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Plastic Production and Trade in Small States and SIDS: The Shift Towards a Circular Economy

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Abstract

Small states and small island developing states (SIDS) are particularly vulnerable to plastics pollution and the threat of global warming and climate change – without being part of the cause. These countries are concerned by the effects that increasing plastics pollution will have on their development prospects, particularly for ocean-based sectors such as tourism and fisheries. They have played a significant role in bringing regulations and trade policies to the international arena in their efforts to reduce plastics pollution. At the same time, they are aware that finding alternatives to plastic will be a profitable opportunity for those who can do it.

This paper focuses not only on the special needs of small states and SIDS in the challenge to reduce plastics pollution, production and trade, but also on the opportunities. It draws on new information made available in an UNCTAD prototype database that tracks trade in plastics across the entire life cycle and identifies phases in the plastics industry that could offer export opportunities to small states and SIDS. This kind of structural transformation will not happen by itself, however. Part of the solution will depend upon having coherent trade policies, industrial circularity, effective waste management policies and incentives for the emergence of sustainable plastic substitutes and related sunrise industries that meet the need to reduce plastics use and pollution.

JEL Classifications: F13, L65, Q52, Q54

Keywords: plastics, pollution, trade, development, structural transformation, green economy, blue economy

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Abbreviations and Acronyms

EPPs	environmentally preferable products
GATT	General Agreement on Tariffs and Trade
GHG	greenhouse gas
HS	Harmonised Systems
LDCs	least developed countries
MMT	million metric ton
NGO	non-governmental organisation
PBTs	persistent, bioaccumulative and toxic contaminants
SDG	Sustainable Development Goal
SIDS	small island developing states
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

1. Introduction

Small states,¹ and especially small island developing states (SIDS),² are particularly vulnerable to the tide of plastics pollution and the more general threat of global warming and climate change – without contributing much to the problem. There is a kind of irony in the fact that the COVID-19 lockdown and social distancing policies adopted by many countries around the world had the effect of reducing greenhouse gas (GHG) emissions, even if only temporarily, because at the same time it may lead to an increased use of plastics, which is a significant contributor to global warming.³ The health crisis spawned new and useful forms of plastic (such as face masks and personal protection equipment) and simultaneously decimated the price of the fossil fuels that are the main ingredient in plastic, making it even cheaper than before and likely stimulating further demand.

Plastics are big business – a new UNCTAD database that tracks the plastics trade across its entire life cycle estimated this to be worth more than US\$1 trillion globally in the most recent year for which data are available (2018). Of this, around \$200 billion is due to plastic textiles and \$50 billion to packaging alone.⁴ The trade employs millions of people along its life-cycle value chain and has been for many developing countries a way to diversify their economies and raise value-added. Now its role is being widely reappraised amid growing efforts to promote a more circular economy, to reduce single-use plastics and, indeed, to reduce the production and trade in plastics more generally. As countries emerge from the social and economic impact of coronavirus – even if the pandemic has not yet passed – there is a great consciousness that governments and countries need to put a higher priority on the natural environment as a development issue and to help achieve the Sustainable Development Goals (SDGs), and more specifically goals 12, 13 and

14.⁵ This paper focuses attention on the special needs of small states and SIDS in the challenge to reduce plastic pollution, production and trade. It shows that their contribution to worldwide production and trade in plastic inputs and products is extremely small, yet they are greatly impacted because plastics are so deeply embedded in virtually every aspect of consumption, production and trade. This paper also aims to identify potential opportunities for small states and SIDS to offer alternatives to plastic and to use this as a means of diversifying and strengthening their economies.

Aware of their vulnerability, SIDS, small states and least developed countries (LDCs) have taken action. They have notified 25 separate plastics trade and trade-related measures to the World Trade Organization (WTO) over the last decade, accounting for 20 per cent of the total measures, in addition to widespread and highly publicised actions to raise awareness about their plight (UNCTAD, 2020a).⁶ Developing countries (including LDCs and SIDS) more generally are leading in efforts to reduce the plastics trade, having initiated 90 notifications, which account for 71 per cent of the total number put forward globally and showing leadership from the South on this global issue. They are also alert to the employment and income-generating potential of alternatives to fossil fuel-based plastics, or substitutes, and some are already trying to diversify their economies to break into these ‘sunrise’ (new and growing) industries. Achieving this will require a coherent set of financial, industrial and development policies in addition to the trade measures already started. The plastics topic of this paper is not only important in its own right; it also points to challenges raised and some of their solutions for the wider transformation to a cleaner, greener world economy (UNCTAD, 2019b).

2. SIDS, small states and their role in the plastics challenge narrative

The countries loosely grouped under the title SIDS and small states are vulnerable economies

that were already struggling at the uncomfortable nexus of climate change, development and

trade challenges even before the spread of coronavirus in early 2020. Many had been on ‘red alert’ to global warming for the last decade as they suffered an increase in climate-related natural disasters, including hurricanes, typhoons, flooding, drought and rising temperatures. These left countries reeling from the flow-on impact to their industries in the tourism, transport, fisheries and agricultural sectors as well as the direct impacts on the environment; it has even delayed graduation from LDC status for some of them.⁷ The COVID-19 pandemic made matters worse. Even remote island countries without a single case of coronavirus at the time of writing, such as Fiji, are seeing tourism revenues and remittances plummet because of lockdown policies in other countries.

The COVID-19 experience should help situate debate about plastic pollution in the wider developmental narrative that has emerged in recent years (Barrowclough and Deere Birkbeck, 2020). In the past, the focus was usually on ‘downstream’ plastics pollution to the ocean, and this remains extremely important for SIDS as well as many environmental advocates and non-governmental organisations (NGOs) who are making laudable efforts to clean up waters and beaches. The fact there is now a huge patch of plastic waste and other forms of garbage in the Pacific Ocean of significant density, but to some extent scattered distribution,⁸ is just one example of the continuing need for this. At the same time, the narrative is expanding to the wider impact on all countries, even those without a seashore. This includes plastic pollution’s impact on the ecosystem and the wildlife impact of macro plastic and the microplastics that enter the food chain and become potentially toxic to fish, the food web and humankind. SIDS and small states, as with all developing countries, are also extremely vulnerable to ‘mid-stream challenges’ associated with the plastics life cycle, relating to the effects of chemical pollution, health impacts, the carbon footprint of plastics and the economic and fiscal costs associated with their use.⁹

However, the positioning of SIDS in this nexus is complex and has many facets, reflecting the heterogeneity and diversity of the countries in this category. A few countries, such as Trinidad and Tobago, are also fossil fuel producers, while some of the poorest are hosts to

the chemical industries that produce plastic. All face the health effects of global warming and polluted water, soil and air from the production, manufacturing or incineration of plastics, especially the poorest countries or those emerging from conflict whose recycling and waste management facilities are the worst. Thus the narrative about plastics is broadening to go beyond pollution to also include their impact on countries’ abilities to create jobs and revenue in other areas that depend on clean ecosystems, such as tourism and fisheries, not to mention the costs to governments of dealing with plastic refuse in already over-burdened infrastructures – sewage systems and roads may become clogged with plastic, putting them under pressure.

