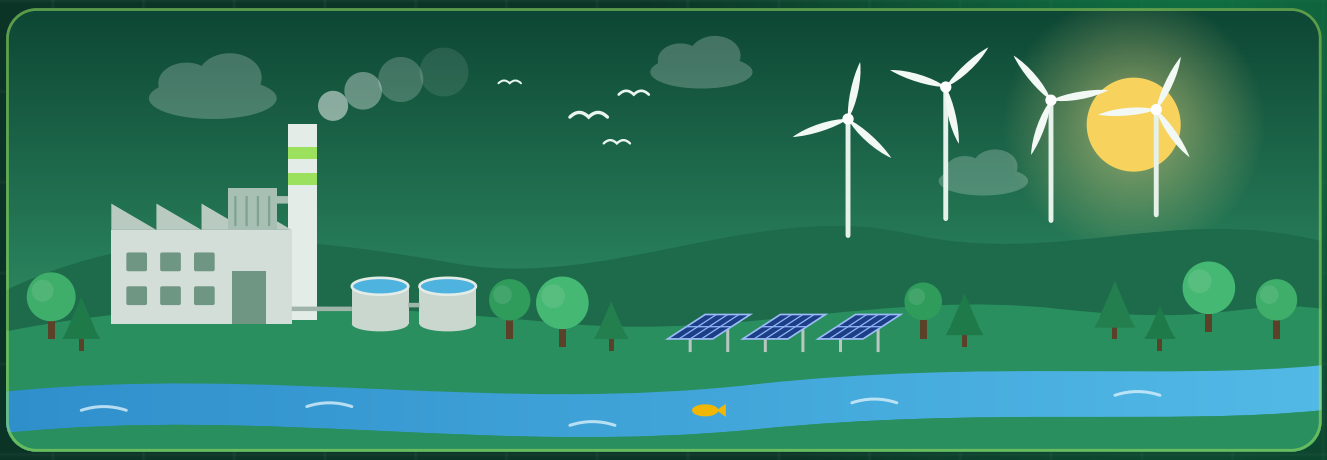
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APPSC AEE · A.P. POLLUTION CONTROL BOARD



AEE · PAPER II · COMMON SUBJECT

APPSC ASSISTANT ENVIRONMENTAL ENGINEER · PAPER II

Environmental Science & Engineering

The complete Paper II (Common Subject) syllabus, written from APPSC's own 2025 questions, with solved numericals and the standards APPSC asks

English Medium | **2026-27 Edition**

10
syllabus units, one chapter each

148
APPSC 2025 questions inside, with the final key

EN
English, like the paper

INSIDE

01 Ecosystems
02 Natural resources
03 Biodiversity and biotic resources
04 Engineering materials
05 Fluid mechanics and hydraulics
06 Process calculations and thermodynamics
07 Air, water, soil and noise pollution and their control
08 Solid and industrial waste management
09 Global environmental problems, policies and laws
10 Environmental impact assessment and sustainable development
11 Standards and numbers at a glance



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About this book



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This book is for **Paper II (Common Subject)** of the APPSC **Assistant Environmental Engineer** exam, the post in the **A.P. Pollution Control Board**. Paper II is where engineers from four branches meet on one syllabus: civil, mechanical, chemical and environmental graduates all write the same 150 questions, in **English only**, and nobody's degree covered all of it.

Paper	Questions	Marks	Time	Language
Paper I: General Studies & Mental Ability	150	150	150 min	English and Telugu
Paper II: Common Subject	**150**	**150**	**150 min**	**English only**

Every wrong answer costs **one-third of a mark**, so a guess has to be a good guess. The computer proficiency test after the written exam is only qualifying.

How APPSC asks it. We studied every question of APPSC's 2025 Paper II (APPSC's final key of 6 August 2025) and sorted all 148 valid questions by the ten units of the syllabus. Three things stand out. The ten units carry **almost equal weight** (12 to 18 questions each), so no unit can be skipped. Most questions test **one clear idea** (what an EIA is for, what an activated sludge tank does, which risk method is qualitative), not long derivations. And **about one question in five** is a "statement and conclusions" or match-the-following question (32 of 148), which only rewards a student who understands the idea. The few numericals (pressure from a liquid column, a unit conversion, atoms per unit cell) are one-line calculations: know the units and the basic formulas.

How each chapter works

- A chapter opens with the **syllabus line** and a table of **what APPSC asked** from it in 2025.
- Sections tagged **ASKED BY APPSC** carry a real 2025 question, and **every one of the 148 questions is printed in this book** inside a **From the exam** box, with APPSC's own answer and a short explanation. Sections tagged **2025-26 UPDATE** carry rules and figures changed recently.
- **Key idea**, **Remember** and **formula** boxes hold what you must not forget; a **meme break** gives your brain a rest.
- Each chapter ends with a **Quick revision** page, **practice MCQs** in APPSC's style (with answers and reasons), and a **rapid-fire** table for the last day.

How to use it. Read a chapter once fully, then do its MCQs without looking. Mark what you got wrong and re-read only those sections. In the last week, read only the Quick revision pages, the rapid-fire tables and the From the exam boxes.

Rules and figures (EIA amendments, standards, footprint data) are as on **18 November 2026**.

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CHAPTER 10

Environmental impact assessment and sustainable development

Syllabus Unit 10 · Covers: what an EIA is and why it exists, the EIA Notification 2006 and its four stages, baseline studies, impact identification methods, risk assessment, the Environmental Management Plan, APPCB consents, sustainable development and the SDGs, HDI, ecological footprint and biocapacity, life cycle assessment, sustainable lifestyles and cities, environmental education, and population and environment

This is the unit where your job begins. As an AEE in the A.P. Pollution Control Board you will sit in public hearings, check EIA reports, and decide whether an industry gets its consent to start. APPSC knows this: **18 of the 148 valid questions in 2025** came from this one unit, more than from any other.

What APPSC asked in 2025	Questions	Where in this chapter
EIA: purpose, baseline data, risk methods, EMP	6 (Q134, 137, 142, 146, 147, 149)	10.1 to 10.6
Sustainable development and lifestyle indicators (HDI)	2 (Q19, 143)	10.7
Ecological footprint and Life Cycle Assessment	4 (Q141, 144, 145, 150)	10.8, 10.9
Consumerism, transport, health, urban sprawl	4 (Q136, 138, 139, 140)	10.10
Environmental education	1 (Q135)	10.11
Population and environment	1 (Q148)	10.12

Notice the style: no question asked for a date or a section number. Every one asked **what a tool is for** or **which idea fits**. So learn each tool by its purpose first, and its numbers second.

10.1 What an EIA is, and why it exists

ASKED BY APPSC

Environmental Impact Assessment (EIA) is a study done **before a project is approved** to predict its effects on the environment and people, compare alternatives, and decide how to avoid or reduce the harm. Its output is a decision: go ahead with conditions, change the design or site, or do not go ahead.

