4 Proposing biodiversity management alternatives

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Biodiversity: a chance for the forest and its landscapes

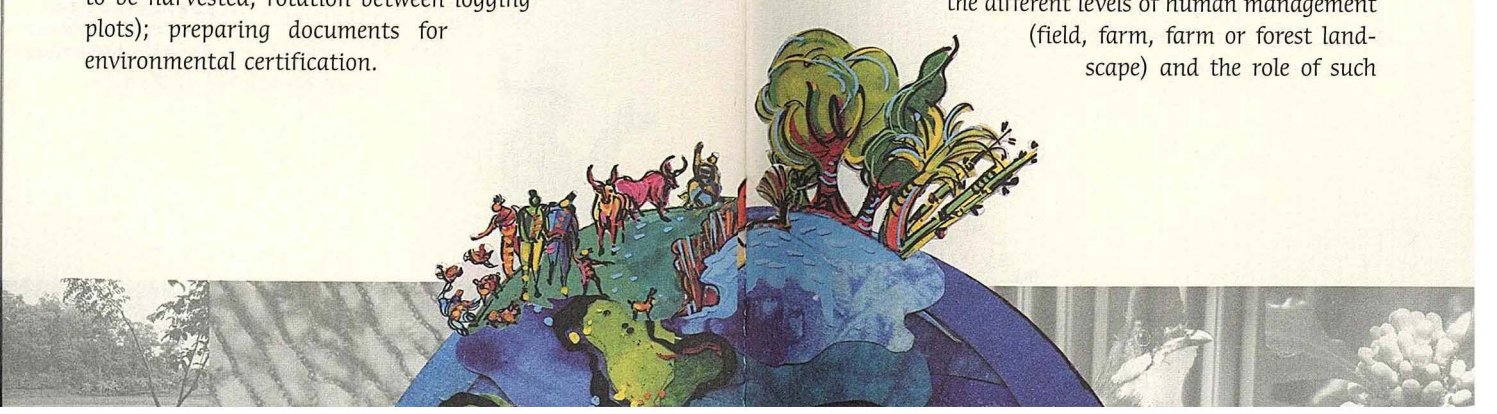
Forest is a complex mosaic, both in ecological terms and in terms of its many stakeholders, whose interests sometimes conflict and who include individuals, communities, villages and local associations, farmers, fishermen, hunters and gatherers, national and international NGOs, the timber industry, local authorities, local elected officials, the State, research, managers of protected areas, etc.

Each stakeholder group has its own rationale. For example, traditional hunting grounds or gathering territories are unrelated to the boundaries of forest concessions or municipalities. To achieve equitable and sustainable planning for tropical forest ecosystems, it is recommended to act at every level, in consultation with all stakeholder groups. In central Africa, in less than ten years this work has resulted in a mandatory procedure for sustainable management of forest concessions in Congo, the Democratic Republic of Congo, Cameroon, Gabon and Equatorial Guinea. Through these plans, management of forest biodiversity in the Congo basin is no longer restricted to the protected areas but also covers logging concession areas.

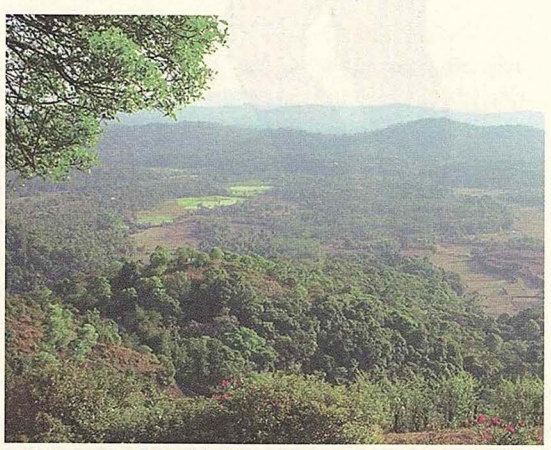
The management plan provides for systematic scientific inventorying of the forest, including plant and animal biodiversity; controlling the damage done to the forest and introducing measures to protect biodiversity (conserving fragile areas, combating illegal hunting, low-impact forestry methods); ensuring better forest regeneration after logging (controlling felling diameter, planning the species and volumes to be harvested, rotation between logging plots); preparing documents for environmental certification.

The forest concessions, which cover 40% to 60% of Central Africa's land area (protected areas rarely cover more than 10%) are now major players for conserving biodiversity. They also help to maintain other forest services such as maintenance of wildlife habitats, stabilisation of watersheds and the water regime of rivers, as well as the maintenance of the social role of the forest (sacred forests).

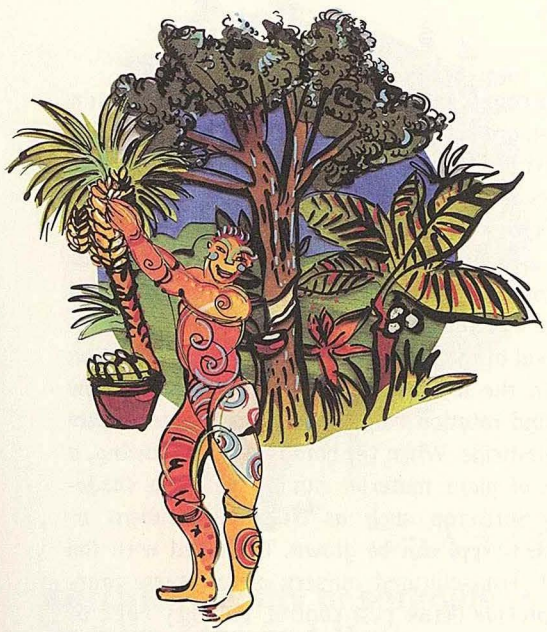
CIRAD and its partners are also working on a "landscape" approach to conservation and sustainable use of biological diversity in tropical forests, reconciling the biophysical and social dimensions of landscape. This approach is intended to take account of the different levels of human management (field, farm, farm or forest landscape) and the role of such



management in ecological processes that have their own levels of organisation. There is no ideal scale for studying interactions between the landscape and its stakeholders; a multi-scale approach is needed. This means deploying and integrating numerous disciplines and tools including the biological sciences (landscape ecology, ecosystem ecology), ethnosciences (anthropology, economics of natural resources, ethnobotany, human geography, sociology), remote sensing, information systems, spatial analysis, modelling.



• *Raja's Seat in Madikeri, Kodagu district, Karnataka, India is a complex landscape combining rice fields, dense forest and agroforest. A model of biodiversity management.*



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Reintroducing biological diversity in monocrop banana plantations of the French Antilles

In the French Antilles as in many other countries, bananas for export are grown in single-variety plantations under heavy pressure from three pests: Mycosphaerella musicola, a fungus that causes Sigatoka disease, Radopholus similis, a nematode that causes root and bulb necrosis, and Cosmopolites sordidus, a boring insect whose larvae do serious damage to the bulbs. Large quantities of pesticides are used on banana plantations, some of them highly persistent, with the result that soils and water are heavily polluted.

Solutions are needed to make banana growing both economically viable and ecologically acceptable. CIRAD and its partners in the French Antilles are working to reintroduce more biological diversity in these monocrop systems, as a credible alternative to large-scale use of pesticides. The many interactions between cultivated plant, pests and the components of the environment play a decisive role in the functioning and resilience of these agro-ecosystems.