INDIAN OCEAN COMMISSION

# PREVENTION, REDUCTION AND CONTROL OF MARINE PLASTIC POLLUTION IN AFRICAN AND INDIAN OCEAN DEVELOPING ISLAND STATES (AIODIS)

BACKGROUND DOCUMENT

SWIOFISH 2

WORLD BANK GROUP


# PREVENTION, REDUCTION AND CONTROL OF MARINE PLASTIC POLLUTION IN AFRICAN AND INDIAN OCEAN DEVELOPING ISLAND STATES (AIODIS)

BACKGROUND DOCUMENT

**Disclaimers:**

WORLD BANK GROUP

The contents of this publication are the sole responsibility of the SWIOFish2/IOC project and can in no way be taken to reflect the views of the World Bank.

INDIAN OCEAN COMMISSION



The designation of geographical entities in this report, and the presentation of the material herein, do not imply the expression of any opinion whatsoever on the part of the publisher or the participating organizations concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitations of its frontiers or boundaries.

**Citation :**

For bibliographic purposes, this document may be cited as:

IOC SWIOFish2/AIODIS project. Prevention, Reduction and Control of Marine Plastic Pollution in African and Indian Ocean Developing Island States, 2021.

This publication is funded by the World Bank.

This document was prepared by Kieran Kelleher.

Printed by Cathay Printing Ltd.

Figure 6. Fluxes of marine microplastics ..... 38
Figure 7. Mismanaged plastic waste in Africa (Left: kg/capita; Right: tons/annum and %) ..... 41
Figure 8. The $8 billion costs of plastic pollution on natural capital by product ..... 44
Figure 9. Income, waste generation and MPP in AIODIS ..... 79
Figure 10. Links between solid waste management and the SDGs ..... 80
Figure 11. Shipping traffic density in AIODIS ..... 81
Figure 12. Graphical representation of relative microplastic density ..... 84
Figure 13. Currents in the Eastern Central Atlantic and Gulf of Guinea ..... 85
Figure 14. WIO surface currents and plastic carried by ocean currents (model) ..... 86
Figure 15. PCBs in plastics in the environment ..... 86
Figure 16. Plastic waste and plastic bag bans in Africa, 2015 ..... 92
Figure 17. Material flows: plastic pollution, the circular economy and the marine environment ..... 103
Figure 18. Institutional potential for AIODIS regional cooperation ..... 109

## Acronyms and Abbreviations

| | |
|---|---|
| 3RI | 3R Initiative |
| $ | US dollar |
| ABNJ/ BBNJ | areas beyond national jurisdiction/ biodiversity beyond national jurisdiction |
| AC | Abidjan Convention |
| AIODIS | Africa Indian Ocean Developing Island States |
| AIR | avoid, intercept, redesign |
| ALDFG | abandoned lost or discarded fishing gear |
| AMCEN | African Ministerial Conference on the Environment |
| APEC | Asia-Pacific Economic Cooperation |
| AU | African Union |
| BAU | business-as-usual |
| BRC | Basil and Rotterdam Conventions |
| CBD | Convention on Biological Diversity |
| CE | circular economy |
| CGF | Consumer Goods Forum |
| COMESA | Common Market for Eastern and Southern Africa |
| COP | Conference of the Parties |
| ECCAS | Economic Community of Central African States |
| ECOWAS | Economic Community of West African States |
| EoL | End-of-life |
| EPR | extended product responsibility |
| ETS | European Trading System (for carbon credits) |
| EU | European Union |
| FAO | Food and Agriculture Organisation |
| FP | focal point |
| GEF | Global Environment Facility |
| GESAMP | Joint Group of Experts on the Scientific Aspects of Marine Environmental |
| GG | Gulf of Guinea |
| GAIA | Global Alliance for Incinerator Alternatives |
| GPA | Global Programme of Action for the Protection of the Marine Environment from Land-based Activities |
| GPML | Global Partnership on Marine Litter |
| GRP | glass-reinforced-plastic (fibreglass) |
| HDPE | high density polyethylene |
| IEA(s) | international environmental agreement(s) |
| IMO | International Maritime Organisation |
| IOC | Indian Ocean Commission |
| IORA | Indian Ocean Rim Association |
| IOTC | Indian Ocean Tuna Commission |

| | |
|---|---|
| IPR/IP | intellectual property rights |
| ISO | International Standardisation Organisation |
| LBS/LBSA | land-based sources / land-based sources and activities |
| LBSMP | land-based sources of marine pollution |
| LCA | life-cycle assessment/ analysis |
| LDC | Less developed country |
| LDPE | Low density polyethylene |
| MARPOL | The International Convention for the Prevention of Pollution from Ships |
| MoU(s) | Memorandum(a) of understanding |
| MPP | marine plastic pollution |
| MR | Mechanical recycling |
| MSFD | Marine Strategy Framework Directive (EU) |
| MSW | municipal solid waste |
| NC | Nairobi Convention |
| NGO(s) | non-governmental organisation(s) |
| NIMBY | not in my backyard |
| NMP | Nano-Microplastics |
| OECD | Organisation for Economic Co-operation and Development |
| PA | polyamide |
| PAH | polycyclic aromatic hydrocarbon |
| PBTs | bioaccumulative and toxic compounds |
| PC | polycarbonate |
| PCB | polychlorinated biphenyl |
| PE | polyethylene |
| PENAf | Ports Environmental Network-Africa |
| PET | polyethylene terephthalate |
| POPs | persistent organic pollutants |
| PP | polypropylene |
| PPHMN | Port Harbour Masters Network |
| PS | polystyrene |
| PSMA | Port State Measures Agreement |
| PBTs | persistent bioaccumulative and toxic compounds |
| PTER | private transnational environmental regulation |
| PVC | polyvinyl chloride |
| REC(s) | regional economic commission(s) |
| RSC(s) | Regional Seas Convention(s) |
| SADC | Southern African Development Community |
| SCM | WTO Subsidies and Countervailing Measures Agreement. |
| SDGs | Sustainable Development Goals |
| SIDS | Small Island Developing State(s) |
| SUP | single use plastic(s) |
| SWM | solid waste management |
| TBT | WTO Technical Barriers to Trade Agreement |
| tons | metric tons |
| UN | United Nations |
| UNCED | United Nations Conference on Environment and Development |
| UNCLOS | United Nations Convention on the Law of the Sea |
| UNDOA-LOS | United Nations Department of Ocean Affairs and Law of the Sea |
| UNEA | United Nations Environment Assembly |
| UNEP | UN Environment Programme/ UN Environment |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNGA | United Nations General Assembly |
| UNIDO | UN Industrial Development Organisation |
| WEEE | Waste electrical and electronic equipment |
| WEF | World Economic Forum |
| WFD | Waste Framework Directive (EU) |
| WHO | World Health Organisation |
| WIEGO | Women in Informal Employment: Globalizing and Organizing |
| WIO | Western Indian Ocean |
| WIOMSA | Western Indian Ocean Marine Science Association |
| WTO | World Trade Organisation |

# Foreword

By Dr. Charlotte de Fontaubert, World Bank

We are pleased to be associated with the publication of these reports on the circular economy in the island states of Africa and of the Indian Ocean, which aim at accelerating a development that respects the environment and that is resilient to climate change. These documents, produced by the Indian Ocean Commission (IOC) as part of the implementation of the sub-component AIODIS of the second project on the Governance of fisheries and shared growth in the South-West Indian Ocean (SWIOFish2), deal with three important aspects of circular economy in the AIODIS countries: (i) the state of the circular economy, (ii) the questions of intellectual property with regard to innovative projects and (iii) the prevention, reduction and control measures of marine plastic pollution.

The World Bank has supported, since 2015, the countries of Africa and of the South-West Indian Ocean to meet the Sustainable Development Goals (SDGs) of the United Nations. To this end, we help several countries in their transition to a more sustainable ocean economy (SDG 14). The principle of blue economy is precisely a sustainable use of marine resources to stimulate economic growth, livelihoods and employment, while preserving the health of the ocean ecosystems. In that sense, the World Bank finances regional programmes on fisheries management in the islands of the Pacific, the Caribbean, West Africa and South-West Indian Ocean. It is in this context that lies our SWIOFish2 project in coordination with the IOC.