> EIA IN ONE LINE
>
> EIA looks forward: **predict** → **evaluate** → **mitigate** → **decide**, all before the first brick is laid. Fixing damage after a project is built is not EIA; that is remediation.

The four jobs of an EIA

1. **Inform the decision-maker** (MoEFCC or the State authority) about the likely impacts.
2. **Find alternatives**: another site, another technology, a smaller size, and always the **"no-project" alternative**.
3. **Plan mitigation** through an Environmental Management Plan (EMP).
4. **Give affected people a voice** through public consultation.

Where EIA came from

Year	Milestone
1969	USA's **National Environmental Policy Act (NEPA)**: the world's first law requiring EIA (in force from 1 January 1970)

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Year	Milestone
1976-77	India: the Planning Commission asks the Department of Science & Technology to examine **river valley projects** from the environmental angle
1986	**Environment (Protection) Act**: the parent law under which EIA rules are made
1992	**Rio Declaration, Principle 17**: EIA to be used as a national instrument for projects likely to have significant adverse impacts
27 Jan 1994	India's **first EIA Notification**: EIA becomes mandatory for listed projects
14 Sep 2006	**EIA Notification, 2006** (S.O. 1533(E)) replaces it, and is still in force with many amendments

Kinds of assessment

- **Project EIA**: one project (a thermal plant, a mine). This is what the 2006 Notification covers.
- **Strategic Environmental Assessment (SEA)**: for a policy, plan or programme, before projects are even designed (a state's industrial policy, a river basin plan).
- **Cumulative EIA**: the combined effect of many projects in one area (several cement plants in one taluk, many dams on one river).
- **Rapid EIA** uses baseline data of **one season** (other than the monsoon); **comprehensive EIA** uses data of **all seasons**, about a year.

FROM THE EXAM · APPSC AEE 2025 · PAPER II

Q149 What is the key purpose of the Environmental Impact Assessment (EIA)?

(1) To provide financial assistance for large projects

(2) To evaluate and mitigate environmental impacts of proposed projects

(3) To promote unregulated economic development

(4) To approve projects without public input

APPSC's answer: (2) To evaluate and mitigate environmental impacts of proposed projects. Environmental Impact Assessment is a planning tool that predicts and evaluates the environmental effects of a proposed project before it is approved, and suggests measures to avoid, reduce or offset them through an Environmental Management Plan. In India the EIA Notification, 2006 under the Environment (Protection) Act, 1986 requires prior environmental clearance, with screening, scoping, public consultation and appraisal. It is not a funding scheme and does not bypass public input.

10.2 The EIA Notification, 2006: who clears what

2025-26 UPDATE

Every project listed in the Schedule of the Notification needs **prior Environmental Clearance (EC)** before any construction or land preparation starts. The Schedule lists projects by sector (mining, thermal power, river valley, cement, chemicals, ports, buildings and townships, and so on) and size.

	Category A	Category B
Who appraises	**Expert Appraisal Committee (EAC)** of MoEFCC	**State Expert Appraisal Committee (SEAC)**
Who grants EC	**MoEFCC** (Central Government)	**State Level EIA Authority (SEIAA)**
Sub-types	none	**B1** (needs an EIA report) and **B2** (no EIA report)

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Standing bodies (July 2026). An amendment of 13 July 2026 created, for every State and Union Territory, a **Standing Authority on Environment Impact Assessment (SAEIA)** and a **Standing Committee on Environment Impact Appraisal (SCEIA)**. They do the work of the SEIAA and SEAC, for up to a year, when those bodies are not functioning, so that Category B proposals do not pile up.

The General Condition. A Category B project is treated as **Category A** (appraised at the Centre) if it lies close to a **protected area** under the Wild Life (Protection) Act, a **critically polluted area** identified by CPCB, a notified **eco-sensitive area**, or an **inter-state or international boundary**. The distance was originally 10 km and was later reduced to 5 km for most cases.

The four stages

1 Screening
Only Category B: SEAC decides B1 (needs EIA) or B2 (no EIA)

→

2 Scoping
Terms of Reference (ToR) for the EIA study, within 60 days

→

3 Public consultation
Public hearing by the SPCB within 45 days, plus written comments

→

4 Appraisal
Expert committee within 60 days; decision within 45 days more

1. **Screening** (Category B only): the SEAC uses **Form 1** to decide whether the project is B1 or B2.
2. **Scoping**: the EAC or SEAC fixes the **Terms of Reference (ToR)**: what the EIA must study. If the ToR is not conveyed within **60 days**, the ToR proposed by the applicant is taken as final. Standard ToRs now exist for most sectors.
3. **Public consultation** has two parts: a **public hearing** at or near the site for local affected people, and **written responses** from anyone else concerned. The **State Pollution Control Board** (in our state, **APPCB**) conducts the hearing, completes it within **45 days** of the request, and gives at least **30 days' notice** in a national and a local-language newspaper. The **District Collector** (or an officer not below Additional District Magistrate) supervises it, and the proceedings are video-recorded.
4. **Appraisal**: the committee scrutinises the final EIA report and the hearing record within **60 days**, and the regulatory authority conveys its decision within **45 days** of the recommendation.

> NUMBERS APPSC CAN ASK
>
> **60** days scoping · **45** days public hearing · **30** days' notice · **60** days appraisal · **45** days decision. Appraisal plus decision = **105 days**. Baseline data and the public hearing must not be older than **3 years** when the EC application is made.

Who skips the public hearing? Among others: **B2** projects, **building and construction** projects and area development projects (Item 8 of the Schedule), **modernisation of irrigation** projects, and projects inside **industrial estates or parks** that already hold an EC.

How long is an EC valid? An April 2022 amendment raised the validity:

Project	Valid for	Can be extended by
River valley projects	13 years	2 years
Nuclear power projects	15 years	5 years
Mining projects	30 years	20 years (EIA/EMP reviewed every 5 years after 30)
All other projects	**10 years** (earlier 7)	1 year

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Project	Valid for	Can be extended by
Ports, harbours, breakwaters, dredging (amended September 2026)	up to 20 years	

EIA must come first. In **July 2026** a three-judge bench of the **Supreme Court** (the Vanashakti case) held that screening, scoping, public consultation and appraisal are meant to take place **before construction begins**.

After the EC. The project must send **six-monthly compliance reports** on the EC conditions to the MoEFCC Regional Office. Applications, ToRs, ECs and compliance now move through the online **PARIVESH** portal.

> 2025-26 STATUS
>
> A **draft EIA Notification, 2020** was published for comments but was **never finalised**. The **2006 Notification, as amended** (well over 100 changes through notifications and office memorandums), is the law you work with.

