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A multidisciplinary research approach for climate change impacts in the Brazilian semi-arid region

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The Brazilian northeast is characterized by a semi–arid climate, with highly variable precipitation distribution and high atmospheric evaporation demand. Recent IPCC climate model outcomes have strengthen previous simulations, suggesting an drier climate for the region in the future, strongly affecting the hydrological and nutrient balances. Both natural and anthropogenic related climate and environmental changes are expected to contribute to changes in regional climate, with impacts on the natural and social systems. The rural population accounts to more than 25million inhabitants and the intensification of extreme climate and events (drought spells or intense precipitation) has the potential to impact significantly the local population in the near future. For instance, the lost of agricultural potential, as indicated in future scenarios, does not reflect on clear policy strategies for adaptation. The region is challenged by scarcity of natural resources, lack of livelihood options and widespread poverty. Although an important cash transfer scheme, to this region, is in place by the Brazilian Federal Government aiming on reducing poverty rates, analysis within our research group suggest that those programs are not clearly delivering social development. The aim of this work is to present a multidisciplinary research approach in the Brazilian Northeast where, climate and surface models, remote sensing and experimental activities looking at changes in the land use, nutrient and carbon balances, emissions, agricultural production, are associate to vulnerability estimates. Environmental and social development policies are central to local people's well-being and ecosystem sustainability, thus potential adaptation policy efforts are proposed.