

# PhD Program „Biodiversity and Society“

## Thematic Profile

Financially supported by the state of Lower Saxony, Georg-August-Universität Göttingen has established a new PhD program „Biodiversity and Society – Human dimensions of protection and utilization of biological diversity“. The program is geared towards highly promising junior scientists, and has welcomed the first students in april 2010.

Biodiversity research is one long-standing focus of teaching and research at Georg-August-Universität Göttingen. Thus, the new PhD program is embedded in an exceptionally strong disciplinary and interdisciplinary research environment with active participation by ecology, systematics/taxonomy, agricultural and forestry sciences, conservation science, and several social sciences. Affiliated with Göttingen Graduate School for the Social Sciences ([GGG](#)), the program is co-ordinated by Prof. Dr. Rainer Marggraf, Department of Agricultural Economics and Rural Development.

### **Biodiversity from a social science perspective**

From its very first methodological steps, biodiversity science needs social science input. This applies to the definition of the targets of biodiversity conservation as well as to the design of the procedures by which biological diversity is measured and valued. In this sense, the social sciences are a necessary complement to the natural sciences. Even more so, the social sciences are essential to develop successful instruments for the protection and sustainable utilization of biological diversity because these instruments are virtually always employed in complex social, economic and legal contexts.

In spite of the high importance of social science knowledge for implementing a modern conception of nature conservation, structured academic training at the PhD level has not been available in the area of "Biodiversity and Society" in Germany. With the establishment of this PhD program, Georg-August-Universität Göttingen caters to a demand which is enticed, *inter alia*, by the scientific needs of the United Nations Convention on Biological Diversity (CBD) as well as national and European Union biodiversity strategies.

### **Research Profile**

How valid are approaches to the valuation and appreciation of biological diversity that rely on economic logic, the Rational Actor Paradigm etc.? At first approximation, the new PhD program is dedicated to the investigation of this grand theme. It focuses on the bargaining processes between diverging conservation and utilization interests, and investigates the social, legal, and psychological factors that influence ensuing conflicts and co-operations. Thus, the overarching topic of the PhD

program is not biodiversity itself but the social sciences domain of the tensions between conservation and utilization of biological diversity. Consequently, the single PhD projects investigate which legal, economic ethical, psychological and social factors determine opportunities for and limits to the protection of biological diversity.

A particular focus will be placed on the development, investigation and testing of *instruments* that improve societal and individual decision-making on biological diversity. We understand "instrument" in a wide sense here. It covers scientific methods, legal regulations, pedagogical interventions as well as ethical and political discourse, and public participation processes. The instruments shall either support the valuation of biodiversity, or its public appreciation and individual acknowledgement in decision-making. Of particular interest is the analysis of land use restrictions, economic incentives and compensation payments facilitating biodiversity protection.

In line with the core competences of the participating research groups, we focus on the biological diversity of *terrestrial ecosystems*, foremost in *rural areas*. Thus it is planned to devote a collaborating set of PhD projects to the investigation of the protection and utilization of biological diversity in *traditionally used agricultural landscapes*. The PhD program "Biodiversity and Society" is explicitly open to more general, more fundamental or more specific projects, however.

In order to ensure that the attention of national and international actors in biodiversity politics is drawn to the scientific results of the program, we encourage research that promises to yield a defined contribution to the implementation of the national German biodiversity strategy and/or to advancing the agri-environment programs of the European Union (see section of research clusters below). With key officers the German Federal Office for Conservation (*Stabsstelle zur Umsetzung der Biodiversitätsstrategie des Bundesamtes für Naturschutz*) and the German federal agricultural administration (*Abteilung zur Weiterentwicklung von Landwirtschaftsprogrammen der Deutschen Vernetzungsstelle für den ländlichen Raum*), respective discussions have already been scheduled.

Although it is envisioned that much research will be carried out in Germany, many scientific contributions will have close ties to European and international developments. Thus, PhD projects may be dedicated to the international dimension of biodiversity and society; international case studies are likewise encouraged.

### **Thematic Clusters of PhD Projects**

Within this interdisciplinary PhD program, three thematic clusters will be established. Each cluster offers participating PhD students immediate collaboration opportunities among the most related research groups. This structure enables joint work on scientific tasks that were impossible to cover at sufficient depth within a single project. The thesis advisors of a PhD student can chiefly be recruited

from the faculty participating in a cluster. **We ask all applicants to indicate their affinity to two of the clusters in the application.** More specific as well as more integrative projects proposals are possible. In this case, please point out existing links to the content of this document in your application.

