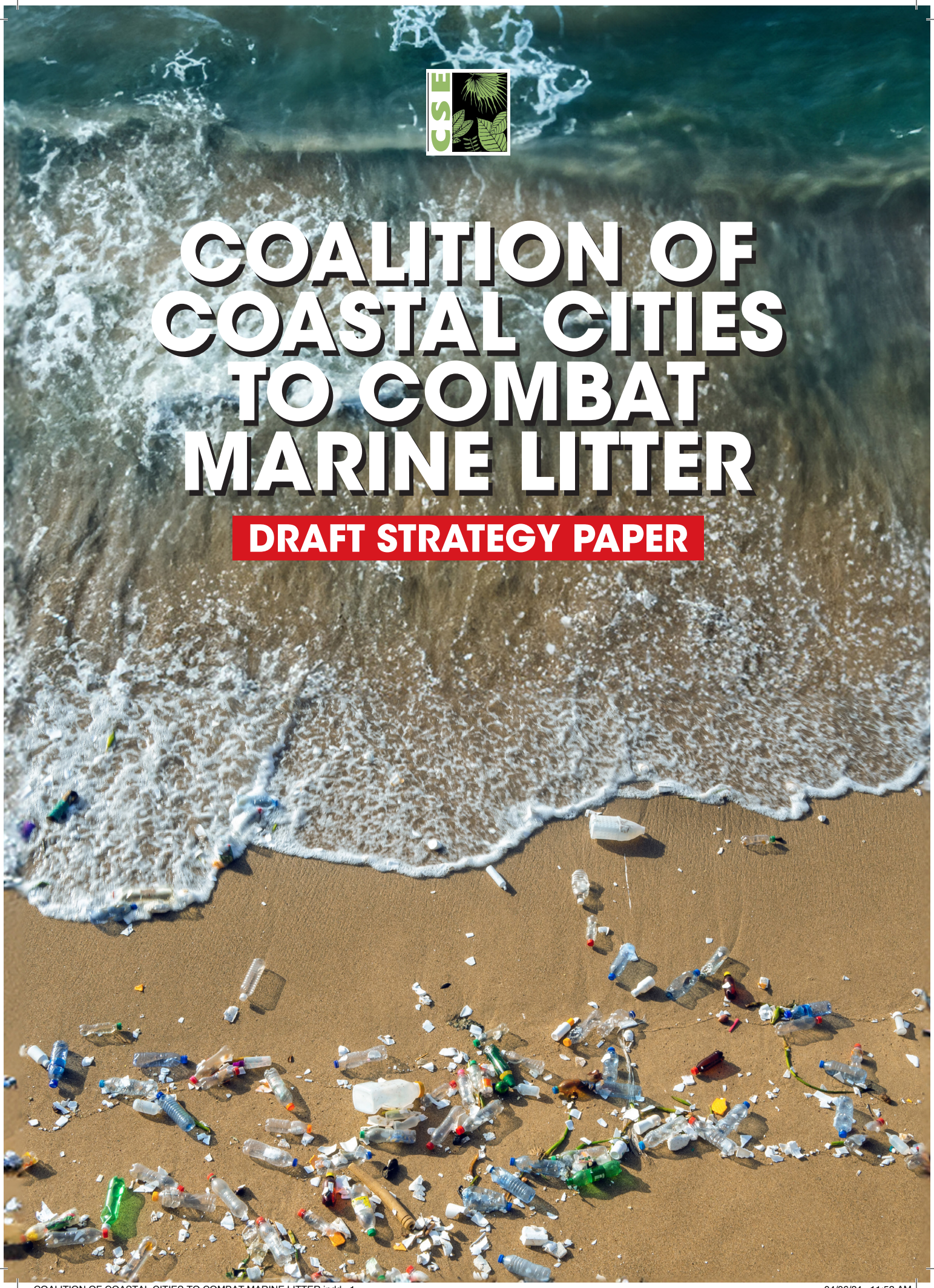

COALITION OF COASTAL CITIES TO COMBAT MARINE LITTER

DRAFT STRATEGY PAPER

COALITION OF COASTAL CITIES TO COMBAT MARINE LITTER

Second National Workshop
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DRAFT STRATEGY PAPER

ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE
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Author: Siddharth Ghanshyam Singh and Atin Biswas

Editor: Souparno Banerjee

Cover: Ajit Bajaj

Production: Rakesh Shrivastava and Gundhar Das

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Centre for Science and Environment
41, Tughlakabad Institutional Area
New Delhi 110062
Phones: 91-11-40616000
Fax: 91-11-29955879
E-mail: sales@cseinida.org
Website: www.cseindia.org

Contents

1
An Introduction to Marine Litter

A definition

According to the United Nations Environment Programme (UNEP) secretariat for the Barcelona Convention, marine litter is defined as "any persistent, manufactured, or processed solid material discarded, disposed of or abandoned, regardless of its size that enters the marine and coastal environment"[1].

This includes items deliberately discarded or unintentionally lost at sea or along the coastline. Common examples prevalent in the Indian marine ecosystem are plastics, wood, metals, glass, rubber, clothing, paper, including religious material[2]. It is important to note that the UNEP definition excludes semi-solid remains such as mineral and vegetable oils, paraffin, and chemicals occasionally found in the sea and on shores, thus differentiating marine litter from marine pollution.

Marine litter is a global threat, particularly in countries with a long coastline. It has been established that plastics comprise 85 per cent of all marine debris from surface waters to deep-sea sediments[3].

