

Man and the Environment

Problems that threatens man's life:

First: Environmental pollution.

- Air pollution.
- Water pollution.
- Soil pollution.
- Food pollution
- Sound pollution

Second: Population explosion.

- Population problem in Egypt:
- Population distribution in Egypt:
- Problems due to population:
- Solution of the population problem:

Third: Food problem.

- Plant production
- Animal production
- Care for marine life
- Non-traditional food sources

Fourth: Energy problem.

- Old energy sources.
- Recent energy sources.

Fifth: Drought problem and desertification. مشكلة الجفاف والتصحر.

- Drought.
- Desertification.

Sixth: Costal erosion and dams problem. تآكل الشواطئ و مشكلة السدود

First: Environmental pollution

Is any change in properties of Environment (in quantity or quality).

Pollution: Presence of any substance or energy with wrong quantity in wrong place or time.

Examples: Excess water in soil, accumulated salts in soil, Petrol on sea water.

Sources of Environment pollution:

1. Combustion of waste. احتراق النفايات
2. Industrial waste.
3. Human wastes.
4. Herbicides & insecticides. مبيدات الأعشاب والمبيدات الحشرية
5. Fertilizers. (الأسمدة)
6. Radioactive substances.
7. Noise pollution due to bad habits.

Biosphere: space between deepest ocean bed and highest mountain top.

pollution remains in Biosphere for long time, may move from site to site, may appear after years

Classification of pollutants:

Biological: Pollen grains, Bacteria. حبوب اللقاح

Chemical: Pesticides, burnt petroleum, CO₂.

Physical: Heat, loud noises.

Types of pollution:

1. Air pollution:

- **Particles:** Factory chimneys, laboratories, mills, power stations, furnaces, exhaust gases of cars, spinning and weaving of cotton, phosphate mines and factories.
- **Ozone (O₃):**
 - It prevents some of the ultra-violet rays from reaching man.
 - If high concentration near Earth surface; it causes red eyes and inflammation, it harms lungs and causes rubber hardening and cracking.
 - Ozone hole is due to using Freon compounds which concentrate near the Earth poles and decay Ozone layer.
- **Radio active pollutants:** results from nuclear explosions and tests.
 - Harmful effects: move distances and fall with rain water and cause death, accumulate into cells causing tumors and deformations that lasts for generations.
 - Get rid of pollutants: store in thick steel containers mixed with cement and buried at great depths (200 – 300 meters) under ground or under ocean.
- **Other pollutants:**
 - Carbon dioxide: most important air pollutant, due to organic fuel combustion. Keeps heat near Earth's surface resulting in increase in Earth's temperature (green house effect)...etc.
 - **Pollen grains:** increases in air during spring and moves with strong wind. They cause various allergies to man and animals
 - **Insecticides & herbicides:** move with air and show harmful side effects in far places.
- **Control air pollution:**
 - Fuel selection: less harmful fuels (natural gas).
 - Preventing pollutants from reaching air: Filters for factory & exhaust.
 - Using clean solar energy.
 - Applying strict (صارم) precautions to control radiation.
 - Construct factories & labs outside cities.

2. Water Pollution:

Any change in physical properties of water that makes it unusable (Color, odor or taste). Human behavior is greatly responsible for water pollution.

Water pollution	Harmful effect
Biological pollutants; viruses, microbes	Several diseases.
Organic compounds that decay.	Consumes Oxygen and kills fish.
Inorganic salts	Water unusable for drink, irrigation & industry.
Aquatic plants nutrients (potassium and phosphate)	Increase rate of growth of aquatic plants
Oily (oil wells under water, leak from tanks)	Float on water service and prevent air which put aquatic life in dangerous.
Industrial waste (minerals, poisonous compounds)	Death of many living organisms.
Thermal pollution (waste hot water from factories)	Death of many living organisms in water.
Human wastes (swage) and agricultural waste	Pollute water and spread diseases.

- Effect of water pollution:

- Drinking water on Man: Cholera, Typhoid, Dysentery, Hepatitis, paralysis.
- Other water on Man: Bilharzias, pollution of vegetables and fruits, Ice prepared from polluted water is very serious source of diseases
- On aquatic animals and plants: kills fishes or decrease rate of production due to accumulation on water bed and making it unsuitable for egg hatching.

- Control water pollution:

1. Avoid industrial and human waste in water unless they are treated first.
2. Treat sewage water (مياه المجاري) and industrial water.
3. Period tests on water samples to study degree of pollution and take actions for treatment
4. Research on transport and precipitation of pollutants in deep water and adopt means of treating waste.

3. Soil Pollution:

Soil pollutants reach soil with irrigation water, wind or dissolved in rain water.

Soil pollutant	Harmful effect
Particles of Insecticides & herbicides, industrial waste, gaseous and radioactive remains	Dissolve in water or decompose in soil Absorbed by plant, eaten by animals and reach man in milk and meat
Compounds (arsenic, lead, Sulphur dioxide, fluoride, pesticides, exhaust gases).	Some remain in soil for years affecting production and fertility and decrease %age of Oxygen and nitrogen in soil air.
Radioactive pollutants	Transmitted from soil to plants and animals causing blood cancer and bones cancer.

