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IMPACT OF MARINE POLLUTION ON HUMAN HEALTH AND THE ENVIRONMENT

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Abstract

Development of fisheries has assumed considerable importance in recent years throughout the world and the biologists are of the opinion that, it is only the sea resources that can adequately support the growing population by way of food supply, which the land resources cannot. Eating fish protect us against variety of diseases and illness in adults, such as cancer, cardiovascular disease, diabetes, depression, psoriasis, prostate cancer, stroke and autoimmune disease. Water covers more than 70 percent of the Earth's surface. While less than three percent of this water is drinkable, all of it is necessary for supporting life on Earth. Water pollution is one of the biggest threats to the environment today. Addressing the pollution on marine resources, this study has stressed the impact of marine pollution on human health and the environment.

Water pollution has been extensively documented as a contributor of health problems in humans and marine ecosystems. It has a huge impact on our lives, and we should play an important part by not throwing thrash or chemicals into our water bodies. We can contribute to the improvement of aquatic life and of our health in general. Not only the government but also the non-governmental organizations as well as every individual should contribute their part in conserving our resources to lead a healthy life. Every individual can impart their duty to safe guard the global commons, namely the ocean.

Keywords: global commons, environment, marine pollution, fisheries, food supply, marine sector

Introduction

Fishing sector has very high potential for economic development, domestic nutritional security, employment generation, gender mainstreaming as well as export earnings. And large number of scientists, technocrats and other categories of personnel are engaged in research, education, training, technology development and administration in marine sector. Development of fisheries has assumed considerable importance in recent years throughout the world and the biologists are of the opinion that, it is only the sea resources that can adequately support the growing population by way of food supply, which the land resources cannot. Water covers more than 70 percent of the Earth's surface. While less than three percent of this water is drinkable, all of it is necessary for supporting life on Earth. Water pollution is one of the biggest threats to the environment today.

Review of Literature

Consumption of contaminated seafood is the major route of uptake and has implications with respect to increasing aquaculture. Marine aerosols afford another route of

exposure for man. Typically, the socio-economic factors are most importantly affected through loss of amenities, ecology and produce, leading to degradation of the environment and, for example, reductions in tourism.

Jose G.B Derraik (2002) in his study "the Pollution of the marine environment by plastic debris: a review has analysed that, a large number of marine species is known to be harmed or killed by plastic debris, which could jeopardize their survival, especially since many are already endangered by other forms of anthropogenic activities. Marine mammals are mostly affected through entanglement in and ingestion of plastic litter. He has concluded that it is harmful for the marine life as well as to the human.

Michael Waldichulc (1974) in his study "Coastal Marine Pollution and Fish Ocean Management" has observed that, the world wide problems of marine pollution and other perturbations of the marine environment caused by man, as they affect the fishery resources, can be classified into four major categories.

1. Distribution or unfavourable modification of the estuaries
2. Adverse alteration of the sea water characteristics, e.g., reduction of dissolved oxygen.
3. Acute and Sub-Lethal toxity to marine organisms and
4. Bio accumulation of metals, organic substances, or pathogenic organisms, reading the seafood unacceptable.

Objectives

1. To trace out the sources of marine pollution and its impact on human health.
2. To suggest the ways to prevent marine pollution.

Fish as a Source of Healthy Diet

Fish are low in saturated fat and contain high quality protein and omega-3 fatty acids. Omega-3 fatty acids are essential for cell development in our body. Fish also supply a number of vitamins and minerals, including calcium, iron, vitamin, zinc, niacin, vitamin B6 and vitamin D. It also contributes to a healthy heart and a child's proper growth and intellectual development. IOWA department of public health (IDPH) and several national health organizations recommend that people of all ages can eat fish a minimum of twice per week to achieve optimal health benefits. Pregnant woman consume fish to ensure proper fetal development. Eating fish protect us against variety of diseases and illness in adults, such as cancer, cardiovascular disease, diabetes, depression, psoriasis, prostate cancer, stroke and autoimmune disease.

