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“CLEANER PRODUCTION INITIATIVES AND CHALLENGES FOR A SUSTAINABLE WORLD”

## **Biodiversity Loss due to Climatic Impact of Land Use in LCA: A Case Study in Regionalization of Carbon Transfer Data in the Brazilian Atlantic Forest**

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### **Abstract**

Land use leads to different impacts on nature, so that the Life Cycle Assessment (LCA) of land use should include at least the impacts on biodiversity, biotic production and regulatory functions in the natural environment. This study focuses on the climatic effect of land use, determined by the carbon transfers between vegetation/soil and atmosphere, considering re-absorption by the earth's surface, aiming to generate usable data for assessing the loss of biodiversity. There are current methods for LCA use, which provide data for the main world biogeographic regions. But considering that carbon transfers are very specific for each microregion of the globe and even the existence of a more detailed division of biomes in each country – each of them with significant differences in species, ecological dynamics, ecological interactions and environmental conditions – a regionalization of the data for the Brazilian biomes is proposed, considering the main land uses. As an example and for validation of the data regionalization process, the study is focused on obtaining data of carbon transfers in the Atlantic Forest Biome. Therefore, initially, data on carbon stocks in soil and vegetation, for each of the strata of the Atlantic Forest Biome, were collected and tabulated. Then, calculation procedures were performed, considering not only the amount transferred, but also the permanence of carbon in the atmosphere, to finally determine values for the carbon transfer to the air due to implantation of pastures in the different strata, expressed as fossil-combustion-equivalent tons of carbon. The case study allowed the conclusion that the regional data are quite different from the generic data previously found for rainforests. Furthermore, differences were found between the values of carbon transfer to the various strata that make up the same biome - the Atlantic Forest. Thus is reinforced the need to regionalize the data on carbon transfer in order to make them more realistic and reliable.

**Keywords:** *Life Cycle Assessment (LCA). Carbon Transfers due to Land Use. Biodiversity Loss.*

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