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Syllabus heading

Environment and Conservation

UPSC Civil Services (Main) Examination · GS III · General Studies Paper III

Conservation, environmental pollution and degradation, environmental impact assessment.

Facts & figures for this syllabus heading.

Numbers move. Confirm the latest Budget, Economic Survey or census round. This sheet is for revision, not a substitute for the model answer.

<https://wrapexams.com/upsc/mains-answers/gs-3/environment/>

Indian Biodiversity

Megadiverse Country & Biodiversity Hotspots; India is one of 17 megadiverse countries, home to approximately 7-8% of global biodiversity despite covering only 2.4% of the Earth's land area.; It includes four global biodiversity hotspots; Western Ghats; Eastern Himalayas; Indo-Burma region; Sundaland (covering the Nicobar Islands) Species Richness; India harbors approximately 92,000 to 97,000 faunal species...

Forest Conservation

Global Forest Status; Forests cover 31% of Earth's land area (~4.06 billion hectares).; Primary forests account for 1.11 billion hectares.

Water Stress

Water Stress & Per Capita Availability; India is classified as water-stressed.; Per-capita water availability.; 2011: ~1,544 m³/year; 2021: ~1,486 m³/year; Projected: ~1,341 m³ (2025), ~1,219 m³ (2050); Water scarcity threshold: ↓ 1,000 m³/year Water Demand & Supply Gap; Forecasted water demand.; ~833 billion m³ (2025); ~899 billion m³ (2050); 54% of India's land area faces high to extreme water stress. Water...

Water Stress

Energy-Water Nexus; 90% of thermal power plants rely on freshwater for cooling.; 40-70% of thermal plants are or will be in high water-stress areas by 2030.; Water shortages have led to supply interruptions and lower performance of several plants.

Water Stress

Infrastructure & Dams; India has 4,407 large dams, the third-highest globally.; Over 1,000 dams are over 50 years old, raising concerns about safety and efficiency.

Air Pollution

National Clean Air Programme (Ncap); Launched in 2019 with a target to reduce PM levels by 20-30% by 2024 (base year: 2017).; Revised goal: 40% reduction in PM10 by 2026.; As of 2024, an average 27% PM reduction was achieved in targeted cities.

Air Pollution

Current Pollution Trends (2025); Delhi has already breached annual pollution safety norms early in the year.; Mumbai's Deonar and Sion zones recorded some of the highest PM2.5 levels in metro regions.; Punjab cities show consistently high pollution levels, even beyond stubble burning seasons.

Government Measures Ethanol blending

E10 target achieved; E20 targeted by 2025-26.; Performance-based grants awarded under NCAP to cities achieving PM reduction targets.; Measures include expanding air quality monitoring, controlling road dust, enforcing industrial norms, and promoting cleaner fuels.

Soil Pollution

Economic And Ecological Impacts; Soil degradation threatens agricultural productivity and food security.; Global cost of land degradation may reach \$23 trillion by 2050 due to loss of food, ecosystem services and income. Legal And Regulatory Framework; Solid Waste Management Rules, 2016; Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016; Plastic Waste Management Rules, 2016; E-Waste...

Plastic Pollution

Global Plastic Scenario; The world produces ~430 million tonnes of plastic annually; over two-thirds are short-lived.; Plastic production is projected to triple by 2060.; Shifting to a circular economy could reduce plastic pollution by 80% by 2040. Marine Ecosystem Impact; Plastic pollution causes an estimated USD 13 billion in annual marine ecosystem damage.; Around 19 million tonnes of plastic leak into the...

Plastic Pollution

Waste Fate And Recycling; 9% of plastic waste is recycled.; 12% is incinerated.; 79% ends up in landfills or the environment.

Plastic Pollution

Regulatory And Implementation Challenges; 25 states failed to submit action plans under Plastic Waste Management Rules.; Over 90% of the plastic industry operates in the informal sector. Government Measures; Plastic Waste Management Rules (2016, amended 2021-22) implemented.; Ban imposed on selected single-use plastic items.; Extended Producer Responsibility (EPR) mechanism introduced.; 2.5 million tonnes of plastic...