The latest step in the narrative is more developmental and focuses on what is called the ‘upstream’ stage of the plastics life cycle, and here too are particular challenges for all developing countries and to SIDS and small states in particular. They have rather limited ability to participate in efforts that are taking place in many countries to improve plastics design and production, to reduce unnecessary use and to encourage more effective recycling and a more circular global economy with respect to plastic. On the other hand, having limited ability does not mean having no ability and, as shown in this paper, developing countries are already doing quite a lot to focus attention on the economic aspects of the plastics life cycle, with efforts to limit production, to regulate their trade (including bans on plastic bags and straws) and to promote plastics alternatives and substitutes as part of an effort to diversify their economies as well as reducing plastics pollution and waste. SIDS in the Caribbean and the Pacific regions, for example, from Barbados and Belize to Vanuatu, have initiated bans on the manufacture and importation of plastic bags. Fiji launched a ‘plastic waste-free islands’ initiative in early 2020, with the support of the Norwegian Agency for Development Cooperation (NORAD) and the International Union for the Conservation of Nature (IUCN), and Fiji’s Minister of Waterways and the Environment called for the creation of “resistance hubs” to plastics pollution. A similar programme is rolling out in the Caribbean (IUCN, undated).

3. Why it is so difficult to reduce the excessive use of plastics?

In order to address the downstream issues of plastics pollution, we need to look at the upstream issues regarding how plastic is produced, used and traded – which includes examining ways to use and trade plastic better as well as to use and trade it less overall. The challenge is all the more difficult because plastics are extremely useful and their use was already forecast to increase extremely rapidly even before COVID-19 spawned a whole new industry making (useful but by definition throw-away) plastics. Vanuatu, which as noted above instituted a ban on plastic bags, nonetheless allows special dispensation for plastic when used to package fish and food products for export – reflecting the tensions with respect to plastics use for many countries that use them as a way to add value and diversify their exports.

A major part of the problem is the fact that plastic production and marketing are closely linked to the oil industry and petrochemical sector, which already has a huge installed capacity and constant need to allocate fossil fuels surpluses into other production or products along the value chain. The falling price of fossil fuels and the prospect of falling demand in the future add to this tension. Plastics are a very affordable material at the moment because of a low oil price scenario, and the collecting, recycling and disposal cost is not included in the price to other businesses downstream or to consumers.

Even before prices started to fall, world plastics demand was forecast to increase significantly in the next few decades, especially as countries that are not at present using them much start to become big consumers. If the world is already overwhelmed by current levels of plastic, imagine how things will be if we reach the four-fold increase forecast for the next three decades (Geyer et al., 2017). This predicts the largest contribution to this increase to come from the Middle East and Africa, followed by developing Asia and China (ibid.). The regions of Latin America, Europe and North America are not expected to increase their use much – perhaps reflecting the fact they have reached capacity consumption, or because of a backlash

against plastics and new consumer preferences for different, greener¹⁰ or bluer¹¹ products. On the other hand, investors from those regions are currently planning to support expanded capacity for plastics-related infrastructure and production, often with government support.

About 75 per cent of all plastic ever produced has become waste (UNCTAD, 2019a), and it may well continue to do so if measures to reduce, substitute, collect, recycle and sustainably dispose of plastics are not put in place worldwide. Even in countries with excellent waste collection and management systems and high public support, it is difficult to recycle plastic waste and the majority remains left in landfills and in some cases reaching lakes, rivers and ocean basins.¹² Inadequate management of plastic waste has led to increased contamination of not only soil but also freshwater, estuarine and marine environments.

Part of the problem is that plastic decays very slowly. For example, plastics in the ocean can take from decades to hundreds of years to break down depending on their type and on external environmental conditions (Whiting, 2018).¹³ But this is not the end of the story. The broken-up pieces end up as micro and nano plastics particles. Ingestion of such particles by aquatic organisms, including fish species of commercial importance, has been documented in laboratory and field studies. Microplastics also tend to contain a mixture of chemicals added during manufacture and can efficiently adsorb persistent, bio accumulative and toxic contaminants (PBTs) from the environment (UNCTAD, 2019a). The ingestion of microplastics by aquatic organisms and the accumulation of PBTs have been central to the perceived hazard and risk of microplastics in the marine environment and in the entire food chain.

Moving away from excessive use of plastic and into new alternatives therefore represents many interlocking challenges and difficulties for SIDS, and indeed for all countries, but there will also be economic opportunities for those who can make the leap. The plastics theme that is the topic of this paper is important for its

own sake, but the challenges raised and some of their solutions can also be seen as concrete examples of the wider transformation to a cleaner, greener economy (UNCTAD, 2019b).

4. Current trends in the trade in plastics

UNCTAD is currently creating a new database measuring, for the first time, trade in plastics across their entire life cycle. A revised version of the database should be released in 2021, but early signals from the prototype database may be of interest to developing countries because these can help to identify key trends in the plastics trade in terms of both potential negative impacts on their economies and also opportunities for them. In particular, the hope explored in this paper is that it can help identify potential phases in the plastics industry life cycle where SIDS and small states can produce and export alternatives to plastics.

At present, the data are at best preliminary and many gaps remain. Some gaps relate to the fact we still do not have a completely clear sense of exactly what should be described as plastic when it comes to HS codes; other gaps concern where plastic is 'hidden' in products and so it is not clear how to identify let alone count it. Another issue is that plastics production data come voluntarily from producers and trade data come voluntarily from national governments; there is as yet no legal requirement to measure or be transparent about this. Quite a lot of countries do not report at all.

