

APES free-response points are earned by naming the process and identifying its direction: which way the nutrient moves, whose cost it becomes, what the population does next. A definition without that consequence scores nothing. 环境科学题必须写出过程名称与变化方向, 只写定义不得分。

Ecosystems and biodiversity

Ecosystem services 生态系统服务 — the benefits people obtain from ecosystems, such as water purification, pollination, flood control and climate regulation

Primary productivity 初级生产力 — the rate at which producers convert solar energy into chemical energy as biomass

Trophic level 营养级 — a feeding position in a food chain; only about 10% of the energy at one level is transferred to the next

Biodiversity 生物多样性 — the variety of species, genes and ecosystems in a region; greater diversity generally increases resilience to disturbance

Keystone species 关键种 — a species whose influence on community structure far exceeds what its abundance would suggest

Biogeochemical cycle 生物地球化学循环 — the movement of an element between living organisms and reservoirs in the atmosphere, water and rock

Populations

Carrying capacity 环境容纳量 — the maximum population an environment can sustain indefinitely given its limiting resources

Sustainable yield 可持续产量 — the amount of a renewable resource that can be harvested without reducing the stock available in future

Demographic transition 人口转型 — the shift from high birth and death rates to low ones as a country industrialises and develops

Ecological footprint 生态足迹 — the area of productive land and water needed to supply a population’s resources and absorb its waste

Land, water and energy

Tragedy of the commons 公地悲剧 — the degradation of a shared resource because each user gains the full benefit of taking more while the cost is spread across everyone

Externality 外部性 — a cost or benefit of an activity that falls on a third party and is not reflected in its market price

Renewable resource 可再生资源 — a resource replenished by natural processes at a rate comparable to its use

Nonrenewable resource 不可再生资源 — a resource whose stock is fixed on human timescales, so use depletes it permanently

Desertification 荒漠化 — the degradation of drylands into desert-like conditions through overgrazing, deforestation or poor irrigation

Salinization 盐碱化 — the accumulation of salts in soil, usually from irrigation water evaporating and leaving its dissolved salts behind

Pollution

Point source pollution 点源污染 — pollution discharged from a single identifiable location, such as a pipe or smokestack

Nonpoint source pollution 非点源污染 — pollution from many diffuse sources, such as agricultural runoff, which is far harder to regulate

Eutrophication 富营养化 — nutrient enrichment of water causing an algal bloom, whose decomposition consumes dissolved oxygen and kills aquatic life

Biomagnification 生物放大 — the increase in concentration of a persistent toxin at each successive trophic level

Bioaccumulation 生物累积 — the build-up of a substance within a single organism over its lifetime, because intake exceeds excretion

Atmosphere and global change

Greenhouse effect 温室效应 — the warming caused when atmospheric gases absorb outgoing infrared radiation and re-emit it toward the surface

Albedo 反照率 — the fraction of incoming solar radiation a surface reflects; ice has a high albedo and open ocean a low one

Ozone depletion 臭氧耗损 — the thinning of stratospheric ozone by chlorine radicals released from CFCs, which admits more UV-B to the surface

Urban sprawl 城市扩张 — low-density outward growth of a city, which raises transport emissions and consumes surrounding farmland