

Joint research for a sustainable development of the Mata Atlântica

It is against this backdrop that the Brazilian and German Ministries of Research launched the joint research program entitled „Science and Technology for the Mata Atlântica“.

The program is developing strategies for conserving what remains of the Mata Atlântica. Interdisciplinary research in the natural and social sciences provides the basis for a sustainable use of the coastal forest, not only for preservation purposes, but also to improve the quality of life for the human inhabitants.

It is crucial to understand the consequences of the fragmentation – or break-up – of the coastal forest into disconnected patches and the necessary conditions that must be fulfilled if the forest is to have a chance of regenerating itself.

At the same time, researchers are investigating how the needs of people can be integrated into the conservation concept on a sustainable basis. In this way, it is intended that the program should contribute to the balanced ecological, social and cultural development of the Mata Atlântica region.

The joint research program offers scientists from Brazil and Germany the opportunity to work together and complement each other's expertise (and know-how). On this basis, a stable partnership between Brazilian and German institutions is created.



Mata Atlântica



Contact for Mata Atlântica

Dr. Lothar Quintern
Phone: ++49 228 8199620
E-Mail: lothar.quintern@dlr.de

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Projektträger des BMBF
Godesberger Allee 119
D-53175 Bonn
Germany
Phone: ++49 228 8199611
Fax: ++49 228 8199640
E-mail: umweltsystemforschung@dlr.de
Internet: www.pt-dlr.de

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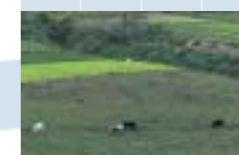
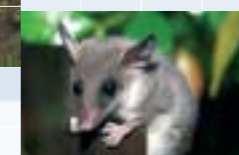
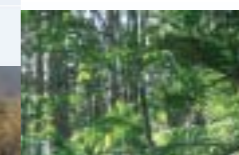
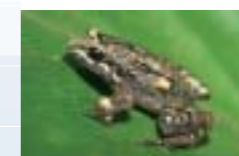
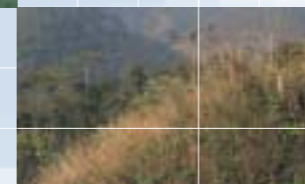
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Mata Atlântica

Brazilian-German Research into Conservation and Use of the Mata Atlântica



The Mata Atlântica

The „Mata Atlântica“ region is located on Brazil's eastern coast. It is characterized by a rainforest vegetation that rises up from sea-level to an altitude of more than 2000 meters. This forest provides a habitat for a biological diversity matched by only very few other locations in the world. Of the 202 endangered animal species included in the Brazilian „Red List“, 171 are found in the Mata Atlântica. The rainforest is also home to more than 8000 plant species that do not grow anywhere else in the world.

But the highly accessible coastal terrain also has attracted man to this region. The high population density and intensive agricultural use of the land have now destroyed over 90 percent of this roughly 4000 kilometer-long habitat. A mere patchwork of isolated areas, in total about 50,000 km², is all that remains of what used to be a continuous rainforest covering more than one million km². Two-thirds about Brazil's population, of 120 million people, live in this strip of land on the Atlantic coast. Nonetheless, the Mata Atlântica still continues to provide a livelihood for almost 70 percent of the people living there.

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THE MATA ATLÂNTICA PROGRAM CONSISTS OF FIVE COOPERATION PROJECTS:

1. Rainforest fragmentation, conservation of nature, and needs of people

On the Atlantic plateau of São Paulo, researchers are investigating how the fragmentation of the Mata Atlântica affects the biological diversity. To this end, selected species of small mammals, birds, amphibians and reptiles as well as soil organisms are recorded and classified. The data is then correlated to size, location and quality of the remaining forest areas. Based on these data, models are developed, which are able to predict how the forest as well as the animal and plant species under investigation will continue to develop in the future.

This natural science-based research is complemented by sociological analyses describing how people's lives are closely interwoven with the land they live on and in what way they make use of the forest. The latter investigations aim to reveal the extent to which people in the Mata Atlântica depend on the forest for subsistence and how they might be affected by possible nature conservation measures.