***Cluster I: Biological diversity of agricultural landscapes from a production perspective***

- **Primary Research Groups:** *Prof.'es Geldermann, Isselstein, Mußhoff, Tschardtke*

Most traditionally used agricultural landscapes in Europe - but also in other places - include a high share of pastures and meadows ("grasslands"). Traditionally used grasslands, thus, characterize the expression and the agriculture of many landscapes. Save a few exceptions, grasslands are either anthropogenic or anthropogenically reshaped. Extensively used and species-rich grasslands are a focus of nature conservation in rural Europe. It is the habitat of strongly endangered plant and animal species. Finally, many (urban) citizens identify diverse landscapes with a substantial grassland component as prototypical "Nature".

Depending on its productive potential for agriculture, species-rich grasslands are threatened by abandonment, intensification of pasture use or, ploughing. These processes are far advanced in many locations. Thus, knowledge of the production and cost structures of agriculture with species-rich grasslands is a necessarily component of systematic approaches to the conservation of the biological diversity here.

The research projects in this cluster shall contribute to a better agronomic and ecological description of the production relations of species-rich grasslands. Recent research shows that extensively managed, species-rich grassland has several ecological advantages. At least in part, these advantages are of agronomic interest. Among them is a higher stability against agricultural pests and a higher abundance of beneficial organisms. In face of the more extreme weather events prognosticated, species-rich grasslands may also display advantages. An example is a potentially higher biomass yield in spite of drought conditions. Agri-ecological investigations need to include an analysis of management effects beyond the single farm or the single field as the success of small-scale interventions frequently depends on landscape-level effects.

If species-rich grassland is intensified or abandoned, its conservation value decreases substantially. In turn, the perpetuation of extensive use may regularly result in financial disadvantages to land owners. These disadvantages can be compensated for, e.g. by payments from agri-environment schemes. From an ecological perspective, committing an area to such a scheme should last several years. Long-term commitments weigh negatively on the entrepreneurial flexibility of the land owner, however. This cost component that includes an uncertainty component is insufficiently accounted for in the literature. Decisions on the financial acceptability of agri-environmental schemes require advanced financial risk

analyses - from a land owner perspective as well as from a social and fiscal perspective.

Along the agricultural value chain, a number of further decision-relevant uncertainties occur. One example deals with temporal changes in private purchasing preferences as well as in collective political preferences for the biological diversity of traditionally used agricultural landscapes. Complementing risk economic analyses, multi-criteria methods for decision support are advanced that account for preference change. Respective methods are particularly important for multi-stage decision-making in regional planning and implementation processes, which can drag on for years.

### ***Cluster II: Biological diversity of agricultural landscapes from a citizen/consumer perspective***

- **Primary research groups:** *Prof.'es Bögeholz, Boos, Marggraf, Steinfath*

Protection and advancement of biological diversity depend on normative legitimization as much as on factual appreciation by society. Using examples on biodiversity conservation in agricultural landscapes, this cluster features fundamental research on the legitimization and appreciation of biodiversity in contribution to the tasks of the national German biodiversity strategy.

In the recent past, value theories re-merged that assign Nature and its manifestations an intrinsic value which is independent of any human valuer. Many engaged conservationists subscribe to such beliefs. How does the justificatory potential for conservation differ among different approaches in environmental ethics? Exemplary issues deal with the applicability of non-anthropocentric value theories to the biological diversity of traditional agricultural - i.e. anthropogenic - landscapes, or with the ethical legitimacy of the protection of old races of domestic animals functionally tied to traditional agriculture.

The political and economic relevance of citizen norms and values on the protection of the biological diversity of traditionally used agricultural landscapes is not a mere function of a popular desire for strict protection. Facing the costs of conservation, citizen willingness-to-pay is highly relevant. The quantification of economic citizen preferences with social science methods is an internationally established but methodologically challenging method. A number of fundamental methodological issues need urgent research.

The expertise of the participating research groups offers an unprecedented opportunity to simultaneously tackle a number of these challenges using a joint valuation task. We intend to investigate: (i) Citizen willingness-to-pay for conservation in face of alternatively offered improvements in the provisioning of other public goods, (ii) influences of pre-concepts and information offers during the valuation exercise, and (iii) influences of social-psychology variables and environmental ethics beliefs on willingness-to-pay. Also the effect of the introduction of public

discourse elements into valuation studies could be researched. The preferences to be assessed may refer directly to the conservation of species-rich agricultural landscapes, to the protection of the ecosystem services they provide, or to the products turned out.

