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2-5 November, 2017
Inclusion of vulnerable groups: Adolescents in focus

Guide

United Nations Environment Programme

Topic 1: Engagement of adolescents in conservation and restoration of ecosystems in urban areas

Topic 2: The impact of pollution on marine life and the engagement of adolescents to prevent it

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Topic 2: The impact of pollution on marine life and the engagement of adolescents to prevent it

Introduction.

Marine pollution occurs when harmful, or potentially harmful, effects result from the entry into the ocean of chemicals, particles, industrial, agricultural, and residential waste, noise, or the spread of invasive organisms. Eighty percent of marine pollution comes from land. Air pollution is also a contributing factor by carrying off pesticides or dirt into the ocean.

The pollution often comes from nonpoint sources such as agricultural runoff, wind-blown debris, and dust. Nutrient pollution, a form of water pollution, refers to contamination by excessive inputs of nutrients. It is a primary cause of eutrophication of surface waters, in which excess nutrients, usually nitrates or phosphates, stimulate algae growth. Many potentially toxic chemicals adhere to tiny particles which are then taken up by plankton and benthic animals, most of which are either deposit feeders or filter feeders. In this way, the toxins are concentrated upward within ocean food chains. Many particles combine chemically in a manner highly depletive of oxygen, causing estuaries to become anoxic.

When pesticides are incorporated into the marine ecosystem, they quickly become absorbed into marine food webs. Once in the food webs, these pesticides can cause mutations, as well as diseases, which can be harmful to humans as well as the entire food web. Toxic metals can also be introduced into marine food webs. These can cause a change to tissue matter, biochemistry, behaviour, reproduction, and suppress growth in marine life. Also, many animal feeds have a high fish meal or fish hydrolysate content. In this way, marine toxins can be transferred to land animals, and appear later in meat and dairy products.

This topic mainly focus on the methods and procedures adolescents can conduct in order to prevent pollution which is affecting marine life as well as the actions adolescents can take in already polluted marine areas.

Definition of Key Terms

Pollution- means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results, or is likely to result,

1. <http://ocean.nationalgeographic.com/ocean/take-action/10-things-you-can-do-to-save-the-ocean>
2. <https://www.sailorsforthesea.org/programs/ocean-watch/plastic-pollution-and-its-solution>
3. https://en.wikipedia.org/wiki/Marine_conservation

in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of seawater and reduction of amenities.

Marine life is concerned with the plants, **animals** and other **organisms** that live in the ocean. Given that in biology many phyla, families and genera have some **species** that live in the sea and others that live on land, **marine** biology classifies **species** based on the environment rather than on taxonomy.

Adolescents - a young person, usually between the ages of 12 and 18, who is developing into an adult.

Background information

Pathways of pollution

1. Direct Discharge

Pollutants enter rivers and the sea directly from urban sewerage and industrial waste discharges, sometimes in the form of hazardous and toxic wastes.

Inland mining for copper, gold, etc., is another source of marine pollution. Most of the pollution is simply soil, which ends up in rivers flowing to the sea. However, some minerals discharged in the course of the mining can cause problems, such as copper, a common industrial pollutant, which can interfere with the life history and development of coral polyps. Mining has a poor environmental track record.

2. Land Runoff

Surface runoff from farming, as well as urban runoff and runoff from the construction of roads, buildings, ports, channels, and harbours, can carry soil and particles laden with carbon, nitrogen, phosphorus, and minerals. This nutrient-rich water can cause fleshy algae and phytoplankton to thrive in coastal areas; known as algal blooms, which have the potential to create hypoxic conditions by using all available oxygen.

Polluted runoff from roads and highways can be a significant source of water pollution in coastal areas. About 75% of the toxic chemicals that flow into Puget Sound are carried by stormwater that runs off paved roads and driveways, rooftops, yards and other developed land.

3. Ship Pollution

Ships can pollute waterways and oceans in many ways. Oil spills can have devastating effects. While being toxic to marine life, polycyclic aromatic hydrocarbons (PAHs), found

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in crude oil, are very difficult to clean up, and last for years in the sediment and marine environment.

Oil spills are probably the most emotive of marine pollution events. Discharge of cargo residues from bulk carriers can pollute ports, waterways, and oceans. In many instances vessels intentionally discharge illegal wastes despite foreign and domestic regulation prohibiting such actions.

