

## WESTERN INDIAN OCEAN

### 4 Union of the Comoros

#### 4.1 Marine plastic pollution in Comoros

The Union of the Comoros (Comoros) does not currently have a comprehensive national strategy to address marine plastic pollution (MPP).<sup>86</sup> Comoros, however, has proposed an investment project to address solid waste management as and when resources become available. This report is a first step to estimate the scale of MPP, to describe the sources of MPP and to develop a national dialogue and action plan on MPP with particular emphasis on use of the existing solid waste management initiatives, developing awareness among key stakeholders and identifying practical steps.

##### 4.1.1 Sources of marine plastic pollution

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

- mismanaged, or unmanaged solid waste, which is by far the most important
- marine sources are mainly fishing activities, shipping, offshore oil and gas platforms and a minor contribution from marine tourism
- plastics may also be transported by ocean currents from other countries.

Plastic waste is part of a much broader waste management problem, one of a range of sustainable development challenges faced by Comoros. The country has a population of about 0.85 million. About 74 percent of the population is 'urban' and the entire population is considered 'coastal' for the purposes of estimating MPP. By this is meant that plastic dumped in any part of the country can potentially become MPP. This is due to the relatively small size of the islands, the steep topography and seasonally high rainfall so that any mismanaged plastic waste could potentially be washed into the marine environment. The tidal range (up to 1.8m) suggests that waste dumped on the shoreline could also result in MPP, particularly when storm surges occur.<sup>87</sup>

The estimate relies on several assumptions. MPP is estimated primarily as a function of mismanaged solid waste in Comoros.<sup>88</sup> Studies indicate the amount of solid waste generated per person is 0.4 kg/person/day.<sup>89</sup> A 2013 survey suggested that the amount of waste could be higher, as only 7 percent of the sample of Mutsamudu (Anjouan) residents surveyed indicated that they produced less than 1 kg/day.<sup>90</sup> The same survey recorded that plastic comprised 14 percent of the waste.<sup>91</sup> A 2016 study noted that wealthier households generated more in Moroni and estimated an average of 1.7kg/day per household (0.36 kg/person).<sup>92</sup>

<sup>86</sup> MPP is generally considered to account for about 80 percent of marine litter or debris.

<sup>87</sup> Risk of cyclones and coastal flooding in Comoros is considered 'high'. <https://thinkhazard.org/en/report/58-comoros/CY>

<sup>88</sup> See Jambeck et al., 2014 and the main report for details of this methodology.

<sup>89</sup> Issihaka Ali, A. 2015. Contribution à l'amélioration de la gestion des déchets ménagers aux Comores. International Journal of Innovation and Applied Studies. Vol. 12 No. 4 Sep. 2015, pp. 786-800. See also: World Bank. What a Waste 2.0. (database).

<sup>90</sup> Sinane, K.M. 2013. Les littoraux des Comores, dynamique d'un système anthropisé : le cas de l'île d'Anjouan. Géographie. Université de la Réunion, 2013. Français. <https://tel.archives-ouvertes.fr/tel-01237270>.

<sup>91</sup> The study acknowledges that the high estimates probably reflect estimates of volume rather than mass by those interviewed.

<sup>92</sup> Mousfou, I.H.Y., 2017. Gestion et traitement des déchets ménagers à Moroni. Memoire Master, Universite d'Antananarivo;

In 2020, an estimated total of approximately 124,000 tons of solid waste was generated by a population of almost 851,000. Plastic is estimated to comprise 5.4 percent of the solid waste stream.<sup>93</sup> In Comoros little of the solid waste is effectively managed and the waste that is collected (up to 40 percent in Moroni) appears to be dumped in uncontrolled landfills where plastic may be burned, carried by the wind, or washed into streams. For the purposes of the estimate, it is considered that 90 percent of the waste is mismanaged, although in recent years some communes, NGOs and communities have invested in waste management (Table 6).<sup>94</sup>

