ENVIRONMENTAL STUDIES

As per National Education Policy (NEP)

Ability Enhancement
Compulsory Course (AECC)

DR. JAYAKARA BHANDARY. M.

Associate Professor of Botany

Government First Grade College

Carstreet, Mangalore.

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AECC-1: ENVIRONMENTAL STUDIES

Ability Enhancement Compulsory Course (AECC)

Course Title: ENVIRONMENTAL STUDIES	
Course Code: AECC-1	**Course Credits: 2**
No. of Teaching Hours/Week: 2	**Duration of End Sem. Exam: 2 Hours**
Total Contact Hours: 28	**Assessment (Marks: 30 (Theory)+20(IA)=50**

Course Objectives:

1. To make students realize the importance and their role in the protection and maintenance of a healthy environment for sustainable development.
2. To enable students to grasp the significance and issues related to ecosystems, biodiversity and natural resources, and ways of managing/protecting them.
3. To enable students to have a nuanced understanding of environmental pollution, solid waste management and climate change and to act with concern on environmental issues.
4. To make students aware of the environmental policies and movements, and the role of individuals and communities in environmental protection for educating and ispiring the young minds.

Learning Outcomes:

At the end of the course, students will -

1. Understand the importance and dimension of a healthy environment, become environmentally conscious, skilled and responsible in all their actions with a concern for sustainable development.
2. Comprehend the significance and issues related to ecosystems, natural resources and bio-diversity and become aware of the need ways to protect/preserve them.
3. Grasp the issues related to environmental pollution, solid waste management and climate change, and become conscious and proactive in the discharge of their responsibilities towards the environment.
4. Become aware and appreciate the values and concerns of environmental movements and policies and the role of communities, and act responsibly on environment-related issues.

SYLLABUS

UNIT - I: INTRODUCTION 7 hrs.

Environmental Studies – Importance and scope, Multidisciplinary Nature, Concept of sustainability and sustainable development

Ecosystems – Concept, structure and function; Pond ecosystem, Forest Ecosystem, Food chains, Food webs, Concept of ecological succession.

Bio-geographical classification of India, Levels of biological diversity- Genetic, Species and Ecosystem; Biodiversity Hotspots with special reference to India; Threats to biodiversity.

Conservation of Biodiversity: In situ and ex situ; Endangered and endemic species –concept; Afforestation – Social forestry, Agroforestry, Green belt.

UNIT - II: ENVIRONMENTAL POLLUTION & ITS MANAGEMENT 7 hrs.

Air pollution, water pollution, noise pollution, - causes, effects and control measures.

Climate Change, global warming , ozone layer depletion, acid rain and its impact on human communities and agriculture.

Solid waste management - biodegradable and non-biodegradable waste, segregation of domestic waste at source.

Impact of plastic on human and animal health

UNIT - III: NATURAL RESOURCES & MANAGEMENT 7 hrs.

Land Resources and Land –use changes; Land degradation, Soil erosion and Desertification.

Water: Use and over-exploitation of surface and groundwater; Water conservation - rain water harvesting; Water shed management – Meaning and importance.

Energy Resources: Renewable and non-renewable energy sources, use of alternate energy sources.

Disaster – Definition and types (Natural and Man-made); Self-protection during disasters (Fire, Floods, Earth quakes, Landslides).

UNIT - IV: ENVIRONMENTAL AWARENESS & LEGISLATIONS 7 hrs.

Human Population Growth: Impact on environment, human health and welfare; Environmental ethics – Role of religion and cultures

Environment movements – Chipko, Narmada Bachao Andolan, Silent Valley, Bishnoi of Rajasthan.

Individual and community initiatives – *Salu Marada Thimmakka*; Concept of Sacred Groves (*Devarakadu)*

Environmental Protection Acts: Biodiversity Act (2002); National Environmental Policy, 2006 – Provisions and importance; Environmental Impact Assessment; *Swachh BharatMission* – Objectives; International agreements – Montreal and Kyoto protocols.

