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## Climate Change and Anthropogenic Impacts on Land Use and Agriculture in the la Plata Basin, South America.

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### Abstract

La Plata Basin (LPB) is one of the biggest basins in the world, occupying 17% of South America's surface with unique regions like Pantanal, Atlantic Rainforest, Cerrado, Chaco, and Pampas. Land use in LPB is highly dynamic and of particular importance for the region and also for the world economy and food security. During the last 40 years new agricultural technologies, increase in demand of agricultural products and favourable climate conditions have caused significant land use change processes in the region, resulting in the prevalence of monocultures and cattle grazing. The major agricultural products in LPB are highly susceptible to climate change, such as: soybean, maize, cotton, sugar/alcohol (sugarcane), forests products (planted forests), meat (pastures), rice, wheat, coffee, and orange, destined mostly for exportation. The project CLARIS LPB - A Europe-South America Network for Climate Change Assessment and Impact Studies, funded by EU FP7 — aims to predict and assess the impacts of climate change, as well as to design adaptation strategies for land-use, agriculture, rural development, hydroelectricity, river transportation, water resources and ecological systems in wetlands. The project initiated in October 2008 and it will take four years. The primary objective of CLARIS LPB is to reveal insights from the complex net of impacts and interdependencies of climate variability, change and anthropogenic adaptation measures on land use, agriculture and deforestation. Interdependencies and relations between land use sectors and other sectors (hydrology, fire) will be taken into account. Future land use scenarios will be elaborated for different climate scenarios through collaboration between researcher groups. The focus is the agricultural sector, especially regarding to small scale versus large-scale farmer's issues. The vulnerability of current cropping systems of major socio-economic relevance for LPB will be analysed through simulations for different climate scenarios by using DSSAT models. Projection of cropping systems under climate change forcing scenarios, sustainability of present cropping systems and adaptation strategies will be elaborated. The costs of climate change for agricultural systems in LPB will also be estimated and the linkage to other land-use sectors will be established.

**Keywords:** Climate change adaptation strategies, climate change, climate models, La Plata Basin

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