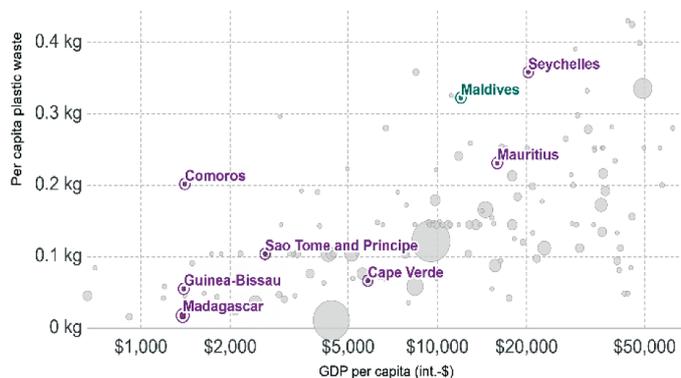
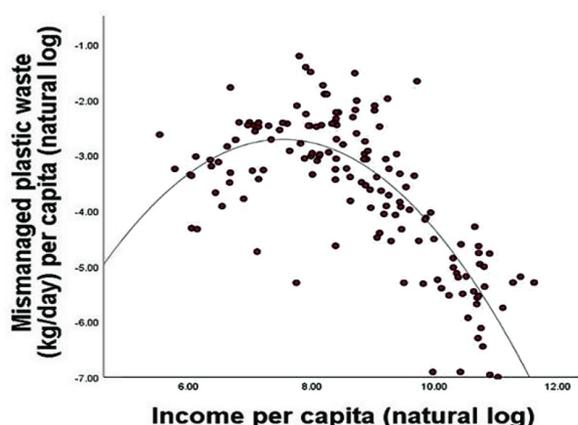
**Table 6. Survey of waste disposal in Anjouan, 2013**

Site of waste disposal	% of survey respondents
Beach	86%
Rivers	5%
Drains	2%
Potential to become MPP	93%
Other, around house	7%
Total	100%

Source: Sinane, 2013.

There is a relationship between plastic waste and income levels (Figure 14).<sup>95</sup> In 2019, the GNI per capita in Comoros was \$1,400, and while consumption of plastic products can be expected to decline during 2020, the increase in the use of plastics to combat the pandemic may offset some of the decrease. Reduced tourist arrivals (about 10.8 percent of GDP) is also likely to temporarily reduce MPP.

**Figure 14. Relationship between income and mismanaged plastic waste**



Source: Jambeck et al. (2015) & World Bank – WDI

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

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 2013 study also showed that waste dumped in or near waterways by inland villages accumulate near the estuaries

Africa Clean Cities Brief 2018.

<sup>93</sup> Hydroplan, 2003. Expertise pour la gestion des déchets solides. Rapport final. Ministère des finances, du budget et de la privatisation des Comores. This study has been repeatedly cited. No more recent study appears available. About 4% of market waste is plastic, see: La direction générale de l'environnement et des forêts. 2019. Rapport sur la caractérisation des déchets solides du marché de volo-volo. Préparer par Service déchets.

<sup>94</sup> Studies in 2003 (Hydroplan) and 2014 (Fouque) also indicate high levels of waste dumping on beaches.

<sup>95</sup> 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>

of these streams. The estimate conservatively assumes that 30 percent of mismanaged plastic waste is leaked into the marine environment. While this value is higher than that used in preparation of the 2014 global estimate, it reflects the practice of dumping waste directly into the sea, or on the shore and that a high proportion of the population live in close proximity to the coast.<sup>96</sup> In 2019, Comoros imported \$2.97 million worth 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.<sup>97</sup> Information on plastic waste exports is not available.

MPP in Comoros is estimated at over 1,800 tons per year (Table 7).

**Table 7. Estimated marine plastic pollution in Comoros**

Item	Value	Source/ Assumption
Population total (million)	850,886	World Bank 2019
Waste (kg/person/day)	0.40	Issihaka Ali, et al. 2015
Solid waste total (tons/year)	124,229	calculation
Plastic (%) of waste	5.4%	Hydroplan, 2003
Plastic waste (tons/year)	6,708	calculation
Mismanaged plastic waste (tons/year)	6,038	90% (see text)
Marine plastic pollution(tons/year)	1,811	30% of mismanaged waste based on Sinane, 2013
Fisheries and shipping (tons/year)	1	assumed (see below)
Microplastics	1	assumed (see below)
Non-Comoros sources	1	assumption (from Madagascar, Mozambique, other)
Estimated MPP (tons/year)	1,814	

#### 4.1.2 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. The causes of mismanaged solid waste are attributed to a combination of factors:

- lack of financial resources either from the government budget or local taxes or service charges
- lack of a comprehensive waste management policy, plan, or strategy
- lack of coordination, divided responsibilities and other institutional obstacles
- weak human resources and technical knowledge
- lack of infrastructure
- difficulties in translating awareness among consumers and households into sustainable practices and little or no sorting of waste.

However, the population is aware of the problem of waste and the impacts on wellbeing. The problem is a lack of commitment to finding and implementing solutions due to the combined effects of institutional inertia, lack of resources and support for a plan to address the problem (see below 4.2.1 on the subject of plans).

<sup>96</sup> 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.

<sup>97</sup> HS Code 39.

