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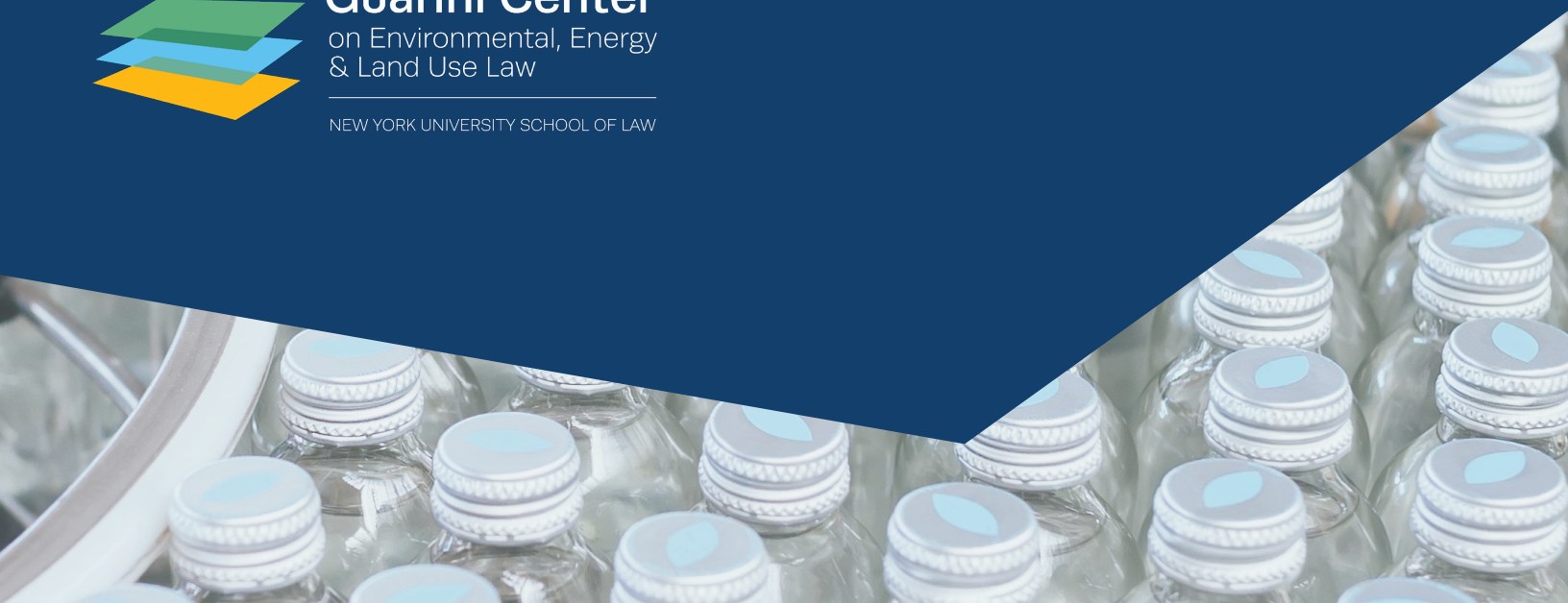
Plastic Production in SIDS

Case Studies of Five Small Island Developing States

Guarini Center
on Environmental, Energy
& Land Use Law

NEW YORK UNIVERSITY SCHOOL OF LAW



RESEARCH PAPER

Plastic Production in SIDS: Case Studies of Five Small Island Developing States

Lead Author

Saeed Hamid, Legal Fellow

Contributing Author

Adalene Minelli, Senior Fellow

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Guarini Center on Environmental, Energy and Land Use Law
New York University School of Law
139 MacDougal Street, 3rd Floor
New York, NY 10012 212

law.guarini@nyu.edu
guarinicenter.org

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Introduction

Plastic pollution, both on land and at sea, is increasing at an alarming and unprecedented rate, to the detriment of human health, livelihoods, economies, marine biodiversity and the wider environment.[1] Recognizing the need to act to address these impacts, the international community has begun the process of developing an international legally binding instrument on plastic pollution, including in the marine environment.[2]

Countries at UNEA tasked an Intergovernmental Negotiating Committee (INC) to develop an instrument that would promote the prevention, reduction, and elimination of plastic pollution, including microplastics, in marine and other environments, by addressing the full lifecycle of plastics, and advancing circular economy approaches, complementarity, and multi-stakeholder involvement.[3] It therefore stands to reason that the resulting instrument is likely to impact activities surrounding plastic production, including the extraction and processing of raw materials, production of raw plastic materials, and production of primary and secondary plastic products.

Building on the findings of a previous study by the Guarini Center which examined the extent to which small island developing states (SIDS) are producing, or planning to produce, plastic,[4] this research aims to develop a deeper understanding of the role of the plastic production industry and of the national policies or regulatory measures in place that impact plastic production in select SIDS.

This paper proceeds as follows. Part I provides background on the study, including the impetus for the research, the study's reasoning for selecting the case study countries, methods used for gathering relevant data and information, and any research challenges or limitations. Part II then presents each of the five case studies which includes discussions on the scope of their respective plastic industries (namely, data on the types and volumes of plastic products produced, exported and imported), as well as domestic policies and regulations that may impact domestic plastic production. Finally, this paper concludes by outlining some key issues for SIDS to consider going forward.

I. Background

Given the relationship between plastics and fossil fuels, their cumulative impact on climate change, and the increasingly unsustainable rates of production and consumption of plastics,[5] UNEA Resolution 5/14 specifically prescribes for the new plastics treaty to include provisions that may affect plastic production activities.[6] Additionally, the resolution leaves open the possibility that the treaty could require states to develop and implement national measures targeting plastic production. Such provisions might regulate—or otherwise call for

1 United Nations Environment Assembly, UNEP/EA.4/Res.6, Marine plastic litter and microplastics, 1 (Mar. 28, 2019).

2 See United Nations Environmental Assembly, UNEP/EA.5/Res.14, **End plastic pollution: Towards an international legally binding instrument** (Mar. 7, 2022) [hereinafter Resolution 5/14].

3 See id.

4 Saeed Hamid, et al., Plastic Production in SIDS: Preliminary data on the role of small island developing states in global plastic production, Guarini Center on Environmental, Energy and Land Use Law (2022).

