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Khajamalai Campus
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Bachelor of Computer Applications (For Students with Speech and Hearing Impairment)

COURSE: ENVIRONMENTAL STUDIES **UNIT-1**

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WHAT DO YOU MEAN BY ENVIRONMENTAL STUDIES?

- ◉ **Environmental studies** is a multidisciplinary academic field which systematically **studies** human interaction with the **environment** in the interests of solving complex problems. ... It is a broad field of study that includes the natural **environment**, the built **environment**, and the sets of relationships between them.

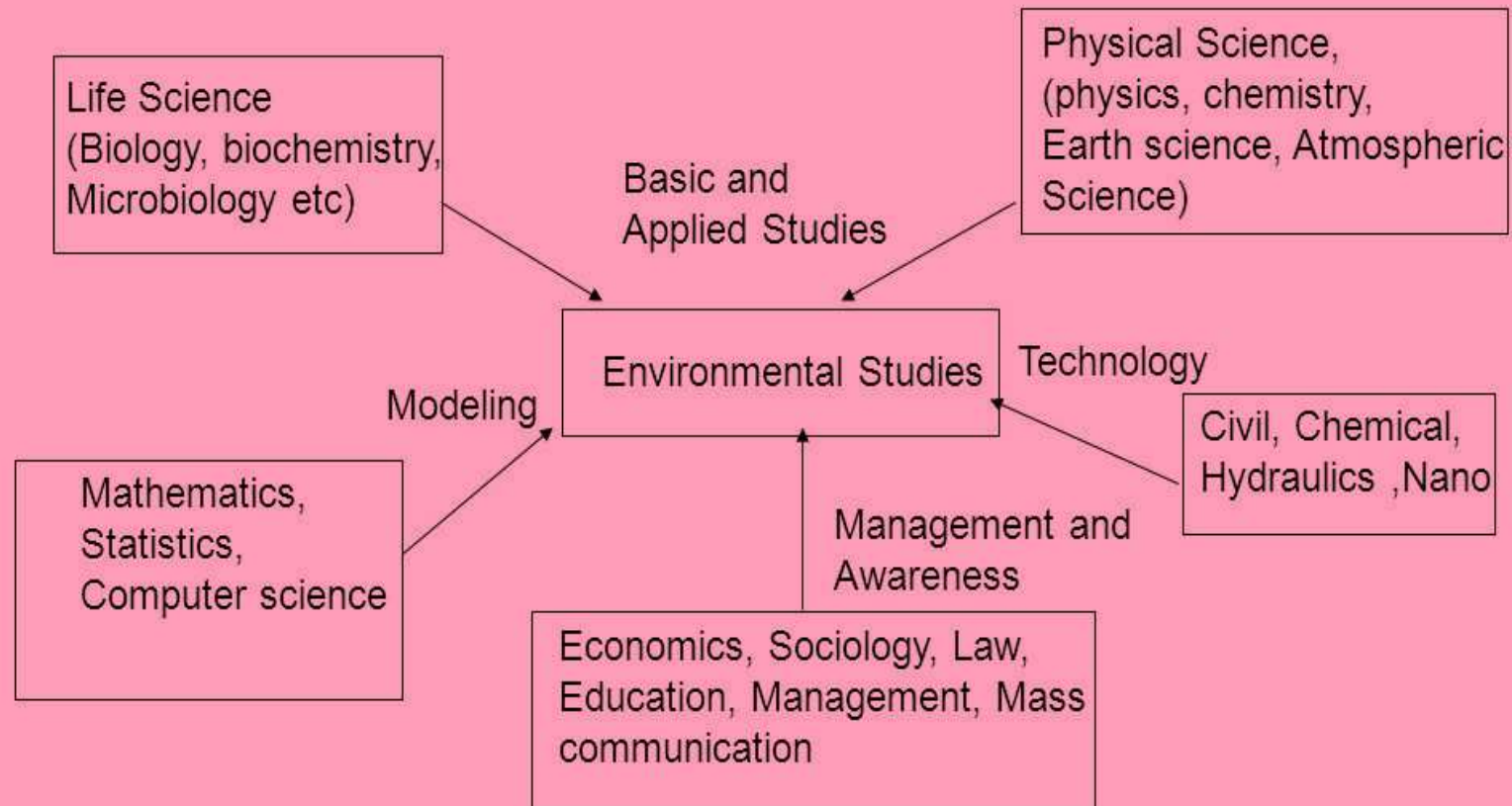
WHAT IS MEANT BY THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES?