Major Climate Agreements UNFCCC (1993)

Stabilize greenhouse gases.; **Kyoto Protocol (2002)** - Binding emission reduction.; **Paris Agreement (2016)** - Limit global warming below 2°C.; **Montreal Protocol (1992)** - Phase-out ozone-depleting substances.; **Kigali Amendment (2019)** - Reduce HFCs.; **International Solar Alliance (2015)** - Promote solar energy.; REDD+ - Reduce deforestation, enhance forest carbon stocks.; Clean Development Mechanism (CDM) - Investment in...

Climate Change

India's Climate Commitments; Net Zero by 2070; 500 GW non-fossil capacity by 2030; 50% electricity from renewables by 2030; Reduce emission intensity by 45% (2005 baseline); 2.5-3 billion tonnes of CO₂ sink by 2030; Avoid 1 billion tonnes of CO₂ by 2030 Sectoral Actions Power;; 50% installed capacity from non-fossil sources.; Renewable Purchase Obligations, Green Term-Ahead Market. Transport;; FAME India, BS-VI...

India's National Plans NAPCC

8 National Missions.; State Action Plans aligned with NAPCC.

Forest Fires

State-wise Data Madhya Pradesh

Highest forest fires in 2025 (~1,743 incidents).; Maharashtra - ~1,245 large fires (Jan-Apr 2025).; Odisha - Over 27,000 fire incidents (Nov 2024-Jun 2025).; Uttarakhand - Around 1,700 fire alerts during 2025-26 season.

Initiatives

National Action on Forest Fires; The Forest Fire Prevention and Management Scheme (FPM); ISRO developed Moderate Resolution Imaging Spectro- radiometer(MODIS),Suomi-National Polar-orbiting Partnership - Visible Infrared Imaging Radiometer Suite(SNPP-VIIRS)for forest fire detection.

49 key performance indicators (KPIs)

22. National Action Plan For Climate Change Guiding Principles; Protection and Inclusion: Prioritize safeguarding vulnerable communities from climate risks.; Sustainable Development: Harmonize ecological sustainability with national economic growth.; Technological Advancements: Use innovation for emission reductions and climate adaptation.

49 key performance indicators (KPIs)

.Other Schemes Related With Environmental Issues Carbon Credit Trading; A strategic initiative by India's Power Ministry, with BEE, to Scheme promote the reduction, removal, or avoidance of greenhouse gas emissions.; Enables trading of Carbon Credit Certificates (CCCs), each representing one tonne of CO₂ equivalent reduced, removed, or avoided.; Open to both obligated entities (with legal emission reduction...

Ganga Prahari

Guardians of the Ganga The objective is to establish a trained cadre of local community members for institutionalizing the conservation efforts of the River Ganga at the grassroots level.

Bio-Decomposer Solution

Fighting Stubble Burning The objective is to combat pollution caused by stubble burning by providing bio-decompose spray to farmers.

Electric Vehicle Policy

Delhi The objective is to implement eco-friendly measures to improve Delhi's air quality by reducing emissions from the transport sector.

Clean Goalpara Green Goalpara

Goalpara, Assam To protect and improve the environment by planting saplings across Goalpara district in a mission-mode effort involving the community and various organizations.

Impact

The initiative successfully planted over 12.6 lakh saplings, increasing the forest coverage area in Goalpara from 19% to 23%.

Implementation of Green Technologies in Road

Goalpara, Assam To provide all-weather connectivity by adopting green technologies, reducing dependence on natural resources, and lowering construction and maintenance costs.

Impact

The initiative has successfully utilized waste plastic and innovative technologies to construct roads, leading to economic benefits and sustainable development for the entire state.

Carbon Neutral Meenangadi

Wayanad, Kerala To develop Meenangadi Gram Panchayat as a carbon-neutral and climate-resilient local body through decentralised climate action, community participation, carbon sequestration, and low-emission development planning.

Bio-village Model

Tripura To promote sustainable rural livelihoods and climate-smart village development by combining organic farming, renewable energy, biogas, improved livestock, and energy-efficient technologies.

LED Street Lighting via ESCO Mode

Thane, Maharashtra To reduce municipal electricity consumption and greenhouse gas emissions by replacing conventional streetlights with energy-efficient LED lights through an Energy Service Company model.

Indira Paryavaran Bhawan

New Delhi To demonstrate energy-efficient and climate-sensitive public infrastructure through a green government building integrating passive design, renewable energy, and efficient resource use.

Sarvajal Project for Providing Safe Drinking Water

Udham Singh Nagar, Uttarakhand To provide community-level safe drinking water to underserved areas using solar-powered, cloud- connected water dispensing kiosks and promote water conservation awareness.