5 **Industry Agenda: The New Plastics Economy, Rethinking the future of plastics**, 10, World Economic Forum (2016).

6 For example, Resolution 5/14, OP3 states: " to develop an international legally binding instrument on plastic pollution…based on a comprehensive approach that addresses the full lifecycle of plastic … including provisions: (b) To promote sustainable production and consumption of plastics, including, among others, product design, and environmentally sound waste management, including through resource efficiency and circular economy approaches" (emphasis added).

national regulation of: chemicals and additives in plastic product design; standards, labelling and coding systems; regulatory controls on different types of plastic products (e.g. single-use plastics); economic market measures; extraction and processing of raw materials; and recycling practices and technologies.

While there is a strong possibility that the treaty could affect plastic production, there is overall lack of understanding as to how the treaty might affect SIDS' plastic industries and—at least up until recently—to what extent plastic production is even occurring in SIDS in the first place. To help fill this knowledge gap, the Guarini Center previously undertook a study which surveyed the presence of different types of plastic production activities in SIDS.[7] This study found that:[8]

Nineteen (56%) SIDS are currently engaged in some form of plastic production, including the production of plastic pellets and/or nurdles, primary plastic products, and/or recycled plastic products, and an additional 11 (32%) SIDS are actively looking to begin some form of production.

- 7 (21%) SIDS are currently producing plastic pellets and/or nurdles, and 1 SIDS is actively looking to begin production.
- 16 (47%) SIDS are currently producing primary plastic products, and 1 SIDS is actively looking to begin production.
- 9 (26%) SIDS are currently producing recycled plastic products, and 10 (29%) are actively looking to begin production.

In light of these findings, this study aims to develop a deeper understanding of the scope and nature of the plastic industry in select SIDS through country-specific case studies.

Research Methods

Paper seeks to provide information and analysis on plastic production industries and regulatory landscapes in the following five SIDS: Fiji, Guyana, Mauritius, Singapore, and Suriname. These five countries were selected from the 39 Alliance of Small Island States (AOSIS) member states with an emphasis on ensuring that the study covered the widest possible range of geographies and plastic production activities.

The study was conducted through literature and public data reviews, primary data collection, and interviews with national authorities and private sector stakeholders in the SIDS, as well as international organizations such as the Basel Convention Regional Center (BCRC) Caribbean and the United Nations Conference on Trade and Development (UNCTAD). Notably, our research revealed that there appears to be very little quantitative public data on domestic plastic production for any of the five case study countries (See Sec. B). As such, the study relied on UNCTAD data on plastic imports and exports as an indication of domestic plastic production.[9]

Challenges and limitations

Over the course of the study, the most glaring challenge was the disparity in how different entities classify or define 'plastics'. For instance, there is an overall inconsistency and lack of clarity on whether goods and commodities which contain plastic components or are packaged in plastic—but are not principally composed of plastic—are considered 'plastic'

7 Saeed Hamid, et al., Plastic Production in SIDS: Preliminary data on the role of small island developing states in global plastic production, Guarini Center on Environmental, Energy and Land Use Law (2022).

8 The Guarini Center's findings on SIDS' role in plastic production is based on survey responses received from thirty-four (34) of thirty-nine (39) AOSIS member states.

9 The UNCTAD data on plastic imports and exports includes data on "intermediate manufactured plastic goods" and "final manufactured plastic goods." See **UNCTADstat**.

for definitional or accounting purposes. Thus, certain sources of data or information may in fact be undercounting the actual amount of plastics being produced. Additionally, these definitions may not always be clearly defined, making evaluating and acknowledging these disparities difficult.

Moreover, at least for the countries that were the focus of this study, it is generally not an established practice of governments to collect and compile data on the volumetric or economic scope of plastics being produced in-country. A primary reason for this lack of data is that private companies are largely not legally required to supply this information, and what information is provided is severely deflated. Government sources explained that this is because there are limited state resources to collect, monitor, and verify this type of data and information. Where companies are not required to provide data and information on plastic production, they are also overwhelmingly unwilling to provide it voluntarily. This unwillingness to provide data was attributed to a fear within the plastics industry that efforts to address plastic pollution might negatively impact revenues in a substantial way, including by putting them at risk of legal regulation or liability.

The lack of available data—both public and internal—created challenges in our attempt to understand the scope of plastic production within these SIDS. However, as detailed in the next section, UNCTAD data on the import and exports of plastics provides some indication of the scope of the industry and the role of the SIDS in global plastics trade.

II. Case Studies

This section presents each of the five SIDS case studies, including general economic overviews, information and data on domestic plastic production, and the types of national policy interventions in place that may impact domestic plastic production.

Fiji

COUNTRY PROFILE

Region	Pacific
Population	909,665
GDP	4.59 billion USD (2021)
Types of plastic products produced	plastic furniture, bags, garments, tents, flowers, twine, fabrics, builders' ware, tanks, vats, doors, windows, fittings, tubes, sacks, caps, sheets, polymers, resins, baths, toys, paints

One of the most developed economies in the Pacific, Fiji is an upper middle income country[10] with an economy heavily fuelled by services, particularly tourism which accounts for nearly 40% of the country's GDP.[11] While other sectors such as mining, fisheries, timber, and clothing are relatively successful,[12] sugar production is still considered a key economic activity, accounting for much of the country's export earnings.[13] As its fruitful services industry continues to expand, domestic construction, manufacturing and retail activities are also notably on the rise.[14]

Domestic plastic production in Fiji

Fiji is one of two pacific states involved with primary plastic production, the second being Papua New Guinea (PNG).[15] While Fiji also

10 **Policy Paper: Fiji: Country Classification**, 4, Asian Development Bank (2021).

11 **World Bank Group's New Country Partnership Framework for Fiji (2021-2024)**, The World Bank (2021).

12 **Fiji - Overview of Economy**, Nations Encyclopedia.

13 **Fiji Sugar Corporation Annual Report 2020**, 2, Fiji Sugar Corporation.

14 **Country Profile - Fiji**, Pacific Trade Invest Australia (2021).

