a lack of understanding of distribution and baseline of pollution of the marine environment by microplastics in ASEAN+3. See [Part 1, Section 2.14.2](#) on the regional summary of research, and [Part 2, Section 6](#).

The 2019 Report on the Role of Packaging Regulations and Standards propose that, in order to support the development of a circular economy and therefore effectively combat pollution from plastic debris, response policies must be nested around four core components:

- Source reduction;
- Source separation and separate collection;
- Landfill; and
- National targets.

These are examined in throughout the following sections and further discussed in the conclusion.

2. REGULATORY APPROACHES TO PLASTIC BAGS, SINGLE-USE PLASTICS AND PACKAGING

2.1 Regulatory approaches to plastic bags

The Report on Legal Limits on Single-Use Plastics shows that regulatory approaches taken by states varies. Approaches may primarily target consumers, the plastic industry or retailers or waste management.

Table 2.5.2.1. Regulatory approaches to plastic bags in ASEAN+3.

(Sources: 2019 GPML-UNEP Report on 'Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations' and 2018 UNEP Report on 'Single-Use Plastics: A Roadmap to Sustainability'.)

Country	Approach to regulatory interventions to limit the number of plastic bags
Brunei	Only regulates disposal at national level (solid waste/litter regulation)
Cambodia	<ul style="list-style-type: none"> - Handle plastic bags are prohibited from importation, production, distribution and use, except for: A- the plastic bags are 0.03 mm or thicker; and B- the plastic bags have a bottom width of at least 25 cm or 10 inches. All importation and local production of plastic bags in A and B above shall have permit from the ministry of environment except for non-commercial importation of less than 100 kg - Customers will pay for plastic bags from supermarkets, commercial centres, and all business and service locations - Legislation requires encouragement of use of renewable materials and minimization of waste generation
China	<ul style="list-style-type: none"> - Ban on the import of used plastic bags and single use plastic products - Ban on non-biodegradable plastic bags <25µ and levy on consumer for thicker ones - No free plastic shopping bags shall be provided at any commodities retail places, and the price of plastic shopping bags shall be clearly marked and charged separately from the commodity price [different measures in different provinces for the same purpose]
Indonesia	<ul style="list-style-type: none"> - Law speaks to creation of policy directives on waste reduction, handling and minimization including the development of a road map on extended producer responsibility - Measures adopted by cities - Manufacturers are obliged to recycle waste by <ul style="list-style-type: none"> (a) preparing a waste recycling programme as part of its business and / or activity; (b) using recyclable production raw materials; and / or (c) reclaiming garbage from product and product packaging for recycling
Japan	<ul style="list-style-type: none"> - Recycling plan instituted by law - Extended producer responsibility for designated businesses who are required to reduce waste containers and packaging discharged through rationalization of use of containers and packaging by using recyclable containers and packaging and reducing the excess use of containers
RO Korea	<ul style="list-style-type: none"> - Prohibition of distribution of packaging for free: Act on the promotion of saving and recycling of resources – For Single use plastic bags and shopping bags -5 cent/bag. - Requirements to put in place a recycling plan for specified products
Lao	<ul style="list-style-type: none"> - General requirements to separate waste for different purposes such as recycle, reuse, reprocess as new products and elimination with methods and techniques within identified areas base
Malaysia	<ul style="list-style-type: none"> - Investment tax allowance for use of biodegradable materials - Locally, charge on bags, ban on non-biodegradable bags
Myanmar	<ul style="list-style-type: none"> - Only regulates disposal at national level (solid waste/litter regulation) - Local bans
Philippines	<ul style="list-style-type: none"> - Rules on waste minimization at source and separation - No specific rules on plastic bags except locally
Singapore	<ul style="list-style-type: none"> - Mandatory requirement to submit waste report and waste reduction plan
Thailand	<ul style="list-style-type: none"> - Only regulates disposal at national level (solid waste/ litter regulation) - Plastic bag levy under study
Vietnam	<ul style="list-style-type: none"> - Non-biodegradable plastic bags are taxed by weight at VND 40,000 (\$1.76) per kilogram (levy on retailer). Amount may be too low - Environmental protection tax issues against use of plastic bags - Requirements for reduction and waste minimization

Whilst single use plastics (specific products) bans and EPR measures (e.g. product-take back schemes, deposit-refund, and waste collection and takeback guarantee) are commonly adopted globally, less examples from ASEAN+3 countries are mentioned, compared to the countries of Africa, Europe and West Asia. With respect to plastic bags, the Report on Legal Limits on Single-Use Plastics

highlights that 66% of countries have adopted some kind of regulation, with the most common being a ban on free distribution within the retail sector. However, in ASEAN+3, few countries have embraced such a ban at national level, with some charging a levy for plastic bags on the consumer (i.e. Cambodia, China and RO Korea).