The Indian scenario

India has a coastline stretching over 7,517 km, across nine states and four Union territories, covering 66 coastal districts and 1,382 offshore islands. This vast coastline offers generous amounts of resources, opportunities and livelihoods. Most coastal regions of India are densely populated and low-lying, with around 250 million people active within a 50-km range of coast.

There are 486 census towns along the Indian coast, according to the Census of 2011. Of them, 36 are classified as Class I towns with a population of more than 100,000. There are 3,600 fishing villages, with 400,000 fisherfolk, operating 250,000 fishing boats. The Indian coastline also has 4,120 km of mangroves.

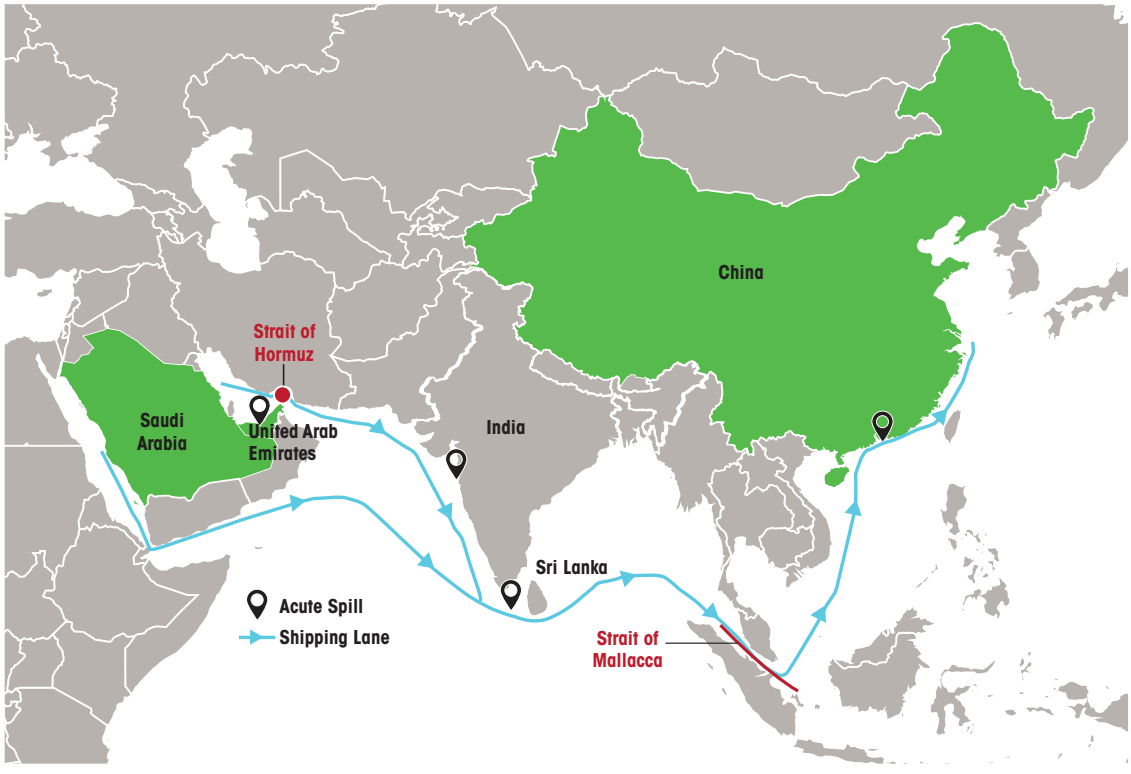
Abandoned, Lost or Discarded Fishing Gear (ALDFG) is a serious threat worldwide. As per the records of the Ministry of Earth Sciences, India has 174,000 units of fishing gear in operation of which 154,008 units are gillnets / driftnets, 7,285 units

are traps and the rest are fishing lines. According to the Food and Agriculture Organisation (FAO), India loses 15,276 tonnes of gillnets annually. In the year 2021, 58,000 kg of ghost net was recovered from the beaches and ocean bed[4].

India has been leading the blue economy discourse at the highest level with its geographic and geostrategic position, putting greater focus on the Indian Ocean region. Twelve major ports and 239 non-major ports are located along the Indian coast. More than 100,000 ships are estimated to transit close to Indian coastal shores every year.

India is strategically located between two important plug points called Strait of Hormuz and Strait of Malacca. 40 per cent of global commercial shipping passes through this route. The Indian Ocean is the world's third largest waterbody, covering 70 million sq km with rich mineral resources and connectivity with global cities. The shipping routes between the two straits have been hotspots for acute plastic pellet spills, which contribute to increasing micro-plastic and nano-plastic load in the ocean.

Map 1: The shipping routes between the Strait of Hormuz and the Strait of Malacca



Source: Mapping the Global Plastic Pellet Supply Chain, 2023, Fidra. Redesigned by DTE-CSE

According to a study conducted by the United Nations Environment Programme (UNEP) in 2019, 15,434 tonnes of plastic waste leaked into South Asian seas daily (annually 5.6 million tonne per year of plastic waste). The waste in South Asian seas would also be contributed by Indian cities as they are in the region[5].

To mark the 75th year of India's independence, Government of India has launched the 'Swacch Sagar Surakshit Sagar' (*A clean sea is a safe sea*) campaign, which aims at cleaning 75 beaches in the nine coastal states of the country. The campaign estimates that the Indian coastline contributes about 0.98 metric tonne of trash per km stretch of the coastline (concentration of 0.012 kg of trash per sq m).