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UNIT 1: INTRODUCTION

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1.2. Ecosystems – Concept, structure and function; Pond ecosystem, Forest Ecosystem, Food chains, Food webs, Concept of ecological succession.

1.3. Bio-geographical classification of India, Levels of biological diversity- Genetic, Species and Ecosystem; Biodiversity Hotspots with special reference to India; Threats to biodiversity.

1.4. Conservation of Biodiversity: *In situ* and *ex situ*; Endangered and endemic species –concept; Afforestation – Social forestry, Agroforestry, Green belt.

1.1. Environmental Studies – Importance and scope, Multidisciplinary nature, Concept of sustainability and sustainable development

Definition:

Environmental studies is a multidisciplinary academic field which systematically studies human interactions with the environment. It deals with our natural world, the impact of human activities on it and the ways and means of correcting the adverse impacts. Thus, environmental studies focuses on every issue that affects living organisms on this earth. Students of environmental studies are expected to learn the causes, effects, and possible solutions to address important environmental problems currently bothering us.

This term was first used by American scholar and diplomat **George Perkins Marsh** in his book **Man and Nature**, first published in 1864. In this book, Marsh warned that man could destroy himself and the Earth

if he does not restore and sustain global resources and raise awareness about his actions. It is one of the first works to document the effects of human actions on the environment and it helped to launch the modern nature conservation movements.

Environmental Studies focuses on the scientific, social, legal, ethical and management aspects of environmental issues, from multiple perspectives involving both scientific and the humanitarian aspects. In this way, it differs from a related branch of study called **Environmental Science**, which focuses mainly on the scientific aspects of the environment.

Environmental Studies is a compulsory subject for students of all under graduate courses in India. This action was taken after the Supreme Court of India directed University Grants Commission of India (UGC) in 1991, through a judgement, in response to the writ petition filed by environmentalist and lawyer **M. C. Mehta**.

Environment and its components:

In simple words, Environment is what surrounds us. It may be defined as the sum total of physical and biological materials surrounding us and other organisms. The physical factors are soil, air, water, light, temperature, etc. The biological factors include all forms of life like plants, animals and microorganisms.

In general, the environment is considered to comprise the following four components or segments:

(1) Lithosphere, (2) Hydrosphere, (3) Atmosphere, and (4) Biosphere.

Lithosphere: The Lithosphere, or solid Earth, is that part of the Earth upon which organisms live and from which they extract most of their food, minerals, and fuels.The most important part of the lithosphere for life on Earth is soil, formed by the disintegrating weathering action of physical, geochemical, and biological processes on rocks. It is the medium upon which all plants grow, and virtually all terrestrial organisms depend upon it for their existence.

Hydrosphere: The hydrosphere contains Earth's water which covers about 70% of Earth's surface. It is a vitally important substance and occurs in all parts of the environment. Water is essential part of all

living systems and is the medium from which life evolved and in which life exists.

Atmosphere: The atmosphere is the thin layer of gases that envelopes the Earth. Earth's atmosphere is about 300 miles (480 kilometers) thick, but most of it is within 10 miles (16 km) the surface. It is divided into five main layers: the exosphere, the thermosphere, the mesosphere, the stratosphere and the troposphere. Atmosphere consists of gasses like Nitrogen (78%), Oxygen (21 %), Argon (0.93 %), Carbon dioxide (0.04 %) and trace amounts of Neon, Helium, Methane, Krypton and Hydrogen, as well as water vapor. It is the source of carbon dioxide needed for plant photosynthesis and of oxygen for respiration.

Biosphere: Biosphere is the life zone of the earth, including the lower part of the atmosphere, the hydrosphere, and the lithosphere to a depth of about 2 kilometers. The biosphere covers the entire realm of living organisms and their interactions with other segments of the environment, namely lithosphere, atmosphere, and hydrosphere.The biosphere strongly influences, and is strongly influenced by the other parts of the environment.

