

MARINE LITTER – STATE OF THE ART

Still lacking a global ocean governance framework to manage the globe's oceans, with 60% of them outside national jurisdiction borders, a shared international responsibility is vital. Under the overarching UN Convention on the Law of the Sea, a plethora of jurisdictional rights, institutions, and specific frameworks have been set up to try managing the way humans use these waters.

The remarkable upsurge in environmental awareness of the last twenty years has culminated in 2015 to agree for Sustainable Development Agenda with the adoption of 17 Goals (SDGs) to achieve by 2030. **SDG 14, LIFE UNDER WATER**, addresses marine pollution, providing the opportunity to realign and strengthen national efforts to achieve economic prosperity in a more environmental manner respecting the natural milieu.

The framework of international law comprises a complex network of international and regional agreements, intergovernmental and civil society organisations, and economic market-based drivers.

The **London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter**, signed in 1972, and the 1996 **Protocol to the Convention (London Protocol)**¹ cover the control of dumping of wastes at sea, being the Protocol more restrictive.

Another essential international framework governing the use and development of the oceans is the United Nations **Convention on the Law of the Sea (UNCLOS)**, 1982. In the said framework, parties have agreed to take all measures needed to prevent, reduce and control pollution of the marine environment from any source.

The **Food and Agricultural Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries**, adopted in 1995, addresses not only pollution, but also, lost or abandoned gear and disposal systems in harbours.

The UN **Global Programme of Action (GPA)** for the Protection of the Marine Environment from Land-Based Activities,² the **International Maritime Organization (IMO)**, the **Basel Convention**³ and the **Honolulu Strategy (2011)**⁴ are other extremely important frameworks.

¹ The London Protocol fixes the “**precautionary approach**” (appropriate preventative measures are to be taken when there is reason to believe that wastes or other items leaking to the marine environment can cause harm – even in the absence of conclusive causal evidence), and the **Polluter Pays Principle** (the polluter bears the cost of pollution). It stresses that Contracting Parties should ensure that waste/pollution is not being transferred from one part of the environment to another.

² Adopted in 1995 by more than 100 countries, and administered by UN Environment (UNEP), the GPA addresses the impact of land-based activities on coastal and marine environments. It is designed to assist states in taking action within their respective policies to prevent, reduce and control the ruin of marine environment.

³ **The Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal** (Basel Convention) 1989/1992 aims to protect human health and the environment minimizing hazardous waste production, addressing the issue through an “integrated life-cycle approach,” calling strong controls from the generation of hazardous waste to its storage, transport, treatment, reuse, recycling, recovery and final disposal.

⁴ **HONOLULU STRATEGIES TO PREVENT & REDUCE THE IMPACTS OF MARINE DEBRIS**

Goal A: Reduce land-based sources of marine debris

1. Conduct education & outreach on marine debris impacts and improve SWM
2. Employ market-based tools to support SWM, in particular waste minimization
3. Employ infrastructure and implement best practices for improving storm water management and reducing discharge of solid waste into waterways
4. Develop, strengthen and enact rules and policies to support solid waste prevention, minimization and management
5. Improve regulatory framework for storm water, sewer systems and debris in waterways
6. Monitor and enforce regulations on litter, dumping, SWM, storm water, and surface runoff

But the main International treaty to govern the prevention of marine pollution from ships is **MARPOL** with its six annexes. Annex V is particularly important, because it prohibits ocean garbage dumping from ships, compelling ports to provide reception facilities.

These Global policy frameworks that address marine pollution are extremely comprehensive. They outline governments' obligations and commitments while offering plans for integrated solutions to marine litter.

