For use with Edexcel GCE

Geography Advanced
Paper 3 — 9GE0/03

RESOURCE BOOKLET

Plastic Pollution:
Oceans, Governance, Consumption and Inequality

You are advised to spend the first 15 minutes reading this booklet.
You must use this **Resource Booklet** to answer questions in Section A (Questions 1–4) and Section B (Questions 5–6) of the question paper.

SECTION A — Figures for Questions 1 to 4

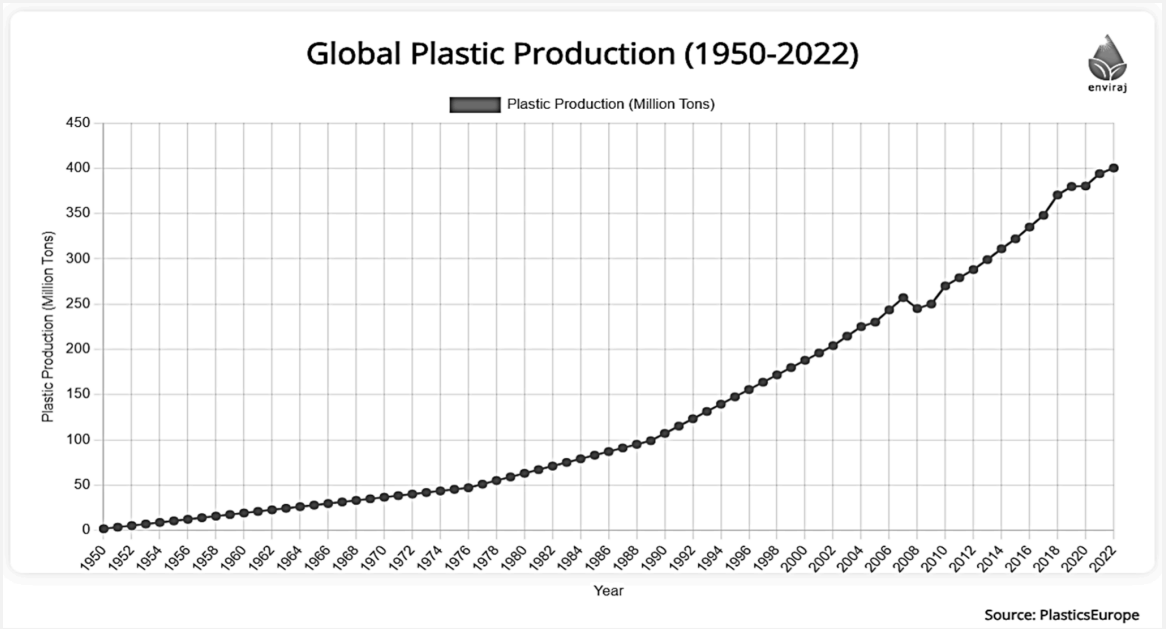
Figure 1: Annual plastic waste generated per capita and HDI score for ten countries, 2022

Country	Plastic waste per capita (kg/person/year)	Rank (A)	HDI score (2022)	Rank (B)	d (A−B)	d^2
USA	130	1	0.926	4	-3	9
Australia	110	2	0.951	1	1	1
Germany	99	3	0.942	2	1	1
UK	88	4	0.940	3	1	1
China	52	5	0.788	5	0	0
Brazil	41	6	0.760	6	0	0
Indonesia	29	7	0.713	7	0	0
India	18	8	0.633	9	−1	—
Nigeria	11	9	0.535	10	−1	—
Philippines	6	10	0.710	8	2	—

Source: adapted from OECD Global Plastics Outlook 2022 and UNDP Human Development Report 2022

> *Note: the d^2 column contains three missing values for you to calculate in Question 2.*

