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Marine implications: The issues and strategies for the advancement of the world

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Abstract: This paper throws the spark on the reasons for the marine pollution. Moreover, pollution and poor land use practices by population concentrated along rivers and other waterways affect downstream marine habitats because sediments remainigs are washed into canals and local rivers. Habitat conversion and degradation are generally thought to be the most significant threats to terrestrial life. Within marine ecosystems, they rank along with overexploitation and pollution as major causes of biodiversity loss.According to a 1995 report, from 1988 to 1991, humans removed about 8 percent of all annual primary production (the total amount of living carbon) within aquatic ecosystems. Dumping and discharging of pollutants into the sea, oil spills, nutrient- and silt-laden runoff from land and rivers, fallout of chemicals carried by the wind from land-based sources, and noise from ships and other machinery (which disrupts communication among whales and other species) are some of the major contaminants affecting marine species and ecosystems. Over-fishing of a single species can certainly affect other unharvested species within the marine ecosystem. But even such disturbances as deforestation along a river can lead to the degradation of a coral reef or estuary thousands of kilometers away

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All most more than the half of the people in the world live within roughly 100 kilometers of the shore. This means that about 3.6 billion people depend for their basic needs like food, building materials, and agricultural and recreational, and utilise the dumping places and sewage areas. Moreover, pollution and poor land use practices by population concentrated along rivers and other waterways affect downstream marine habitats because sediments remainigs are washed into canals and local rivers.

Most of the world's marine ecosystems-particularly near shore habitats-are stressed by a combination of these factors. The Black Sea, for example, is dying under the weight of pollution and over-fishing. Eutrophication has left 90 percent of the Black Sea facing critically low oxygen levels.

Impact on Marine Biodiversity

The reasons leading to the loss of marine biodiversity can be broken into five categories:

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1. Habitat Loss:

Habitat conversion and degradation are generally thought to be the most significant threats to terrestrial life. Within marine ecosystems, they rank along with overexploitation and pollution as major causes of biodiversity loss.

Coastal development contributes to habitat loss in a number of ways. These include conversion of mangroves and other wetlands as a result of urbanization and agricultural expansion, the building of shoreline stabilization structures such as breakwaters, mining, oil drilling, and dredging and filling. These result both in the destruction of wetlands and other habitats and in the degradation of nearby areas (through siltation and changes in water temperature and flow, salinity, and other physical factors).

Damming of rivers and water diversion projects lead to changes in downstream estuarine and marine communities, because interruption of freshwater flow changes the physical environment of such areas and the amount of nutrients that they receive. In addition, dams can cut off species access to spawning areas-this includes not only species that live in saltwater and reproduce in rivers (such as salmon) but also freshwater species that breed at sea (such as freshwater eels).

Intense exploitation of marine resources can indirectly lead to habitat loss. Fishing with dynamite and harvesting of corals are major threats to coral reef areas.

2. Intense Overexploitation: According to a 1995 report, from 1988 to 1991, humans removed about 8 percent of all annual primary production (the total amount of living carbon) within aquatic ecosystems. This figure is lower than the ratio of primary production co-opted for human use in terrestrial systems; however, it marks exceptionally high removal rates within some of the most productive and species-rich ecosystems. For example, more than one-fourth of all production occurring within ocean upwellings and tropical marine shelf areas is consumed by humans; in temperature shelf regions, it is about 35 percent. Continued exploitation at such levels is leading to changes in species composition, loss of biodiversity, and shifts in dominance and survival ability.

Much of the global fishing effort is targeted at a few species, located primarily near the top of the food chain. Overexploitation of these species has three effects:

- First, it results in the loss of genetic diversity as fish populations decline.
- Second, over-fishing affects the relative abundance of individual species or the mix of different species within an ecosystem. Often, populations of both the target species and the predators that feed on these species decline and are replaced by stocks of lesser commercial value.
- Third, depleted fisheries have direct economic impacts, including reduced income (and unemployment) and higher consumer prices.

3. Contamination and Sedimentation: Dumping and discharging of pollutants into the sea, oil spills, nutrient- and silt-laden runoff from land and rivers, fallout of chemicals carried by the

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wind from land-based sources, and noise from ships and other machinery (which disrupts communication among whales and other species) are some of the major contaminants affecting marine species and ecosystems. As figure 3.4 shows, air pollution and runoff and point discharges from the land (and rivers) account for some three-fourths of the pollutants entering marine ecosystems.

4. Species Introduction: Ships carry an enormous variety of exotic species, including both plankton and larger species in larval form, within their ballast water. According to one estimate, about 3,000 species are transported in ships around the world each day. Accidental introduction of exotic species may be one factor in the apparent spread of toxic blooms; it is also the suspected cause of a disease affecting corals that has recently appeared in waters off the coast of Asia and the Middle East. By feeding on or overrunning dominant native species, exotic species can trigger changes in the species mix within ecosystem.