The first objective of the project is to assist these States to grasp and to increase the economic, social and environmental advantages of blue economy. This can be achieved by improving the management of their marine resources, namely by limiting the depletion of the fish stocks. This is also possible through an increase in alternative livelihood activities for targeted fishermen, and a reinforced regional cooperation in this sector.

With the sustainability of these resources under serious threat, addressing the sources of these multiple and interconnected threats requires us to rethink our entire economy. From the World Bank's perspective, this is why we are committed to supporting these states in their journey towards a circular economy that is best described as a restorative or regenerative industrial system by intent and design.

We are confident that by pooling their experiences and their initiatives through the AIODIS cooperation mechanism, these States will be able to better face their common challenges. Overcoming these challenges will require the use of sufficient technical and financial means coming from institutional frameworks and infrastructure conducive to the development of a circular economy. Thus, it was essential to identify them for each country, so as to set up the foundations of a framework that is adapted to different socio-economic contexts. Endowed with this new knowledge, we can henceforth move forward together towards a circular economy that brings sustainable and inclusive growth opportunities.

# Foreword

## Plastic: a marker of our times and a responsibility for action

By Prof. Vêlayoudom Marimoutou,
Secretary General of the Indian Ocean Commission

**''The obligation to suffer gives us the right to know.''**
**Jean Rostand**

Biologist Commoner draws our attention on one of the characteristics of human action: *"its capacity to produce materials that cannot be found in nature"*, and therefore *"to introduce in the system substances that are utterly unknown to it".* The great circular economy of nature, in which *"nothing is lost, but everything is transformed",* is more and more upset and disturbed by human manoeuvres.

The Modern world is also a world of pollution and, as Barnosky said in 2014, today *"there are few places on earth that are not affected by man-made environmental pollutants. It is common to find traces of pesticides and industrial pollutants in samples of soil and tree bark of any forest in the world, in whales' fat, in the body of polar bears, in fishes of most of the rivers and oceans".* Pollution has become one of the major problems of our times; local or global, of agricultural, industrial or urban origin, it contaminates the lands, the waters and the atmosphere, jeopardising the health of the ecosystems and thereupon that of humans.

## Plastic is emblematic of pollution in general

In 2016, J. Zalasiewikz and his colleagues propose to use plastic as an emblematic signature of the general pollution of the Earth's ecosystem characterising the Anthropocene epoch. Plastics are polymers manufactured from petrochemicals, although some are made from cellulose (8% of petrol extracted on the planet, half as raw material). Adapted to multiples uses, plastic impresses with its theoretical capacity to infinite recycling and to the promise of saving natural resources, and because of its hygienic qualities which led to its adoption in pharmacies and hospitals. From the 1950s onwards, it has grown with mass consumption, on the back of synthetic materials and on the rising production of disposable items. It has rapidly become an essential component of electronics and informatics.

Despite its theoretical infinite recycling capacity, we are far from the mark: it is estimated that 50% is recycled or converted into energy (pyrolysis), the proportion recycled being 15% to 25% in Europe and less than 5% in the USA. We therefore have an idea of the amount of plastic debris dispersed each year, in the form of fragments smaller than 5 mm, or even nano plastics, in the environment. Lightweight, easily transported by wind or water, plastic debris has invaded the entire planet, including the oceans, where it is dispersed from the surface to the bottom of ocean basins. The lightest plastics form areas of highest concentration around the 5 major ocean gyres. They represent a total of 25,000 tonnes of floating debris on the sea surface.

## Invasion, resistance and toxicity

The problem posed by this pollution is two-fold.

The first is its resistance. Depending on their composition, the degradation of plastics takes between 50 years and 5 centuries, or even millennia for debris to sink to the deep seabed. If we take into account both this resistance to degradation and the 5 to 13 million tonnes of debris that reach the world's oceans each year, we can see the scale of the problem we are building. And according to B. Montsaignon, 'bioplastics' cannot provide a real solution: their manufacture from plant materials does not guarantee the biodegradability of polymers, and moreover it increases industrial pressure on agricultural land; as for those that are claimed to be compostable or fragmentable, they are still derived from petrochemical products.

Second is its toxicity: 50% of the chemical components of plastics are classified as hazardous by the United Nations classification system for chemicals. Studies have also shown the ability of additives used in PVC to pass into the human bloodstream, as well as the carcinogenic risks of certain components of PVC, polystyrene, polyurethane and polycarbonate. Similarly, biologists have warned of the risks that plastic debris poses to fauna, from micro-organisms to whales or seabirds, which are part of the food chain right up to our plate.

## Rethinking the models, blue and circular

So, what should we do?

Regeneration, reinvention and restoration form a new framework for action to (re)think our strategies, to innovate and to provide solutions to this global challenge, which raises significant local issues in island territories. It is not a question of going to war against plastic, which has proved to be a useful, practical and inexpensive material. It is a question of analysing our relationship with this material, of defining new ways of consuming and producing it, and of developing innovative ways of disposing of it and reducing the pollution generated on our coasts and at sea.

To address the multifaceted challenge of marine plastic pollution in the islands of Africa and the Indian Ocean, the IOC and the World Bank, through the AIODIS component of the IOC-SWIOFish2 project, are publishing three studies on i) the state of the art of the circular economy, ii) intellectual property issues on innovative projects and iii) measures to prevent, reduce and control marine plastic pollution. We hope that they will prove useful to policy makers, entrepreneurs, and developers in the blue and circular economy sectors.

# Introduction

This is a background study for prevention, reduction and control of marine plastic pollution in Africa Indian Ocean Developing Island States (AIODIS). The AIODIS included in the study are: Cape Verde, Comoros, Guinea Bissau, Madagascar, Maldives, Mauritius, São Tomé and Seychelles. La Réunion is a member of the AIODIS group, but is not included in the study. The study has a particular focus on development of sensitisation strategies and the role of the circular economy.

**Part I** summarises global and regional characteristics of marine plastic pollution (MPP). It describes the complexity of the MPP problem and the challenges facing governments, industries and consumers. It describes the scale of the problem, the nature of plastics, the structure of the plastics economy and global trade in plastics. It quantifies the impacts on economies and on the environment and on biodiversity. Part I sets out the problem of MPP in the context of international law, describes initiatives to build an international convention to prevent, reduce and control plastic waste, and briefly describes actions under two regional seas conventions.

**Part II** addresses marine plastic pollution in AIODIS and builds on inputs from AIODIS stakeholders through Country Working Papers.

**Part III** describes the range of approaches and initiatives to prevent, reduce and control marine plastic pollution, with specific reference to the circular economy, to building awareness and to the challenges in AIODIS and small/ island economies.

