ENVIRONMENTAL STUDIES

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Biodiversity

RESPECT THE BALANCE!

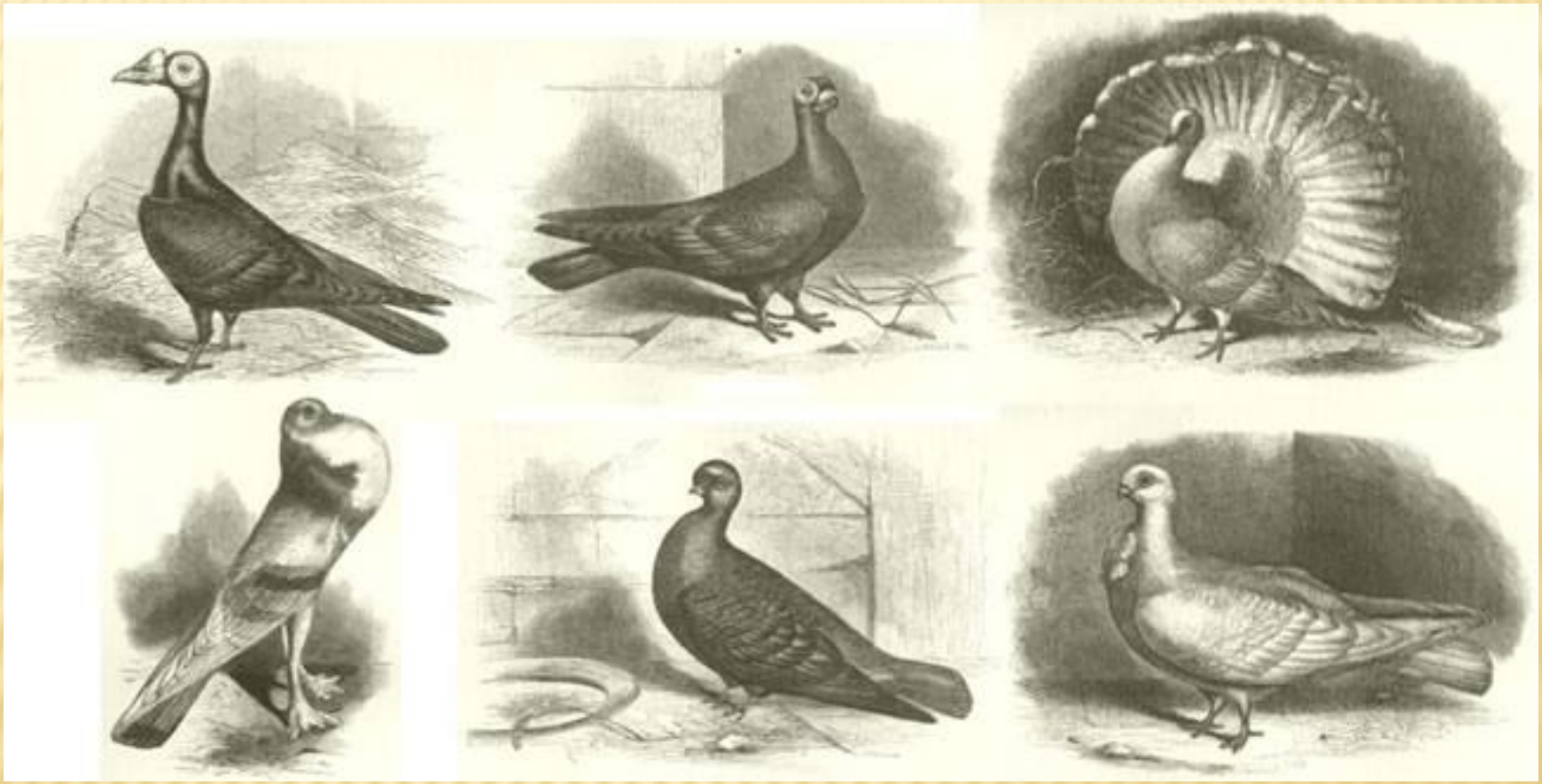
INTRODUCTION

- BIO means Life and DIVERSITY means Variety
- Biodiversity is the variety of life on earth
- It includes all life forms-from the unicellular fungi, protozoa and bacteria to complex multicellular organisms such as plants, birds, fishes and animals.
- Biodiversity is the variety of flora and fauna on this planet earth.