- ◉ The multidisciplinary nature of Environmental Science is imbibed in its definition that it is the study of the interaction of physical, chemical and biological components of human surroundings. To put it straight any action taken by human and its effect on the surrounding and vice versa comes under the purview of Environmental Science. Lemme give an example, air pollution is a grave issue threatening the existence of life on Earth.

- ◉ In recent time , considering the extent of various environmental problem like Air Pollution, Water Pollution, it is clearly observed that all these problems are somehow integrally associated. For example as the air pollution is increasing, the global temperature increases which further causes the growth of blue green algae in ponds and rivers causing eutrophication. Also considering the variables that contribute to our immediate environment like humans, animals, insects, microbes, air, water, temperature, Sun, etc. etc. and their complex interactions.

- ◎ Many theories like Gaia hypothesis, has already proven that nothing on this planet earth is isolated. We all are somehow contribute to everything else in this biosphere. There are usually rippling effects that occur when there is a disturbance to an area's natural environment. For example, what if there is a proposal to build a housing development in an area where there is a natural forest inhabited by many indigenous organisms.

The multidisciplinary nature of environmental science is illustrated in following diagram



- ① **Environmental Studies: Meaning, Objectives, Scope and Importance of Environmental Studies**
- ① Environment literally means Surrounding in which we are living. Environment includes all those things on which we are directly or indirectly dependent for our survival, whether it is living component like animals, plants or non living component like soil, air water.

- ◉ Environmental Protection Act (1986) defined “Environment as the sum total of water, air and land, their interrelationship among themselves and with the human beings, other living beings and property.”
- ◉ ***Ecology and Scope of Ecological Studies:***
- ◉ Ecology is that part of environmental studies in which we study about organisms, plants and animals and their relationship or interdependence on other living and non living environment.
- ◉ The term ‘Ecology’ is derived from Greek word ‘Oekologue’ which is composed of two words:

- ◉ **The scope of ecological study includes:**
- ◉ 1. It deals with the study of flow of energy and materials in the environment.
- ◉ 2. It deals with the study of nature and its function.
- ◉ 3. It deals with the exchange of various materials between the biotic and abiotic components of environment. E.g., Biogeochemical cycles.
- ◉ ***Meaning Of Environmental Studies:***
- ◉ Environmental studies are the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.
- ◉ (b) Imparting basic knowledge about the environment and its allied problems.
- ◉ (c) Developing an attitude of concern for the environment.
- ◉ (d) Motivating public to participate in environment protection and environment improvement.

- ◉ (e) Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- ◉ (f) Striving to attain harmony with Nature.
- ◉ According to UNESCO, the guiding principles of environmental education should be as follows:
 - ◉
 - ◉ (a) Environmental education should be compulsory, right from the primary up to the post graduate stage.
 - ◉ (b) Environmental education should have an interdisciplinary approach by including physical, chemical, biological as well as socio-cultural aspects of the environment. It should build a bridge between biology and technology. (c) Environmental education should take into account the historical perspective, the current and the potential historical issues.
 - ◉ (d) Environmental education should emphasise the importance of sustainable development i.e., economic development without degrading the environment.
 - ◉ (e) Environmental education should emphasise the necessity of seeking international cooperation in environmental planning.
 - ◉ (f) Environmental education should lay more stress on practical activities and first hand experiences.

- ◉ ***Scope and Importance of Environmental Studies:***
- ◉ The disciplines included in environmental education are environmental sciences, environmental engineering and environmental management.
- ◉ **(a) Environmental Science:**
- ◉ It deals with the scientific study of environmental system (air, water, soil and land), the inherent or induced changes on organisms and the environmental damages incurred as a result of human interaction with the environment.
- ◉ **(b) Environmental Engineering:**
- ◉ It deals with the study of technical processes involved in the protection of environment from the potentially deleterious effects of human activity and improving the environmental quality for the health and well beings of humans.

