Sustainable Management and Valuation of Ecosystems

Course title – Intitulé du cours	Sustainable Management and Valuation of Ecosystems
Level / Semester – Niveau /semestre	M2/S2
School – Composante	Ecole d'Economie de Toulouse
Teacher – Enseignant responsable	Marion DESQUILBET
Other teacher(s) – Autre(s) enseignant(s)	Philippe DELACOTE
Other teacher(s) – Autre(s) enseignant(s)	Nicola GALLAI
Other teacher(s) – Autre(s) enseignant(s)	Lucie BOTTEGA
Other teacher(s) – Autre(s) enseignant(s)	Pierre LEBAILLY (epidemiology)
Other teacher(s) – Autre(s) enseignant(s)	Clélia SIRAMI (ecology)
Other teacher(s) – Autre(s) enseignant(s)	
Lecture Hours – Volume Horaire CM	30
TA Hours – Volume horaire TD	
TP Hours – Volume horaire TP	
Course Language – Langue du cours	English
TA and/or TP Language – Langue des TD et/ou TP	

Teaching staff contacts – Coordonnées de l'équipe pédagogique :

Marion Desquilbet: T.323. Meeting on appointment, please mail to marion.desquilbet@inrae.fr

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Nicola Gallai: nicola.gallai@ensfea.fr

Lucie Bottega: TJ13. lucie.bottega@tse-fr.eu

Course Objectives – Objectifs du cours :

The rapid growth of human activities in the past fifty years has had profound effects on other species and on ecosystems, on which our own survival depends. Policies for environmental management are increasingly concerned by such biological and ecological issues, as witnessed for instance by new laws on biodiversity adopted by many countries (including France), the issue of deforestation, the increasing number of sustainability labels and standards, or the debates on pesticides. This class aims at providing the students with a set of tools to analyze the numerous issues that arise when economic activities involve living beings. The goal is to identify the sources and extent of externalities and discuss the appropriateness of alternative policy instruments in a number of qualitatively different settings.

Prerequisites – Pré requis :

No special prerequisites except for knowledge about economics obtained either prior, or during the first semester of TSE M2 E&E.

Grading system – Modalités d'évaluation :

20% of the grade is determined by attendance and participation; 20% by a group case study on sustainability labels; 60% by an individual term paper that aims at evaluating real policy in the light of the course material.

1) Participation and attendance: be on time, participate actively.

2) For sustainability labels, the students will gather in groups to develop a case study. The students' grade will be on the participation and preparation of the case studies.

3) For the term paper your mission is to:

- Choose a real regulatory policy (or law) related to an ecological or biological issue: for example, a policy against deforestation in Brazil, against over-fishing in Iceland, for protecting wetlands in Great Britain, for protecting ecosystems against invasive species, for regulating the use of genetically modified crops, for managing antibiotic prescription practices, etc...

- Write a report on this policy, as if you were the advisor in charge of evaluating the policy: first a summary of the situation, then a diagnosis of the policy, finally some suggestions for reform.

In particular, in the report you need to accurately identify the sources of economic and ecological/biological issues:

- for the economic issues this means identifying the externalities and the sources of these externalities.

- for the ecological/biological issues this means describing in what ways there is mismanagement of the ecological/biological resource at hand (the forest, the stock of fish, an invaded ecosystem, the biodiversity in a given ecosystem, …) and the reasons for this mismanagement (for instance, is it because property rights are not well defined? is it because information about the population is missing? is it because the reproductive season is disrupted by human activity? is it because the habitats are becoming too fragmented? Etc).

This term paper is as an opportunity to combine insights about the economic consequences of human activities with some insights about their ecological/biological consequences. It represents the element of this course which is meant to give you an edge in the competition for jobs in companies and organizations that evaluate economic and ecological consequences of human activities. The report should refer to relevant theory and academic literature and to any relevant data that you'll find on the Internet. The report should include at least 10 pages written by you (this excludes for example tables or graphs that you reproduce from other sources), and a bibliography. You may also propose a modelling of the situation, but only if it is useful to your report.

Bibliography/references – Bibliographie/références :

Sustainability in agriculture and food systems

Green, R.E., Cornell, S.J., Scharlemann, J.P.W., Balmford, A., 2005. Farming and the fate of wild nature. Science 307, 550-555.

Loconto, A., Desquilbet, M., Moreau, T., Couvet, D., Dorin, B., 2018. The land sparing – land sharing controversy: tracing the politics of knowledge. Land Use Policy 96, 103610.

Möhring et al., 2020. Pathways for advancing pesticide policies. Nature Food 1, 535-540.

Pe'er, G. et al., 2019. A greener path for the EU Common Agricultural Policy. Science 365, 449-451.