Nonetheless, based on the prototype data currently available, UNCTAD research suggests that trade is extremely significant at all phases in the life cycle of plastics production, trade and consumption (UNCTAD, forthcoming). At the global level, plastics exports are estimated to be worth US\$1 trillion in the latest year for which data are available (2018), with transactions accounting for some 336 million tons of plastic¹⁴ (Barrowclough et al., 2020). SIDS and small states account for just a fraction of this at \$15 billion and 8 million tons, but these amounts can be significant for the countries involved. Better data are still required and the current reporting is only preliminary; for example, some country exports are somewhat surprising, and the picture may change when the dataset is more refined. Nonetheless, it appears that almost all are to some extent

present in all the different phases of the plastics life cycle – as one would expect, given the prevalence and usefulness of plastics in everyday life. The actual amounts involved are very small in some cases, yet it still appears that not only do they widely export and import final plastics but many also export and import intermediate plastics that may be used in local value chains. For some, plastics are important inputs into their efforts to diversify into other activities – synthetic textiles imports, for example, then lead to exports of finished clothing, and imported packaging may be used to export agricultural and other products as well as for local uses.

Potentially most interesting for SIDS and small states is to see the high value of the market in certain sub-sectors of the plastics trade where they could potentially offer non-plastic alternatives. These include plastic textiles and clothing and plastic packaging, as highlighted in Table 1. These markets could be significant for countries that already have some comparative advantage in making bio-mass alternatives to plastic or have the capacity to create these without too ambitious a leap.¹⁵ A number are already active in these functionally related sectors, even if only to a small extent. Other countries that are not SIDS or small states but that nonetheless share some of their economic characteristics and vulnerabilities are also highlighting these activities (for example, Sri Lanka), as well as larger countries with expertise in bio products (such as Finland, see Box 1).

Taken from this perspective, therefore, findings from the UNCTAD prototype database most relevant for SIDS and small states include the following:

- **Plastic textiles** (nylon, polypropylene, etc.). The plastics-based textiles and clothing sector has grown massively and now accounts for \$209 billion worth of exports at the global level and 38 million tons of plastics by volume. This market segment is also extremely large compared to currently

Table 1. Snapshot annual exports in selected plastics along the value chain (US\$ billions and MMTs, for year 2018)

	Global exports	SIDS and small states exports
Intermediate forms of plastic	\$158 bn (39 MMT)	\$1.4 bn (0.5 MMT)
Intermediate manufactured plastic goods	\$83 bn (18 MMT)	\$155 mn (0.24 MMT)
Final manufactured plastic products	\$416 bn (74 MMT)	\$2.2 bn (0.29 MMT)
Plastic textiles	\$209 bn (38 MMT)	\$654 mn (0.7 MMT)
Plastic packaging	\$53 bn (14 MMT)	\$0.3 bn (0.08 MMT)
Total plastics exports	\$1,008 bn (336 MMT)	\$15 bn (8 MMT)

Note: Total volume is the sum of all individual transactions, i.e., the volume of plastics traded, not necessarily the volume created.

Source: Preliminary data from UNCTAD plastics database (prototype) as of February 2021.

traded products that could be alternatives to plastic – global exports of cotton fabrics, for example, were valued at \$12.9 billion in the same year. SIDS and small states are currently present in these markets, with the total exports of plastics-based textiles aggregating to less than \$1 million in value and accounting for just 67,000 tons in volume. Haiti, Malta and Singapore are among the largest small states and SIDS exporters in this sector, with the Dominican Republic, Fiji and Mauritius following.

- **Plastic packaging.** This was estimated to be worth \$53 billion globally in 2018 and account for 14 million tons of plastics. Moreover, this is a significant underestimate, because it only reflects HS codes that

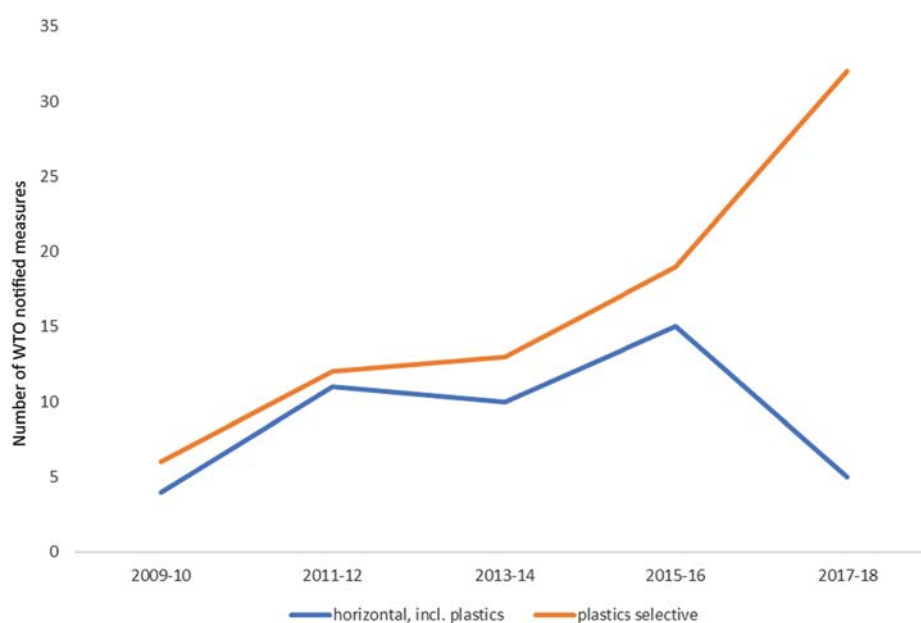
are specifically related to trade in plastic packaging and does not capture the millions of tons of plastic packaging that form part of other traded products that are defined by other HS codes. SIDS and small states are present already in these markets, although to a very small degree, accounting for in aggregate around \$0.3 billion exports and 0.08 million metric tons (MMTs) by volume. Reflecting the diversity of countries in this grouping, some are exporting quite significant amounts (Mauritius and Singapore, for example). Smaller scale exporters include Bahrain, the Dominican Republic, Malta and, to a much lesser extent, Trinidad and Tobago and Cabo Verde.

5. SIDS' and small states' contribution to reducing plastics pollution

Concerns about plastics have led over the past decade to a big increase in WTO notifications of related trade measures. These increased at a rate of 28 per cent annually. From 2015 onwards, members have progressively shifted to plastic-selective policies as opposed to horizontal measures including plastics, for which notifications have been diminishing. Plastic-selective policies made up 86 per cent of plastic-related measures notified to the WTO in the

biennium 2017-2018 compared to 56 per cent in 2015-2016 (UNCTAD, 2020b) – see Figure 1. SIDS and small states are no exception to this regulatory trend. Of about 127 measures notified to the WTO that are relevant to plastics, nine have been notified by two SIDS: Mauritius and Seychelles. The type of measures notified are mainly bans on import, sales and manufacture of certain plastics bags (including non-woven polypropylene bags), straws, tableware

Figure 1. Plastics trade and trade-related measures notified to the WTO, 2009–2018



Note: Analysis conducted on a sample of 127 measures listed in 104 notifications by 43 Members. The sample was derived from a bulk extraction of notifications containing the keyword 'plastic' (n=128). Measures regulating non-plastic goods whose notification only incidentally mentions plastics, or whose primary objective is not to address plastic pollution or plastic-related environmental and health concerns, were excluded. Selective measures are policies with a clear and unequivocal focus on plastics in terms of object (product) or purpose, while horizontal measures are policies that apply to a basket of goods or material inputs, including but not limited to plastics.