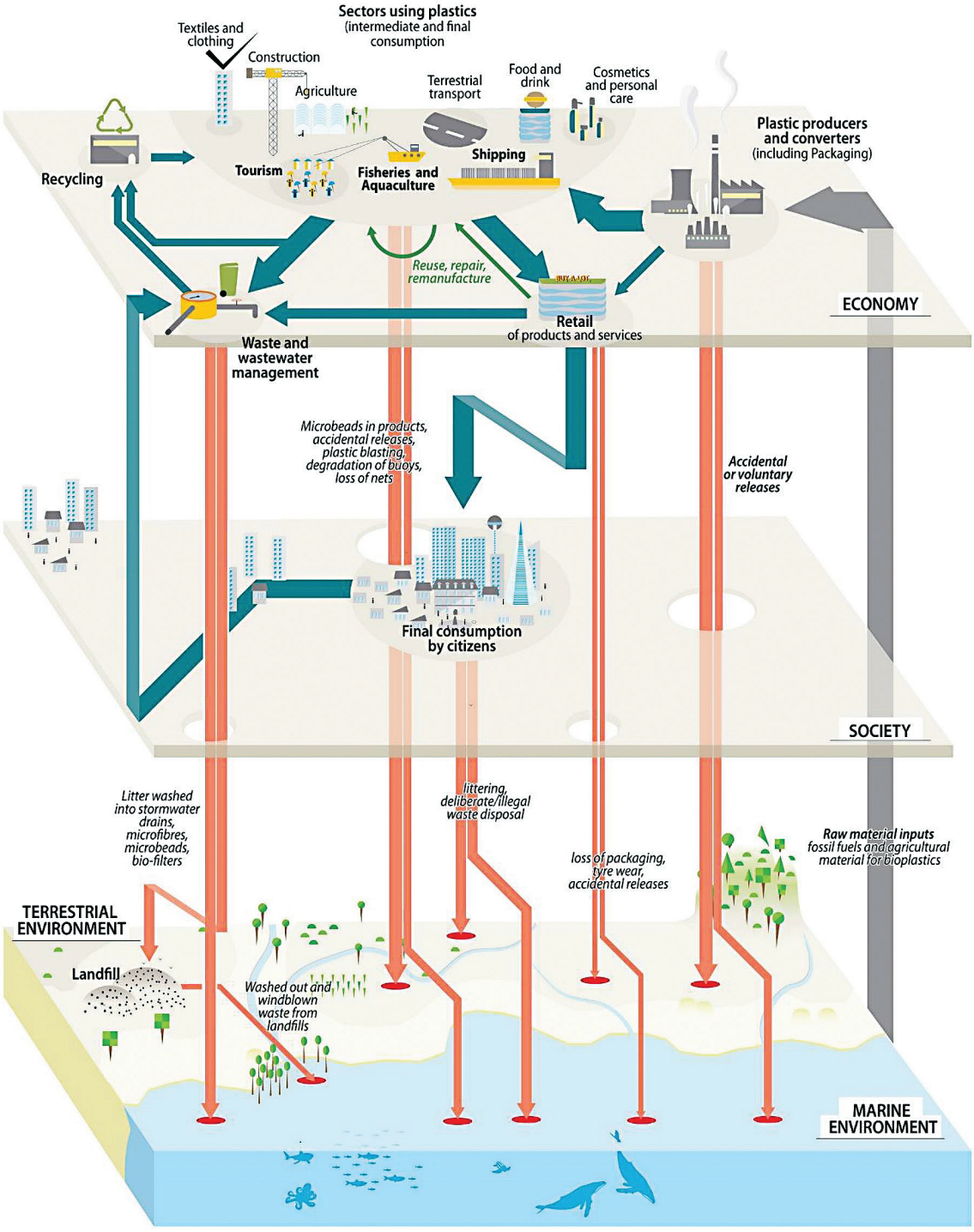
The report sets out and builds on several conclusions:

- a clear understanding of the integrated nature of the problem of MPP is important for development of a national action plan to combat MPP
- public awareness of the problem is fundamental to building the political willingness for actions, as actions can incur costs for consumers, for businesses, for local authorities and to public finance
- consumers and businesses need to be engaged through stakeholder consultation and participation
- MPP is part of a more general waste management problem, in particular, the management of urban solid waste and waste generated by shipping and fisheries activities
- governments will require coherent policies, regulatory measures, public support for waste management, incentives for changes in consumer and business behaviours and support for innovation in and adoption of the circular economy in the business community
- in the AIODIS, national resources and efforts may need to be supplemented by external financial resources, including for private sector investment and technologies
- national actions should ideally be complemented with regional and global actions to be effective, as the problem of MPP is global, requiring actions across sectors and economies
- given the small size of many AIODIS economies, actions to combat MPP can benefit from a regional approach on trade in plastics and plastic waste which may generate the economies of scale and opportunities for a circular economy approach.

This report is a companion report for other reports to be prepared under this project. These other reports will examine the role of the circular economy in addressing plastic waste and plastic pollution in more detail and will also examine intellectual property rights, particularly those associated with circular economy technologies and initiatives.

This work is financed by the World Bank under the 'Promotion of African & Indian Ocean Island Developing States Blue Economy' component of the regional 'South West Indian Ocean Fisheries Governance and Shared Growth Project' (SWIOFish2). The component is managed by the Indian Ocean Commission.

**Figure 1. How plastic pollutes the marine environment**




*Source: Grid Arendal, Riccardo Pavettoni*

# EXECUTIVE SUMMARY

## Key Messages

The **objective** of the study is to compile and present information on key aspects of marine plastic pollution to enable AIODIS to consider national and regional actions to combat marine plastic pollution with particular emphasis on awareness and the circular economy.

### A. What is the Marine Plastic Pollution problem?

1. Marine Plastic Pollution (MPP) is growing in AIODIS and worldwide. There are numerous social, economic and environmental impacts. The impacts are complex, cumulative, largely irreversible and difficult to quantify.

2. MPP results in estimated global losses of over $2 billion/year. The losses are disproportionately suffered by island economies. Losses for AIODIS have not been estimated but are considered significant, particularly for tourism, public health and the cumulative loss of ecosystem function.

3. MPP is part of a more general solid waste management (SWM) problem, in particular the management of urban solid waste and waste generated by shipping and fisheries.

4. Global, regional and national actions are not significantly halting or reversing global MPP.

5. Multiple actions across the entire plastics value chain with greater commitments by business stakeholders and concerted international actions are considered fundamental to effectively prevent, reduce and control MPP.

### B. How are AIODIS combatting Marine Plastic Pollution?

1. Countries are developing increasing awareness of 'the plastics problem'. All AIODIS have introduced restrictions on single-use-plastic bags. All countries have beach clean-up activities.

2. Only one country has a comprehensive action plan on MPP.

3. Only South Asia has a regional action plan on marine debris.

4. There are no regionally binding measures on MPP and no regional agreements facilitating sustainable trade in plastic waste.

5. The implementation and effectiveness of the two existing regional protocols on land-based sources of marine pollution has not been evaluated in relation to MPP.

6. All countries face technical, resourcing and institutional fragmentation challenges with respect to SWM. Deficient solid waste management (SWM) is the major cause of MPP.

7. There is limited business engagement in combatting MPP. Circular economy initiatives and extended producer responsibility schemes are in their infancy.

## C. What more can be done to prevent, reduce and control MPP?

### National actions

1. Countries can develop implement comprehensive national MPP action plans.
2. The plan should be an integral part of the national SWM plan, engage stakeholders across the plastics value chain, link to the national vision, the SDGs, and to relevant national environmental, social and economic initiatives.
3. The plan should have a strong regional cooperation component and address trade issues.

### Regional actions

1. MPP requires global and regional cooperative efforts, as the problem and the solutions are beyond the capabilities of single countries.
2. Actions at all levels will benefit from enhanced regional cooperation.
3. Ideally, regional action plans should be prepared with effective engagement of the regional economic communities and organisations.
4. A regional action plan should include a trade dimension, help access resources and finance, and help establish a regional position on MPP.
5. Ideally, the action plan should foster development of a binding agreements on measures to combat MPP.

# 3 São Tomé e Príncipe

## 3.1 Marine plastic pollution in São Tomé e Príncipe

São Tomé e Príncipe (STP) has a comprehensive solid waste management plan but does not currently have a comprehensive national strategy to address marine plastic pollution (MPP).[49] This report is a first step to estimate the scale of MPP and to develop a dialogue and action plan on MPP with particular emphasis on use of the existing solid waste plans, developing awareness among key stakeholders and identifying practical steps.

### 3.1.1 Sources of marine plastic pollution

This note provides a preliminary estimate of marine plastic pollution (MPP) in STP and provides a synthesis of available information on MPP. There are three main sources of MPP in STP:

- mismanaged, or unmanaged solid waste, which is by far the most important. This can be subdivided into two main categories: urban and rural waste.
- marine sources are mainly fishing activities and shipping with a minor contribution from marine tourism
- plastics are also transported by ocean currents from other countries, notably from Nigeria's river outflows and the Congo outflow.

Plastic waste is part of a much broader waste management problem, one of a range of sustainable development challenges faced by STP's population of almost 0.22 million. About 74 percent of the population is urban and the entire population is considered 'coastal', as due to the steep topography and seasonally high rainfall, any mismanaged plastic waste could potentially enter the marine environment. The tidal range (up to 1.8m) suggests that waste dumped on the shoreline could also result in MPP.

