**Unit I: Introduction to environmental science (21.3.22 to 4.4.22)**

**Definition, concept, multidisciplinary nature, scope and importance of environmental Science**

**Factors- biotic and abiotic and types.**

**Concept of sustainability and sustainable development**

**Need for environmental education and awareness, environmental ethics**

**Environmental calendar of activities**

**I.Origin of word psychology**: ‘Environment’ is a term derived from the French word ‘Environner’ that means ‘to surround’.

**II.What consists the ‘environment’?**

* **physical world** surrounding us including **soil, rocks, water and air.**
* **plants, animals-** flora, fauna  **and micro-organisms** on this earth, including **human beings** are an integral part of the environment.
* **the interactions and inter-relationships** of all living organisms with the **physical surroundings**.

**III.Definitions:**

**1.As per Environment (Protection) Act, 1986, ‘environment’ includes all the physical and biological surroundings of an organism along with their interactions.**

**Environment also includes:**

all types of **social, cultural and technological activities** carried out by human beings also have a profound influence on various components of the environment.

Thus various **built structures, materials and technological innovations** also became a part of the environment.

**biological (biotic**) and **non-biological (abiotic**) entities surrounding us are included in the term ‘environment’

**2. Environment is thus defined** as “the sum total of water, air and land and the inter-relationships that exist among them and with the human beings, other living organisms and materials.”

**IV.Multidisciplinary approach of environment:**

Environmental studies deals with every issue that affects an organism. It is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impacts on its integrity. It is an applied science as its seeks practical answers to making human civilization sustainable on the earth’s finite resources. Its components include biology, geology, chemistry, physics, engineering, sociology, health, anthropology, economics, statistics, computers and philosophy

**V.Scope of EVS**

Environmental studies as a subject has a wide scope. It encompasses a large number of areas and aspects, which may be summarized as follows:

**Natural resources—their conservation and management**

**Ecology and biodiversity**

**Environmental pollution and control**

**Social issues in relation to development and environment**

**Human population and environment**

Career options have emerged in this field that are broadly categorized as:

1. **Research & Development (R & D) in environment**: Skilled environmental scientists have an important role to play in examining various environmental problems in a scientific manner and carry out R & D activities for developing cleaner technologies and promoting sustainable development, environmental management and environmental engineering, pollution control technologies & its marketing
2. **Green advocacy**: to plead the cases related to water and air pollution, forest, wildlife etc
3. **Green marketing**: While ensuring the quality of products with ISO mark, now there is an increasing emphasis on marketing goods that are environment friendly. Such products have ecomark or ISO 14000 certification. Environmental auditors and environmental managers would be in great demand in the coming years.
4. **Green media**: Environmental awareness can be spread amongst masses through mass media like television, radio, newspaper, magazines, hoardings, advertisements etc. for which environmentally educated persons are required
5. **Environment consultancy**: Many non-government organisations (NGOs), industries and government bodies are engaging environmental consultants for systematically studying and tackling environment related problems

**VI.Importance of environment:**

1. **Global vs. Local Importance of Environment:**

Issues like global warming, depletion of ozone layer, dwindling forests and energy resources, loss of global biodiversity etc. which are going to affect the mankind as a whole are global in nature and for that we have to think and plan globally.

However, there are some environmental problems which are of localized importance. For dealing with local environmental issues, e.g. impact of mining or hydroelectric project in an area, problems of disposal and management of solid waste, river or lake pollution, soil erosion, water logging and salinization of soil, fluorosis problem in local population, arsenic pollution of groundwater etc., we have to think and act locally.

1. **Individualistic Importance of Environment**:

Environmental studies is very important since it deals with the most mundane problems of life where each individual matters, like dealing with safe and clean drinking water, hygienic living conditions, clean and fresh air, fertile land, healthy food and sustainable development. If we want to live in a clean, healthy, aesthetically beautiful, safe and secure environment for a long time and wish to hand over a clean and safe earth to our children, grandchildren and great grandchildren, it is most essential to understand the basics of environment

1. **Our dependence on nature** is so great that we cannot continue to live without protecting the earth’s environmental resources. Thus most traditions refer to our environment as ‘Mother Nature’ and most traditional societies have learned that respecting nature is vital for their livelihoods. This has led to many cultural practices that helped traditional societies protect and preserve their natural resources. Respect for nature and all living creatures is not new to India. All our traditions are based on these values. Emperor Ashoka’s edict proclaimed that all forms of life are important for our well being in Fourth Century BC.