Pollution Caused in the Marine Resources

The ocean with its significant properties is now polluted due to number of factors. Concerns regarding consumption of fish are now on the alarm due to the rising pollution in the ocean. Low levels of chemicals, both natural and man-made exist in the ocean, but these chemicals due to the bio-reaction in water are converted into dangerous chemicals which is very harmful while consumed. The primary sources of pollution are runoff from

fertilizers, animal manure, sewage discharges, car and power plant emissions, failing septic tanks and residues from industries.

Impact of Mercury on Human Health

Mercury poisoning in fish is of particular concern because fish accumulate the methyl mercury in their tissue where it becomes strongly bonded. Long-lived larger fish that feed on other fish accumulate the highest levels of methyl mercury and pose the greatest risk to people who eat them regularly. Methyl mercury is not removed from fish tissues by any practical cooking method. In the year 1950, the fishermen and their families in the minamata Bay area of Kyushu inland, Japan were stricken with a mysterious neurological illness. Only then people were aware of the toxin mercury in the water. The symptoms were impaired hand-eye co-ordination, memory and speech loss, blurred vision, blindness, muscle weakening and in some cases death. Due to airborne contamination mercury in water are converted to methyl mercury which is very dangerous to human life as well as to the marine resources. Pregnant women and children are more prone to the disease when they consume this polluted fish. It is mainly found in predatory fish (E.g. Sword fish, Shark, Tile fish and King Mackerel)[1].

Impact of Nutrient Pollution

Nutrients such as nitrogen and phosphorus are chemical elements that all living organisms need to grow. But when too much nitrogen and phosphorus is applied both the air as well as water gets polluted. Nutrients can lead to a massive over growth of algae, known as an algae bloom. Certain types of algae emit toxins which cause stomach aches, rashes and other serious problems for human. And again the chemicals used to treate the nutrient polluted water, including chlorine; react with the algae in the water and affects reproductive and developmental health problems.

Algae blooms make water cloudy reduce the ability of aquatic life to find food and clog fish gills. It also consume large amount of oxygen making insufficient for the fish, shell fish and other aquatic organisms to survive.

Impact of Litter and Debris

Litter makes shorelines unattractive and potentially hazardous which de-promotes tourism and economic health. Large amount of fund is spent to increase beach maintenance. Many mammals confuse debris for food and cannot regurgitate an item once it has been swallowed. It lodges in their throat and digestive tracts. Debris which does not pass out of the stomach gives a false sense of fullness, causing some animals to stop eating and slowly starve to death. Most coastal communities rely on the income generated by seaside business and this is affected by the debris and litters collected in the seashore. This scenery of the beach discourages people from fishing, boating, swimming and visiting coastal areas and the income generation of the fishing community is naturally affected.

Impact of Fishing Gears

Certain types of gears such as karaivalai are abandoned in most areas. But still, fishermen apply this gear in order to get more catch. But this gear scrapes the sea floor along with fish, the coral reefs, juvenile fish, eggs and other resources in the sea. Coral reef is very essential for laying eggs and also for the breeding of fish. When this gear is applied, the coral reefs are damaged and scraped off from the sea bed. This affects the process of fish growth and reproduction.

Impact of Sewage

Globally, sewage remains the largest source of contaminations, by volume, of the marine and coastal environment (Gesamp 2001a), and coastal sewage discharges have increased dramatically in the past three decades. In the developing world, with growing population, the provision of basic sanitation, as well as urban sewer systems and sewage treatment, has not kept pace. Recent study suggests that bathing in water well within current micro biological standard still poses significant risk of gastrointestinal disease, and that sewage contamination of marine water is a health problem of global performance. Human settlements along the banks of rivers cause human and animal waste to be discharged into them. The sewage contains the feces, urine and chemical wastes released by millions of people every day. The maltreated sewage is discharged in a wrong manner, besides there being leakages too. Sometimes, the sewage seeps through the ground and contaminates the groundwater. Instead of treating the sewage properly, most of the time, the sewage is released directly into the sea or the rivers, thus polluting the marine life and habitat.

