Learning Material

Environmental Education

B.Ed(2 year B.Ed)

S.no.	Content Outline
Module 1.	Fundamentals of Environmental Education
Unit 1.	Concept of Environmental & Its Issues
a.	Environment: • Meaning – Definition of environment Environment refers to the surrounding of an organism which include both living and non living components. Derived from a French word *'Environ'* means to 'Encircle' or 'Surround'. Environment is the sum total of air, water and land, interrelationship among themselves and also with the human being, plants, animals and other organisms.Environment thus includes all physical and biological surroundings and their interactions. • Components of Environment – (Biotic and Abiotic): Biotic : the living components of ecosystem are called biotic factors. This includes all living organisms as plants, animals, bacteria and viruses. Abiotic : non living components of an ecosystem are called abiotic factors. This include – climatic factors as solar radiations, temperature, wind, water, rainfall; physical factors as light, fire, pressure, geomagnetism; chemical factors as acidity, salinity and inorganic nutrients required by plants. • Concept of Eco System: "Ecosystem can be defined as a particular category of physical systems, consisting of organisms and inorganic components in a relatively stable equilibrium, open and of various sizes and kinds." – *Sir Arthur. G Tansley (1935)* The word ecosystem is not a synonym of habitat, community or some other similar descriptive terms. Rather, it is a technical term in ecology and refers to *"a system of living and non-living components interacting as a whole."* Ecological Pyramids (Numbers, Mass, Energy): • Ecosystem comprises of various trophic levels and these are called producers (autotrophs), primary consumers (herbivores), secondary consumers (primary carnivores), and tertiary consumers (top consumers or top carnivores). • Food energy passes from one trophic level to another trophic level, and in each transfer much of its energy is lost as heat and as such each trophic level receives less energy as compared to previous trophic level. The energy level in the food chain thus gradually tapers, forming a pyramid like structure. • The graphic representation of relationship between the various trophic levels of a food chain is called as **Ecological Pyramid**. • Ecological Pyramid of Numbers: In this, the number of organisms of each trophic level is counted and accordingly

	respective volumes to each trophic level in the pyramid is allotted. Eg: Grassland ecosystem (upright), Pond ecosystem (upright),Tree ecosystem (inverted). • Ecological Pyramid of Mass: Biomass is the total weight of dry matter (dry weight) present in the eco system at any one time. Ecological pyramid of mass shows the total biomass of organisms at each trophic level and provides a rough picture of the overall effect of the food chain relationships for the ecological group as a whole. Eg: Grassland ecosystem (upright), Forest ecosystem (upright), Pond ecosystem (inverted). • Ecological Pyramid of Energy: At every trophic level organisms use the energy from the previous trophic level for its own growth and metabolism while some amount of energy is lost to the environment in the form of heat. Thus the energy transfer is never 100%. Eventually, the amount of energy and matter transferred through food to successive higher trophic levels become less and less which forms the energy pyramid. (and hence it is always upright) **Food Web:** • In the biosphere the energy flows from producers to primary consumers; from primary consumers to secondary consumers; from secondary consumers to tertiary consumers and from tertiary consumers to decomposers. This process of transfer of energy from producers to consumers and then to decomposers is called **food chain**. • However, the food chain does not remain simple and linear in an ecosystem, sometime it becomes complicated by several inter-connected overlapping food chains. This happens when greater number of species feed on many kinds of prey. The complicated food chain forming a complex network like structure is known as **food web**.
b.	Major Environmental issues: Climate change Meaning,Causes, effects and remedies. Loss of Biodiversity Meaning,Causes, effects and remedies.
c.	Ecological energy dynamics and concept of entropic pollution • Defn. of Energy, concept of entropy, types of pollution • How pollution is caused and avoided.
Task / Assignment	Prepare an Environmental Audit Report for an individual process • Auditing refers to the examination and assessment of a certain type of performance. • *Environmental Audit / Eco Audit is a management tool comprising a systematic, documented, periodic and objective evaluation of how well a project, organization or equipment is performing with the aim of helping to safeguard the environment.* **Individual Processes** • Transportation /Commutation • Cooking /Kitchen chores • Washing /Cleaning • Office jobs • Shopping/Marketing