(d) **International Efforts for Environment:**

Environmental issues received international attention about 35 years back in **Stockholm Conference, held on 5th June, 1972**. Since then we celebrate **World Environment Day on 5th June.**

At the **United Nations Conference on Environment and Development** held at **Rio de Janeiro, in 1992,** known popularly as **Earth Summit**, and ten years later, the **World Summit on Sustainable Development, held at Johannesberg in 2002**, key issues of global environmental concern were highlighted. Attention of general public was drawn towards the deteriorating environmental conditions all over the world.

**Award of the Nobel Peace Prize (2004) to an environmentalist**, for the first time, came as a landmark decision, showing increasing global concern towards environmental issues and recognition to efforts being made for environmental conservation and protection.

The **2004 Nobel Peace Prize** was awarded to **Kenyan Environmentalist Wangari Maathai** for her contribution to sustainable development, democracy and peace. Maathai, Kenya’s Deputy Environment Minister is the founder of Kenya based **Green Belt Movement**. This movement comprising mainly of women has planted about 30 million trees across Africa. This has helped in slowing desertification, preserving forest habitats for wildlife and food for future generations and has helped combat poverty

Maathai has given a beautiful slogan “**When we plant new trees, we plant the seeds of peace**.”

**Nobel peace prize, 2007 was awarded jointly to Intergovernmental Panel on Climate Change (IPCC)** headed by Indian Environmentalist **Dr. R.K. Pachauri, and former US vice-president Al Gore.**

IPCC, the UN body comprising of 3,000 experts from various fields is an authority on global warming and its impacts.

Al Gore is “probably the single individual who has done most to create greater world-wide understanding to the measures that need to be adopted.

1. **Public Awareness for Environment:** The goals of sustainable development cannot be achieved by any government at its own level until the public has a participatory role in it. Public participation is possible only when the public is aware about the ecological and environmental issues.

**VII. Indian Environmentalists in Environmental Awareness**

Two noted personalities who need a mention here, are **Justice Kuldeep Singh**, known popularly as the **green judge** and **Sh. M.C. Mehta, the green advocate**, who have immensely contributed to the cause of environment.

In 1991, the Supreme Court of our country issued directives to make all curricula environment-oriented. This directive was, in fact, in response to a **Public Interest Litigation (PIL) filed by M.C. Mehta vs. Union of India (1988)** that prompted the apex court to give a mandate for creating environmental awareness among all citizens of India. Based on the judgement, Environmental Studies is being taught as a compulsory course to all students

**Sh. Sunderlal Bahuguna**, known for his **‘Chipko movement’** and ‘Tehri Bachao Andolan’, **Smt. Medha Patkar** and **Ms. Arundhati Roy** known for their ‘Narmada Bachao Andolan’, the Magsaysay awardee **Sh. Rajender Singh** known for his water conservation efforts are some such contemporary figures. Salim Ali is a renowned ornithologist, famous for his work on Indian birds. In modern India, our late Prime Minister **Mrs. Indira Gandhi** was instrumental in introducing the concept of environmental protection in the Constitution of India as a fundamental duty while **Mrs. Maneka Gandhi**, formerly environment minister, has worked a lot for the cause of wildlife protection. Citizens report on environment was first published by late **Sh. Anil Aggarwal**, the founder Chairman of Centre for Science & Environment.

**VIII.Concept of Ecomark**:

In order to increase consumer awareness about environment, the Government of India has introduced a scheme of ecolabelling of consumer products as **‘Ecomark’** in 1991. It is an ‘**earthen pitcher’**–a symbol of eco-friendliness and our traditional heritage. A product that is made, used or disposed off in a harmless manner is called eco-friendly and is awarded this eco-mark

In a drive to disseminate environmental awareness ‘**Eco-Clubs’** for children and ‘**Eco-task force’** for army men have also been launched by the government.

