



INDIAN OCEAN
COMMISSION

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

BACKGROUND DOCUMENT





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Acronyms and Abbreviations

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

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

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.

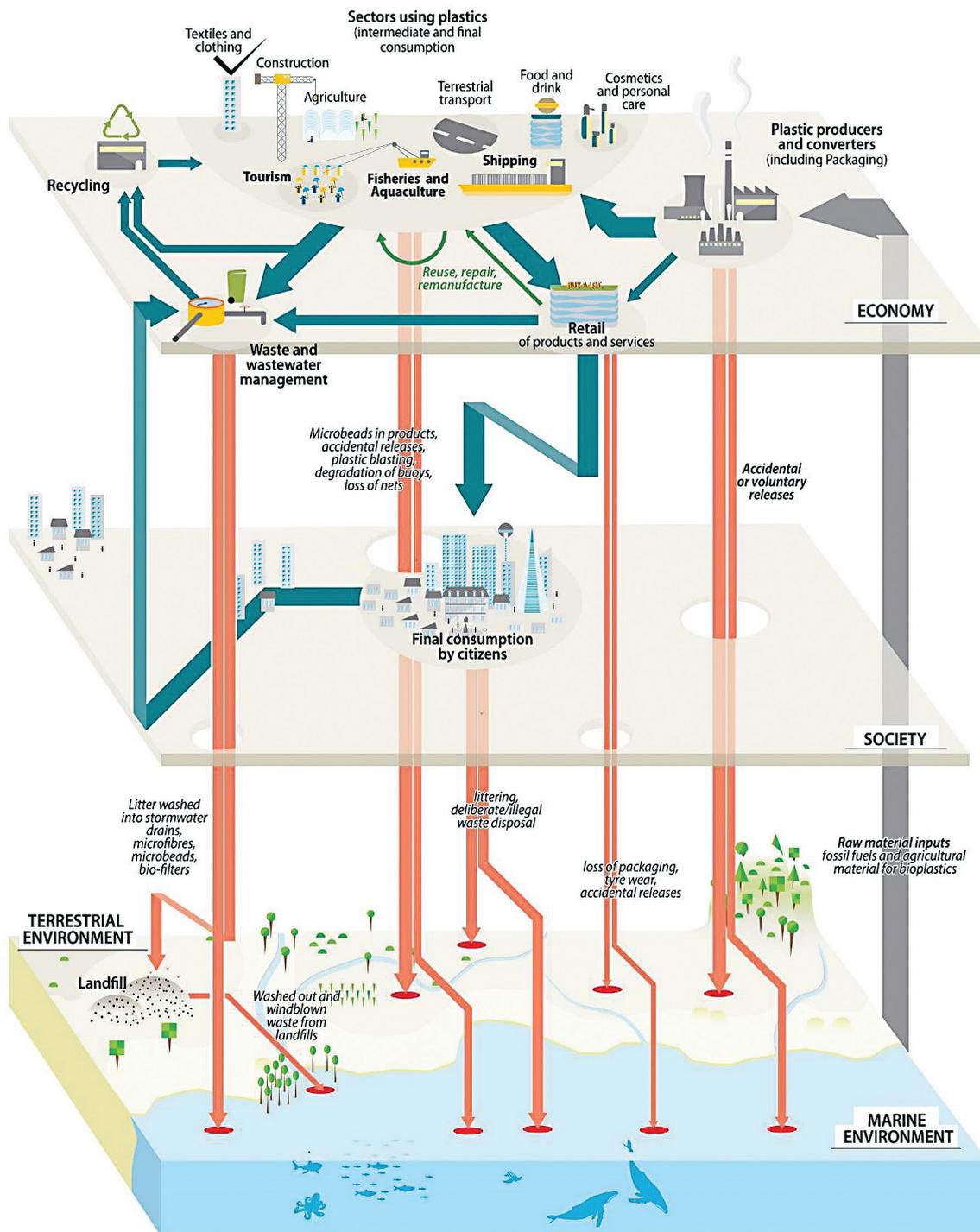
The report sets out and builds on several conclusions:

- 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.



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WEST AFRICA

1 Cape Verde

1.1 Marine plastic pollution in Cape Verde

1.1.1 Sources of marine plastic pollution

This report provides the first estimate of marine plastic pollution (MPP) in Cape Verde. The estimate is preliminary and relies on several assumptions (see Table 1). There are three main sources of MPP in Cape Verde:

- mismanaged, or unmanaged solid waste which is by far the most important
- marine sources, mainly fishing activities and shipping with a minor contribution from marine leisure (yachts, cruise ships)
- plastics transported by ocean currents from non-AIODIS countries.