	Components of Eco Audit with Parameters: • **Energy audit** – Fuel type, Consumption, Wastage, Efficiency of Electrical devices, Eco-labeled products, etc. • **Water audit** – Consumption, Usage, Wastage • **Waste audit** – Generation, Accumulation, Reuse, Recycle, Disposal • **Safety audit** – Safety structures, Material, Mechanisms • **Travel audit** – Frequency, Mode, Efficiency • **Audit Plan & Report:** Strategies/techniques to access information – (Eg: Questionnaire/Check list/rating scale/Audit Calculator) • Key questions to ask – (Eg: How frequently do you use washing machine/dish washer?) • Summary of findings – • Points identified for action – ✓ Behavioral Recommendation (Eg: use of washable cutlery instead of disposable material.) ✓ Operational Recommendation (Eg: Switching off appliances at the wall rather than leaving them on standby) ✓ Technical Recommendations (Eg: Replacing 100W bulbs with 20W CFLs which have a much longer lifespan and energy efficiency)
Unit 2.	Development of Environmental Education
a.	Historical developments: Salient features • Stockholm conference (1972): **Stockholm /United Nations Conference on Human Environment** **Sweden,** **5th June to 16th June 1972** 113 countries attended to work out a practical plan for the future generation This was the first International Conference specially dealing with the global environment concerns The discussions, recommendations in the conference was important – MAGNA CARTA on environment Two Strategies that emerged from the Conference Salient features/Recommendations ▪ It was emphasised that there should be active co operation among states in the sphere of human environment. ▪ 5th June to be designated as World Environment Day . They urged the govt. & organizations under the UN to undertake on this day world wide every year activities to re affirm their concern for the protection of the environment. ▪ Another resolution was passed which provided institutional & financial arrangement for international co operation for environment. ▪ Provision was made for establishing a governing council for environment programmes with headquarters at Nairobi was to be set up. This led to the

establishment of Environment Secretariat and Environment fund to which member countries contribute for environment projects

- The governing councils formulated long term and short term plans for environment protection related to development al Activities.

The concept of Environment edn.ent emerged from this conference. Recommendations 95 – 101 of the conference emphasised the need for an environmentally oriented education system, since it was felt that only through education can reforms be brought about in the society and it would help every individual to acquire the essential knowledge & skills, develop attitude & commitment to improve quantity of environment which will help resolve environmental crisis by preparing environmentally conscious citizens.

- Intergovernmental conference (1977):

Intergovernmental Governmental conferences (1977)

- The Intergovernmental Conference on EE Organized by UNESCO & UNEP at Tbilisi, USSR , 1977

This Tbilisi Conference emphasised the importance of EE in the preservation & improvement of the World's Environment

Need was felt to properly plan & manage human activities to check the accelerrated rate of environment degradation

Need was felt for clarifying the role of education & measures to be adopted

Emphasised pre service & inservice training of teachers in envt. Edn.

Disseminating information through mass media was also emphasised

The conference reinforced the major goals of EE

- To develop awareness in matters of inter relations & interdependence in the envt & problems
- Opportunities were to be provided to acquire knowledge, skills, attitude, values
- EE should be an essential component of all programmes & courses
- Attitude of concern for quality of biophysical envt – motivate them to solve problems

- Kyoto Protocol (2005)

Kyoto protocol was an international agreement negotiated in Dec '97 by

(i) which industralised nations have committed to make substantial reduction in their emissions of GHG by 2012.

(ii) transfer technology to developing countries so that they can too reduce emissions

- In 1992, Rio conference, UN framework convention on Climate change was adopted. The nations who signed, agreed to develop national inventories of GHG emissions and establish national programs to reduce emissions.