15 Saeed Hamid, et al., Plastic Production in SIDS: Prelim-

Year	Imports	Exports	Exports less imports
2015	130,703.87	8,269.60	-122,434.27
2016	172,515.45	10,429.56	-162,085.89
2017	167,380.38	8,971.45	-158,408.93
2018	187,952.69	10,062.81	-177,889.88
2019	157,945.26	9,387.77	-148,557.49

Figure 1. Value of total plastics exported and imported in Fiji between 2015-2019 (USD at current prices in thousands). Source: UNCTAD.

engages in the production of plastic products via recycling, PNG is one of few SIDS engaged in all three production activities previously studied, i.e. production of plastic pellets/nurdles, primary plastic products, and plastics via recycling.[16] Plastics typically produced by Fiji include furniture, bags, garments, tents, flowers, twine, fabrics, builders' ware, tanks, vats, doors, windows, fittings, tubes, sacks, caps, sheets, polymers, resins, baths, toys and paints.

Interestingly, Fiji has consistently imported significantly more plastics than it exports. Indeed, in 2019, imports were almost 17 times the value of exports. As stated previously, much of the value in exports is derived from sugar and other forms of agriculture. However, domestic consumption may account for much of the plastics produced, particularly plastic bags. For example, in 2017 one major Fijian plastic bag manufacturer reported 100,000 tonnes of plastic bags produced annually with an estimated 20% exported to countries within the region; meaning much of the merchandise was consumed locally at the time.[17]

Policies in Fiji affecting domestic plastic production

Bans on polystyrene and single-use plastic products. In 2021, Fiji implemented a ban on the import, export, manufacture, sale, supply and distribution of polystyrene (aka "styrofoam"[18]) containers, cups, plates, and trays.[19] In an effort to support compliance with the ban, Fiji also decreased the duty on imports of biodegradable materials to zero percent.[20] In 2020, a ban on single-use plastic bags also took effect, which prohibited the manufacture, sale, supply, or distribution of plastic bags that are made entirely or in part of polyethylene (PET), less than 50 microns in thickness, and used for the purpose of carrying or transporting goods. In a further effort to discourage the use of plastic bags overall, the ban also institutes a levy of 50 cents on reusable plastic bags that are permitted by the law and thicker than 50 microns.[21] However, one criticism arising from permitting plastic bags thicker than 50 microns is the retention of plastics in the economy and everyday life through efforts by companies to redesign plastic bags in order to qualify for

inary data on the role of small island developing states in global plastic production, Guarini Center on Environmental, Energy and Land Use Law (2022).

16 Id.

17 Selita Bolanavanua, **Plastic Bag Levy, Not So Good for Makers**, Fiji Sun (Jul. 29, 2017).

18 Kate Brierly, **Is styrofoam recyclable? Behind the main ingredient polystyrene**, Green Matters (Mar. 12, 2021).

19 **Ban on Polystyrene (Styrofoam)**, Ministry of Economy Fiji (2020). See also Environment Management (Amendment) Act 2020 of Fiji.

20 Id.

21 Mong Palatino, **Fiji netizens say #PlasticFree campaign is misleading**, Global Voices Asia (Jan. 7, 2020).

exemption under the law.[22]

Collection and Recycling Systems. Expanding upon the Mission Pacific recycling programme initiated in 1999,[23] Coca-Cola Oceania and bottling partner Coca-Cola Europacific Partners Fiji launched a model of production and consumption seeking to retain existing plastic materials in the economy for as long as possible, with the ultimate goal of removing 300 tonnes of virgin plastic from their production line and collecting their PET bottle footprint by the year 2030.[24] Consumers are also rewarded five cents per bottle to encourage a higher collection rate.[25] Collection sites also serve as a source of income for many citizens.[26] To date, it was reported that PET bottles smaller than one litre are now made from 100% recycled plastic and bottles were redesigned to make it easier to recycle. For example, colorants were removed from the Sprite bottle design to produce transparent bottles rendering them easier to recycle.[27] While the initiative could be considered successful, it is largely the product of corporate discretion and not necessarily industry-wide government-mandated container deposit schemes, despite the enactment of regulations to advance container deposit schemes.[28]

Sustainable Urban Resource Management (SURM) Initiative. With support from the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the SURM Initiative is a pilot project launched in 2021 that seeks to improve waste management, reduce residential waste, and increase resource recovery, including through the declaration of a tax-free zone in one of the heavily populated areas outside the Fijian Capital, Nasinu Town Council.[29] This tax-free incentive would allow companies to set up their own recycling facilities in the Naboro zone, coincidentally where the landfill is located, in return for exemptions on income tax and import duties on raw materials and machinery. Notably, the project has also led to the development of a "Resource Recovery Facility," and capacity-building programmes based on the findings of community-based research and stakeholder engagements.[30]

Fiji has taken robust steps to reduce plastic production and increase recycling. However, the design of regulations needs to carefully consider means of circumvention by consumers and business stakeholders. The SURM initiative offers a multidisciplinary and inclusive approach that will also provide some amount of lessons learnt and data on what is required to advance the recycling industry and reduce virgin plastic production.

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22 Id.

23 **About Mission Pacific Fiji**, Mission Pacific Fiji.

24 Laisa Lui, **Recycle a Bottle for Five Cents**, Fiji Sun (May 11, 2022).

25 Id.

26 **Sustainability in Fiji: 2020 Fact Sheet**, Coca-Cola Amatil Fiji (2020).

27 **Coca-Cola Oceania and Coca-Cola Europacific Partners Fiji announce major commitment to step up use of recycled plastic**, Coca-Cola Europacific Partners (May 10, 2022).

28 Tricia Farrelly, et al, **Plastic Pollution Prevention in Pacific Island Countries: Gap analysis of current legislation, policies and plans**, Environmental Investigation Agency (2020). See also The Environment Management (Waste Disposal and Recycling) Regulations 2007 and the Environmental Management (Container Deposit) Regulations 2011, enacted under the Environment Management Act of Fiji.

29 **Fiji encourages recycling, waste management to protect environment**, Xinhuanet Asia Pacific News (Feb. 18, 2021).

30 **CLGF pilo recognized by Fiji Minister**, Commonwealth Local Government Forum (2021).