### ***Cluster III: Biological Diversity of agricultural landscapes from an international perspective***

- **Primary research groups:** *Prof.'es Bizer, Marggraf, Stoll, Wittke*

In this cluster, we focus research on the international dimension of the conservation of biological diversity in agricultural landscapes.

A substantial share of states in Europe is member of the European Union, and subjected to the regulations of its *Common Agricultural Policy (CAP)*. As member states differ in mechanisms to solve land use conflicts, it appears useful to compare biodiversity protection strategies across member states. A particularly promising set of member states and affiliated countries stretches along the former "iron curtain" (e.g., Germany, Czech Republic, Romania, Albania). In this context, the *European Framework for Protection of Nature and Biodiversity* represents a highly relevant policy framework. PhD projects could, for example, investigate if and how European Union financial incentives have to change in order to ensure a representative protection of European habitats and species. In particular, the influence of the instruments and procedures of regional development planning should highlighted.

CAP brings about opportunities but also restrictions with respect to the instruments of biodiversity protection. Further restrictions are provided by the legal agreements of the World Trade Organisation (WTO) on free trade in agricultural goods. For example, CAP and WTO define which support schemes for agricultural production of grains, meat and milk may be "allowed" in the future. Such restrictions may have dramatic effects on the financial feasibility of traditional and/or extensive forms of land use in agricultural landscapes. A set of potentially WTO-conform instruments for biodiversity conservation are voluntary conservation contracts, in particular outcome-oriented auctioning schemes. Do date, only a limited number of examples is documented. A systematic analysis of these examples promises to yield essential information for the national as well as for European agri-environmental policy, particularly with respect to traditionally used grasslands.

However, legal and financial conditions determine only part of the success or failure of regional and supra-regional approaches the conservation of traditionally used agricultural landscapes and their biological diversity. The vertical and horizontal co-operation of the relevant actors in agriculture, conservation, economy, and politics is an important additional precondition. In a comparative study at the European level, fostering as well as retarding conditions for the successful design and implementation of the social co-operation processes that facilitate biodiversity protection in agricultural landscapes should be identified.

## Research Group Overview

We ask all applicants to assign themselves to one of the members of the following research groups with first and second preference.

<b>Name</b>	<b>Arbeitsbereich</b>	<b>Department/Institut/Zentrum/Fakultät</b>
Prof. Dr. Kilian Bizer	Environmental- and Institutional Economics	Volkswirtschaftliches Seminar, Fakultät für Wirtschaftswissenschaften
Prof. Dr. Susanne Bögeholz	Didactics of Biology, Environmental Education	Zentrum für empirische Unterrichts- und Schulforschung sowie Biologische Fakultät
Prof. Dr. Margarete Boos mit PD Dr. Micha Strack	Social and Communication Psychology	Georg-Elias-Müller-Institut für Psychologie, Biologische Fakultät
Prof. Dr. Jutta Geldermann	Production and Logistics	Betriebswirtschaftliches Seminar, Fakultät für Wirtschaftswissenschaften
Prof. Dr. Johannes Isselstein	Grassland Science	Department für Nutzpflanzenwissenschaften, Fakultät für Agrarwissenschaften
Prof. Dr. Rainer Marggraf	Environmental and Resource Economics	Department für Agrarökonomie und Rurale Entwicklung, Fakultät für Agrarwissenschaften
Prof. Dr. Oliver Mußhoff	Farm Management	Department für Agrarökonomie und Rurale Entwicklung, Fakultät für Agrarwissenschaften
Prof. Dr. Holmer Steinfath	Practical Philosophy and Ethics	Philosophisches Seminar, Philosophische Fakultät
Prof. Dr. Peter-Tobias Stoll	International Economic and Environmental Law	Institut für Völkerrecht und Europarecht, Juristische Fakultät
Prof. Dr. Teja Tschardtke	Agricultural Ecology	Department für Nutzpflanzenwissenschaften, Fakultät für Agrarwissenschaften
Prof. Dr. Volker Wittke	Economic Sociology	Soziologisches Forschungsinstitut e.V., Institut für Soziologie, Sozialwissenschaftliche Fakultät