

Tamil Nadu Public Service Commission
Syllabus
Environmental Science
(Degree Standard)

Code: 599

Unit I: Scope and Importance of Environmental Science (15 Questions)

Definition; scope and importance, multidisciplinary nature of environmental science, components Of environment: Atmosphere, Hydrosphere, Lithosphere and Biosphere. Geographical coordinates: Geographical zones of Earth. Role in Sustainable Development, United Nations Sustainable Development Goals (UNSDGs)

Unit II: Ecological Concepts (15 Questions)

Ecosystem definition; structure and function; energy flow, food chain and food web; ecological pyramids, biogeochemical cycles (Carbon, Nitrogen, Phosphorus and Sulfur); Hydrological cycle; Terrestrial and Aquatic Ecosystems, Ecological Succession and Resiliencies, Ecosystem services and Valuation, Urban Ecology and Landscape Ecology.

Unit III: Natural Resources and Sustainable Management (25 Questions)

Renewable and Non Renewable Resources: Concept, Use and Conservation: Forest Resources: Water Resources: Mineral Resources: Food Resources: Energy Resources: Land Resources: Afforestation, Social Forestry Water Shed Management, Rain Water Harvesting, Ground Water Recharge, Resource Accounting Resource Circular Economy, Organic Farming, Agro Forestry, Climate Smart Agriculture.

Unit IV: Biodiversity and Conservation (20 Questions)

Biodiversity - Definition; Levels of Biodiversity. Bio geographical classification of India: Forest types of Tamil Nadu: Biodiversity Hotspots in India: Values and Threats of Biodiversity: Endangered and Endemic Species of India. Conservation Strategies of Biodiversity: In-Situ and Ex-Situ. National And International Frame work: Wildlife Protection Act (1972), Amendments (2022), Biodiversity Act (2002), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Biological Diversity (CBD), Nagoya Protocol, Tamil Nadu Forest Conservation Act.

Unit V: Human Population and Environment (15 Questions)

Population growth and regulation: Age pyramids, Malthusian theory, global trends of population growth, Urbanization, Migration and Environmental Stress, Human Development Index (HDI), Gini Coefficient: Environmental health, Nutrition and health, Environmental Performance Index (EPI).

Communicable diseases - typhoid, cholera, tuberculosis, hepatitis, influenza, HIV- social issues. Non- communicable diseases - heart disease, diabetes, asthma. Epidemics. – COVID 19 Environmental risk factors. Human displacement and rehabilitation, tribal population and welfare schemes, women and child welfare. Human rights, Gender Equality, Environmental Justice, Occupational Health and Safety, Intellectual Property Rights.

Unit VI: Natural Catastrophies and Disaster Management (20 Questions)

Causes and effects of natural catastrophies – Earthquakes, floods, cyclones, hurricanes, storms, landslides, drought, famine, tsunami; Manmade disaster – Nuclear , Biological, Chemical, Fire accidents, Travel Accidents, Terrorism, Pollution Episodes, Societal Hazards. pre-disaster and post - disaster management, risk assessment, early warning systems and forecasting. Role of administrators, scientists, planners, volunteers. National Disaster Management Authority NDMA policies and Frame work.

Unit VII: Environmental Pollution (25 Questions)

Air, Water, Soil, Noise, Thermal, Marine and Radioactive pollution: Sources, Effects, Standards, Control measures and Mitigation. Industrial Pollution and Clean Development Mechanism (CDM).Waste Management: Solid, Hazardous, Bio-Medical and E-Waste. Plastic Pollution and Extended Producer Responsibilities (EPR), Sustainable sanitation. Case Studies: Cement Industry, Chemical and Fertilizer Industry, Leather Industry, Fly ash, Thermal stations, Nuclear power plants.

Unit VIII: Environmental Management and Legislation (25 Questions)

Environmental Impact Assessment: Objectives Types of EIA- Rapid, Comprehensive and Strategic EIA; Processes of EIA, Alternatives in EIA; EIA Methodologies, EIA Notifications of MoEF. Environmental Impact Statements (EIS), Environmental Management Plan (EMP) and Environmental Auditing – Eco Labeling, Eco-Mark. Geographic Information System (GIS) and Remote Sensing (RS) Artificial Intelligence (AI) tools.

Legislative framework of environmental protection, and Indian constitutional provisions; Sanction and enforcement bodies of environmental laws: role of high court (Green Bench), Supreme Court, State and Central Pollution Control Boards: National Action Plan on Climate Change (NAPCC); Environmental policy in India – National Environmental Policy 2006, 2021. National Forest Policy 1988, National Water Policy 2002. The Water (Prevention and Control of Pollution) Cess Act, 1977. The Air (Prevention and Control of Pollution) Act, 1981. National Environmental Tribunal Act, 1995; National Green Tribunal Act, 2010, 2022. The Environmental (Protection) Act, 1986 - Noise pollution control rules 2000, Waste management rules – Solid waste, Hazardous waste, Bio-medical waste, E-waste, Plastic Waste. Coastal Zone Regulation, 1997, 2011, 2019. All with Latest amendments (till 2024).

Unit IX: Environmental Organisations and Agencies (15 Questions)

International Organisations: United Nations Environment Programme (UNEP), International Union for Conservation of Nature and Natural Resources (IUCN), United Nation Framework for Convention and Climate Change (UNFCCC), International Panel on Climate Change (IPCC), International Panel on Oceans (IPO), Earth Summit, Convention on Biological Diversity (CBD), World Wide Fund for Nature (WWF), Wildlife Institute of India(WII), Botanical Survey of India (BSI), National Biodiversity Authority (NBA), Zoological Survey of India (ZSI), Centre for Science and Environment (CSC, New Delhi), Bombay Natural History Society (BNHS), Man and Biosphere Programme (MAB), India: Ministry of Environment, Forests and Climate Change (MoEFCC), Ministry of Earth Sciences (MoES), Salim Ali Centre for Ornithology and Natural History (SACON), CPR Environmental Education Centre NGO's.

Unit X: Contemporary Environmental Issues (25 Questions)

Global Environmental Issues – Biodiversity loss, Resource Depletion, Sea Level rise, Ocean Acidification, Over Population, Green House Gases Emission (GHG), Urban Heat Islands (UTI), Urban Sprawn, Desertification, Extreme Weather, Water Scarcity, Ozone Depletion, Over Fishing, Fossil Fuel Emissions, Coral Bleaching.

International treaties: Montreal Protocol, Kyoto protocol, Paris Agreement. Chipko Movement, Basel Convention, Ramsar Convention, Green Bonds, Ecological Foot Print, Carbon Trading. India's Climate Commitment: LiFE Movement, NET Zero (2070), Carbon Neutrality, Conference of Parties (CoP), National Hydrogen Mission.

Dated: 17.10.2025