10.3 The baseline: what an EIA studies

ASKED BY APPSC

Before you can predict a change you must know **what is there now**. This "before" picture is the **baseline**. The study area is usually a **10 km radius** around the site: the **core zone** (the project land) and the **buffer zone** around it.

An EIA studies three environments:

Environment	What is studied
Physical	Air quality, meteorology (wind, temperature, rainfall), noise, surface and ground water, soil, land use, geology and drainage
Biological	Plants and animals, forests and wildlife habitats, endangered species, aquatic life, **migration routes of birds**
Socio-economic and cultural	Population and settlements, livelihoods, health, land acquisition and resettlement, heritage sites, traffic

How the baseline data are collected

Component	Method
Air	Ambient air quality monitoring stations (PM10, PM2.5, SO_2, NO_2, CO), 24-hour samples twice a week through the season; on-site weather station → **wind rose**
Water	Grab samples of surface and ground water: pH, DO, BOD, COD, TDS, coliforms, heavy metals
Soil	**Soil coring and sampling** at several points: texture, bulk density, pH, electrical conductivity, organic carbon, N-P-K, heavy metals
Noise	Sound level meter: day and night equivalent levels (Leq)
Land use	**Satellite imagery** with GIS: forest, crop land, water bodies, settlements
Ecology	Quadrats for plants, transects and point counts for animals and birds
Socio-economic	Census data plus household surveys

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THE TRAP IN Q137

Satellite imagery tells you **where** the soil is and what covers it, not **what is in it**. Soil chemistry needs a soil sample in a laboratory. Erosion models and vegetation surveys use soil data; they do not collect it.

FROM THE EXAM · APPSC AEE 2025 · PAPER II

Q134 Which of the following is an example of a biological aspect considered in Environmental Impact Assessment (EIA)?

(1) Population density of nearby towns
(2) Migration patterns of birds in the area
(3) Economic growth projections
(4) Traffic congestion during construction

APPSC's answer: (2) Migration patterns of birds in the area. An EIA studies the physical, biological and socio-economic environment. The biological environment covers flora and fauna, such as forests, wildlife habitats, endangered species and the migration patterns of birds, which the project may disturb. Population density, economic growth and traffic congestion belong to the socio-economic and physical aspects, not the biological one.

Q137 Which method is often employed to acquire baseline data on soil characteristics in Environmental Impact Assessment (EIA)?

(1) Satellite imagery analysis
(2) Soil coring and sampling
(3) Soil erosion modelling
(4) Surveys of vegetation cover

APPSC's answer: (2) Soil coring and sampling. Baseline soil data in an EIA are collected by field sampling: soil cores or samples are taken at several locations in the study area and analysed in the laboratory for texture, bulk density, pH, electrical conductivity, organic carbon, nutrients (N, P, K) and heavy metals. Satellite imagery gives land-use cover, erosion modelling predicts impacts, and vegetation surveys describe flora, but none of them measures soil characteristics directly.

10.4 Methods to identify and predict impacts

An impact can be **direct** (dust from a quarry) or **indirect** (new roads bring settlements into a forest), **short-term** or **long-term**, **reversible** or **irreversible**, **positive** or **negative**, and **cumulative** when it adds to others. Several methods help the EIA team find them.

Method	How it works	Good for	Weakness
Ad hoc	Experts give their judgement on broad areas	Quick first look	Subjective
Checklists	Lists of environmental factors to tick (simple, descriptive, scaling, weighting-scaling)	Not missing anything	Do not show cause and effect
Matrices	Project actions on one axis, environmental components on the other; each cell marks an interaction	Seeing all interactions at once	Miss chains of indirect effects
Networks	Cause → effect → further effect chains	**Indirect and secondary** impacts	Become large and complex
Overlays	Transparent maps of each factor laid one over another (now done in **GIS**)	**Siting** of roads, pipelines, power lines	Hard to show magnitude
Battelle system	Scores 78 parameters, weighted by importance	Comparing alternatives with numbers	Needs lots of data

The Leopold matrix (Leopold and others, US Geological Survey, 1971) has **100 project actions** across and **88 environmental characteristics** down. In each cell where an action affects a characteristic, the assessor writes the **magnitude** (1 to 10) and the **importance** (1 to 10).

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The Battelle Environmental Evaluation System groups **78 parameters** under four heads (ecology, environmental pollution, aesthetics and human interest) and shares **1,000 parameter importance units (PIU)** among them.

```
Environmental impact units (EIU) = PIU × environmental quality (0 to 1)
Net impact of a project = Σ EIU with project − Σ EIU without project
```

Prediction models then put numbers on the main impacts: air dispersion models such as the Gaussian plume model for stack emissions, the **Streeter-Phelps** oxygen sag model for effluent in a river, and noise attenuation with distance.

10.5 Risk assessment

ASKED BY APPSC

A **hazard** is something that can cause harm (a chlorine tank). **Risk** is how likely the harm is and how bad it would be.

```
Risk = probability (likelihood) × consequence (severity)
```

Projects that store or handle hazardous chemicals must add a **risk assessment** and a **Disaster Management Plan** to the EIA: an **on-site** emergency plan by the occupier and an **off-site** plan prepared by the district administration (under the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989).

Steps: identify the hazards → estimate how often they may occur → work out the consequences (the **maximum credible accident**: fire, explosion or toxic gas release, and how far the damage reaches) → rank the risk → decide controls.

Qualitative (judgement, categories)	Quantitative (numbers, probabilities)
Risk matrix: likelihood against severity, giving low, medium or high risk	**Fault tree analysis**: works **backwards** from a top event (an explosion) through AND/OR gates to its causes
Checklists and **what-if** analysis	**Event tree analysis**: works **forwards** from an initiating event (a leak) to its possible outcomes
HAZOP (hazard and operability study) with guide words such as no, more, less, reverse	**Monte Carlo simulation**: thousands of random runs to show the spread of possible results
Expert judgement, Delphi technique	**Sensitivity analysis**: how the result changes when one input changes

GIS is the working tool for **vulnerability analysis**: it maps hazard zones, population, hospitals and escape routes, and can be **updated** as new data come in. A risk assessment is never "done once": it is **revised** when the process, the plant or the surroundings change.

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Q146 Which of the following is a qualitative method used in risk assessment for Environmental Impact Assessment (EIA)?

(1) Monte Carlo simulation
(2) Fault tree analysis
(3) Matrix technique
(4) Sensitivity analysis

APPSC's answer: (3) Matrix technique. The matrix technique, such as a risk matrix that ranks hazards by likelihood and consequence or the Leopold matrix of project actions against environmental components, gives a qualitative or semi-quantitative judgement of impacts and risk. Monte Carlo simulation and sensitivity analysis are numerical, quantitative methods, and fault tree analysis is normally used quantitatively to calculate failure probabilities.

