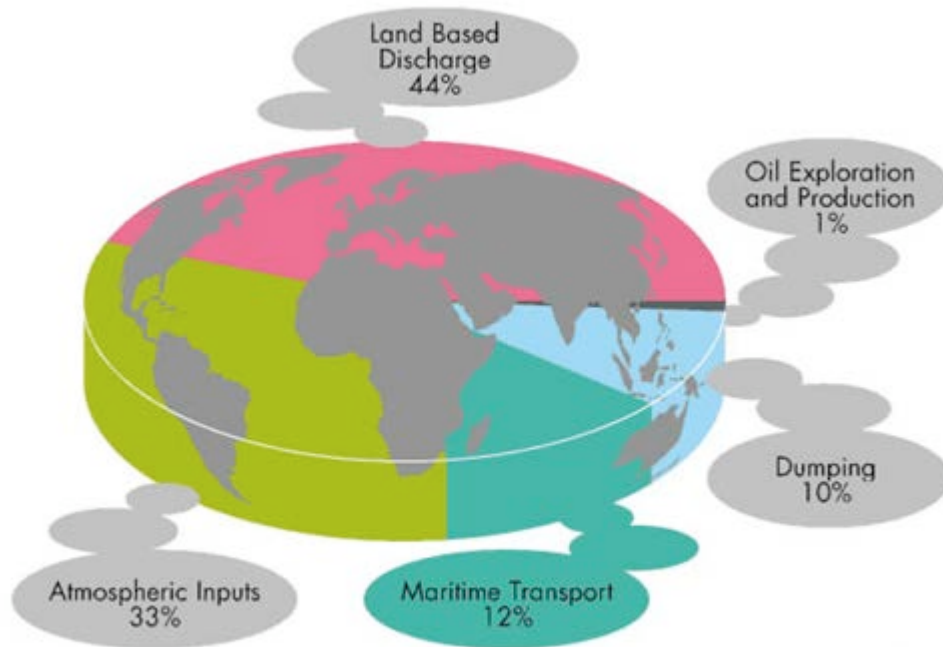


MARINE POLLUTION – DEGRADATION MITIGATION MANAGEMENT IS ESSENTIAL FOR IMPROVING MARINE ENVIRONMENT



Marine Pollution Chart

The health of the world's oceans and marine life is degrading rapidly as a result of excess human activities. Furthermore, as the human population continues to grow and extend the range of its activities, as well as increase its demands for marine goods and services, the world's oceans and coasts will be increasingly stressed. In fact, growing coastal populations and overuse of marine resources are the main source of the problem. The pollution – linked with rising coastal populations, availability of inadequate treatment infrastructure of sewage and other waste handling facilities – is putting at risk human health and wildlife as well as livelihoods from fisheries to tourism.

A. Facts about marine environment - Understanding the elements of the global oceans, their biological, chemical and physical processes and the linkages amongst and between them, is critical to understanding how anthropogenic activities affect and impact the oceans and coasts, and to developing effective management protocols to protect the oceans, coasts and their resources for future generations. Facts about marine environment are listed:

(a) Knowledge of the marine environment is limited,

(b) Degradation of the marine environment due to human activities is likely to be increasing due to increased shipping, ports, marinas, coastal housing and coastal development,

(c) In some parts the area covered by seagrass has declined by up to 80% since the 1960s,

(d) Trawling is having significant ecological impacts in some areas.

B. Degradation of marine environment - In general, degradation of the marine environment refers to damage caused to marine ecosystems and species and are considered as direct and indirect effects of various human activities.

(i) Direct effects of humans on marine habitats and biota includes dredging and dumping (reclamation), removal of biota (through fishing), and construction of marinas, port facilities or breakwaters.

(ii) Indirect effects include introduction of foreign diseases or species, and discharge of nutrients (accelerating the growth of some organisms) and other pollutants that can adversely affect marine biota and habitats.

C. Activities responsible for marine environment degradation -

(i) Direct impacts are caused by a variety of pressures, mainly due to an increasing population, urbanization and industry and tourism development.

(ii) Dredging refers to excavation of sediments from the sea bed to make the water deeper, or as a part of an extractive process.

