

## CARBON SEQUESTRATION AND ECOSYSTEM SERVICES POTENTIAL IN A FRAGMENTED LANDSCAPE IN THE ATLANTIC FOREST, RIO DE JANEIRO.

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Carbon sequestration projects under the framework of Land Use, Land Use Change and Forestry (LULUCF) of the Clean Development Mechanism (CDM) could represent a valuable opportunity to protect severely endangered ecosystems and at the same time enhance the living conditions of the inhabitants of the surrounding areas. The municipality of Cachoeiras de Macacu (Rio de Janeiro State, Brazil) is located in a highly biodiverse but intensely degraded ecosystem: the Atlantic Forest. The present paper explores the potential areas for LULUCF projects through a top-down baseline approach comparing a land cover map obtained from satellite images (1985) and a land use map of 2007. In addition, semi-structured interviews and an evaluation of the institutional framework and potential stakeholders related to forest carbon projects in national, regional and municipal levels were conducted. Historically deforested areas, like the Atlantic forests, have relatively high percentage of suitable areas for LULUCF initiatives, but also a significant demand for areas for settlements and food production. In Cachoeiras de Macacu, 27% of the municipality area has potential lands for LULUCF projects. However, the lands are highly fragmented and mainly occupied by pastures lands or agricultural lands. Difficulties to measure the available areas, the costs, the lack of local communities' engagement and finally the absence of stakeholders' participation are other important concerns. The specificity of existing methodologies and demonstration of additionality represent main obstacles. Additionally, both for large-scale and for small-scale, the specificity of the existing methodologies, does extremely difficult to use them in other initiatives. Nevertheless, the existing institutional infrastructure and the megacities in the vicinity of the area make a future appliance of Payment of Environmental Services in the region possible. There is a need to develop a more holistic and integrative approach that incorporates carbon mitigation alternatives to other ecosystem services.