# BAGB409 Agri-environmental and Sustainable Land Management

ECTS Value: 5 ECTS

## Overall Objectives and Outcomes

The aim of the unit is to provide participants with an understanding of the interactions of agriculture with the surrounding environment. This module focuses on agricultural sustainability, the role of the agri-environment in ensuring crop production and the consequences of intensive management practices on the environment. It will provide an overview of soil formation and management practices, hydrological relationships and water management systems, the habitats and ecosystems and key agroecological principles and their application in sustainable rural land management.

By the end of this module, the learner will be able to:

### Competences

a.  develop an understanding of the characteristics of soil;

b.  evaluate the role of soil organic matter in maintaining soil structure and in the supply of water and nutrients to the crop;

c.  critically review the different methods available to ensure soil and water conservation;

d.  evaluate the important role of the agri-environment in maintaining crop production through the delivery of agroecosystem services.

### Knowledge

a.  describe the physical and chemical characteristics of soil;

b.  describe how the soil's physical characteristics affect its nutrient balance;

c.  identify the key factors involved in the chemical and biological processes of composting;

d.  describe the factors that determine the rate of evaporation and evapotranspiration;

e.  identify different point and non-point sources of water pollution and their impacts on the agricultural and natural environment;

f.  distinguish between species and functional biodiversity;

g.  define the term ecosystem services and give examples that are relevant to farming systems;

h.  identify the requirements and implications of organic certification;

i.  identify the objectives of the EU common agricultural policy (CAP).

## Skills

a. produce a soil management plan for a given site to improve the soil condition for cropping;

b. prepare a composting system that may be used in a farming system;

c. apply measures to ensure water conservation in farming systems;

d. assess the contribution of agrobiodiversity to crop production through the delivery of agroecosystem services;

e. analyse how technological and agroecological principles can be applied in a low intensity farming system to ensure crop productivity and sustainable farming;

f. evaluate the value of agricultural biodiversity in maintaining crop production;

g. evaluate different methods that may be used to improve soil fertility;

h. analyse the relationship between agriculture and the environment;

i. evaluate the pros and cons of organic and low intensity agriculture;

j. compare and contrast conventional and organic agriculture;

k. present a soil management plan in a report format;

l. discuss and present technological and agroecological farming solutions for sustainable agriculture;

m. explain the process of organic certification;

n. describe the effect of natural and human-induced processes upon soil characteristics;

o. formulate a soil management plan for the improvement of soil fertility;

p. describe the hydrologic cycle and identify key flows of water between different earth systems;

q. identify measures to reduce dependence on ground water and for improved water quality;

r. identify good agricultural practices in field cropping;

s. analyse the role of biodiversity in agricultural production;

t. evaluate the use of a range of cultural techniques and systems in organic and other low intensity farming systems;

u. identify the requirements and implications of organic certification;

v. use presentation software;

w. use scientific and agricultural equipment in a work-place environment;

x. access scientific literature to learn about innovative solutions for sustainable farming;

*y.* prepare reports and to make us of communication technologies.

## Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

## Assessment Methods

This module will be assessed through: Project-based Assessment, Report and Presentation

## Suggested Readings

**Core Reading List**

1. Jack, B. 2016. Agriculture and EU Environmental Law. Routledge, London.
2. Martin, K. & Sauerborn, J. 2013. Agroecology. Springer, Dordrech.
3. Altieri, M. 1995. Agroecology: the science of sustainable agriculture. 2nd Edition. CRC Press.
4. Vandermeer, J.H. 2011. The ecology of agroecosystems. Jones and Bartlett Publishers. Boston.
5. Ashman, M., R., and G. Puri. 2002. Essential Soil Science. Blackwell Publishing.
6. Bardgett, R.D., 2005. The Biology of Soils. A Community and Ecosystem Approach. Oxford University Press.
7. Lockeretz, W. 2011. Organic Farming: An International History. CABI Publishing.
8. Fossel, P.V. 2014. Organic Farming: How to Raise, Certify, and Market Organic Crops and Livestock. Voyageur Press, Minneapolis, USA
9. FAO, 2006. Malta: Water Resources Review. Food and Agriculture Organization of the United Nations. Rome. [Online]. Available at: http://www.fao.org/docrep/009/a0994e/a0994e00.htm. [Accessed 19 03 2018].

**Supplementary Reading List**

1. Lewis, K., Tzilivakis, J. Warner, D., Green, A. (2018). Agri-environmental Management in Europe: Sustainable Challenges and Solutions - From Policy Interventions to Practical Farm Management. 5m Publishing
2. FAO, (2000). Manual on integrated soil management and conservation practices. Food and Agriculture Organisation Land and Water Bulletin. [Online]. Available at: http://www.fao.org/docrep/016/x4799e/x4799e.pdf. [Accessed 10 02 2018].
3. Gliessman, S,R. (2014). Agroecology: the ecology of sustainable food systems. 3rd Edition. CRC Press.
4. Rowell, D. L. (1994). Soil Science Methods and Applications Prentice Hall.