A total of 81 tonne of marine litter was collected during clean-up initiatives conducted in 2022 and 2023 across the nation (*see Table*). Notably, more than 40 tonne of this amount comprised plastic litter, indicating that plastics make up approximately 50 per cent of the overall collected litter in India[4,5]. According to the European Environment Agency, plastics comprise 85 per cent of all marine debris from surface waters to deep-sea sediments[6].

The waste profile of the recovered material was as follows:

Type of Trash	Contribution to marine litter (%)
Plastic	55 – 57%
Foam Plastic	0 – 2%
Fabric	0 – 2%
Paper	2 – 3%
Glass	0 – 2%
Religious Material*	40 – 41%

(*Note: Religious material may contain, biodegradable waste, plastic, paper, fabric and glass)

Source: National Coastal Cleanup 2022, National Coastal Guard, NCCR, MoES.

Several research organisations such as the National Centre for Coastal Research (NCCR), Ministry of Earth Sciences and National Centre for Sustainable Coastal Management (NCSCM), and agencies under the Ministry of Environment, Forests, and Climate Change have been conducting research to understand the extent of marine litter at various beaches across the coast of India. Findings from some of the most relevant research are as follows:

- A study conducted by NCCR and NCSCM in 2021 on the Digha coast located in Purba Medinipur district of West Bengal has revealed that the 64-km long coastline between Subarnarekha and Rasulpur rivers houses approximately five million people. The survey which covered 8,500 sq m area revealed 16,597 litter items, with cumulative waste of 65.6 kg[9].

- Along the Marina Beach in Chennai, Tamil Nadu, a total of 6,872 pieces, characterised under 46 debris categories, were collected in a bi-monthly survey conducted between March and April 2015. This study was led by researchers from the Wildlife Institute of India, Dehradun. The total weight of the debris was 129.67 kg. There was a clear and systematic difference in the seasonal pattern with respect to the abundance and weight of the debris observed during different sampling periods[10].

- A 2023 study by the Chennai-based National Centre for Sustainable Coastal Management in the southeastern Arabian Sea coast showed that 77.6 per cent of marine litter washed ashore consisted of plastics, mostly being rigid plastics. However, the distribution of anthropogenic marine litter (AML) was significantly influenced by littoral and coastal currents. The study also suggested that 17.71 per cent of the AML was hazardous plastic. A total of 4,911 AML items were classified into nine categories, weighing 16.79 kg, and retrieved from an area of 8,000 sq m[11]. In this 2023 study, the marine debris flowing into the Arabian Sea through a water channel was characterized and quantified using an entrapment device installed at the down-stream end of Juhu creek in Mumbai. The results indicated that the mean numbers of marine debris items during high and low tide were 111 ± 5 and 184 ± 12, respectively[12].

- According to a study done by the National Centre for Coastal Research (NCCR), Chennai in 2020, the national average weight of beach litter was 0.059 kg/sq m. Zone-wise observation on the weight of beach litter indicates that the west coast had a higher average (0.07 kg/sq m) compared to the islands (0.068 kg/sq m) and east coast beaches (0.044 kg/sq m). The weight concentration was observed to be maximum in Fort Kochi (0.588 kg/sq m) and minimum in Rushikulya in Odisha (0.001 kg/sq m)[13].

Although India has a long coastline, its marine litter research is still in its infancy compared to that in the US, UK, Brazil, Indonesia and Australia, among others. Of the few studies conducted, none of them follow a consistent methodology for making meaningful comparisons between different Indian beaches. The problem of this litter is poised to escalate in India, given the rapid pace at which the country is generating and utilising primary plastics. Additionally, there is rampant mismanagement of plastic waste.

According to the PlastIndia Foundation India in 2021, India produced roughly 20 million tonne of plastics making it one of the largest manufacturers of primary plastic products in the world[14]. The Central Pollution Control Board (CPCB)

estimated in 2015 based on extrapolation of a study carried out in different landfill sites that the total plastic waste generation by the country was roughly 9.5 million tonne[15]. In 2022, CPCB revised this to 4.1 million tonnes based on the information provided by state pollution boards[16].

The CPCB in its annual report on the state of plastic waste in the country for 2020-2021, estimated that India recycles only 13.08 per cent of its plastic waste and burns 13.69 per cent[17]. This information is based on the data provided to CPCB by the state pollution control boards, and it only captures what is 'officially' recycled by the authorized agencies. The data on plastic waste varies as recycling by the informal sector is not captured in most studies. It does not provide information on the recycling by the informal and small scale sector However, it is widely accepted that plastic waste, particularly of the kind which has little recycling value, is disposed of on land and waterbodies.

Perceptions, knowledge, awareness, and attitudes toward the theme are crucial in its mitigation and prevention. It has also been documented that with no meaningful actions, the quantity of plastic waste entering aquatic ecosystems can nearly triple by 2040 (UNEP, 2021). Predictions are alarming, reinforcing the urgency of action. The Indian Government has started taking baby-steps to address this issue and is actively working in its national capacity and capabilities and also with the global community to address this issue.

2
Sources of marine litter

Marine litter originates from both land-based and ocean-based sources, resulting in widespread pollution. The transportation of marine litter can occur over considerable distances before being deposited, contributing to the complex nature of the issue.

Land-based sources encompass diverse origins, primarily driven by recreational coastal use, general public litter, and inadequately managed landfills and dumps near coastal regions. Additional contributions arise from sewage overflows and extreme events, with rivers and industrial discharges transporting litter to the sea. Winds can also play a role, blowing debris into the marine environment.