The estimate relies on several assumptions (see). MPP in STP is estimated primarily as a function of mismanaged solid waste.[50] Studies indicate the amount of solid waste generated per person is 0.4 kg/person/day.[51] In 2020, an estimated total of approximately 32,000 tons of waste was generated by a population of almost 220,000. In 2017, an estimated 38 percent of municipal solid waste was collected and the balance is considered to be mismanaged waste.[52] In 2017, plastic was estimated to comprise 5 percent of the solid waste stream.[53]

The mismanagement of solid waste means that the waste plastic can be leaked or transported into the ocean by rainfall and flooding, by dumping directly into rivers or the sea, by dumping on the shore, or by wind which carries plastic from dumps, or plastic particles from burning plastic. The estimate assumes that 5 percent of mismanaged plastic waste is leaked into the marine environment. While this value is substantially below that used for preparing the 2014 global estimate[54] it appears consistent

[49] The terminology used in Lusophone countries generally refers to marine litter or debris ('lixo marinho'). rather than to marine plastic pollution. MPP is generally considered to account for about 80 percent of marine litter or debris.

50 See Jambeck et al., 2014 and the main report for details of this methodology.

[51] TESE, EcoGestus, 2010. Plano de Acção para a Gestão Integrada de Residuos Sólidos Urbanos (PA-GIRSU) - São Tomé e Principe, 2011-2016. The PA-GIRSU scenario (2010) has uses a rate of 0.35 kg. The assessment prepared for the 2018 Plan estimates 0.3875 kg/person/day. See also: World Bank. What a Waste 2.0.

[52] World Bank. What a Waste 2.0; review of PA-GIRSU (2017); INE data (2012) indicated that only 19.3% of the population was served by solid waste collection.

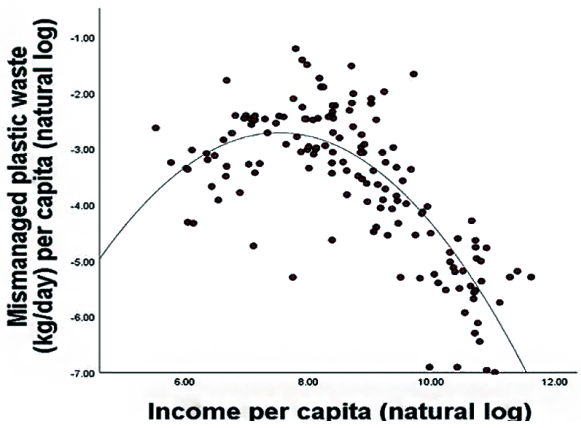
[53] PA-GIRSU studies indicated that about 4 percent of the waste in 2010 was 'identifiable' plastics and additional plastics, such as food wrappers, were in mixed waste; PA-GIRSU (2018) gives a value of 4.85%.

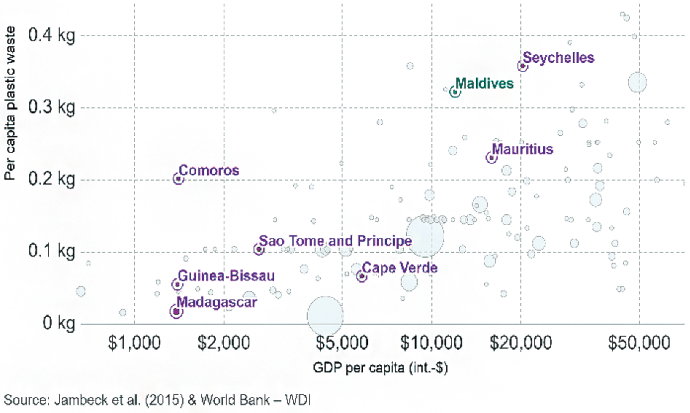
[54] Jambeck et al., 2014 consider that 10-20% of mismanaged waste in the coastal area leaks into the marine environment. The 5% value used here appears consistent with direct observations made in some African countries.

with direct observations in several African countries. In 2019, STP imported $2.97 million of plastics. However, imports under the 'plastics' custom code do not include drinks bottles and other plastic containers, or plastics used in packaging which is the type of plastic most likely to become MPP.[55] Information on plastic waste exports is not available.[56]

There is a relationship between plastic waste and income levels (Figure 8).[57] In 2019, the GNI per capita in STP was $1,960, but is expected to decline as a result of a projected GDP contraction of 9.5 percent in 2020. While consumption of plastics may decrease as a result, the increase in the use of plastics to combat the pandemic is likely to compensate for any such temporary decline. Tourist arrivals (almost 30,000 per year pre-pandemic) have declined and consumption by tourists (about 10.8 percent of GDP) is also likely to temporarily reduce MPP.[58] MPP in STP is estimated at 61 tons per year (Table 5).

**Figure 8. Relationship between income and mismanaged plastic waste**




*Sources: Barnes, 2019; Jambeck, et al. 2015.*

**Table 5. Estimated marine plastic waste in STP**

| Item | Value | Source/ Assumption |
|---|---|---|
| Population total (million) | 0.22 | World Bank 2019 |
| Waste (kg/person/day) | 0.4 | PA-GIRSU; World Bank |
| Solid waste total (tons/year) | 32,120 | calculation |
| Plastic (%) of waste | 5% | assumption |
| Plastic waste (tons/year) | 1,606 | Calculation (all recyclables 3,272 tons) |
| Mismanaged plastic waste (tons/year) | 996 | 51.6% (= uncollected waste, World Bank) |
| Marine plastic pollution(tons/year) | 50 | 5% of mismanaged waste (assumption) |
| Fisheries and shipping (tons/year) | 5 | assumed (see below) |
| Microplastics | 1 | assumed (see below) |
| Non-STP sources | 5 | assumption (from Niger, Congo, other rivers) |
| Estimated MPP (tons/year) | 61 | |

[55] HS Code 39.

[56] While plastic represents about 4% of waste collected by the municipalities, some plastic waste of value has already been collected separated by catadores and others.

[57] Barnes, Stuart J. 2019. Understanding plastics pollution: The role of economic development and technological research. Environmental Pollution 249, December 2019. https://www.sciencedirect.com/science/article/abs/pii/S0269749119306505

[58] Montes-Rojas, G. and R. Barroso, 2020. What Are the Empirical Determinants of International Tourist Arrivals and Expenditures? An Empirical Application to the Case of São Tomé and Príncipe. World Bank Policy Research Working Paper 9189.

### 3.1.2 Management of solid waste

Because of the relatively small size of the island ecosystems, unmanaged plastic waste can have a long-term impact on soils, water supplies, the air quality (through open burning) and the marine environment and cause a wide range of negative effects on health, tourism, food supply and the quality of life. The impacts of MPP are addressed in detail in the main report.

Two districts in particular, Água-Grande and Mé-Zochi, account for more than half the population and the preponderance of solid waste. There has been a trend in increased import of plastic products, or products in plastic containers or wrapping. As in other small island economies, STP lacks the economies of scale for investment in recycling. In common with Cape Verde, the mountainous terrain and difficulties in accessing residences, or villages, raises the costs of household waste collection. High humidity and high seasonal rainfall means that waste may be wet, or heavy and difficult to handle and chemicals may leach from plastics into the water supply. Imported trucks and other waste management equipment may rust or incur high maintenance costs in the tropical climate. Retaining qualified personnel, such as waste managers or engineers, is also a challenge, particularly for local councils. The cost of transporting waste from Principe, or from more remote parts of São Tomé is also likely to outweigh its value for reuse or recycling.

The collection of urban waste has been in decline due to resource and logistics constraints. In some areas waste collection is non-existent. As a result, wastes may be dumped on unused ground, or may be burned by the roadside or in gardens. Even when waste is dumped at the municipal landfills, it may be burned or become a health hazard by lying unburied.

**The 2010 solid waste management plan**. The solid waste management action plan (PA-GIRSU, 2010) set out a comprehensive and balanced approach to waste management. It was revised and updated in 2018 and the changes in the period to 2017 was reviewed:[59]

- training and community assistance occurred (2011)
- composting of bio-waste and construction of Agua Grande composting facility (2012-13) took place
- an environmental impact tax on plastics was introduced (2013)
- improved waste separation and commercial sale of compost ensued (2014)
- a biogas pilot project was completed and composting was extended to other districts (2015)
- a central waste sorting/ processing station was established (2016)
- the main landfill (Penha) expanded from 0.75 to 2.25 hectares
- overall costs attributable to waste increased significantly (x 3.4 in the 2011-2017 period)
- collection declined to 38 percent and collection and handling equipment degraded and became dysfunctional in some districts.