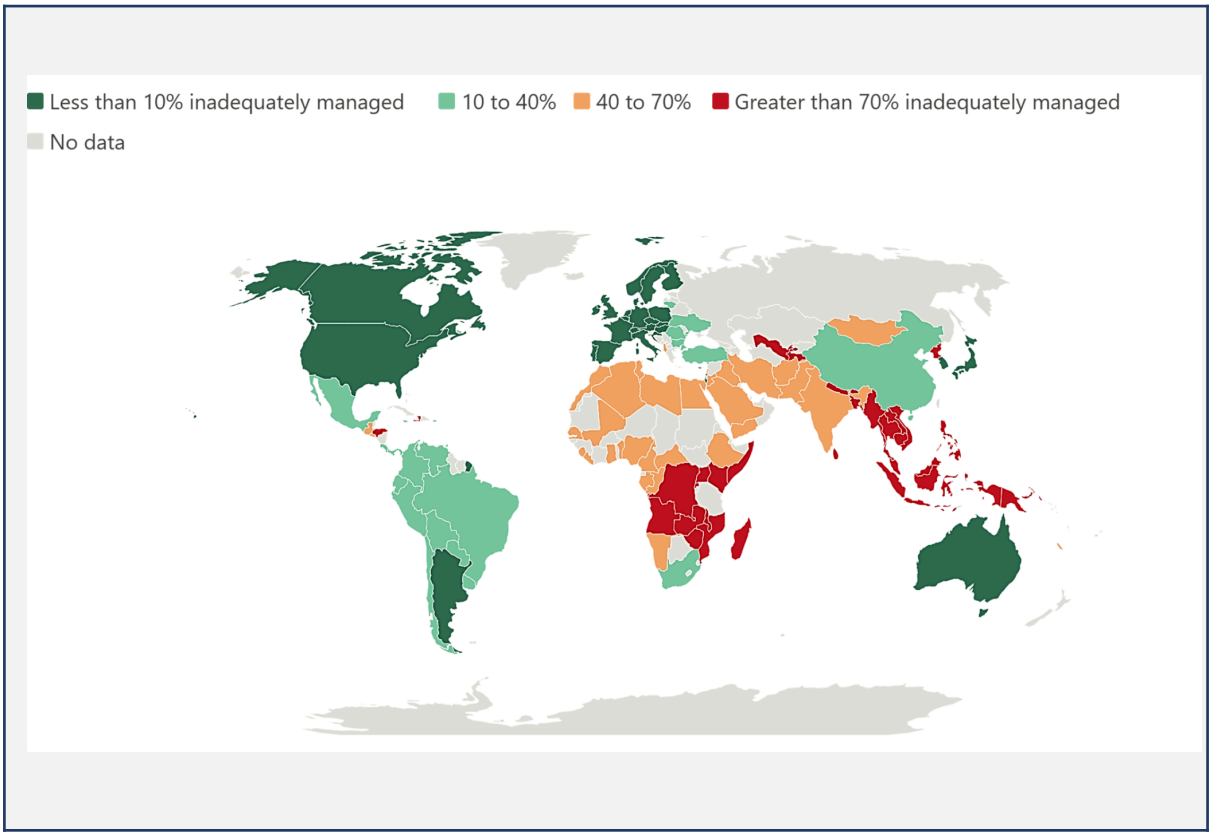
Figure 2: Global plastic production, 1950–2022



Over half of all plastic ever produced has been manufactured since 2000.

Source: adapted from Plastics Europe, Plastics the Facts, 2023

Figure 3: Proportion of plastic waste inadequately managed by country, 2022



Countries producing the least plastic per capita are often responsible for managing the highest proportions of inadequately treated waste.