BIOLOGICAL DIVERSITY

- Genetic diversity – the genetic variation among individuals in a species
- Species diversity – the number of different species in a given area
- Ecosystem (Habitat) diversity – the variety of interactions among organisms in a community (or the variety of ecosystems on Earth)

Genetic diversity



Species Diversity

A species is one of the basic units of biodiversity.

Different Species of Frogs

ECOSYSTEM DIVERSITY

- This is the diversity of ecological variations in ecological niches, trophic structure, food-webs, nutrient cycling etc.



BENEFITS OF BIODIVERSITY

Consumptive value:

- Food/Drink
- Fuel
- Medicine
- Better crop varieties
- Industrial Material

Non-Consumptive Value:

- Recreation
- Education and Research
- Traditional value

Ecological services:

- Balance of nature
- Biological productivity
- Regulation of climate
- Degradation of waste
- Cleaning of air and water
- Cycling of nutrients
- Maintenance of Soil fertility

THREATS TO BIODIVERSITY

Natural causes:

- Narrow geographical area
- Low population
- Low breeding rate
- Natural disasters

Anthropogenenic causes:

- Habitat modification
- Over exploitation of selected species
- Innovation by exotic species

- Pollution
- Hunting
- Global warming and climate change
- Agriculture
- Domino effect

CONSERVATION OF BIODIVERSITY

Biodiversity is our life. If the Biodiversity got lost at this rate then in near future, the survival of human being will be threatened. So, it is our moral duty to conserve Biodiversity as well our Environment.

- Conservation Biology – study and implementation of methods to protect biodiversity
- Legal Protections of species
- Preserving habitats

CONSERVATION OF BIODIVERSITY

- Habitat corridors
- Working with people (park rangers and the like)
- Reintroduction and species preservation programs
- Captivity
- Protecting plant species

ENVIRONMENT POLLUTION AND PREVENTION

- **Environmental Pollution can be defined as any undesirable change in physical, chemical, or biological characteristics of any component of the environment i.e. air, water, soil which can cause harmful effects on various forms of life or property.**

- **Pollution: The term pollution can be defined as influence of any substance causing nuisance, harmful effects, and uneasiness to the organisms**

- **Pollutant:- Any substance causing Nuisance or harmful effects or uneasiness to the organisms, then that particular substance may be called as the pollutant.**

TYPES OF POLLUTION

- WATER POLLUTION
- MARINE POLLUTION
- THERMAL POLLUTION
- AIR POLLUTION
- NOISE POLLUTION

WATER POLLUTION

- Water Pollution can be defined as alteration in physical, chemical, or biological characteristics of water through natural or human activities and making it unsuitable for its designated use.

The sources of water pollution can be classified as:

- Municipal Waste Water
- Industrial Waste
- Inorganic Pollutants
- Organic Pollutants
- Agricultural Wastes

MUNICIPAL WASTE WATER

Industrial Pollutants

Inorganic Pollutants

Organic Pollutants

AGRICULTURAL WASTES

- Chemical fertilizers and pesticides have become essential for present day high yielding crops.
- Consequently , they have become a potential source of water pollution. These fertilizers contain major plants nutrients mainly nitrogen, phosphorous, and potassium.
- Excess fertilizers may reach the ground water by leaching or may be mixed with surface water of rivers, lakes and ponds by runoff and drainage.

MARINE POLLUTION

- Ocean are the final sink of all natural and manmade pollutants. Rivers discharge their pollutants into the sea. The sewage and garbage of costal cities are also dumped into the sea. The other sources include, discharge ofoils,grease, detergents, and radioactive wastes from ships.