4. Atmospheric pollution

Another pathway of pollution occurs through the atmosphere. Wind-blown dust and debris, including plastic bags, are blown seaward from landfills and other areas. Dust from the Sahara moving around the southern periphery of the subtropical ridge moves into the Caribbean and Florida during the warm season as the ridge builds and moves northward through the subtropical Atlantic. Dust can also be attributed to a global transport from the Gobi and Taklamakandeserts across Korea, Japan, and the Northern Pacific to the Hawaiian Islands. Since 1970, dust outbreaks have worsened due to periods of drought in Africa. There is a large variability in dust transport to the Caribbean and Florida from year to year; however, the flux is greater during positive phases of the North Atlantic Oscillation.

Climate change is raising ocean temperatures and raising levels of carbon dioxide in the atmosphere. These rising levels of carbon dioxide are acidifying the oceans. This, in turn, is altering aquatic ecosystems and modifying fish distributions, with impacts on the sustainability of fisheries and the livelihoods of the communities that depend on them. Healthy ocean ecosystems are also important for the mitigation of climate change

5. Deep sea mining

Deep sea mining is a relatively new mineral retrieval process that takes place on the ocean floor. Ocean mining sites are usually around large areas of polymetallic nodules or active and extinct hydrothermal vents at about 1,400 – 3,700 meters below the ocean's surface. The vents create sulfide deposits, which contain precious metals such as silver, gold, copper, manganese, cobalt, and zinc. The deposits are mined using either hydraulic pumps or bucket systems that take ore to the surface to be processed. As with all mining operations, deep sea mining raises questions about environmental damages to the surrounding areas. Because deep sea mining is a relatively new field, the complete consequences of full-scale mining operations are unknown. However, experts are certain that removal of parts of the sea floor will result in disturbances to the benthic layer, increased toxicity of the water column, and sediment plumes from tailings. Removing parts of the sea floor disturbs the habitat of benthic organisms, possibly, depending on the type of mining and location, causing permanent disturbances. Aside from direct impact of mining the area, leakage, spills, and corrosion would alter the mining area's chemical makeup.

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Types of Pollution

1. Ocean Acidification

The oceans are normally a natural carbon sink, absorbing carbon dioxide from the atmosphere. Because the levels of atmospheric carbon dioxide are increasing, the oceans are becoming more acidic. The potential consequences of ocean acidification are not fully understood, Oceans and coastal ecosystems play an important role in the global carbon cycle and have removed about 25% of the carbon dioxide emitted by human activities between 2000 and 2007 and about half the anthropogenic CO₂ released since the start of the industrial revolution. Rising ocean temperatures and ocean acidification means that the capacity of the ocean carbon sink will gradually get weaker, giving rise to global concerns expressed in the Monaco and Manado Declarations.

2. Eutrophication

Eutrophication is an increase in chemical nutrients, typically compounds containing nitrogen or phosphorus, in an ecosystem. It can result in an increase in the ecosystem's primary productivity (excessive plant growth and decay), and further effects including lack of oxygen and severe reductions in water quality, fish, and other animal populations.

The biggest culprit are rivers that empty into the ocean, and with it the many chemicals used as fertilizers in agriculture as well as waste from livestock and humans. An excess of oxygen-depleting chemicals in the water can lead to hypoxia and the creation of a dead zone.

Estuaries tend to be naturally eutrophic because land-derived nutrients are concentrated where runoff enters the marine environment in a confined channel. The World Resources Institute has identified 375 hypoxic coastal zones around the world, concentrated in coastal areas in Western Europe, the Eastern and Southern coasts of the US, and East Asia, particularly in Japan. In the ocean, there are frequent red tide algae blooms that kill fish and marine mammals and cause respiratory problems in humans and some domestic animals when the blooms reach close to shore.

3. Plastic debris

Marine debris is mainly discarded human rubbish, which floats on, or is suspended in the ocean. Eighty percent of marine debris is plastic – a component that has been rapidly accumulating since the end of World War II. The mass of plastic in the oceans may be as high as 100,000,000 tonnes (98,000,000 long tons; 110,000,000 short tons).

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Discarded plastic bags, six pack rings, and other forms of plastic waste which finish up in the ocean present dangers to wildlife and fisheries. Aquatic life can be threatened through entanglement, suffocation, and ingestion. Fishing nets, usually made of plastic, can be left or lost in the ocean by fishermen. Known as ghost nets, these entangle fish, dolphins, sea turtles, sharks, dugongs, crocodiles, seabirds, crabs, and other creatures, restricting movement, causing starvation, laceration, infection, and, in those that need to return to the surface to breathe, suffocation.