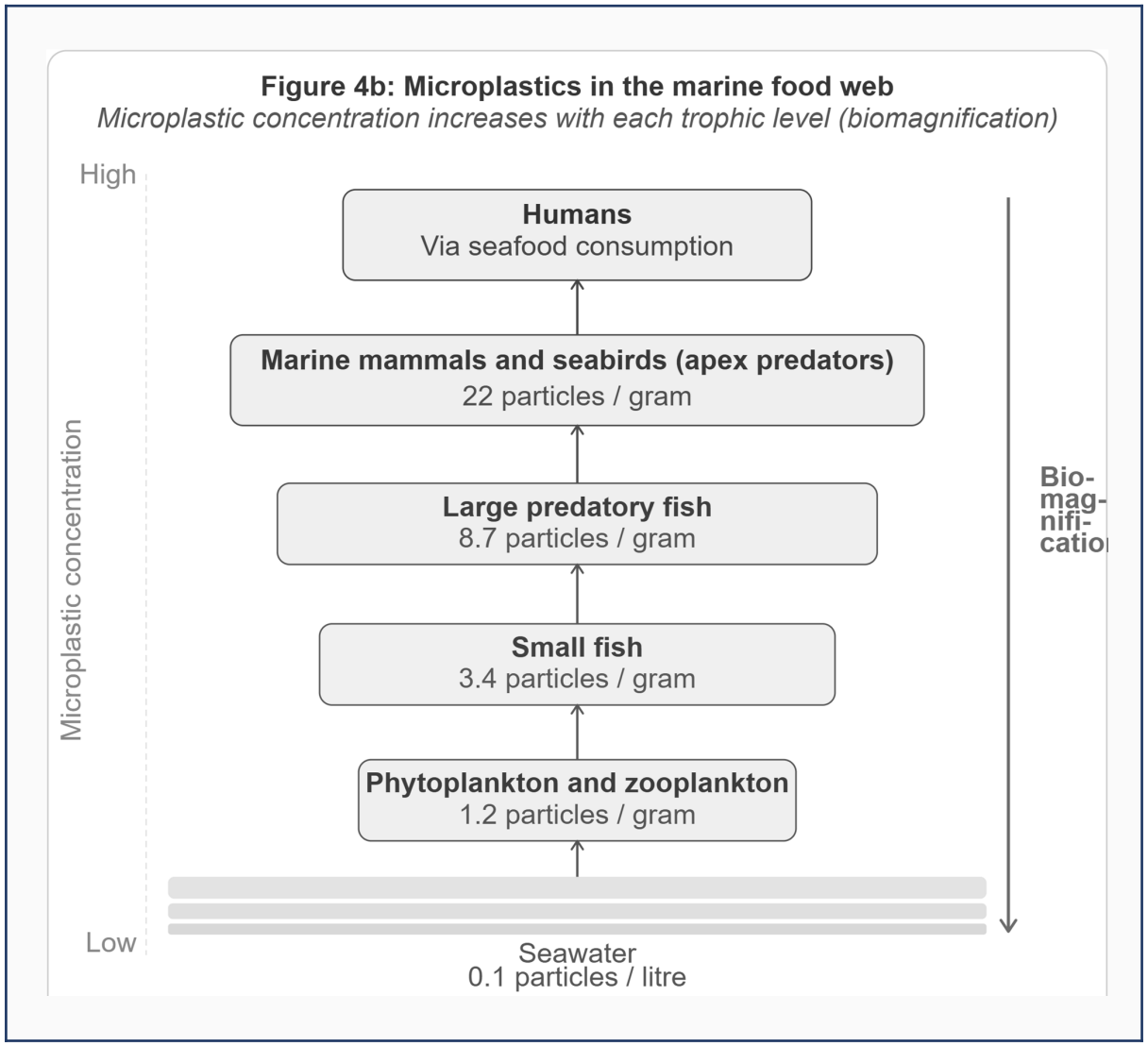
Source: adapted from OECD Global Plastics Outlook 2022

Figure 4a: Visualising what the Great Pacific Garbage Patch might look like

The Great Pacific Garbage Patch covers an estimated 1.6 million km² — approximately three times the area of France.

*Contrary to popular belief, **the patch is not a solid mass of plastics**. Ships can sail in and out, and sailors may not realise they are passing through the patch. Studies show that more than 92% of the total mass found in the area is debris greater than 5 cm (1.9 in) in size; however, it is microplastics that account for 94% of the estimated 1.8 trillion pieces floating in the area. Adapted from The Ocean Cleanup 2026*

Figure 4b: Microplastics in the marine food web



Source: adapted from peer-reviewed literature on marine microplastic bioaccumulation, 2023

Figure 4c: Microplastics and human health — emerging evidence

Text extract, adapted from the World Health Organisation and peer-reviewed scientific literature, 2023

Microplastics are particles of plastic smaller than 5mm in diameter. They enter the human body through food, water and inhalation. A landmark 2022 study published in the journal Environment International detected microplastics in the bloodstream of 77% of participants tested, with polystyrene and polyethylene being the most common types identified.