  The convemtion required developed and developing countries to reduce GHG to the level it was in 1990 by the year 2000.
- Number of large developing countries including India and China refused to make binding commitments to reduce emissions. They preferred other ways of

	eliminating GHG. • Kyoto protocol required US to reduce emissions by 7% below 1990 by 2012 as US alone accounted for 30% of world's GHG. • Finally agreement was reached, committing developed countries to legally binding reductions in GHG during 2008 -12. The agreement was called Kyoto Protocol signed on 16 February 2005, at Kyoto in japan **Tbilisi + 30 , Ahmedabad, 2007** **These recommendations reflect the essence of the recommendations made at confe rences. They called education , sustainable practitioners, institutions, int'l orgns, national govt to work individually and collectively to transform words into action.** • **Reaffirming the recommendations made by 3rd int'l envt edn conference and Un's int'l implementation scheme for DESD (Decade of Edn for Sustainable Development) that edn must be recognized as an effective edriver of change along with ethical actions, govt policies, ecological technologies** • **Re orientating formal education towards education for sustainable development (ESD)** • **Support SD throught Open learning and distance learning** • **Emphaised role of teacher as catalyst for orienting edn to SD** • **Youth to be involved as trendsetters of ESD** • **Responsible Corporate citizenship** • **Media and effective leadership** • **Encourage research foundations and regional centres of expertise** • **Monitoring and evaluation** **It was felt that there was a need for a paradigm shift. Paradigm based on ideas that progress is rooted in science and reason. Paradigm which recognizes that we must live within the limits of nature's s ystem.**
b.	**Environment education : Meaning**: E. E. is an integral process which deals with man's interrelationship with his natural and man-made surrounding's including the relation of population growth, pollution resources allocation and deflection, conservation, technology and urban and rural planning to total human environment. E. E. is a study of the factors influencing ecosystems, mental and physical health, leaving and working condition, decaying cities and population pressures. E. E. is the process of recognizing values and clarifying concepts related to environment and its problems in order to develop skills and attitudes necessary to understand the environment. E. E. also entails practice in decision making and self – formulating a code of behavior about issues concerning environmental quality. **Objectives:** Awareness: to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems. Knowledge: to help individuals and social groups acquire basic understanding of the total

	environment, its associated problems and humanity's critically responsible presence and role in it. Attitude: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement. Skills: to help individuals and social groups acquire the skills for solving environmental problems. Evaluation ability: to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors. Participation: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems. Principles of Environmental Education: The principles that support to the inclusion of environmental education in school curriculum are given below: • Principle of dependence and mutual influence: every component depending on and influencing the other directly or indirectly. Interdependence and interaction are key terms. • Principle of balance: due to this interdependence and interaction, environment remains more or less stable, there is ecological balance. • Principle of unity: all leaving components are made up of the same basic units namely; amino acids and the same structural and functional unite namely, cells. This is not so of artificial substance. • Principle of diversity: organisms differ in terms of their morphological characteristics. This diversity gives stability to the environment. • Principle of active tendency: organisms can develop resistance against man-made substances. • Principle of continuous production: normal loss in an organism is replaced but nature keeps most population within limits. Any excess is detrimental. Significance of Environmental Education: • E. E. is very important for the child and the adult for self fulfillment and social development. • It helps in the maintenance of life and health, in self preservation and in the preservation of the human race. • It helps to understand different food chains and ecological balance in nature. • It helps to understand and appreciate how the environment is used for making a living and for promoting a material culture. • It helps in appreciating and enjoying nature and society. • It stimulates concern for changing environment in a systematic manner for the long run as well as the immediate welfare of mankind.