Q147 A statement is given below, followed by two conclusions numbered I and II. Assuming that the information given in the statement is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions can be drawn definitely from the given statement.
Statement:
Risk assessment and vulnerability analysis require identifying key areas of concern, evaluating the frequency and intensity of hazards, and utilising tools like GIS for updates and assessments.
Conclusions:
I. GIS enables efficient updates and assessments during risk analysis.
II. Risk assessment does not need periodic revision after it is initially done.

(1) Only conclusion I follows.
(2) Only conclusion II follows.
(3) Neither I nor II follows.
(4) Both I and II follow.

APPSC's answer: (1) Only conclusion I follows. The statement says risk assessment and vulnerability analysis use tools like GIS for updates and assessments, so conclusion I, that GIS enables efficient updates and assessments, follows. Conclusion II contradicts the statement: the need for 'updates' shows that a risk assessment is revised periodically as hazards, land use and exposure change. Hence only conclusion I follows.

10.6 The Environmental Management Plan, and APPCB's consents

The **Environmental Management Plan (EMP)** turns the EIA's findings into actions. It follows the **mitigation hierarchy**:

Avoid	→	**Minimise**	→	**Restore**	→	**Offset**
Change the site or design so the impact never happens		Reduce what cannot be avoided (scrubbers, ETPs, noise barriers)		Repair the damage (backfill a mine, replant)		Compensate elsewhere (compensatory afforestation)

An EMP contains: the mitigation measure for each impact; an **environmental monitoring programme** (what to measure, where and how often); the **institutional set-up** (an environment cell with named responsibilities); the **budget**, capital and recurring; a **green belt** plan; and how **stakeholders** (villagers, workers, local bodies) will be consulted and kept informed.

Green belt norms (2025-26 UPDATE). For years EC conditions asked most industries to keep **33 per cent** of their land green. An office memorandum of **29 October 2025** replaced this with norms based on pollution potential: a new **industrial estate** must keep at least **10 per cent** as a common green area (dense planting, about 2,500 trees per hectare); units inside an estate keep **15 per cent (red category)** or **10 per cent (orange)**; standalone red-category units keep **20 to 25 per cent**.

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EC is not the only permission. Your board gives its own consents under the Water Act and the Air Act. In Andhra Pradesh they are called CFE and CFO (most other states say CTE and CTO):

Permission	Given by	Under	When
Environmental Clearance (EC)	MoEFCC or SEIAA	EIA Notification, 2006 (Environment Protection Act)	Before construction, for scheduled projects
Consent for Establishment (CFE)	**APPCB**	Section 25 of the **Water Act, 1974** and Section 21 of the **Air Act, 1981**	Before the unit is built
Consent for Operation (CFO)	**APPCB**	The same sections	Before production starts; renewed periodically
Authorisation	APPCB	Hazardous and Other Wastes Rules, 2016 (and other waste rules)	For handling such wastes

Colour categories (CPCB, January 2025). Industries are grouped by a **Pollution Index (PI)** from 0 to 100, based on their emissions, effluents and hazardous wastes:

Category	Pollution Index	What it means
Red	80 and above	Most polluting; normally not allowed in ecologically fragile areas
Orange	55 to below 80	Moderately polluting
Green	25 to below 55	Less polluting
White	below 25	Practically non-polluting; **no CFE or CFO needed**
Blue (new)	not by PI	**Essential environmental services** for household waste (for example waste-to-energy, biomining of legacy waste); **2 extra years** of consent validity

CPCB has placed **419 sectors**: 125 Red, 137 Orange, 94 Green, 54 White and 9 Blue. (Older books give the 2016 scheme: Red 60 and above, Orange 41 to 59, Green 21 to 40, White 20 and below.)

FROM THE EXAM · APPSC AEE 2025 · PAPER II

Q142 Read the following statement and conclusions carefully and decide which of the given conclusions is/are true based on the statement.

Statement:Environmental Management Plans (EMPs) play a crucial role in enhancing corporate sustainability by integrating environmental considerations into project planning and implementation.

Conclusions:

I. EMPs prioritise short-term economic gains over long-term environmental sustainability.

II. Stakeholder engagement and participation are key components of developing effective EMPs.

(1) Only conclusion I is true

(2) Only conclusion II is true

(3) Both conclusions I and II are true

(4) Neither conclusion I nor II is true

APPSC's answer: (2) Only conclusion II is true. The statement says EMPs integrate environmental considerations into project planning and support sustainability, so conclusion I, that they put short-term economic gain above long-term sustainability, contradicts it. Conclusion II is true: effective EMPs set out mitigation, monitoring and responsibilities, and developing and implementing them needs the engagement of affected people, regulators and other stakeholders. Hence only conclusion II is true.

10.7 Sustainable development

ASKED BY APPSC

The best-known definition comes from the **Brundtland Commission** (the World Commission on Environment and Development, chaired by Gro Harlem Brundtland of Norway) in its 1987 report **"Our Common Future"**:

> SUSTAINABLE DEVELOPMENT
>
> Development that **meets the needs of the present** without compromising the ability of **future generations** to meet their own needs.

It rests on **three pillars** that must be balanced: **economic growth**, **social equity** and **environmental protection**. Business calls it the **triple bottom line**: people, planet, profit. Growth that ignores the environment fails the test; so does protecting nature while ignoring people's needs.

Year	Milestone
1972	**Stockholm** UN Conference on the Human Environment; **UNEP** set up; 5 June becomes World Environment Day
1987	**Brundtland Report**, "Our Common Future"
1992	**Rio Earth Summit**: Agenda 21, the Rio Declaration (27 principles), the climate convention (UNFCCC) and the Convention on Biological Diversity
2002	Johannesburg World Summit on Sustainable Development
2012	**Rio+20**, "The Future We Want": starts the process for the SDGs
2015	**Agenda 2030**: **17 Sustainable Development Goals, 169 targets**, adopted 25 September 2015, for 2016 to 2030

Principles you must know

- **Inter-generational equity**: the present generation holds the environment in trust for the next.
- **Precautionary principle** (Rio Principle 15): where there is a threat of serious or irreversible damage, lack of full scientific certainty is no reason to postpone protection.
- **Polluter pays principle** (Rio Principle 16): the polluter bears the cost of the pollution and of restoring the damage.
- **Public participation** (Rio Principle 10) and **EIA** (Rio Principle 17).

In India the Supreme Court accepted the precautionary and polluter pays principles as part of the law of the land in **Vellore Citizens' Welfare Forum v. Union of India (1996)**, a case about tannery effluents in Tamil Nadu.