Strictly observing the SDGs, Central and State Governments should govern marine resources based on the welfare of the whole community targeting intergenerational equity. Policies should be aligned with them to efficiently meet **international and intergenerational** duties, namely:

- Improving existing structures, policies and regulations to effectively align with international directives and commitments
- Integrating marine pollution prevention and control strategies into wider planning frameworks
- Raising public awareness about the importance of marine ecosystems to prompt behavioural change
- Strengthening multi-sectorial mechanisms and partnerships to address marine pollution
- Prioritizing and rising funding for marine pollution prevention and control

INCEPTIONS

The knowledge about the exact types of marine debris to be targeted by the regulations would allow creating the array of policy instruments relevant to marine litter. As we don't have data on it, the array has to be still more comprehensive.

Then, Marine Litter presents quite a challenge in terms of target setting.

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7. Conduct regular clean-ups of solid waste on coastal lands, in watersheds, and in waterways —especially at hot spots of marine debris

Goal B: Reduce sea-based sources of marine debris (including solid waste, lost cargo, ALDFG and abandoned vessels)

1. Conduct ocean-user education and outreach on marine debris impacts, prevention, and management
2. Develop incentives and markets to strengthen implementation of waste minimization and proper waste storage at sea, and of disposal at port reception facilities
3. Implement industry best management practices (BMP) designed to minimize abandonment of vessels and loss of cargo, solid waste, and gear at sea
4. Develop and promote use of fishing gear modifications or alternative technologies
5. Develop and implement legislation & policies to prevent and manage marine debris from-sea sources, in line with MARPOL Annex V, and other relevant international instruments
6. Monitor and enforce national and local legislation, and compliance with MARPOL Annex V and other relevant international instruments

Goal C. Reduce accumulated marine debris on shorelines, benthic habitats & pelagic waters

1. Conduct education and outreach on marine debris impacts and removal
2. Develop and promote use of technologies and methods to effectively locate and remove marine debris hotspots
3. Build capacity to co-manage marine debris removal response
4. Implement incentives for removal of ALDFG and other accretions of marine debris at sea
5. Establish appropriate local, regional and national mechanisms for removal of marine debris
6. Remove marine debris from shorelines, benthic habitats and pelagic water

At first place there is a need for better implementation of existing legislation on the disposal of litter from inland and at sea, namely, Solid Waste Management Rules, 2016 and Plastic Waste Management Rules, 2016 and the MARPOL.

Secondly, we have to know which existing rules from Central/ State legal frameworks should be amended, better enforced or better implemented to safeguard a significant drop of waste (solid and liquid) entering the ocean.

Thirdly, which new rules are required to fill gaps in the body of regulations in order to end the entrance of litter to the ocean from Indian sources.

Actually, to draw a marine trash policy we need to zoom in to its full cluster and

1. to assess the possible relevance of each piece of legislation to marine litter, identifying specific types of debris that could be affected by different set of rules, ensuring that measures are in place to address marine litter

2. to identify potential policy options to improve the performance of legislation to assist in reducing the amount of marine litter. Government has to outline the steps to be taken by State or Central regulatory authorities **enforcing priority measures**, here itemised at point **A**. After identifying gaps in current legislation and infrastructure (e.g. point **B.1.**) a comprehensive body of rules is to be offered

ANNEXURES

1. NATIONAL GOVERNMENT MINISTRIES, DEPARTMENTS, ORGANIZATIONS, NGOS AND CIVIC GROUPS

The following Government Ministries, Departments and Organizations should have the mandate to address marine pollution and protect any potential coastal environment related issues in general, though not specific to marine debris:

A. POLICYMAKING RESPONSIBLE BODIES

National Development Council is to secure the sustainability of development itself in the areas that affect the Ocean: Blue Economy, Circular Economy, Packaging, Solid, Liquid & Plastic Waste Management

Ministry of Environment, Forests and Climate Change through the **Central and State Pollution Control Boards** [protection of marine environment, management of coastal resources and implementation of legal frameworks]

Ministry of Agriculture & Fisheries (Development of fisheries, aquaculture, fish processing)

Ministry of Water Resources [prevent riverine littering]

Ministry of Defence (Indian Coast Guard – anti-pollution measures)

Ministry of Surface Transport (Ports, shipping, road side litter, etc.)