	• It directs attention towards the problems of population explosion, exhaustion of natural recourses and pollution of the environment and sheds light on methods of solving them. • E. E. helps in promoting learning experiences from simple to complex. • E. E. helps to proceed from indefinite ideas to definite ones. • E. E. helps to proceed from concrete to abstract. • E. E. helps in the ordering of learning experiences from the empirical to the rational. Environmental protection starts by creating awareness among the people so that it becomes part of people's life style. The key to achieving this goals and objectives lies in environmental education and its related programmes
c.	Approaches of teaching environmental education: Multidisciplinary and Interdisciplinary - meaning and characteristics.
Task / Assignment	Conduct an activity based on Indigenous Technical Knowledge (ITK) Practices and submit a report **'Conduct an activity based on Indigenous Technical Knowledge (ITK) Practices and submit a report'** • Introduction to Indigenous technical knowledge (ITK) • Area/Field of ITK (e.g. - Agriculture, Animal husbandry etc.) • Origin of the ITK (Activity performed • Strengths of the stock of ITK • Methodology/Procedure of the activity • Significance • References **ITK (Indigenous Technical knowledge) is part of the lives of the rural poor;** their livelihood depends almost entirely on specific skills and knowledge essential for their survival. **What is ITK???** Indigenous technical/traditional knowledge in a community, local and rural in origin. The source of ITK is our ancestors who learned techniques from their past experiences and experiments. These varies from place to place, and knowledge spreads through folk songs, stories & scriptures etc. Indigenous knowledge is **relevant** on **three levels for the development process**. **Local community** in which the bearers of such knowledge live and produce. **Development agents** (NGOs, governments, donors, local leaders, and private sector initiatives) need to **recognize** it, **value** it and **appreciate** it in their interaction with the local communities.

	Before incorporating it in their approaches, they need to understand it – and critically validate it against the usefulness for their intended objectives. **<u>Global knowledge</u>** In this context, it has a value and relevance in itself. **Indigenous knowledge can be preserved, transferred, or adopted and adapted elsewhere**. The **development process interacts with indigenous knowledge. When** designing or implementing development programs or projects, three scenarios can be observed: The development strategy either • relies entirely or substantially on indigenous knowledge, • overrides indigenous knowledge or, incorporates indigenous knowledge
Module - II	Education for Sustainable Development
Unit 3.	Sustainable Environment management
a.	Sustainable Development: ▪ The term was used for the first time in 1987 in 'Our Common Future' the report of the World Commission on Environment and Development. It was chaired by the Norwegian prime minister Gro Harlem Brundtland. ▪ Definition – 'Development that meets the needs of the people without compromising the ability of future generations to meet their own needs.' ▪ NNEP/WWF "Improving the quality of human life while living within the carrying capacity of the supportive mechanism." ▪ Principle of Rio declaration "Human beings are at the center . They are entitled to a healthy and productive life in harmony with nature." ▪ When destruction is greater than creation or usage is greater than regeneration it is unsustainable development. Need ▪ 1)Satisfaction of basic human needs and right to economic efficiency and growth. ▪ Agenda 21 (of the Earth Summit at Rio in 1992) in its 900 page report –proposal for international funds to eradicate poverty, provide sanitation and clean water to everyone, reduce indoor pollution,meet basic health care needs for all, resources for family planning and education for women. ▪ 2)Survival of all life forms. Preservation of Biodiversity at all costs. Different species form part of the food web on which humans rely. For example, if unsustainable agricultural practices are used in regard to pesticides, bees and other pollinators could be negatively impacted. Without bees, at least 19 major food crops would suffer and nearly 50% of the food in most grocery stores would be non-existent. ▪ Preservation of the quality of environment and ecosystem for one's own sake and passing it on to the next generation. (Preventing soil erosion, degradation of forests, preserving mangroves, wetlands etc.) ▪ 4)Social Justice a) Fairness in sharing the benefits of development between the developed and developing world, the privileged and deprived classes of society. Eg. While the developing countries are struggling to meet their basic necessities the affluent countries are practising waste consumerism. ▪ 5)Sharing a responsibility in terms of emissions. The developed countries are the

ones that have fouled up the atmosphere the most they have to cut down the emissions or provide cleaner alternative technologies.