Source: UNCTAD analysis on data from the WTO Environmental Database (2020).

and kitchenware, as well as plastic and foam boxes and other containers. These measures have been notified as quantitative restrictions under the 1994 General Agreement on Tariffs and Trade (GATT) and under the WTO Agreement on Technical Barriers to Trade (TBT). The notifications reflect policies that are part of wider environmental objectives seeking to incrementally reduce plastics use, remove plastics from the environment (including from the ocean) and encourage the sale and use of biodegradable items.

While not notified to the WTO, other small economies and SIDS have also introduced bans or plans to phase out or reduce the use of

single-use plastics. Table 2 shows an illustrative list of trade regulatory measures taken on single-use plastics and related products in small states and SIDS. It shows a regulatory trend that is very positive in conservation and pollution-prevention terms, although it is rather limited in scope to the challenge of single-use plastics. It also shows that bans are consistent in terms of both imports and manufacture. Most SIDS will need to look at the after-ban scenario – including enforcement measures and waste management – and to explore the type of materials that could be used to substitute single-use plastics, whether of a durable, disposable or biodegradable nature.

6. Policy options and initiatives to support SIDS and small states

6.1 Strategic support from different angles

The movement to reduce plastics use and find sustainable alternatives or substitutes to plastics

can represent an important business opportunity for those countries that make the shift into sunrise activities. However, it will not happen automatically or be left just to the impetus of

Table 2. Plastics trade regulatory measures undertaken by SIDS

Country (year)	Scope and key features of the measures taken	Notified to the WTO
Barbados (2019)	Ban on the import, distribution, sale and use of single-use plastic containers, cutlery, straws in place now and a ban on import, manufacture, distribution, sale and use of plastic bags made with a petroleum-based resin. There are exceptions, including bags for garbage, medical use, preservation of food and a few other uses. See Government of Barbados, 2019.	
Belize (2020)	Regulation on the importation and manufacture of certain prohibited products including various forms of single-use plastics such as plastic bags and straws and Styrofoam plates, bowls, cups, cutlery and boxes. See Department of the Environment, 2020.	
Fiji (2017 and 2019)	Regulations on a plastic bag levy. A bill seeking to ban the use and importation of single-use plastics and polystyrene from 2021 in under discussion (Leannem, 2020). See Government of Fiji, 2019.	
Guyana (2016)	Ban on the importation and use of Styrofoam items. See Environmental Protection Agency of Guyana, 2015.	
Marshall Islands (2017)	Ban on the importation, manufacture and use of single-use plastic carrier bags and on Styrofoam and plastic cups, plates and packages. See Republic of the Marshall Islands, 2016.	
Mauritius (2015)	Ban on the import of plastic bags, including non-woven polypropylene bags. See Government of Mauritius, 2015.	X
Papua New Guinea (2020)	Ban on the issuing of permits and the import of single-use plastic shopping bags by manufacturers. See CEPA, 2020.	
Samoa (2018)	Ban on the import, manufacture and distribution of single-use plastic shopping bags, packing bags and straws. See Ministry of Natural Resources and Environment, 2019.	
Seychelles (2017)	Seychelles has banned the sale, manufacturing and importation of some plastic items such as plastic bags, Styrofoam boxes and some plastic utensils and single-use plastic straws. See Government of Seychelles, 2017.	X
Vanuatu (2018)	Ban on the manufacture, use and import of single-use plastic bags, straws and polystyrene takeaway boxes. Certain items such as bags to wrap and carry fish or meat are exempt. See Republic of Vanuatu, 2018.	

Source: Compiled by the authors, 2020.

the market because there can be just as many strong economic reasons for maintaining the status quo, which is profitable and employment creating even if only in the short term. Change is difficult. As with all efforts for structural transformation that are at the heart of responses to climate change, governments need to also face the costs of the process of transition, as there will be a big threat to those currently employed in plastics-related 'sunset' industries, and the systematic and strategic use of industrial policy and also financial policies to create credit and direct it to the new activities will be needed (UNCTAD, 2019b), just as economies have done in the past. Such a transformation of the economy from the fossil fuel-dependent mode to a greener and bluer mode will require

support from many different angles, including investment in capacity building for new alternatives; technology sharing, especially when intellectual property rights may be involved; special access to finance on favourable terms through development banks and other mechanisms; and global policy support through, for example, official development assistance (ODA) and Aid for Trade (UNCTAD 2019b; Barrowclough and Deere Birkbeck 2020).

Different countries will prefer different policy options depending on their context, although one useful example of how national strategies need to be broad-based and coherent and with support from all stakeholders can be seen in the industrial policy programme initiated recently by Finland (Ministry of the Environment,

2019). The message could be highly relevant for SIDS and small states, even if their economies are different, in part because the programme is strongly linked to natural resource industries in forestry and agriculture: “The plastics challenge is also an opportunity for Finland, [which] has strong expertise in biomaterials, as well as raw materials that offer opportunities to find solutions for replacing plastics. The plastics challenge is also high on the agenda in Finland’s international affairs¹⁶” (see Box 1).

6.2 Improving waste management

SIDS, small economies and LDCs will still need to improve their waste management capacity, which includes the collection, transport, treatment, recycling and disposal of waste. Waste management capacity also implies clear-testing and categorization systems to deal with different types of wastes and risks, which can range from toxic ones to biodegradable ones depending on the case. Most plastic waste is considered solid waste, which can have polluting effects on soil and water through unmanaged disposal or on the air if through incineration. Poorly

managed waste has negative impacts on public health, on fragile terrestrial, coastal and marine ecosystems and on important economic sectors such as tourism and fisheries (UNEP and ISWA, 2015).

Improving waste management is not an easy task as usually the competence falls at the municipal level and it is implemented by direct provision of urban public services, procurement of services or concessions. In many cases, there are not even national policies or enough coordination to introduce incentives to attract recycling or waste treatment private sector participation and investment or to improve economies of scale.

Without this assistance, developing countries may even find they are locked out of the new greener alternatives opening up if, for example, regulatory or private standards change in ways that impact on their current production and export patterns. The need therefore is to be proactive, not merely re-active, if countries are to be able to benefit from the global shift towards a greener and bluer economy by improving waste management capacity and by creating links with circular processes.