Dechezlepretre, A., Sato, M., 2017. The impacts of environmental regulations on competitiveness. Rev. Env. Econ. Policy 11, 183-206.

Grogan, K.A., 2014. When ignorance is not bliss: pest control decisions involving beneficial insects. Ecological Economics 107, 104-113.

Deforestation

Angelsen, A. and Kaimowitz, D., Rethinking the causes of deforestation: lessons from economic models, The World Bank Research Observer, 1999.

Angelsen, A., REDD models and baselines, International Forestry Review, 2008.

Barbier, E., Delacote, P., Wolfersberger, J. (2017). The economic analysis of the forest transition, Journal of Forest Economics, 27, 10-17.

Keles, D., Delacote, P., Pfaff, A., Mascia, M. (2020). What drives the erasure of protected areas? Evidence from across the Brazilian Amazon, Ecological Economics, 176, 106773.

Jayachandran S., de Laat J., Lambin E.F., Stanton C.Y., Audy R., Thomas N.E. (2017). Cash for carbon: A randomized trial of payments for ecosystem services to reduce deforestation, Science, 357, 267-273.

Ecosystem services

Christie M, Fazey I, Cooper R, et al (2012) An evaluation of monetary and non-monetary techniques for assessing the importance of biodiversity and ecosystem services to people in countries with developing economies. Ecological Economics 83:67–78. https://doi.org/10.1016/j.ecolecon.2012.08.012

Gallai N, Salles J-M, Settele J, Vaissière BE (2009) Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. Ecological Economics 68:810–821. https://doi.org/10.1016/j.ecolecon.2008.06.014

Millennium Ecosystem Assessment (2005) Ecosystems and human well-being : Washington, D.C.

Potschin, M., Haines-Young, R.H., Fish, R., Turner, R.K. (Eds.), 2016. Routledge handbook of ecosystem services. Routledge, Taylor & Francis Group, London ; New York.

Potts SG, Imperatriz-Fonseca VL, Ngo HT, et al (2016) The assessment report on pollinators, pollination and food production: summary for policymakers

Sagoff M (2011) The quantification and valuation of ecosystem services. Ecological Economics 70:497–502. https://doi.org/10.1016/j.ecolecon.2010.10.006

Sustainability standards

The references will be made available on the Moodle platform.

Session planning – Planification des séances :

1- Sustainability in agriculture and food systems (Marion Desquilbet, with participation of Pierre Lebailly and Clélia Sirami) – 12h

This course will cover a range of issues and challenges for sustainable farming and food systems: the land sparing / land sharing debate (should we intensify agriculture to save land?), incentives from the European Common Agricultural Policy, the bio-economics of chemical versus biological or agroecological pest control, pesticide regulation (authorisation or ban, taxation, other policies), and the challenge of measuring the impacts of pesticides on human health and the environment with a toxicological and epidemiological perspective.

2- Deforestation (Philippe Delacote) – 6h

Deforestation is a major environmental and development concern for tropical countries, in relation with agricultural expansion, biodiversity losses and climate change. The objective of this class is to give an overview of the way economists investigate with this issue, and to address key questions arising at the international level: policies to reduce deforestation, impacts of protected areas, spatial dynamics of deforestation, droughts impacts on land-use change, carbon offsetting. The class will take the form of a literature review presentation, combined with insights from on-going research.

3- Ecosystem services (Nicolas Gallai) – 6h

Ecosystem services are the benefits we derive from nature. However, these services are in danger, mainly due to anthropogenic pressure. This course will define the concept of ecosystem services. The stakes and consequences for society will also be valued and analyzed. Finally, we'll look at how public policy is addressing ecosystem services in Europe. The example of pollination will be used to illustrate the course. This ecosystem service provides a wide range of services, since it is involved in the production of market goods such as agricultural products, as well as non-market goods such as landscape aesthetics.

4- Sustainability labels and standards (Lucie Bottega) – 6h

Various sustainability labels, standards and initiatives aim to help preserve resources though informing consumers on sustainability criteria for the goods they buy. They may relate to different ecological components, such as fisheries, forestry, bioenergy, carbon offsetting or biodiversity for example. For this course, an overview of the main economic issues on sustainability labels and standards will be presented. Then, students will be divided into subgroups of two students, each selecting and developing a case study. For each case study, a debate will be prepared, with one group defending the label or standard and another presenting the negative aspects.

Distance learning:

Distance learning can be provided when necessary by implementing, for example:

- Interactive virtual classrooms
- Recorded lectures (videos)
- MCQ tests and other online exercises and assignments
- Remote (online) tutorials (classes)
- Chatrooms