

ENVIRONMENT AND SUSTAINABILITY

3-0-0-0-9

Biosphere; essential components for life: energy, carbon, water and nutrients and their role in sustaining life; biomes and ecosystems; Lithosphere; plate tectonics, types of rocks, rock and soil formation processes, types of rocks, rock cycle; Hydrosphere; water cycle, surface and groundwater origin and its quality, oceans, ocean currents, ocean water quality; Atmosphere; components of atmosphere; earths energy budget; air quality, winds, cloud formation, storms; biogeochemical cycles (water, carbon, nutrient, nitrogen etc.); Human evolution and history of how humans have degraded the environment over past 100,000 years; Current state of environment in India and world; Underlying reasons (root causes) of modern environmental degradation (social, psychological, cultural); Global environmental problems (climate change, biodiversity extinction, land degradation, resource scarcity, ecosystem service loss); Local and regional scale environmental problems (air pollution, surface water and marine pollution, groundwater pollution, solid waste); Impact of different economic sectors on the environment; Negative impacts of environmental degradation on economies and human health (e.g., rise in pandemics); Environmental impact assessment (EIA); Sustainable Development Goals (SDGs); Life cycle assessment (LCA) tool; Ecological economics and payment for ecosystem services concepts; Renewable energy and green transport; Sustainable agricultural and diets; Sustainable construction and smart cities; International policies and environmental missions by Indian government, industries and NGOs to deal with impacts.