Ministry of Tourism [Tourism activities in coastal areas]

Ministry of Shipping and Ports [shipping waste, ports reception facilities, good practices]

Ministry of Economy [circular economy to minimize waste generation]

Ministry of External Affairs [International laws ratify, UNCLOS III negotiations]

Ministry of Earth Sciences [research on Marine Litter]

Ministry of Science and Technology [research on Marine Litter, Packaging design]

Ministry of Urban Development [urban waste]

Ministry of Human Resource Development [innovation in reducing waste]

Ministry of Culture [Ocean literacy and Good Practices for all]

Ministry of Commerce and Industry [Circular economy, EPR, IPP]

Ministry of Consumer Affairs, Food and Public Distribution [Packaging, EPR, IPP]

Ministry of Corporate Affairs [SDGs, Circular Economy, Innovation for Sustainability]

Ministry of Information and Broadcasting [Ocean literacy and Good Practices for all]

Ministry of Micro, Small and Medium Enterprises [SDGs Literacy, Innovation, Packaging]

Ministry of Panchayati Raj [riverine waste prevention, strict enforcement of SWM Rules]

Ministry of Road Transport and Highways [Road waste management]

Ministry of Rural Development [Solid, Plastic & Liquid Waste Management]

Ministry of Skill Development and Entrepreneurship [SDGs Literacy, Innovation]

Ministry of Youth Affairs and Sports [SDGs and Ocean Literacy]

Ministry of Communications [SDGs, Ocean Literacy Good Practices for all]

Ministry of Food Processing Industries [Packaging, EPR, IPP]

Ministry of Shipping [surveillance for enforcement of MARPOL]

Ministry of Animal Husbandry, Dairying and Fisheries [Amend all Fisheries Rules]

Ministry of Finance [environmental taxes and fiscal benefits]

B. COASTAL STATE GOVERNMENTS

Indian Coast Guard

Indian Navy

Coastal District Administration and Municipalities/Panchayats of coastal cities/towns

Central Pollution Control Board
 Department of Town Planning
 Department of Fisheries
 Department of Ocean Development
 Department of Environment & Forests
 Central Wetlands Regulatory Authority
 State Maritime Board
 State Pollution Control Board

2. INDIAN LEGAL FRAMES THAT SHOULD MEET FOR MARINE LITTER POLICY

notifying Amendments related to marine litter

- The Merchant Shipping Act
- The Wild Life (Protection) Act
- The Environment (Protection) Act
- The Maritime Zones of India Act
- The Coast Guard Act
- The Marine Products Export Development Authority (MPEDA)
- The Territorial Sea, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Acts
- Ocean Policy⁵
- The Coastal Regulation Zone (CRZ)
- Biological Diversity Act
- The Marine Fishing Policy⁶
- The Coastal Aquaculture Authority Act
- Marine Fisheries (Regulation and Management) Bill

⁵ **OCEAN POLICY, 1982**

The Policy Statement highlights the following:

- * Need to map living resources, prepare an inventory of commercially exploitable fauna and to map and assess the availability of mineral resources from the deep sea.
- * Optimum utilisation of living resources and seaweeds, exploitation of non living resources such as hydrocarbons and heavy placer deposits, harnessing of renewable resources of ocean energy from the waves, temperature difference in water column.
- * Technological advances geared to the utilisation and preservation of the marine environment.
- * Research and development in basic ocean sciences.
- * Development of indigenous technology and setting up of infrastructure facilities and services to operate large sized fishing vessels.
- * Development of technologies relating to instrumentation, diving systems, position fixing, materials development, oceanic data collecting devices, submersible etc.
- * Broadening and strengthening of available infrastructure facilities.
- * Establishment of a centralised data system with appropriate mechanism for collection, collation and dissemination of ocean related information both from indigenous and foreign sources.
- * Training of skilled manpower and creation of self-reliant technological base.
- * Establishment of an integrated legal framework and commitment for its enforcement.
- * Cooperation with both developed and developing countries

⁶ **THE MARINE FISHING POLICY, 2004**

7.4 The Coastal Regulation Zone notification would review the present zonation of areas keeping in view the topography of each region and ensure that any human activity in the high tide limit (HTL) which may cause degradation of the coastal environment would not be permitted.