The 2010 plan was comprehensive, but components were implemented selectively, probably as a function of the targets and policies of the cooperation programmes backed by the development partners. The major infrastructure, items, notably the construction of sanitary or managed landfills was not undertaken and remains largely unfinanced, largely because of the high cost and technical issues (siting, drainage, transport logistics to a central landfill).[60] The waste management responsibilities given to the district authorities were not matched by either public support or by revenues from

[59] Actualização do Plano Nacional de Gestao Integrada dos Residuos (2018-2030). https://issuu.com/joaovaz71/docs/stp_res_duos_waste_management__pngir__2018_00.

[60] TRAGSA study 2008-2009.

user charges for waste collection. Waste collection declined and waste handling equipment was not replaced in a timely manner. A number of legislative instruments were approved, but their application and effectiveness is unclear (Box 2). The awareness and environmental education efforts which were undertaken do not appear to have been matched with effective and timely community actions and support, although the composting activities appear to be sustainable in some districts. The planned national waste management authority (Autoridade Nacional de Resíduos) was not established so that STP remains without an institution which has a mandate to coordinate the activities of the various stakeholders (e.g., environment, health, local authorities, business and civil society organisations); to take responsibility for preparation of targeted investments; to secure finance for implementing the waste management plans; and to develop a scheme for financing the recurrent costs of waste management.

The district councils (Câmaras Distritais) which have primary responsibility waste management are constrained by weak financial and human resources (with the exception of the Água Grande and Mé-Zóchi district councils which are more well-equipped). Despite a general awareness of environmental sustainability and a recognition of the waste problem, there is an apparent lack of well-structured community engagement backed by catalytic investments. Nevertheless, a number of NGOs have engaged with development partners to raise awareness and contribute to waste management efforts. A single private waste disposal company is complemented with numerous informal waste transporters.

The composting and glass recycling (tile making) initiatives have had a measure of success. Plastic containers are reused numerous times and some waste plastic is made into artisanal items, e.g., for the tourist trade. On Principe, there has been a scheme to exchange 50 plastic (PET) bottles for one aluminium bottle in order to protect the Biosphere reserve.

Waste collection has taken various approaches, such as: partnerships with associations, private companies and NGOs (e.g. TESE); using door-to-door collection for households and businesses; and establishing communal waste sites. Some of these sites are located on the coast which can contribute to MPP (Figure 9). In several cases, efforts to 'create value' have experienced challenges in implementing business plans which ensure their sustainability.

**Figure 9. Placement of waste and waste collection on the coast**


*Source: 2018 Plan*

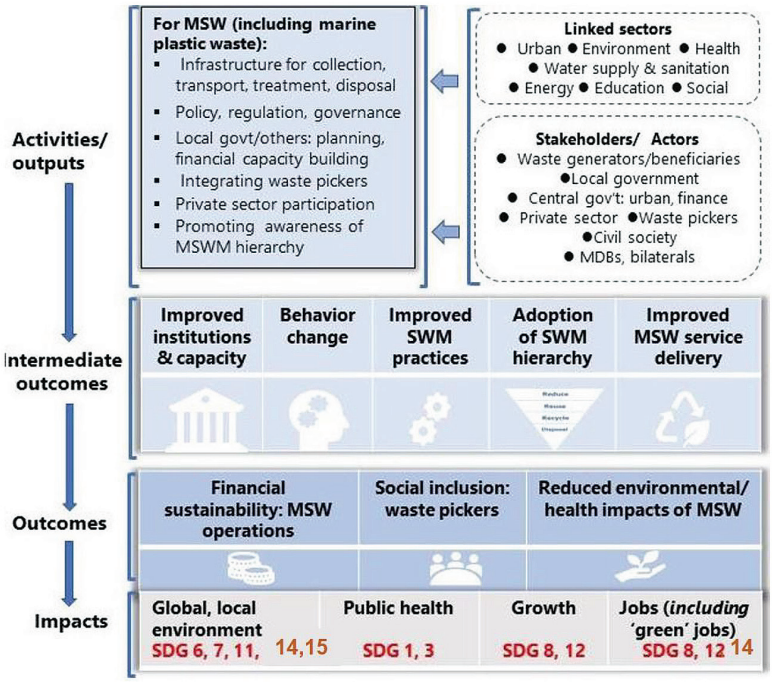
Estimates of the amount and composition of solid waste which are derived from analysis of waste collected by the municipalities are not necessarily representative, as households carry out considerable sorting for reuse or resale. Composition also varies by island and district. In particular, glass, cans, plastic bottle and cardboard may be separated. Food waste is also extensively used to feed animals, while excess food may be shared in the community. Cooking may be done with charcoal, so ash may form a significant portion of waste. Similarly, yard sweepings mixed with soil and sand may also be a significant waste component by weight. As a result, the waste profile may not be directly comparable

to the profile of some other AIODIS municipalities. The disposal of solid waste in rural areas is unclear. However, based on reports of practices in many sub-Saharan rural communities, much of the waste is burned, placed in household waste pits, or in unmanaged communal dump sites.

An estimated $3 million worth of plastics were imported in 2019.[61] However, this excludes the import of drinks and liquids which account for 6.6 percent of imports by value; excludes the import of synthetic clothing; and excludes plastics used for construction (e.g. pipes, panels) and other purposes.

In conclusion, the main driver of MPP in STP is deficient solid waste management, but MPP and plastic waste in general is just one part of a much broader waste management problem. The relationship of MPP and solid waste management in general to the SDGs is shown in the following figure.

**Figure 10. Links between management of municipal solid waste and the SDGs**




*Source: World Bank, Independent Evaluation Group.*

*Note: MSW = municipal solid waste; MDB = multilateral development bank; MSWM = municipal solid waste management; SWM = solid waste management.*

**Fisheries**. Both local small-scale and large-scale fisheries and foreign fishing are sources of MPP through lost gear.[62] Losses are generally related to the type of gear and location where the fishing takes place. There are over 2,000 active fishers in STP with catches in the order of 10,000 tons/year. There are about 2,000 small unpowered wooden canoes and over 500 small powered vessels. Access agreements with the EU and private operators for tuna fishing are an important source of revenue.[63] The 2019-2024 agreement provides for 28 tuna seiners and 6 longliners and reference catch of 8,000 tons/ year.

There no information on losses of fishing gear or MPP from fisheries. However, STP imports about 1.6 tons of netting per year, so that an equivalent amount is assumed to be lost or become waste. Designation of sites for collection of waste fishing gear, possibly through fishing organisations and

[61] COMTRADE code HS39.

[62] FAO, 2016. Abandoned, lost and discarded gillnets and trammel nets: methods to estimate ghost fishing mortality, and the status of regional monitoring and management. FAO Technical Paper No. 600. Rome. Italy.

[63] €0.84 million/ year.

arrangements with importers for responsible disposal could be of practise value in addressing fisheries MPP. Given the nature of the canoe fisheries marking of fishing gear and 'fishing' for lost gear may not be practical. However, 'fishing' for lost gear and other MPP by volunteer divers at prime tourist dive sites or beaches may be of value.

FADs are likely to be the main source of marine debris from the tuna fleet which also fishes in other West African countries. Analyses of beach litter from the Western Indian Ocean suggest that garbage from Asian fishing vessels can contribute significantly to MPP, even if not fishing in the STP EEZ. As few of the industrial vessels operating in STP visit port, there is a lack of information on vessel garbage disposal, or disposal of waste fishing gear by industrial vessels. As there is no direct information on MPP from fisheries in STP, the estimate given in should be considered as a 'place-holder' until such time as further information is available.

While there are a range of guidelines available to prevent marine debris from fishing vessels, and various workshops have been held, it is unclear to what extent best practices are implemented in STP and regionally. A 2019 regional workshop indicated a low level of awareness on the scale of lost or abandoned gear and nature of appropriate solutions.[64] Although many small-scale fishing vessels are wooden, fibreglass (GRP) fishing vessels and other GRP vessels are progressively reaching the end of their useful life. These will accumulate as plastic waste and may degrade to marine microplastics if abandoned on beaches. Most countries have no provision for appropriate disposal of GRP vessels.