Table 1. Estimate of marine plastic pollution in Cape Verde

Item		Source/ Assumption
Population	549,935	World Bank 2019
Waste (kg/person/day)	0.874	PENGeR 2016
Waste (tons/year)	175,435	calculation
Plastic (%)	10.2%	PENGeR 2018
Plastic waste (tons/year)	17,859	calculation
Mismanaged plastic waste (tons/year)	5,358	30% (assumption)
Marine plastic pollution(tons/year)	268	5% of mismanaged waste (assumption)
Fisheries and shipping (tons/year)	30	assumed*
Microplastics	2	assumed
Non-Cape Verde sources	-	no information

* mainly attributable to regional tuna fishing

The impacts of MPP are addressed in the main report.¹

Solid waste. Although a relatively high proportion of urban waste collection is reported (about 85 percent of residences serviced), progress on implementation of national waste management plans has been slow.² Implementation faces a number of problems, including the island geography of Cape Verde and the mountainous terrain which results in relatively high costs of waste transport, lack of economies of scale for the municipal authorities responsible for about 17 municipal dumps and

¹ Specifically for the Eastern Central Atlantic islands, see e.g.: Rodríguez, Y. et al. 2020. Socio-economic impacts of marine litter for remote oceanic islands: The case of the Azores Marine Pollution Bulletin Volume 160, November 2020, 111631. <https://www.sciencedirect.com/science/article/abs/pii/S0025326X20307499>.

² Plano Nacional de Gestão de Resíduos (PNGR) 2004-2014; Plano Estratégico Nacional de Gestão dos Resíduos Sólidos (PENGeR) 2015-2030; Ecovisão. 2017. Roadmap dos Resíduos em Cabo Verde.

various collection systems.³ In addition, high seasonal winds in Cape Verde carry plastic waste from mismanaged dumps where burning also contributes to dispersion of plastic waste particles. In 2017, over 8 percent of households disposed of waste directly into the environment (i.e., in gardens or local public spaces), while over 10 percent burned waste locally. Occasional flash floods may also transport waste plastic and litter to the ocean, including from about 150 'uncontrolled' waste dumps.

Progress on national waste management plans and 'roadmap' remains constrained by resources, lack of opportunities for recycling and means of generating value from wastes. Attempts have been made to organise waste-pickers, known as 'catadores' and there is ongoing concern for the health and well-being of these disadvantaged workers.⁴

Fisheries. Both local fisheries and international tuna fishing is a source of MPP through lost gear, including fish aggregating devices. Losses are generally related to the type of gear and location where the fishing takes place. Over 200 small-scale fishing boats operate in Cape Verde and about 50 larger 'industrial' (mainly tuna) vessels are based in Cape Verde. Global estimates of MPP from these sources are preliminary.⁵ Gillnets have a high level of loss while fishing on rocky bottoms also increases losses

Since 2015, the NGO 'Calao' has collected over 16 tons of marine debris on Sal islands western beaches (about 90 percent plastic), a constant leakage of debris, mainly produced by the international fishing industry, some carried from mainland West African coastal fisheries. While there are a range of guidelines available, and various workshops have been held, it is unclear to what extent best practices are implemented in Cape Verde and regionally.⁶ A 2019 regional workshop indicated a low level of awareness on the scale of and nature of appropriate solutions. Although most small fishing vessels are wooden, fibreglass (GRP) fishing vessels and pleasure boats are progressively reaching the end of their useful life, 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, including from cruise ships, 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 in Cape Verde needs assessment. Inter-island cargo shipment of is about 1 million tons per year, an increase of over 12 percent per year in recent years.

³ Ventura J.E., Santos E.D.O.S., Cabral A., 2013. A Problemática dos Resíduos Sólidos na Cidade da Praia. Atas do Colóquio Internacional Cabo Verde Guiné-Bissau: Percursos do saber e da ciência.

⁴ About 80 catadores worked in Praia in 2015 (UNISOL study). See: <http://www.southsouthworld.org/pt/component/k2/97-solution-pt-br/2109/apoio-a-promocao-do-artesanato-e-a-reciclagem-de-lixo-na-cidade-da-praia-cabo-verde-pt-br>.

