

Course Code : ECO 201

Course Title : Environmental Science and Agroecology

Credit Hours : 2(2+0) Full Marks: 50 Theory: 50 Practical: 0

OBJECTIVES

Upon the completion of this course, the students will know the concept of environmental Science and Agroecology, EIA and its method, climate change and its impact in agro-ecology.

I.SYLLABUS

Introduction to environmental science and agro-ecology, environmental issues, conservation and management strategies and recent advances, farm house ecology, ecological principles and agro-ecosystem dynamics, agro-ecosystem ecology, environmental impacts on agriculture, EIA, Global warming and climate changes, agro-ecology of production systems and sustainability of agro-ecosystem.

II. COURSE OUTLINE

A. Lecture

S.N.	Topic	No. of Lectures
1	Introduction to environmental science and agroecology	2
	1.1 Concepts, fields, and scope of environmental science and agroecology with particular reference to Nepal	
	1.2 Interrelationships between human population and the environment	
2	Environmental issues	4
	2.1 Environmental issues: population, deforestation, urbanization, waste disposal, pesticide uses and abuse	
	2.2 Types and sources of pollutants (air, soil and water)	
	2.3 Their impacts on natural ecosystems.	
	2.4 Their impact on agricultural ecosystems.	
3	Conservation and management Strategies and recent advances	5
	3.1 Different organization involved in agroecology and different strategies used by our country	
	3.2 Effect of Climate change in agroecology	
	3.3 Different adaption procedure in crop field	
	3.4 Government policy and people's participation in law and programs in environmental management	
	3.5 Education, research and development in environmental science and agroecology	

4	Farmhouse ecology and ecological principles and agroecosystem dynamics	2
4.1	Understanding and analysis of environmental components of farm house/ home garden, interlinkages of and agroecosystem (farm, crop, farmers, etc)	
4.2	Component agroecosystem, their linkages, Energy flow, ecological pyramids, food chains, food webs and trophic level.	
5	Agroecosystem ecology	2
5.1	Interaction of crop with weeds, pest, pathogens and their interaction	
5.2	Different management strategies in crop field	
6	Environmental impacts on agriculture	3
6.1	Ecological degradation due to chemical agriculture, deforestation and soil erosion	
6.2	Declining soil fertility, soil productivity and farm profitability and reduction in biodiversity	
6.3	Food quality degradation, water bodies contamination, Biomagnification and health hazard	
7.	Environmental Impact Assessment	3
7.1	Definition of EIA, IEE, need of EIA and IEE and legal provision of EIA and IEE	
7.2	Different types of environmental impacts and impact identification	
7.3	Procedure for EIA and IEE	
8	Global warming and climate change	3
8.1	Green house effect, global warming and climate change	
8.2	Source and sink of green house gases	
8.3	Impacts of climate change on snow melting, sea level rise, and agriculture and economy of Nepal.	
9	Agro-ecology of production system	4
9.1	Agro-ecology of shifting cultivation, multiple cropping, crop rotation, cover cropping, agroforestry system	
9.2	Definition, advantage and limitation for sustainable agriculture	
9.3	Conservation agriculture and principles of CA and Organic farming	
9.4	Ecological aspects of CA and SALT	
10	Sustainability of Agro-ecosystem	2
10.1	Properties of Agro-ecosystem: Productivity, stability, equitability and sustainability	
10.2	Challenges, strategies and requirement of sustainable agriculture	
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REFERENCES

Altieri, M. A. 1987. Agro-ecology. The Scientific Basis of Alternative Agriculture. Division of Biological Control. University of California.

Conway G. R. 1986. Agro-ecosystem Analysis for Research and Development. Bangkok Winrock International Institute for Agriculture Development.

Shimpei Murakami. 1991. Lessons from Nature. A Guide to Ecological Agriculture in the Tropics. NongJok Natural Farming Center. Bangkok. Thailand.

R. B. Khadka, Ron Bisset and Peter A. Neame. 1996. EIA Training Manual for Professional and Managers. IUCN Publication.