Ocean-based sources include activities such as commercial shipping, ferries, liners, fishing vessels, military and research fleets, pleasure boats, and offshore installations like platforms, rigs, and aquaculture sites. Factors influencing the types and quantities of litter in the open ocean or along beaches include ocean currents, climate, tides, and proximity to urban, industrial, and recreational areas, shipping lanes, and fishing grounds.

A classification of marine litter based on its origin reveals that only 20 per cent can be attributed to ships and installations, while the remaining 80 per cent stems from land-based sources[18]. This underscores the necessity of addressing the root causes to effectively combat the issue.

In the Indian context, marine litter emanates from diverse sources, with notable contributors being:

Land-based sources

- Urban run-off: Waste, including litter and pollutants, from urban areas can be transported into waterbodies, reaching the marine environment through run-off.

- Improper waste disposal: Inadequate waste management practices, such as open dumping, contribute to debris transport to coastal and marine areas.

- Rivers and waterways: Plastic and litter deposited in drains and rivers can get carried to the ocean.

Fishing activities

- Lost or abandoned fishing gear and equipment: Discarded or lost fishing gear, such as nets and traps, significantly add to marine litter. Similarly discarded fishing equipment such as ropes, buoys and lines used in fishing operations may end up as marine litter.

Tourism and recreational activities

- Beach litter: Tourism and recreational activities often result in litter on beaches, including plastic bottles, bags, and packaging materials.

Shipping and maritime activities

- Cargo spills: Accidental or deliberate cargo releases during shipping can contribute to marine litter.

- Vessel discharge: Improper disposal practices on ships result in the release of litter into the sea.

Industrial activities

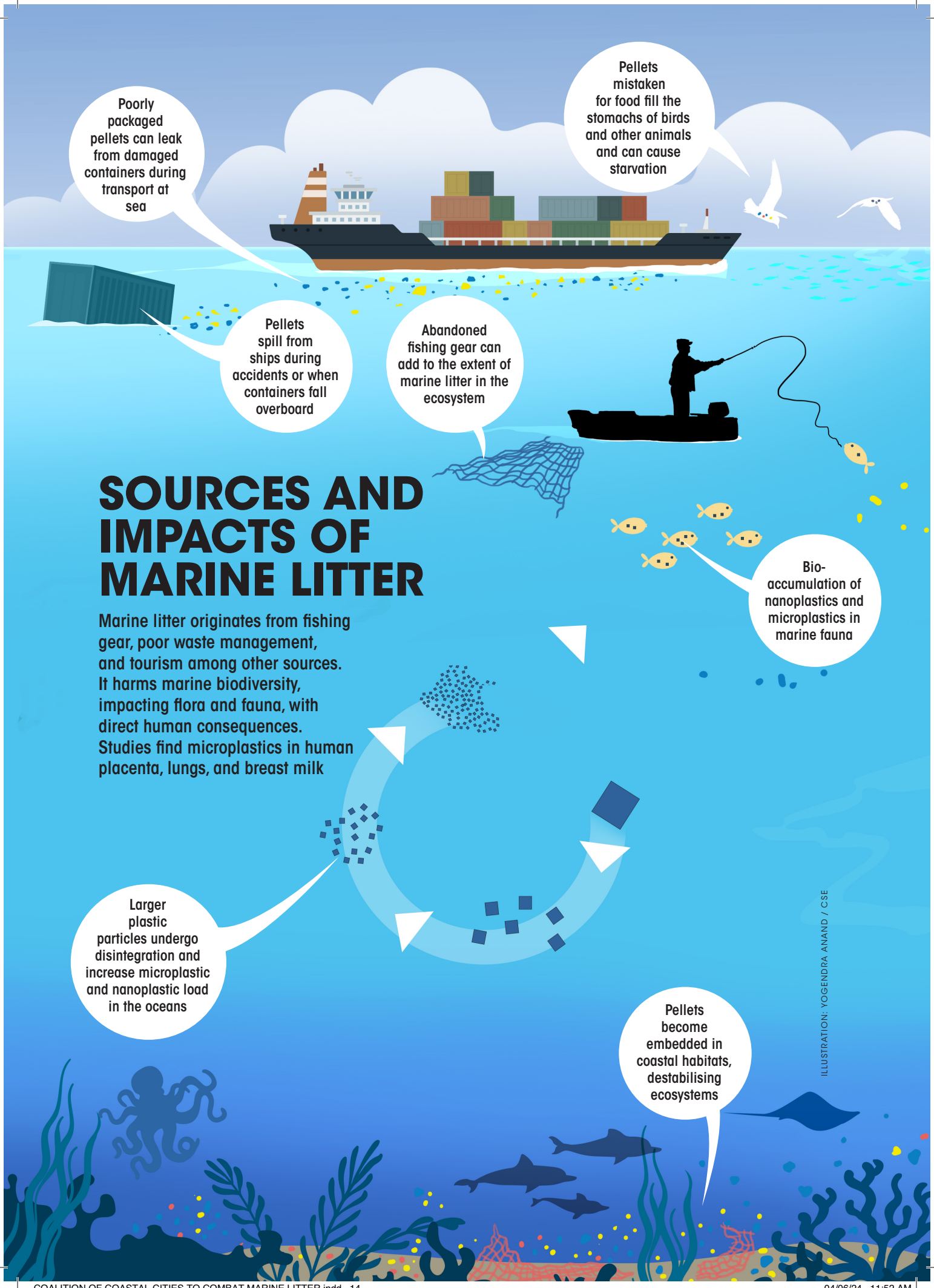
- Improper disposal: Industries near coastlines may contribute to marine litter through improper waste disposal into waterbodies.

