# Position paper of sectoral department

# Marine Litter

## The Background

This paper presents GIZ`s approach to reducing marine litter. The focus is on interactions between waste management and marine biodiversity. We look at waste streams from their source to their entry into marine ecosystems (source-to-sea approach).

Marine litter, according to UNEP[1], comprises solid waste streams, including in particular (macro)plastics (60-80 %)[2], but also other solid waste materials. Marine pollution caused by the entry of fluids (e. g. oil), sediments, or their chemical constituents are not covered in this paper. Overall, about 80 % of marine litter comes from land-based sources, with 20 % attributable to maritime-based sources (fisheries, shipping, especially container ships, raw material industries, and others).[3] Quantity data on marine litter input vary considerably. Estimates assume 11 million tons in 2016.[4]

Although developing and emerging countries usually produce less waste per capita, in these countries most of marine litter is discharged into the oceans due to inadequate waste management. The packaging industry is the largest plastics-producing sector (36 %), whose contribution has continued to grow in the short term due to COVID 19 (increased hygiene and disposable demand). In the long term, packaging quantities are expected to quadruple from 78 million tons in 2013 to 318 million tons in 2050.[5] Most solid marine debris decompose very slowly. They are found floating on the ocean surface (15 %), in the water column (15 %) and on the ocean floor (70 %).[6]

Marine litter is a global problem that is recognized by the public and in international environmental policy. This has also raised waste management from a local to a global level. The top priority is to stop further plastic waste discharges as quickly as possible. The urgent need to find solutions to reduce marine litter is emphasized by a wide range of international agreements, strategies, and commitments, such as

- BMZ 10-point action plan: Marine conservation and sustainable fisheries (BMZ 10 Punkte Aktionsplan: Meeresschutz und nachhaltige Fischerei);
- BMZ Action Program on Circular Economy (BMZ Aktionsprogramm Kreislaufwirtschaft);
- BMU 5-point plan for less plastic and more recycling (BMU 5-Punkte-Plan für weniger Plastik und mehr Recycling); der G7 Action Plan to Combat Marine Litter;
- G20 Action Plan on Marine Litter;
- EU Marine Strategy Framework Directive; Convention on Biological Diversity (CBD);
- UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA);
- UNEA Resolutions on Marine Litter;
- Agenda 2030 - SDG 14, Target 14.1.

Marine litter causes species loss in coastal and marine ecosystems due to mortality and other non-lethal effects (entanglement and trapping). Damage and structural changes to seafloor communities and coral reefs are mostly due to abandoned fishing gear such as fishing nets.[7] These also create transport routes, allowing harmful pathogens to enter the human food web and invasive species to spread.

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Accumulation of waste can prevent the gas exchange between the water column and the pore water of the sediment. As a result, oxygen content in the sediment is reduced that can have a negative impact on ecosystem functioning and may suffocate benthic organisms; in addition, it can change the composition of seabed biota[8] and cause physical damage to benthic living environments.[9]

Research on quantifying the impacts of marine litter has so far focused on the species level. Of the more than 1,400 marine and coastal species examined[10], 210 are on the IUCN Red List.

Since 70 % of marine litter lie on the seabed[11], its impacts and consequences on biodiversity and ecosystem services are not only global and transboundary, but also three-dimensional, i. e. from the surface, through the water column to the seafloor. At the same time, litter accumulated on the seabed is inaccessible to any kind of cleaning.

## Our position

*GIZ's work to reduce marine litter is guided by the concept of recycling management, which combines waste management with sustainable consumption and production, while at the same time taking into account urgent ecosystem requirements. It therefore requires an integrated approach with sector-wide long-term, as well as localized short-term solutions.*

■ **Our goal is to prevent losses of marine biodiversity and ecosystem benefits;** including avoiding plastic entering the food chain and preserving tourism potential. This may also require implementation of short-term measures (e. g. retention of marine litter, local cleanup) complementary to long-term sustainable measures in waste management and in the consumption and production sector.

■ **Both land-based and sea-based sources of entry must be considered in the analysis of marine litter.** We design our measures according to the relevance of the various sources in the respective partner region.

■ **We are guided by the principle of the waste hierarchy: avoid, recycle, dispose of.** In the context of a recycling management approach, the life cycle of materials must be taken into account. Whenever possible, priority is given to waste avoidance and recycling over energy (re) production. This also reduces the generation of greenhouse gases and thus contributes to climate protection.

■ **The entry of waste into the oceans must be prevented as early as possible.** This is because waste prevention is more effective than waste collection; waste collection on land is more effective than retention in canals, streams, and mangroves; retention on the coast is more effective than cleansing in the sea; clean-up near the coast is often still possible, while waste on the seabed is usually out of reach.

■ **The principle of ecosystem resilience guides our actions.** Healthy and thus resilient marine and coastal ecosystems have buffers to maintain important functions despite negative impacts from marine litter pollution.