- Indian Ports Bill, 2011
- Marine Fishing Regulation Acts (MFRA)
- Wetlands (Conservation and Management) Rules
- National Policy on Marine Fisheries⁷
- Marine Protected Areas
- All Waste Rules (Solid, Plastic, E-waste, Bio-medical, Construction & demolition, etc.)

In addition to the Amendment of all Fisheries related legal frameworks to align with the Code of Conduct for Responsible Fisheries (CCRF) and other National and International lawful instruments (in collaboration with Regional Fisheries Management Organization, National Fisheries Development Board, etc.) **other measures should be taken**, such as

- Licensing of all fishing (and recreational) boats
- Strict enforcement of legal instruments through the Vessel Monitoring System (VMS) and Remotely Operated Vehicle (ROV)
- Fiscal reforms and new policies for sustainable development⁸
- Integrated Coastal Management (ICM)
- Ban of destructive gears and trawler fleet⁹
- Boosting local communities for sustainable eco-friendly fishing procedures
- Implementation of **Suchitwa Sagaram** (CleanSea) in all Maritime States

⁷ NATIONAL POLICY ON MARINE FISHERIES, 2017

Marine Environment and Pollution

37. The Government will strengthen regulatory mechanisms to control pollutants to ensure that land and sea-based pollution are effectively controlled and the ecosystems monitored. Fishers will make all out efforts to ensure that fishing vessels do not contribute to marine pollution in any form by taking required measures into account, in their design and construction.

38. Government will consider placing adequate mechanisms to address these aspects while considering infrastructure developments on the coast.

39. The Government will consider a landscape- to- seascape approach where sound management of inland water resources will also ensure the health and well-being of the coastal eco-systems.

40.0 While promoting development of sustainable fisheries, the Government will place emphasis on maintenance of the ecological integrity of marine environment, so as to ensure that there are no adverse effects on the endangered, threatened or protected marine species. Mangroves, sea grass beds and coral reefs are integral part of the coastal marine eco-systems and provide a range of eco-system services, including habitation for many fish species and marine mammals. Such ecosystems will be protected from anthropogenic impacts.

⁸ A discussion may be opened on what tax rates or economic instruments will make affordable and viable the use of biodegradable nets, for instance.

⁹ The recommended solution is to stop using nylon nets and use cotton or hemp or coir to allow fishnets to decompose on the ocean floor.

1ST DRAFT FOR MARINE LITTER POLICY

PREAMBLE

Government wants to show leadership

We are called to leave a legacy of care for the most important resource on the planet – the Sea, that is exceedingly endangered now and the impacts and costs of inaction on Fisheries & Aquaculture, Shipping, Tourism, etc. become environmentally unbearable.

Taking up the UN concept, marine debris comprises any anthropogenic, manufactured or processed solid material, irrespective of its size, discarded, disposed of or abandoned in the environment, including all materials discarded into the sea, on the shore, or brought indirectly to the sea by rivers, sewage, storm water or winds.

The aim of this draft is to address the adverse impacts of litter on the marine and coastal environment through the identification of its sources, prevention, reduction and removal, namely

- to prevent marine litter from entering marine and coastal environments
- to reduce marine litter's environmental impact and costs

1. Sources and types of marine litter (land and sea based)

Regrettably data on the amounts, types and origins of marine litter in the Indian coast is inexistent or very limited and parochial.

Sea-Based sources of marine debris, include solid waste such as lost cargo, abandoned, lost, or otherwise discarded fishing gear (ALDFG), derelict vessels, aquaculture, merchant shipping, fishing vessels, recreational boating, military fleets.

Land-Based sources of marine debris include municipal waste, riverine dumping, waterways dumping, discharge of untreated individual, collective sewage, industrial facilities and particularly tourism.