Although legislation is in place to establish a national waste management authority, Comoros currently lacks an institution which coordinates the activities of the various stakeholders (e.g., environment, health, local authorities, business and civil society organisations); takes responsibility for preparation of targeted investments; secures finance for implementing the waste management plans; develops a scheme for financing the recurrent costs of waste management; and provides incentives for waste use and recycling. The waste management responsibilities given to the district authorities are not matched by either public support or by revenues from user charges for waste collection.

Some waste collection takes place. This appears to vary by district and the availability of collection resources (e.g., trucks, fuel), appears erratic and little, if any, separation of waste takes place. Collected waste also appears to be dumped in uncontrolled sites where plastics may be burned or washed into streams of the sea. A number of NGOs, youth groups, environment protection groups, community association and communes are actively engaged in addressing waste management.<sup>98</sup> In some cases they are supported by religious leaders and quartier chiefs, resources from development partners and waste collection services provided by the local authorities. Investment in major infrastructure, notably the construction of sanitary or managed landfills has not been undertaken and remains largely unfinanced (see below 4.2.1 on proposed plans). Comoros has a unique problem in that the selection of inland waste landfill sites must be at elevation and limited by the geomorphology, as leachate from upland landfill can readily contaminate a fragile water-table.

**Figure 15. Placement of waste and waste collection sites on the coast**



Source: Hydromet, *Comoros Actualites*<sup>99</sup>

As in other AIODIS economies, Comoros has a trend in increased import of plastic products, or products in plastic containers or wrapping, but lacks the economies of scale for investment in recycling. The cost of transporting waste between islands is likely to outweigh its value for reuse or recycling. Island geography and mountainous terrain raises the costs of household waste collection and disposal. High humidity and high seasonal rainfall means that waste may be wet, or heavy and difficult to handle. Imported trucks and other waste management equipment may incur high maintenance costs in

<sup>98</sup> E.g., AIDE, ULANGA, 2 Mains.

<sup>99</sup> <http://www.comores-actualites.net/2019/09/18/les-cotes-de-la-ville-diconi-croule-sous-les-dechets-plastique/>

the tropical climate. Retaining qualified personnel, such as waste managers or engineers, is also a challenge, given the diaspora enjoyed by Comoros. It is unclear if chemicals from plastics are leaching into the water supply, but due to its complex hydrogeology, Comoros already faces major challenges in assuring a sustainable supply of drinking water and effective waste management is part of the solution.

In conclusion, the main driver of MPP in Comoros is a weak solid waste management. MPP and plastic waste is just one part of a much broader waste management problem.

**Fisheries.** As there is no direct information on MPP from fisheries in Comoros, the estimate given in should be considered as a 'place-holder' until such time as further information is available. Both local small-scale and large-scale fisheries and foreign fishing are potential sources of MPP through lost gear and garbage disposal.<sup>100</sup> Losses are generally related to the type of gear and location where the fishing takes place. There are over 8,000 active fishers in Comoros operating about 1,500 GRP vessels and 3,500 wooden canoes with catches in the order of 16,000 tons (Figure 16).<sup>101</sup> Access agreements with the EU for tuna fishing were an important source of revenue before the agreement was denounced in 2016 with a major impact on total annual fisheries access revenues of about \$1.3 million.

**Figure 16 GRP vessels in Comoros**

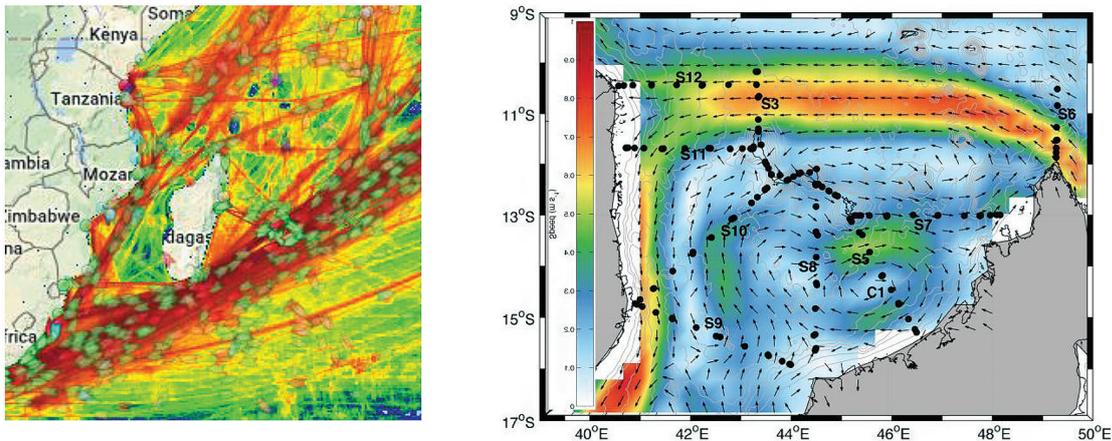


There is no information on losses of fishing gear or MPP from fisheries. Available import information indicates that Comoros imports less than 1 ton of fishing nets per year which appears to be a substantial underestimate, but it is assumed that at least 1 ton/ year is lost or becomes MPP.