**IX**. **Ecology**

The term **Ecology was coined by Earnst Haeckel in 1869**. It is derived from the Greek words **Oikos- home + logos- study.** So ecology deals with the study of organisms in their natural home interacting with their surroundings. The surroundings or environment consists of other **living organisms (biotic) and physical (abiotic) components**.

Modern ecologists believe that an adequate definition of ecology must specify some unit of study and one such basic unit described by **Tansley (1935)** was ecosystem. An ecosystem is a self-regulating group of biotic communities of species interacting with one another and with their non-living environment exchanging energy and matter. Now **ecology is often defined as ‘‘the study of ecosystems’’.**

**X. Definition of ecosystem:**

An **ecosystem** is **an integrated unit consisting of interacting plants, animals and micro-organisms whose survival depends upon the maintenance and regulation of their biotic and abiotic structures and functions.**

The ecosystem is thus, a unit or a system which is composed of a number of sub-units, that are all directly or indirectly linked with each other. They may be freely exchanging energy and matter from outside—an open ecosystem or may be isolated from outside in term of exchange of matter—a closed ecosystem.

Ecosystems show large variations in their size, structure, composition etc. However, all the ecosystems are characterized by certain basic structural and functional features which are common. Composition and organization of biological communities and abiotic components constitute the structure of an ecosystem.

Thus, ecosystems have basically **two types of components**, **the biotic and abiotic**, as described below:

**(a) Biotic components**: Different living organisms constitute the biotic component of an ecosystem and belong to the following categories:

**(i) Producers:** These are mainly producing food themselves e.g., Green plants produce food by photosynthesis in the presence of sunlight from raw materials like water and carbon dioxide. They are known as photo-autotrophs (auto = self, photo = light, troph = food). There are some chemo-autotrophs, which are a group of bacteria, producing their food from oxidation of certain chemicals. e.g. sulphur bacteria.

**(ii) Consumers:** These organisms get their food by feeding on other organisms. They are of the following types:

**• Herbivores**—which feed on plants e.g. rabbit, insect.

**• Carnivores**—which feed on herbivores as secondary carnivores (e.g., frog, small fish) or tertiary carnivores (e.g., snake, big fish), which feed on other consumers.

**• Omnivores**—which feed on both plants and animals e.g., humans, rats, many birds.

**• Detritivores**—which feed on dead organisms e.g., earth worm, crab, ants.

**(iii) Decomposers**: These are micro-organisms which break down organic matter into inorganic compounds and in this process they derive their nutrition. They play a very important role in converting the essential nutrients from unavailable organic form to free inorganic form that is available for use by plants e.g., bacteria, fungi.

**(b)** **Abiotic components**: Various physico-chemical components of the ecosystem constitute the abiotic structure:

**(i) Physical components** include sunlight, solar intensity, rainfall, temperature, wind speed and direction, water availability, soil texture etc.

**(ii) Chemical components** include major essential nutrients like C, N, P, K, H2, O2, S etc. and micronutrients like Fe, Mo, Zn, Cu etc., salts and toxic substances like pesticides. These physico-chemical factors of water, air and soil play an important role in ecosystem functioning.

Ecosystems have a unique property **of self-regulation**. The ecosystem comprising various sub-components of biotic and abiotic nature, which are inter-linked and inter-dependent, have an inherent property to resist change. **That means, the ecosystems have a property to tolerate external disturbance or stress. This property is known as homeostasis.** The ecosystems have a definite structure comprised of certain types of living organisms, which have a definite place and role in the ecosystem, as defined by their position in the food-web. Together, in interaction with the abiotic components, these ecosystems perform the functions of energy flow and material cycling, and finally give a desired output in the form of productivity. Every ecosystem can operate within a range of conditions, depending upon its homeostasis (capacity to resist change)

**XI. Sustainability & Sustainable development (SD)**

Our natural resources can be compared with money in a bank. If we use it rapidly, the capital will be reduced to zero. On the other hand, if we use only the interest, it can sustain us over the longer term. This is called sustainable utilisation or development.

**Sustainable development (SD)** should integrate **social, environmental, and economic sustainability** and use these three to start to make development sustainable.

