

Remediation of lands degraded by bauxite mining in the state of Goiás, Brazil – Adaptation to the climate changes by improving biodiversity

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ABSTRACT

Since 2009 the Brazilian government has created several programs to guide actions to achieve the goals of greenhouse gases emission reduction stated by the government during 15^a Conferences of United Nations on the Climate (COP 15) held in Copenhagen. The federal government program in the State of Goiás predicts the remediation of degraded areas in which the goal is to remediate 15 million hectares by using many strategies, among them the agroforestry systems applied to the mining sector. Seeking to address this problem, the goal of this study was to better understand the adaptation of plants to the climatic changes in areas degraded by bauxite mining. The study was conducted in the municipality of Barro Alto, State of Goiás, and was carried out in plastic vases by using the Cerrado Biome native species *Triplaris brasiliana*, *Anadenanthera macrocarpa* and *Tabebuia impetiginosa*, respectively as pioneer, secondary and climácea species. The tested treatments were defined from the combination of cattle manure, sugar cane bagasse, clayie bauxite mining waste, and fertilizer formularization 4-14-8. The height and the diameter of the plants were measured monthly during 150 days. All treatments, except the one with no fertilizer applied, showed suitable chemical characteristics for the development of plants. The highest height for the pioneer and secondary species, respectively 117.40cm and 116,37cm, was found at the end of the experiment for the soil amended with a mixing of cattle manure, sugar cane bagasse, and fertilizer. For the climácea species the highest height (27,60cm) was found at the second measurement. The excess of cattle manure inhibited the growth of the secondary species and this shows the sensitivity of those species to the excess of this soil amendment. In conclusion, the growth and development of the forest species in the degraded areas depends on the substrate used in the treatments. This particular study as well as the research project on this topic has been conducted under a scientific, technological, and innovation cooperation program established between Brazilian Universities, countries from the European Union, Germany and Spain, and Cuba. The exchange of experiences between these institutions and the involvement of graduation and undergraduate students have been a fruitful experience and are important actions for the development of technologies seeking Clean Development Mechanisms and Environmental Education.

Keywords: Forest Species, Soil Bioremediation, Clayie Waste