2.3 Resource consumption and stewardship

Name: _____ Class: _____ Date: _____ **Total: 30 marks**

KEY WORDS ecological footprint • middle class • renewable resource • non-renewable resource • Green Revolution • resource stewardship • circular economy

Objective

Build the skills to answer exam questions on **resource consumption** : population and the growing middle class, the **ecological footprint** , renewable and non-renewable resources, and views on resource futures: Malthus, Boserup, the Sustainable Development Goals and the **circular economy** .

You must be able to:

- explain why consumption grows faster than population
- calculate and interpret ecological footprint and overshoot data
- distinguish renewable and non-renewable resources
- compare the views of Malthus and Boserup and judge them with evidence
- evaluate resource stewardship strategies: the SDGs and the circular economy

1 Key knowledge and worked examples

Consumption

The world population passed 8 billion in November 2022. Consumption grows faster than population because more people join the **middle class** and buy more meat, cars and electronics.

The **ecological footprint** is the area of land and sea needed to supply what a person uses and absorb their waste, in global hectares (gha). World average about 2.6 gha per person; the Earth can supply about 1.6 gha per person, so humanity uses about $2.6 \div 1.6 \approx 1.6$ Earths. In 2024 **Earth Overshoot Day** was 1 August.

- **Renewable resources** (fish, forests, wind, sunlight) last if used no faster than they renew.
- **Non-renewable resources** (coal, oil, metals) exist in a fixed amount.

Views on resources

view	idea	evidence
Malthus (1798)	population grows faster than food, so famine, disease and war stop growth	local famines; soil and water limits
Boserup (1965)	"necessity is the mother of invention": people find new ways to grow more food	the **Green Revolution** (1960s–70s): new seeds, fertilizer and irrigation raised grain output faster than population

But the Green Revolution used much water and fertilizer, so a limit may come from the environment instead of from food.

Stewardship

Resource stewardship means using resources carefully so they last. The UN's 17 **Sustainable Development Goals** (2015) include clean water (6), clean energy (7) and responsible consumption (12). A **circular economy** keeps materials in use (repair, reuse, recycle) instead of "take, make, throw away". China passed a Circular Economy Promotion Law in 2008.

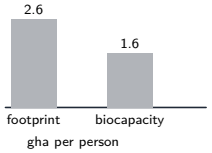
Worked example. A country's footprint is 4.0 gha per person and its biocapacity 1.0 gha per person. It uses $4.0 \div 1.0 = 4$ times what its own land can supply, so it depends on imports or on using up stocks.

2 Practice

2.1 Define **ecological footprint**. [2]

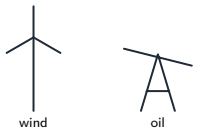


2.2 The world average ecological footprint is about 2.6 gha per person, and the Earth can supply about 1.6 gha per person. Calculate how many Earths humanity uses, and explain what this means. [3]

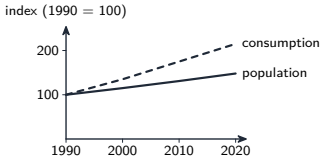


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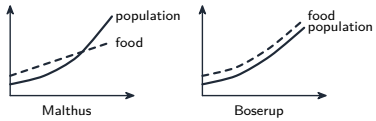
2.3 Distinguish between **renewable** and **non-renewable** resources, with an example of each. [2]



2.4 Explain why world resource consumption has grown faster than world population. [3]



2.5 Compare the views of **Malthus** and **Boserup** on population and resources. [4]



3 Exam-style questions

3.1 *(Paper 2 style.)* The table shows ecological footprint and biocapacity per person for four countries.

(a) Identify the country with the largest **ecological deficit** per person, and calculate its size. [2]

(b) Suggest **two** reasons why the footprint per person differs between Country W and Country Z. [4]

country	footprint	biocapacity
W	6.0	3.5
X	5.0	1.0
Y	2.5	2.2
Z	1.2	0.7

3.2 "Boserup's view of resources is more convincing than Malthus's." Discuss this statement. [10]

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