- 6)People's participation and initiative of the locals. The affected,those at the grass root level to take initiatives or firm stands.
- 7)Policy making,legislation and a political will to implement.
- 8)Change of values and ethics. A change in attitudes and lifestyles on part of the developed world is very imperative.

Guiding Principles

- The *Rio Declaration on Environment and Development* fleshes out the definition by listing 18 principles

These guiding principles of Sustainable development provide a framework for governance and practices. They are

- 1)Right to a dignified life
- People are entitled to a healthy and productive life in harmony with nature. Every citizen is entitled to a dignified life satisfying basic needs. Eradicating poverty and reducing disparities in living standards in different parts of the world are essential to achieve sustainable development and meet the needs of the majority of people.
- 2)Stewardship
- Development today must not undermine the development and environment needs of present and future generations. There should not be over exploitation of the resources. Today's decisions are to be balanced with tomorrow's effects.
- 3)Shift in concept of development
- Economic decisions should adequately reflect environmental, human health and social effects. Environmental and health initiatives should adequately take into account economic, human health and social consequences.
- Every country needs to re-examine its Gross National Product(GNP) in terms of its ecological budget because no economic or industrial growth takes place without ecological costs.
- 4)Social justice
- Inter generation and intra generation equity
- 5)Responsibility of nations at global level
- Nations have the sovereign right to exploit their own resources, but without causing environmental damage beyond their borders.
- Nations shall warn one another of natural disasters or activities that may have
- harmful trans boundary impacts.
- 6)International laws
- International laws should be developed to provide compensation for damage that activities of one nation cause to areas beyond their borders.
- The polluter should, in principle, bear the cost of pollution.
- 7)Conservation and restoration

(a)maintain the ecological processes, biological diversity and life-support systems of the envt

(b) harvest renewable resources on a sustainable basis;

(c) make wise and efficient use of renewable and non-renewable resources

(d) enhance the long-term productive capability, quality and capacity of natural

	ecosystems. e) endeavor to repair damage to or degradation of the environment. ▪ 8)Sharing Knowledge and expertise ▪ Sustainable development requires better scientific understanding of the problems. ▪ Nations should share knowledge and innovative technologies to achieve the goal of sustainability. ▪ 9)People's participation ▪ Nations shall facilitate and encourage public awareness and participation by making environmental information widely available. ▪ Environmental issues are best handled with the participation of all concerned citizens. ▪ The full participation of women, youth and indigenous people is essential to achieve sustainable development. ▪ 10)Environment protection policy during conflict ▪ Warfare is inherently destructive of sustainable development, and Nations shall respect international laws protecting the environment in times of armed conflict, and shall cooperate in their further establishment. ▪ Peace, development and environmental protection are interdependent and indivisible.
b.	Sustainable Environmental Practices: Meaning, Process, Significance Rain Water Harvesting: Rainfall is seasonal all over the world . Percolation capacity differs from region to region depending on the soil and rocks. • Hence amount of rain water varies from place to place • But now the quantity of water required is more than the quantity available • If the rate of groundwater withdrawal is more than the rate of recharge by percolation. • The level of ground water will fall and more & more energy will be required to pump water from greater depths Techniques of water conservation Rural areas- dams, wells, tanks, canals etc. Urban areas – Roof top rain water harvesting. It utilises rain water and prevent it from going down the drains Rainfalling on the roof is channelised into storage tanks. Further with the help of recharge pits, water is recharged into the aquifiers, thus improving the quality of ground water. Also flooding gets arrested . The run off along the roadside can be diverted into a trench & used for washing, cleaning purposes. Significance: ■ Maintains/ improves ground water level ■ Prevents soil erosion ■ Helps in improving irrigation practices ■ Improves vegetation (forests, trees) ■ Regulates rainfall

- Maintains the climate
- Prevents conditions of draughts.