World Wildlife Fund's (107) definition of sustainable development is similar: **"Improvement in the quality of human life within the carrying capacity of supporting ecosystems.”**

Brundtland (105) definition: **"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."**

**Sustainability** includes an element of **not harming the future** (**intergenerational equity**), and some find the intergenerational equity component of sustainability to be its most important element. If the world cannot move toward **intragenerational sustainability** during this generation, it will be that much more difficult to achieve intergenerational sustainability sometime in the future, for the capacity of environmental services will be lower in the future than it is today.

**Environmental sustainability** seeks **to sustain global life-support systems indefinitely** (this refers principally to those systems maintaining human life). **Source capacities** of the global ecosystem provide raw material inputs-food, water, air, energy; **sink capacities** assimilate outputs or wastes. These source and sink capacities are large but finite; sustainability requires that they be maintained rather than run down. **Overuse of a capacity impairs its provision of life-support services**. For example, accumulation of CFCs is damaging the capacity of the atmosphere to protect humans and other biota from harmful UVb radiation

**Three pillars of sustainability**

**Environmental Sustainability**

Ecological integrity is maintained, all of earth’s environmental systems are kept in balance while natural resources within them are consumed by humans at a rate where they are able to replenish themselves.

**Economic Sustainability**

Human communities across the globe are able to maintain their independence and have access to the resources that they require, financial and other, to meet their needs.

**Social Sustainability**

Universal human rights and basic necessities are attainable by all people, who have access to enough resources in order to keep their families and communities healthy and secure.

**Environment education and awareness**: Perhaps the most important concern is related to creating an ethos that will support a sustainable lifestyle in society. This brings us to the need for environmental education. The Honorary Supreme Court of our country has thus ordered that every young individual at school and college level be exposed to a course on environment. It is not to create only an awareness of environmental issues, but also to bring about pro environmental action. Among the variety of tools that can bring home the ethical issues of the environment, no solution is as powerful as real life experiences in nature. Creating a love for nature brings about strong pro environmental action. Our current educational processes at school and college level are being reoriented to bring this about.

**XII. Environmental ethics**

**Man is all powerful & the supreme creature on this earth & man is the master of nature & can harness it at his will**

**( human-centric thinking)**

**Vs**

**Nature has provided us with all the resources for leading a beautiful life & she nourishes us like a mother**

**( earth-centric thinking)**

**Ecocentric worldview**: This is based on earth wisdom. The basic beliefs are that nature exists for all species, earth’s resources are limited & that a healthy economy depends on a healthy environment.

**Anthropocentric worldview:** This view guides most industrial societies. It puts man at the center, giving them the highest status, unlimited supply of resources.

**There are two aspects that are closely connected with ethical issues that are related to our environment**.

**These are based on valuing nature and appreciating the beauty of nature and treasuring the magnificence of the wilderness**.

**Valuing nature as a resource:** It is essential that a value system that is based on environmental concern becomes a part of the thinking that we as responsible citizens of our country and our earth need to bring into our own daily lives. For our ancestors, Nature was considered to be like a mother. This has been essentially forgotten. In ancient India, forests were considered sacred. We now know that forests clean up our air, and act like a sponge that can hold water for the dry season. In the Hindu scriptures, Buddhist philosophy and especially in the Jain religion, each and every species on earth is supposed to have a place in the scheme of life. Many species were not only valued, but also venerated. In today’s world where many of us are far removed from nature, we need to remind ourselves that everything we use, if tracked back to its source, has come from nature. We depend on an intact unpolluted world which is based on nature’s goods and services. No life is possible without this. **If we as citizens begin to again respect Nature and all its varied species forming a complex web of life, and appreciate Nature’s functions and services, it will continue to support our lives.** If we disrespect nature one cannot expect her to continue to support our well being. Nature’s resources that we all use and depend on can only be optimized if they are equitably shared by all of us. If the disparity is too great it can only result in anarchy. The ‘have not’s’ cannot be expected to remain in abject poverty, making a bare minimum living from the meager resources they can get, while the ‘haves’, who are already rich become richer through unsustainable consumer oriented, short-term economic development strategies.