**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 Comoros may need attention, as marine transport between islands is a key component of the transport network. In addition, growing offshore oil/gas exploration activities can be a source of MPP and effective waste management may require to be specified or included in any revisions of the legislation on marine pollution or in the terms and conditions of concessions.

<sup>100</sup> 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.

<sup>101</sup> In 2012, FAO reported a total of 10,000 fishers and 5 800 vessels of which nearly 70% were unpowered.

**Figure 17. Shipping traffic density and ocean surface currents in the Comoros area**

Foreign sources of MPP. It is likely that MPP originating from the African mainland and possibly from Madagascar is transported to Comoros by ocean currents from shipping and from rivers. However, shipping traffic is relatively light in the Northern Mozambique Channel and the surface current systems appear to have a tendency to form eddies rather than act as a major carrier of marine debris.<sup>102</sup> However, specific information on the quantities arriving in Comoros is not available and beach clean-up activities do not sort debris by possible origin.

**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 Comoros, 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 untreated waste water (cosmetics, cleaning agents, laundry); road runoff of rainwater containing microplastics from car tyre abrasion; and airborne microplastics resulting from burning and breakdown of macroplastics by wind and sun. As the area of surfaced/tarmac road is relatively small, microplastics from tyre abrasion may be trapped in the soil before reaching the sea.

## 4.2 Existing and potential measures to combat MPP

### 4.2.1 Policy and planning

**Policies.** There is no policy or plan to combat MPP. There is no integrated national policy on solid waste management, although the environment ministry and local authorities have policy positions. A comprehensive information system on waste quantities, composition, or disposal upon which to effectively plan initiatives is lacking. Solid waste management lacks specific budget allocations and a tax base, such as universal collection charges or import taxes on plastics. Waste collection and waste disposal has been described as “anarchique”. The business environment is constrained by burdensome laws inhibiting investment in enterprises that could add value to waste or provide services.<sup>103</sup>

**Constraints.** These deficiencies are the result of deeper systemic structural problems of governance in terms of institutional arrangements, resourcing and finance and regulation. There is a lack of cooperation and coordination among the multiple actors and governance levels involved: the Union

<sup>102</sup> Collins, C., J. C. Hermes, and C. J. C. Reason (2016), First dedicated hydrographic survey of the Comoros Basin, *J. Geophys. Res. Oceans*, 121, 1291–1305, doi:10.1002/2015JC011418.; Quartly, G.D., et al. 2013. Mozambique Channel eddies in GCMs: A question of resolution and slippage. *Ocean Modelling* Volume 63, March 2013, Pages 56-67

<sup>103</sup> Comoros 'Doing Business 2020' score is 47.9 compared to a Sub-Saharan Africa score of 51.8 and a score of 81.5 for Mauritius.

government, the three island governments, the Commission de l'Environnement des îles, the municipal authorities (mairies) which have the direct responsibility for solid waste management, contractors engaged in provision of waste collection and a range of civil society organisations engaged in reuse and recycling.<sup>104</sup>

**Institutions.** The main responsibilities are split. The communes are responsible for the organisation, management and implementation of waste services and cleaning of public areas, collection, transport, handling and disposal of solid wastes. The Union government is responsible for dangerous wastes, for legislation, for setting norms and for any international cooperation required.

The island-level governments are responsible for the island's waste management plan, the identification and management of the waste disposal sites and the monitoring and control of waste management. In Moroni the Environment Commission (rather than the mairie) contracts the private service providers which collect household waste. Le Comité de Pilotage des Villages des Riverains is responsible for control of the main landfill, while communities are represented by L'Union des Associations de Moroni.<sup>105</sup> Service contracts may lack clarity and performance measures, but as budget management is weak, contractors also risk late payment.

