



Sustainable development and biodiversity . 1

1. Introduction

The emergence of *sustainable development* as the main norm for guiding local state and international policies and actions, has deeply changed the way biodiversity is perceived and managed by societies. Research carried out in Montpellier reflects this evolution by focusing on the *new socio-environmental systems and mechanisms* affecting biodiversity. It is aimed at improving the use, management and valorisation of renewable resources, at encouraging a fairer trade and a more equitable share of benefits among all parties, and at preventing and managing conflicts. They encompass (1) the recognition and promotion of local knowledge and practices affecting biodiversity, (2) the definition of conservation strategies taking into account resource access legal systems, new public/private partnerships and territorial and governance arrangements, and (3) the development of methods and tools in the fields of finance and market developments.

2. Themes

Several groups are involved in research on the emergence of socio-environmental innovations, their potentials and limits, and the way they contribute to the design and implementation of global governance on biodiversity. Work is conducted at the junction between economic and social (geography, sociology, anthropology) sciences and technical, biological and modelling sciences. They cover several themes.

Local knowledge: a management tool for conservation and development?

Breaking from a classical ethnological approach, Montpellier scientists develop original studies on the decomposition/recovery of local knowledge accompanying the evolution of the global discourse on traditional ecological knowledge (TEK), the globalisation of goods and norms, and the promotion/protection of TEK as important elements of biodiversity and of its sustainable use. These studies also involve research on (a) the emergence of new actors and knowledge systems on natural elements, (b) alternative valorisation mechanisms through the certification or quality assurance of derived products, [such as “Appellation of Origin” or other geographical indications, ecolabels (“Biodiversity-friendly product”)], and (c) fair trade. This research combines agronomic, ecological, ethnobotanical, sociological and socio-political approaches.



Beyond protected areas, new territorial strategies

The implementation of protected areas is no longer seen as the main tool for biodiversity protection. Conservation programmes now involve participatory development activities at the periphery of protected areas as a way of improving efficiency. Such an evolution has called for the design of new methodologies for protected areas management, raised new questions in terms of governance and territory engineering, and pointed out the interactions between protected areas and “ordinary” agricultural areas.

More generally, connectivity tends to become a leading international trend in biodiversity conservation, and concepts such as corridors, networks or trans-boundary parks are revisited. New investigations on the relevancy, limits and challenges of such approaches attempt to analyze the relationships between biological, social and political connectivity.

Beyond forest timber logging or forest biodiversity conservation: sustainable management of forest ecosystem

How to reconcile the protection of forest ecosystems (such as carbon sequestration and biodiversity conservation) and their social and economic roles (logging activities for fuel wood or timber production)? Segregation (“production forests” versus “protection forests”) was considered as the best alternative. In partnership with national and international research organisations, scientists have shown that the management of forest concessions reconciles both biodiversity conservation AND socioeconomic functions. This new concept for the sustainable development of forest ecosystems is now applied in the different countries of the Congo Basin for tropical natural and “domestic” forests.

Beyond ex-situ conservation, new conservation strategies

Research on the emergence, evolution and dynamic conservation of genetic resources also contributes to sustainable development through interdisciplinary studies on the relationships between the social networks and genetic diversity of cultivated plants. For example, the management of grassroots seed density can maintain and promote genetic diversity. This suggests that there may be alternatives to the present seed management and distribution system that is increasingly centralised and revolves around: (1) research programmes to create high-yielding varieties; and (2) collecting and storing germplasms in genebanks for multiplication and distribution to farmers.

Access to and exchange of biodiversity resources: legal, market and geo-political strategies

A major challenge for biodiversity management, regarding both the international debate and local experiences, is to reach an agreement on the “systems” of property, valorisation and protection of the various elements of biodiversity. This is essential to solve issues raised by the development of “new markets for biodiversity products” by biotechnology, cosmetic or food industries. Montpellier researchers pay particular attention to the definition of access, exchange and use rights, to how these markets are developing, and to the financial, juridical and institutional arrangements that are implemented. The role of influence groups and ideologies is of central importance to understand the emergence of global thinking and the way it will impact the sustainable use of biodiversity (conservation + valorisation + fair share of the trade benefits).

(> *Sustainable development and biodiversity . 2 - Inserts*)

Negotiations and mediation

Research addresses the need for renewed territorial and governance arrangements that make it possible to reconcile environmental protection and socio-economic development through an improved co-ordination between multiple stakeholders, especially in case of controversies, divergences and conflicts. At the local level, integrating companion modelling and multi-agent systems can facilitate the adaptive learning processes to result in a decentralized collective management strategy that meets the balanced needs of all parties. Models are thus powerful tools for studying and understanding systems-of-interest, for communicating and providing a base for discussion or negotiation (see inserts). At the global level, research analyses how new governance tools may improve biodiversity conservation. It focuses on how private standards and certification systems can play a role to complement traditional collective action, like intergovernmental negotiation on forests. Regarding access and benefit sharing issues, new instruments in emerging countries like Brazil are preventing potential conflicts between technological innovation and biodiversity protection. Such tools have a significant influence on the construction of biodiversity international regimes. Research also addresses the new possibilities to finance biodiversity conservation through the payment for ecosystem services.

3. Training

University Training: “Ethnoscience and environment”, in the BGAE master and SIBAGHE doctoral school, Um2.

Professional training: Man and Biosphere Reserves (MAB): Green: Multi agent systems and role playing games: Green

4. Conclusion and perspectives

To address the links between biodiversity and sustainable development, research groups acknowledge the complexity and the diversity of the interactions between society and environment. Both academic and applied research are mobilised, the latter within a decision support perspective based on prospective and constructive posture and methods.

In line with international concerns, debates and arrangements, the research agenda has rapidly evolved. Human and social sciences have played an important role within this process. However, interdisciplinarity is considered necessary to address the interactions between social and ecological dynamics and to support decision making processes.

Many groups from different institutions are involved. Most of them show interest in tropical problematics. This makes it possible to conduct international comparisons. The diversity of the situation also opens opportunities for global studies and assessments and for a better understanding of local/global interactions. This generally contributes to the formulation of controversies and to the design of global thinking regarding the management of environmental public goods.



Some publications

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