2. Impacts of marine litter – ecological, sanitary, social, economic and health.

REGULATORY PRINCIPLES to be adopted by a MARINE LITTER DIRECTIVE

- **ecosystem approach**
- **precautionary and preventive stance**
- **best available clean & eco-friendly technology**
- **polluter pays principle**
- **PAYT scheme** (pay as you throw)
- **EPR** (Extended Producer Responsibility)
- **IPP** (Integrated Product Policy)

A. COASTAL REGULATED ZONES

1. LOCAL BODIES

Rules on Solid Waste Management are comprehensive, but, implementation and enforcement is lacking. A strict implementation at urban & rural levels of Waste Management Rules (Solid, Liquid, Plastic, E-Waste, Bio- Medical, Construction and demolition Debris, Hazardous, etc.) is mandatory.

a) It shall be the responsibility of the concerned **Municipal Body and Grama Panchayats** to ensure that the Solid Wastes are handled as per respective SWM rules and no untreated sewage is discharged on to the coast or coastal waters.

- Properly design, and compel, that on the banks of water bodies, the sewage of all

toilets/septic tanks is periodically shifted by suitably equipped vehicles.

- Establish a centralized common Faecal Sludge Treatment Plant (FSTP) for Local Bodies of villages and small towns where all the sewage produced from that zone will be collected by suitably equipped vehicles.
- b) Annual reports on implementation of these Rules in their respective jurisdiction for the previous financial year shall be submitted to the respective Executive Officer of Taluk Panchayat in case of all Grama Panchayats and to the Deputy Commissioners in case of all Urban Local Bodies within 30th April of every year.
- c) All Taluk Panchayats in turn shall submit the compiled annual reports to their respective CEOs of Zilla Panchayats within 31st May of every year. All CEOs of Zilla Panchayats and the Deputy Commissioners of the respective Districts shall submit the annual reports giving the compiled status of implementation of these Rules to the Director, Municipal Administration or Secretary, Rural Development Ministry, with a copy marked to the regulatory bodies like State Pollution Control Boards within 30th June of every year.
- d) All state Pollution Control Boards/Pollution Control Committees shall submit the compiled annual reports of the state of the previous financial year to the Central Pollution Control Boards within 31st July of every year
- e) MLAs will submit yearly an Action Plan dressed by Panchayat Raj Engineers, to block, in all possible ways, leakage of litter from waterways, water bodies, rivers, envisioning the most efficient ways to capture debris before their reaching the sea

2. TOURISM DEPARTMENT¹⁰

will tackle waste produced by tourism and recreation in coastal areas

- a) It shall be the responsibility of the concerned **Tourism Department** to ensure the compliance with the Waste Rules by all registered and non-registered Tourism service providers, as well as ensuring that no untreated sewage is discharged on to the coast or to the coastal waters by way of tourism.
- b) Old licence will be cancelled and no new licence be given for a period of 5 years, if the operators do not show evidence of provisions to strictly manage all solid and liquid waste (sewerage included) from the visitors, guests, hosts, lodgers.
- c) No permanent or temporary tourism operators shall be allowed to run any kind of business on the beach if facilities for the treatment and disposal of different waste streams are not provided including cigarette butts, sanitary pads and diapers.
- d) On the beach, common bins for previously agreed joint operators can be accepted within a no longer distance than 200mts
- e) An environmental tax is to be levied to tourists and tourist operators, to be used for clean-ups.
- f) A comprehensive penalty scheme is to be strictly affected to visitors and operators who litter.

¹⁰ Since one of the rampant sources of marine trash is tourism activity, specific rules for this sector have to be fixed and they have to be extremely strict to prevent marine pollution namely from solid and liquid waste mismanagement and waste burning.

Raised to the rank of the world's leading economic activity, the tourism industry standardizes facilities (hotels, beaches, guided tours, restaurants, homestays, recreational boating, cruise ships, etc.), and tourist sites became privileged consumption areas of strong economic development and massive pollution. Major source of marine litter, this sector has inadequate (eco-friendly) infrastructure to deal with the huge seasonal influx of tourists.