4. Toxins

Apart from plastics, there are particular problems with other toxins that do not disintegrate rapidly in the marine environment. Examples of persistent toxins are PCBs, DDT, TBT, pesticides, furans, dioxins, phenols, and radioactive waste. Heavy metals are metallic chemical elements that have a relatively high density and are toxic or poisonous at low concentrations. Examples are mercury, lead, nickel, arsenic, and cadmium. Such toxins can accumulate in the tissues of many species of aquatic life in a process called bioaccumulation.

5. Underwater noise

Marine life can be susceptible to noise or the sound pollution from sources such as passing ships, oil exploration seismic surveys, and naval low-frequency active sonar. Sound travels more rapidly and over larger distances in the sea than in the atmosphere. Marine animals, such as cetaceans, often have weak eyesight, and live in a world largely defined by acoustic information. This applies also to many deeper sea fish, who live in a world of darkness. Noise also makes species communicate louder, which is called the Lombard vocal response. Whale songs are longer when submarine-detectors are on. If creatures don't "speak" loud enough, their voice can be masked by anthropogenic sounds. These unheard voices might be warnings, finding of prey, or preparations of net-bubbling. When one species begins speaking louder, it will mask other species voices, causing the whole ecosystem to eventually speak louder.

Organizations involved

Environmental defence a non-profit organization based in New York bringing together experts in science, law and economics to tackle complex environmental issues that affect our oceans, our air, our natural resources, the livability of our man-made environment, and the species with whom we share our world.

Global Marine Litter Information Gateway[®]: a co-operative effort of the UNEP GPA Coordination Office, the Swedish Environmental Protection Agency, and the UN International Maritime Organization. The objective is to provide a clearing-house, a

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gateway, for supply and exchange of information on the global, regional and local problem of marine litter.

International Maritime Organization

The **International Maritime Organization(IMO)**, known as the **Inter-Governmental Maritime Consultative Organization (IMCO)** until 1982, is a specialised agency of the United Nations responsible for regulating shipping. The IMO's primary purpose is to develop and maintain a comprehensive regulatory framework for shipping and its remit today includes safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping.

Greenpeace International⁴: Greenpeace's oceans campaign focusing on three major threats to the world's oceans: overfishing, pirate fishing, whaling, and intensive shrimp aquaculture.

Institute for Ocean Conservation Science⁵: to advance ocean conservation through science. They conduct world-class scientific research that increases knowledge about critical threats to oceans and their inhabitants, provides the foundation for smarter ocean policy, and establishes new frameworks for improved ocean conservation.

United Nations Environment Programme

As a leading global authority on the environmental theme that determines the environmental agenda, the United Nations Environment Program (UNEP), which was founded in 1972, emphasizes and promotes the sustainable development in the field of environmental issues within the United Nations and global pleader and advocate for the concern of the environment. It has formulated its own mission as follows: "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations."⁵ It provides research and development programs on regional, national and international level, thus aiming to tackle the biggest environmental issues of our time, including soil degradation and erosion.

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Timeline of Events

Date	Event	Outcome
1950	United Nations Conventions on the Law of the Sea	Marine pollution was a concern. Most scientists believed that the oceans were so vast that they had unlimited ability to dilute, and thus render pollution harmless.
late 1950s - early 1960s,	Dumping Radio active waste	Dumping radioactive waste off the coasts of the United States by companies licensed by the Atomic Energy Commission, into the Irish Sea from the British reprocessing facility at Windscale, and into the Mediterranean Sea by the French Commissariat à l'Energie Atomique.
1967 1969	Crash of the oil tanker Torrey Canyon Santa Barbara oil spill off the coast of California. International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION).	Severe marine pollution

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1973	International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)	Prevent marine Pollution
1990	International Convention on Oil Pollution Preparedness, Response, and Cooperation (OPRC).	Prevent marine Pollution
1972	United Nations Conference on the Human Environment, held in Stockholm. London Convention	Marine pollution was a major area of discussion. Signing of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
2001	Stockholm Convention on Persistent Organic Pollutants	signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants
2009	Blue Vision summit	Organized by Blue Frontier To develop strategies for protecting oceans.

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2017	United Nations Ocean Conference	Conservation and sustainable use of the oceans, seas and marine resources.
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Previous Attempts to solve the Issue

Earlier this year, the UN declared war on ocean plastic. Launched at the Economist World Ocean Summit in Bali, the #CleanSeas campaign urges governments to pass plastic reduction policies, targets industries to minimize plastic packaging and redesign products, and urges people to change their own habits. In 2010 the international community agreed to protect 10% of the ocean by 2020 in the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011–2020 and Sustainable Development Goal 14. However as of June 2017 less than 3% of the ocean are under some form of protection. Pledges made during the conference would add around an additional 4.4 percent of protected marine areas, increasing the protected total to around 7.4% of the ocean.

