

## 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

##### 2. ENVIRONMENTAL ISSUES CAUSED BY HUMAN ACTIVITIES

Human Activity	Environmental Impact
Agriculture	Deforestation, desertification, climate change from fossil fuels
Fishing	Overfishing → extinction; dynamite use destroys reefs and habitats
Irrigation	Soil salinization; depletes rivers/lakes; groundwater pollution
Meat production	Land and water degradation, greenhouse gas emissions
Mining	Soil erosion, deforestation, water contamination with toxins
Transport	Air pollution via CO <sub>2</sub> 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):** CO<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>O 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 **SO<sub>2</sub>** and **CO<sub>2</sub>** dissolve in rainwater → form **sulphuric and carbonic acids**
- **Effects:**
  - Burns plant leaves → less photosynthesis
  - Corrodes buildings
  - 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

#### 6. OVERPOPULATION

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

#### 7. THE SIXTH MASS EXTINCTION

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

#### 8. ECOTOURISM (A SUSTAINABLE SOLUTION)

Benefit	Description
<b>Economic</b>	Generates jobs: guides, rangers, hotel staff
<b>Educational</b>	Promotes environmental awareness



Benefit	Description
<b>Community</b>	Improves infrastructure, income, education
<b>Environmental</b>	Funds conservation efforts; preserves ecosystems

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

## 9. STRATEGIES FOR ENVIRONMENTAL PROTECTION

Strategy	Impact
<b>Recycling</b>	Reduces waste and saves resources
<b>Renewable energy</b>	Solar, wind reduce fossil fuel use
<b>Afforestation</b>	Prevents erosion, restores biodiversity
<b>Legislation</b>	Environmental laws regulate pollution & protect endangered species
<b>Sustainable agriculture</b>	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