THERMAL POLLUTION

- **Thermal Pollution of water is caused by the rise in temperature of water. The main source of thermal pollution are the thermal and nuclear power plants. The power generating plants use water as coolants and release hot water into the original source. Sudden rise in temperature kills fish and other aquatic animals.**

AIR POLLUTION

- **Air pollution** is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or built environment, into the atmosphere.

- A substance in the air that can cause harm to humans and the environment is known as an air pollutant.

CAUSES OF AIR POLLUTION

- Carbon dioxide-this happens because of Deforestation and fossil fuel burning.
- Sulfur dioxide –Due to the burning of sulfur containing compounds of fossil fuels.
- Sulfur oxides- very dangerous to humans at a high concentration. Sulfur in the atmosphere is responsible for acid rain.

AIR POLLUTION

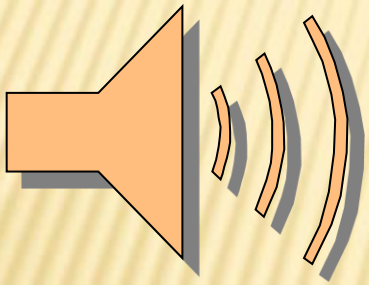
NOISE POLLUTION

- **Noise pollution** is excessive, displeasing human, animal, or machine-created environmental noise that disrupts the activity or balance of human or animal life.

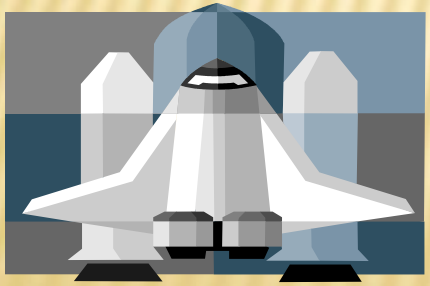
SOUND INTENSITY

Very High above than 100db

Jet take off



Loudspeaker



Space vehicle launch

High Approximate 80db

Heavy Traffic

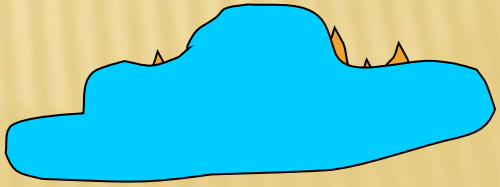
Loud Conversation

Sports car

Pleasant below than 80dB

Quit Conversation

Ticking Clock



Quit Raining

WASTE MANAGEMENT

- Waste management is the "generation, prevention, characterization, monitoring, treatment, handling, reuse and residual disposition of solid wastes"