Box 1. An example from existing bio-material producers: The Plastics Roadmap for Finland

The Finnish Plastics Roadmap is a comprehensive and broad-ranging strategy to help Finland reduce its plastics waste, usage and production. Of particular interest to developing countries could be its focus on how to take advantage of the commercial opportunities in producing and exporting alternatives to traditional plastics. Finland already has strong expertise in bio-material production, but the roadmap recognises that much needs to come together for promising new ideas to make it to market.

One part of the roadmap is the establishment of a national programme to develop solutions, materials and technologies to replace plastic. Important aims are to create new business and to be exporting several novel replacements for plastic within the next five years, including through start-ups and small and medium enterprises (SMEs). To achieve this, the roadmap brings together various ministries with business and associations in the forestry, agriculture and plastics industries. It offers finance to collaborations and networks that bring together various stakeholders, including product users and manufacturers, to help strengthen the international competitiveness of Finnish firms in this new activity. It also supports cooperation between those operating in the value chains – e.g., in developing food packaging.

By creating a New Plastics Finland knowledge network, the programme aims to enhance the material competence of companies, strengthen the value chains of plastic recycling and research and disseminate knowledge on solutions to replace traditional plastics.

This programme to support the production and trade of alternative solutions is further supported by another nine complementary strategies, including the use of “financial steering instruments” to reduce plastic production and waste, such as producer responsibility instruments and the possible introduction of a tax on plastic production, as well as investment in plastic waste management and recycling. The roadmap also called for international support, including the creation of an internationally approved basis for the assessment of plastics alternatives, standardisation of concepts and definitions and an unbiased coordinating body that follows and makes efficient use of international research and development.

Source: Ministry of the Environment, 2019.

7. New markets for SIDS and small states: Substitutes and alternatives for plastics

7.1 Existing substitutes

One key area of interest for promoting a more sustainable plastic economy is to make use of existing substitutes that can perform the same or similar functions as plastic but without its negative health or environmental impacts (see Table 3). Here, when referring to plastic substitutes, the focus is on non-fossil fuels-based materials from mineral or organic/biomass origins. Such non-plastic substitutes could allow

the reduction and/or phasing out of chemically based polymers used in certain value chains if sufficient incentives and demand emerge, and/or if the imposition of restrictions on single-use plastics and demand and requirements to purchase non-plastic substitutes continue to increase.

Developing countries are already key suppliers of materials of vegetable or mineral origin that may substitute for plastics in some of their

Table 3. Illustrative list of potential top plastic substitutes in SIDS, small economies and LCDs

Product	Origin	Main uses	Properties	Health impact	Environmental impact
Glass	Sand-based	Food and pharmaceutical products, containers, construction material	Solid, fragile, flexible, insulating, microwavable, heavy but tradable	Very good insulating material and non-toxic ²⁰	Does not contain chemicals or carbon (only minerals), reusable, very slow degradation by erosion and recyclable
Pottery and ceramics	Mineral and water-based	Tableware, container and ornamental uses	Solid, fragile, flexible, supports heat, heavy but tradable	Non-toxic material	Reusable, very slow degradation by erosion and recyclable
Natural fibres	Plant-based (e.g., jute, cotton, coconut, palm)	Textiles, packaging, ropes, clothes, furniture, etc.	Strong, flexible, light, and fully tradable	Non-toxic; production can allow carbon storage	Reusable, biodegradable and recyclable
Paper and cardboard	Cellulose-based	Bags, boxes, packaging, decoration, inputs to industrial products	Flexible, light, and fully tradable	Non-toxic	Reusable, biodegradable and recyclable, but increase in use may generate pressure on timber extraction, unless from managed or certified forests or from recycling
Organic wastes	Bagasse, rice and corn husks, other organic wastes	Cups, cutlery, dishes, construction components and inputs for composite materials	Flexible and light, and tradable.	Non-toxic with some insulation properties	Biodegradable

Source: Adapted from UNCTAD 2020a.

functions. Such materials include vegetable fibres (e.g., coconut, jute and sisal), glass and ceramics, paper and cardboard and natural rubber. Increased demand for these products could create trade and investment opportunities for sunrise industries and promote sustainable development in SIDS, small economies and LDCs.

For example, Madagascar exported US\$6.8 million in vegetable fibres (HS 53: Other vegetable textile fibres; paper yarn and woven fabric of paper yarn) and Mauritius \$0.4 million in 2018.¹⁷ These fibres include coconut, palm, sisal and other types of natural fibre. In terms of exports of cardboard and other paper and cellulose materials and products,¹⁸ Madagascar exported \$9 million while Barbados and Fiji exported \$1.4 million and \$8.7 million, respectively, in 2018. Glass and ceramic ware exports¹⁹ by Barbados and Mauritius were \$0.24 million and \$0.1 million, respectively, in 2018. The scale-up in the production and exports to regional markets of these materials and products could complement current bans or regulations on production, imports and sales of single-use plastics and provide local suitable substitutes that are environmentally friendlier or preferable if compared to the plastic option.

Most SIDS are not oil producers, nor do they have a role on the global petrochemical value chains. By choosing plastics substitutes, there could be less reliance on imports of single-use plastics and other consumer goods, therefore improving the trade balance and replacing unsustainable imports with local sustainable production and exports based on natural materials. There would also be balance of payments benefits if this reduced countries' exposure to volatile US dollar and other currency markets.

A list of environmentally friendly plastics substitutes based on a sound methodology could be an excellent way to direct states', businesses' and consumers' purchases towards clear material options to reduce plastic production and consumption. If such a list is considered as a positive way forward, a future renewal of WTO, plurilateral or regional negotiations on Environmental Goods and Services (EGS) could clearly include such substitutes in order to incentivise their trade and speed up the substitution. Additionally, to the list of plastic substitutes could be added essential environmental services such as waste management and recycling. Table 3 illustrates potential

plastics substitutes, main uses, properties and environmental impacts with potential for the emergence of sunrise industries in SIDS, small economies and LDCs.

7.2 Future alternatives

A second route for SIDS to enter the plastics-alternatives economic space is to build what does not yet exist. This could yield promising new solutions once research has been carried out for new processes and designs for less plastic-intensive packing and business methods that imply direct delivery of products or less use of single-use plastics. This too is already starting to happen and could be of great interest to SIDS and small states. Some examples that involve a not-too-far leap from existing comparative advantage include new forms of cellulose fibres that could be spun into yarns for packaging and fabrics, others into entirely new materials that could be used for packaging to carry liquids, etc. This is the kind of knowledge creation and sharing that is at the heart of the plastics network created by Finland and described above.