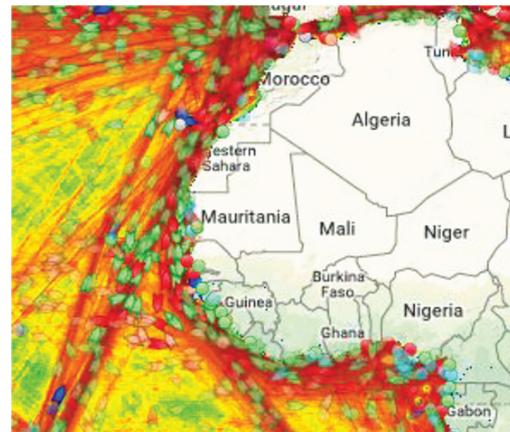
⁵ FAO, 2016. Abandoned, lost and discarded gillnets and trammel nets: methods to estimate ghost fishing mortality, and the status of regional monitoring and management. FAO Technical Paper No. 600. Rome. Italy.

⁶ 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. MPP in Cape Verde results from MPP in other countries including mainland Africa and South America. Beach litter surveys show marine litter originating in 25 countries. Circulation models for the Canary Current, the North Equatorial Counter-current and the Amazon plume suggest that plastic marine debris, including microplastics can be transported to Cape Verde waters. In addition, it is possible that some microplastics are carried in atmospheric dust on the NE trade winds from the West Africa mainland.⁷ Although there are no specific reports of marine plastic debris originating from non-Cape Verde flag vessels, it is likely that industrial longline gear, FADs and other lost or abandoned gear contributes to MPP (see main report also).

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 factors. Where there are slow-moving rivers and extensive estuaries microplastics may become trapped before entering the sea. However, this is not the case in Cape Verde and 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. There are no requirements to exclude microplastics from cosmetics and cleaning agents imported into or sold in Cape Verde. It is unclear if the various waste water treatment plants trap and effectively dispose of microplastics. The Ministry of Agriculture and Environment is understood to have initiated a study on microplastics.

Figure 1. Shipping traffic density West Africa



1.1.2 Existing and potential measures to combat MPP

The priority is to implement the PENGeR, which provides a comprehensive check-list of policy, legislative, infrastructure and behavioural actions required by government, by the private sector and by consumers. Financing for implementation of the PENGeR appears to be a significant constraint and is not prioritised in any of the plans of the major development partners.⁸ Parliamentarians have referred the Canaries ('zero plasticos no mar') and the Azores as providing examples of good practices adapted to Macaronesian region. Solid waste management is linked to numerous SDGs. The inclusion and tracking of indicators on urban waste management (SDG 11), plastic consumption (SDG 12) and marine pollution (SDG 14) in the INE reports on sustainability could be considered.⁹

A review of policy gaps and PENGeR implementation could uncover some cost-effective measures to reduce waste in general and MPP in particular. These may include measures to reduce or phase-out SUPs, codes of industry conduct for tourism to reduce SUPs and plastic waste, EPR schemes and a ban on the import of cosmetic and other household products which contain microbeads. Measures with respect to fisheries, shipping and development of awareness are briefly described below. Reference should be made to the main project reports for greater detail and discussion of recycling of plastic waste.

Solid waste management. A number of the activities set out in the PENGeR are under way or have been completed, such as the establishment of an information system (Sistema de Informação de Resíduos (Sires)) and the development of the Ilha Santiago sanitary landfill. National regulations on

⁷ Zhang, Y. et al. 2020. Atmospheric microplastics: A review on current status and perspectives. *Earth-Science Reviews*, Volume 203, April 2020, 103118.

⁸ E.g., WB, AfDB, EU, Luxembourg, Portugal.

⁹ INE, 2019. Relatório Estatístico. Indicadores dos Objectivos de Desenvolvimento Sustentável, Cabo Verde. Agenda 2030.

municipal waste management were approved in 2020;¹⁰ the prohibition on plastic shopping bags was introduced in 2015.¹¹ A range of studies may also provide insights for solid waste management.¹² Work by NGOs, by partnerships and others may also provide a basis for actions to combat MPP and address some the social issues involved.¹³

Tourism, including cruises, contributes about 25 percent of Cape Verde's GDP but drives about 40 percent of the economy. The number of tourists has quadrupled in the 2001-2017 period placing significant strain on waste management. A projected decline of about 70 percent in tourism in 2020 may offer the opportunity to introduce measures on plastic pollution and waste management, such as in tourist codes of conduct and reduction of SUPs by hotels. About 70 percent of cruise passengers disembark and spend an average of \$45 per day.