- Control soil pollution:

1. Build factories and labs away from farms and put filters on chimneys.
2. Decrease use of pesticides and fertilizers. المبيدات والأسمدة
3. Security precautions in atomic reactors. مفاعلات نووية
4. Carry out nuclear explosions in far enough areas and they should be as few as possible.
5. Proper drainage (صرف زراعي) of soil and treatment of sewage (صرف صحي)

4. Food pollution:

Two major sources of food pollution;

- Microbes and parasites (الجراثيم و الطفيليات)
- Chemicals.

Food pollutant	Harmful effect
Tuberculosis transmitted by (مرض السل) contaminated food (milk)	Pneumonia (التهاب رئوي)
Salmonella bacteria causing food decay	Food poisoning
Microbes	Intestinal diseases (Cholera, typhoid, dysentery and intestinal worms)
Poisonous substances stored in fish	Death to many people.

- Control food pollution:

1. Proper washing of vegetables and fruits, proper cooking of food.
2. Preservation of food against decay (تلف).
3. Periodic medical examination of cooks and waiters to make sure they don't infect others.
4. keep food covered all the time.
5. destroy spoiled food.

5. Sound pollution

Sources of noise:

Machines (airplanes, transportation, factory machines). Car horns and microphones. Sound intensity is measured by decibel.

Sound intensity	Harmful effect
>80 decibels for several hours every day	Nervous tension and complete deafness may occur
If a person is subject to sudden loud sound of jet plane or explosion	Nervous disorder with high blood pressure.

- Control sound pollution:

1. Decrease intensity of source sound.
 - Use more quiet machines.
 - Move airports high ways and factories away from inhabitant places.
 - Use less noise alarms.
2. Inhibition (كبت) of the medium in which sound transfers.
 - Place machines on rubber bases.
 - Use sound absorbers, sound barriers and sound reflectors.
3. Protect the recipient.
 - Use protective ear covers.

Second: Population Explosion

- The great increase in population growth.
- 1820:1 billion; 1930: 2 billion; 1965: 3 billion; 1974; 4 billion; 1985 (after 11 years only): 4.841 billion.
- The traditional demographic theory: nations of the world pass through 3 major population stages:
 1. Primitive stage: High birth and high death rate; low natural increase; 1000s years ago
 2. The Transitional stage: High birth rate, low death rate; high natural increase; Europe went through this stage many years ago; Egypt in it.
 3. The stable state: low birth and death rate; low natural increase; developed countries. (الدول المتقدمة).

Population problem in Egypt:

- Egypt is passing the transitional stage.
- Increase by one child every 23.6 seconds.

Population distribution in Egypt:

- On 4% of the total area; density = $890/\text{km}^2$ (high)
- 18% of total population in Cairo due to internal migration.
- 2 Million visit Cairo daily for work from surrounding towns and villages.
- Most dense areas in Cairo have $19000/\text{m}^2$

Problems due to population:

- Economic problems
- Health problem.
- Social problem.

Solution of the population problem:

- Desert invasion (غزو الصحراء)
- Emigration
- Economic development.
- Birth control.

Third: Food problem

1. Plant production

- Selection of seeds
- New strains. أنواع محاصيل جديدة
- Suitable plants for soil
- Service and time of cultivation
- Combating pests. مكافحة الآفات

2. Animal production

- Improve hereditary condition
- Improve environment condition.

3. Care for marine life

- Fish breeding and transportation to consumers (المستهلكين)
- Researches on preserve and develop fish resources.

4. Non-traditional food sources

- Researchers produced non traditional foods rich in protein and tastes like meat.

Fourth: Energy Problem

Old energy sources: Animals (carry, raise water...etc), fats for light candles; wind and water falls to operate mills; wood fuel; coal fuel.

Recent energy sources: fossilized fuel and nuclear fuel. Solar energy.

Egypt: Best is Solar energy and wind energy.

Fifth: Drought and Desertification

Drought: Shortage of rain or any source of water for agriculture.

Factors lead to drought:

- Over grazing الإكثار من الرعي
- Over cutting of trees
- Factors prevent rain from falling.

Desertification: decrease in biological products of soil.

It is one of the most serious problems in Egypt:

- Egypt is part of the dry region
- Soil is subject to getting more salt and alkaline.
- The cultivated soil is subject to great population stress.

Combating desertification:

- Stop desert creeping by conserving trees.
- Protect regions from desertification by improving soil utilization.

Sixth: Costal Decay and dams problem

Factors affecting costal decay:

- Waves: most important factor; fight by putting obstacles
- Tide
- The High Dam
 - Development of agriculture, production of energy, storage of water.
 - Ability of water to carry clay, epidemic diseases, physical change in ecosystems of rivers, social (emigration and rehabilitation إعادة التوطين).