

Exercise walk-through

5.3

The Green Revolution

AP Environmental Science

Agriculture and food

The **Green Revolution**

raised yields with high-yield crops, fertilizer, irrigation, mechanization, and monoculture.

Costs: eutrophication, desertification, lost biodiversity.



Intensive farmland: high yield, high impact

Exam tips

- Explain the **tragedy of the commons** – shared, unowned resources get overused – and how rules/ownership prevent it.
- Weigh the trade-offs of the green revolution, irrigation (salinisation, aquifer depletion), and mining/urbanisation.
- Compute an **ecological footprint** in “number of Earths” (footprint $\div$ biocapacity per person); it is measured **per person**.
- List the harms of **deforestation** (erosion, flooding, lost habitat, more CO₂).
- Define **sustainability** (meeting needs without harming future generations) and give sustainable methods (IPM, crop rotation, quotas).

Unit 5 – key takeaways

1

Commons

gain to one, cost to all; regulation or ownership

2

Food & water

Green Revolution trade-offs; drip beats flood

3

Pests & harvest

IPM over spraying; sustainable yield

4

Cities

impervious runoff, heat island; footprint vs biocapacity

Exercises 2.1-2.3

2.1 Name two methods of the Green Revolution.

[2]

2.2 State one benefit of the Green Revolution.

[1]

2.3 What is monoculture?

[1]

Exercises 2.1-2.3

2.1 Name two methods of the Green Revolution. [2]

2.1

- Any two: high-yield seeds, synthetic fertilizers, pesticides, irrigation, mechanization
-

2.2 State one benefit of the Green Revolution. [1]

2.2

- It greatly increased food production / reduced famine
-

2.3 What is monoculture? [1]

2.3

- Growing a single crop over a large area

Exercise 3.1

3.1 A drawback of monoculture is that a single pest or disease can

[1]

☐

A improve the harvest

B destroy the entire crop

C increase diversity

D enrich the soil

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3.1 B

- destroy the entire crop

Exercise 3.2 (a)

3.2 A country adopts Green Revolution farming.

(a) State one benefit and one environmental cost.

[2]

Exercise 3.2 (a)

3.2 A country adopts Green Revolution farming.

(a) State one benefit and one environmental cost.

[2]

(a)

- Benefit: much more food; cost: any one of soil degradation, water pollution, high water/energy use, loss of diversity

Exercise 3.2 (b)

3.2 A country adopts Green Revolution farming.

(b) Explain why fertilizer use can harm nearby waterways.

[2]

Exercise 3.2 (b)

3.2 A country adopts Green Revolution farming.

(b) Explain why fertilizer use can harm nearby waterways.

[2]

(b)

- Excess fertilizer runs off into water, adding nutrients that cause algal blooms and eutrophication

Exercise 3.3

3.3 Explain why monoculture increases the risk of crop failure.

[2]

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[2]

3.3

- With genetically similar plants over a large area, one pest or disease that can attack it can spread and wipe out the whole crop