Research published in the New England Journal of Medicine in 2024 found that patients with microplastics detected in arterial plaque had a significantly higher risk of heart attack, stroke and death than those without. A 2023 study found microplastic particles in human lung tissue, placental tissue and breast milk.

The long-term health consequences of chronic microplastic exposure remain uncertain. Scientists have identified potential mechanisms, including inflammation, oxidative stress and endocrine disruptions. The WHO has called for urgent further research and notes that current regulatory frameworks do not address microplastic contamination of food and water supplies.

SECTION B — Figures for Questions 5 and 6

Figure 5: The political economy of plastic — governance and the role of TNCs

Text extract, adapted from the Centre for International Environmental Law, 2023

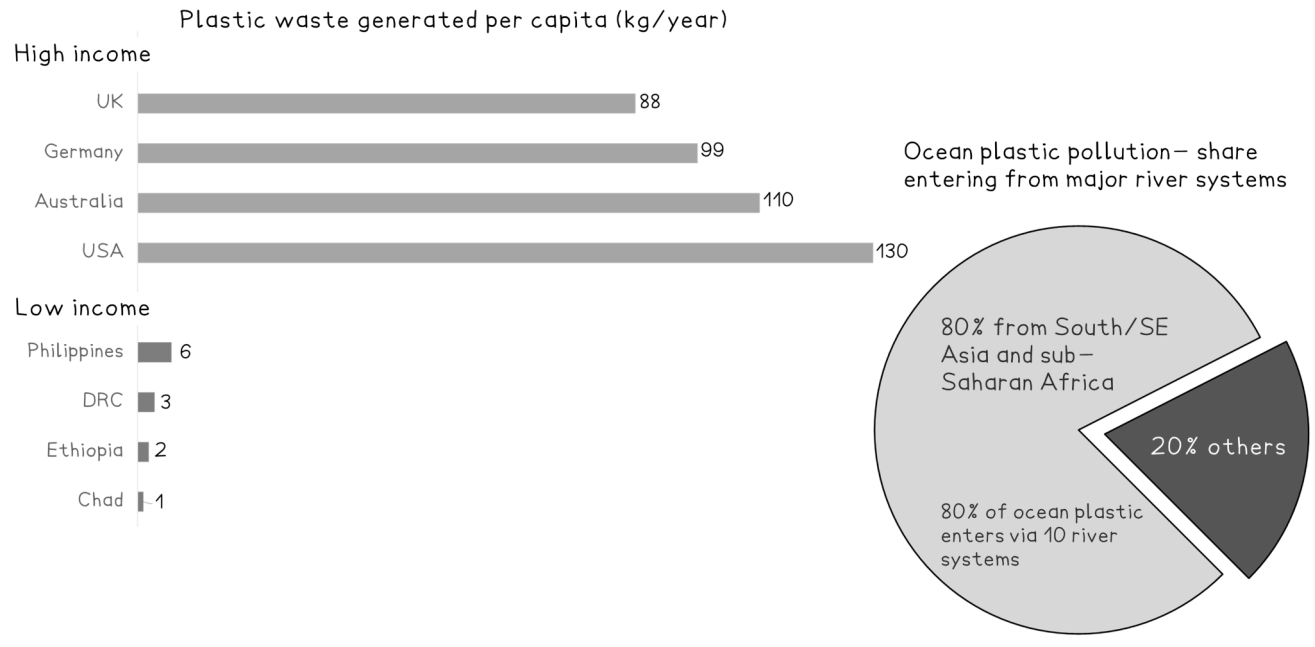
A small number of petrochemical transnational corporations, including ExxonMobil, Dow, BASF, and Sinopec, dominate global plastic production. These companies generate combined annual revenues exceeding $400 billion from plastic-related products. Their economic power gives them significant lobbying influence over national governments and international regulatory bodies.