One critical issue for SIDS – and indeed all developing countries – is going to be ensuring affordable access to new knowledge processes and raw materials, as well as to recycling and waste management technologies, whether proprietary or not. It will be important they are not left behind in the race that is about to start. In this regard, making use of flexibility in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), green patent pooling, preferential licenses, technological incentives and technical support to make use of new or mature but effective technologies will be of great importance. Furthermore, making use of soft intellectual property protection categories such as utility models and industrial design protection may be very relevant to allow and promote local and low-cost innovation.

At the same time, SIDS must not lose the policy space already existing for plastics measures, including the banning of single-use plastic bags or the promotion of plastics alternatives. There have been some reports, for example, that certain major oil companies are pressuring Kenya to change its world-leading stance against plastic waste (*The Guardian*, 2020a). It would be unfortunate if efforts by developing countries to reduce their single-use plastic consumption and trade were hindered by powerful 'brown' industries lobbies, and SIDS are urged to maintain the

use of policy space to its fullest in order to reduce use, increase recyclability, expand sunrise alternative plastic industries and enable investment in waste management and other environmental services. Ensuring these remain within the framework of relevant United Nations multilateral environmental agreements (MEAs) and WTO Agreements will be key to success.

Finally, development finance institutions such as regional and South-led development

banks can support new and existing enterprises to scale up and succeed in this new sector. These could be further linked with South-South industrial policies from the larger developing countries including, for example, procurement policies for regional purchases of plastics alternatives and support for research into how plastics alternatives can be combined in existing regional value chains that currently use plastics inputs, and in which SIDS could participate.

8. Some ways forward

SIDS and small states find themselves in the familiar position of being extremely negatively impacted by external threats that are not of their own making. They have worked hard to raise awareness at the international level of plastics pollution and have also shown their commitment to making efforts to mitigate this, trying to regulate the excessive use of plastic and the rise of plastic waste by contributing to about 7 per cent of all WTO notified trade measures aimed at regulating plastics production and trade. These were for the most part individual measures notified by individual countries – in practice, the share would be even higher if all SIDS had acted in aggregate and all notified trade measures on single plastics use and trade.

There is a lot that can be done at the level of individual countries in a shift towards a more circular economy, and these efforts need to be continued. However, what is really needed is for support to come from all levels of the economy (corporate, civil society, local and national government) and from all countries, because global co-ordination will be essential if these efforts are to succeed.

A recent announcement on the need for a United Nations treaty on plastic pollution that would include transparency and monitoring of plastic waste, reduction of marine litter and voluntary commitments to reduce plastic use and enable recyclability and substitution is generating political waves and hopes for increased international cooperation on the matter. The initiation of negotiations of such a treaty is supported by most United Nations Members (McVeigh, 2020a), recently including the United Kingdom (McVeigh, 2020b) as well as by responsible businesses²¹ and civil society

coalitions (Ellen MacArthur Foundation, 2020). Within the Commonwealth, the United Kingdom and Vanuatu are the Co-Champions who lead the marine plastics action group (Commonwealth Clean Ocean Alliance) under the Commonwealth Blue Charter.²² This action group has more than 30 members.

On the issue of plastic waste management, for example, there is a need for enhanced national coordination, and this can include financial incentives and investment to be deployed to enable the expansion of waste management systems and recycling from municipal to federal levels. In small states and SIDS, this is imperative as lack of space and negative impacts of uncontrolled waste on land and on coasts can hinder essential activities such as tourism and fisheries. At the same time as these national initiatives, however, global measures are essential. Pressure on small states and SIDS will likely rise as many developing countries are now refusing to continue to accept waste imports from the global North. To help this, further research is needed to better understand regulatory trends surrounding plastics and plastic waste in terms of scope and regulatory distance in SIDS, small economies and LDCs to explore the feasibility of regional or multilateral trade solutions.

The main thrust of this paper, however, is to encourage those countries that can to participate in the national and foreign market for plastic substitutes in order to increase the potential of circularity. This is a very new approach. It stems from the growing appreciation that mitigation and adaptation to climate change offer economic opportunities for countries as well as challenges. In the plastics industry alone, the markets for new alternatives

will potentially be very big indeed, given the size of existing plastics production and trade. They will also contribute to diversification and reducing dependency on just a few activities, the present threat for many SIDS that remain extremely vulnerable on commodities that are traded only in dollars, or to activities that are highly dependent on external circumstances over which they have little control, such as travel and tourism – as proven by the COVID-19 pandemic impact.

Opportunities in plastic substitutes could also reduce imports of fossil fuels and derivatives, leading to lower trade imbalances in SIDS and small economies and less exposure to global volatility in exchange rates.

To make the most of this opportunity, SIDS may need support in the process of identifying the most suitable new materials and their design into useful alternatives to plastic that are attractive in international markets. The re-designing of recycling and waste management technological options and incentives to enable massive access, transfer and use under a new green and blue deal approach will be key.

As long as SIDS remain essentially unsupported, this will not only hinder their own efforts but also impact all nations seeking to benefit from the fisheries and clean water resources in the high seas. The wider efforts to reduce CO₂ emissions, to which plastics' contribution is just starting to be understood, will also be undermined.

UNCTAD and other multilateral institutions have a role to play in supporting these efforts. The World Bank and regional financial institutions can help SIDS and small states by reducing and eventually stopping their promotion of fossil fuel and plastics activities and rather guiding finance to help build more innovative solutions. This is likely to happen anyway, and it will be important that SIDS are not excluded from the new green and blue wave of investment. In the wake of COVID-19, some small states are already recognising the need to upscale focus on sustainable alternatives in some key sectors and have mobilised innovative financing mechanisms to support the blue economy (Kampel, 2020a, b). The United Nations and other institutions can also help with research, technical assistance and international rule-making.

To this end, UNCTAD's new database on the plastics trade and regional research on how to upscale plastic substitutes aims to contribute to a better understanding of the issues and to help pinpoint areas where policymakers can usefully focus attention. The COVID-19 shock of 2020 represents a painful and timely reminder that climate change is already upon us and can have much greater direct and indirect economic shocks than people perhaps anticipated. It has also led to a massive fall in the price of fossil fuels that could be very bad news for efforts to reduce the excessive use of plastics. SIDS must not be left alone in the challenge to wean the world off this useful but too costly material.