- Leakages from production and recycling facilities: Primary plastics in the form of flakes, powder or pellets may leak into the environment and end up in waterbodies.

Storms and natural events

- Storm surges: Extreme weather events like storms and cyclones can disperse debris from coastal areas into the ocean.

It is imperative to stress that efforts to address marine litter necessitate comprehensive strategies, including reducing plastic usage, enhancing waste management practices, and fostering awareness and responsible behavior among communities, industries and government bodies.


Poorly packaged pellets can leak from damaged containers during transport at sea
Pellets mistaken for food fill the stomachs of birds and other animals and can cause starvation
Pellets spill from ships during accidents or when containers fall overboard
Abandoned fishing gear can add to the extent of marine litter in the ecosystem
SOURCES AND IMPACTS OF MARINE LITTER
Marine litter originates from fishing gear, poor waste management, and tourism among other sources. It harms marine biodiversity, impacting flora and fauna, with direct human consequences. Studies find microplastics in human placenta, lungs, and breast milk
Bio-accumulation of nanoplastics and microplastics in marine fauna
Larger plastic particles undergo disintegration and increase microplastic and nanoplastic load in the oceans
Pellets become embedded in coastal habitats, destabilising ecosystems
ILLUSTRATION: YOGENDRA ANAND / CSE


Pellets spilled at industrial sites enter ocean via drains and waterways
Dumpsites on the vicinity of waterbodies increase the extent of leakage
Litter on tourism and recreational sites like beaches can leak into the waterbodies
Pellets floating on the ocean surface are mistaken for food by wildlife
Pellets (and their associated chemicals) can travel up the food chain if predators eat prey containing pellets
Pellets have been found in the mouths and stomachs of dead fish

3
Impacts of marine litter

Marine litter has significant and far-reaching impacts on marine ecosystems, wildlife and human activities. Some of the key impacts are as follows.

Environmental impacts

- Habitat degradation: Marine litter accumulates on coastlines, in shallow waters, and on the seabed, leading to degradation of marine habitats.

- Affecting water quality: Decomposition of some litter items such as plastics can release harmful substances like microplastics that could affect water quality and prove potentially harmful for aquatic life.

Impacts on aquatic life

- Ingestion: Marine animals, including fish, seabirds and marine mammals, may ingest marine litter, leading to blockages, malnutrition and internal injuries – some of these conditions can be fatal.

- Entanglement: Wildlife can become entangled in marine debris such as abandoned fishing gear, resulting in injuries, drowning or death.

Economic impacts

- Fisheries and tourism: Marine litter negatively affects industries and sectors that are dependent on healthy oceans, such as fisheries and tourism, leading to economic losses.

- Clean-up costs: Governments and organisations incur significant costs in cleaning up coastal areas and managing the impacts of marine litter.

Impacts on human beings

- Contaminated seafood: Marine litter introduces pollutants into the marine environment, which can bioaccumulate in seafood, potentially affecting human health through the consumption of contaminated fish and shellfish.

- Recreational hazards: Debris in the water poses safety risks to recreational activities such as swimming, diving and boating.

Global impacts

- Transboundary pollution: Marine litter can travel across vast distances through ocean currents, contributing to transboundary pollution and affecting regions far from the source.

- Climate change: The production and disposal of plastics generate greenhouse gas emissions, contributing to climate change.

Aesthetic and cultural impacts

- Aesthetic degradation: Coastal areas and beaches, often significant for tourism and cultural activities, lose their aesthetic appeal due to the presence of marine litter.

- Cultural heritage: Litter can impact cultural heritage sites along coastlines, affecting the historical and cultural significance of these areas.

Efforts to mitigate the impacts of marine litter include international agreements, coastal clean-up initiatives, waste management improvements, and public awareness campaigns to reduce plastic consumption and promote responsible waste disposal. Addressing the problem of marine litter requires a comprehensive, collaborative approach at local, national and global levels.

4
A strategy to combat the problem of marine litter: An overview

The aim of the proposed strategy against marine litter is deeply rooted in the nation's commitment to fostering a clean, healthy, safe, and biologically diverse marine and coastal environment that caters to the long-term needs of both its people and nature. This strategy encompasses the sustainable management of seas to safeguard rich biological diversity, ensuring that marine ecosystems continue to provide economic and social benefits for the people.

The strategy builds upon the significant work already in progress across local, national, regional, and international levels in India, and plans on consolidating these efforts for greater coordination. Acknowledging the substantial voluntary contributions made by individuals, local initiatives, community groups, and NGOs, the strategy seeks to amplify and streamline these endeavors within the unique context of India.

The vision for the strategy revolves around reinforcing existing actions contributing to defined goals and identifying new, measurable, and achievable actions to be completed within a realistic timescale. These actions focus on strengthening the existing policy across the sources of marine litter, preventing litter from entering the marine environment, aligning with efforts in litter removal and behavior change, followed by monitoring of the situation and stakeholder coordination.

Measurable steps should be taken not only to prevent marine litter, but also to actively support removal initiatives. This will be achieved through coordinated efforts, including inter-ministerial coordination, collaboration and leadership of various ministries such as environment, earth sciences, housing and urban affairs, and partnerships at various administrative levels like states, cities and gram panchayats within India.