- g)** Take-back facility should be made available in outlets and shops. (For instance, return is given for items such as plastic bottles, sachets, electronic stuffs, etc., when given back to any similar item-selling units. Periodically, companies or gleaners should collect all the items and transport it to recycling units.

3. DEPARTMENT OF RELIGIOUS AND CHARITABLE ENDOWMENTS

- a)** The concerned Temples will report to the Deputy Commissioners of respective districts on the provisions of these Rules. All temples, registered and non-registered, to strictly manage all solid and liquid waste (sewage included) from the visitors, guests, hosts, etc.
- b)** Non-compliance with the Rules will imply the closing of the temple for the time required to lawfully implement the management of their wastes.

4. PORTS, HARBOURS, MARINAS, ANCHORAGES¹¹ - Undertakings and Reception Facilities

- a)** Ports (fishing, boating, sporting...) must submit bi-annually Waste Handling Plans and have to offer PRF to any vessel compelled to land any waste produced/collected offshore, monitoring the discharges.
- b)** install operational equipment in port facilities for the storage and recycling of litter
- c)** provide training for fishers, seafarers, port agents and in charge officers
- d)** create schemes for waste collection for all seafarers
- e)** boost all stakeholders to participate in projects to remove lost fishing gear
- f)** Special provisions for fishing harbours are to be given:
- Single flat fee for fishermen to deliver garbage in port
 - Deposit return systems for key waste items such as buoys and fish boxes¹²

- 5. COAST GUARD¹³** will take all the required measures to preserve and protect the maritime environment and to prevent and control marine pollution, such as:

- a)** The **Commandant of the Coast Guard** shall monitor and enforce compliance with MARPOL, Annex V
- b)** In coordination with key stakeholders, craft and implement a plan to manage vessels waste at ports reception facilities (keeping track record)
- c)** remove lost fishing gear from the sea

6. POLLUTION CONTROL BOARD

¹¹ The international convention on pollution prevention from ships (**MARPOL**) mandates ports to provide adequate Port Reception Facilities (PRF) and to develop plans for the management of ship's waste.

Also in terms of Part-XIB of **MERCHANT SHIPPING ACT, 1958**, Ports will provide appropriate reception facilities (...) in accordance with the following:

I. Details of reception facilities and ways to dispose of waste shall be prescribed by the Government

¹² Following the anti-disposable stance we have to move away from using a high valuable finite resource, towards a low value refill and/or return scheme, and the government has to establish a strong and strict deposit return scheme (DRS) putting planet first, corporate interests second.

¹³ **THE COAST GUARD ACT, 1978**, CHAPTER III – DUTIES AND FUNCTIONS OF THE COAST GUARD

(2) (...) (c) taking such measures as are necessary to preserve and protect the maritime environment and to prevent and control marine pollution; (...)

(3) The Coast Guard shall perform its functions under this section in accordance with, and subject to such rules as may be prescribed and such rules may, in particular, make provisions for ensuring that the Coast: Guard functions in close liaison with Union agencies, institutions and authorities so as to avoid duplication of effort.

The state Pollution control Boards/Pollution Control Committees as the case may be, shall be responsible for enforcing the said Rules in the state through their Regional Offices.

B. FISHERIES¹⁴ AND SHIPPING

1. GAPS IN LEGAL FRAMEWORKS AND INFRASTRUCTURES to be tackled

- Exceptions in regulations for most fishing boats
- Ports lack vital role in waste handling facilities and activities
- Lack of inspections and enforcement
- Lack of a Strategy for Sustainable Development of Fishing and Port activities
- Lack of regulatory corpus for the mounting impact of fisheries waste mismanagement

