Exercise walk-through

6.3
Climate change: mitigation and adaptation

International Baccalaureate · IB Diploma · Environmental Systems and Societies · HL

Independent lines of evidence

Instruments and change

Stations, satellites, oceans, glaciers and biological timing.

Sea level: thermal expansion and land-ice loss; floating sea ice has little direct effect.

Past climates

Ice-core bubbles preserve ancient air; isotopes provide temperature-related proxies.

Tree rings, pollen and sediments require calibration and dating; not all directly measure CO_2.

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Mitigation and adaptation

Mitigation

Reduce emissions or increase net atmospheric removal.

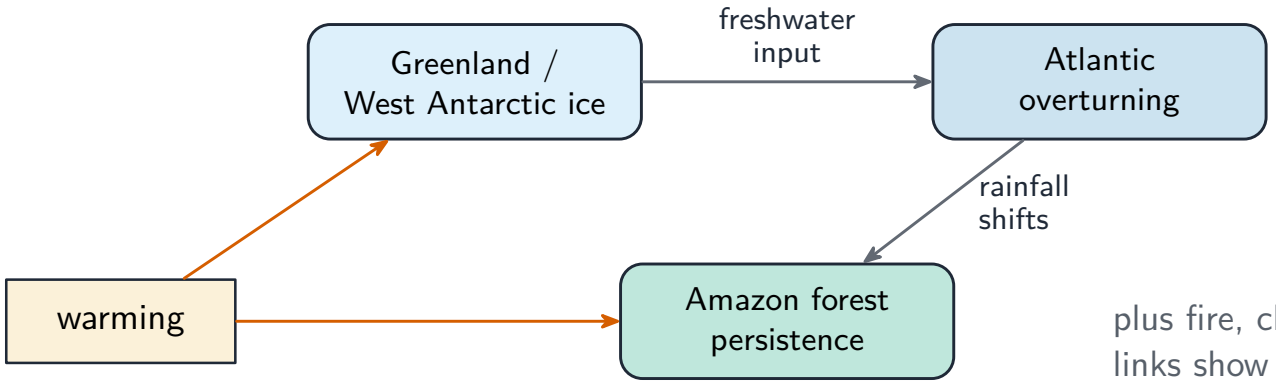
Clean energy, methane-leak reduction and protecting carbon stores.

Adaptation

Reduce exposure or vulnerability to impacts.

Flood defences, warnings and changed planting dates; some actions do both.

Linked tipping elements



plus fire, clearance, rainfall change;
links show possible influence,
not certain cascades

> The links are possible, not certain

Exercises 2.1·2.2

2.1 Distinguish between climate change mitigation and adaptation, giving **one** example of each. [2]



solar panels



sea wall

2.2 Classify each action as mitigation (M) or adaptation (A): sea wall; solar farm; drought-resistant maize; carbon tax; planting forests; flood early-warning system. [3]

sea wall | solar farm | drought maize

carbon tax | planting forests | flood warning

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solar panels



sea wall

2.1

mitigation: reducing greenhouse gas emissions or removing them from the air, e.g. solar power, reforestation; adaptation: changing how we live to reduce harm from climate change, e.g. sea walls, drought-resistant crops

2.2 Classify each action as mitigation (M) or adaptation (A): sea wall; solar farm; drought-resistant maize; carbon tax; planting forests; flood early-warning system. [3]

sea wall	solar farm	drought maize
carbon tax	planting forests	flood warning

2.2

award [1] for every two correct: M: solar farm, carbon tax, planting forests; A: sea wall, drought-resistant maize, flood early-warning system

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Exercise 3.1 (a)

3.1 A government introduces a carbon tax of \$50 per tonne of CO_2.

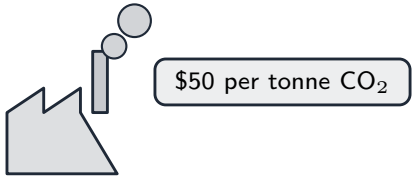
(a) Explain how a carbon tax reduces emissions. [2]



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(a) burning fossil fuels becomes more expensive; so firms and consumers switch to low-carbon energy, use less energy and invest in efficiency

Exercise 3.1 (b)

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(b) Outline **two** reasons why some people oppose a carbon tax. [2]

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(b) any two: raises prices of fuel and goods, hitting poorer households hardest; firms may move to countries without the tax (carbon leakage); job losses in coal and heavy industry

Exercise 3.2 (a)

3.2 Bangladesh has a large, low-lying delta with many people living near the coast.

(a) Suggest **two** adaptation strategies for people in the delta. [2]

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(a) Suggest **two** adaptation strategies for people in the delta. [2]

(a) any two: raised houses or homes on stilts; embankments and cyclone shelters; flood and cyclone warning systems; salt-tolerant rice; floating gardens

Exercise 3.2 (b)

3.2 Bangladesh has a large, low-lying delta with many people living near the coast.

(b) Explain why adaptation alone is not enough to deal with climate change. [3]



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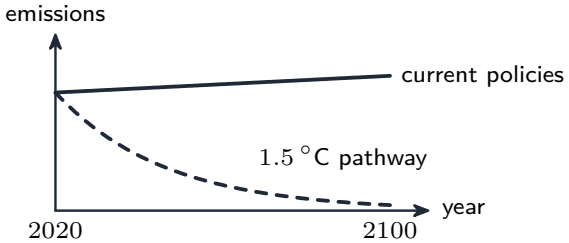


(b) adaptation does not reduce the cause, so warming and its impacts keep growing; there are limits, e.g. walls cannot hold back very high sea levels and some land will be lost; adaptation is costly and poorer countries cannot afford enough of it, so emissions must also be cut (mitigation)

Exercise 3.3

3.3 In 2015 almost every country signed the Paris Agreement.

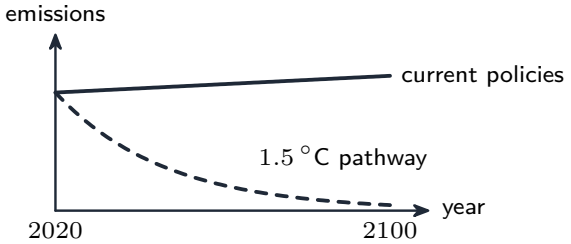
Discuss the effectiveness of the Paris Agreement. [5]



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3.3

award up to [5]: strengths: nearly every country takes part, rich and poor; clear goal of well below 2 °C, aiming for 1.5 °C; targets reviewed and raised every five years; weaknesses: targets are set by each country and not legally enforced; current pledges still lead to about 2.5–3 °C; the USA has left it twice; conclusion: a useful framework that depends on countries raising and meeting their targets