Proposed strategic directions

The vision aligns with six strategic directions and associated actions tailored for the Indian context:

1. **Recognise** the issue of marine litter and strengthen the existing policy landscape (governing solid waste, tourism, fisheries, industrial pollution, shipping and trade) to address the issue in the country.

2. **Enhance** public and business attitudes and behaviors around marine and coastal litter, in coordination with state pollution control boards, urban local bodies, and district and state administrations.

3. **Reduce** marine and coastal-based sources of litter, prioritising the most problematic sources, in coordination with efforts to reduce land-sourced litter.

4. **Support** the removal of marine litter from the marine and coastal environment by diverting financial flows and utilising best available technologies.

5. **Increase** monitoring at a local, regional, and national scale and develop measures for strategy evaluation specific to India.

6. **Strengthen** stakeholder coordination within India, regionally, and globally to address the unique challenges and opportunities in the Indian marine environment.

Each of these strategic directions have been tagged to sources of marine litter (*discussed in a section earlier*). A matrix has been prepared which will present a bird's-eye view of challenges, proposed solutions and recommended actions. Some of the policy-level challenges and governance issues have also been addressed in the matrix.

Strategy matrix

Policies and governance issues

S No	Key challenges	Proposed solutions	Actionable points
1.	Limited focus by city governments and gram panchayats on addressing the marine litter issue.	Acknowledge the problem of marine litter and enhance the current policy framework (related to solid waste, tourism, fisheries, industrial pollution, shipping, and trade) to effectively tackle the issue in the country.	Ensure that the following policies and laws reflect the marine litter issue: Solid Waste Management Rules 2016; Plastic Waste Management Rules 2016; Coastal Regulation Zone Policy and Biological Diversity Act 2002; (Draft) National Fisheries Policy 2020; (Draft) National Tourism Policy, 2022 Create an inter-ministerial coordinating body to develop a dedicated policy for marine litter, with the involvement of Ministry of Earth Sciences; Ministry of Environment, Forests, and Climate Change; Ministry of Housing and Urban Affairs; Ministry of Jal Shakti; Ministry of Panchayati Raj; Ministry of Chemicals and Fertilizers; Ministry of Fisheries, Animal Husbandry and Dairying; Ministry of Tourism and other relevant government agencies
2.	Litter from cities and villages makes its way into the ocean/seas through drains, sewer canals and rivers, adding to the quantum of marine litter	Expand interception mechanisms such as clean-up and litter capture technologies in riverine projects to complement coastal clean-up initiatives	City governments and gram panchayats should install appropriate infrastructures like bubble barriers, iron arrestors and nets to prevent waste from making its way into rivers City Solid Waste Action Plans (CSWAP) made by the Ministry of Housing and Urban Affairs (MoHUA) should mandate preparation of a marine litter sub-plan, with adequate financial allocation to report for data on leakages, hotspots, pathways and measures for reduction and removal of litter Funds for such activities can be routed from city governments (15th Finance Commission grants) Gram Panchayat Development Plans, and Swacch Bharat Mission Additional Central Assistance

Source of the litter: Due to solid waste mismanagement

S No	Key challenges	Proposed solutions	Actionable points
1	Non-compliance with the Solid Waste Management Rules, 2016 – especially, segregation at source	Information, Education, and Communication (IEC) campaigns to promote behavior change among citizens in rural and urban areas	Empanelment of agencies with a proven track record of achieving at least 85-90 per cent of source separation Empanelment should be based on a proven track record of a successful and a functional pilot carried out by the agency in a panchayat, city, block, district or a catchment area
		Incentivise source segregation for citizens – for instance, several cities have announced a property tax rebate of 3-5 per cent for source segregation	Cities that have announced such rebates (for instance Mumbai) should be directed to implement the measure while simultaneously improving their collection and processing capacities to generate revenue from the segregated stream of waste Coastal cities should address the issue of marine litter in their bye-laws to prevent leakage of solid/plastic waste into waterbodies such as drains and sewers. The bye-laws should have strong punitive measures to ensure compliance and prevent the entry of litter into waterbodies Rebate can be provided on utility bills like water, electricity, or maintenance charges to promote source segregation
2	Non-compliance with the ban on single use plastic products under the Plastic Waste Management Rules, 2016	Enhanced monitoring by the city, district and state administrations for identifying single use plastic production facilities	City governments to create a list of single use plastic producing facilities in their jurisdiction and coordinate with state pollution control boards and committees to take legal action
		Coastal states to strengthen the SUP ban laws in their jurisdictions	Notifying state-level bye-laws that will be adopted by all coastal cities and gram panchayats Identifying unnecessary, problematic, and non-recyclable plastic through waste audits conducted during clean-up activities along river banks and coastlines; populate the list of items to be banned (for instance, Himachal Pradesh and Sikkim have banned the manufacture and use of carry bags)

