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Farming Systems and Regional Natural and Economic Stability Issues in the Mata Atlântica, Brazil

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Abstract

The natural environment of the Atlantic Rainforest of Brazil, the Mata Atlântica, has been exposed to competing intensive exploitation for centuries. Low natural production risks, reliable rainfall and perennial water courses as well as profound and fertile soils, have favoured the establishment of intensive land use systems. Intensities and extension of land use have resulted in negative external effects, such as effecting water resources quality and reliability, and reducing the natural system stability within the remaining fragments of the forest systems.

The approach of a cluster research project in the south-eastern region of the Mata Atlântica has identified the following major issues in regional development:

- How to preserve forest areas and biodiversity considering spatial aspects of natural functionality for the totality of the economic and natural systems?
- Preservation strategies in this context might involve permitting controlled economic exploitation by land users.
- How to internalize external effects of agricultural land use while preserving economic sustainability of the farming system and of regional development?

An incentive system has to be established to influence farmers' behaviour. The success of such an incentive system depends very much on understanding farming systems interactions, internal interactions as well as the specifically focused interaction with the bordering forest systems. This can be achieved by assuming a farming system approach which considers the decision situation and the resource allocation problems of a farm household.

For analysing the environmental impacts of agricultural systems on natural resources such as biodiversity and ecosystem stability, water and soil, they need to be assessed on aggregate level. The challenge in optimising Mata Atlântica preservation strategies is to combine farming system analysis and biosphere analysis with integrative regional modelling techniques.

Keywords: Biodiversity, biosphere analysis, farming system analysis, incentive systems, natural preservation, regional modelling