Fisheries. In Cape Verde, marking of fishing gear, requirements for reporting loss and location of loss (i.e. with GIS reference), 'fishing' to recover lost gear, port reception facilities for waste gear and arrangements for recycling are all measures which can help reduce MPP from fishing.¹⁴ Measures based on MARPOL Annex V can be applied to fishing vessels. The arrangements for collection and recycling of fishing gear collection and gear recycling programme require practical local solutions. Recycling of nets and ropes may require the economies of scale which are only feasible through regional schemes, 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.¹⁵ 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.

Reduction of MPP from international fisheries (e.g., tuna) requires a regional approach. This could start with resolutions by ICCAT, SRFC, and COMAFAT phasing in MARPOL Annex V requirements for vessels and with respect to FADs and specifying responsibility for recovery of FADs. 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 be an approved ICCAT management measure. Fisheries support vessels could be included. FAO might be requested to provide support for design of a phased approach.

¹⁰ DL 26/2020.

¹¹ Lei nº 99/VIII/2015.

¹² Moreira, A.J.G. et al., 2020. Application of a decision support tool for municipal solid waste open dumps remediation in Cape Verde. *African Journal of Environmental Science and Technology*, January 2020; Silva, M.A.R., 2018. Plano De Negócios – Criação de uma Empresa de Reciclagem em Cabo Verde. Projeto de Mestrado, Instituto Politécnico de Lisboa; Mendes de Castro, M.E., 2017. Avaliação Ambiental Estratégica (AAE) de um Plano Operacional de Gestão de Resíduos na ilha do Sal - Cabo Verde. Universidade do Minho.

¹³ WWF/ FIBA, 2010. Proposta do Plano de Gestão da Reserva Natural Marinha de Santa Luzia, Ilhéus Branco e Raso; and work by Sociedade Portuguesa para o Estudo das Aves (SPEA); GCV, ANMCV & PNUD. 2017. Catalog of Good Practices of Development in Cape Verde; Dias, S., 2018. Three ways waste pickers can be included in the new circular economy. *Equal Times*, 23 March 2018. www.equaltimes.org/three-ways-waste-pickers-can-be#.

¹⁴ 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.

¹⁵ 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>.

Shipping. Ensuring that Cape Verde 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 Enapor, responsible ministries and municipal authorities. Dialogues could also help in separation of recyclables in ship's garbage. Possible dialogue IMO and regional port authorities could ensure coordinated measures to prevent dumping of waste by other shipping and foster codes of conduct by cruise lines.¹⁶

Possible regional initiatives. Prevention, reduction, or control of MPP from foreign sources requires regional (or global) action. Cape Verde could consider several cooperative initiatives:

- preparation of 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 of programme and associated funding submission for a regional MPP monitoring. including from distant sources and 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 in the context of a follow up to the Mindelo Declaration (2018).

Cape Verde could also consider initiating a dialogue in ECOWAS 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 substitutes and collection and recycling 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, Cape Verde 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).

Awareness of MPP. A range of approaches to raising awareness is detailed in the main AIODIS report. In the case of Cape Verde, 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. Specific attention may need to be directed to preparing consumers for possible measures on SUPs and raising awareness on microplastic pollution as this is less visible. In addition to possible public awareness campaigns, awareness activities can build on the work of environmental NGOs and the development of materials for school curricula. Campaigns can also focus on voluntary actions and procurement policies, e.g., elimination of SUPs from public procurement. Given the relatively low level of manufacturing in Cape Verde engagement with existing manufacturers (e.g., CERIS(Estrela) and AguaBrava (water)) could foster innovation, initiatives and awareness.

¹⁶ 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 (see commitment on phasing out of SUPs).

Resources. As already noted, solid waste management does not appear to have a high priority in any of agendas of the development partners. 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. A small task force could review the PENGeR with an emphasis on availability investment and recurrent finance and (in the absence of investment funds) the prioritisation of low-cost actions, including awareness raising and change in consumer and household behaviour on waste management. Island-level, or sector-specific plans to combat MPP, or to manage waste could be considered with a view to improved synergies between existing public and private efforts. The proposed 'blue bond' concept note flags the challenge posed by MPP and solid waste management and could potentially provide catalytic resources.¹⁷

¹⁷ World Bank. 2020. Cabo Verde: Blue Bond Note. Report No: AUS0001012. See also: World Bank, 2016. World Bank Group Engagement in Small States: The Cases of the OECS, PICs, Cabo Verde, Djibouti, Mauritius, and the Seychelles Clustered Country Program Evaluation.