(iii) Dumping (or reclamation) refers to the deposition of sediments in the marine environment to create new land.

(iv) Both of these processes (whether they are conducted during extractive operations, construction of pipeline trenches, port expansions, shipping activities, or construction of marinas and canals) are destructive to many marine ecosystems.

(v) Introducing soil and mud into the water column increases turbidity and sedimentation, leading to smothering and shading of benthic flora and fauna.

(vi) Reclamation results in complete physical loss of the natural environment.

(vii) Over-fishing and some fishing activities (e.g. trawling, aquaculture) can have severe impacts on species and degrade marine habitat.

(viii) Over-fishing of a target species removes predator or prey animals and affects the ecological food chain.

(ix) Trawling (the dragging of a weighted net behind a boat) can include catch of non-target species, such as seals, dolphins, sharks, sea snakes, fish, turtles, crocodiles, birds and invertebrates (known collectively as by-catch), and has the potential to devastate benthic habitats.

(x) Aquaculture (farming of marine flora and fauna) can contribute to degradation of habitat (for ponds, access and infrastructure) and change the ecology of an area by contributing nutrient waste, and potentially transmitting disease or reducing genetic variability.

It is estimated that land based discharge (sewage, industrial effluent and urban/river run off etc.) and atmospheric inputs from land industry sources account for some 77% of marine pollution generated from human activities and maritime transport is only responsible for some 12% of the total.

D. Classification of marine pollution - Marine pollution can be classified in various ways. It can be categorized by its essential elements (what it is) or where it comes from (the source). A combination of these two is often most useful because it helps us determine the likely impacts and where to focus our efforts to stop the polluting activities. The most serious pollution impacts on the marine environment result from:

(a) Sewage — Un-treated or poorly treated waste waters from human settlements. Sewage in the marine environment is linked to several problems including human diseases, excessive sediments and nutrients in the water, and sometimes, toxic chemicals and marine debris.

(b) Persistent Pollutants— Industries, factories, and mines generate toxic chemicals and heavy metals such as polychlorinated biphenyls or PCBs, some pesticides, and lead that do not break down over time in the environment or in the food chain.

(c) Nutrients— Fertilizers used in agriculture, the nitrogen and phosphorous found in sewage, power plant emissions, and common household products promote excessive algal growth in coastal waters, destroying the delicate balance that keeps reefs and other coastal ecosystems alive. At times, the algae rapidly consume all the oxygen in the water of a particular area, leading to fish kills.

(d) Sediments— Runoff from construction sites, agriculture, and deforestation often send excessive amounts of sediments to coastal areas, smothering corals and degrading other marine habitats.

(e) Solid waste— Litter, especially plastics, makes coastal areas unattractive and harms wildlife. Trash originates from a wide variety of human activities, including poor trash disposal practices on land as well as from all types of boats, especially cruise ships.

(f) Hydrocarbons— Oil, gasoline, and other petroleum products spilled or dumped from offshore drilling platforms and tankers as well as from many businesses, industries, and boats are not only unsightly, but also damage coastal habitats and are deadly to marine wildlife.

(g) Physical alteration and destruction of habitats— Marine, coastal, and inland construction often destroy important habitats such as wetlands. Wetlands not only act as pollution filters, keeping pollutants from reaching marine waters, they are also important spawning and nursery grounds for fish. Their destruction thus worsens the problem of declining fish populations caused by over-fishing.

(h) Heat— Power plants and other industries in coastal areas harm the marine environment by artificially elevating the water temperature which makes these areas inhospitable for the species that have evolved there.

(i) Activities on land pollute the ocean – Pollution generated on land can reach the ocean directly, through the pipes we use to dump our waste. It can also reach the ocean indirectly, through surface water (street runoff into rivers and streams), groundwater, or the air. When we emit chemicals such as

persistent organic pollutants, heavy metals such as lead, and nutrients such as nitrogen into the air, much of that ends up in the ocean through rainfall.