**Appreciating the beauty of Nature** **and treasuring the magnificence of the Wilderness**: We often take Nature for granted. We rarely take the opportunity to gaze at a scenic sunset, or spend the time to sit in the incredible silence of the forest, or listen to the songs of birds and the sound of the wind rustling through the leaves. Or take the trouble to watch the magic of a seed germinating from the ground and gradually growing into a seedling over several days. Or observe a tree through a round of seasons as it gets new leaves, flowers, fruit and seeds. Or reflect on the incredibly large number of linkages between all the different animals and birds that depend on the seasonal changes in their habitat. It is the beauty of Nature that gives it an intrinsic value which we tend to ignore. These are not mundane day to day events, they are magical and mystical aspects of nature’s clock that is ticking silently all around us. They are part of our living throbbing earth. If we fail to enjoy these wondrous aspects of Nature our lives will always remain empty. Once we realise that the wilderness has a value all on its own, this puts man in his rightful role as a custodian of nature rather than an exploiter. Visit a wilderness area, a forest, lakeside, waterfall, or seashore where man’s hand has not made drastic changes to the ecosystem and one begins to value its beauty. It is there to heal the human soul and elevate his spirit. Without the wilderness, the earth would be a sad bleak human dominated landscape. The problem is how much of the wilderness can we preserve in the presence of an ever-growing hunger for land and resources for its utilitarian values. Unless we begin to see the ecological values of the wilderness, an ethic for its conservation cannot become part of our daily lives. And without the wilderness the earth will eventually become unlivable.

The concept of ‘Karma’ is based on a thinking that the soul moves from man to animal and in reverse depending on one’s actions. This itself brings about a concept of the oneness of all forms of life. Ahimsa or non-violence towards life which includes all plants and animals provides India with its basic philosophy which early Hindu philosophers and later sages such as Buddha, Mahavir and Mahatma Gandhi spoke of. Buddhist and Jain philosophy is intrinsically woven around non-violence and the great value of all forms of ‘life’. It brings in the notion that animals are not to be viewed purely for their utility value but are a part of the earth’s oneness which is linked with our own lives as well. In Hindu philosophy the earth itself is respected and venerated. In contrast, in Western thought Nature is to be subjugated and used. These are basic differences in thinking processes. Several modern philosophers in the West have now begun to see these eastern patterns of thought as a new basis for human development. This shift however, from a purely utilitarian or scientific exploitation of Nature, to one of harmony with Nature, can only occur if each of us loves and respects nature’s great ‘oneness’.

**Environmental ethics** deals with issues related to the **rights of individuals** that are fundamental to life & well being. This concerns not only the needs of each person today, but also those who will come after us. It also deals with the **rights of other living creatures** that inhabit our earth.

The just distribution of resources has global, national and local concerns that we need to address. There are rich and poor nations. There are rich and poor communities in every country. And there are rich and poor families. In this era of modern economic development, **the disparity between the haves and have-nots is widening**.

**Our human environments in the urban, rural and wilderness sectors**, use natural resources that shift from the wilderness (forests, grasslands, wetlands, etc.) to the rural sector, and from there to the urban sector. Wealth also shifts in the same direction.

This unequal distribution of wealth and access to land and its resources is a serious environmental concern. An equitable sharing of resources forms the basis of sustainable development for urban, rural and wilderness dwelling communities. As **the political power base is in the urban centers, this itself leads to inequalities** and a subsequent loss of sustainability in resource management in the rural and even more so for forest dwelling

people.

In 1985, **Anil Agarwal** published the first report on the Status of India’s Environment. It emphasized that India’s environmental problems were caused by the excessive consumption patterns of the rich that left the poor poorer. It was appreciated for the first time that tribals, especially women and other marginalized sectors of our society, were being left out of economic development. There are multiple stakeholders in Indian society who are dependent on different natural resources which cater directly or indirectly to their survival needs. **Anil Agarwal brought forth a set of 8 propositions** which are of great relevance to the ethical issues that are related to environmental concerns. These include:

**1. Environmental destruction is largely caused by the consumption of the rich.**

**2. The worst sufferers of environmental destruction are the poor.**

**3. Even where nature is being ‘recreated’, as in afforestation, it is being transformed away from the needs of the poor and towards those of the rich.**

**4. Even among the poor, the worst sufferers are the marginalised cultures and occupations, and most of all, women.**

**5. There cannot be proper economic and social development without a holistic understanding of society and nature.**

**6. If we care for the poor, we cannot allow the Gross Nature Product to be destroyed any further. Conserving and recreating nature has become our highest priority.**

