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Marine Pollution

- Marine Pollution is caused due to Sewage Sludge, Industrial Effluents, Detergents, solid waste, plastic, etc.
- Sources :
 - River- Bring pollutants from drainage basins
 - Catchment Area- Human Settlements
 - Oil Drilling & Shipment
- Effects :
 - Fishes show mortality
 - Oil disrupts the insulating capacity of feathers



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Control measures

Effluents should not be discharged

Treatment before discharge

Strict law enforcement- regarding drilling in Eco-sensitive zones, dumping of toxic & Hazardous wastes





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Thermal Pollution



Definition : Presence of waste heat which can cause undesirable changes in natural environment.

Causes:

Heat producing Industries

Power plants utilize only 1/3rd energy produced by fossil fuel rest is wasted as heat

Cold water is taken from water body for cooling



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Effects...?

- Oxygen penetration decreases, dissolved oxygen also reduces as the solubility is decreased
- Heat kills fishes and other aquatic life.
- Toxicity of pesticides & chemicals increase with increase in temperature
- Fish migration is affected
- Composition of flora & fauna changes-
- Temp. tolerant spp. Start developing





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Control of Thermal pollution

Cooling ponds, cooling towers and spray ponds





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Noise pollution

- Unwanted and unbearable sound is “Noise”
- Sound travels in form of pressure waves through air, liquid or solid
- Measured on **DECIBEL SCALE**.
- Maximum during Diwali, Ganpati and other festivals
- Higher in Industrial area.
- 80 to 120 dB
- Crackers: 125 dB
- Construction: 100 dB





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Sources and effects

Transportation

Heavy Machinery

Construction activities

Celebrations and household appliances

Physiological and psychological
changes

Communication disturb

Hearing damage

Sleep disturbance





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Noise standards

Night 10 p.m. to morning 6 a.m.- loud noise banned.

Declaration of Zones

Permissible dB levels

Area	Day time 6 am to 10 pm	Night time 10 pm to 6 am
a) Industrial	75dB	70dB
b) Commercial	65dB	55dB
c) Residential	55dB	45dB
d) Silence zone	50dB	40dB



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Control

- Reduction at the source
- Proper maintenance of machineries
- Machineries should be covered
- Use of sound absorbing silencers
- Through law
- Planting more trees of broad leaves





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Nuclear Or Radioactive Hazard

- Natural radioactive decay
- Give out fast moving particles, high energy, radiations.
- Nuclear accidents, test laboratories radioactive fallout





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Effects and control

Genetic damage : DNA alterations, gene damage, chromosome damage

Somatic damage: Burns, miscarriages, eye cataract, cancers of skin, bones, breast.

Proper siting.

Proper disposal.





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Soil pollution

- Soil is upper layer of earth crust, contains organic matter, fertile
- Dumping of wastes causes soil pollution
- Garbage
- Rubbish like glass, plastics, metallic cans, papers, cloth rags, containers
- Discharge of Industrial wastes.
- Fly ash from Thermal power plants
- Fertilizers and pesticides: DDT, endrin, Lindane.
- Sewage sludge and radioactive wastes



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Effects and control

- Reduce soil productivity
- Affects soil flora and fauna
- Sludge contains worms, bacteria and pathogens.
- Radioactive wastes enter food chain:

- Convert waste to biogas, fuel etc.
- Recover from soil.



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Social issues and the Environment



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Key aspects for sustainable development

- 1) **Inter- generational equity:** We should minimize any adverse impacts on resources and environment for future generation i.e. we should hand over a safe, healthy and resourceful environment to our future generations. This can be possible only if we stop over-exploitation of resources, reduce waste discharge and emissions and maintain ecological balance.
- 2) **Intra generational equity:** This emphasizes that the development processes should seek to minimize the wealth gaps within and between nations.

The technology should address the problems of the developing countries, producing drought tolerant varieties for uncertain climates etc.