The most common legal measures focus on single use plastics, recycling requirements and solid waste management regulations, whether implicitly or explicitly focused on plastics. (see Table 2.5.2.1 above). Case studies from other developing and tropical countries in Africa and the Caribbean show that a ban of plastic bags is possible, with exemption for essential use, hygiene and sanitary purposes. Other approaches include bans of particular polymers and/or over certain thickness.

Ongoing work and projects on this topic in ASEAN+3 suggest that new measures are about to be adopted in most states, each with their own approach. The reports also highlight the greater success of a holistic approach that is not solely focused on legal interventions or incentives or waste management. Standardised measurements of pollution status would assist assessment of measure efficiency.

Table 2.5.2.2. Policy tools to limit the use of plastic bags.

(Adapted from the 2018 UNEP Report on 'Single-Use Plastics: A Roadmap to Sustainability', page 23.)

Policy tools		Features
Regulatory instruments	Ban	Prohibition of a particular Type or combination of single-use plastics (including plastic bags, foamed plastic products, etc.). The ban can be total or partial (for those of certain specifications, e.g. plastic bags)
Economic instruments	Tax on/to manufacturers, importers or suppliers	Levy paid by suppliers of plastic bags (domestic producers or importers). For such a tax to be effective in inducing behavioural change, it should be fully passed on from suppliers to retailers, enticing the latter to (i) charge consumers for plastic bags or (ii) offer a rebate/reward to consumers who do not ask for plastic bags, promoting the use of reusable ones. Can be a tax on import and/or manufacture and/or distribution
	Tax/levy/incentives on/to retailers	Levy to be paid by the retailer when purchasing plastic bags. The retailers are not obligated to convey the tax to the consumers. Can be a tax on distribution
	Levy/fee/incentive on/to consumers	Charge on each bag sold at the point of sale; standard price defined by law. Can be a fee on end-user
Combination of regulatory and economic instruments	Ban and tax/levy/fee	Combination of ban and levy (for instance a ban on thin plastic bags and a levy on thicker ones)
Voluntary reduction strategies	Public campaign	Public campaigns and reward system, preferably in addition to other measures with aim of changing social behaviour
	Public education	Education and awareness on issues to convince of need for social behavioural change, risks of status quo and alternatives available
	Private-public agreements	Choice of modalities left to the private sector such as agreement between retailer or producer and government (e.g. voluntary framework for EPR)

The Report on Single-Use Plastics also highlights challenges linked to bans on plastic bags, such as the controversy on reusable bags due to some of them not being easily recyclable, depending on their composition. Prior to banning a product, alternative solutions must be explored. The Report points again to the benefit of addressing plastic pollution in a holistic manner that envisages all relevant stakeholders and public-private partnerships. It also presents policy tools adapted in Table 2.5.2.2 above.

Whilst plastic bags are often treated as a separate issue, all factors raised in this context are also relevant to the wider issue of single-use plastic packaging, especially the policy approaches.

2.2 Policy landscape on packaging regulations and EPR

2.2.1 General analysis

Packaging regulations include the regulation of single-use or non-reusable plastics themselves composed of a wide diversity of products such as (in addition to plastic bags) stirrers, disposable utensils, cups, cigarette butts, styrofoam (Expanded polystyrene or EPS) boxes, etc. The reports indicate that nearly 50% of plastics generated globally in 2015 are from plastic packaging but that recycling rate has stagnated at less than 10%, with the remainder going to landfills, incinerations and leakages to the environment.

Table 2.5.2.3 below provides a summary of the policy landscape for packaging regulations in ASEAN countries and Japan on the basis of the UNEP-GA Circular 2019 Report on the Role of Packaging Regulations and Standards.

Table 2.5.2.3. Policy landscape for packaging regulations in ASEAN+3.