(C) ENVIRONMENTAL MANAGEMENT:

- ◉ It promotes due regard for physical, social and economic environment of the enterprise or projects. It encourages planned investment at the start of the production chain rather than forced investment in cleaning up at the end.
- ◉ It generally covers the areas as environment and enterprise objectives, scope, and structure of the environment, interaction of nature, society and the enterprise, environment impact assessment, economics of pollution, prevention, environmental management standards etc.
- ◉ The importance's of environmental studies are as follows:
- ◉ 1. To clarify modern environmental concept like how to conserve biodiversity.
- ◉ 2. To know the more sustainable way of living.
- ◉ 3. To use natural resources more efficiently.
- ◉ 4. To know the behaviour of organism under natural conditions.

- ◉ 5. To know the interrelationship between organisms in populations and communities.
- ◉ 6. To aware and educate people regarding environmental issues and problems at local, national and international levels.
- ◉ ***Need of Public Awareness about Environment:***
- ◉ In today's world because of industrialization and increasing population, the natural resources has been rapidly utilised and our environment is being increasingly degraded by human activities, so we need to protect the environment.
- ◉ It is not only the duty of government but also the people to take active role for protecting the environment, so protecting our environment is economically more viable than cleaning it up once, it is damaged.

ROLE OF MASS MEDIA

- ◉ The role of mass media such as newspapers, radio, television, etc is also very important to make people aware regarding environment. There are various institutions, which are playing positive role towards environment to make people aware regarding environment like BSI (Botanical Survey of India, 1890), ZSI (Zoological Survey of India, 1916), WII (Wild Life Institute of India, 1982) etc.

ENVIRONMENT

Definition: The complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual or organism and that ultimately determines its form and nature of its survival.

- 1) All factors living and nonliving that affect an individual organism or population at any point in the life cycle.
- 2) Set of circumstances surrounding a particular occurrence.
- 3) All the things that surrounds us.

ENVIRONMENTAL SCIENCE

An interdisciplinary branch of science that investigates questions related to the human population, resources, and damages caused by pollution and disturbance.

Environmental science is integrative and involves complex biology, chemistry, politics, sociology, geology, agriculture, economics.

WHY WE WANT TO STUDY THE STATE OF ENVIRONMENT?

- The need for information that clarifies modern environmental concepts such as the need to conserve **biodiversity**, the need to lead more **sustainable** lifestyles and the need to use resources more equitably.
- A need to change the way in which we view our own environment by a practical approach based on observation and self learning.
- The need to create a concern for our environment that will trigger pro-environmental action, including activities we can do in our daily life to protect it.
- ❖ **Biodiversity:** The part of nature which includes the differences in genes among the individuals of a species, the variety and richness of all the plant and animal species at different scales in space i.E. Local, regional, country wise and global, and various types of ecosystems- both terrestrial and aquatic-within a defined area.
- ❖ **Sustainable development:** Implies the use of resources in a managed way as to provide resources for future generations.

OBJECTIVE OF THIS COURSE

- Develop a concern for our environment.
- Begin to act at your own level to protect the environment we all live in.

SCOPE AND IMPORTANCE

- ◉ We live in natural surrounding (forest, river, mountain, etc.).
Resources: renewable (forest and water) and non-renewable (minerals and oil).
- ◉ Due to increase in population these resources are getting depleted gradually.
- ◉ There is a need to understand make ourselves aware of our natural assets and get concerned about our environment and sustainable utilize the resources.
- ◉ Scope of environmental studies is very wide and nearly covers some aspects of every major discipline (biology, chemistry, physics, geography, resource management, economy, etc.).