S No	Key challenges	Proposed solutions	Actionable points
3	Limited collection of dry waste; collected dry waste is channelised to dumpsites located mostly in the vicinity of a waterbody	Improve collection systems by involving and integrating the informal sector. There is evidence that this model has helped save local governments the cost for collection, and has helped channelise more recyclables to MRFs	Informal sector workers have to be encouraged to form cooperatives and contribute to the collection aspect of the solid waste management value chain The informal sector should be provided space to work within the city/panchayat/ block limits Informal sector workers should be provided space to work and store the recyclable and non-recyclable materials that they sort out of the dry waste fraction
		Train staff to collect source segregated waste in all neighborhoods in rural and urban scenarios	Formal and informal waste collection staff should be supported to collect source-segregated waste through short training interventions which should be repeated at regular intervals
4	Many dumpsites are located close to waterbodies like canals, storm water drains, rivers, oceans etc	Prioritise remediation of dumpsites located next to waterbodies — relocate those facilities away from such areas	Ministry of Housing and Urban Affairs should direct the State Urban Development Department in the coastal states to take relevant action for prioritization of dumpsite remediation closer to water bodies. Urban Local Bodies should take action to build a temporary structure around the boundary of the dumpsites in the vicinity of a water body to restrict and reduce leakage from such sources. State Pollution control board to monitor the implementation.

Source of the litter: Lost fishing gears

S No	Key challenges	Proposed solutions	Actionable points
1	The fishing community unknowingly contributes to marine litter, thus affecting their own livelihoods	Increased collaborations with the fishing sector and coastal communities to address the issue of fishing litter	The Department of Fisheries in every state should run capacity building programmes for fishing communities to address the issue of dumping of nets into waterbodies
2	Lack of technologies and incentives for fisherfolk to recover and retrieve lost fishing gear	Support the development of tools, technologies and schemes for the Indian fishing industry to retrieve lost gear	National Centre for Coastal Research should develop a waste management scheme for recycling end-of-life fishing gear on the lines of a 'fishing for litter' initiative, which compensates fisherfolk for bringing trash from the oceans to the coast Funds for incentivising fisherfolk should be routed from Pradhan Mantri Matsya Sampada Yojana under the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying Industries involved in manufacturing fishing gear should contribute to the development of circular design standards for fishing gear, facilitating better waste management and recycling opportunities
		Explore mechanisms to assist communities in reducing costs associated with disposing of collected beach litter with support from urban local bodies and private players	Every city government and gram panchayat on the coastline should ensure collection and scientific disposal of marine litter collected through clean-up activities in the absence of any recycling/processing options within their jurisdictions Department of Fisheries should improve its engagement with fisherfolk working on projects like 'fishing for litter' to improve data collection on marine litter Industries (PIBOs) should support pilot projects through CSR funds to address challenges in recycling fouled marine litter effectively

Source of the litter: Tourism

S No	Key challenges	Proposed solutions	Actionable points
	Littering by tourists during recreational visits increases the amount of waste that may end up as marine litter	Build capacity of tourists to engage with them, thereby reducing the amount of litter	Department of Tourism in coastal states should conduct public attitude surveys to better understand how the Indian public values the marine environment
		Levy a tourism fee for entering the coastal districts in the coastal states	The tourism fee levied should be passed on to the coastal districts and city administrations for reduction and removal of marine litter from waterbodies

Source of the litter: Industry (petrochemicals and plastics)

S No	Key challenges	Proposed solutions	Actionable points
	Petrochemical manufacturers producing primary polymers, plastic manufacturers and the plastic recycling industry contribute to marine litter	Collaboration with petrochemical and plastic manufacturers and the plastics recycling industry to promote responsible handling and prevent plastic pellet loss	CII and FICCI, in consultation with the Ministry of Chemicals and Fertilisers, should take the lead to develop and promote international standards on manufacturing and recycling plant design that prevents loss of plastic pellets into the marine environment

WHAT INDIA IS DOING

- There are many legislative and regulatory tools that guide India's approach to tackling marine litter, especially from land-based sources. These include national laws such as the Waste Management Rules, 2016; Plastic Waste Management Rules, 2016 and its amendment; Coastal Regulation Zone Notification, 2019; and international agreements like the Basel Convention, to which India is a party. Additionally, India actively engages in the Regional Seas Conventions, including the South Asian Seas Action Plan, as a platform for regional cooperation in addressing marine pollution and litter[19].

- As part of the global community, India is committed to the principles outlined in the Basel Convention's Ban Amendment, which addresses the transboundary movement of hazardous waste. The country actively participates in international forums to share best practices, experiences, and scientific knowledge in the fight against marine litter.

- India's first National Coastal Mission, launched in 2020 under the National Action Plan on Climate Change, encompasses a comprehensive approach to marine and coastal management, including initiatives to address marine litter. The mission emphasises on community participation, scientific research, and sustainable development practices to ensure the health and well-being of India's coastal and marine ecosystems.

- Research is being conducted on microscopic plastic particles and characterisation of plastic particles – this will help strengthen monitoring capabilities of agencies such as the National Centre for Coastal Research (NCCR) and National Centre for Sustainable Coastal Management (NCSCM).

- India is a signatory to the UN Convention on the Law of the Sea, 1982 which calls signatory states to develop a legal framework to prevent, reduce and control pollution of the marine environment by dumping.

- India is a signatory to the International Convention for the Prevention of Pollution from Ships (MARPOL) that calls for prevention of pollution of the marine environment by ships from operational or accidental causes.

- India has secured a US $400 million financing envelope from the World Bank to enhance its coastal resources, protect coastal populations from pollution, erosion, and sea level rise, and improve livelihood opportunities for coastal communities. The first phase of the project has provided US $180 million for the Enhancing Coastal and Ocean Resource Efficiency (ENCORE) project[20].