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Measures for sustainable Development

Using appropriate technology: It is one which is locally adaptable, eco-friendly efficient and culturally suitable. It involves local labours, less resources and produces minimum waste The Concept is “**Design with Nature**”.

Promoting environmental education awareness: Environmental education will help in changing the thinking and attitude of people towards environment.

Population stabilization: We can achieve sustainable development by controlling population.

Conservation of nonrenewable resources: It should be conserved by recycling and reusing.



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How to achieve sustainable development ?

- Reduce our dependency on heavy metals and fossil fuels such as coal, oil and natural gas.
- Reduce our dependency on synthetic chemicals.
- Reduce our destruction of nature which includes clearing of forest and natural habitats for human needs.
- The fourth principal is to ensure that we don't stop people from meeting their needs in order to achieve environmental sustainability. We must maintain a balance between environmental and economic sustainability.



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ENVIRONMENTAL-ETHICS

Issues and Possible Solutions

Environmental ethics refers to the issues, principles and guidelines relating to human interactions with their environment. It is rightly said, The environmental crisis is an outward manifestation of the crisis of mind and spirit..

These two world-views are discussed here in relation to environmental protection:

- (a) Anthropocentric Worldview and
- (b) Eco-centric Worldview



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- (a) Anthropocentric Worldview:** This view is guiding most industrial societies. It puts human beings in the center giving them the highest status. Man is considered to be most capable for managing the planet earth. The guiding principles of this view are:
- (i) Man is the planets most important species and is the in-charge of the rest of nature.
 - (ii) Earth has an unlimited supply of resources and it all belongs to us.
 - (iii) Economic growth is very good and more the growth, the better it is, because it raises our quality of life and the potential for economic growth is unlimited.
 - (iv) A healthy environment depends upon a healthy economy.
 - (v) The success of mankind depends upon how good managers we are for deriving benefits for us from nature.



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(b) Eco-centric Worldview: This is based on earth-wisdom. The basic beliefs are as follows:

- (i) Nature exists not for human beings alone, but for all the species.
- (ii) The earth resources are limited and they do not belong only to human beings.
- (iii) Economic growth is good till it encourages earth-sustaining development and discourages earth-degrading development.
- (iv) A healthy economy depends upon a healthy environment.



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Guidelines

- Environmental ethics can provide us the guidelines for putting our beliefs into action and help us decide what to do when faced with crucial situations. Some important ethical guidelines known as Earth ethics or Environmental Ethics are as follows:
- You should love and honour the earth since it has blessed you with life and governs your survival.
- You should keep each day sacred to earth and celebrate the turning of its seasons.
- You should not hold yourself above other living things and have no right to drive them to extinction.
- You should be grateful to the plants and animals which nourish you by giving you food.
- You should limit your off springs because too many people will overburden the earth.
- You should not waste your resources on destructive weapons.



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Water conservation management



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How can we conserve water

Water being one of the most precious and indispensable resources needs to be conserved.

Water conserving strategies:

- a. **Decreasing run off:** Huge water-loss occurs due to runoff on most of the soils, which can be reduced by allowing most of the water to infiltrate into the soil. This can be achieved by following practices.

Conservation-bench terracing involves construction of a series of benches for catching the run off water.

Chemical wetting agents (Surfactants) increase the water intake rates when added to normal irrigated soils.



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- a. surface crop residues, Tillage, mulch, animal residues etc. help in reducing run-off by allowing more time for water to penetrate into the land.
- b. Reducing evaporation losses: This is more relevant in humid regions. Horizontal barriers of asphalt placed below the soil surface increase water availability and and increase crop yields by 35-40%.
- c. Storing water in soil: Storage of water takes place in the soil root zone in humid regions when the soil is wetted to the field capacity.



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d. Reducing irrigation losses:

- Use of lined or covered canals to reduce seepage
- Irrigation in early morning or late evening to reduce evaporation losses.
- Sprinkling irrigation and drip irrigation to conserve water by 30-50%.

e. Reuse of water

f. Preventing wastage of water