



Species-rich tropical montane rainforest in the southern Ecuadorian Andes. The lower montane forests resemble the structurally rich lowland forests.

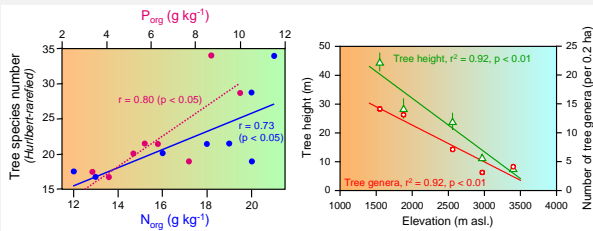
Spectacular species in tropical rainforests: (1) Quetzal (Sulawesi), (2) longhorn beetle (Sulawesi), (3) Quetzal trogon bird (Costa Rica).

Tropical moist forests in East Africa are the natural habitats of coffee that grows in the understorey (Bale Mountains, Ethiopia).

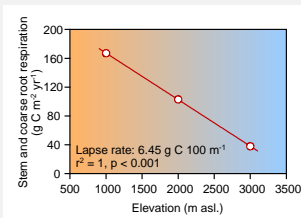
## Background

Tropical forests have fascinated many scientists for a long time because of their particular richness of plant and animal species and their complex structure. At most tropical regions, the natural forests cover is dramatically reduced by gross timber extraction and conversion into agricultural land. Accordingly, there is a strong need for research on the meaning of biodiversity for ecological functioning in tropical forests, but also on the effects of land use intensification on ecosystem processes in tropical countries.

## Research

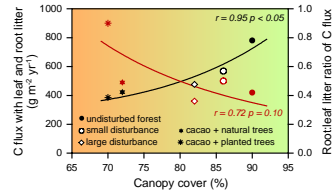


Tree species diversity in tropical montane forests is found to coincide with nutrient stocks in the soil (Ecuador, left). Other parameters, however, such as elevation not only affect tree height but also the diversity of tree genera (Bale Mts, Ethiopia).

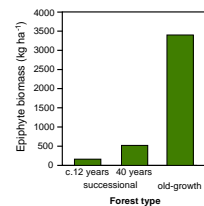
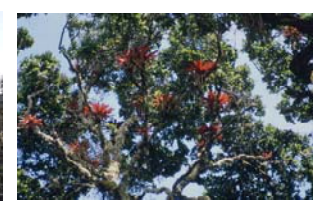


The 'Estación Científica de San Francisco' in the south-ecuadorian Andes is an excellent facility for studies on the ecology of tropical mountain forests.

Respiratory activity of tree organs in tropical forests is tightly related to the elevational decrease of the air temperature (South Ecuador).



Secondary vegetation and agricultural systems frequently replace natural tropical forest (e.g. Central Sulawesi, Indonesia). Important ecosystem functions e.g. carbon flux via leaf and root litter to the soil are altered via forest conversion (above). Hence, knowledge about ecological attributes of successional tree species is important (left).



Disturbance of old-growth forests in tropical mountains has not only major implications for the forest structure and related carbon stocks, but also for the abundance of vascular epiphytes such as bromelias (Costa Rica).

Major projects: "Nutrient limitation in tropical mountain forests" - DFG Research Unit 816 "A Mountain Ecosystem in South Ecuador"  
 "Stability of Rainforest margins in Indoensia STORMA" - former DFG Collaborative Research Centre 552

## Key results

- Despite increasing efforts in the past years, ecologists are still at the beginning of an enhanced understanding of the relationship between biodiversity and ecosystem functioning in tropical forests.
- Tropical montane forests appear in many ecological functions to be in particular sensitive to differences in nutrient availability.
- Forest use intensity and forest conversion into agricultural systems have major implications for not only for plant and animal species composition, but also for important ecosystem functions (such as the carbon cycle).