Impact of Industrial Wastes

One of the major causes of water pollution is the discharge of wastes from industries. It is a common observation that industries find rivers and the sea a comfortable place to dump their waste material into. These wastes contain toxic substances and also include elements like lead, mercury, nitrates and sulfates. They are quite harmful for humans as well as aquatic animals. A large amount of money is wasted on treating the water bodies that get contaminated and making them suitable to use for drinking purposes again. Moreover, there are still risks of various diseases after consuming the water containing such toxic materials. Often, hot or contaminated water is also released into the rivers from these industries, which increases the overall temperature of the rivers, thus making them unfavorable for the aquatic flora and fauna. Industrial wastes result in global warming and acid rain. The most common gas emitted from industrial waste is carbon dioxide, accounting for about 50% of all greenhouse gases. Other gases, including methane, CFCs, nitrogen oxides, and ozone, also contribute to forming the greenhouse layer.

Impact of Oilspills from Ships

Nowadays, oil spills have become common and are one of the major causes of water pollution. There have been numerous examples of big tanker ships spilling millions of

gallons of oil into the sea. Sometimes, it is an accidental spill, but most of the time, wastes which are in form of oil are deliberately released into the sea. The spilled oil spreads to huge areas to form oil slicks, making it impossible for marine life and plants of the aqua to get proper sunlight and air. This causes a lot of deaths, and increases the possibility of extinction of some of the already endangered species. If there are trials to sink the oil or chemically treat it, the marine and beach ecosystems will face further disruption. Because oil does not dissolve, it stays on the water surface and suffocates fish. Oil also gets caught in the feathers of sea birds stopping them from flying. Some animals die as a result.

Table.1 Disease Burden of Selective Common and Marine-Related Diseases

Disease	DALYs/Year (Millions)	Economic Impact (US$ Billions)
Malaria	31.0	124.0
Diabetes	11.0	44.0
Trachea, Brachia and Lung Cancer	8.8	35.0
Stomach Cancer	7.7	31.0
Intestinal Nematodes	5.0	20.0
Upper respiratory tract infections	1.3	5.2
Trachoma	1.0	4.0
Dengue Fever	0.75	3.0
Japanese Encephalitis	0.74	3.0
Diphtheria	0.36	1.4
DISEASES RELATED TO CONTAMINATION		
Related to Bathing and Swimming	0.4	1.6
Seafood Consumption (Hepatitis)	1.8	7.2
Seafood Consumption (Algal toxins)	1.0	4.0
Sub Total	**3.2**	**12.8**

Source: GESAMP 2001 A

Steps to be Followed to Prevent Marine Pollution

We have come across many problems of marine pollution and its impacts on the human health and what can be done to reduce this pollutions. Every individual can impart their duty to safe guard the global commons, namely the ocean. Let us follow these simple steps in our day-today life to conserve and protect the precious nature given to us.

Conserve Soil

Erosion is one of the biggest causes of marine pollution today. Planting vegetative covers, strict erosion management and implementing beneficial farming methods are just a few of the many possible approaches to soil conservation.

Dispose of Toxic Chemicals Properly

It's always a good idea to use lower VOC (Volatile Organic Compounds) products in your home whenever possible. If you do use toxic chemicals, such as paints, stains or cleaning supplies, dispose of them properly. Paints can be recycled and oils can be reused after treatment. Proper disposal keeps these substances out of storm drains, water ways and septic tanks.

Keep Machinery in Good Working Order

Oil is one of the largest polluters of water in the world. It's estimated that just the transportation of oil is responsible for .0001 percent of oil contamination in water. Take steps to ensure you aren't adding to this problem by repairing oil leaks in cars and machinery as soon as they are spotted. Clean up the residue and dispose of the used oils properly.

Clean Up Beaches and Waterways

Just picking up waste and litter wherever it is spotted can go a long way to keeping debris and pollutants out of the water. Do your part by taking your own trash, other wastes and any you see to a nearby disposal facility.

Avoid Plastics when Possible

Plastic bags in the ocean are a well documented water pollutant. Keep this problem from getting worse by changing to reusable grocery bags whenever possible.

Conclusion

Water pollution has been extensively documented as a contributor of health problems in humans and marine ecosystems. It has a huge impact on our lives, and we should play an important part by not throwing thrash or chemicals into our water bodies. We can contribute to the improvement of aquatic life and of our health in general. Not only the government but also the non-governmental organizations as well as every individual should contribute their part in conserving our resources to lead a healthy life.

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