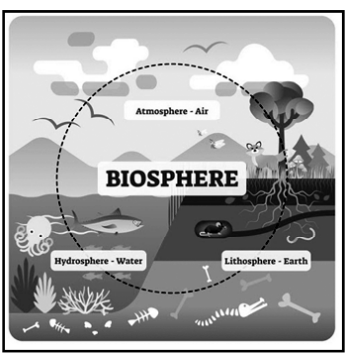

Fig.1. Environment

Recently, a fifth component called **Anthrosphere** is added to the concept of environment. The anthrosphere is a specific part of biosphere and may be defined as that part of the environment made or modified by humans and used for their various activities. The anthrosphere is very complex with an enormous potential to affect and modify the environment.

Scope and importance:

The scope of environmental studies is very wide and varied. It mainly involves:

1. Study of structure and functions of all natural landscapes like forests, deserts, grasslands, ponds, lakes, rivers, oceans, etc.

2. Human life is dependent on resources spread in these natural landscapes. We need water for agriculture, food and fish for living, fodder for our cattles, fuel wood for cooking, air for breathing. Thus our every activity is linked with natural resources. During the process of utilisation of these resources, they get inevitably affected. But as living without these resources is impossible, we cannot afford turning a blind eye towards the environmental impacts we have produced. So, learning about environmental modifications by human activities forms another important interest of environmental studies.

3. Realisation and understanding of the multiple affects of human activities on environment need to be followed by seeking practical solutions to these problems. Continued survival of human and other life can be ensured on earth only with protection and preservation of earth's natural resources.

4. We also have to search for new sources of energy to compensate for the fast depleting non-renewable resources like coal and oil, if we have any concern for our future generations. So, all these aspects fall within the realm of environmental studies.

Thus, ultimately, every issue that affects a living organism and connected with the continuation of life on earth is included within the scope of environmental studies.

Environmental Study is important because:

1. It makes us to understand the importance of environment for survival of plants and animals, including humans

2. It explains the need to conserve natural resources like forests and biodiversity, the need to lead more sustainable lifestyles, and the need to use resources more equitably.

3.It can change the way we view our own environment, using a practical approach based on observation and self-learning, and

4. It can create concern for our environment that will trigger pro-environmental action, including simple activities we can do in our daily life to protect it.

Multidisciplinary nature of Environmental Studies:

Study of environment is not a matter of any single subject. It requires application and integration of several disciplines belonging to both science and social studies. The very objective of environmental studies is to understand and solve the major environmental problems with the help of inter-disciplinary and trans-disciplinary approaches. It is a subject which is centered around environmental biology, but depends on all other disciplines. Therefore, environmental studies is said to be multidisciplinary subject.

To effectively understand the multiple dimensions of environment, we need to understand and apply the principles of biology, chemistry, physics, mathematics, geography, geology, economics, politics, ethics and population studies. Even principles of engineering sciences, computers, electronics and help of medical sciences is also essential for environmental studies. For example, understanding and solving health problems caused by environmental pollution requires the involvement of medical sciences.

Designing proper landfills for solid waste management, construction of dams to generate electricity or store water for irrigation requires engineering science.

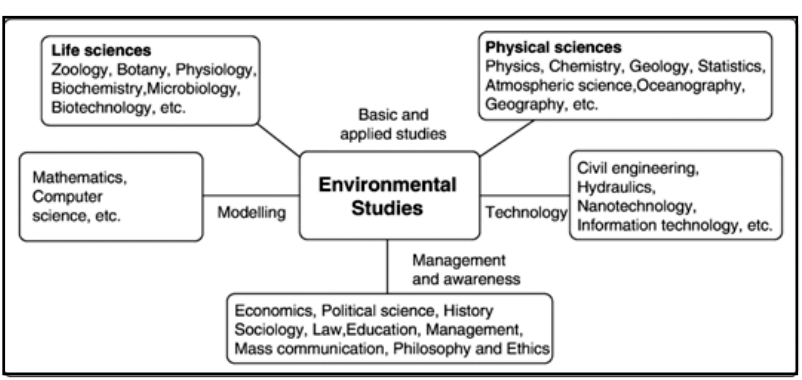

Fig.2. Multidisciplinary nature of Environmental Studies

Modern techniques of resource mapping like remote sensing, population modelling, disaster forecasting and warning is not possible