Importance

- ◉ Water, air, soil, forests are all part of our life support systems. Without them life itself would be impossible.
- ◉ Natural resources are limited in nature and continue to shrink and may be get depleted if not utilized in a sustainable manner.
- ◉ Almost every act of human beings cause some effect on environment: solid waste, water pollution, air pollution, soil pollution , etc. And these have ill-effect on human health.
- ◉ Individual efforts together with the public and also government actions are needed to protect our environment from further more degradation and safeguard it.

VALUES OF NATURE

- ◉ Productive value
- ◉ Aesthetic value, recreational value
- ◉ Option value

PRODUCTIVE VALUE OF NATURE

- Biotechnology is fast advancing in this modern world.
- Nature has species which contain an incredible and uncountable number of complex chemicals that are raw material and can be used for developing new medicines and industrial products.
- Destruction of these species due to human activity is happening rapidly and hence these species might become extinct in near future.
- Hence there is an urgent need to protect these species
- Protection of these species by individual or group efforts.

AESTHETIC AND RECREATIONAL VALUE OF NATURE

- ◉ Nature encompasses every aspect of living (biodiversity: flora and fauna) and non-living (sea, forest, desert) part of the earth.
- ◉ Nature enlivens our existence on earth.
 - Developing national parks and wildlife sanctuaries in relatively undisturbed areas.
- ◉ Enjoy the wilderness - nature tourism or wildlife tourism - pleasurable experience and also creates a deep respect and love for nature.
- ◉ Urban setting there will be green spaces and gardens - psychological and physical health of city dwellers and provides aesthetic value and visual appeal. It also gives access to certain amount of peace and tranquility.

THE OPTION VALUES OF NATURE

- ◉ Day-to-day activities have adverse impacts on nature's integrity.
- ◉ Present generation's lifestyles and economies are based on unsustainable pattern which can lead to destruction of biodiversity and will leave nothing for future generations.
- ◉ Option value: nature provides us with options to utilize its resources which we can use it either greedily (destroy its integrity and long term values) or sustainably and reducing our impacts on environment.
- Allows us to use its resources sustainably and preserve its goods and services for the future.

NEED FOR PUBLIC AWARENESS

- ◉ Earth's resources are dwindling and our environment is being increasingly degraded by human activities and hence something needs to be done.
- ◉ Government alone cannot perform all the clean-up functions.
- ◉ Individual/group efforts in their own every possible way has to be made to protect our environment.
- ◉ Mass public awareness: newspapers, radio, television strongly influences public opinion on conserving our environment.

- ◉ Interested students can join environmental group (WWF-I, BNHS)
- ◉ Read environment related magazines such 'DOWN TO EARTH', 'WWF-I', BNHS HORNBILL', etc.
- ◉ Practice and promote good civic sense: no spitting, no tobacco chewing, not throwing garbage on the road, etc.
- ◉ Take part in events organized on world environment day, wildlife week, etc.
- ◉ Visit a national park or sanctuary, or spend time in whatever nature you have near your home.

INSTITUTIONS IN ENVIRONMENT

Bombay Natural History Society (BNHS), Mumbai

- An NGO founded in 1883.
- Wildlife policy building, research, popular publications and peoples action have been unique features of this multifaceted society.
- Works towards conservation of wildlife species and ecosystems.
- Publications: HORNBILL, journal on natural history, Salim Ali handbook on birds, JC Daniel's book on Indian reptiles, SH Prater's book of Indian mammals and PV Bole's book of Indian trees.
- Assisting government in framing of wildlife related laws.
- 'SAVE THE SILENT VALLEY' campaign.

World Wide Fund for Nature (WWF-I), New Delhi

- Initiated in 1969 in Mumbai and then moved to new Delhi with several branch offices all over India.
- Wildlife education and awareness.
- Organizes nature clubs of India program for children. Works as a think tank and lobby force for environment and development issues.

Center for Science and Environment (CSE), New Delhi

- Organizing campaigns, holding workshops/conferences and producing environment related publications are some of its activities.
- It published 'State of India's Environment', the first of its kind to be produced as a Citizen's Report on the Environment.
- It publishes popular magazine 'DOWN TO EARTH' a Science and Environment fortnightly.
- It is also involved in publication of material in the form of books, posters, video films and also conducts workshops and seminars on biodiversity related issues.