- Solid Waste management

All unwanted and discarded materials from domestic, urban, industrial & agricultural activities are together termed as Waste

Solid waste is the term used to describe non liquid waste, material arising from domestic trade, commercial , industrial , agricultural, mining activities andfrom public services. Eg: Food wastes, paper, discarded clothing, construction waste, industrial waste, pathological waste etc.

There are 3 categories: Municipal waste, Industrial waste, Hazardous waste

- Waste Management

The range of measures employed to make use of waste material or to render them safe are collectively termed as ' management of waste'

Domestic garbage

Degradable Non degradable

Process of Solid Waste Management

- Collection – Collected from houses
- Storage – Stored in bins in areas
- Segregation – Segregation of waste
- Transport – Transport the garbage to disposal
- Processing & recovery – Solid wastes/ selected components may be of value as a source of raw material for industry, fuel for production of power, material for landfill
- Disposal – Other waste which is of no further use, needs to be disposed. Eg: residue left after solid waste is processed

There are 2 ways for long term handling of solid waste

Land fill

Incineration

Disposal at the bottom of the ocean

Significance

- It prevents pollution
- Recycling provides raw materials for industries
- Land becomes available for community activities, sports, recreational activites
- Helps preserve biodiversity – as waste accumulates (toxic) pollutes water, land, air etc.
- Provides healthy life- no diseases
- Economical

Mangroves management

- Mangroves are woody plants that grow in the inter tidal zones of sheltered shores, creeks, marshes, backwaters.
- There are many species of mangroves but all have a common property – their tolerance of salt water

	▪ Mangroves have special adaptations that enable them to grow in conditions of saline water, heavy winds, high temperature and anaerobic soil substrate. Process: ▪ The GOI has declared mangroves as ecologically sensitive area under Environment Protection act 1986 ▪ Coastal Zone Regulation Notification 1991 prohibits developmental activities & disposed of wastes in mangroves areas ▪ The supreme court 1996 has notified mangroves as forests/ sanctuaries. Different methods adopted to conserve mangroves a) Maintaining the flow of tidal currents to ensure healthy growth of plants b) Nutrient recycling (leave all nutrients intact, don't overload it) by maintaining mangroves and associated forest species c) Discouraging sand dredging & quarrying ▪ Activities to minimize sedimentation ▪ Controlling pollution & waste dumping & oil spills ▪ Re introduction & restoration of degraded mangroves. Significance: • Protect coastal lines from storms, Tsunamis – act as buffers • Prevent coastal erosion • Breeding for fishes & home for number of acquatic & terrestrial animals- thus maintaining biodiversity • Medicines, fuel, fodder • Absorbs excess rain and controls floods
c.	Environmental Impact Assessment : Meaning ▪ EIA has been recognised as the most valuable, inter-disciplinary and objective decision-making tool with respect to alternate routes for development, process technologies and project sites. ▪ It is considered an ideal anticipatory mechanism allowing measures that ensure environmental compatibility in our quest for socioeconomic development. Steps ▪ **Project screening:** ▪ **Scoping:** ▪ **Consideration of alternatives:** ▪ **Description of the project/development action** ▪ **Description of the environmental baseline:** ▪ **Identification of key impacts:** ▪ **The prediction of impacts:** ▪ **Evaluation and assessment of significance:** ▪ **Mitigation:** ▪ **Public consultation and participation:** ▪ Steps ▪ **EIS presentation:** ▪ **Review:**