**7. Gross Nature Product will be enhanced only if we can arrest and reverse the growing alienation between the people and the common property resources. In this we will have to learn a lot from our traditional cultures.**

**8. It is totally inadequate to talk only of sustainable rural development, as the World Conservation Strategy does. We cannot save the rural environment or rural people dependent on it, unless we can bring about sustainable urban development.**

**Equitable use of forest resources:** We think of forests as being degraded due to fuelwood collection by poor rural communities, but forget that the rich use much greater quantities of timber. Biomass based industries include cotton textiles, paper, plywood, rubber, soap, sugar, tobacco, jute, chocolate, food processing and packaging. These need land, energy, irrigation and forest resources. Do each of us realise this when we utilise, use excessively or waste these resources that we get indirectly from the forests?

**Who pays for the cost of environmental degradation?**

Most sections of society do not feel the direct effects of degradation of the environment till it is too late. Those who **suffer most are the poor, especially rural women, and tribal people who are dependent on forests**. Eg.Traditional fishermen who are dependent on streams and rivers, and coastal people who fish & catch crustacea, are seriously affected by the degradation of aquatic ecosystems. Fuelwood gatherers from different types of forests, and pastoralists who are dependent on common grazing lands suffer when their resources are depleted.

**The economically advanced West has exploited their own natural resources** to such an extent that they have exhausted them nearly everywhere. They **now buy their resources from resource rich but economically deprived nations at a low cost**. This depletes the developing nations of natural resources on which their poor depend for their livelihood. Changing this **unfair economic practice** to a more just and fair way in managing trade would require a new thinking on the part of people who live in the super rich countries.

**The common property of rural communities has increasingly been used to supply the needs of the urban sector.** Land itself that was once held as a common property resource of villages is being taken over by the urban and industrial sectors as it expands. The rural sector not only supplies food, but also a part of the energy needs (mainly fuelwood) to most towns and cities in India, at a pittance. As a result, the commons of the rural sector are being depleted of their resources. Thus while the cities get richer, the rural sector, especially the landless, get poorer. The urban rich must appreciate where their resources are derived from and be willing to pay a fair price for using them.

All over India, **especially in the rural sector, women work on the whole longer hours than men. The life of a woman is enmeshed in an inextricable cycle of poverty**. In attempting to eke out a living from their environment, they must constantly collect fuelwood for their homes and for sale to nearby urban areas. They laboriously collect fodder for their cattle. They have to trudge several kilometers to reach a reasonably clean water source All this can take 10 to 12 hours a day of very hard work, every day of the year. There is thus the question of who should control the environmental resources of a rural community. **Unfortunately it is the men who play a decisive role in managing the village commons and its resources whereas it should be the local women whose lives are deeply linked with the utilisation and conservation patterns of natural resources, who should be decision makers at the local level.**

**While nature by itself has natural prey-predator relationships, left to itself, nature maintains a balance in each ecosystem.** While evolution has developed a system whereby species become extinct and new ones evolve to fill the world’s ecosystems with new plant and animal species, it is man alone that has been responsible for the recent rapid decline in the number of species on earth. Much more important man is now reducing the abundance levels of so many species that in the near future we will in all probability create a major extinction spasm on earth that will seriously endanger the existence of mankind.

**Animals have a right to a dignified existence, and their life, well-being and liberty must be respected. While dominating over the animal world due to his superior intelligence, man cannot remain unfeeling to the right to life and well being of other species. There is a growing awareness of animal rights in our country and cruelty to animals is being increasingly regarded as a criminal offence.**

**XI. Environment Calendar**

World Wetland Day February 2

World Forest Day March 21

World Day for Water March 22

World Meteorological Day March 23

Earth Day April 22

International Biodiversity Day May 22

Anti-tobacco Day May 31

World Environment Day June 5

World Ocean Day June 8

World Population Day July 11

Ozone Week Sept. 16–23

World Car-free Day Sept. 22

Green Consumer Day Sept. 28

World Farm Animal’s Day Oct. 2

World Habitat Day Oct. 3

World Animal Welfare Day Oct. 4

Wildlife Week Oct. 1–7

International Day for Natural Disaster Reduction Oct. 13

World Conservation Day Oct. 24

International Day for Biological Diversity Dec. 29

**February 2**: **World Wetland Day** is celebrated to create awareness about wetlands and their value to mankind. On February 2nd 1971, the **Ramsar Convention on Wetlands of International Importance** was signed at Ramsar in Iran. You can initiate a campaign for proper use and maintenance of wetlands in the vicinity of the city or village.