CPR Environmental Education Centre, Madras

- CPR EEC was set up in 1988.
- Conducts variety of programs to spread environmental awareness and creates an interest in conservation among the general public.
- It focusses attention on NGOs, teachers, women, youth and children to generally promote conservation of nature and natural resources.
- Its programs include components on wildlife and biodiversity issues. It also produces a large number of publications.

Centre for Environment Education (CEE), Ahmedabad

- It was initiated in 1989.
- It has wide range of programs on the environment and produces a variety of educational material. CEE's training in Environment Education (TEE) program has trained many environment educators.

Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER), Pune

- This institute is a part of Bharati Vidyapeeth Deemed University and has a Ph.D, masters and Bachelors program in Environmental Sciences.
- Also offers an innovative Diploma in Environment Education for in-service teachers.
- It implements a large outreach programme that has covered over 135 schools in which it trains teachers and conducts fortnightly Environment Education Programs.
- Biodiversity Conservation is a major focus of its research initiatives.

- It develops low cost Interpretation Centres for Natural and Architectural sites that are highly locale specific as well as a large amount of innovative environment educational material for a variety of target groups.
- Its unique feature is that it conducts environment education from primary school level to the the post graduate level.
- It has produced several EE aids, developed a teacher's handbook linked to school curriculum, a textbook for UGC for its undergraduate course on environment .
- Its director has developed a CD ROM on India's biodiversity published by Mapin Publishers, Ahmedabad.

Uttarkhand Seva Nidhi (UKSN), Almora

- A Nodal Agency and supports NGOs in need of funds for their environment related activities.
- Major program is organising and training school teachers to use its locale specific Environment Education Workbook Program.
- The main targets are linked with sustainable resource use at the village level through training school children.
- Its environment education program covers about 500 schools.

Kalpavriksh, Pune

- It is an NGO and works on variety of fronts: education and awareness; investigation and research; direct action and lobbying; and litigation with regard to environment and development issues.
- Its activities include talks and audio-visuals in schools and colleges, nature walks and outstation camps, organizing student participation in ongoing campaigns including street demonstrations, pushing for consumer awareness regarding organic food, press statements, handling green alerts, and meetings with the city's administrators.
- It is involved with the preparation of site-specific, environmental manuals for school teachers.
- Kalpavriksh was responsible for developing India's National Biodiversity Strategy and Action Plan in 2003.

Salim Ali Center for Ornithology and Natural History (SACON), Coimbatore

- Dr.Salim Ali wished to support a group of committed conservation scientists on permanent basis and that dream became a reality only after his demise.
- It is an independent organization and is based at Coimbatore since 1990.
- It has instituted a variety of field programs that have added to the country's information on our threatened biodiversity.

Wildlife Institute of India (WII), Dehradun

- This institution was established in 1982 as a major training establishment for Forest Officials and Research in Wildlife Management.
- Its most significant publication has been 'Planning A Wildlife Protected Area Network for India' (Rodgers and Panwar, 1988).
- The organisation has over the years added an enormous amount of information on India's biological wealth.
- It has trained a large number of Forest Department Officials and Staff as Wildlife Managers.
- Its M.Sc. Program has trained excellent wildlife scientists. It also has an Environment Impact Assessment (EIA) cell.
- It trains personnel in ecodevelopment, wildlife biology, habitat management and Nature interpretation.

Botanical Survey of India (BSI)

- It was established in 1890 at the Royal Botanic Gardens, Calcutta.
- However it was closed for several years after 1939 and was reopened in 1954.
- It carries out surveys of plant resources in different regions.

Zoological Survey of India (ZSI)

- It was established in 1916.
- Its mandate was to do a systematic survey of fauna in India.
- It has over the years collected 'type specimens' on the bases of which our animal life has been studied over the years. Its origins were collections based at the Indian Museum at Calcutta, which was established in 1875.
- Older collections of the Asiatic Society of Bengal, which were made between 1814 and 1875, as well as those of the Indian Museum made between 1875 and 1916 were then transferred to the ZSI.
- Today it has over a million species!. This makes it one of the largest collections in Asia.
- It has done an enormous amount of work on taxonomy and ecology.

