

Course Code:MCC102A
Course Title:Environmental Studies

Lecture No: 16
Title: Solid waste
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Lecture-16

Intended Learning Outcomes

At the end of this lecture, students will be able to

- Define solid waste and Marine pollution
- List the sources of solid waste
- Describe effects of marine pollution
- Explain different sources of marine pollution



Solid Waste

- Urban India produces 1,20,000 tons of MSW/Day.
- Per capita waste generation in major cities of India ranges from 0.8 kg to 1.0 kg per day.
- Of the MSW collected; 94% is dumped on land and 5% is composted
- Karnataka State generates 3553.97 tons/Day , disposes 2848.05 tons/Day and the remaining is uncollected wastes.



Sources

- Municipal Wastes
- Agricultural Wastes And Sewage Sludge
- Industrial Wastes and Mining Wastes
- Bio-Medical Wastes
- E-Wastes
- Radioactive W



Effects of Solid Wastes

- Pollute ground water
- Waste becomes storehouses for pathogens
- Causes skin diseases, respiratory tract infections, stomach infections, eye irritation, etc.
- Dumping helps the breeding of mosquitoes
- Burning releases furans (Chlorinated Carbons) which reduces the fertility of human.
- Hazardous substances include mercury, chromium, etc
- Bioaccumulation-Accumulation of copper in soil inhibit plant growth.



Marine Pollution

- Marine pollution includes a range of threats including from land-based sources,
 - Oil spills
 - Untreated sewage
 - Eutrophication (nutrient enrichment)
 - Invasive species
 - Persistent organic pollutants (POP's)
 - Heavy metals from mine tailings and other sources
 - Acidification
 - Radioactive substances
 - Overfishing and destruction of coastal and marine habitats



Marine Pollution



There are three main types of inputs of pollution into the ocean:

- Direct discharge of waste into the oceans
- Runoff into the waters due to rain
- Pollutants that are released from the atmosphere

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
- Acid mine drainage causes severe environmental problems in Rio Tinto river, Spain



Surface Run-off

- 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



Ship's pollution

Ships can pollute waterways and oceans in many ways.:

- Oil spills can have devastating effects.
- The components in crude oil, are very difficult to clean up, and last for years in the sediment and marine environment.
- It has been estimated that container ships lose over 10,000 containers at sea each year (usually during storms).
- Ships also create noise pollution that disturbs natural wildlife



Eutrophication



- Eutrophication is the enrichment of water as a result of an increase in nutrients, which can have a negative impact on the marine and coastal environment.
- The negative effects of Eutrophication on marine ecosystems includes:
 - Algal blooms
 - Increased growth of macroalgae
 - Increased sedimentation and oxygen consumption
 - Oxygen depletion in the bottom water

Effects of marine pollution

- Many important commercially important marine species are also killed due to clogging of gills
- When liquid oil is spilled on the sea it spreads over the surface of the water to form a thin film called an oil slick
- Drill cuttings dumped on the seabed create anoxic conditions and result in the production of toxic Sulphides



Summary

- Solid waste means any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant
- Major causes of marine pollution are oil spill, Eutrophication, Invasive species, Persistent organic pollutants (POP's), Overfishing and destruction of coastal and marine habitats
- Marine pollution is due to direct discharge, surface runoff etc

