

AMAR-15 ENVIRONMENTAL SCIENCE

UNIT-1 INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES

- 1.1 Definition, scope and importance of environment- need for public awareness
- 1.2 Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people
- 1.3 Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems
- 1.4 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
- 1.5 Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.
- 1.6 Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
- 1.7 Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification- role of an individual in conservation of natural resources
- 1.8 Equitable use of resources for sustainable lifestyles.
- 1.9 Field study of local area to document environmental assets- river/ forest/ grassland/ hill/ mountain.

UNIT-2 ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

- 2.1 Concept of an ecosystem- structure and function of an ecosystem- producers, consumers and decomposers- energy flow in the ecosystem- ecological succession- food chains, food webs and ecological pyramids- Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
- 2.2 Introduction to biodiversity definition: genetic, species and ecosystem diversity- biogeographical classification of India
- 2.3 Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- 2.4 Biodiversity at global, national and local levels
- 2.5 India as a mega diversity nation- hot-spots of biodiversity- threats to biodiversity: habitat loss, poaching of wildlife, and man-wildlife conflicts- endangered and endemic species of India
- 2.6 Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds;
- 2.7 Field study of simple ecosystems- pond, river, and hill slopes, etc.

UNIT-3 ENVIRONMENTAL POLLUTION

- 1.5 Definition- causes, effects and control measures of:
- 1.6 (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards

- 1.7 Soil waste management: causes, effects and control measures of municipal solid wastes- role of an individual in prevention of pollution- pollution case studies-
- 1.8 Disaster management: floods, earthquake, cyclone and landslides.
- 1.9 Field study of local polluted site- Urban / Rural / Industrial / Agricultural.

UNIT-4 SOCIAL ISSUES AND THE ENVIRONMENT

- 4.1 From unsustainable to sustainable development- urban problems related to energy- water conservation, rain water harvesting, watershed management
- 4.2 Resettlement and rehabilitation of people; its problems and concerns, case studies
- 4.3 Role of non-governmental organization environmental ethics: Issues and possible solutions –
- 4.4 Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
- 4.5 Wasteland reclamation- consumerism and waste products- environment production act- Air (Prevention and Control of Pollution) act
- 4.6 Water (Prevention and control of Pollution) act- Wildlife protection act
- 4.7 Forest conservation act- enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT-5 HUMAN POPULATION AND THE ENVIRONMENT

- 5.1 Population growth, variation among nations- population explosion- family welfare programme
- 5.2 Environment and human health- human rights- value education- HIV / AIDS
- 5.3 Women and child welfare
- 5.4 Role of information technology in environment and human health

References Books:

1. Cunningham, W.P. Cooper, T.H. Gorhani, “Environmental Encyclopedia”, Jaico Publ., House, Mumbai, 2001.
2. Dharmendra S. Sengar, “Environmental law”, Prentice hall of India PVT LTD, New Delhi, 2007
3. Rajagopalan, R, “Environmental Studies-From Crisis to Cure”, Oxford University Press, 2005
4. Richard T. Wright, “Environmental Science” Prentice Hall of India Pvt. Ltd., New Delhi, 2007