■ **Biotechnical solutions for the reduction of marine litter are still at the research stage and therefore cannot yet be implemented in our work.** The decomposition of plastics holds potential, e. g. via biofilms on the surface of plastics and via benthic suspension.

■ **We do not currently promote the use of "biodegradable plastic or packaging material" in our projects.** The use of organic-based materials does not only offer advantages, even if they are produced sustainably and do not displace food production. This is because the substances do not decompose quickly enough either in the environment or in standard composting facilities, but if they reach recycling plants, they can significantly impair the processes there. We are monitoring the assessments that the EU Commission will develop on organic-based materials in 2021.

■ **Chemical recycling processes, including pyrolysis, are not yet at the level of development required for technology transfer to developing countries.** We continuously monitor these and other new technology developments and evaluate them with regard to their ecological impact, cost-effectiveness, operational requirements and suitability for our work in developing and emerging countries.

■ **We see the expansion of international cooperation and the further development of international agreements - such as the UN Convention against Marine Litter and Plastic Pollution planned for February 2022 - as a necessary contribution to reducing marine litter globally.** Efforts in individual cities and

countries require a global framework, which is negotiated within the UN Environment Assembly, the Basel Convention, the Convention on Biological Diversity, G7/G20 and other global and regional forums. We support the exchange between our Federal Government, the EU and partner countries on this issue.

## Our recommended actions

**We know from our marine litter projects that using models to analyse and quantify waste flows generates political goodwill among decision makers and supports participatory identification of actions.** In its projects, GIZ uses the Waste Flow Diagram (WFD), a tool for recording waste flows and plastic entry into the (aquatic) environment within a municipality. The WFD provides concrete information for operational decisions and priority improvement actions. We also use it to create baselines, develop scenarios for the effectiveness of interventions, monitor and benchmark municipalities. In addition, we maintain an exchange of experience on the application of a variety of models in order to further develop them and make them useful for policy advice.

*Beyond the municipal level, we work in our marine litter projects at national level as well as in cross-border approaches. Depending on the extent of threats to marine ecosystems, the political will for long-term transformative changes in the waste sector and to address concrete waste management deficits, we develop an integrated project approach from the instruments presented below.*

■ **We promote waste prevention and minimization as the most sustainable and long-term cost-effective approaches to reducing marine litter.** This includes measures in the area of product design aimed at efficient use of raw materials, reuse and recyclability. This can be achieved by (a) switching from single-use plastic to reusable alternatives and recyclable packaging, (b) reducing the proportion of plastic, especially in packaging, and (c) by substituting plastics with natural materials. We support our partners in developing the economic incentives and regulatory instruments needed to achieve this, e. g. product standards or public procurement. Strategies and guidelines of the EU and the German government (e. g. the EU Plastic Strategy and Single-Use Plastic Regulation) are guiding our work. We also encourage far-reaching changes in consumption and production patterns along the value chains with our partners, suporting new business models and product innovations. In the fisheries sector, we promote the use of biodegradable fishing gear.

■ **Raising awareness among the general public is an important pillar in our projects.** Together with partners from civil society, municipalities and schools, we pass on knowledge about the negative effects of (marine) litter on people and the environment, as well as alternative courses of action. The aim is to change the behaviour of polluters (e. g. illegal disposal and dumping of waste) and consumers. Buying behaviour affects the entire supply chain, including retail and distribution strategies For effective and sustainable urban waste management, households have a special responsibility in the sorting of waste. Measuring behaviour change and its contribution to marine litter reduction is complex and requires collaboration with partners from the research community and the private sector.

■ **We advise our partners on how to reduce marine litter through recycling.** Prerequisites for this are intelligent product and packaging designs, appropriate waste collection and separation systems, and regulatory and economic instruments to increase recycling rates (e. g. binding quotas, tax benefits, greater producer responsibility). We support the recycling industry in improving and expanding its processes. The safety of recycled materials for health and the environment must be ensured. Encouraging capacity building for energy (re)generation from co-incineration of waste, e. g. in cement production, are options for non-recyclable waste. (s. Waste to Energy).

■ **As the most effective lever for reducing marine litter in developing countries, we recommend the expansion of integrated sustainable waste management.** We support our partners with capacity-building measures to create essential framework conditions. This includes a legal and strategic framework (national waste strategies, master plans, marine litter action plans, national plastic action partnerships (NPAPs)), adequate technical systems, and qualified waste companies and government institutions. To develop innovative, locally adapted solutions, we use funding competitions, support economic incentives such as plastic credits or deposit systems, and work in collaboration with civil society and in development partnerships with the industry. In many countries, the informal sector plays a significant role in the collection, separation, and recycling of reusable materials. We support our partners in integrating the informal sector into waste management in a way that improves both working conditions and health protection.