(Source: UNEP-GA Circular 2019 report on 'The Role of Packaging Regulations and Standards in Driving the Circular Economy'. China and RO Korea were not included in the scope of this report.)

Legend: ✓ indicates adoption of different policy approaches or regulations;

■ Indicates that no such policy has been adopted; ■ >60% ASEAN MS; ■ most ASEAN MS; ■ few ASEAN MS.

	JPN	BRN	KHM	IDN	MYS	MMR	PHL	SGP	THA	VNM	% in ASEAN
Source reduction by design or material restriction	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	88%
Green procurement plan	✓	■	■	✓	■	■	✓	■	✓	■	33%
Domestic trade policy on plastic waste	✓	■	■	✓	✓	■	✓	■	✓	✓	55%
EPR- legislative framework (gen'l)	✓	■	■	✓	✓	■	■	■	■	■	22%
EPR- Reporting	✓	■	■	■	■	■	■	✓	■	■	11%
EPR-Take back requirements	✓	■	■	✓	✓	■	■	■	■	■	22%
EPR- Taxes/fees for packaging (excl plastic bags)	✓	■	■	■	■	■	■	■	■	■	0%
EPR- Packaging marks and labels	✓	■	■	■	■	■	■	✓	✓	■	22%
EPR- Voluntary efforts	✓	■	■	✓	■	■	■	■	■	■	11%
Waste management policy or legislation (gen'l)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100%
Source separation and collection	✓	■	✓	✓	✓	■	✓	■	■	✓	55%
Recycling content policy, recycling/recovery targets	✓	✓	■	✓	✓	✓	✓	✓	✓	✓	88%
Landfill regulations (incl waste to energy)	✓	■	✓	✓	✓	✓	✓	■	✓	✓	77%
Marine litter legislation	✓	■	■	✓	✓	■	✓	✓	✓	✓	66%
Anti-litter legislation	■	✓	■	■	✓	✓	✓	✓	✓	✓	77%

This analysis illustrates the general awareness of marine plastic debris in the ASEAN + Japan where most coastal states have adopted marine litter legislation in addition to general anti-litter legislation and waste management policy or legislation. While there is a strong emphasis on waste management, upstream measures are progressively being developed (such as source reduction, source separation, green purchasing and recycling targets and policy content) in order to stimulate the closing of the economic loop and avoid discharge into the marine environment.

However, the report provides a broad analysis waste management and includes an array of different measures. It therefore does not reflect on the different stages of development of waste management practices. For example, despite a theoretical source selection and separation of waste, [Part 1, Section 2](#) has shown that the infrastructure is often insufficient to prevent accumulation areas leaking into the marine environment, especially (though not only) in ASEAN countries. In particular, the 2016 Report on Marine Litter Legislation highlights some useful components that may not be widely adopted or implemented as described across all ASEAN+3 countries, particularly:

- Landfill siting and operation;
- Planning and disaster preparedness for countries that are exposed to natural disasters such as earthquakes, flooding and typhoons; and
- Incineration.

Recycling content policies and recycling targets appear to be a focus in the ASEAN to some extent, but are at an early stage of development. Finally, the development of new 'environmentally friendly' and biodegradable plastic is raising new challenges.

The reports reviewed also highlight that whilst the ASEAN countries have all committed to a circular economy approach in a number of instruments and intergovernmental documents, modalities of implementation of this approach are still being defined. In the same way that upstream policies on source restriction are still primarily focused on plastic bags (and locally styrofoam boxes), the implementation of EPR is still in its early stage with Indonesia and Malaysia as early movers in the ASEAN on the set-up of a legislative framework.

2.2.2 EPR and other market-based policy approaches

EPR is generally understood as a policy approach designed to extend to the responsibility of a producer to the post-consumer stage of a product's life cycle to the producer. It encompasses a large array of possible mechanisms and varying degrees of sharing of responsibility between the consumer and the producer with respect to the end of life of the product.

Several types of EPR that are being used to combat pollution from plastic are mentioned in the previous section. From the most stringent on the producer to more flexible mechanisms, they include:

- Take back requirements;
- Taxes/fees for packaging;
- Waste management reporting by the producer;
- Packaging marks and labels; and
- Voluntary efforts.

Hybrid mechanisms can also be envisaged. For example, a tax can be applied to the distributor/dealer of non-returnable plastic containers or other packaging unless the distributor/dealer has an adequate system for the recycling of these items.