Overall, the project will provide the foundation to effectively develop strategies for the preservation of the biological diversity including (for example) the creation of a network of nature conservation areas. As is well known, however, such a plan can only succeed if the interests of the inhabitants are taken into account from the onset.

Contact: Jean Paul Metzger / jpm@ib.usp.br
Klaus Henle / klaus.henle@ufz.de

2. Regeneration of the Atlantic rainforest fragments

In the State of Pernambuco in north-eastern Brazil, the focus primarily lies on whether the forest fragments of the Mata Atlântica and their biological diversity will be able to survive in the long term despite their isolated location.

To this end, all fragments within an area of 300 km² are mapped. For every forest fragment two sampling areas, each covering more than 200 hectares, are selected and investigated in great detail.

The following issues will be addressed:

- Is the species composition in the sampling areas markedly influenced by buffer zones?
- What are the implications of the current intensive use of the vegetation as a resource?
- How are the most common tree species affected by the fragmentation: which animals pollinate the blossoms? Which germ buds grow in which areas and how many of them survive?

Information on the conditions under which a forest patch is able to recover and insights into whether the original diversity of species is restored are important prerequisites for successful nature conservation and systematic regional planning.

Contact: Maria Jesus Mogueira Rodal / rodal@truenet.com.br
Gerhard Gottsberger / gerhard.gottsberger@biologie.uni-ulm.de

3. Forest and land use in the Mata Atlântica

How do the various types of forest and land use in the Mata Atlântica affect biological diversity? This is the question under examination by researchers participating in this project. Specific forest fragments from the mountain forest of the Mata Atlântica right down to the coast are investigated regarding the composition of the respective plant communities and the ecological and economic consequences of e.g. pastures, fruit and vegetable crops or tourism, bordering directly on the forest edges.

In these particularly critical border zones, the demands placed on regional development are intensive and partially conflicting. The use of these border zones must ensure that conservation of the forested areas is guaranteed, while at the same time people can still make a living. Thus, for example, protective corridors are envisaged, that will enable endangered animal species to move from one forest fragment to the next. The research findings are intended to support regional planners as they strive to maintain this difficult balance between conservation and use.

Contact: Dalva Maria da Silva Matos / matos@ism.com.br
Hartmut Gaese / bg100@mail.dvz.fh-koeln.de

4. Fertile soils – a prerequisite for healthy forest growth

The quality of the soils is crucially important for the resilience of an ecosystem. It is for this reason that soil scientists and soil zoologists in the southern Mata Atlântica are examining the condition of the soils and the diversity of soil organisms – ranging from bacteria and fungi to earthworms, ants, beetles and spiders. Indicators of the condition of the soils include species

composition and quantity of soil organisms. The comparison between forest areas of various ages on different soil types is intended to pinpoint the factors that determine the occurrence and diversity of vital soil organisms. These analyses illustrate the effects of human impacts on the community of soil organisms and suggest the measures that need to be undertaken in order to promote healthy forest growth.

Contact: Renato Marques / rques@agrarias.ufpr.br
Hubert Höfer / hubert.hoefer@smnk.de

5. Interaction between plants and animals in the Mata Atlântica

The canopies of tropical rainforests are typically home to an extraordinary abundance of plants and animals. This diversity of species is possible, because the various plants and animals interact in multiple ways.

The project examines the symbiosis between small animal organisms and bromeliads. These plants offer food, protection and a habitat between their leaves for numerous organisms such as dragonfly larvae, beetles, isopods, myriapods and spiders. Their blossoms are visited, inter alia, by bees, butterflies and hummingbirds.

Based on this example of symbiosis, scientists may be able to understand more thoroughly, how the complicated interactions between the numerous animal and plant species of a tropical rainforest function. This insight will help them assess the effects of human intrusions into the remains of the Brazilian coastal rainforest.

Contact: Carlos Brisola Marcondes / cbrisola@mbox1.ufsc.br
Anne Zillikens / Anne.zillikens@uni-tuebingen.de

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