The waste management problem, and the resulting marine pollution is well recognised in the national vision:

“ Dans le cadre de la gestion des déchets et de la salubrité publique, le pays n'arrive toujours pas à proposer un mécanisme durable de lutte de contre ce fléau, car les infrastructures adéquates ne sont pas encore mises en place et aucun mécanisme durable de gestion des déchets n'a été jusqu'à présent défini.”<sup>106</sup>

A recent decree approved the establishment of a national waste management authority.<sup>107</sup> The authority will be established under the environment ministry with four departments and island level 'antennae'. Revenues are to be derived from the government budget, from service charges, levies on waste removal, entry charges for landfill sites, from loans and grants.<sup>108</sup>

**Plans.** Several analyses and plans have been prepared in the past.<sup>109</sup> They have identified the problems and proposed various sectoral or island-level solutions, but the structural constraints outlined above have generally blocked comprehensive implementation. Because the intertwined technical, financial, institutional and environmental education issues all need to be systematically addressed, development partners have not engaged in what is likely to be a long-term endeavour. In 2019, an major solid waste management investment plan was prepared as an input for the Development Partners Conference (Table 8).<sup>110</sup> The proposal (2019 Plan) is focused largely on capital investment. It is not backed by any feasibility analysis or a plan for sustainable financing, although a 2014 study does provide estimates of recurrent costs and indicates the sources of finance.<sup>111</sup> Plan Comores Emergent 2030 has suggested a waste management policy with enhanced reliance on voluntary stakeholder actions.<sup>112</sup>

<sup>104</sup> The 2 Mains NGO has been particularly active, fostering waste separation, composting, 'valorisation' awareness and cooperation among communes. [http://www.2-mains.org/index.php?option=com\\_content&view=article&id=6&Itemid=115](http://www.2-mains.org/index.php?option=com_content&view=article&id=6&Itemid=115),

<sup>105</sup> Hydroconseil/ Ecogeos, 2014. Diagnostic de la filière déchets à Moroni (et dans les communes environnantes). Rapport 2. Assistance technique pour améliorer la gestion des déchets solides à Moroni, Comores. Banque Mondiale. This study provides an analysis of the institutional issues.

<sup>106</sup> Plan Comores Emergent 2030.

<sup>107</sup> Decree 20/104 (August 2020).

<sup>108</sup> Currently, only Domoni, Moroni and Fumboni communes are understood to apply household waste charges.

<sup>109</sup> PNUD/IAGU, Union des Comores, Plan de gestion intégrée des déchets solides ménagers et hospitaliers dans l'agglomération de Moroni. Etude réalisée par l'Institut Africain de Gestion Urbaine (IAGU); PNUD, 2007. Union des Comores. Formulation d'un programme de gestion intégrée de déchets solides pour les principales villes. Rapport de mission exploratoire; Mousfou, 2017; Plan de Développement Urbain de Moroni. Document de synthèse.

<sup>110</sup> Conférence des Partenaires au Développement des Comores, Paris: 02 - 03 décembre 2019. Conférence des Partenaires au Développement des Comores. Projet structurant : Gestion intégrée des déchets en Union des Comores.

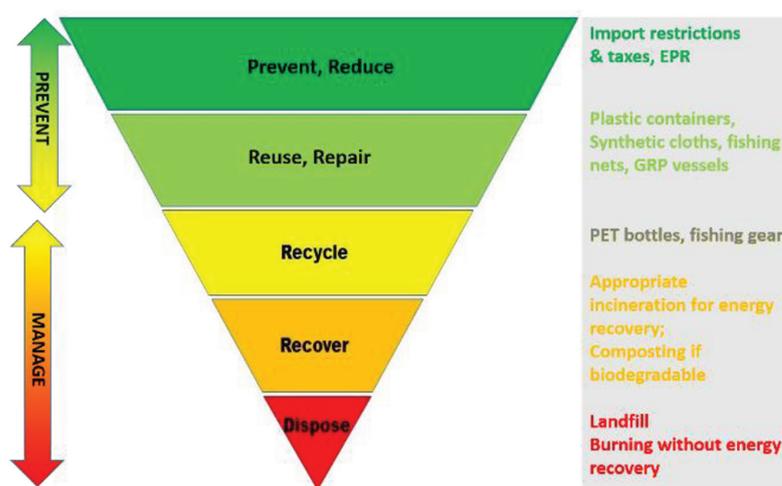
<sup>111</sup> Hydroconseil/ Ecogeos, 2014. (World Bank).

<sup>112</sup> "Mettre en place une politique nationale volontariste de gestion des déchets."

**Table 8. Integrated waste management project proposal (2019 Plan)**

Component	€ million	%
Disposal of wastes	10	29%
Waste collection	10	29%
'Valorisation' of wastes	12	34%
Institutional development	2	6%
Communication and best practices	1	3%
Total	35.6	100%

The 2019 Plan provides a useful start in recognising that substantial investment is required, but perhaps underestimates the underlying structural challenges and that without institutional reforms the proposed capital investments may be less than successful. An outline national plan to combat MPP could be prepared if the 2019 Plan is advanced. If the establishment or resourcing of the proposed national waste management authority is delayed, 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.