Of note, EPR can encompass additional responsibilities including the recovery and recycling of products, responsibility for return, and trade controls or lifecycle management of a range of products that includes management of the potential environmental impacts of a product in all stages of production, distribution, use, collection, re-use, recycling, reprocessing and disposal. EPR schemes generally take the form of a hybrid of regulatory and economic instruments.

The 2019 Report on Legal Limits on Single-Use Plastics and Microplastics indicates that in ASEAN+3, Indonesia, the RO Korea and Japan have an EPR regulation that involves take-back of plastic packaging. Indonesia seeks to push waste recycling through businesses having to institute a recycling programme as part of their activities, using production and raw materials that can be recycled, and reclaiming waste from products and product packaging for recycling. Similar results can be sought with a deposit-refund scheme. Indonesia and Malaysia are at the forefront of the ASEAN with EPR framework regulations with specific obligations on industries being under consideration. Case studies from these countries as well as the RO Korea and Japan could be very informative for further development of comparable schemes in the region.

3. CHALLENGES LINKED TO DIFFERENT APPROACHES TO PLASTIC RECYCLING AND BIODEGRADABLE PLASTICS AND OTHER PLASTIC ALTERNATIVES

3.1 Recycling capacity vs new plastic substitutes

The reports reviewed identify two parallel and potentially conflicting processes that are discussed in this section:

- The development of recycling capacity of solid waste in general and plastic waste in particular; and,
- The development of plastic substitutes including 'biodegradable' plastic products.

The development of recycling capacity for plastic waste through the setting of recycling targets, as well as the separation of recyclable and non-recyclable components and the separation of different waste streams prior to collection (to avoid difficult (if possible) subsequent sorting), are expected to result in greater product recovery and repurposing or recycling. This approach can be further encouraged by recycled content policies that aim to increase the proportion of recycled (rather than virgin) material for new product-making. A limit to note in this approach is the situation where plastic products contain mixtures of different plastic materials (e.g. multi-layers of different polymers) that may not be easily separated.

The parallel objective of plastic reduction at source tends to be pursued through policies that include improved design with less or no plastic, material bans and restrictions, and alternative packaging policies including biodegradable plastics. However, these approaches can result in the development of new products or increase the use and disposal of materials that waste management sorting systems

are unable to deal with where the products are disposed off. This thereby creates a new open loop in the economy, rather than supporting the closing of the existing loop towards a circular economy.

3.2 Recycling mandate and recycling capacity

The development of national policies on recycling capacity starts with a waste management system which includes recycling of plastic products, whether implicitly or explicitly. Many countries have such mandate through solid waste management laws that explicitly include plastic products. In the ASEAN+3, Indonesia, the RO Korea, Malaysia and the Philippines have established recycling regulatory mandates that include specific measures for single-use plastic items. Recycling is also practiced in other countries to different extents under a less formal policy structure that includes local initiatives from the private sector and civil society.

Elements that need to be included in the recycling mandate to stimulate progress towards a circular economy model are:

- Separation of different recyclable products and of non-recyclables;
- Separate collection;
- Recycling and recovery technology and infrastructure;
- Most products can be reused, repurposed or recycled; and
- Recycling targets (e.g. packaging waste recovery) and recycled content policy (e.g. requirement that single-use products are made of recycled material).

Of note, EPR is a useful tool to support such a recycling policy approach and can include return, collection and recycling of single-use plastic items. Public-private agreements are also relied on in a number of countries where public institutions provide a collection infrastructure prior to handing the products back to different industries under the agreement, as an example.

However, adoption of these procedures relies on a solid understanding of the materials being used, on their recyclability, and on the existence of end-markets for these materials. In this context, for new types of materials to fit within this framework, their development must follow a consistent and rigorous approach. This would include a common understanding of what 'biodegradable' and 'compostable' mean in the context of waste treatment.

3.3 New biodegradable plastics and plastic substitutes

Bans of non-biodegradable plastic in plastic bags and single-use plastic items, as well as the urgency to limit products that are persistent and polluting the marine environment, have triggered the development of new types of plant-based plastic materials that are marketed as being 'biodegradable' or oxobiodegradable (e.g. from cornstarch).