Guyana

COUNTRY PROFILE

Region	Caribbean
Population	794,148
GDP	19.9 billion USD (2021)
Types of plastic products produced	Silicones, polymers, plastic tubes, pipes, hoses, tableware, kitchenware, office supplies, sacks, bags, twine, garments, tents, furniture, construction materials

With one of the fastest growing economies in the world, owing largely to its emerging status as a petroleum-producing state, Guyana is a South American country rich in natural resources and productive agricultural lands.[31] The export of sugar, gold, bauxite, shrimp, timber, rice and more recently, crude oil, has made significant contributions to the economy of Guyana. While its tourism industry is not as broad as its Caribbean counterparts, there has been growth in the sector following petroleum exploration and production activities.[32]

Domestic plastic production in Guyana

Guyana is one of the few SIDS involved with all three categories of production activities (i.e. production of plastic pellets/nurdles, primary plastic products, and plastics via recycling).[33] Plastics typically produced in Guyana include silicones, polymers, plastic tubes, pipes, hoses, tableware, kitchenware, office supplies, sacks, bags, twine, garments, tents, furniture, construction materials, etc.

Guyana has seen consistent growth in its exports of plastics, save the year 2019. While the industry may not be a large contributor to exports, interviews with stakeholders have indicated that plastics play a prominent role in domestic consumption, especially in the construction sector[34] and the food industry (such as food and snack manufacturers, PET bottlers, plastic carrier bags, plastic packaging, etc). One relatively new company specializing in local plastic packaging reported up to 100,000 kilos of plastic monthly, including garbage bags, t-shirt bags and packaging for rice and sugar industries.[35]

Notably, improper plastic waste management has plagued Guyana for many years leading to a proliferation in illegal burning and dumping, and large volumes of plastic waste in open streets, alleys, waterways, and trenches.[36] Due to an absence of waste segregation and limited waste management infrastructure, Guyana also has an extremely low rate of recycling, with only one known major company involved with recycling.[37] During discussions with stakeholders, it was revealed that a large local recycler of cardboard waste to make biodegradable food containers had discontinued its work owing to the lack of waste segregation for uncontaminated feedstock material as well as demand issues.

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31 **Guyana Country Commercial Guide**, International Trade Administration (Oct. 14, 2021).

32 Isaiah Braithwaite, **Oil and Gas will allow Guyana to diversify its economy**, Department of Public Information Guyana (Feb. 15, 2022).

33 Based on data collected by previous research conducted by the Guarini Center.

34 **Guyana Thermo-Plastics Limited cements name through certification**, Guyana Chronicle Newspaper (Aug. 29, 2021). See also Fibre Tech Industrial Plastic, Guyana Manufacturing and Services Association.

35 **Plastic-manufacturing company at Diamond takes packaging market by storm**, Kaieteur News Guyana (Oct. 15, 2017).

36 **Dumping of plastics: We're heading for an environmental apocalypse - UNEP**, Stabroek News Guyana (Feb. 4, 2022).

37 **Clear Waters renews commitment to a green city by recycling bottles**, Guyana Times Newspapers (Jul. 11, 2016).

Year	Imports	Exports	Exports less imports
2015	84,774.6	3,036.02	-81,738.58
2016	88,162.48	3,099.04	-85,063.44
2017	88,447.90	4,134.73	-84,313.17
2018	103,864.78	4,997.37	-98,867.41
2019	158,937.22	3,501.98	-155,435.24

Figure 2. Value of total plastics exported and imported in Guyana between 2015-2019 (USD at current prices in thousands). Source: UNCTAD.

Policies in Guyana affecting domestic plastic production

Environmental Protection (Expanded Polystyrene) Regulations of 2015. Despite resistance from factions within the business community, in 2016 Guyana successfully implemented a ban on the importation, manufacture, and sale of expanded polystyrene (styrofoam) products, including food containers in the service industry.[38] The ban was later complemented by tax exemptions by the Guyana Revenue Authority (GRA) on biodegradable containers.[39] Notwithstanding these exemptions, with the banning of styrofoam food containers as one category of problematic plastics, consumers lamented the limited availability and costs of biodegradable containers, resulting in a proliferation in the use of other more affordable single-use plastic food containers, thereby sustaining similar environmental challenges caused by the improper management of styrofoam products.[40] Subsequently, in 2019, Guyana announced a systemic ban on single-use plastics would take effect in 2021.[41] However, following a number of delays the lead authority on the design and implementation of the proposed ban, the Environmental Protection Agency (EPA), indicated that there would instead be the development of a "long-term strategy to manage pollution", which may or may not include a systemic ban.[42]

Draft Revised Low Carbon Development Strategy (LCDS) of 2030. Originally launched in 2009, the LCDS was designed as a sustainable development plan, particularly in the area of forest management, in response to urgent environmental threats.[43] In 2021, the Government of Guyana launched a new draft revised on the basis of Guyana's emerging oil and gas sector, as well as developments in knowledge, science, data and progress in relation to international environmental obligations. The revised draft focuses on four main objectives: 'Align with global climate goals'; 'Forest Climate Services and other ecosystem services'; 'Protect against climate change'; and 'Stimulate future growth through clean energy and sustainable economic activities'; with the last objective being most relevant to plastic production, though remotely, through activities fostering "product innovation, research and development." However, beyond this, the strategy

38 **January Styrofoam ban pits environmentalists against business lobbyists**, Stabroek Newspapers Guyana (Oct. 23, 2015).

39 **Public Notice: Tax exemptions on bio-degradable containers**, Guyana Revenue Authority (GRA) Publications (May 7, 2018).

40 Rehanna Ramsay, **Single-use plastic giving City Hall headache**, Kaieteur News Guyana (Apr. 29, 2022).

41 **2021 set for systematic ban of single-use plastics, Department of Public Information**, Guyana (Mar. 04, 2019).

42 **Ban on single-use plastics part of long-term strategy to cut pollution - EPA Head**, News Room Guyana (Feb. 24, 2022).

43 **Guyana's Low Carbon Development Strategy 2030: Draft for Consultation**, 4, Low Carbon Development Strategy, Government of Guyana (2021).

does not specifically reference any measures or targets for plastic pollution, plastic production or circular economy approaches. Consultations on the revised draft are currently ongoing. With numerous discoveries under its belt and several production installations expected to initiate over the next few years, Guyana has also announced a major gas to energy project, signalling an expansion of its oil and gas industry. This could eventually include the refinery of the raw materials required to make plastics and consequently, a proliferation in plastic production and/or Guyana's more expanded role in the global plastics chain. However, Guyana has the opportunity to benefit from the lessons learnt and experiences of other SIDS in designing effective responses to the plastics issue on a national level.