**Figure 18. The waste hierarchy**

A task force could include representatives of the environment ministry, 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 which could gradually develop locally adapted and effective waste management practices, including greater separation of wastes and improved opportunities for reuse and recycling.<sup>113</sup> Consideration could be given to the organisation of waste pickers and development of EPR in relation to major waste items, such as PET bottles. 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. In particular, composting appears to have considerable potential given the low productivity of some of the soils in Comoros.<sup>114</sup>

MPP needs to be seen in the context of overall waste management in Comoros, the level of poverty, the governance challenges, the competing national development priorities, and the scarcity of human and financial resources and the lack of vision on solutions which can be adapted to the local conditions.

<sup>113</sup> NGOs with potential to contribute to a circular economy include: Le Réseau des Jeunes Entrepreneurs-Plateforme Nationale, L'association Banda Bitsi, L'FOICOM, Association 2Mains, SHAWIRI, Synergie Jeunes, SHINOON CoWorking, Association DAHARI, Maecha, FNACFA.

<sup>114</sup> 2-Mains, Ulanga Traitement, Banda Bitsi.

## 4.2.2 Regulation

The basic law on environmental protection (1994) prohibits dumping waste along the roadside or near houses.<sup>115</sup> It obliges all citizens and entities to practice ecologically sound waste management, but does not specify the modalities of application. A 2017 law prohibits the production, import, sale and distribution of non-biodegradable low density plastic bags.<sup>116</sup> It appears that these and other relevant laws are not effectively applied and are generally ignored.<sup>117</sup> Given effective enforcement, reduction in import of non-essential plastics using bans or import taxes could be envisaged, i.e., for selected single-use-plastics (SUPs) and a ban on the import of cosmetics containing microbeads. This 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). The problem with waste PET bottles appears so great that a substantial import tax could be considered to reduce imports and provide incentives for production of water local drinks in reused glass bottles or in larger water containers.

## 4.2.3 Fisheries

Given the nature of the small-scale 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 near the marine park, or near main beaches may be of value. Designation of sites for collection of waste fishing gear, possibly through the Syndicat National pour le Développement de la Pêche aux Comores (SNDPC) and EPR arrangements with importers for responsible disposal could be of practise value in addressing fisheries MPP. FADs are likely to be a source of marine debris from the tuna fleet which also fishes in other WIO countries. Analyses of beach litter from the Seychelles suggest that garbage from Asian fishing vessels can contribute significantly to MPP, even if not fishing in the Comoros EEZ. As industrial vessels operating in Comoros do not visit port, there is a lack of information on vessel garbage disposal, or disposal of waste fishing gear by industrial vessels.

For larger, 'port-based' vessels, reception facilities based on MARPOL Annex V requirements can be applied to fishing vessels.<sup>118</sup> Recycling of nets and ropes may require the economies of scale which may only be feasible through regional schemes (e.g. catalysed by SWIOFC or IOC), 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.<sup>119</sup> Fishers could introduce local rules to curtail gillnets in rocky areas where nets are frequently lost, as ghost fishing impacts on all fishers.

<sup>115</sup> Article 54, Loi-cadre N° 94-018 relative à l'environnement. See also: Loi N°11-001/AU portant code de la santé publique.

<sup>116</sup> Law 17/011/AU of 2017 banning plastic bags.

<sup>117</sup> 67% of people interviews on Anjouan reported that they dumped rubbish within 200m of their house.

<sup>118</sup> 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.

<sup>119</sup> 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>.

There are a range of guidelines available to prevent marine debris from fishing vessels. Workshops have been held, but it is unclear to what extent best practices are implemented in Comoros, or regionally. A 2019 African regional workshop indicated a low level of awareness on the scale of lost or abandoned gear and nature of appropriate solutions.<sup>120</sup>

Reduction of MPP from foreign fishing vessels requires a regional approach, particularly as foreign vessels fishing in Comoros land catches elsewhere (e.g., Port Louis, Victoria, Diego Suarez) and do not make port calls to Comoros. This could start with resolutions by IOTC, SEAFO, 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 any future EU fisheries access agreement.

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. Abandoned GRP vessels present a growing plastic waste problem and are likely to degrade to marine microplastics if abandoned on beaches. Most countries have no provision for appropriate disposal of GRP vessels. Rules for their 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.

#### 4.2.4 Shipping and tourism

Ensuring that Comoros 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.<sup>121</sup> Possible dialogues with IMO and regional port authorities could ensure coordinated measures to prevent dumping of waste by other shipping in the Northern Mozambique Channel and to foster codes of conduct for regional shipping lines.<sup>122</sup> MARPOL Annex V also applies to the disposal of garbage from fixed or floating platforms engaged in the exploration or exploitation of seabed oil and gas and should be stipulated in the relevant authorisations.