Construction of Subsurface Dams

YSR (Kadapa), Andhra Pradesh To address water shortages in drought-prone Kadapa district by constructing subsurface dams using Z sheet piling technology for sustainable irrigation.

16 Water Resource Conservation

NITI AAYOG BEST PRACTISES 58

16 Water Resource Conservation

NITI AAYOG BEST PRACTISES 59

16 Water Resource Conservation

Recharging Open Wells for Sustainable Water Access - Thrissur, Kerala To ensure sustainable drinking water access by using rooftop rainwater harvesting to recharge open wells through community participation and Panchayati Raj institutions.

16 Water Resource Conservation

NITI AAYOG BEST PRACTISES 60

16 Water Resource Conservation

IMPORTANT CONSTITUTIONAL AMENDMENTS AND ARTICLES

Madhav Gadgil Committee, 2010 [Steps to preserve

Focus Areas Recommendations Classification Classify 64% of the Western Ghats region into Ecologically Sensitive Zones (ESZ1, ESZ2, ESZ3) covering six states, 44 districts, and 142 taluks. Biodiversity Recognize Western Ghats as a UNESCO Biodiversity Hotspot, Hotspot containing over 30% of India's species across various categories. Developmental Restrictions In ESZ-1, halt activities like mining, thermal power...

Shailesh Nayak Committee, 2014 [Regarding Coastal

Focus Areas Recommendations Shift to State Regulate all development and construction activities at the state and Local Bodies local levels, except those requiring environmental clearances. High-Density Reduce the "no-development buffer zone" to 50 meters from the High Rural Areas Tide Line (HTL) for rural areas with population density over 2,161 persons/sq km, and 200 meters for others. IMPORTANT COMMITTEES...

Mihir Shah Committee, 2016 [Augmentation,

Resources] Focus Areas Recommendations National Water Restructure and unify the **Central Water Commission** (CWC) and **Central Ground Commission** Water Board (CGWB) into a new **National Water Commission** (NWC). Irrigation Create an Irrigation Reform Division to assist states with irrigation projects and Reform Division improve water management. River Rejuvena- Establish a River Rejuvenation Division to implement...

Standing Committee Report on Promotion of Climate

The **Standing Committee** on Agriculture chaired by Mr. P.C. Gaddigoudar presented its report on 'Promotion of Climate Resilient Farming' on February 7, 2024. Key findings and recommendations:; Impact & Mitigation: Extend the NICRA Scheme to all climate-vulnerable villages using advanced technology for resilience.; Crop Diversification: Promote crop diversification with supportive policies and resources to ensure food...

Ganga Prahari - Guardians of the Ganga

The objective is to establish a trained cadre of local community members for institutionalizing the conservation efforts of the River Ganga at the grassroots level. Impact:; Over 2,000 Ganga Praharis (Guardians of the Ganga) identified and registered.; They organize awareness programmes, consultative meetings, and training sessions.; Actively engaged in Ganga Mashal Yatra under NMCG.; Ganga Praharis have used their...

Bio-Decomposer Solution - Fighting Stubble Burning

The objective is to combat pollution caused by stubble burning by providing bio-decompose spray to farmers. Impact:; Soil organic carbon increased by 5.36% to 42.11%, and available nitrogen increased by 2.70% to 24.21% in paddy fields where spraying was applied.; Seed germination of wheat increased by 17% to 20%.; Consumption of DAP and Urea reduced by 20-25 kg per acre.; Wheat productivity increased by 3% to 3.25%...

Electric Vehicle Policy - Delhi

The objective is to implement eco-friendly measures to improve Delhi's air quality by reducing emissions from the transport sector. NITI AAYOG BEST PRACTISES 10 Impact:; Approximately 22,000 EVs have been registered.; Over 9,000 EVs have been purchased, with INR 34.31 crore in subsidies disbursed to eligible beneficiaries.; 28 private charging points have been installed, with plans for 100 public charging stations...

Clean Goalpara Green Goalpara - Goalpara, Assam

To protect and improve the environment by planting saplings across Goalpara district in a mission-mode effort involving the community and various organizations. Impact:; The initiative successfully planted over 12.6 lakh saplings, increasing the forest coverage area in Goalpara from 19% to 23%.; Topics where it can be Applied: Afforestation, Sustainable Development.; How to Use:; Illustrate the success of...

