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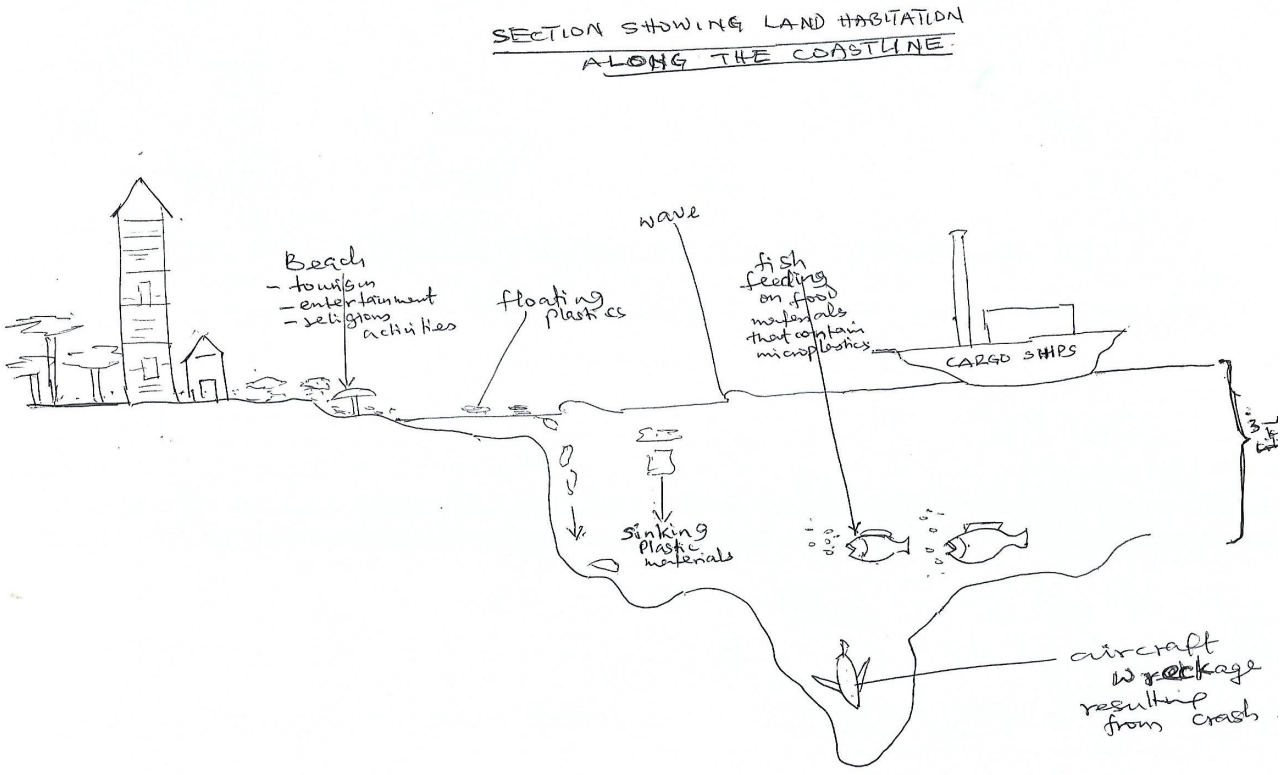
AN OCEAN FREE OF PLASTICS

The oceans represent the largest part of the earth's biosphere, covering 71% of the earth's surface and average depth of 3.75km. Their greatest depths can reach more than 4.5km below sea level. Life occurs throughout this enormous volume of water. The oceans are the cradle of life with a variety of plants and animals living there – more than 200,000 species of plants and animals.

A major threat to the survival of this great diversity of living things is the challenge of plastic pollution. The plastics which exist in various shapes and sizes such as; broken plastic chairs, canopies, plastic bottles are ubiquitous and cause serious harm near coastlines or when they are spread by wind and global ocean currents around the world. It is a problem that requires holistic environmental mitigation at the global stage.



Plastic materials are quite useful and their major end application include packaging, building and construction materials along with automotive components, electrical and electronic equipment, agriculture, and medical equipments. There is bound to be increased global plastic consumption due to population growth. Plastic are essential component of development but efforts should be made to prevent them from polluting the environment.

Source of Marine Plastics:

There are many sources of plastics into the ocean which include land-based sources and ocean-based sources.

