



INDIAN OCEAN
COMMISSION

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

BACKGROUND DOCUMENT





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

BACKGROUND DOCUMENT

Disclaimers:



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.



This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder provided acknowledgement of the source is made.

IOC would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from IOC.

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 | 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.

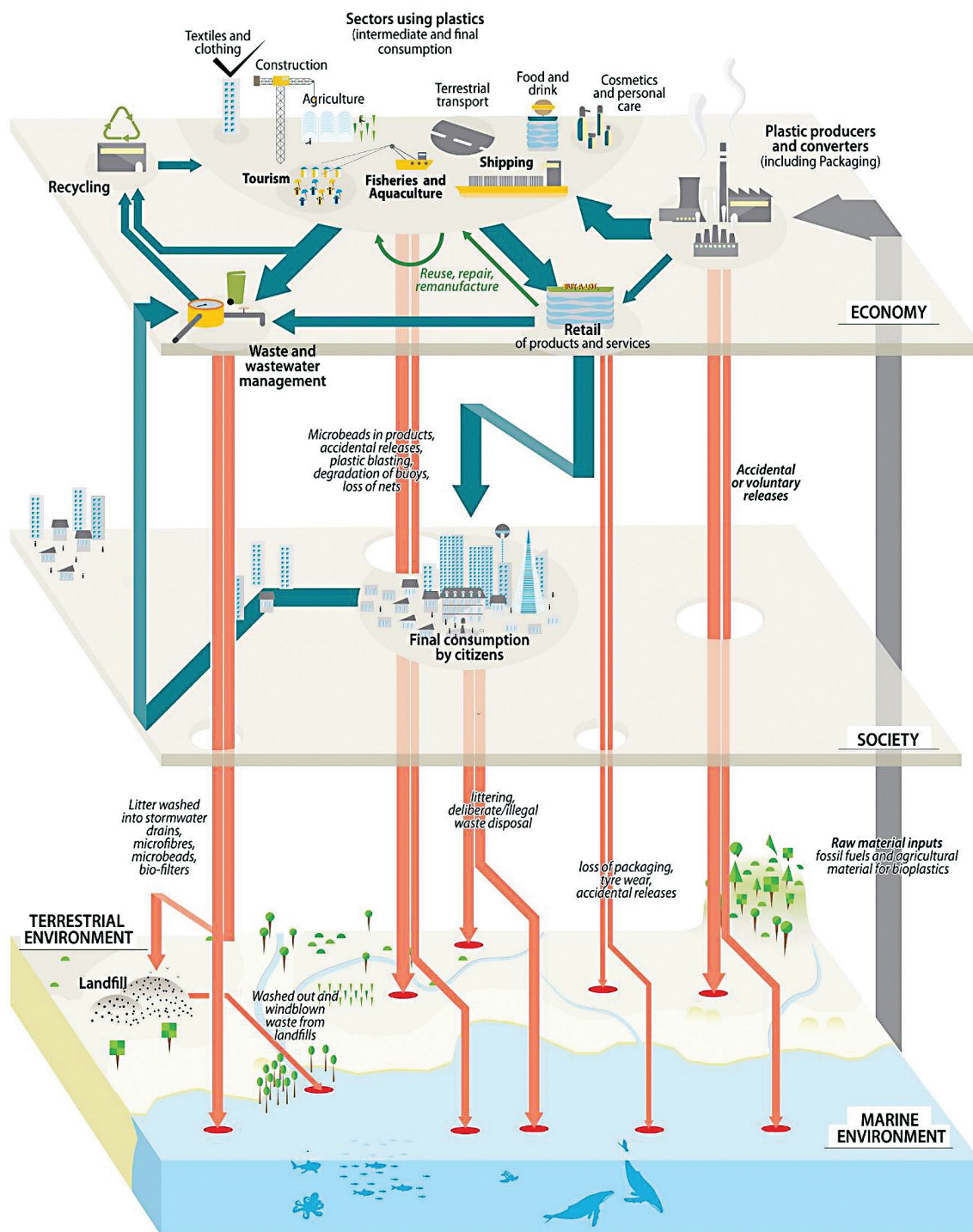
The report sets out and builds on several conclusions:

- 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.



INDIAN OCEAN
COMMISSION

Blue Tower, 3rd floor, Rue de l'Institut,
Ebène, Mauritius
Tel: (+230) 402 61 00
www.commissionoceanindien.org