We advise our partners in accordance with the Basel Convention on illegal or incorrectly declared waste imports that overburden local waste management systems. For non-recyclable residual materials, we support the establishment of orderly disposal sites or the rehabilitation of existing landfills, including protective measures to prevent waste from entering aquatic environments.

■ **We support our partners in the collecting and recycling of fishing gear and ship-generated waste.** For waste management on ships, we support the establishment of adequate registration and acceptance procedures in ports as well as associated recycling and recovery systems. Thus we contribute to the implementation of international agreements and guidelines such as the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78, Annex V, updated 2012), the 1995 FAO Code of Conduct for Responsible Fisheries, and the FAO Voluntary Guidelines for the labelling of fisheries equipment. Port state controls, as established by the FAO Port State Measures Agreement (PSMA), are important to prevent illegal, unreported, and unregulated (IUU) fishing that results in abandoned, lost, and discarded fishing gear (ALDFG). We also support the collection and recycling of these fishing tools.

■ **We advise our partners on financing and cooperation with manufacturers from the private sector.** We advise our partners on financing improved waste management, e. g., through waste fees, product levies, feed-in tariffs to the power grid for energy generated from waste, infrastructure loans and grants, earmarked taxes and subsidies. The decisive factors here are framework conditions such as laws and regulations on waste charges, financial autonomy of municipalities or support funds for private waste companies. Since waste management is underfunded in the main input countries for marine litter, synergies with other local and global goals (especially climate protection) can also decisively strengthen the argument in favour of necessary capital and operational expenditure. The guiding principle for the financing of the waste management sector is the polluter-pays principle, on which extended producer responsibility (EPR) systems are also founded. We advise our partners on the development of EPR systems for packaging and support the dialogue between public institutions and the private sector as well as the exchange of knowledge with stakeholders of existing and emerging EPR systems in the EU, Africa, Asia and Latin America. We follow international guidance and directives such as the OECD Guidance on EPR (2016), the revised Basel Convention Manual of Practice on EPR (2019), and EU directives (Waste Framework Directive (Art. 3, 8, 8a); Packaging Directive (Art. 7)). One of the practical implementation tools we use is the EPR Toolbox from the PREVENT Waste Alliance.

■ **We support effective multi-actor coordination to negotiate different interests and needs.** Planning processes such as integrated coastal area management, marine land use planning, stewardship approaches, industrial zone management, and others contribute to the development and implementation of improved waste management solutions through awareness, transparency, and engagement of all stakeholders. Successes include the designation of low-risk (e. g., flood-protected) sites for safe waste disposal or the explicit reduction and control of waste discharges for sustainable management of marine protected areas (see Mediterranean Action Plan (MAP), part of the Barcelona Convention). As part of the Source-to-Sea Framework of the Stockholm International Water Institute (SIWI), - together with other stakeholders - we are developing circular economy-based interventions to reduce marine debris discharge with stakeholders in both upstream and downstream river basins. We also support transboundary cooperation to reduce marine litter pollution, e.g. in advising river basin organizations.

■ **We support our partners in retention and clean-up measures as immediately effective options to prevent coastal and marine ecosystem loss.** They are tailored to specific needs, and usually only have a local and temporary effect. They do not replace a long-term and sustainable recycling management approach, but they promote it by raising awareness. We support our partners in retention and clean-up efforts when ecosystems are acutely threatened. Technical measures include the installation of debris rakes and other retention devices in irrigation and wastewater canals. Coastal woodlands, especially mangroves can retain marine debris as part of an ecosystem approach and make collection and return possible. Even in the sea itself, collection campaigns by fishermen, divers or technical measures can relieve ecosystems locally. Buyback programs and subsidies for fisheries ALDFG and other debris promote effective marine waste management.

## Innovations

■ **Avoidance of single-use plastic in food deliveries and takeaways**

In Thailand, Indonesia and other countries in Southeast Asia, as well as in China, we are supporting multi-stakeholder dialogues, pilot projects and awareness raising to avoid single-use plastic in the food to-go sector, which has been growing considerably in the wake of the COVID-19 pandemic. With restaurants and takeaways, online platforms, transportation service providers and public institutions, we are developing joint approaches and start-up models to this end. The focus is on the promotion of reusable food containers, cups, cutlery and bags via return and deposit systems. (https://beatplastic-pollution.eu/rethinking-plastics/, CAP-SEA Projekt).

■ **Innovative/ alternative financing models for waste projects**
The PREVENT Waste Alliance finances the piloting of demonstration projects by various project teams in 15 countries Among other things, the establishment of 'plastic loans' as an alternative financing option for waste services is being promoted. They are an innovative market mechanism to create a sustainable source of income for low-income groups working in waste collection, recovery and recycling of plastic litter. The collaboration partners develop scientific benchmarks and complementary process standards to the Circular Action Hub. In collaboration with Plastic Bank and cirplus, the use of digital marketplaces and blockchain applications is being piloted. (https://prevent-waste.net/pilotprojects/).