**Shipping.** Galley waste from shipping can be a source of MPP, particularly if the waste disposal arrangements at ports are inadequate. Most major ports have waste reception facilities and implement the controls required under MARPOL Annex V. There are no reported irregularities regarding the access to waste disposal in AIODIS main ports. Arrangements for disposal of ships garbage in smaller ports or landing sites in STP may need attention as marine transport between islands is a key component of the transport network.

**Figure 11. Shipping traffic density and ocean currents in the Gulf of Guinea/ STP area**

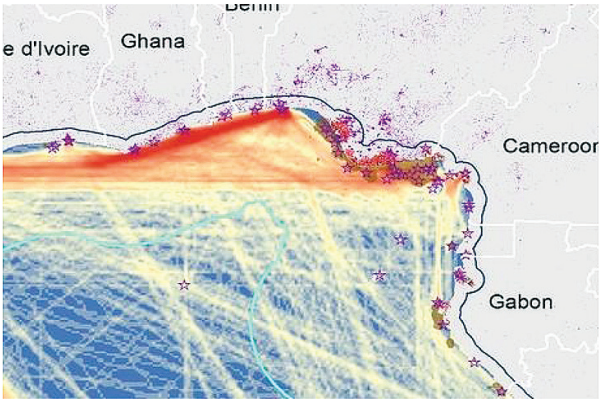
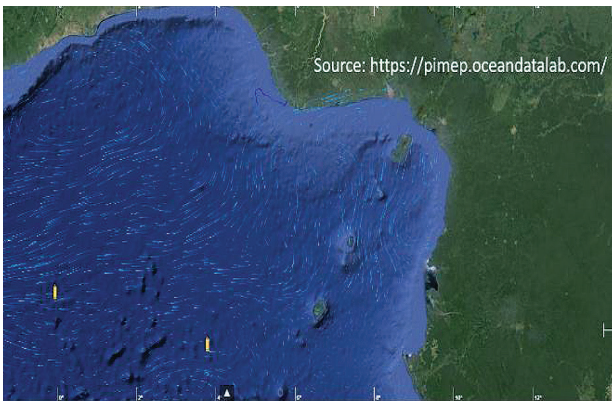



**Figure 12. Surface currents in the Gulf of Guinea/ STP area**




[64] Macfadyen, G., Huntington, T., and Cappell, R. 2009. Abandoned, lost or otherwise discarded fishing gear. UNEP Regional Seas Reports and Studies No.185; FAO Fisheries and Aquaculture Technical Paper, No. 523. Rome, UNEP/FAO. 2009. 115p.; FAO 2020. Report of 2019 FAO Regional workshops on best practices to prevent and reduce abandoned, lost or discarded fishing gear in collaboration with the Global Ghost Gear Initiative. Port Vila, Vanuatu, 27–30 May 2019. Bali, Indonesia, 8–11 June 2019. Dakar, Senegal, 14–17 October 2019. Panama City, Panama, 18–23 November 2019. FAO Fisheries and Aquaculture Report No 1312. Rome. https://doi.org/10.4060/ca9348en.

**Foreign sources of MPP**. It is highly likely that MPP originating from the Africa mainland is transported to STP by ocean currents from shipping and from rivers. However, specific information on the quantities arriving in STP is not available. In 2015, three rivers entering the Gulf of Guinea were ranked among the top 20 plastic polluting rivers at a global level. The estimated MPP loads were: Cross (Nigeria/ Cameroon) 40,300 tons; Imo (Nigeria) 21,500 tons; and Kwa Ibo (Nigeria) 11,900 tons.[65] No estimate is available for the Congo, which is the world's second largest river in terms of water discharge (1,308 $km^3$/year).[66] The absence of dams downstream of the major population areas in these river basins suggests that plastic waste in these catchment areas can be transported to the sea. A 2017 model, estimated that the Niger discharged 38,700 - 6,650 tons/year of plastic waste.[67] More recently, using a model based on HDI, population and population density, plastic waste discharge by all African rivers was estimated at 6,730 tons (range 3,730 – 11,100 tons). The wide range of the estimates strongly suggests that further study is required.[68] There is a strong correlation between the amount of mismanaged plastic waste in the catchment and the amount of plastic entering the sea: an average of 0.3 percent. This correlation is strongest for microplastics.[69] However, this relationship describes large 'inland' catchments of Asian or European rivers and does not necessarily apply to the 'short' coastal catchments of STP and other AIODIS.

**Microplastics**. The level of marine microplastic pollution depends on a wide range of factors. Population, density of housing and the type of treatment of waste water are important. In STP, the absence of slow-moving rivers or extensive estuaries means that microplastics are likely to get flushed into the ocean. The main sources are likely to be waste water (cosmetics, cleaning agents, laundry); road runoff of rainwater containing microplastics from car tyre abrasion; and air-borne microplastics resulting from burning and breakdown of macroplastics by wind and sun. As the area of tarmac road is relatively small, microplastics from tyre abrasion may be trapped in the soil before reaching the sea.

## 3.2 Existing and potential measures to combat MPP

### 3.2.1 Policy and planning

The 2018 national integrated waste management plan (2018 Plan)[70] provides an in-depth assessment of the challenges and sets out a robust and comprehensive approach. It identifies a lack of finance as the primary reason for lack of effective implementation of the 2011 Plan and builds on the lessons learned from the efforts to implement the 2011 Plan.

The 2018 Plan recognises that investment in hard infrastructure will remain a challenge and focuses on a range of partnerships backed by targeted regulations and their enforcement. It emphasises catalytic investments to foster a circular economy for wastes, by 'valuing waste', including through measures to reinforce existing activities, such as composting, reuse and recycling. It favour technologically simple, labour-intensive solutions, rather than a reliance on imported mechanical equipment, which may be difficult to maintain and costly to operate effectively. It recognises the seasonal changes in the composition of wastes, the need to reduce wastes and to progressively eliminate the open unsanitary landfills and unhealthy practices such as burning of plastics and other waste. The plan recognises

[65] Lebreton, L., et al. 2017. River plastic emissions to the world's oceans. Nat Commun 8, 15611 (2017). https://doi.org/10.1038/ncomms15611.

[66] Kinshasa plastic waste. https://www.youtube.com/watch?v=gNtIv-TrlBE.

[67] Schmidt C, Krauth T, Wagner S. Export of Plastic Debris by Rivers into the Sea. Environ Sci Technol. 2017 Nov 7;51(21):12246-12253. doi: 10.1021/acs.est.7b02368.

[68] Mai L., et al. 2020. Global Riverine Plastic Outflows. Environmental Science & Technology. 2020 Aug. 54(16):10049-10056. DOI:10.1021/acs.est.0c02273.

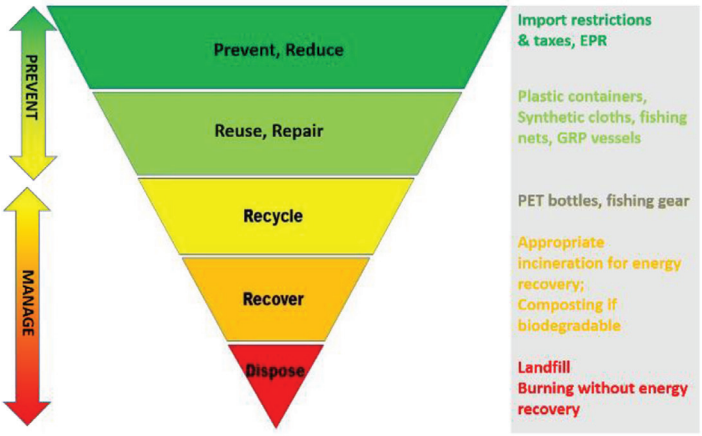
[69] Schmidt, op. cit.

[70] Ministério das Infraestruturas, Recursos Naturais e Ambiente, 2018. Plano Nacional de Gestão Integrada de Resíduos Sólidos Urbanos (PNGIRSU) 2018-2023. https://issuu.com/joaovaz71/docs/stp_res_duos_waste_management_pngir_2018_00

the need for an effective means of ensuring stakeholder cooperation and alignment of projects and initiatives; and for undertaking critical institutional and legislative reforms which can create incentives for sustainable practices, enforce rules and ring-fence revenues for waste management.