Mauritius

COUNTRY PROFILE

Region	African, Indian Ocean and South China Sea
Population	1,276,008
GDP	4 billion USD (2021)
Types of plastic products produced	Polymers in primary forms, silicones, tubes and piping, plates, sheets, film, strips, sacks, bags, crates, boxes, lids, caps, packaging, synthetic fabrics, garments, tents, insulation and construction material, PET bottles, furniture fittings, buttons, construction fittings

Mauritius is an upper-middle income economy driven by the services sector, which amounts to 68.2% of the GDP and includes tourism and financial services as significant contributors.[44] With a population of nearly 1.3 million, the small island has long been lauded for having one of the more successful, competitive, and diversified economies which includes sectors such as textiles, business development, information and communication technology, seafood processing, real estate, energy, and education.[45] Consequently, its industrial sector, which includes plastic production,[46] also plays a role in the economy, accounting for 16.7% of the GDP.[47]

Domestic plastic production in Mauritius

While Mauritius does not engage in the production of pellets/nurdles, it produces both primary and recycled plastic products. Plastics are produced domestically for a variety of sectors in Mauritius, including pharmaceuticals, industry, cosmetics, food processing, and households. Products include polymers in primary forms, silicones, tubes and piping, plates, sheets, film, strips, sacks, bags, crates, boxes, lids, caps, packaging, synthetic fabrics, garments, tents, insulation and construction material, PET bottles, furniture fittings, buttons, and construction fittings.[48]

Between 2015-2019, there has been a steady increase in exports of plastics in Mauritius, with a similar increase in imports, except for 2019. However, Mauritius' exports remain significantly lower than its imports, which suggests the country could be relying on plastics produced elsewhere.

Plastic constitutes the second largest category of municipal solid waste in Mauritius[49] with an estimated 71,963 tonnes of plastic

44 **Mauritius Trade Easy**, Mauritius Economic Outline (2022).

45 **Mauritius Country Commercial Guide**, Mauritius Market Overview, Export.gov (2019).

46 **Economic Development Board Mauritius**, Mauritius Manufacturing Industry.

47 Id.

48 **Economic Development Board Mauritius**, Virtual Trade Promotion Platform: Plastic Products.

49 **Industrial Waste Assessment in the Republic of Mauritius: Opportunities for Industrial Symbiosis**, 36, PAGE (2017).

Year	Imports	Exports	Exports less imports
2015	223,940.07	56,861.80	-167,078.27
2016	238,274.67	64,482.63	-173,792.04
2017	254,686.13	78,679.68	-176,006.45
2018	273,908.03	80,137.64	-193,770.39
2019	263,620.18	80,963.59	-182,656.59

Figure 3. Value of total plastics exported and imported in Mauritius between 2015-2019 (USD at current prices in thousands). Source: UNCTAD.

waste generated in 2019.[50] Quite often, waste, including plastics, is turned into secondary raw materials which are mostly intended for export.[51] However, of the estimated 140 million PET bottles manufactured annually, only 40% are collected.[52] Moreover, while plastic waste accounts for over 70,000 tonnes of the waste stream annually, only 2000 to 3000 tonnes are recycled each year.[53] A key challenge to the sustainability of recycled plastics products and the phasing out of plastics is the limit on how many times plastic can be recycled indefinitely within a circular economy approach.[54] Other challenges include insufficient plastic waste stock appropriate for recycling, low levels of waste separation, lack of deposit mechanisms for recyclable waste, limited research and development into environmentally friendly alternatives, and a lack of incentives and financial mechanisms to promote the industry.[55]

Policies in Mauritius affecting domestic plastic production

Environmental Protection (PET Bottle Permit) Regulations 2001. Since 2001, Mauritius has sought to regulate PET bottle beverage companies based on the principle of extended producer responsibility (EPR) by means of a permit, including reporting obligations on the production, collection, recycling and export of PET bottles.[56] To complement these Regulations and boost recycling efforts, a Financial Incentive Scheme was also established under the Excise Act in 2014, with the most recent increase in incentive implemented in 2019 amounting to a total incentive value of Rs 15 per kg of exported PET waste in excess of 1 tonne.[57] However, it is estimated that only around 40 percent (2,000 tonnes) are retrieved and recycled.[58] Much of the PET waste retrieved for treatment is made into plastic flakes or granules for export.[59] The intended impact of significantly reducing virgin plastic

50 United Nations Development Programme Mauritius, et al., **Circular Economy: Optimising private sector investment in Mauritius**, (2021).

51 Id.

52 **Mauritius' efforts to become plastic free through private-public collaboration**, The African Courier (Dec. 9, 2021).

53 **Strategies to effectively tackle plastic pollution in Mauritius**, Yonature (Jun. 9, 2021).

54 **Mauritius' efforts to become plastic free through private-public collaboration**, The African Courier (Dec. 9, 2021) .

55 United Nations Development Programme Mauritius, et al., **Circular Economy: Optimising private sector investment in Mauritius**, 14, (2021).

56 **Environment Protection (Polyethylene Terephthalate (PET) bottle Permit) Regulations 2001**, made by the Minister under Section 74 of the Environment Protection Act 1991.

57 **Environmental Protection (Polyethylene Terephthalate (PET) Bottle Permit) Regulations 2001**, One Planet Network (2022).

58 United Nations Development Programme Mauritius, et al., **Circular Economy: Optimising private sector investment in Mauritius**, 38, (2021).

59 **Industrial Waste Assessment in the Republic of Mauritius: Opportunities for Industrial Symbiosis**, 39, PAGE (2017).

production is therefore inhibited.

Environment Protection (Banning of Plastic Bags) Regulations and Environment Protection (Control of Single Use Plastic Products) Regulations. Following the PET bottle regulations, movements toward a 'Plastics Free Mauritius' saw the development of two additional regulations seeking to curb the use, importation, manufacture, sale and supply of plastic bags[60] and single use plastic products[61], while promoting the development of environmentally friendly alternatives.[62] These regulations were complemented by stringent enforcement exercises, including the seizure of prohibited plastic products.[63] In an effort to further reduce usage of plastics, non-biodegradable plastic containers were subjected to a Rs 2 levy in 2019 via an amendment to the Excise Act of Mauritius.[64] Of note, the regulations prohibiting the possession, use, distribution, sale, export, import, manufacture or supply of plastics bags have no restrictions on size(s) or dimensions like the Fijian example, however, they prescribe strict registration protocols for importers and manufacturers of biodegradable or compostable plastic bags and plastic bags exempted for agriculture, medicine, packaging, resealable bags, sampling or waste.