Measuring a good life: the Human Development Index. UNDP has published the HDI since **1990** (designed by Mahbub ul Haq, with Amartya Sen). It is the geometric mean of three dimensions:

Dimension	Indicator
A long and healthy life	Life expectancy at birth
Knowledge	Mean years of schooling and expected years of schooling
A decent standard of living	Gross national income per person (PPP)

So the indicators of a sustainable, good quality of life are **increased longevity, more knowledge and higher income**. "No income enhancement" is the odd one out in Q19. In the **Human Development Report 2025** (released 6 May 2025), **India ranks 130 of 193** with an HDI of **0.685**, in the medium human development group (high starts at 0.700). Since 2020 UNDP also publishes a **planetary pressures-adjusted HDI (PHDI)**, which lowers a country's score for high carbon emissions and material use.

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FROM THE EXAM · APPSC AEE 2025 · PAPER II

Q143 Which of the following best defines sustainable development?

(1) Maximising economic growth without considering environmental impacts

(2) Balancing economic growth with social equity and environmental protection

(3) Prioritising environmental protection over social and economic concerns

(4) Focusing solely on social equity without regard for economic or environmental factors

APPSC's answer: (2) Balancing economic growth with social equity and environmental protection. The Brundtland Commission report 'Our Common Future' (1987) defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It balances three pillars: economic growth, social equity and environmental protection. Options 1, 3 and 4 each favour one pillar and ignore the others.

Q19 Which of the following is NOT an indicator of sustainable lifestyles in human life?

(1) No income enhancement

(2) Increased longevity

(3) An increase in knowledge

(4) An enhancement of income

APPSC's answer: (1) No income enhancement. The indicators of quality of life and sustainable lifestyles are increased longevity, an increase in knowledge and an enhancement of income, which match the three dimensions of UNDP's Human Development Index (life expectancy, education and per-capita income). 'No income enhancement' shows no improvement in living standards, so it is not an indicator of a sustainable lifestyle.

10.8 Ecological footprint and biocapacity

ASKED BY APPSC

2025-26 UPDATE

The **ecological footprint** is the area of **biologically productive land and water** needed to produce everything a person (or city, or country) consumes and to **absorb its wastes**, mainly carbon dioxide. It was developed by **Mathis Wackernagel and William Rees** in the 1990s and is measured in **global hectares (gha)**, hectares of world-average productivity.

The footprint adds six kinds of area: **cropland, grazing land, fishing grounds, forest land** for timber and paper, **built-up land**, and the **carbon footprint** (forest area needed to absorb our CO_2 emissions). The carbon part is the largest, about 60 per cent of humanity's footprint.

Biocapacity is the other side of the account: how much the planet's ecosystems can actually **regenerate** in a year.

- Footprint **more than** biocapacity → **ecological deficit** (overshoot): we are using up natural capital, like spending from savings.
- Footprint **less than** biocapacity → **ecological reserve**.

```
Earth Overshoot Day = (Earth's biocapacity ÷ humanity's ecological footprint) × 365
```

LATEST FIGURES (GLOBAL FOOTPRINT NETWORK)

- **Earth Overshoot Day 2026 fell on 30 July** (it was 24 July in 2025). The date is announced every year on **5 June**, World Environment Day.
- Global **biocapacity is about 1.5 gha per person**. A country whose footprint per person is below this would not exhaust the planet's yearly budget if everyone lived like its people. **India** is one such country.
- **In the exam, use the numbers given in the question.** APPSC's Q150 used older textbook figures: an average footprint of 2.3 hectares against 1.7 hectares available per person.

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Other footprints

- **Carbon footprint**: total greenhouse gases caused by a person, product or organisation, in tonnes of CO_2-equivalent.
- **Water footprint** (Arjen Hoekstra, 2002): total fresh water used, split into **green** (rainwater), **blue** (surface and ground water) and **grey** (water needed to dilute the pollution).
- **Virtual water** (Tony Allan): water hidden in traded goods; exporting rice exports water.

Cutting a household footprint. Energy-efficient appliances do the same work with less electricity, so less coal is burnt and less CO_2 is emitted. In India the **Bureau of Energy Efficiency (BEE) star label** (1 to 5 stars, 5 the most efficient) shows this on fans, ACs, refrigerators and other appliances.

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Q150 Match the columns based on the concept of ecological footprint in 2023 and select the correct option from the following.

Concepts	Details
1. Ecological footprint	A. 2.3 hectares per capita
2. Global average footprint	B. Exceeding available resources
3. Sustainable land availability	C. 1.7 hectares per capita
4. Unsustainable usage	D. Land required for resources and waste disposal

(1) 1-D, 2-B, 3-C, 4-A
(2) 1-C, 2-A, 3-D, 4-B
(3) 1-D, 2-A, 3-C, 4-B
(4) 1-C, 2-B, 3-D, 4-A

APPSC's answer: (3) 1-D, 2-A, 3-C, 4-B. Ecological footprint is the area of biologically productive land and water needed to supply a population's resources and absorb its wastes (1-D). The global average footprint per person (2.3 hectares in this question) is larger than the sustainable land, or biocapacity, available per person (1.7 hectares) (2-A, 3-C), and using more than is available is unsustainable overshoot (4-B). Global Footprint Network figures differ slightly (humanity uses about 1.7 Earths), but the matching is the same.

Q144 Read the following statement and conclusions carefully and decide which of the given conclusions is/are true based on the statement.
Statement:Adopting energy-efficient appliances reduces the ecological footprint of households.
Conclusions:
I. Energy-efficient appliances consume less electricity, reducing carbon emissions.
II. Energy-efficient appliances are least expensive and easily accessible to most households.

(1) Only conclusion I is true
(2) Only conclusion II is true
(3) Both conclusions I and II are true
(4) Neither conclusion I nor II is true

APPSC's answer: (1) Only conclusion I is true. Energy-efficient appliances use less electricity for the same service, so less fuel is burnt in power plants and carbon emissions fall; this is how they reduce the household ecological footprint, so conclusion I is true. Conclusion II does not follow: the statement says nothing about price or availability, and efficient appliances (such as BEE 5-star rated ones) often cost more upfront.

10.9 Life Cycle Assessment (LCA)

ASKED BY APPSC

A **Life Cycle Assessment** measures the environmental impacts of a product or service over its **whole life**: from raw material extraction, through manufacture, transport and use, to **disposal or recycling**. It is often called a **"cradle to grave"** study. It is an environmental tool, not a costing or profit tool.

Four phases (international standards **ISO 14040 and ISO 14044**):

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1 Goal and scope
Purpose, system boundary and the **functional unit** (for example, carrying 1,000 kg of groceries)

→

2 Inventory (LCI)
All inputs (energy, water, materials) and outputs (emissions, wastes)

→

3 Impact assessment (LCIA)
Global warming, acidification, eutrophication, ozone depletion, toxicity, resource use

→

4 Interpretation
Hot spots, conclusions, what to improve

Boundary	Covers
Cradle to gate	Raw material to the factory gate
Gate to gate	One process inside the factory
Cradle to grave	The full life, including use and disposal
Cradle to cradle	The product is recycled into a new one: a **circular economy**

LCA is used to compare products (paper bag or plastic bag; petrol car or electric car), to design greener products, and to support eco-labels such as India's **Ecomark** (1991) and **Extended Producer Responsibility** rules.