5. Oil Pollution: The most serious types of oil pollution occur when an oil tanker goes ashore or hits a reef and spills its contents. As the oil drifts ashore, great damage is done to beaches, rocky shores, salt marshes, or mangrove forests. Cleanup is often attempted using mechanical means, or the application if dispersants, with mixed results. Usually, a proportion of native organisms are killed, but given time, the lighter fractions of oil evaporate, while the heavier fractions are decomposed by photochemical processes and microorganisms. International law now requires that vessel owners be responsible for any loss of oil, damage to existing ecosystems, and the costs of recommended cleanup.

Chronic low levels of oil pollution, resulting from accidental spills when loading or unloading, or from washing out oil tanks, are widespread and of significant concern. For example, it has been determined that corals around an oil terminal in the Red Sea have experienced lower growth rates and poor reproduction.

Major Sources and their Impact on Marine Pollution

1. Contaminants affect marine biodiversity in a number of ways. Untreated sewage, oil, heavy metals, and other wastes may be directly toxic to some marine organisms. Their effects may be instantaneous or cumulative. For example, oil has lethal and almost immediate effects on a wide range of marine life-from algae to seabirds-resulting in death through asphyxiation, poisoning, and, among mammals and birds, loss of the insulating functions of feathers and fur, causing hyperthermia. Eggs and larvae are particularly sensitive to the toxic effects of pollutants, as are organisms living at the ocean surface and on the seabed, where wastes tend to accumulate.
2. Other contaminants such as radioactive waste, pesticides, and other chemicals have cumulative effects, building up within individuals over time, especially within species high on the food chain. Moreover, various contaminants and physical degradation can act together in a cumulative or synergistic fashion.

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3. Between 1987 and 1991, dolphin and seal-offs were recorded in the North and Baltic seas, off the eastern coast of the United States,and other parts of Mexico. The carcasses of these animals were found to contain elevated levels of polychlorinated biphenyls (PCBs), dioxins, and other organochlorines, known to accumulate in the blubber (or lipid tissues) of large species and predators at the top of the food chain. These die-offs and an epidemic of tumours observed within green sea turtles have been linked to the cumulative
4. buildup of PCBs and other chemicals that are believed to weaken immune systems, creating a vulnerability to viral infections.
5. Other contaminants can trigger ecosystem-wide changes, resulting in conditions that are inimical to a range of species. Runoff of sewage from cities and of fertilizers from agricultural areas elevates the levels of nutrients within nearshore waters. Certain algal species capitalize on these conditions, undergoing massive population explosions (known as blooms), which, by lowering water clarity and oxygen content, effectively crowd out others in the community. (Algal blooms block the light reaching algae living within corals and other photosynthesizing bottom-dwelling organisms, killing them; then, the decomposition of the bloom algae deoxygenates the water.)
6. Many bloom species produce toxins. So-called killer blooms have been linked to die-offs of fish, shellfish, and other species that consume or come into contact with toxic algae or that ingest other consumes of those algae. Human health can also be at risk. A 1987 toxic bloom occurring off the Guatemaian coast, for example, indirectly resulted in the death of 26 people and produced seafood. Although small-scale blooms (both toxic and non-toxic) are a naturally occurring phenomenon in most regions, the frequency, magnitude, and toxicity of such events appear to have increased dramatically in recent years.
7. Widespread effects are often noted as a result of sedimentation. Soils eroded from deforested areas and poorly managed agricultural lands often end up at sea, reducing light penetration to sea-grass bed, coral, and other communities dependent on the productivity of photosynthesizers living on the sea floor. As sediments settle out, they smother bottom-dwelling organisms and affect filter-feeding species.
8. Non-toxic solid wastes and marine debris cause significant mortality among marine species. For example, plastic bags, fishing lines, and other debris can entangle seals, seabirds, and other organisms, causing slow but sure deaths. Bits of plastic and other man-made materials are regularly ingested by sea turtles and other species, often with fatal consequences.
9. The current problem will be dreadful to marine biodiversity. Among other effects, rising waters and other wetland habitats. Even if global warming were to proceed at pace slow enough to permit species to colonize new coastline boundaries, the presence of existing agricultural and urban development with protective bulkheads and dikes would, in many cases, prevent th3e establishment of new wetland areas.

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10. Projected climate change could have other effects, including changes in ocean currents, salinity (due to changes in river flow), and surface temperatures. These would alter the
11. species composition found within individual ecosystems today, perhaps triggering local and global extinctions in the process.

Tools for Protecting Marine Biodiversity

Because of the human activity both at near shore and far upstream places, many marine species are at risk, there is a great need for comprehensive far-reaching strategies to conserve marine biodiversity. Over-fishing of a single species can certainly affect other unharvested species within the marine ecosystem. But even such disturbances as deforestation along a river can lead to the degradation of a coral reef or estuary thousands of kilometers away. To be effective future measures must include not only mechanisms for protecting species (and ecosystems) whose ranges overlap several countries but also mechanisms to protect species within international waters.

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