

Achievements In addition to numerous original papers in peer-reviewed journals our results are summarized in two books and a booklet:

- Gradients in a tropical mountain ecosystem (2008). Ecological Studies, Vol 198, 525 pp, Springer, Berlin, Heidelberg
- Provisional checklist of flora and fauna of the San Francisco valley and its surroundings (2008). Ecotropical Monographs 4, 256 pp, Soc. for Tropical Ecology, Bonn
- The mountain rainforest: Scientific discoveries in a highly diverse ecosystem in southern Ecuador (2008). 64 pp, NCI, Loja, Ecuador.

Researchers are collecting caterpillars, burying litter bags for nutrient experiments, discussing results and extracting soil samples.



A major political achievement was the establishment of the UNESCO Biosphere Reserve *Podocarpus - El Condor*, which was jointly pursued by the local and national authorities, the local universities, NGOs, and our research unit.

Capacity Building The endeavours of capacity building in the scope of our research focus on:

- Education and training of scientists of all levels
- Improvement of the scientific infrastructure of the institutions
- Joint organisation of conferences
- Promotion of university staff
- Participation in local efforts in environmental education.

Students and staff are involved in scientific projects.



Partners We co-operate with several Ecuadorian Universities, mainly the Universities in Loja and Cuenca, the foundation Naturaleza y Cultura Internacional (NCI, Loja and San Diego), and the European Distributed Institute of Taxonomy (EDIT).



Funding

DFG the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG, Bonn). www.dfg.de

NATURALEZA & CULTURA INTERNACIONAL Naturaleza y Cultura Internacional (NCI, Loja and San Diego). www.natureandculture.org



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Information Details about our research, facilities, people and publications, as well as our newsletter are provided on our website:

www.TropicalMountainForest.org

Deutsche Forschungsgemeinschaft



Research Unit Tropical Mountain Forest (TMF)



Biodiversity & Sustainable Management of a Megadiverse Mountain Ecosystem in South Ecuador





Landslides and breakdown of old trees increase the natural dynamics of the mountain forest ecosystem. Both create new ground for pioneering plants which later on are successively replaced by shrubs, bushes and trees. This process contributes to the conservation of its biological diversity and in turn to the stability of the ecosystem.

About We are a multidisciplinary research consortium working in about 25 projects on biodiversity and ecosystem functioning, ecosystem services and management. Since 1997 we study one of the hottest hotspots in the world: the megadiverse tropical mountain forest in South Ecuador.

The *Reserva Biologica* also harbors a wealth of insects and vertebrates.



Objectives The main goal of our research is to elaborate science-directed land use options that preserve biodiversity, ecosystem functioning and services, that rehabilitate attenuated diversity and lost usability, and thus serve a better livelihood for the people.

The pastures on the mountains seem to thrive. In reality, however, they represent a non-sustainable form of land use: A fern-dominated vegetation (dun colour) encroaches the slopes and due to the frequent use of fire as agricultural measure destroys the pastures.



Approach We investigate how biodiversity influences ecosystem services by directly comparing the natural forest with its anthropogenic replacement systems: Pastures and abandoned pastures. The ecosystems stretch out over the slopes of the *Rio San Francisco* valley at similar elevations. The studies include small-scale experiments that have been permitted by local people and authorities.

Models will be generated to describe functional traits of the ecosystems. Scenarios will be used to predict possible reactions to environmental changes such as global warming.

Studies of the socio-economic situation of the population combined with the ecological results will enable us to elaborate a sustainable land use and management portfolio. The portfolio will also include experimentally tested measures for restoration of indigenous forests or rehabilitated pastures on abandoned areas.

Location The central study site is the valley of the *Rio San Francisco* between the Ecuadorian provincial capitals Loja and Zamora. Its altitudes extend from about 1000 to 3200 meters a.s.l.. The core area, the *Reserva Biologica San Francisco*, comprises eleven square kilometers and the research station *Estación Científica San Francisco*.

The research station offers 35 working and sleeping places, lab and IT facilities, and rooms for courses and conventions.



Data We already stored more than 19 million data sets of scientific results in a central data warehouse which also serves administration of the entire venture and communication among the scientists.