Efforts to establish binding global governance of plastic production have repeatedly stalled. The 2022 United Nations Environment Assembly in Nairobi agreed in principle to negotiate a legally binding global plastics treaty by 2024. However, negotiations have been complicated by disagreements between oil-producing nations, which oppose production caps, and a coalition of smaller nations and environmental organisations, which argue that reducing production is essential.

Critics argue that current voluntary frameworks and recycling targets allow TNCs to present the appearance of action without reducing production. The concept of extended producer responsibility, which would make manufacturers financially liable for the end-of-life costs of their products, has been resisted by industry groups in most jurisdictions. Meanwhile, global plastic production is projected to double by 2040 under current policy trajectories.

The governance gap is also evident at a national scale. Plastic bag bans and single-use plastic restrictions have been implemented in over 130 countries, but enforcement is weak in many low-income nations that lack the regulatory infrastructure to implement them effectively.

Figure 6: The global inequality of plastic pollution



*High-income countries generate up to **65 times more plastic per capita** than low-income countries, yet low-income countries are disproportionately impacted by plastic pollution due to inadequate waste management infrastructure.*

*An estimated **11 to 19 million people** globally work as informal waste pickers, the majority in South and South-East Asia. Their labour partly offsets the absence of formal waste management systems.*

Source: adapted from OECD Global Plastics Outlook 2022 and the Global Alliance of Waste Pickers

Figure 7: Informal waste economies — opportunity or exploitation?

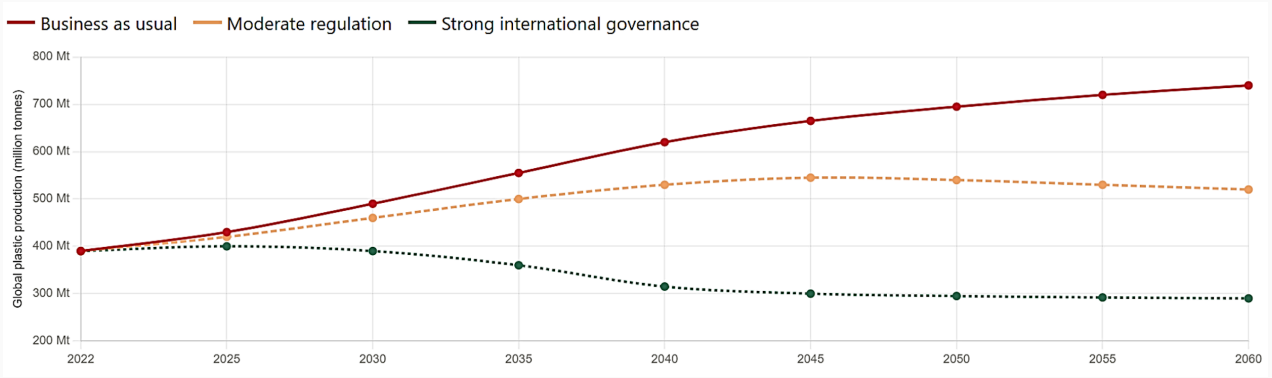
Text extract, adapted from the International Labour Organisation, 2023

Informal waste pickers play a critical role in recovering recyclable materials in countries where formal waste management infrastructure is absent or inadequate. In cities such as Jakarta, Cairo, and Mumbai, informal waste workers recover an estimated 50–80% of recyclable materials that would otherwise enter landfills or waterways.

However, the conditions under which waste pickers work are frequently hazardous. Exposure to toxic chemicals, a lack of protective equipment, insecure income, and the absence of legal employment rights are characteristics of the sector. A disproportionate number of children are in the workforce, especially in South and South-East Asia.

In some cases, efforts to formalise waste management systems, including the introduction of mechanised sorting facilities and contracted municipal collections, have excluded existing wastepicker communities from livelihoods they have depended on for generations. This tension between environmental improvement and social justice represents one of the most complex dimensions of the global plastic governance challenge.

Figure 8: Projected global plastic production to 2060 and the governance challenge



Under business-as-usual projections, plastic pollution in the ocean is expected to nearly triple by 2060. Only binding international governance targeting production, not just waste management, is projected to reverse this trajectory.

Source: adapted from OECD Global Plastics Outlook 2022