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**Development of a Conceptual Model for the Dinario Project, Rio de  
Janeiro, Brazil**

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**Abstract**

The complexity of interactions between numerous environmental and socioeconomic systems in the globalised world requires a deeper understanding of the related systems. Global problems, such as climate change, land degradation, energy crisis or poverty cannot be solved without an understanding of system behaviour and structure. For various broad-scale systems, models have been developed. Well known are climate models which are used to generate projections of future climate. For use on regional scales, climate models are downscaled. In addition to climate models, numerous other models have been developed, related to specific topics, such as regional economic models, hydrology models, erosion models, or traffic models. Common aim to all models is the optimisation of systems or the solution of certain problems, respectively.

In the hinterland of Rio de Janeiro, many problems, such as biodiversity loss, water pollution, and soil degradation are related to land use intensification processes which are in turn linked to population and economic growth. Against the background of biodiversity conservation in the Atlantic forest, the BMBF project BLUMEN (2002–2005) focused on system stability in the agricultural landscape in the mountain region of the Serra dos Órgãos, which still contains a high proportion of small forest fragments. Based on BLUMEN, the current BMBF project DINARIO - Climate Change, Landscape Dynamics, Land Use and Natural Resources in the Atlantic Forest of Rio de Janeiro - integrates lowland landscapes into the research. Furthermore, the development of sustainable land use strategies will be supported by a deeper analysis of water and soil systems.

Here we show the conceptual model for the DINARIO project developed by ITT M.Sc. students and their supervisors. It is based on a problem analysis via literature research in the fields of biodiversity, water availability, water quality, soils and geomorphology, climate change, agricultural structure analysis, agronomy and socioeconomics. Methods of information exchange, definition of system boundaries, identification of key parameters, analysis of relations between the parameters, as well as means of evaluation are briefly described. The conceptual model can be used as a basis for numeric models and decision support systems.

**Keywords:** Atlantic forest, DINARIO, Rio de Janeiro, sustainability, system analysis

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