Production of such new material is encouraged by a number of regulations that ban or seek to limit plastic bags and single-use plastic, which exclude 'biodegradable' plastic from these regulations. Biodegradable plastic can be defined very differently, and is an issue that needs addressing. Plastic bag thickness can for example be used to characterise biodegradability or avoid application of a ban. The

Report on Legal Limits on Single-use Plastics indicates that 38 countries regulate the thickness of plastic bags with varying threshold of 10 to 100 microns and above; bags that are thinner than this threshold are within the scope of the ban or other restrictive measures. In ASEAN+3, the threshold adopted by China is 25 microns whereas Cambodia and Vietnam have adopted higher threshold. In Vietnam, environmental-friendly bags that are thicker than 50 microns are reported to be exempt from tax.

Some countries also combine a thickness threshold with a requirement of oxo-biodegradability or use 'biodegradability' as an exemption from restrictive rules. This raises two issues: first, the definition of biodegradable; and second, the treatment of biodegradable plastic.

On the definition of biodegradability, the reports highlight the difference between biodegradability and photodegradability of plastic, which are often confused. Photodegradability is defined as the slow break down of plastic into small fragments also known as microplastics, under the effect of sun and oxygen. By contrast, biodegradability designates the breakdown of a material into the components of carbon dioxide, biomass and water.

With respect to the treatment of biodegradable plastic products, the reports on Single Use Plastics and on the Role of Packaging Regulations and Standards point to unintended consequences of biodegradable plastics on waste collection and treatment systems, on the basis that they break down completely only if they are exposed to prolonged high temperatures above 50°C and oxygen. In marine environments, biodegradable products are reported as having their degradation slowed down even further due to the lack of high temperature and oxygen. Therefore, even bioplastics derived from renewable sources (such as corn starch, cassava roots, or sugarcane) or from bacterial fermentation of sugar or lipids (PHA) do not automatically degrade in the environment and especially not in the ocean. The post-disposal journey of biodegradable or compostable plastics or bioplastics requires particular scrutiny that includes separate collection, special treatment for bioplastics and ensuring that it is effectively subject to waste treatment. Separation from traditional plastics waste streams is due to differing chemical compositions of biodegradable plastics, the need to ensure high-quality recyclates production, and the durability of plastic products made of these recyclates.

Oxo-degradable plastics raise another series of issues. They are made by blending a prodegradant-additive into the plastic during the extrusion process, and this additive causes the plastic to decompose when exposed to heat or sunlight. It is then assumed that microorganisms which can ingest this decomposed plastic can speed up the degradation by digesting it. This degradation process, however, presupposes the availability of heat and oxygen. It also raises concerns with respect to the breaking down into microplastics which are still harmful to the environment even if they address the littering issue.

Whilst biodegradability is not a common requirement in ASEAN+3, a definition that is shared between science, industry and market practices would contribute to improving the development of new 'biodegradable' materials, and preventing that which would defeat the aim of limiting input of new marine plastic debris. Existing standards may be considered in this context.

4. UPSTREAM SOURCE RESTRICTIONS

The UNEP Report on Single-Use Plastics highlights that Southeast Asia consumes less than half of single-use plastic than does Northeast Asia, a little bit less than Europe, and many times more than Africa or South America. Upstream source restriction is therefore an important area of study for the region.

Source reduction can aim to:

- Restrict the manufacturing of material: this can include the ban of particular polymers, require that material be made of recycled products or plastic bag ban of particular thickness or composition;
- Restrictions on use of material: this can include biodegradability requirements for specific items, green purchasing procurement measures, or tax on single-use plastics (e.g. special environmental tax, waste disposal fees or charges or higher excise taxes for single-use plastics); and
- Reduction by design: this can include bringing packaging weight and volume to the minimum needed for safety or hygiene and consumer acceptance of the packet product.

In ASEAN, source reduction has for now been mostly focused on plastic bags with ongoing work on single-use plastic. Bans or restrictions for dealing with single-use plastic products can be implemented across stages of manufacture, distribution, use, sale and import, and on specific products with targeted polystyrene polymer.

However, locally, there appears to have been restrictions on specific types of plastic polymers. There has been restriction on importing, trading or distributing high-density polyethylene (HDPE) in Yangon City in 2009 and PE in Mandalay in 2011. Some measures have also been adopted in Vietnam on nylon bags.

In Singapore, incentives have been given to brands to reduce their packaging and inform consumers who want to reduce their waste footprint. Examples include the granting of awards to brands for the development of products which incorporate new designs which reduce packaging waste.