Tourism is not considered a significant driver of MPP and may provide an incentive to maintain the cleanliness of beaches and waterfronts.

<sup>120</sup> 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>.

<sup>121</sup> A wide range of IMO guidelines are available: Prevention of Pollution by Garbage from Ships <https://www.imo.org/en/OurWork/Environment/Pages/Garbage-Default.aspx>; Resolution MEPC.220(63) Guidelines for the Development of Garbage Management Plans; 2017 Guidelines for the implementation of MARPOL Annex V. <https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.1-Circ.834-Rev.1.pdf>; IMO, 2018. Consolidated guidance for port reception facility providers and users. <https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.1-Circ.834-Rev.1.pdf>.

<sup>122</sup> 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 Comoros may not currently receive cruise ships, the commitment on phasing out of SUPs is of interest).

#### 4.2.5 Awareness of MPP

There is an awareness of MPP in Comoros as evidenced by the Comoros ratification of the Nairobi Convention's LBSA Protocol, ratification of MARPOL Annex V, and national legislation on plastic bags. A number of awareness programmes have taken place, or are part of environmental sustainability projects (Figure 19).<sup>123</sup> A range of approaches to raising awareness is detailed in the main AIODIS report.

Almost 90 percent of persons surveyed on Anjouan considered that beach pollution posed a problem.<sup>124</sup> Bad smell, mosquitos, risk of injury and reducing the attractiveness of the beach were cited as the main impacts. After sand extraction, dumping of wastes is seen as the most important cause of beach degradation by 36 percent of coastal villagers and by 14 percent of fishers interviewed. On Anjouan, there is a pernicious link between extraction of beach sand and dumping of waste in the littoral area. Because sand extraction contributes to erosion and collapse of sea walls, dumping of rubbish in the sand pits is seen as necessary to stop erosion. In some cases, there is a demand for more sea walls rather than the politically more difficult prevention of sand extraction and waste dumping.

In 2013, a stakeholder survey indicated the origin of marine debris on the beaches was attributable as follows: households 36 percent; commerce 30 percent; other industries (agriculture, fishing) 31 percent; and also mentioned tourism and shipping (1 percent each). The survey noted a belief that the littoral zone was generally the only area available for dumping as there was little or no 'public land'.

**Figure 19. Awareness activities and related projects**



<sup>123</sup> <https://www.gcca.eu/videos/beach-clean-2019-gcca-comoros-plastic-bags>; L'Alliance Mondiale contre le Changement Climatique (AMCC) <https://amcc-comores.info/pdf/la-pollution-plastique/>.

<sup>124</sup> Sinane, 2013.

In the case of Comoros, 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 'valorisation' of waste streams.<sup>125</sup> In 2020, it was indicated that an awareness campaign on urban 'cleanliness' would be launched.<sup>126</sup> In addition to public awareness campaigns, awareness activities can build on the work of environmental NGOs by focusing on: raising community pride in cleanliness; establishing more formal relationships between waste buyers and informal waste-pickers; supporting SMEs that can foster innovation that adds value to waste; and on the development of materials for school curricula. Campaigns can also focus on voluntary actions and procurement policies, e.g.: elimination of SUPs 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.<sup>127</sup>

#### 4.2.6 Possible regional initiatives

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

- preparation of a joint strategic plan on MPP under the Nairobi Convention
- a COP resolution on monitoring and reporting on MPP and marine microplastic pollution as part of the implementing arrangements for the Nairobi LBSA Protocol
- preparation of a funding submission by the Nairobi Convention secretariat 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 the regional projects supported by the IOC and Cap Business (e.g. in relation to recycling of PET bottles).

In conjunction with other countries, Comoros could also consider initiating a dialogue in the regional economic commissions (COMESA, SADC) on trade issues related to MPP and plastic waste management in general. In particular, regional arrangements on trade in plastic waste (and other recyclable 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 fishing nets, 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.

<sup>125</sup> World Bank, 2019. Country Economic Memorandum: Background Note 6. Stock take on business environment reform in São Tomé and Príncipe.

<sup>126</sup> "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>.

<sup>127</sup> Mohamed, Naïda, 2015. Les activités génératrices de revenus basées sur le recyclage des déchets dégradables, métalliques, plastiques et en verre aux Comores. Plan de gestion durable des déchets dans la région de Domoni, Anjouan, Comores; Chevalley, Isabelle., 2011. Recyclage et valorisation des déchets de la Grande Comore. Terre e Faune. Coastal clean-ups: Plongeurs du Monde, Parc National de Mohéli aux Comores, 2019. Work by youth groups, e.g., Mitsamihouli. Maire de Fomboni awareness: <https://www.youtube.com/watch?v=tR4d4tsNqyI>. Employment from waste management : Banda Bitsi. Transforme la pollution marine en opportunité d'emplois durable et pérenne. Comores Zéro Déchets 2023.

