EV801 ENVIRONMENT AND SUSTAINABLE DEVELOPMENT 4-0-0-4

UNIT 1. WHAT IS SUSTAINABLE DEVELOPMENT:

1.1 Sustainability and Environment, Sustainable development (Ecological, Social and Economic aspects), Three pillars and IUCN Egg shell model, Ecological footprint, Bio-capacity, Disparity between developed and developing countries. Causes of unsustainability

1.2 Sustainable Solutions: Sustainable lifestyle, attitudinal change, Green technology, Our role in Environment protection, Peoples actions, Environmental movements. Happy Planet Index, Case study Bhutan

UNIT 2. ECOLOGY AND ECOSYSTEMS: What is Ecology and Ecosystems.Types of Ecosystems Natural Ecosystems, Forests, Wetlands, Threats to Ecosystem, Case studies, Conservation strategies.

UNIT 3: BIODIVERSITY AND ITS CONSERVATION

3.1 Definition: Species, Genetic & Ecosystem Diversity

3.2 Value of Biodiversity: Consumptive, Productive use, Social, Ethical, Aesthetic and Optional Values. Economic value of ecosystem services

3.3 Biodiversity at Global, National and Local Levels (Western Ghats, Nilgiri Biosphere Reserve) 3.4 India as a Mega-Diversity Nation (Hotspots) & Protected Area Network (National Parks, Sanctuaries, UNESCO's MAB Reserves, Community Reserves, Protected Forests, Reserved Forests, Important Bird Areas (IBAs), Sacred Groves, Ramsar Sites), Community Biodiversity Registers.

3.5 Threats to Biodiversity (Habitat Loss,, Deforestation, Fragmentation, Land Degradation, Desertification, Biological invasion, Poaching & Trade of Wildlife, Human-wildlife Conflicts) Case studies

3.6 Rare, Endangered and Endemic Species of India,

3.7 Indigenous knowledge systems. Tradition of conservation (Buddha, Gandhi, Ashoka, Bishnoyi community, sacred grooves, Hindu worships, cow, snake, elephant god, Vat vriksha Puja, van mahtsava)

3.8 Conservation of Biodiversity.(In-Situ, Ex-situ: Zoos & Captive Breeding Centers, Gene Banks). Peoples' actions.

3.9 Protected areas in India

UNIT 4: NATURAL RESOURCES

4.1 Renewable and Non-Renewable Resources

Natural resources and associated problems, Non-renewable resources, Renewable resources

a. Forest Resources: Present status**,** Use and over-exploitation, deforestation, case studies (eg: Forest degradation in Western Ghats). Equitable distribution of resources. Timber extraction, mining, dams, roads etc. Effects of unplanned development such as dams, roads, industries, buildings, mining etc on forests and dependant tribal community. Need of Peoples' participation in forest management, interlinkages. Success stories Forest related policies and environmental regulations

b. Water Resources: Present status, Scarcity of water**,** use and over-utilization of surface and ground water (Domestic, Agriculture, Industry), water pollution, floods, drought, conflicts over water, dams – benefits and problems **Towards sustainable Solutions**: Watershed management,

rain water harvesting, small check dams. other interlinkages, recycling, industrial ecology, health, sanitation, water related policies and regulations
c. Living spaces: Land as resource, land degradation**,** urbanisation, impacts of unplanned constructions, degradation of forest, wetland and environment, **Sustainable Solution:** Sustainable habitat, Traditional eco homes, Green building, Eco-friendly construction

d. Energy Resources: Present status**,** Increasing energy needs, Renewable/ non renewable, (advantages, disadvantages). Non renewable, thermal (coal, gas, oil), nuclear, Environmental cost of energy. Use of Alternate energy sources & technology, Solar, Wind, Wave, Geothermal, biomass etc, Success stories in India. Energy related policies and environmental regulations

4.2 Equitable use of Resources for Sustainable Lifestyles

UNIT 5: GLOBAL CLIMATE CHANGE AND OTHER ENVIRONMENTAL ISSUES

5.1 Global Climate Change & Its Impacts, causes, effects and control measures
Green House Effect, GHGs, CFCs, IPCC, Case Studies. Adaptive measures to Global Climate change. (3 lectures)
5.2 Ozone depletion.
5.3 Air pollution, Noise pollution, Mitigation measures
Sustainable solutions: Sustainable lifestyle, sustainable development, reduction of GHG emissions, Air pollution act, Kyoto protocol, post Kyoto scenario

Unit 6: WASTE/ RESOURCE MANAGEMENT:
6.1 Urban and Industrial waste Management (solid and Liquid) Green technology, closed loop system, circular economy, Industrial ecology
6.2 Hazardous waste management
6.3 Green business, Sustainable business, Eco labeling
6.4 Problems and solutions with case studies

UNIT 7: SOCIAL ISSUES AND THE ENVIRONMENT
7.1 Population, Health and Environment, Water, Sanitation, Hygiene
Economic, social, gender inequality
7.2 Sustainable livelihood and environment (Resource mapping, PRA techniques)
7.3 Adaptability to Climate change
7.4 Corporate Social Responsibility, Sustainability Reporting

TEXT BOOKS/ REFERENCES:

1. R. Rajagopalan “Environmental Studies-From Crisis to Cure”, Oxford University Press.
2. G.T. Miller Jr., “Environmental Science”, 11th Edition, Cenage Learning India Pvt. Ltd., 2008.
3. Benny Joseph “Environmental Studies”, Tata McGraw-Hill Publishing Company Limited, 2006.
4. http://collegesat.du.ac.in/UG/Envinromental%20Studies_ebook.pdf

Further Readings

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2. Bharucha Erach, 2003. The Biodiversity of India, Mapin Publishing Pvt. Ltd, Ahmedabad – 380013, India. Email: mapin@icenet.net

3. Brunner RC, 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480pgs.

4. Clark RS, Marine Pollution, Clanderson Press, Oxofrd (TB).

5. Cunningham WP, Cooper TH, Gorhani E & Hepworth MT, 2001. Environmental Encyclopaedia,Jaico Publishing House, Mumbai, 1196pgs.

6. De AK, Environmental Chemistry, Wiley Eastern Ltd.

7. Down to Earth, Center for Science and Environment (R)

8. Gleick HP, 1993. Water in Crisis, Pacific Institute for Studies in Development, Environment and Security. Stockholm Environmental Institute, Oxford University Press, 473pgs.

9. Hawkins RE, Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)

10. Heywood VH, and Watson RT, 1995. global Biodiversity Assessment. Cambridge University

Press 1140pgs.

11. Jadhav H and Bhosale VM, 1995. Environmental Protection and Laws. Himalaya Publishing

House, Delhi 284pgs.

12. Mckinney ML and Schoch RM, 1996. Environmental Science Systems and Solutions. Web enhanced edition, 639pgs.

13. Mhaskar AK, Matter Hazardous, Techno-Science Publications (TB)

14. Miller TG, Jr. Environmental Science, Wadsworth Publishing CO. (TB)

15. Odum EP, 1971. Fundamentals of Ecology. WB Saunders Co. USA, 574pgs.

16. Rao MN and Datta AK, 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.