Mauritius Government Programme (2020-2024). Launched in 2020, the aforementioned programme seeks to promote sustainable development based on four pillars: clean energy, climate change mitigation, a "cleaner and greener Mauritius", and marine protection.[65] The latter two pillars prove most relevant to the plastics issue, as they will include improvements in waste management and circular economy approaches.[66] However, it remains to be seen how successful the specific regulatory interventions pursuant to these pillars will be.

Mauritius has accelerated its response to the plastics issue, with more of an emphasis on prescriptive legislative measures. Of note, these measures are also complemented by financial mechanisms geared toward facilitating compliance. Most interestingly, there also seems to be a push for improved data collection in-country, which most SIDS should strive toward.

Singapore

COUNTRY PROFILE

Region	African, Indian Ocean and South China Sea
Population	5,994,110
GDP	396 billion USD (2021)
Types of plastic products produced	Plastic pipes and fittings, plastic toys, plastic packaging, plastic film, plastic furniture, plastic floor coverings

Following a period of rapid industrialization in the 1960s, Singapore is presently considered a high-income economy, with manufacturing being one of its main drivers of growth since

60 Roll-on bags, pocket type bags, duty-free plastic bags, and all such types of non-biodegradable plastic bags manufactured for export.

61 Plastic cutlery, plates, cups, bowls, trays, stirrers, hinged containers, lids, straws (including straws forming an integral part of the packaging of another product) and other receptacles used to contain food intended for immediate consumption.

62 **Environment Protection (Banning of Plastic Bags) Regulations 2020** & **Environment Protection (Control of Single Use Plastic Products) Regulations 2020** made under Section 96 of the Environment Protection Act.

63 **Environment Protection (Banning of Plastic Bags) Regulations 2020 and Environment Protection (Control of Single Use Plastic Products) Regulations 2020**, One Planet Network (2022).

64 **Strategies to effectively tackle plastic pollution in Mauritius**, Yonature (Jun. 9, 2021).

65 **Mauritius puts Sustainable Development at the forefront for 2020-2024**, PAGE.

66 See **Government Programme 2020-2024: Towards an inclusive, high income and green Mauritius forging ahead together**. See also Richard, Nicolas, et al., **Plastic Ban in Mauritius**, DLA Piper Africa (2021).

Year	Imports	Exports[1]	Exports less imports
2016	8,253,640.57	15,13,3680.93	6,880,040.36
2017	9,342,619.873	16,962,260.96	7,619,641.09
2018	10,389,740.10	18,297,858.93	7,908,118.83
2019	10,024,222.56	16,738,148.46	6,713,925.90

Figure 4. Value of total plastics exported and imported in Singapore between 2016-2019 (USD at current prices in thousands). Source: UNCTAD.

1 Includes "Final manufactured plastic goods".

independence.[67] Its manufacturing sector contributes 20-25% of the country's annual GDP and includes chemicals, electronics, logistics, biomedical sciences, transport engineering and plastics.[68] The importance of the plastics manufacturing industry to the economy is evidenced by the establishment of the Singapore Plastic Industry Association (SPIA) in 1989, which merged several existing plastic manufacturing bodies in an effort to more cohesively and systemically represent views and interests to the relevant government and economic bodies on matters affecting the plastics industry in Singapore.[69] The SPIA remains the largest representative body of small, medium and large scale enterprises involved with virtually every aspect of the industry, including the manufacturing and supply of raw materials, machinery and equipment.[70]

Domestic plastic production in Singapore

Singapore engages in the production of both plastic nurdles/pellets and a wide variety of primary plastic products, such as plastic pipes and fittings, plastic toys, plastic packaging, plastic film, plastic furniture, and plastic floor coverings.[71] In addition to the foregoing, exports include plastics-based textiles, plasticisers, polyethylene, propylene, styrene polymers, resins, and acrylic paints. Data from the year 2018 positions Singapore as one of the top ten exporters of plastic feedstocks and primary plastic products in the world.[72]

While Singapore appears to manufacture a significant amount of plastics based on its exports figures, the production of plastic products via recycling is considerably low. For instance, only about 4% of the estimated 500 million polyethylene terephthalate (PET) bottles discarded in Singapore each year are recycled.[73] Moreover, of the nearly 950,000 tonnes of general plastic waste generated in 2018, only an estimated 4% was recycled.[74]

However, one industrial recycling service in

67 **The World Bank Country Overview: Singapore**.

68 Singapore Economic Development Board (EDB), **Singapore: A leading manufacturing hub** (2018); **What makes the Singapore economy tick?**, Guide Me Singapore.

69 See also **Singapore Plastic Industry Association**. The SPIA is an amalgamation of the Singapore Plastic Manufacturers' Association, Singapore Polythene Packaging Association, Singapore Plastic Mould and Moulding Manufacturers' Association, and Singapore PVC Leather Goods Association.

70 Id.

71 **Singapore Companies Directory: Plastics Companies List**.

72 Diana Barrowclough, et al., **Global trade in plastics insights from the first life-cycle trade database**, UNCTAD Research Paper No. 53 (UNCTAD/SER.RP/2020/12 (2020).

73 Justin Ong, **Study underway for Singapore's first plastic bottle recycling plant, which could recycle 150 million bottles a year**, Today (Aug. 17, 2021).

74 Tammy Ho, et al., **A Singapore perspective on plastics and the opportunity for brands to drive change**, 2, IPSOS Briefing (2020).