Notes

- 1 The Commonwealth criteria for small states include smallness and vulnerability. It has 32 small states members. See: <https://thecommonwealth.org/our-work/small-states>.
- 2 UNCTAD's criteria for small island developing states includes insularity, smallness, developing status and statehood. Its list of SIDS includes 28 states. See: https://unctad.org/system/files/official-document/tdb64d9_en.pdf.
- 3 On average, each ton of plastics produced results in 2.5 tons of CO₂ emissions from the production process alone. In addition, carbon embedded in the material corresponds to another 2.7 tons of CO₂ (see Material Economics, 2018).
- 4 Preliminary data from UNCTAD Plastics Trade Database prototype as of December 2020.
- 5 SDG 12: Responsible consumption and production; SDG 13: Climate action; SDG 14: Life below water.
- 6 Calculations based on Trade and Environment Members notifications to the WTO (from the Trade and Environment Database).
- 7 As noted by His Excellency Chad Blackman, Ambassador and Permanent Representative of Barbados to the United Nations and Other International Organisations in Geneva, at the Commonwealth Small States Geneva Office virtual capacity-building meeting on "Trade, Climate Change, Sustainable Development post-COVID-19", 23 September 2020.
- 8 Known as the Great Pacific Garbage Patch, see <https://theoceancleanup.com/great-pacific-garbage-patch/>
- 9 Many issues stem from the fact that 98 per cent of plastics production comes from fossil fuels, some with chemical additives such as bisphenol A, a known endocrine-disrupting persistent organic pollutant (POP).
- 10 When referring to green products, UNCTAD has tended to apply the concept of environmentally

- preferable products (EPPs) since the early stage of the environmental goods and services debate. EPPs are usually defined as products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose (UNCTAD, 1995).
- 11 For the definition of blue products, UNCTAD has developed its own classification of ocean-based tradable goods and services through the application of the five pillar criteria of sustainability: economic, environmental, social, scientific and governance. UNCTAD's Sustainable Oceans-based economies classification includes a list of six good sectors, six services sectors and one hybrid sector (energy) based on the Harmonised System (HS), Central Product Classification (CPC) and WTO 120 systems. See UNCTAD, forthcoming.
 - 12 For example, Canada recycles 11 per cent of its plastic waste despite high levels of support from its population; other countries find it even more difficult. See, for example, McCarthy, 2020.
 - 13 This is how long everyday plastic items last in the ocean. See Whiting, 2018; Ward et al., 2019.
 - 14 UNCTAD will be releasing this new database in 2021. It goes beyond the current plastics trade data expressed in Chapter 39 of the Harmonized Commodity Description and Coding System, to include otherwise semi-hidden plastics trade. Current data is preliminary and based on the prototype database. Re volume figures cited in this paper, these are not the total volume of plastic created, because some plastics could be exported multiple times as they move through the value chain and hence over-counted. However, to the extent that trade also creates conditions for plastic waste and pollution to occur, and also because it is an indication of market size, the cumulated total is a useful measure.
 - 15 This concept is supported by findings by Hausmann and Klinger (2011), Hausmann et al. (2007) and UNCTAD that countries can diversify into other products that are not too far from what they are currently producing, as long as they have the knowledge or capabilities to make the leap across the 'product space'. In the plastics case, countries would need to invest in gaining the new knowledge and technology to make products that share the useful characteristics of flexibility, non-permeability, transparency, lightness, etc. For the first steps that are related to the biomass inputs, however, they likely have what is needed already.
 - 16 See <https://ym.fi/en/plastics-roadmap-for-finland>
 - 17 All the data in this paragraph come from UN Comtrade International Trade Statistics database (2020). See <https://comtrade.un.org/>
 - 18 HS code 4819: Cartons, boxes, cases, bags and other packing containers, of paper, paperboard, cellulose wadding or webs of cellulose fibers.
 - 19 HS 7013: Glassware of a kind used for table, kitchen, toilet, office, indoor decoration or similar purposes.
 - 20 The material itself; it is assumed not to be mixed with toxic chemicals.
 - 21 See <https://www.plasticpollutiontreaty.org/>
 - 22 See <https://bluecharter.thecommonwealth.org/action-groups/marine-plastic-pollution/>

References

- Barrowclough, D and C Deere Birkbeck (2020) "The Political Economy of the Global Plastics Economy: Production, Trade and Governance". *GEG Working Paper 142, April*. Oxford: Global Economic Governance Programme. https://static1.squarespace.com/static/5b0520e5d274cbfd845e8c55/t/5f209bd567382841acf31b30/1595972575701/GEG+WP+142+Transforming+the+Global+Plastics+Economy_Diana+Barrowclough+and+Carolyn+Deere+Birkbeck_1.pdf
- Barrowclough, D, C Deere Birkbeck and J Christen (2020) "Global Trade in Plastics: Insights from the First Life-Cycle Trade Database". *UNCTAD Research Paper No. 53*. Geneva: United Nations Conference on Trade and Development.
- CIEL (Center for International Environmental Law) (2019) "Plastic and Climate: The Hidden Cost of a Plastic Planet". <https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf>
- CEPA (Conservation and Environment Protection Agency) (2020) "CEPA Moves to Ban Single-Use Plastic Shopping Bags in PNG". <https://islands-business.com/images/2020content/February/Ads/PNG%20Conservation%20&%20Environ.pdf>
- Commonwealth Secretariat (2015) "Small States and the Multilateral Trading System". https://www.thecommonwealth-ilibrary.org/commonwealth/trade/small-states-and-the-multilateral-trading-system/annex-1-list-of-31-commonwealth-small-states_9781848599338-10-en
- Department of the Environment (2020) "Pollution from Plastics Regulations 2020". <https://doe.gov.bz/download/pollution-from-plastics-regulations-2020/>
- Ellen MacArthur Foundations (2020) "NGOs and Businesses Call for UN Treaty on Plastic Pollution". 14 October. <https://www.ellenmacarthurfoundation.org/news/ngos-and-businesses-call-for-un-treaty-on-plastic-pollution>
- Geyer, R, JR Jambeck and KL Law (2017) "Production, Use, and Fate of All Plastics Ever Made". *Science Advances* 3(7). <https://advances.sciencemag.org/content/3/7/e1700782.full>
- Government of Barbados (2019) *Control of Disposable Plastics Act, 2019-11*. <https://www.barbadosparliament.com/uploads/document/8dfda40c3ffafef35aaae98691f50536.pdf>
- Government of Fiji (2019) *Climate Change Bill 2019*. <https://www.economy.gov.fj/images/CCIC/uploads/BILL/Draft-Climate-Change-Bill.pdf>
- Government of Mauritius (2015) "The Environment Protection (Banning of Plastic Bags) Amendment Regulations 2015". <https://environment.govmu.org/Documents/Environment%20Protection%20%20Banning%20of%20Plastic%20Bags%20Amended%20Regulations%202015.pdf>