DO NOT CONFUSE

ISO 14001 is the standard for an **Environmental Management System** in an organisation. **ISO 14040/14044** are the LCA standards. And LCA never looks "only at production": disposal is part of it.

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Q141 What is the primary purpose of a Life Cycle Assessment (LCA)?

(1) To measure profit
(2) To analyse environmental impact
(3) To study political effects
(4) To raise product cost

APPSC's answer: (2) To analyse environmental impact. Life Cycle Assessment (ISO 14040/14044) evaluates the environmental impacts of a product or service over its whole life, from raw material extraction through manufacture, transport and use to end-of-life disposal or recycling ('cradle to grave'). It covers energy use, emissions, resource depletion and waste so that improvements can be identified. It is not a profit, political or costing tool.

Q145 Read the following statement and conclusions carefully and decide which of the given conclusions is/are true based on the statement.
Statement:Life Cycle Assessment (LCA) considers the environmental impacts of a product throughout its entire life cycle.
Conclusions:
I. LCA provides insights into the environmental effects of product disposal.
II. LCA focuses solely on the production phase of a product.

(1) Only conclusion I is true
(2) Only conclusion II is true
(3) Both conclusions I and II are true
(4) Neither conclusion I nor II is true

APPSC's answer: (1) Only conclusion I is true. Since LCA covers a product's entire life cycle, from raw material extraction, manufacture and use to end-of-life disposal or recycling, it gives insight into the environmental effects of disposal, so conclusion I is true. Conclusion II contradicts the statement, because LCA does not look only at the production phase. Hence only conclusion I is true.

10.10 Sustainable lifestyles, transport and cities

ASKED BY APPSC · 2025-26 UPDATE

Consumerism. "Crazy consumerism" means buying far more than we need, often use-and-throw goods. Every

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extra product needs raw materials, water and energy, and ends up as waste: the result is **overexploitation of resources and environmental degradation**. The answer is **mindful consumption**: reduce, reuse, repair, recycle, and a **circular economy** in which waste becomes a resource. India's **Extended Producer Responsibility** rules make producers responsible for collecting their plastic packaging, e-waste and batteries.

Mission LiFE (Lifestyle for Environment). The Prime Minister proposed the idea at **COP26 in Glasgow** (1 November 2021) and launched the mission on **20 October 2022 at Ekta Nagar (Kevadia), Gujarat**, with UN Secretary-General António Guterres.

- Aim: get **at least one billion** Indians and global citizens to take environment-friendly action in **2022 to 2027**, making them **Pro-Planet People (P3)**.
- **75 LiFE actions** under **seven themes**: save energy, save water, say no to single-use plastic, adopt sustainable food systems, reduce waste, adopt healthy lifestyles, and reduce e-waste.
- Three phases: change in **demand** (individual habits), then in **supply** (industry responds), then in **policy**.

Transport. Per kilometre travelled, **walking and cycling** emit almost nothing; buses and trains emit little per passenger; petrol and diesel cars emit much more; and a **long flight** has a very large footprint per passenger.

Active transport (walking, cycling) builds daily physical activity into travel. Regular activity lowers the risk of **obesity, heart disease, high blood pressure, type 2 diabetes and stroke**, and fewer cars mean cleaner air for everyone.

Urban sprawl is the **unplanned, low-density spread of a city into surrounding rural land**: along highways (**ribbon development**), in scattered patches (**leapfrog development**), or as endless low-rise suburbs. It:

- eats up farmland, forests, lakes and wetlands;
- makes people depend on cars, so travel, fuel use and air pollution rise;
- raises the cost of water, sewer and road networks per household;
- strengthens the **urban heat island**.

The remedy is the **compact city**: mixed land use, higher density near public transport (**Transit Oriented Development**), green belts and urban growth boundaries.

Green buildings. Buildings use a large share of India's electricity. The tools:

Tool	What it is
ECSBC 2024 (Energy Conservation and Sustainable Building Code)	BEE's code for commercial and office buildings; it builds on ECBC 2017 and adds sustainability. Three levels: **ECSBC Compliant, ECSBC Plus, Super ECSBC**
Eco Niwas Samhita (ENS)	BEE's energy code for **residential** buildings
GRIHA	India's national rating system (TERI with the Ministry of New and Renewable Energy), 1 to 5 stars
IGBC	Indian Green Building Council (of CII) ratings
LEED	The US Green Building Council's international rating

In July 2026 the Ministry of Power proposed **mandatory energy ratings for large buildings**: a BEE Star Rating of **3 to 5 stars** (3 for ECSBC, 4 for ECSBC Plus, 5 for Super ECSBC), with GRIHA, IGBC, LEED and GEM ratings accepted after registering with BEE.

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Q138 How does crazy consumerism impact environmental sustainability?

(1) It promotes recycling and waste reduction initiatives.

(2) It encourages mindful consumption of natural resources.

(3) It leads to overexploitation of resources and environmental degradation.

(4) It fosters sustainable production practices.

APPSC's answer: (3) It leads to overexploitation of resources and environmental degradation. Crazy (excessive) consumerism means buying far more goods than needed, often use-and-throw items. It raises demand for raw materials, water and energy, leading to overexploitation of natural resources, more emissions and huge quantities of waste, which degrade the environment. It works against recycling, mindful consumption and sustainable production, so options 1, 2 and 4 are wrong.

Q136 Which transportation choice contributes the least to carbon emissions?

(1) Driving a conventional gasoline car

(2) Riding a bicycle

(3) Taking a long flight

(4) Using a diesel-powered vehicle

APPSC's answer: (2) Riding a bicycle. A bicycle is human-powered and has no tailpipe emissions, so its carbon footprint is close to zero apart from manufacture. Petrol and diesel vehicles burn fossil fuels and emit carbon dioxide for every kilometre, and long flights produce very high emissions per passenger. Hence cycling contributes the least to carbon emissions.

Q140 Which of the following is a potential health benefit of active transportation modes, such as walking and cycling?

(1) Increased air pollution exposure

(2) Reduced risk of chronic diseases like obesity and heart disease

(3) Higher dependence on fossil fuels

(4) Limited access to green spaces

APPSC's answer: (2) Reduced risk of chronic diseases like obesity and heart disease. Walking and cycling build physical activity into daily travel. Regular activity lowers the risk of obesity, heart disease, high blood pressure, type 2 diabetes and stroke (WHO). Active transport also reduces fossil fuel use and air pollution, so options 1, 3 and 4 describe effects opposite to its benefits.