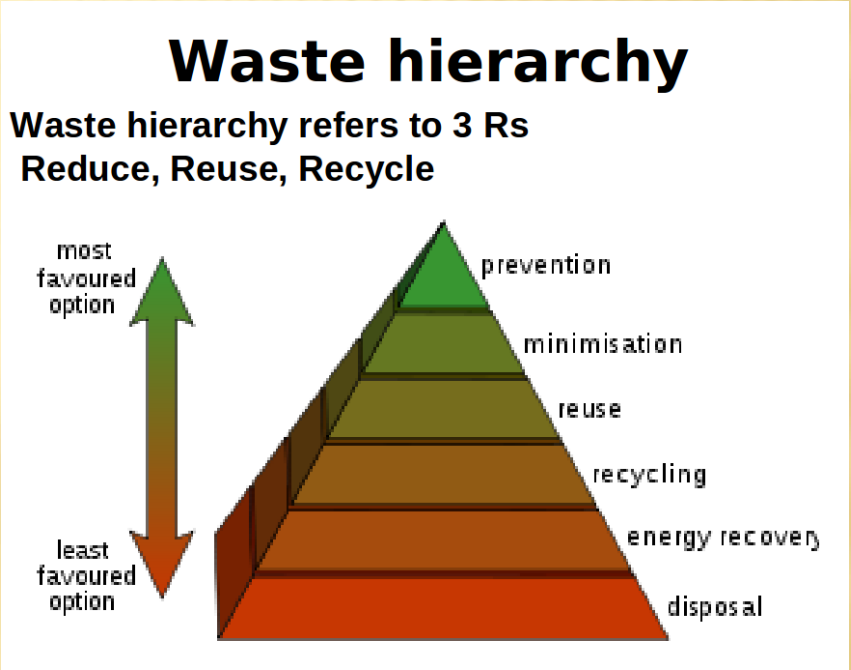
Sources of Wastes

Households

Commerce and Industry

IMPACTS OF WASTE IF NOT MANAGED WISELY

- Affects our health
- Affects our socio-economic conditions
- Affects our coastal and marine environment
- Affects our climate



DISASTER MANAGEMENT

Disaster management is the managerial function charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters.

SUSTAINABLE DEVELOPMENT

- Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It also looks at the equity between countries and continents, races and classes, gender and ages.

- It includes social development and economic opportunity on one hand and the requirements of environment on the other. It is based on improving the quality of life for all, especially the poor and deprived within the carrying capacity of the supporting ecosystems.

- We have moved form unsustainable means of development to sustainable means of development due to the adverse effects our actions have wreaked on the planet. The need for energy and resources for the future has led us to adopt conservation methods and establish ethics and moral for development.

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WATER CONSERVATION

- **Saving water in agriculture: Drip irrigation** supplies water to plants near its roots through a system of tubes, thus saving water

- **Saving water in urban settings**: Urban people waste large amounts of water. Leaking taps and pipes are a major source of loss of water.

- Current technologies of rainwater harvesting require that all roof and terrace water passes down into a covered tank where it can be stored.\Another way of using rooftop rainwater harvesting is to collect it so that it percolates into the ground to recharge wells instead of flowing over the ground into rivers

- The management of a **single unit of land with its water drainage system is called watershed management**. This includes soil and water management and developing vegetative cover. The natural drainage pattern of a watershed unit if managed appropriately can bring about local prosperity by a year round abundance of water that improves the quality of human life in the area.

WATERSHED MANAGEMENT MEASURES

- Take appropriate soil conservation measures. This is done by constructing a series of long trenches and mounds along contours of the hill to hold the rainwater and allow it to percolate into the ground

- 2. Allowing grasses and shrubs to grow and by planting trees (mainly local species) which hold the soil and prevents it from being washed away in the monsoon. Local grass cover can however only increase if free grazing of domestic animals is prevented by stall feeding.

- 3. The next measure is to make ‘nala’ plugs in the streams so that the water is held in the stream and does not rush down the hillside. In selected sites, several small check dams are built which together hold back larger amounts of water.

RESETTLEMENT

- The Government is expected to find ‘good’ arable land to resettle displaced persons and provide them with an adequate rehabilitation package to recover from the disruption. This has rarely occurred to the satisfaction of the project affected individuals. Eg. Tehri Project

ENVIRONMENTAL ETHICS

- Environmental ethics is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world.
- Resource consumption patterns and the need for their equitable utilisation

- **Status of India's Environment by Anil Agarwal**
  - Environmental destruction is largely caused by the consumption of the rich. The worst sufferers of environmental destruction are the poor.
  - Even where nature is being 'recreated', as in afforestation, it is being transformed away from the needs of the poor and towards those of the rich.

- If we care for the poor, we cannot allow the Gross Nature Product to be destroyed any further. Conserving and recreating nature has become our highest priority.]

- Gross Nature Product will be enhanced only if we can arrest and reverse the growing alienation between the people and the common property resources. In this we will have to learn a lot from our traditional cultures.

- It is totally inadequate to talk only of sustainable rural development, as the World Conservation Strategy does. We cannot save the rural environment or rural people dependent on it, unless we can bring about sustainable urban development.