Implementation of Green Technologies in Road

To provide all-weather connectivity by adopting green technologies, reducing dependence on natural resources, and lowering construction and maintenance costs. Impact:; The initiative has successfully utilized waste plastic and innovative technologies to construct roads, leading to economic benefits and sustainable development for the entire state.; Topics where it can be Applied: Sustainable Infrastructure...

Carbon Neutral Meenangadi - Wayanad, Kerala

To develop Meenangadi Gram Panchayat as a carbon-neutral and climate-resilient local body through decentralised climate action, community participation, carbon sequestration, and low-emission development planning. Impact: Launched in 2016, Carbon Neutral Meenangadi adopted a bottom-up model for integrating climate action into local development. The initiative prepared an emissions baseline using recognised...

Climate Budget - Odisha

To mainstream climate change concerns into public expenditure by identifying, tracking, and analysing climate-relevant and climate-sensitive budgetary allocations. Impact: Odisha became the first Indian state to prepare a Climate Budget. The initiative uses Climate Budget Tagging to integrate climate-related expenditure into the budgeting process. It classifies sectors and schemes using indicators such as Climate...

Bio-village Model - Tripura

To promote sustainable rural livelihoods and climate-smart village development by combining organic farming, renewable energy, biogas, improved livestock, and energy-efficient technologies. Impact: Tripura's Bio-village concept was introduced by the Directorate of Biotechnology, Government of Tripura in 2018 to promote sustainable agriculture and allied sectors. The model includes biogas units, improved livestock...

Sarvajal Project for Providing Safe Drinking Water

To provide community-level safe drinking water to underserved areas using solar-powered, cloud-connected water dispensing kiosks and promote water conservation awareness. Impact:; The initiative in Udham Singh Nagar has enabled remote communities to access clean water, fostering sustainable infrastructure and promoting water conservation through school-led campaigns.; Topics where it can be Applied: Water...

'Taanka' Technique for Water Conservation -

To ensure long-term sustainable water conservation by employing traditional rainwater harvesting techniques using underground storage tanks. Impact:; The initiative in Sonbhadra has significantly increased water storage capacity, ensuring adequate water supply during peak summer months and reducing reliance on water tankers.; Topics where it can be Applied: Water Conservation, Sustainable Agriculture.; How to Use...

Construction of Subsurface Dams - YSR (Kadapa),

To address water shortages in drought-prone Kadapa district by constructing subsurface dams using Z sheet piling technology for sustainable irrigation. Impact:; The initiative has significantly improved the water table and controlled groundwater level fluctuations, enhancing sustainable irrigation in the region.; Topics where it can be Applied: Water Conservation, Sustainable Development.; How to Use:; Discuss how...

Jal Sabha-led Initiative for Sustainable Drinking

To address the drinking water crisis through community-led planning, pond expansion, women's participation, and a financially sustainable water-management system. Impact: Villagers formed a Jal Sabha and created a Jal Kosh to pool community funds and ensure accountability. The capacity of Gawai Talaab was expanded from 2,869 CuM to 5,218 CuM, while Narsingh Nasa pond was expanded from 2,308 CuM to 26,601 CuM. The...

Jal Dal: Children's Institutions for Water

To ensure clean drinking water in schools and improve enrolment, attendance, and water conservation through student-led water management. Impact: In Godawas Khurd village, a 40,000-litre water tank was constructed in the school and a 10-member student body called Jal Dal was formed to maintain it. The Jal Dal ensured cleanliness of the tank, cleaning of silt chambers, proper functioning of the hand pump, and...

Mazhapolima: Recharging Open Wells for Sustainable

To ensure sustainable drinking water access by using rooftop rainwater harvesting to recharge open wells through community participation and Panchayati Raj institutions. Impact: Launched in 2009 by the Thrissur district administration, Mazhapolima promoted decentralised water management by channelling rooftop rainwater into open wells. The initiative improved groundwater recharge, strengthened drinking water...

Farm Ponds for Water Conservation and Aquaculture -

Pradesh To conserve water, manage liquid waste, promote aquaculture, and create community-friendly public spaces through the construction and maintenance of farm ponds. Impact: Nallajerla Mandal constructed and maintained 827 farm ponds for water conservation. Its 625 km underground drainage system was used to channel liquid waste into these ponds. A special fish species was introduced to prevent foul odour and...