2. GENERAL ACTIONS TO REDUCE FISHERIES WASTE:

- Maritime States must fix as priority to fight gear loss and fisheries related waste
- Create operational framework for an integrated recycling scheme for major sorts of fisheries waste: nets, packaging polystyrene, lighting devices, buoys, etc.
- Compel companies to eco-design their products in line with the EPR
- Address the prior stages of products design to succeed waste reduction
- Address litter originating from aquaculture and industrial activities

3. UPSTREAM PREVENTION is preferable to downstream removal (in terms of resources and expenditures) so, stringent strategies to prevent lost/abandoned nets in the marine environment have to be set, namely:

- Gear marking system at source to identify ownership¹⁵
- Technology to avoid unwanted gear contact with the seabed
- Technology to track gear position
- Gear designs and materials that reduce the risk of gear loss
- Identify hotspots of gear tearing or/and prominent dumping sites
- Favour less-durable and degradable gear to reduce ghost¹⁶ fishing duration¹⁷
- Buy-back facility for fishnets is to be provided by fisheries department or selling points.
- Marine spatial and temporal planning, (isolate passive and mobile gears to avoid gear conflicts and gear loss)
- Incentives for proper disposal of unwanted fishing gear

¹⁴ **BLUE RESPONSIBILITY** “More tons of litter are thrown into the sea than tons of fish removed”. As **fisheries** are the most important element of coastal communities, a special focus to design behavioral change in blue industries is crucial. Outreach programs have to target not only the already active fishers, seafarers and tourists, summoning all to urgently abate marine debris, as also the next generation of fishers and seafarers, conveying knowledge about the impacts of marine debris on the marine ecosystems, emphasizing the role of people living of the sea, by the sea and enjoying the sea, in marine litter prevention.

¹⁵To prevent ALDFG, marking fishing craft & gears with Code tags becomes compulsory. Applied at every fishing gear, and easily scanned with a simple mobile device, they will inform about its ownership, tracing its lifecycle.

¹⁶ **Ghost’ gear** – 640,000 tons of fishing gear is lost or disposed into the oceans every year. This ‘ghost’ gear - gillnet fragments, rope, dolly rope, and monofilament lines - has a devastating effect on marine animals. It often travels long distances and accumulates in hotspots driven by the currents. It is of need to establish **best practices in gear management** and to identify gear loss hotspots is essential to address this problem.

¹⁷ Polyhydroxyalkanoate (PHA) use as a biodegradable plastic in fisheries

- Penalties for ALDFG at sea or seashore
- Adopt **Best Practices for Fisheries** waste management
- End of life options for fish gears are to be defined and certified by Fisheries Department
- Reward fishers for the nylon dolly ropes collected
- Suitable and accessible port reception facilities for retrieved fishing gear

4. COMERCIAL VESSELS DUTIES:

- The **Fishing for Litter Scheme** (ships collect marine litter during their fishing activities) mandates waste management on board for litter collected in fishing gear
- install equipment on board for the collection and storage of litter
- pay a proportional/tons fee for landing their waste in port
- have equipment on board to retrieve lost gear
- attempt to retrieve any ALDFG as soon as possible and, if cannot retrieve, immediately inform competent authority of gear type and location¹⁸

5. CIRCULAR ECONOMY,¹⁹ applied to fisheries sector, calls for various innovative tools, namely **IPP** and **EPR**

- Design the product for its entire life-cycle
- Implement strict deposit/return schemes for key waste items (e.g. buoys, fish boxes)
- Choose reusable packaging
- Replace plastic petrol based material wherever possible
- Develop market for recycling fisheries waste items
- Ban products clearly designed to litter, such as polystyrene.

6. STRATEGIES TO IMPLEMENT

- **Extended producer responsibility:** Rules must explicitly force manufacturers to comply with EPR
- **Deposit/refund schemes:** Infrastructure for a national recycling scheme is necessary to support the return scheme – whichever be the condition of the gear when returned
- **Reward schemes:** Regulations must specify which authority will provide rewards or incentives (local/municipal gov't, etc.).
- **Environmental tax:** is to be regulated and applied to the most damaging alternatives²⁰
- **Gear marking at source:** Gear registration databases are to be created. Regulations for gear marking are needed.
- **Good practices charts** for port authorities (civil and military), fishermen and fisherwomen (household and fish markets level)
- Simple **engineering waste catch system** fixed at rivers/backwaters outlet just before

¹⁸ The cost of retrieval done by marine authority of unreported lost gear is charged to the vessel owner

¹⁹ that minimizes waste, reuses materials repairs and recycle them into new products.