Singapore has attributed this decline in recycling to the contamination of plastic waste materials by other substances, difficulties in segregating plastics by type, and issues with plastic product designs (e.g. products may contain different types of plastics or additives which may not be compatible with the relevant recycling technology).[75] Another similar Singaporean recycling service, which processes 600 to 700 tonnes of plastic a month, added that consumers and companies need to be more aware of recycling, and sorting plastics by type and colour is one of the most costly parts of the process, requiring expensive machinery and skilled labour.[76] It was also lamented that the company is forced to export the recyclable plastic waste to Malaysia for processing due to high labour and land costs.[77]

Policies in Singapore affecting domestic plastic production

Plastics Recycling Association of Singapore (PRAS). Officially launched in August 2021 by the Ministry of Sustainability and the Environment, PRAS seeks to promote improved recycling and plastic waste management by, inter alia, introducing initiatives to expand plastic waste collection (such as a beverage container return scheme); establishing a PET bottle recycling facility to reduce the production of virgin plastics; promoting research and development programmes (including through the Government's new Plastics Recycling Centre of Excellence); and developing a new integrated waste management facility.[78] PRAS utilizes a multi-stakeholder approach which brings together organizations, institutions, government agencies and other local entities to explore solutions and promote circular economy approaches to plastics, in alignment with the objective of Singapore's Zero Waste Masterplan (2019) to reach a fourfold increase in plastics reuse and recycling by 2030.[79]

National Environment Agency (NEA) Endeavours. While there are currently no bans or charges on plastic bags or single use plastics, the NEA has proposed the implementation of a levy on carrier bags at supermarkets beginning in 2023.[80] The NEA has also sought to increase the number of recycling bins available, expand awareness campaigns, promote research grants to develop sustainable waste management technologies, and implement reporting requirements for plastic consumption and production.[81] With the support of the NEA, initiatives such as 'Say Yes to Waste Less', 'Plastic ACTion (PACT)' and the 'Singapore Packaging Agreement (SPA)' have involved working closely with industry stakeholders to develop circular economy approaches through sustainable production and designs, mandatory reporting of plastic packaging data by producers and retailers, and designing the contours of a potential Extended Producer Responsibility (EPR) framework[82] expected to come to fruition in 2025 through Singapore's Resource Sustainability Act (RSA).[83] There have also been voluntary commitments by the private sector to phase out

75 **Gee Hose Seng Pte Ltd**.

76 Jason Quah, **How Singapore's Plastic Waste is Recycled**, Today Online (Sep. 24, 2018).

77 Id.

78 Grace Yeoh, **New Association launched to help enhance rate of recycling plastic waste in Singapore**, Channel News Asia (Aug. 17, 2021).

79 **Singapore plastics industry supports innovations towards a circular economy**, Plastics Technology (Jan. 31, 2022).

80 **Singapore seeks to slash waste with plastic bags charge**, Reuters (Jan. 27, 2022). Notably, only supermarkets with an annual revenue of more than $100 million would be required to implement the levy, while smaller retailers and food vendors would be exempt from doing so, raising concerns about whether the measure would be effective in reducing plastic waste. Ann Koh, **Singapore joins push for disposable bag fees to reduce waste**, Bloomberg US Edition (Mar 7, 2022).

81 John Geddie, **In Singapore, where trash becomes ash, plastics are still a problem**, Reuters (2018).

82 Woo Qiyun, **Beyond Plastic Recycling: A look at Extended Producer Responsibility in Singapore**, Singapore Policy Journal (Sep. 8, 2020).

83 **Chapter 3: A Circular Economy Approach to Closing Three Resource Loops - Packaging, Towards Zero Waste**.

plastics, however a lack of demand for recyclables and alternatives, high costs and commercial viability continue to prove challenging to these endeavours.[84]

Singapore Green Plan 2030. Officially launched in February 2021, the Green Plan was designed as an inter-ministerial agenda to advance sustainable development in Singapore through the fulfilment of cross-cutting concrete targets by the year 2030.[85] Relevant to the plastics issue, the Closing the Resource Loop (CTRL) Funding Initiative seeks to achieve a 70% recycling rate by 2030 and promote research and development on environmentally friendly solutions and resource recovery initiatives.[86]

In recent years, Singapore has more aggressively pursued policy measures and programmes targeting the plastics issue, specifically around the promotion of a circular economy and in-country capacity-building. Moreover, their involvement of key stakeholders such as the private sector and other local entities, is critical to promoting compliance and designing effective strategies, and is also envisioned by the mandate resolution for the development of a legally binding instrument on plastic pollution.[87]

84 Tammy Ho, et al, **A Singapore perspective on plastics and the opportunity for brands to drive change**, 7, IPSOS Briefing (2020).

85 Audrey Tan, **Singapore Green Plan 2030 to change the way people live, work, study and play**, The Straits Times (Feb. 10, 2021).

86 **Good progress made on the Singapore Green Plan 2030 as Government accelerates decarbonisation and sustainability efforts**, National Climate Change Secretariat, Singapore (Mar. 8, 2022). See also March 2022 Media Release (discussing progress to date including the dispensation of funds for the various initiatives under the Green Plan).

87 Resolution 5/14, PP14 ("Further recognizing that each country is best positioned to understand its own national circumstances, including its stakeholder activities, related to addressing plastic pollution, including in the marine environment") and OP3L ("To encourage action by all stakeholders, including the private sector, and to promote cooperation at the global, regional, national and local levels").

Suriname

COUNTRY PROFILE

Region	Caribbean
Population	597,371
GDP	3.81 billion USD (2020)
Types of plastic products produced	Plastic film rolls, shrink film for beverage bottles, t-shirt bags, garbage bags, printed bags

Located in South America, Suriname is considered an upper middle-income country, with its major industries including bauxite, wood, agriculture, gold and oil;[88] the latter two amounting to approximately 85% of exports.[89] Its petroleum industry has contributed to the economy since the 1980s, and given recent commercial offshore discoveries, this support to the economy is expected to increase significantly.[90]

Domestic plastic production in Suriname

Prima facie, plastic production in Suriname does not appear to play a significant role in the economy, when compared to its natural resources such as bauxite and minerals. However, given the close relationship between plastics and fossil fuels, the expanding petroleum sector in Suriname may facilitate growth within the plastic production industry (e.g. through petroleum refinery, pellet production, etc) especially as Suriname seeks to diversify and expand its economy.[91] At present, Suriname only engages in the production of primary and recycled plastic products. Domestic plastic products include film rolls, shrink film for

88 **Suriname Exports - Summary, Trading Economics** (2021).

89 **Suriname Economic Indicators**, Moody Analytics (2020).