- Government of Seychelles (2017) “Environment Protection (Restriction on Manufacturing, Importation, Distribution and Sale of Plastic Bags) Regulations, 2017”. <https://seylii.org/sc/legislation/si/37/SI%2037%20of%202017%20Environment%20Protection%20Act%2C%202016.pdf>
- The Guardian* (2020) “Oil Industry Lobbies US to Help Weaken Kenya’s Strong Stance on Plastic Waste”. 1 September. <https://www.theguardian.com/world/2020/sep/01/kenya-plastic-oil-industry-lobbies-us>
- Hausmann, R and B Klinger (2007) “The Structure of the Product Space and the Evolution of Comparative Advantage”. *CID Working Paper No. 146*. Cambridge, MA: Center for International Development. <https://www.hks.harvard.edu/centers/cid/publications/faculty-working-papers/structure-product-space-and-evolution-comparative-advantage>
- Hausmann, R, CA Hidalgo, S Bustos, M Coscia, A Simoes and MA Yildirim (2011) *The Atlas of Economic Complexity*. Cambridge, MA: The MIT Press. <https://www.media.mit.edu/publications/the-atlas-of-economic-complexity/>
- IUCN (International Union for Conservation of Nature) (undated) “Plastic Waste-Free Islands”. Factsheet. https://www.oneplanetnetwork.org/sites/default/files/pwfi_factsheet_final.pdf
- Kampel, K (2020a) “COVID-19 and Tourism: Charting a Sustainable Resilient Recovery for Small States”. *Hot Trade Topics 163, July*. <https://thecommonwealth.org/sites/default/files/inline/THT%20163%20FINAL.pdf>
- Kampel, K (2020b) “LDC Tourism: Making Strides Towards Sustainable, Resilient Recovery from COVID-19”. *EIF Trade4Dev News*, 29 October. <https://trade4devnews.enhancedif.org/en/op-ed/ldc-tourism-making-strides-towards-sustainable-resilient-recovery-covid-19>
- Leannem (2020) “Fiji to Ban Polystyrene in 2021”. SPREP (Secretariat of the Pacific Regional Environment Programme), 5 October. <https://www.sprep.org/news/fiji-to-ban-polystyrene-in-2021>
- McCarthy, N (2020) “The Countries Polluting the Ocean the Most”. Statista, 12 February. <https://www.statista.com/chart/12211/the-countries-polluting-the-oceans-the-most/>
- McVeigh, K (2020a) “Global Treaty to Tackle Plastic Pollution Gains Steam Without US and UK”. *The Guardian*, 16 November. <https://www.theguardian.com/environment/2020/nov/16/us-and-uk-yet-to-show-support-for-global-treaty-to-tackle-plastic-pollution>
- McVeigh, K (2020b) “UK to Support Plans for New Global Treaty to ‘Turn Tide’ on Plastic Pollution”. *The Guardian*, 19 November. <https://www.theguardian.com/environment/2020/nov/19/uk-to-support-plans-for-new-global-treaty-to-turn-tide-on-plastic-pollution>
- Material Economics (2018) *The Circular Economy: A Powerful Force for Climate Mitigation*. Stockholm: Material Economics. <https://materialeconomics.com/publications/the-circular-economy>
- Ministry of Natural Resources and Environment (2019) “Public Notice Plastic Prohibition (Ban) 2019”. https://nicholasinstitute.duke.edu/sites/default/files/plastics-policies/1818_N_2019_Samoa_Bag_Ban.pdf
- Ministry of the Environment (2019). “Reduce and Refuse, Recycle and Replace: A Plastic Roadmap for Finland”. Helsinki: Ministry of the Environment. <https://muovitiekartta.fi/userassets/uploads/2019/03/Reduce-and-refuse-recycle-and-replace.-A-Plastics-Roadmap-for-Finland.pdf>
- Republic of the Marshall Islands (2016) *Styrofoam and Plastic Products Prohibition Act 2016*. <https://rmiparliament.org/cms/images/LEGISLATION/BILLS/2016/2016-0028/StyrofoamandPlasticProductsProhibitionAct2016.pdf>
- Republic of Vanuatu (2018) “Waste Management Regulations Order No. 15 of 2018”. <https://environment.gov.vu/images/Environmental.Protection/Official-Gazette-No.-10-of-2018-dated-2-February-2018.pdf>
- UNCTAD (United Nations Conference on Trade and Development) (1995) “Environmentally Preferable Products (EPPs) as a Trade Opportunity for Developing Countries”. Report by the UNCTAD Secretariat, UNCTAD/COM/70. <https://unctad.org/system/files/official-document/unctadcom70.pdf>
- UNCTAD (2019a) “Advancing Sustainable Development Goal 14: Sustainable Fish, Seafood Value Chains, Trade and Climate”. Geneva: United Nations. <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2576>
- UNCTAD (2019b) *Trade and Development Report 2019: Financing a Global Green New Deal*. Geneva: United Nations. https://unctad.org/system/files/official-document/tdr2019_en.pdf
- UNCTAD (2020a) *Trade and Development Report 2020: From Global Pandemic to Prosperity for All – Avoiding Another Lost Decade*. Geneva: United Nations. https://unctad.org/system/files/official-document/tdr2020_en.pdf
- UNCTAD (2020b) “Communication on Trade in Plastics, Sustainability and Development by the United Nations Conference on Trade and Development (UNCTAD)”. Submitted to the WTO Committee on Trade and Environment, JOB/TE/63, 10 June. https://unctad.org/system/files/information-document/wto_unctad_CTE2020_en.pdf
- UNCTAD (forthcoming) “Towards a Harmonized International Trade Classification for the Development of Sustainable Oceans-based Economies”.
- UNEP (United Nations Environment Programme) and ISWA (International Solid Waste Association) (2015) *Global Waste Management Outlook*. Nairobi: UNEP. <https://www.uncclearn.org/wp-content/uploads/library/unep23092015.pdf>
- Ward, CP, CJ Armstrong, AN Walsh, JH Jackson and CM Reddy (2019) “Sunlight Converts Polystyrene to Carbon Dioxide and Dissolved Organic Carbon”. *Environmental Science & Technology Letters* 6(11): p669-674. <https://pubs.acs.org/doi/abs/10.1021/acs.estlett.9b00532>
- Whiting, K (2018) “This Is How Long Everyday Plastic Items Last in the Ocean”. World Economic Forum, 2 November. <https://www.weforum.org/agenda/2018/11/chart-of-the-day-this-is-how-long-everyday-plastic-items-last-in-the-ocean/>