People in Environment

Individuals who have been instrumental in shaping the environmental history in our country:-

Salim Ali

- He has written several great books including the famous 'Book of Indian Birds'.
- His autobiography, 'Fall of a Sparrow' should be read by every nature enthusiast.
- He was our country's leading conservation scientist and influenced environmental policies in our country for over 50 years.

Indira Gandhi

- As a PM, she has played a highly significant role in the preservation of India's wild life.
- It was during her period as a PM, that the network of protected areas (Pas) grew from 65 to 298!.
- The Wildlife Protection Act was formulated during the period when she was PM and the Indian Board for Wildlife was extremely active as she personally chaired all its meetings.
- India gained a name for itself by being a major player in CITES and other International Environmental Treaties and Accords during her tenure.

SP Godrej

- One of India's greatest supporters of wildlife conservation and nature awareness programs.
- He was awarded the Padma Bhushan in 1999 and several other awards between 1975 and 1999.

MS Swaminathan

- One of India's foremost agricultural scientists and has also been concerned with various aspects of biodiversity conservation both of cultivars and wild biodiversity.
- Founder of the MS Swaminathan Research Foundation in Chennai, which does work on the conservation of biological diversity.

Madhav Gadgil

- A well known ecologist in India.
- His interests range from broad ecological issues such as developing Community Biodiversity Registers and conserving sacred groves to studies on the behavior of mammals, birds and insects.

Anil Agarwal

- He was a journalist who wrote the first report on the 'State of India's Environment' in 1982.
- He founded the Center for Science and Environment which is an active NGO that supports various environmental issues.

MC Mehta

- India's most famous environmental lawyer.
- Since 1984, he has filed several Public Interest Litigation (PIL) for supporting the cause of environmental conservation.
- Protecting the Taj Mahal, cleaning up the Ganges River, banning intensive shrimp farming on the coast, initiating Government to implement environmental education in schools and colleges, and a variety of other conservation issues.

Medha Patkar

- She is known as one of India's Champions who has supported the cause of downtrodden tribal people whose environment is being affected by the dams on the Narmada river.

Sunderlal Bahuguna

- His Chipko Movement has become an internationally well-known example of a highly successful conservation action program through the efforts of local people for guarding their forest resources.
- His fight to prevent the construction of the Tehri Dam in a fragile earthquake prone setting is a battle the he continues to wage.
- The Garhwal Hills will always remember his dedication to the cause for which he has walked over 20 thousand kilometers.

Internationally known environmental thinkers who have made landmarks and whose names are frequently mentioned are:-

Charles Darwin

- Author of “Origin of Species” which brought to light the close relationship between habitats and species.
- It also brought about a new thinking of man’s relationship with other species that was based on evolution.
- Alfred Wallace came to the same conclusions during his work.

Henry Thoreau

- In 1860, he wrote that the wilderness should be preserved after he lived in the wild for a year.
- He felt that most people did not care for nature and would sell it off for a small sum of money.

Ralph Emerson

- He spoke of the dangers of commerce to our environment way back in the 1840s.

John Muir

- He is remembered as having saved the great ancient sequoia trees in California's forests.
- In the 1890s he formed the Sierra club, which is a major conservation NGO in the USA.

Aldo Leopold

- He was a forest official in the US in the 1920s.
- He designed the early policies on wilderness conservation and wildlife management.

Rachel Carson

- In the 1960s Rachel Carson published several articles that caused immediate worldwide concern on the effects of pesticide on nature and mankind.
- She wrote a well-known book called 'Silent Spring' which eventually led to a change in Government policy and public awareness.

EO Wilson

- An entomologist who envisioned that biological diversity was a key to human survival on earth.
- He wrote 'Diversity of Life' in 1993, which was awarded a prize for the best book published on environmental issues.
- His writings brought home to the world the risks to mankind due to man made disturbances in natural ecosystems that are leading to the rapid extinction of species at the global level.

◎ Thank you