* Where there is absence of effective landfills, we may experience fragments of plastic from open dumping grounds into stream, rivers or directly into the ocean. During heavy downpours of rain, people dispose their wastes directly into drains.

* Plastic wastes may also be disposed into streams, rivers or oceans during production and transportation when carrying out industrial activity. Very small plastic particles (microplastics) such as cosmetic, micro beads or fibres from clothing from treatment plants that filter wastes is a source of microsplastic pollution.

* Coastal littering by the beach goers or those who practice religious activities at the beach and those who derive pleasure by visiting the beach to carryout entertainment shows amount to a reasonable percentage of plastic pollution. They leave behind food and beverage packaging and plastic beach toys.

* Runoff water can pick up municipal wastes, wastes from dumpsites, street litter or even landfill wastes can be discharged into the stream, rivers, and oceans during heavy storms through drainable networks.

* Fishing is another sources of plastic pollution of the ocean. Abandoned nets, lines, rope and other fishing gear constitute a huge amount of plastic pollution. Fishing boats and wreckages of ships, trawlers, and crash remains of crashed aircrafts are other sources of plastic pollution. Cargo ships may discharge litter into the ocean by accident.

* Litter can accidentally be released into the ocean during offshore oil and gas under sea exploration. The recently introduced modular refinery activities at the coastline settlements in my country, Nigeria can also contribute to the source of plastic pollution.

* Natural disasters like flooding, earthquake and tsunami as it occurred in Japan in 2011 can introduce unwanted plastic materials into the ocean.

Effects of Plastic Pollution of the Ocean:

Plastic pollution of the ocean can bring about a wide range of environmental, social and economic impacts. Plastic debris threatens marine life and ecosystem in many ways which include the following:

* Loss of aesthetic value: The presence of plastic pollutants makes our coasts to look unsightly, ugly and unwelcoming unlike a pristine beach. Litters of plastic materials or wastes do not promote tourism. Some beaches are used as recreational facilities for swimming, diving and water sports. Where there are large amounts of plastic fibres and polymers, it can cause incidents of entanglements of swimmers and divers.

* Navigationalhazards: Abandoned fishing gear can bring about of the entanglement of anchors and fouling of a vessel's propeller leading to breakdown of vessels and at times cause loss of human lives.

* Ingestion: Many species of marine species ingest plastic litters causing physical damage or blockage of the intestinal tract and this can lead to infection, starvation and death. The ingestion of polychlorinated biphenyl(PCB) can cause reproductive and health disorders among marine animals. Accumulation of microplastics can lead to a high concentration of persistent organic pollutants. Meals can become unattractive when we come across plastic in fish.

* Entanglement and ghost fishing: Marine animals can be entangled in nets, ropes and other plastic debris. Abandoned fishing gear can continue to 'ghost fish' for a long period of time in oceans. Cases of death of vital marine animals such as whales at Bar beach in Lagos have been reported in electronic and print media.

* Economic impact: There are lots of economic implications resulting from plastic pollution of our oceans in terms of lost or reduced revenue. The pollution leads to decline in tourism and losses to fisheries and aquaculture. Shipping industry is likely to experiences reductions in revenue due to damage of vessels, higher cost of rescue operations of vessels affected by marine plastic litters and additional costs in the management of habours and marinas. More costs in the removal of litter from beaches and clean-up exercises.

REMEDIES:

The incidence of plastic pollutants in our oceans is an urgent problem that should involve a concerted efforts global level through policy makers and other stakeholders. The solutions should go as far as reducing the use disposable products and packaging materials; and also better product design.

There should be a better waste disposal and handling along with increased cycling, monitoring of pollution at source and a good measure of public awareness or enlightenment to moderate littering behaviour.

There should be regulation to include bans on certain products and incentives for individuals involve in supply, use and disposal chain. Plastic producers and distributors are to adopt end-of-life waste management practices through policy formulations on marine plastic pollution. Both governments and NGOs are to get involved in the war against plastic pollution through appropriate legislation globally.

REFERENCES:

1. *UNEP (2015)* Global Waste Management Outlook

2. *GESAMP (2015)* "Sources, fate and effects of microplastics in "The marine environment: a global assessment". *GESAMP No: 90, pp96.*

3. *Grantham Institute Briefing paper No 19 (2016).* The Ocean Plastic Pollution Challenger by Erik Van Sebille, Charikleia Spathi and Alyssa Gilbert