E. Functionality of marine environment protection - To protect the marine environment and ensure there is no significant further loss and degradation of marine habitats, biota and functionality by:

(a) Defining and protecting environmental values in order to protect and improve the condition of the marine environment;

(b) Reducing and eliminating (where practical) the major environmental pressures that degrade, or threaten to degrade, the marine environment and its associated values;

(c) Conserving the marine environment and associated values identified as most important; and

(d) Managing and using marine resources in a sustainable manner and rehabilitating degraded marine areas where practical.

F. Major pressure areas for degradation –

(a) Major shipping corridors result in direct damage to the marine environment by anchor drag and the need for dredging activities to maintain shipping channels. Activities at larger ports present a risk of introduction of species, accidental spills, potential contamination, and habitat destruction. Pressure from ports, other marine facilities and related infrastructure is expected to increase.

(b) Offshore petroleum extraction and onshore industry can place pressure on marine habitats and biota by releasing toxic compounds and nutrients, through physical disturbance and by light and noise pollution. Future increases in pressure are forecast because of expansion of the oil and gas industries.

(c) Pipelines that connect offshore industry to mainland transport infrastructure can impact the marine environment, especially during the construction period.

(d) Areas where people live and stay along the coast are also often subject to degradation of the marine environment. The construction of coastal housing can impact or destroy coastal ecosystems. The marine

environment also affected by discharges of treated waste water to the marine environment. In addition, people need infrastructure to access and use the marine environment, such as jetties, wharves, groynes, sea walls, marinas and moorings.

(e) Fishing has a variety of environmental impacts, including targeting of particular species and size classes and potential to impact other species as either by-catch, prey or predator species. Even though the managed fisheries are relatively well managed and moving toward a whole-of-ecosystem based approach, significant pressure remains from increased recreational fishing, some non-compliance and illegal fishing. Trawling is a method of fishing that has been singled out as having a high environmental impact.

(f) Aquaculture can contribute to marine degradation from the release of waste, accidental release of introduced species, altered water regimes, and clearing of coastal native vegetation to support infrastructure

G. Marine environmental management – Model control measures taken by some of the developed nation to mitigate the effects are discussed below:

(i) Environmental impact assessment is undertaken by developers with projects that are likely to significantly impact the environment.

(ii) Impacts have to be considered collectively, such as dredging, nutrient enrichment and the input of contaminants, and cumulatively where impacts from multiple developments contribute to significant, cumulative loss or disturbance of habitats.

(iii) Marine and coastal habitat mapping are incorporated by some of the nation, in order to estimate the geographically the scale of damage caused due to human activities. There are many projects underway by such government departments and individual companies to map marine and coastal habitats. The capacity for mapping the sea floor has been enhanced dramatically by improved hydro-acoustic techniques. Underwater video footage has also been used in some of the cases to generate state-of-the-art maps of the marine environment.

(iv) Mangrove assessment projects are also being undertaken by some nation to identify, document and assess information about mangroves, in order to assist in their management and conservation.

(v) By-catch action plans: The fisheries department of some nation requires implementation of by-catch action plans for prawn and scallop trawl fisheries.

(vi) Biodiversity Trawl Project aims to gain an understanding of the impacts of trawling on the marine environment, especially with reference to long-term ecological changes.

(vii) Various mitigation measures to be implemented to reduce impacts to benthic habitats from marine pollution and towed equipment, as well as mitigation to be implemented to reduce impacts to reef fish, will also minimize impacts to corals from various marine projects.

H. Conclusion - The oceans are a vast resource whose usefulness to the global society is continuing to be realized. Thus, it is in the best interest of humanity that they are exploited in a manner that is protective and sustainable, in order to preserve their health and guarantee their continuing viability.

There are major implications for the marine environment if degradation pressures are allowed to continue unabated. Marine ecosystems will become more fragmented and less equipped to adapt to changing conditions, such as the effects of climate change. Trawling and over-fishing are also impacting on marine ecosystems and many of the ecological or species changes associated with these issues have not yet been scientifically addressed. Future challenges for protecting the marine environment will hinge on addressing collective pressures and cumulative impacts.

Source : <http://saferenvironment.wordpress.com/2008/10/04/marine-pollution-%E2%80%93-degradation-mitigation-management-is-essential-for-improving-marine-environment/>