Possible Solutions that adolescents can achieve

Preventing marine pollution is vital for the well-being of the sea, the marine life it supports and us! Cleaner oceans mean we can continue to enjoy our beaches for swimming, fishing and recreation.

There's plenty you can do, either on your own or in a group, to make a huge difference.

1. Organise a beach clean-up

Wouldn't it be great if we never saw any rubbish on our beaches? Unfortunately, this isn't always the case. Picking up other people's rubbish, if it is safe, is an easy way to help reduce pollution on our beaches and in the ocean. Some people pick up beach rubbish in groups – this is called a beach clean-up. Beach clean-ups are doing great things to reduce marine pollution. If you would like to join a beach clean-up group take a look at the Love your coast website to see if any groups already exist.

2. Reduce your rubbish

Studies have shown that about 80 percent of marine pollution comes from the land. So, one of the main ways to reduce marine pollution is to get rid of rubbish carefully, wherever

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we are. If we reduce the amount of rubbish we make on the land it is likely there will be less rubbish in the ocean.

You can reduce your rubbish at home and at school by recycling paper, glass, cans and some plastic containers. You could also compost food scraps and find ways to reuse some of your rubbish.

3. Taking care of the local stream

As most streams and rivers flow into the ocean, taking care of them can help reduce marine pollution. If rubbish ends up in a stream or river it will very likely end up in the ocean. Another type of marine pollution that comes from streams and rivers is soil or sediment pollution. Sediment pollution can happen when soil enters waterways that flow to the sea. It is natural for some sediment to enter the ocean, but when there is a lot of it entering the ocean it becomes a problem. Sediment pollution can be increased by human activities such as earthworks near streams or when plants near streams have been removed

4. Use Fewer Plastic Products

Plastics that end up as ocean debris contribute to habitat destruction and entangle and kill tens of thousands of marine animals each year. To limit your impact, carry a reusable water bottle, store food in nondisposable containers, bring your own cloth tote or other reusable bag when shopping, and recycle whenever possible.

5. Don't Purchase Items That Exploit Marine Life

Certain products contribute to the harming of fragile coral reefs and marine populations. Avoid purchasing items such as coral jewelry, tortoiseshell hair accessories (made from hawksbill turtles), and shark products.

6. Support Organizations Working to Protect the Ocean

Many institutes and organizations are fighting to protect ocean habitats and marine wildlife. Find a national organization and consider giving financial support or volunteering for hands-on work or advocacy. If you live near the coast, join up with a local branch or group and get involved in projects close to home.

7. Influence Change in Your Community

Research the ocean policies of public officials before you vote or contact your local representatives to let them know you support marine conservation projects. Consider patronizing restaurants and grocery stores that offer only sustainable seafood, and speak up about your concerns if you spot a threatened species on the menu or at the seafood counter.

8. Educate Yourself About Oceans and Marine Life

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All life on Earth is connected to the ocean and its inhabitants. The more you learn about the issues facing this vital system, the more you'll want to help ensure its health—then share that knowledge to educate and inspire others.

Useful links:

1. <http://ocean.nationalgeographic.com/ocean/take-action/10-things-you-can-do-to-save-the-ocean>
2. <https://www.sailorsforthesea.org/programs/ocean-watch/plastic-pollution-and-its-solution>
3. <http://www.un.org/en/sections/issues-depth/oceans-and-law-sea>
4. <http://www.un.org/apps/news/story.asp?NewsID=56638#.WdOBkZMjF8c>
5. <http://www.un.org/en/conf/ocean/news.shtml>
6. <http://ecosalon.com/10-ocean-conservation-groups-making-a-difference>
7. <https://www.epa.gov/international-cooperation/protecting-marine-environment>
8. <https://mfe.govt.nz/marine/marine-pages-kids/how-you-can-reduce-marine-pollution>
9. <https://environment.gov.au/marine/marine-pollution>
10. <http://www.brighthubengineering.com/seafaring/37397-effects-of-marine-pollution-on-the-sea>
11. http://wedocs.unep.org/bitstream/handle/20.500.11822/7096/Consolidated_BC95_Eng.pdf?sequence=1&isAllowed=y

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