MPP needs to be seen in the context of overall waste management in STP, the level of poverty, governance challenges, the competing national development priorities, and the scarcity of human and financial resources. In 2018, STP was ranked 137 out of 189 countries with respect to the Human Development Index (HDI), a score of 0.69 compared to the Sub-Saharan Africa mean of 0.54. In 2018, per capita GNI was $1,870 compared to a Sun-Saharan Africa mean of 3,443. Population growth is 1.9 percent/year.

**Figure 13. The waste hierarchy**




While the 2018 Plan provides a useful roadmap for development of solid waste management and recognises that there have been many difficulties in implementation, there is little in the way of concrete investment proposals in the national budgets, nor does solid waste management figure prominently in any programmes agreed with development partners. If solid waste management is included in the 'list' of development priorities, opportunities are likely to arise to insert small but catalytic actions to combat MPP and plastic pollution into projects and any initiatives that target the related SDGs (Figure 3). National 'state of the environment' reports could include indicators on urban waste management (SDG 11), plastic consumption (SDG 12) and marine pollution (SDG 14). The main project report provides greater detail and discussion of option for recycling of plastic waste.

A draft, or outline national plan to combat MPP could be prepared as an add-on to the 2018 Plan. The MPP plan could affirm widely accepted principles for preventing, reducing and controlling plastic pollution, such as the waste hierarchy, cost recovery and the circular economy (Figure 5). The 2018 Plan already prioritises the establishment of an effective institutional arrangement for coordination of solid waste management and the sustainable financing and development of the system. While the establishment of an 'Autoridade' could take time, a ministerial-level task force, or working group could be established to improve cooperation between key institutions, including through memoranda of understanding, budget alignment and sharing of information. A task force could include representatives of the environment ministry,[71] municipal authorities, finance ministry, chamber of commerce, the media and concerned NGOs; and in the case of MPP, the fisheries administration, port authority and tourism stakeholders. The NGOs could include resident's associations and representatives of the 'catadores'. Devolution of some responsibilities or contracts with resident's associations and more organised 'catadores' associations could gradually develop locally adapted and effective waste management practices, including greater separation of wastes and improved opportunities for reuse and recycling.

STP already has a ban on plastic bags.[72] However, it is reported that this ban is not widely respected or enforced. Further reduction in import of non-essential plastics using bans or import taxes could be envisaged, i.e., for selected SUPs and a ban on the import of cosmetics containing microbeads. This

[71] Direcção de Ambiente Urbano e Controle das Poluições, or equivalent.

[72] Decreto no. 16/2013 prohibits the manufacture, import, sale and distribution of several types of plastic bags including those made from polyethylene and polypropylene.

could both potentially reduce consumption and provide revenue while possibly creating a market for local products (e.g. schoolbags made from local, or reused materials).

Even if investment in sanitary landfills is not considered feasible, alternative investments in 'controlled' landfills will need to be accompanied by arrangements for maintenance and, if possible, facilities for catadores (storage of sorted wastes, sanitation).[73] Investments could possibly prioritise the various forms of community actions, including voluntary local clean-ups, deployment of youth groups, innovation in reuse and recycling and partnerships with business with a view to the use of unskilled labour to add value to waste. Greater community engagement could potentially secure the resources which are not available to municipal authorities through voluntary efforts or through labour paid by adding value to waste.

### 3.2.2 Regulation

Despite the existence of laws on plastic bags, the 2018 Plan points out that there is no national policy on reduction of plastic bag consumption and sets out a number of measures to reduce consumption of plastic bags by 75 percent through:

- creation of legal norms for reduction of plastic bags in commerce
- raising awareness of alternatives among commercial establishment (shops, supermarkets) and among consumers
- taxes on plastic bags paid by consumers and collected by shops
- prohibition of advertising on plastic bags
- joint industry/ public campaigns on awareness of the environmental impact of plastic bags and plastic pollution.

STP has a range of legislative instruments of relevance to MPP (Box 2). However, while setting out useful measures (such as an environmental tax), they have not been considered entirely complementary in terms of their application or effectiveness.

[73] Global Alliance of Waste Pickers. 2012. First Global Strategic Workshop of Waste Pickers: Inclusive Solid Waste Management Pune, India 2012 (globalrec.org). See models for Dakar and Bamako.

| *Box 2.Selected legislation of relevance to marine plastic pollution* |
|---|
| Law 10/1992 set out the responsibilities and competences of the district authorities in relation to waste.<br>Law 10/1999 Towards adequate waste management (policy/ principles).<br>Law 36/1999, Waste law.<br>Law 14/2003 (DR nº.16, 5º.Suplemento) creates and applies the 'Sanitary tax' (TS) and the Environmental Impact tax (TIA);<br>Law No. 13/2007 establishing the Basic Law on Maritime Safety and Prevention of Marine Pollution.<br>Decree-Law No. 32/2007 creating the Maritime and Harbour Institute of Sao Tomé e Príncipe (IMAP-STP) November 2007.<br>Regional Legislative Decree No 3/ALRAP December 2009 on the protection of marine turtles.<br>Order No. 12/2012 approving the Participatory Strategy for Water and Sanitation of Sao Tomé e Príncipe until 2030 and makes provision for monitoring of water quality.<br>Decree-Law No. 64/2013 creating the Environmental Impact Tax (TIA) introduces the principle of the extended responsibility of the producer of goods to the production of waste. An Environmental Impact Fee (called TIA) is to be collected by customs on imports of plastic packaging.<br>Decreto n. 27/2018 – adops the clean environment policy (Política Nacional do Saneamento Ambiental (PNSA)).<br>Law No. 8/2019 approving the Major Options Plan for the Economic Year of 2019 includes provisions for educational and awareness campaigns for environmental preservation. The Major Options Plan for 2020 provides for improvement of solid waste management.<br>Law No. 8/2020 approving Measures to Reduce the Use of Plastic Bags in São Tomé and Príncipe. The Law prohibits the production, import, commercialization and distribution of non-biodegradable plastic bags. |

### 3.2.3 Fisheries

For larger, 'port-based' vessels, reception facilities based on MARPOL Annex V requirements can be applied to fishing vessels.[74] Recycling of nets and ropes may require the economies of scale which may only be feasible through regional schemes (e.g. COREP), through close engagement with businesses and possibly with economic support from EPR arrangements with importers. Studies suggest that the direct economic costs and benefits of fishing gear EPR schemes, such as deposit-return arrangements, or 'environmental taxes' on fishing gear imports are considered to be about equal (excluding indirect environmental benefits). However, the distribution of costs can be skewed, e.g., if manufacturers simply increase the cost of gear to fishers to cover EPR.[75] Fishers could introduce local rules to curtail gillnets in rocky areas where nets are frequently lost, as ghost fishing impacts on all fishers.

Abandoned GRP vessels present a growing plastic waste problem. Rules for disposal are required and the responsibilities specified. Measures could include a requirement that the annual vessel registration fee is paid until appropriate disposal is certified. EPR schemes may be difficult to design given the life of these boats. In the case of STP, most small-scale vessels are made of timber and GRP vessels may not present a major disposal problem.

Reduction of MPP from foreign fishing vessels requires a regional approach, particularly as foreign

[74] Huntington, T.C., 2016. Development of a best practice framework for the management of fishing gear – Part 2: Best practice framework for the management of fishing gear. Confidential report to World Animal Protection; Also see the Global Ghost Gear Initiative.

[75] EC, 2018. Study to support impact assessment for options to reduce the level of ALDFG Final Report 22-02-2018. https://webgate.ec.europa.eu/maritimeforum/en/system/files/Final%20Report%20Plastics%20from%20Fishing%20Gear%20Delivered.pdf.

vessels fishing in STP land catches elsewhere (e.g., Abidjan is a regional tuna hub) and do not make port calls to STP. This could start with resolutions by ICCAT, the Regional Commission of Fisheries of Gulf of Guinea (COREP), and COMAFAT, possibly phasing in MARPOL Annex V requirements for vessels; introducing measures with respect to marking gear and FADs; and specifying responsibility for recovery of lost gear. Enforcement could be through the PSMA. Appropriate requirements could eventually become part of minimum terms and conditions of access, included in licenses for vessels and could be an approved regional management measure. Fisheries support vessels could be included in such a scheme. FAO could be requested to provide support for design of a phased approach and the issue could be raised in the context of the EU fisheries access agreement.