²⁰ The environmental impacts of the **fish farming** industry needs to be addressed through an environmental assessment and a strategic framework for its sustainable development. Meanwhile, as the prices of fisheries products do not reflect their real environmental responsibility, an environmental tax would increase the product's cost, and producers would look for eco-friendly alternatives.

Such tax is to be applied also to products designed to break apart during their use in the ocean (polystyrene floats, buoys, dolly rope²⁰), if not replaced with compostable materials.

monsoon

C. CENTRAL & STATE GOVERNEMENT

1. **Ministries of Commerce, Consumer and Corporate Affairs**, will
 - Create a legally binding framework for **Packaging and Packaging Waste** to highly impact on reducing marine litter, namely stopping all-India packaging under 50micron, and constrain to sustainably redesign individual sachet products which are hard to recollect and recycle.
 - Force manufacturers to practice return/'take back' facility (with the possibility to keep deposits while selling huge quantity of goods in retail form)
2. **Ministry of Science and Technology**, as the National Institute of Design, will compel companies to eco-design their products in line with the EPR
3. **Ministry of Human Resource Development** shall implement **Ocean Literacy** frameworks across India at the formal and informal sectors to raise the required public awareness for civic society to solve marine debris.
4. **MARITIME STATES** are to develop and implement Plans of Action to address the negative impacts of marine debris in their waters, particularly tackling plastics and ALDFG.
5. An **INSTITUTE for MARINE HEALTH**²¹ (in coordination with GOs, NGOs and corporations) will be created with the mission to fix a timeframe for implementation, monitoring and assessment of the following strategies:
 - a) **Land-based Marine Litter**
 - Strict implementation of Solid and Plastic Waste Management Rules in urban and rural areas
 - Inclusion of Marine Litter Management in Local Bodies Waste Plans of Coastal Talukas
 - Affect **Extended Producer Responsibility** Strategies to all producers and importers
 - b) **Sea-based Marine Litter**
 - Strict enforcement of ratified international laws
 - Reliable/Suitable Port Reception Facilities
 - EPR schemes or deposit systems for fishing gears
 - Strict fines for littering at ocean
 - c) **Downstream litter removal**
 - Organize fishing for litter schemes
 - Identify current or historic abandoned, lost and discarded fishing gear (ALDFG) hotspots
 - Retrieve ALDFG
 - d) **Education and Public Awareness on Marine Litter**²²
 - Launch educational drives for fishermen & fisherwomen on their lawful and civic duties
 - Promote ocean literacy for all, including the tourism sector²³

²¹ Would it be of interest to create a Unique Marine Litter Authority of India, or An INSTITUTE for MARINE HEALTH would be enough?

²² At all fisheries sector meetings, a foundational point should be made mandatory, on ocean literacy to craft awareness on the disastrous situation – that either is just ignored by lack of knowledge, or that is ignored by lack of wish to acknowledge it.

²³ **Ocean literacy** of coastal communities: formal (coastal schools) and informal (fishers, officers, seafarers, tourists).

- Create environmental awareness programs for fishermen fisheries sector
- Raise public awareness on the impact and prevention of marine litter

GLOSSARY

ALDFG – Abandoned, Lost, or otherwise Discarded Fishing Gear

EPR – Extended Producer Responsibility

FSTP – Faecal Sludge Treatment Plant

IMO – International Maritime Organization

IPP – Integrated Product Policy

PAYT – Pay As You Throw

SDG – Sustainable Development Goals

SWM – Solid Waste Management

UNCLOS – United Nations Convention on the Law of the Sea