

The insurance value of biodiversity

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Rationale and objective:

Humans make use of *ecosystem services* in a variety of ways. Typically, these ecosystem services are *stochastic*, such as e.g. the production of green biomass in grasslands, water runoff in a watershed, the level of pollination provided by insects, etc. *Economic decision makers*, who (i) consider ecosystem services as contributing to their income or, more generally, their well-being, and (ii) are risk-averse, thus, face a risk. This includes orchard farmers, water utility managers or rangeland managers. *Biodiversity* influences their risk, as it influences the underlying ecosystem processes and functioning. In particular, it influences the statistical distribution at which ecosystem services are being provided.

This leads to the hypothesis that, under certain conditions, biodiversity can provide natural insurance for risk-averse users of ecosystem services. This symposium explores this hypothesis from an ecological-economic point of view. Contributions to the symposium will discuss results from ecology about how biodiversity influences ecosystem functioning and services, and integrate these with an economic analysis of decision-making under uncertainty and in different institutional settings. Questions to be discussed include the following:

- How can one define an “insurance value” of biodiversity?
- What ecological and economic factors and relationships determine this insurance value in different ecological-economic settings?
- In what way can biodiversity (as a natural form of insurance) be seen as a substitute for – or as a complement to – commercial (financial) insurance against income risks?
- How is the level of biodiversity, as a natural form of insurance, influenced by different institutional arrangements concerning ecosystem management?
- How does biodiversity’s function and use as an insurance relate to the other functions and uses of biodiversity?

Contributions (with Speakers in CAPITAL letters):

1. STEFAN BAUMGÄRTNER (Research Center for Environmental Economics, University of Heidelberg, Germany):
Biodiversity as insurance: an ecological- economic perspective
2. MICHEL LOREAU (Laboratoire d'Ecologie, Ecole Normale Supérieure Paris, France) :
Biodiversity as insurance: the ecological perspective
3. Bernhard Schmid and FELIX SCHLÄPFER (Institute of Environmental Sciences, University of Zurich, Switzerland):
Biodiversity, ecosystem functioning, and ecosystem management: constant vs. changing environments and planted vs. naturally assembling communities
4. JASON SHOGREN (Department of Economics and Finance, University of Wyoming, USA):
On protecting ecosystem value
5. Salvatore di Falco and CHARLES PERRINGS (Environment Department, University of York, UK):
Biodiversity conservation and risk management in agriculture
6. STEVE POLASKY and David Tilman (Department of Applied Economics and Department of Ecology, Evolution and Behavior, University of Minnesota, St. Paul, USA):
Diversity and ecosystem services