### 3.2.4 Shipping and tourism

Ensuring that STP meets its obligations under MARPOL Annex V is the key action. Engagement between vessels operators and agents, port officials and waste disposal enterprises can help to ensure compliance on ships garbage disposal. Clarity on responsibilities for control, for inspection of ship's waste management logbooks and monitoring of practices at smaller ports may require agreements between port authorities, responsible ministries and municipal waste management authorities. Dialogues could also help in separation of recyclables in ship's garbage. Possible dialogues with IMO and regional port authorities could ensure coordinated measures to prevent dumping of waste by other shipping and to foster codes of conduct for regional shipping lines.[76]

**Tourism**. Although tourist arrivals increased by 263 percent in the 2010-2016 period with 29,000 arrivals for about a 1,500 bed capacity, tourism is considered to still be in an embryonic state. The vision is for STP to be the 'the most conserved island destination in equatorial Africa'. Tourism is not perceived as causing public cleanliness problems. Public cleanliness is seen as detracting from the quality of tourist experiences, and tourists give STP sanitary conditions a relatively low score. Both traders and stakeholders in the tourism sector consider public cleanliness as one of the two most important areas for improvement and also rank environmental awareness as a major issue.[77]

### 3.2.5 Awareness of MPP

There is an awareness of MPP in STP. This is evidenced by the STP's endorsement of the Mindelo Declaration on marine litter; ratification of the Abidjan Convention's LBSA Protocol; ratification of MARPOL Annex V; and national legislation on plastic bags. The awareness exists at the level of decision-makers. However, a similar level of awareness may not exist among consumers and businesses as evidenced by the reported weak compliance with the plastic bag regulations.

A range of approaches to raising awareness is detailed in the main AIODIS report. A recent public opinion survey ranked 'health' as the number one development priority in STP, so that emphasising the health benefits of improved solid waste management could raise its profile in the development project portfolio.[78] In the case of STP, the existing awareness may need to be channelled into practical actions, such as the separation of plastic waste, access to sources of funding for recycling, possibilities with regard to EPR schemes and development of a business case for 'valorização' of waste streams.[79] In 2020, it was indicated that an awareness campaign on urban 'cleanliness' would be launched.[80] In

[76] UK Chamber of Shipping, 2020. Best Practice on combatting Single-Use Plastic in Shipping; Carnival Corporation & PLC, 2019. Sustainability from Ship to Shore FY2019 Sustainability Report (although STP does not receive cruise ships, the commitment on phasing out of SUPs is of interest).

[77] Governo de São Tomé e Príncipe, 2018. Plano Estratégico e de Marketing para o Turismo de São Tomé e Príncipe.

[78] World Bank, 2019. World Bank Group Country Opinion Survey 2019: Sao Tome and Principe.

[79] World Bank, 2019. Country Economic Memorandum: Background Note 6. Stock take on business environment reform in São Tomé and Príncipe.

[80] "uma campanha que vai ser realizada na televisão e nas rádios [...] destinada aos munícipes". QW Noticias 20 August 2020. https://www.dw.com/pt-002/###-est%C3%A1-cansada-do-problema-do-lixo/a-54636646.

addition to public awareness campaigns, awareness activities can build on the work of environmental NGOs, focus on: raising community pride in cleanliness; establishing more formal relationships between waste buyers and catadores; supporting SMEs that can foster innovation that adds value to waste; and on the development of materials for school curricula.[81] Campaigns can also focus on voluntary actions and procurement policies, e.g.: elimination of SUPs from and reduction of plastics in public procurement, beach cleaning in tourist areas, codes of industry conduct to reduce SUPs and plastic waste, and EPR schemes to improve markets for waste products.[82]

Catadores can have an important role in adding value to waste. Plastic represents about 17 percent of the materials they collect and plastic comprises 15 percent of the items collected at the Penha landfill.[83] Studies suggests that basic organisation of these marginalised workers could improve supply and market opportunities for recycled/ reused materials, reduce plastic pollution and contribute to management of municipal solid waste.[84]

### 3.2.6 Possible regional initiatives

Prevention, reduction, or control of MPP from foreign sources requires regional (or global) action. In cooperation with other countries, STP could consider several initiatives:

- preparation of a joint strategic plan on MPP under the Abidjan Convention
- a COP resolution on monitoring and reporting on MPP and marine microplastic pollution as part of the implementing arrangements for the Abidjan LBSA Protocol
- preparation by the Abidjan Convention secretariat of a funding submission for a regional MPP monitoring programme, including from distant sources, collating information on beach clean-up through existing initiatives, and preparation of a strategic plan on MPP
- further use of Comunidade dos Países de Língua Portuguesa to follow on the Mindelo Declaration (2018).

In conjunction with other countries, STP could also consider initiating a dialogue in ECCAS on trade issues related to MPP and plastic waste management in general. In particular, regional arrangements on trade in plastic (and other) waste would be useful to enable economies of scale in recycling. Regional measures to reduce or eliminate un-necessary plastics, such as microbeads in household products and selected SUPs would also foster innovation in development of local substitutes. Regional initiatives could also underpin a dialogue on EPR with regional suppliers, such as agents for soft drinks (e.g., development of regional deposit return schemes). Regional measures also invoke market power in relation to the behaviour of major users of plastics (e.g. PET bottles), can underpin dialogues with major corporate sources of MPP (see main report), and inform discussions within the WTO.

At the level of AIODIS and Africa, STP could consider contributing to a common AIODIS position on MPP, possibly with a view to consolidating actions and positions through existing AMCEN and SIDS initiatives. Such engagement could also contribute to the oceans agenda of UNGA and UNEA. A regional action plan could also enable access to resources, including from global partnerships on plastic waste (see main report).

---

[81] E.g., educational videos produced by TESE, Projeto +ValoRES - Sustentabilidade e Economia Verde na Gestão de Resíduos (EU & Instituto Camões). https://www.facebook.com/pg/LIXO-ZERO-EM-STP-1409225786038334/posts/.

[82] Téla Nón, 2019. STP começa a envolver-se na limpeza do mar para Turismo ser futuro seguro. 25 de Setembro de 2019. See also: TESE - Associação para o Desenvolvimento - https://www.linkedin.com/in/teseongd/.

[83] Cruz, V.G., et al. 2018. Gestão sustentável dos Resíduos Sólidos Urbanos em São Tomé e Príncipe: Contributos da Educação Ambiental. AmbientalMente sustentable, xaneiro-decembro 2017, ano XII, vol. I, núm. 23-24, páxinas 47-62.

[84] See: Machado, G.B. Os Catadores e a Politica Nacional de Resíduos Sólidos. Resíduos Sólidos (Brazil). https://portalresiduossolidos.com/os-catadores-e-a-politica-nacional-de-residuos-solidos/.

### 3.2.7 Resources

As already noted, solid waste management does not appear to have a high priority in the agendas of the development partners, or the problem has been 'dissipated' among other challenges, such as health, infrastructure, public finance or education. This implies increased attention to the cost-effectiveness of waste management, means to reduce wastes (e.g., import of packaging), application of 'polluter pays' charges on items such as plastic bottles and plastic packaging, recovery of waste collection costs and possible cross-subsidy for collection from remote communities.

In the absence of major investment funds, low-cost actions, including awareness raising and change in consumer and household behaviour on waste management could be targeted. As suggested above, small interventions could be identified as part of projects that address the relevant SDGs. In particular, community initiatives to manage waste and improved synergies between any existing public and private efforts could be considered. Lessons could possibly be learned from the Dakar catadores (Association des Recuperateurs et Recycleurs de Mbeubeuss (BOKK DIOM)) which services households, commercial establishments, hospitals, markets and other producers of wastes. Further studies could be prepared possibly as part of university theses, but organised in such a way as to fill gaps in understanding of waste management and to identify options for waste valuation or for local products to substitute plastics.[85]

[85] Accelerating the Circular Economy in Africa – Lessons from Algeria, Ethiopia, and Rwanda. https://vimeo.com/484171717; Angola. Desburocratização do mercado do lixo. https://www.angop.ao/noticias/ambiente/jomo-fortunato-quer-desburocratizacao-do-mercado-do-lixo/