	▪ **Decision-making:** ▪ **Post-decision monitoring:** ▪ **Auditing:** Significance The benefits to local communities from taking part in environmental assessments include: ▪ A healthier local environment (forests, water sources, agricultural potential, recreational potential, aesthetic values, and clean living in urban areas). ▪ Improved human health. ▪ Maintenance of biodiversity. ▪ Decreased resource use. ▪ Fewer conflicts over natural resource use. ▪ Increased community skills, knowledge and pride. ▪ Significance ▪ Reduced cost and time of project implementation. ▪ Cost-saving modifications in project design. ▪ Increased project acceptance. ▪ Avoided impacts and violations of laws and regulations. ▪ Improved project performance. ▪ Avoided treatment/clean up costs. ▪ Significance ▪ **To facilitate decision-making:** ▪ **To aid in the formation of development:** ▪ **To be an instrument for sustainable development:**
Task / Assignment	Conduct a life cycle assessment of any item/ commodity of daily use and prepare a report Pointers: 1. Product or project development and improvement 2. Strategic planning 3. Public policy making 4. Marketing and eco-declarations What are the environmental, social, and economic affects? Ways to reduce environmental impacts.
Unit 4.	Environmental Initiatives, Projects and Laws
a.	Movements: Salient features Narmada Bachao Andolan • History – (of controversy) • Location of the river – states involved • Proposed dams on the river • Sardar Sarovar Dam – its impact (help) • Effect on biodiversity • Effect on people • The andolan – Medha Patkar, others involved

	• Present scenario Green Peace Movement (salient features) • International (Indian) – History – Founders, when started, why it was started, first voyage – Core Values (combine intnl and Indian) – Structure & Organisation – Success Stories (Intnl & Indian) - brief – Present Projects (Intnl & Indian) - brief
b.	Projects: Salient features Tiger Project Ganga Action Plan What is GAP ■ It is a project of cleaning the river Ganga Why GAP needed ❑ Ganga is a sacred & holy river of the Hindu because of its legend & also because it is a life support system for the people of India ■ Objective of GAP ■ To improve the water quality of river Ganga to acceptable standard by preventing pollution loads reaching the river ■ To improve the water quality of river Ganga to bathing standard ■ To establish sewage treatment plants, effluent treatment plant include activities such as solid waste management, installation of electric crematories, riverfront development & provision of low cost sanitation facilities Who started GAP ■ The Central Pollution Control Board(CPCB) in the year 1981- 82 conducted a study on the river water. ■ Prepared a document and Central Ganga Authority set up in 1985 under the chairmanship of Rajiv Gandhi ■ GAP Phase I was launched on 14 June 1986 ■ It envisaged to intercept, divert & treat 882million litre per day out of 1340 mld of water generated in 25 class I towns in 3 states of UP, Bihar & WB ■ Major task of GAP I to tackle pollution from Municipal waste ie. 75% of river creating ETP, STP, toilets electric crematoria, improvement in bathing Ghats ■ They decided to complete by 1990 but it was extended upto 2001 ■ While GAP I was in progress, GAP II was launched in 1993 still exists to complete in 2005, now extended to 2008 ■ GAP II – 6 states – Uttranchal, Haryana, Delhi , UP, Bihar, WB . ■ State and government should share ■ Date for completion Dec' 2005. now Dec 2008. ■ Present Status ■ Pace of development was slow, money not sufficient, some funds diverted ■ GAP I declared closed but not yet ■ No uniformity in selection of towns/ Parameters inaccurate for towns in GAP II ■ No mechanism to evaluate the estimation of sewage by states however it was more than expected

	■ No detail record of visits, submission, expenditure ■ Only 45% of grossly polluting industries installed ETP out of these 18% didn't function and didn't meet technical standards ■ It spoke of only BOD but nothing about heavy metals & toxins ■ No public participation ■ GAP follows trial & error method ie. GAP was formulated without proper assessment of actual ground realities
c.	Laws of Conservation & Protection: Provisions and penalty • Wildlife protection Act – 1972, • Environmental Protection Act – 1986, • Noise Pollution Act - 2000
Task/ Assignment	Conduct a case analysis of an Ecological Reserve and suggest measures to promote Ecotourism ○ What is an Ecological Reserve? ○ Select one Ecological Reserve – India/Abroad ○ Location, area, year of establishment, objectives and other information about the Ecological Reserve. ○ History behind starting Ecological Reserve- status today- number of species – Statistical information. ○ What is Eco-tourism? ○ Ways to promote Eco-tourism. ○ Use of creativity – Pictures, related articles, research papers, etc