GRADE 10

LIFE SCIENCES

HUMAN IMPACT ON THE ENVIRONMENT

TOPIC 12: HUMAN IMPACT ON THE ENVIRONMENT

1. THE ANTHROPOGENIC EFFECT

- Anthropogenic = "human-caused."
- Refers to how human activities are changing ecosystems, climate, and biodiversity.
- The **6th mass extinction** is currently underway, driven mainly by humans

1 2. ENVIRONMENTAL ISSUES CAUSED BY HUMAN ACTIVITIES

Human Activity Environmental Impact

Agriculture Deforestation, desertification, climate change from fossil fuels

Fishing Overfishing \rightarrow extinction; dynamite use destroys reefs and habitats

Soil salinization; depletes rivers/lakes; groundwater pollution Irrigation

Meat production Land and water degradation, greenhouse gas emissions

Mining Soil erosion, deforestation, water contamination with toxins

Transport Air pollution via CO₂ from petrol/diesel; contributes to global warming

Oil industry Land and air pollution; ecosystem destruction

Fracking Threatens fossil beds and underground water reserves



3. GLOBAL WARMING & CLIMATE CHANGE

Greenhouse Effect

- Greenhouse gases (GHGs): CO₂, CH₄, H₂O vapour, ozone.
- These trap **infrared radiation**, warming Earth's surface.
- Normal GHGs are essential—but human activities have increased their concentration

Global Warming

- Caused mainly by burning fossil fuels
- Consequences:
 - Melting polar ice caps
 - Rising sea levels
 - Changes in weather and rainfall
 - Drier conditions in places like SA

Loss of biodiversity

🛖 4. ACID RAIN

- Cause: Gases like SO₂ and CO₂ dissolve in rainwater → form sulphuric and carbonic acids
- Effects:
 - o Burns plant leaves → less photosynthesis
 - o Corrodes buildings
 - o Acidifies soil and water → harms aquatic life

5. MONOCULTURE

• Growing one crop over large areas repeatedly.

Problems:

- Depletes soil nutrients
- Attracts pests and diseases → increased pesticide use
- Chemical runoff pollutes water and harms biodiversity

99 6. OVERPOPULATION

- Carrying capacity = max number of organisms an ecosystem can support
- Human population now exceeds carrying capacity, causing:
 - o Food, water, and space shortages
 - Waste accumulation (non-biodegradable)
 - o Resource exhaustion (fossil fuels, fresh water)

7. THE SIXTH MASS EXTINCTION

- Estimated 140,000 species go extinct annually
- Main causes:
 - Habitat destruction
 - Hunting
 - o Pollution
 - Invasive species

¥ 8. ECOTOURISM (A SUSTAINABLE SOLUTION)

Benefit	Description
Economic	Generates jobs: guides, rangers, hotel staff
Educational	Promotes environmental awareness

Benefit Description

Community Improves infrastructure, income, education

Environmental Funds conservation efforts; preserves ecosystems

Must be **ethical**: respect local culture, don't litter, avoid disturbing wildlife.

🛟 9. STRATEGIES FOR ENVIRONMENTAL PROTECTION

Strategy **Impact**

Recycling Reduces waste and saves resources

Renewable energy Solar, wind reduce fossil fuel use

Afforestation Prevents erosion, restores biodiversity

Legislation Environmental laws regulate pollution & protect endangered species

Sustainable agriculture Crop rotation, organic farming, reduce monoculture & pesticides

10. SUMMARY TABLE

Concept Description

Anthropogenic **Human-caused effects**

Greenhouse gases Trap heat in atmosphere

Global warming Rising Earth temperatures

Acid rain Rain with dissolved acids

Monoculture Growing one crop repeatedly

Overpopulation More people than resources

Ecotourism Sustainable, low-impact tourism