At the level of AIODIS and Africa, Comoros 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).

#### 4.2.7 Resources

Comoros' fiscal revenue is less than half of the SSA average (8.3 percent versus 17.7 percent of GDP in 2018) and the management of public finances is complicated by budget overruns, reallocations inter-island allocation issues and a high public service wage bill that crowds out other priority spending.<sup>128</sup> Until its inclusion in the *Conférence des Partenaires au Développement des Comores* (2019) portfolio,<sup>129</sup> solid waste management does not appear to have had a high priority in the national development agenda, or those of the development partners and the problem has been 'dissipated' by other challenges, such as water, sanitation and health.

As solid waste management is now included in the 'portfolio' of development proposals, opportunities are likely to arise to include catalytic actions to combat MPP and solid waste management into projects and any initiatives that target the several related SDGs (Figure 20). 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 relationship of MPP and solid waste management to the SDGs is illustrated in Figure 20.

In the absence of major funds for infrastructure investment, lower-cost interventions, including awareness raising and use of incentives to consumer and household behaviour on waste management could be targeted. Catalytic 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 experiences in organising informal waste-pickers to sort, collect, reuse, or recycle wastes generated by households, commercial establishments, hospitals, markets and other producers of wastes.<sup>130</sup> Further studies could be prepared possibly as part of university theses, but organised in such a way as to target gaps in understanding of waste management, to identify options for waste valuation or for production of local products to substitute imported plastics.<sup>131</sup>

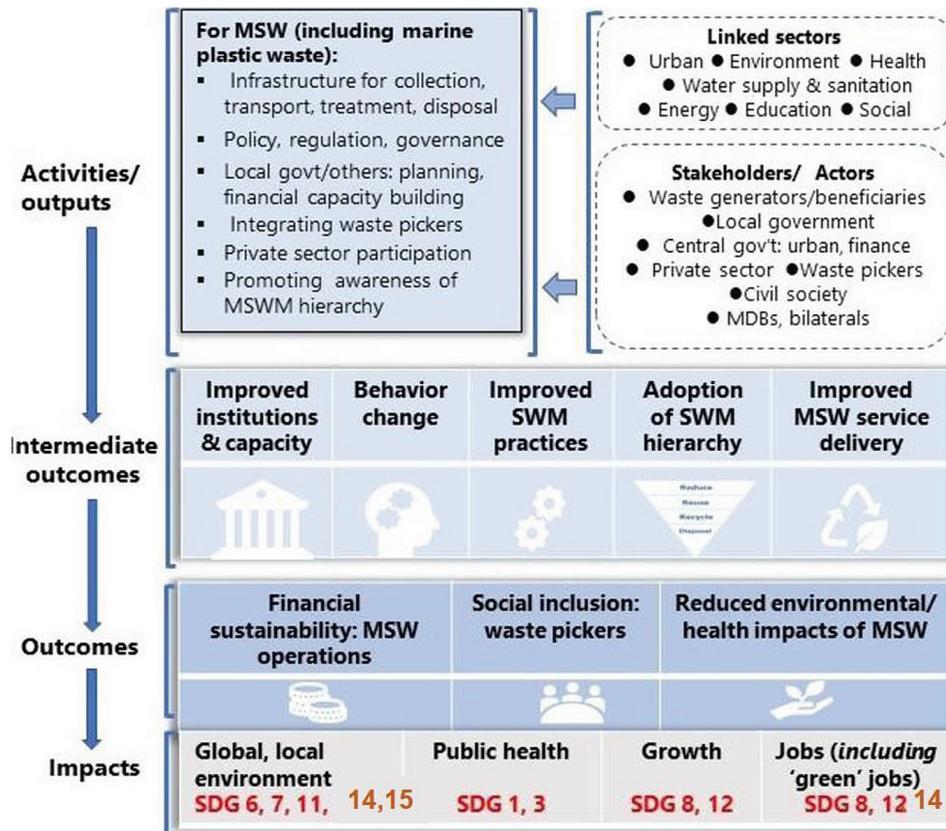
128 IMF, 2020.

129 Fiche : *Projet de Gestion Intégrée des Déchets en Union des Comores*.

130 *Informal Economy Monitoring Study (IEMS). Pune's Waste Pickers: Realities & Recommendations*.

131 *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/>

**Figure 20. 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.

The main project report provides greater detail and discussion of option for recycling of plastic waste. Reference can also be made to companion reports on the circular economy.