90 **World Bank: Macro Poverty Outlook (MPO) Suriname**, 140, (2021).

91 **Economic Indicators: Suriname**, Moody's Analytics.

Year	Imports	Exports[1]	Exports less imports
2015	100,132.53	2,312.97	-97,819.56
2016	60,283.06	550.56	-59,732.50
2017	60,152.64	380.35	-59,772.29
2018	83,566.00	312.10	-83,253.90
2019	102,194.73	1,609.80	-100,584.93

Figure 5. Value of total plastics exported and imported in Suriname between 2015-2019 (USD at current prices in thousands). Source: UNCTAD.

1 Includes "Final manufactured plastic goods".

beverage bottles, t-shirt bags, garbage bags, and printed bags.

Much like most of the other SIDS included in this research, imports of plastics are significantly higher than exports, which can be construed to mean domestic plastic production is relatively low in Suriname. During interviews with the Ministry of Spatial Planning and Environment (MSPE) and the Suriname Waste Management Foundation (SUWAMA), it was approximated that there may be ten (10) to thirteen (13) major plastic producers in the country.

Similar to many other SIDS with finite resources and limited waste management legislation or policies, plastic waste poses a significant challenge for Suriname. Plastic waste is typically sent to a dumpsite, illegally burned, or otherwise disposed of in the natural environment, including in the marine environment.

Presently, there are only a handful of private recycling facilities, most of which export their recycled plastic materials.[92] Indeed, current data shows that less than 10% of all plastic waste is recycled[93] owing to a variety of factors, including lack of incentives and low public awareness.[94] However, discussions with authorities have revealed that a new facility has been collecting plastic waste for the last year and commenced the production of garbage bags via recycling technology for the domestic market.

Policies in Suriname affecting domestic plastic production

Polystyrene Foam Ban 2019. Since 2019, Suriname has successfully implemented a ban on the import, use and productio of styrofoam in the food industry due to its impacts on health and the environment.[95] Similar to the other SIDS included in this research, Suriname's ban on polystyrene products led to a proliferation in other single-use plastic products. While there is no ban on single-use plastic commodities in Suriname, consultations with national

92 **Regional Project Proposal for Plastics Management in Caribbean SIDS**, UNEP(DEPI) CAR WG.41/INF.21 Rev.1, Fifth Meeting of the Scientific and Technical Advisory Committee (STAC) to the Protocol Concerning Pollution from Land-Based Sources and Activities in the Wider Caribbean (Jun. 9, 2021).

93 **Replacing Single Use Plastic Commodities in the Economy of Suriname**, Green Policy Platform (Jan. 2022)

94 **Regional Project Proposal for Plastics Management in Caribbean SIDS**, UNEP(DEPI) CAR WG.41/INF.21 Rev.1, Fifth Meeting of the Scientific and Technical Advisory Committee (STAC) to the Protocol Concerning Pollution from Land-Based Sources and Activities in the Wider Caribbean (Jun. 9, 2021).

95 **Trade Ministry to issue Styrofoam import ban**, Times of Suriname, (Mar. 23, 2019).

authorities have indicated that it is actively being considered as single-use plastic wastes continue to pose risks to the environment.

Replacing single use plastic commodities in the economy of Suriname. Following the polystyrene ban, the above titled project is a recent collaboration between the Basel Convention Regional Center (BCRC) Caribbean and the Suriname Waste Management Foundation (SUWAMA) which began in July 2021, and seeks to improve plastic waste management through a series of activities, including the collection of data on single-use plastics (SUP) in Suriname, pilot projects to ban single-use plastic bags, promoting zero-plastics schools, etc. To date, stakeholder engagements were conducted, the single-use plastics data inventory is continuously developing, and thirty (30) women were trained and equipped to produce reusable bags as alternatives to producing and utilizing plastic bags in supermarkets.[96] The project uses a multidisciplinary approach that would assist with waste reduction, data collection, capacity building, economic development and stakeholder engagement.

Suriname has joined many other countries across the globe in the fight against styrofoam products in the food industry, however, the proliferation of other single-use plastics has resulted in a waste management crisis and leakage into the environment to the detriment of human health, economies and biodiversity. Suriname's pilot project on replacing single-use plastic commodities is an effective first step toward gathering the data, lessons learnt and institutional challenges to better inform the design and implementation of a potential nation-wide prohibition.

96 **Project newsletter: Replacing single use plastic commodities in the economy of Suriname**, SUWAMA (2021).

Conclusion

This research set out to develop a deeper understanding of the role and size of the plastic production industry in select SIDS. Despite challenges in obtaining quantitative data on production, UNCTAD data on the imports and exports of plastics provides an indication of the scope of the industry. This data suggests that each of the case study countries—Fiji, Suriname, Guyana, Singapore, and Mauritius—produce plastics, though Singapore is the only country that exported more plastics than it imported.

SIDS are a dynamic and varied group of countries, and some SIDS might have larger roles in the plastics industry than others. Nevertheless, many SIDS experience some of the same core challenges. For example, most of the case study countries have limited capacity for recycling, thereby limiting their capacities to produce plastic from recycled materials. This is particularly problematic because, as a result of SIDS' geographical remoteness and size, landfilling is not a sustainable means of waste management. The most common challenge in advancing the recycling industry among the case study countries was a lack of domestic waste separation measures. Thus, advancing waste separation measures could help to stimulate the production of recycled products by reducing contaminated waste stock and increasing the availability of raw materials for recycling.

Of note, recycled plastics are still plastics that pose risks to human health and the environment if not properly managed. However, if SIDS wish to incentivize a transition from traditional plastic production to that of recycled plastics, they will also require strategic programmes to reduce the consumption of and/or phase out certain types of plastics, including non-recyclable plastics. Moreover, better domestic regulation of the plastics industry, including requiring greater disclosure from plastic producers, could encourage more responsible

corporate action on plastics. Policy measures should be designed to ensure that they do not create additional problems. For example, bans on polystyrene products in the food industry have increased the prevalence of other types of single-use plastics, further contributing to the plastic problem.

Thus, as SIDS work towards developing a new international legally binding instrument on plastics, they will inevitably need to consider how the instrument will address plastic production, to which there is a need to resolve the difficulties and challenges with plastic recycling among SIDS, meaningfully engage corporate stakeholders, and improve waste management practices.

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