**March 21:** **World Forestry Day** can be used to initiate a public awareness campaign about the extremely rapid disappearance of our forests. The program must be action oriented and become an ongoing process with activities such as tree plantation.

**April 7: World Health Day** – **The World Health Organisation (WHO) came into existence on this day in 1948**. A campaign for personal sanitation and hygiene to understanding issues of public health, occupational health, etc. can be carried out. Topics that deal with environment related diseases and their spread can be discussed and preventive measures suggested.

**April 18: World Heritage Day** can be used to arrange a visit to a local fort or museum. Environment also includes our cultural monuments. Students could use this opportunity to create awareness among the local people about their very valuable heritage sites.

**April 22**: **Earth Day was first celebrated in 1970** by a group of people in the USA to draw attention to increasing environmental problems caused by humans on earth. This day is now celebrated all over the world with rallies, festivals, clean-ups, special shows and lectures.

**June 5**: **World Environment Day** marks the anniversary of the **Stockholm Conference** on **Human Environment in Sweden in 1972**, where nations of the world gathered to share their concern over human progress at the expense of the environment. This day can be used to project the various environmental activities that the college has undertaken during the year. New pledges must be made to strengthen an environmental movement at the college level.

**June 11:** **World Population Day** is a day when the vital link between population and environment could be discussed in seminars held at college and other NGOs.

**August 6:** **Hiroshima Day** could be used to discuss our own Bhopal Gas Tragedy and the Chernobyl disaster.

**September 16:** **World Ozone Day** was proclaimed by the **United Nations** as the **International Day for the preservation of the ozone layer**. This is a good occasion for students to find out more about the threats to this layer and initiate discussion on what they can do to help mitigate this global threat. The day marks the **Montreal Protocol** signed in 1987 to control production and consumption of ozone depleting substances.

**September 28:** **Green Consumer Day** could be used to create an awareness in consumers about various products. Students could talk to shopkeepers and consumers about excess packaging and a campaign to use articles which are not heavily packaged could be carried out.

**October 1-7:** **Wildlife Week** can consist of seminars on conserving our species and threatened ecosystems. The State forest Departments organize various activities in which every student should take part. A poster display, a street play to highlight India’s rich biodiversity can be planned. Wildlife does not only mean animals, but includes plants as well.

Unit 1 test Answers

1. **Ecosystem** is the basic unit of study of ecology

2. The organisms who feed directly on producers are called **Herbivores.**

3. The organism which feed on dead organisms, wastes of living organisms is called

**detrtivores**

4. The sequence of eating and being eaten in an ecosystem is called a **Food-chain.**

5. Environment is derived from the French Word ENVIRONNER , Which means to encircle or surround

6. Environment friendly products are given ISO 14,000 certification

7. **World environment day** is celebrated on 5Th JUNE .

8. World Forest Day is observed onMarch 21

9. The inherent property of all living organisms to resist change is called **Homeostasis.**

10.Abiotic component of environment are the air, water, land, nutrients etc

11. The biggest flower in the plant kingdom is **Rafflesia.**

12. The thick layer of ice found frozen under the soil surface throughout the year is called **Permafrost.**

13**.**Plants use **CARBON DIOXIDE** gas for photosynthesis.

14. **33%** of geographical area of a country should be forest area.

15. Ecological issue related with Tehri Dam are taken up by Sh. **SUNDERLAL BAHUGUNA**  , the leader of Chipko movement.

16. Environmentalist activist Medha Patkar is known for her environmental activism for **SARDAR SAROVAR** Dam.

17. A layer of sediment or rock that is highly permeable and contains water(ground water) is called an **AQUIFER** .

18. **DROUGHTS** conditions are created when annual rainfall is below normal and less than evaporation.

19. The Cauvery river water is a bone of contention between **TAMIL NADU** & **KARNATAKA** states.

20. **Anthropocentric worldview**  puts human at the center, giving them the highest status, unlimited supply of resources.

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