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Vulnerability of Rural Small-scale Producers in the Brazilian Amazon: Priorities and Research Needs for Climate Change Adaptation Planning

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Abstract

The Brazilian Amazon, 60% of the national territory, accounts for only 8% of Brazil's GDP. Still, the region's main rural economy sectors: agriculture, fisheries and extractivism contribute about EUR 12 billion annually to the national economy. According to recently published Agricultural Census data, 72% of the almost 800 thousand rural producers in the Brazilian Amazon can be considered small-scale. Research suggests that extreme weather events, such as seasonal droughts or excessive rainfall and related effects on forest fire and river flood susceptibility, are likely to occur more frequently in the Amazon as a result of climate change.

Most studies emphasize the potentially significant impacts of climate change on local livelihoods, based on macro-level assessments of exposition to climate risks. Very few studies have, however, scrutinized the other two components of vulnerability, namely sensitivity and adaptive capacity, which often depend on specific local contexts. Based on results from an ongoing research project, this paper thus attempts to provide preliminary answers to the following interrelated questions: Which factors matter most in determining small-scale producer's vulnerability in the Amazon? If action is needed, what are the priorities and major knowledge gaps for the design of effective adaptation measures? We use stochastic cost-benefit analyses and regression techniques based on field data from a case study in the Baixo Amazonas region to determine the relative importance of climate and non-climate risks in smallholder production systems. New Agricultural Census data in combination with meteorological and spatial information on human activities in the region is used to evaluate the relevance of case study findings at the regional scale. We find that smallholder vulnerability is influenced by (1) spatial and temporal variability in exposure to climate risk, (2) locally highly specific variations in sensitivity to such risks, *e.g.* the diversification of local economies and resource quality, and (3) variations in adaptive capacity due to access to supporting public services, awareness, and cultural background of the members of rural communities. Finally, we discuss the implications of our findings for national and local climate policy and development cooperation.

Keywords: Climate risk, production systems, smallholder

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