Q139 Which of the following best describes urban sprawl?

(1) Compact and efficient urban development

(2) Concentrated growth within city centres

(3) Unplanned expansion of urban areas into surrounding rural lands

(4) Sustainable and environmentally-friendly urban planning

APPSC's answer: (3) Unplanned expansion of urban areas into surrounding rural lands. Urban sprawl is the unplanned, low-density spread of cities outward into surrounding rural and agricultural land, often along highways. It increases dependence on cars, travel distances, energy use and pollution, and consumes farmland, forests and wetlands. Compact, concentrated and planned sustainable development are the opposite of sprawl.

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😂 **MEME BREAK** How (not) to do an EIA



Build the plant first, then write the EIA to "regularise" it ✗



Study the site, hear the villagers, change the design, then decide ✓

👉 The P in EIA is "prior": the clearance must come before the work starts.

10.11 Environmental education

ASKED BY APPSC

Environmental education is not about memorising facts: it builds **awareness, knowledge, attitudes, skills and participation**, so that people make **informed decisions** and **act** for sustainability.

Year	Milestone
1975	**Belgrade Charter** (UNESCO-UNEP workshop): the goal and objectives of environmental education
1977	**Tbilisi Declaration**: the first intergovernmental conference on environmental education (Tbilisi, Georgia). Its five objectives: **awareness, knowledge, attitudes, skills, participation**
2005-2014	UN Decade of Education for Sustainable Development
2015	SDG target 4.7: education for sustainable development for all learners

In India: the Supreme Court, in the M.C. Mehta cases (1991, and its 2003 order), made **environmental studies compulsory** at every level of education; UGC introduced a compulsory course for all undergraduates; the **National Green Corps** runs eco-clubs in schools; and the **Centre for Environment Education (CEE)**, Ahmedabad, set up in 1984, is MoEFCC's centre of excellence for it.

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Q135 What role does environmental education play in empowering individuals and communities?

(1) It discourages critical thinking and problem-solving skills.

(2) It promotes apathy and indifference towards environmental issues.

(3) It enables informed decision-making and encourages active participation in sustainability initiatives.

(4) It reinforces unsustainable behaviours and practices.

APPSC's answer: (3) It enables informed decision-making and encourages active participation in sustainability initiatives. Environmental education, as set out in the Tbilisi Declaration (1977), aims at awareness, knowledge, attitudes, skills and participation. It builds critical thinking so that people can make informed choices and take an active part in conservation and sustainability efforts. The other options describe the opposite of its purpose.

10.12 Population and environment

ASKED BY APPSC

How much damage people do depends on how many they are **and** how much each consumes. The **IPAT equation** (Ehrlich and Holdren, 1971) puts it simply:

```
Impact (I) = Population (P) × Affluence, i.e. consumption per person (A) × Technology (T)
```

Term	Meaning
Population explosion	A sudden, rapid rise in population because **birth rates stay high while death rates fall**
Demographic transition	A society's shift from **high birth and death rates to low birth and death rates** as it industrialises and develops. Stages: high stationary → early expanding → late expanding → low stationary
Carrying capacity (K)	The **largest population** an environment can support **indefinitely** with its resources and technology
Overpopulation	When the number of people **exceeds the capacity** of the area to support a decent standard of living
J-shaped growth	Exponential growth that overshoots and crashes
S-shaped (logistic) growth	Growth that slows and levels off at the carrying capacity
Replacement fertility	A total fertility rate (TFR) of about **2.1** children per woman keeps a population stable in the long run

Thomas Malthus (1798) argued that population grows geometrically while food grows only arithmetically. The world population reached **8 billion on 15 November 2022**, and in 2023 **India became the most populous country**. India's TFR has fallen to **2.0** (NFHS-5, 2019-21), below the replacement level.

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Q148 Match the following terms in List I with their descriptions in List II.

List I (Terms)	List II (Descriptions)
A. Population explosion	1. A sudden, rapid increase in the global population due to high birth rates and declining death rates
B. Demographic transition	2. The process of a society transitioning from high birth and death rates to low birth and death rates as it undergoes industrialisation and economic development
C. Carrying capacity	3. The maximum population size that a given environment can sustain indefinitely, given the resources available and the level of technology and infrastructure
D. Overpopulation	4. The condition where the number of people in an area exceeds the capacity of the environment to support life at a decent standard of living

(1) A-4, B-2, C-3, D-1
(2) A-1, B-2, C-3, D-4
(3) A-3, B-4, C-1, D-2
(4) A-2, B-3, C-4, D-1

APPSC's answer: (2) A-1, B-2, C-3, D-4. Population explosion is a sudden, rapid rise in population due to high birth rates and falling death rates (A-1). Demographic transition is the shift from high birth and death rates to low ones as a society industrialises (B-2). Carrying capacity is the maximum population an environment can sustain indefinitely (C-3). Overpopulation is when the number of people exceeds the environment's capacity to support a decent standard of living (D-4).

Quick revision

- **EIA** = predict, evaluate, mitigate, decide, **before** approval. First law: USA's NEPA 1969. India: Notification **1994**, replaced by **14 Sep 2006** (Environment Protection Act, 1986). Rio Principle **17**.
- **Category A**: EAC + MoEFCC. **Category B**: SEAC + SEIAA; **B1** needs EIA, **B2** does not. General Condition: B becomes A near protected areas, critically polluted areas, eco-sensitive areas, inter-state or international borders.