- India is actively engaged in the Intergovernmental Negotiating Committee (INC), which is responsible for formulating an internationally legally binding instrument to address plastic pollution, including in marine environments. The third session of the INC, held in Nairobi from November 13-19, 2023, involved discussions and negotiations on the zero draft of the instrument. India has endorsed all the provisions pertaining to marine litter and pollution from fishing gears at the national level, taking into account its specific circumstances and capabilities.

- The International Coastal Clean-up Day is observed in various parts of the world in the third week of September every year under the aegis of United Nations Environment Programme (UNEP) and South Asia Co-operative Environment Programme (SACEP) (in the South Asian region). The Indian Coast Guard has been coordinating this activity in India under the 'Swachh Sagar, Surakshit Sagar' initiative launched by the Government of India on July 3, 2022.

5
Annexures

Annexure 1: Solid waste generation in coastal states and Union territories

The nine coastal states and four Union territories produce 84,918.82 tonne of waste every day. This is more than half (53 per cent) the waste generated by the country.

State/UT	Waste generation (TPD – tonne per day)
Andhra Pradesh	6,898
Andaman and Nicobar Islands	89
Dadra and Nagar Haveli & Daman and Diu	267
Goa	226.87
Gujarat	10,373.79
Karnataka	11,085
Kerala	3,543
Lakshadweep	35
Maharashtra	22,632.71
Odisha	2,132.95
Puducherry	504.5
Tamil Nadu	13,422
West Bengal	13,709

Source: Annual Report on Solid Waste Management 2020-21, Central Pollution Control Board

Annexure 2: Dumpsites in coastal states and Union territories

Coastal states and UTs together have 1,167 active dumpsites. This is more than a third of all the 3,184 dumpsites in the country.*

**Dumpsites that have been remediated have not been considered.*

State/UT	Number of existing dumpsites
Andhra Pradesh	124
Andaman and Nicobar Islands	1
Dadra and Nagar Haveli & Daman and Diu	3
Goa	8
Gujarat	164
Karnataka	191
Kerala	41
Lakshadweep	0
Maharashtra	237
Odisha	78
Puducherry	3
Tamil Nadu	210
West Bengal	107

Source: Annual Report on Solid Waste Management 2020-21, Central Pollution Control Board

Annexure 3: Tourist footfall in coastal states and Union territories

State/UT	Number of domestic tourists (2020)	Number of foreign tourists (2020)
Andhra Pradesh	70,828,590	67,591
Andaman and Nicobar Islands	191,207	5,412
Dadra and Nagar Haveli & Daman and Diu	402,395	1,604
Goa	3,258,715	302,751
Gujarat	19,464,517	210,047
Karnataka	77,453,339	165,325
Kerala	4,988,972	340,755
Lakshadweep	3,462	413
Maharashtra	39,234,591	1,262,409
Odisha	4,622,273	10,206
Puducherry	1,114,942	92,080
Tamil Nadu	140,651,241	1,228,323
West Bengal	28,841,732	463,285

Source: India Tourism Statistics 2021, Ministry of Tourism, Government of India

Annexure 4: Fishing community population in coastal states and Union territories

State/UT	Fishing community population
Andhra Pradesh	1,496,688
Andaman and Nicobar Islands	25,941
Dadra and Nagar Haveli & Daman and Diu	40,016
Goa	10,545
Gujarat	558,691
Karnataka	974,277
Kerala	1,044,361
Lakshadweep	6,518
Maharashtra	1,518,228
Odisha	1,517,574
Puducherry	107,272
Tamil Nadu	1,283,751
West Bengal	3,236,261

Source: Handbook on Fisheries Statistics, 2020, Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India

Annexure 5: Petrochemical industries in coastal states and Union territories

Coastal states house 14 of India's 23 petrochemical refineries — 78 per cent of the petrochemical production capacity comes from refineries located on the coastline. Eight of the nine states have a petrochemical refinery on their coast, and Gujarat contributes over 50 per cent of the petrochemical manufacturing that happens on the coast.

State/UT	Location of refinery	Oil company	Capacity (MMTPA)
Andhra Pradesh	Vishakhapatnam	Hindustan Petroleum Corporation Limited (HPCL)	8.3
	Tatipaka	Oil and Natural Gas Corporation Limited (ONGC)	0.1
Gujarat	Koyali	Indian Oil Corporation Limited (IOCL)	13.7
	Jamnagar (DTA)	Reliance Industries Limited (RIL)	33.0
	Jamnagar (SEZ)	Reliance Industries Limited (RIL)	35.2
	Vadinar	Nayara Energy Limited (NEL)	20
Karnataka	Mangaluru	ONGC-Mangalore Refineries and Petrochemicals Limited (MRPL)	15
Kerala	Kochi	Bharat Petroleum Corporation Limited (BPCL)	15.5
Maharashtra	Mumbai	Bharat Petroleum Corporation Limited (BPCL)	12.0
	Mumbai	Hindustan Petroleum Corporation Limited (HPCL)	7.5
Odisha	Paradip	Indian Oil Corporation Limited (IOCL)	15
Tamil Nadu	Manali	Chennai Petroleum Corporation Limited (CPCL)	10.5
	Cauvery Basin	Chennai Petroleum Corporation Limited (CPCL)	1
West Bengal	Haldia	Indian Oil Corporation Limited (IOCL)	7.5

Source: Petroleum Planning and Analysis Cell, Ministry of Petroleum and Natural Gas, Government of India

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Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Phones: 91-11-40616000 Fax: 91-11-29955879
E-mail: cseindia@cseindia.org Website: www.cseindia.org