5. MICROBEADS

Microbeads are identified as one of three important sources of plastic in the marine environment, along with plastic bags and disposable single-use plastic items. The term 'microbeads' is often used to designate mild abrasive plastic particles that have been intentionally added to home and personal care products such as facial cleansers, shampoos, and toothpastes since the 1990s. They are generally under 5mm in size and can vary in chemical composition, size, share and density. As they are persistent in and cannot be recovered from water through conventional water treatment systems, preventing their introduction into the marine environment is often seen as the only way to eliminate this source of marine plastic pollution. However, as of July 2018, only eight countries out of a total of 192 studied countries appear to have adopted legally-binding bans for limiting microbead manufacture and sale through national laws, with some countries including only a subset of personal care products and

cosmetics. These countries consider microbeads to be a toxic substance. Exemptions can include biodegradable alternatives and medical purposes of microbeads. In the absence of such bans, voluntary measures executed by specific governments, companies, civil society organisations and regional government institutions aim to limit microbeads by future binding limits, publicized microbead lists for actions, as well as government plans and statements.

Microbeads do not appear to be a priority in ASEAN+3, unlike microplastics.

6. SUMMARY OF FINDINGS FOR THE REGION ON DOMESTIC POLICIES AND REGULATORY APPROACHES AND OBSTACLES

This review of domestic policies and regulatory approaches and obstacles highlights a few issues and opportunities.

First it demonstrates the global focus on plastic bags and single-use plastic whilst highlighting that ASEAN+3, as a region, has been focusing first on plastic bags with regulatory interventions at local or national levels, involving for example, general or selective bans on specific plastic bags such as extra-thin bags or taxes. This policy approach shows a strong awareness of plastic issues and a diversity of other measures are being considered. It is a dynamic area of policy work.

Second, there are areas of work for which measures have already been developed but are still at an early stage. EPR is a specific area of focus of both COBSEA RAP MALI and the ASEAN FAMAD. The reports reviewed show some measures and movements in this area. However, they also evidence the need for further work in specific regulatory measures that can durably modify the approach of producers and retailers to plastic materials. The new approach must include a greater scrutiny on their type, use, persistence and toxicity in the natural environment, as well as treatment as waste. Examples of measures that have not been widely embraced in the ASEAN+3 are reporting, taxes or fees for packaging other than plastic bags, packaging brands and labels (e.g. showing their content or certifying that they are made of a biodegradable or compostable material), and effective encouragements of voluntary efforts by producers or retailers.

Third, the reports point to issues raised by the ban of some plastic products and the development of new materials to replace them, whether they are claimed to be biodegradable or less polluting as they are reusable rather than single-use products. These create technical and policy challenges to progress towards a circular economy and close the economic loop that involve the design of new recycling frameworks. These also raise educational challenges to ensure that users use the recycling processes appropriately. Mechanisms are needed to overcome these challenges such as measures to ensure that there is a post-use market for all materials being distributed by retailers, that waste is sorted for treatment with source separation and separate collection and that users are informed adequately.

Fourth, these reports highlight that there are two areas that are still at an early stage of consideration, despite scientific studies progressively highlighting them as more and more critical: microbeads and polymer control. Research in microbeads is just starting in the ASEAN, while a lot more research on it is being done in China, Japan and the RO Korea. Similarly, restricting the types of polymer used in

product component, in trade or at post-use stages on the basis that they would be more persistent or toxic, is mostly limited in ASEAN+3. The approach seems to be framed mostly through international regulations developed under the Stockholm and Basel Conventions. In this context, further understanding of and education on polymer types and their characteristics would support the development of a more effective discussion with plastic producers, traders and retailers as well as appropriate and effective measures.

Fifth, these reports highlight the need for harmonised standards, measures and reporting practices that are consistent at national, regional and global levels. The global nature of plastic production and trade, (at the stage of raw plastic, plastic as retail or plastic waste material) commands such mechanisms for the move towards circular economy to be truly successful and also benefit poorer countries. Examples of such standardised definitions and guidelines called for in numerous documents concern:

- Definition of biodegradability;
- Monitoring and evaluation of packaging reporting;
- Measures of plastic pollution;
- Labelling practices;
- Recycling (products and techniques); and
- Recovery technology.