- **Stages**: screening (B only) → scoping (ToR, **60** days) → public consultation (hearing by **SPCB in 45 days**, **30** days' notice, Collector supervises) → appraisal (**60** days) → decision (**45** days). Data not older than **3 years**.
- **EC validity**: general **10** years, river valley 13, nuclear 15, mining 30, ports up to 20 (2026). Six-monthly compliance reports; PARIVESH portal. Draft EIA 2020 never finalised.
- **Baseline**: physical, **biological** (flora, fauna, **bird migration**), socio-economic; 10 km study area; soil data by **coring and sampling**.
- **Methods**: ad hoc, checklists, **matrices** (Leopold **100 × 88**, magnitude and importance 1 to 10), **networks** (indirect impacts), **overlays**/GIS (siting), Battelle (**78** parameters, **1,000 PIU**).
- **Risk** = probability × consequence. **Qualitative**: risk matrix, checklists, what-if, HAZOP. **Quantitative**: fault tree (backwards), event tree (forwards), Monte Carlo, sensitivity analysis. GIS for vulnerability; revise periodically.
- **EMP**: avoid → minimise → restore → offset; monitoring, budget, environment cell, green belt (OM **29 Oct 2025**: estates 10 per cent, red units 15 to 25 per cent; earlier 33 per cent), stakeholder engagement. **SAEIA/SCEIA** (13 July 2026) stand in for non-functioning SEIAA/SEAC.
- **APPCB**: **CFE** before building, **CFO** before production (Water Act s.25, Air Act s.21). PI: Red ≥ 80, Orange 55 to 80, Green 25 to 55, White < 25 (exempt), **Blue** = essential environmental services.
- **Sustainable development**: Brundtland **1987**; three pillars; SDGs **17 / 169**, 2015 to 2030. Precautionary (Rio 15), polluter pays (Rio 16), **Vellore (1996)**.
- **HDI**: longevity, knowledge, income. India **130 / 193, 0.685** (HDR 2025).
- **Footprint**: land and water to supply resources and absorb waste, in **gha**; carbon is the largest part. Biocapacity about **1.5 gha** per person. **Overshoot Day 2026: 30 July**.
- **LCA**: cradle to grave; ISO **14040/14044**; goal and scope → inventory → impact assessment → interpretation. ISO 14001 = EMS.
- **Lifestyles**: consumerism → overexploitation; **Mission LiFE** (20 Oct 2022, 7 themes, 75 actions); bicycle = least emissions; active transport = less obesity and heart disease; **urban sprawl** = unplanned spread into rural land; ECSBC 2024, ENS, GRIHA.
- **Education**: Belgrade 1975, **Tbilisi 1977** (awareness, knowledge, attitudes, skills, participation).
- **Population**: explosion, demographic transition, **carrying capacity**, overpopulation; IPAT; 8 billion (15 Nov 2022).

Practice MCQs

1. Under the EIA Notification, 2006, which stage applies only to Category B projects?
(1) Scoping (2) Screening (3) Public consultation (4) Appraisal

2. The public hearing for a project in Andhra Pradesh is conducted by
(1) the Expert Appraisal Committee of MoEFCC (2) the State Level EIA Authority (3) the A.P. Pollution Control Board (4) the project proponent

3. Which method of impact identification is best at showing secondary and tertiary (indirect) impacts?
(1) Checklist (2) Leopold matrix (3) Network (4) Ad hoc method

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4. Match the following.
A. Leopold matrix | 1. Maps of environmental factors laid over each other
B. Overlay method | 2. 78 parameters and 1,000 importance units
C. Battelle system | 3. Project actions against environmental characteristics
D. Checklist | 4. List of factors to be considered
(1) A-3, B-1, C-2, D-4 (2) A-1, B-3, C-4, D-2 (3) A-3, B-2, C-1, D-4 (4) A-2, B-1, C-3, D-4

5. In risk assessment, an analysis that starts from an undesired top event and works backwards to its causes through AND/OR gates is
(1) event tree analysis (2) fault tree analysis (3) HAZOP (4) Monte Carlo simulation

6. For a project other than river valley, nuclear and mining projects, an Environmental Clearance is now valid for
(1) 5 years (2) 7 years (3) 10 years (4) 30 years

7. In Andhra Pradesh, an industry needs a Consent for Establishment from APPCB under
(1) Section 25 of the Water Act, 1974 and Section 21 of the Air Act, 1981 (2) Section 3 of the Environment (Protection) Act, 1986 only (3) the Wild Life (Protection) Act, 1972 (4) the Forest (Conservation) Act, 1980

8. In CPCB's 2025 classification, the newly added Blue category is meant for
(1) the most polluting industries (2) industries in eco-sensitive zones (3) essential environmental services such as waste-to-energy and biomining of legacy waste (4) non-polluting industries exempt from consent

9. Statement: Earth Overshoot Day now falls about five months before the end of the year.
Conclusions: I. Humanity's yearly demand on nature is more than what Earth's ecosystems regenerate in a year. II. Biocapacity is no longer calculated.
(1) Only I follows (2) Only II follows (3) Both follow (4) Neither follows

10. The correct order of the phases of a Life Cycle Assessment is
(1) Inventory → goal and scope → interpretation → impact assessment (2) Goal and scope → inventory → impact assessment → interpretation (3) Impact assessment → inventory → goal and scope → interpretation (4) Goal and scope → impact assessment → inventory → interpretation

11. Where there is a threat of serious or irreversible damage, the lack of full scientific certainty is no excuse for delaying measures to protect the environment. This is the
(1) polluter pays principle (2) precautionary principle (3) principle of inter-generational equity (4) public trust doctrine

12. The five objectives of environmental education (awareness, knowledge, attitudes, skills and participation) were adopted at
(1) Stockholm, 1972 (2) Tbilisi, 1977 (3) Rio de Janeiro, 1992 (4) Johannesburg, 2002

Rapid fire

Question	Answer
World's first EIA law	NEPA, USA, 1969
India's current EIA Notification	14 September 2006 (S.O. 1533(E))
Who grants EC for Category A	MoEFCC, on EAC's recommendation
Who grants EC for Category B	SEIAA, on SEAC's recommendation
Scoping produces	Terms of Reference (ToR)

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Question	Answer
Public hearing completed within	45 days, by the SPCB
Leopold matrix size	100 actions × 88 characteristics
Qualitative risk method	Risk matrix
Forward-looking risk tree	Event tree
Brundtland Report	"Our Common Future", 1987
SDGs	17 goals, 169 targets, 2015 to 2030
Footprint unit	Global hectare (gha)
Earth Overshoot Day 2026	30 July
LCA standards	ISO 14040 and 14044
Mission LiFE launched	20 Oct 2022, Ekta Nagar (Kevadia)
Tbilisi Declaration	1977, environmental education
IPAT	Impact = Population × Affluence × Technology

Answers

Q	Answer	Why
1	(2)	Screening decides whether a Category B project is B1 or B2; Category A projects go straight to scoping.
2	(3)	The State Pollution Control Board (APPCB in Andhra Pradesh) conducts the hearing, supervised by the District Collector or an ADM.
3	(3)	Networks trace cause → effect → further effect chains. A matrix shows only direct action-component pairs.
4	(1)	Leopold: actions × characteristics; overlays: maps; Battelle: 78 parameters, 1,000 PIU; checklist: a list.
5	(2)	Fault tree analysis is deductive and works backwards from the top event; an event tree works forwards from an initiating event.
6	(3)	The April 2022 amendment raised it from 7 to 10 years, extendable by one year.
7	(1)	CFE and CFO are given under Section 25 of the Water Act and Section 21 of the Air Act.
8	(3)	Blue covers nine essential environmental service sectors, with two extra years of consent validity as an incentive.
9	(1)	Overshoot before 31 December means the footprint is larger than biocapacity. II is false: biocapacity is part of the very calculation.
10	(2)	ISO 14040/14044: goal and scope, inventory analysis, impact assessment, interpretation.
11	(2)	This is the precautionary principle, Principle 15 of the Rio Declaration.
12	(2)	The Tbilisi Declaration of 1977 set these five objectives.

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