## Cooperation partners

■ **PREVENT Waste Alliance and its members (e. g. Plastic Bank, German ReTech Partnership, 3R Initiative, BVRio, Help, WWF):** As the secretariat of the alliance, GIZ promotes the exchange of solution strategies and the piloting of innovative demonstration projects. . The focus is on plastic waste and e-waste as well as on improving framework conditions.
■ **Basel Convention Plastic Waste Partnership:** In support of the BMZ, GIZ makes thematic contributions and provides experience to the exchange of the international partnership.
■ **Source to Sea Platform:** In cooperation with the platform, GIZ has commissioned SIWI to develop a source-to-sea concept for plastic waste, which is currently being tested in two countries.
■ **ISWA Task Force, Uni Leeds, EAWAG und WasteAware:** In coordination with approaches of the ISWA task force, the partner organizations have developed the Waste Flow Diagram/ Plastic Waste Leakage tool and supported its implementation.
■ **AEPW:** GIZ is a strategic partner of the Alliance to End Plastic Waste (AEPW), a non-profit organization of multinational private companies along the plastic value chain committed to combating plastic pollution. GIZ implements projects on behalf of AEPW through International Services.
■ **Global Partnership on Marine Litter (GPML):** In the context of GPA, UNEP has set up the GPML; a multi-actor partnership that promotes the exchange of knowledge. GIZ is a member.
■ **World Bank:** GIZ cooperates with the World Bank on BMZ funding for the PROBLUE multi-donor fund and coordinates with the World Bank on marine litter measures in Asia.
■ **Association of Southeast Asian Nations (ASEAN):** GIZ is working with the ASEAN Secretariat and working groups to support regional solutions for marine litter prevention in Southeast Asia.
■ **Stop Illegal Fishing (SIF):** In the global project Sustainable Fisheries and Aquaculture, GIZ supports the African organization Stop Illegal Fishing (SIF), which, in cooperation with FAO, carries out training measures in individual countries that contribute to the implementation of the Port State Measures Agreement, PSMA.
■ **Partnerships in Environmental Management for the Seas of East Asia (PEMSEA):** GIZ and PEMSEA are jointly supporting the waste management of ships in a Port of the Philippines.
■ **International Union for Conservation of Nature (IUCN):** For example, GIZ and IUCN jointly support the collection and recycling of plastic waste on an isle in Thailand.
■ **Local non-government organizations (NGOs) in partner countries:** GIZ is cooperating with NGOs such as Indonesian Plastic Bag Diet Movement and BINTARI Foundation in Indonesia as well as Philippine Centre for Environmental Protection and Sustainable Development, Philippine Rainforest and Conservation Foundation and Mother Earth Foundation in the Philippines.

# Literatur


[1]United Nations Environment Programme and National Ocean and Atmospheric Administration (2011). The Honolulu Strategy. A global framework for prevention and management of marine debris.
[2]Barnes, David K. A. et al. (2009). Accumulation and fragmentation of plastic debris in global environments. Philosophical transactions of the Royal Society (2009) 00, 1-14.
[3]STAP (2011). Marine Debris as a Global Environmental Problem: Introducing a solutions-based framework focused on plastic. A STAP Information Document. Global Environment Facility, Washington, DC.
[4]Lau et al. (2020). Evaluating scenarios toward zero plastic pollution. Science Vol 369, pp. 1455-1461.
[5]World Economic Forum (2016). The New Plastics Economy. Rethinking the future of plastics.
[6]International Maritime Organization. Marine Litter. https://www.imo.org/en/MediaCentre/HotTopics/Pages/marinelitter-default.aspx. (without date, downloaded: 03.02.2021)
[7]Macfadyen et al. (2009). Abandoned, lost or discarded fishing gear. UNEP Regional Seas Reports and Studies, No. 185; FAO Fisheries and Aquaculture Technical Paper, No. 523. Rome, UNEP/FAO. 2009.
[8]Derraik, José G.B. (2002). The pollution of the marine environment by plastic debris: a review. Marine Pollution Bulletin 44 (2002) 842-852.
[9]Sheavly, S.B., Register, K.M. (2007) Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions. Journal of Polymers and the Environment 15 (2007) 301-305.
[10]Fossi, M. C., Pedà, C., Compa, M., Tsangaris, C., Alomar, C., Claro, F., et al. (2018). Bioindicators for monitoring marine litter ingestion and its impacts on Mediterranean biodiversity. Environ. Pollut. 237, 1023–1040. doi: 10.1016/j.envpol.2017.11.019
[11]International Maritime Organization (ohne Datum).

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