



Smallholder production & climate risk in the Baixo Amazonas, Brazil

Vanesa Rodríguez¹, Rui Pedroso¹, Hartmut Gaese¹, Jan Börner² & Christiane Ehringhaus³

(1) Cologne University of Applied Sciences, Institute for Technology and Resources Management in the Tropics and Subtropics (ITT), Germany, (2) CIAT/Amazon Initiative Consortium (CIM/GTZ), (3) CIFOR (CIM/GTZ)

Introduction

Climate models consistently predict higher incidence of extreme weather events in the Amazon region, projecting also a warmer and drier climate. Societies have always learned to cope with climatic variability. However, climate change in the 21st century brings new risks and not all groups are exposed to the same risk and therefore affected in the same way. Small-scale producers and poor communities can be especially prone to risk related impacts of climate change (economies closely related to climate-sensitive resources).

Identifying and understanding the sources of risk faced and how risk and adaptation measures impact the producer's livelihoods, permit a better management and provide tools for local policy making and international organisations to assess and design interventions that reduce vulnerability of the rural population and their economies.

Objectives

This research seeks to (1) analyse and classify representative producer's types in the study area relevant for later risk analysis, (2) to understand the perception of climatic and non-climatic risks affecting local producers output and wellbeing and (3) identify rural livelihood's exposure to climate risk and to identify their related risk coping strategies.



Methods

- Mapping & sample determination (46 interviews in 26 communities)
- Semi-structured participative interview with producer's: livelihood assessment, welfare assessment, commercialised & consumed products, relative importance of income sources, labour force, risk perception & prioritisation (climatic/non-climatic)
- Producer's categorisation (welfare & diversification indices)
- Revision of historical climatic information, trends, projections & impacts
- Focus group dynamic
- Second round of in-depth interviews with representative producers of each category



Study area

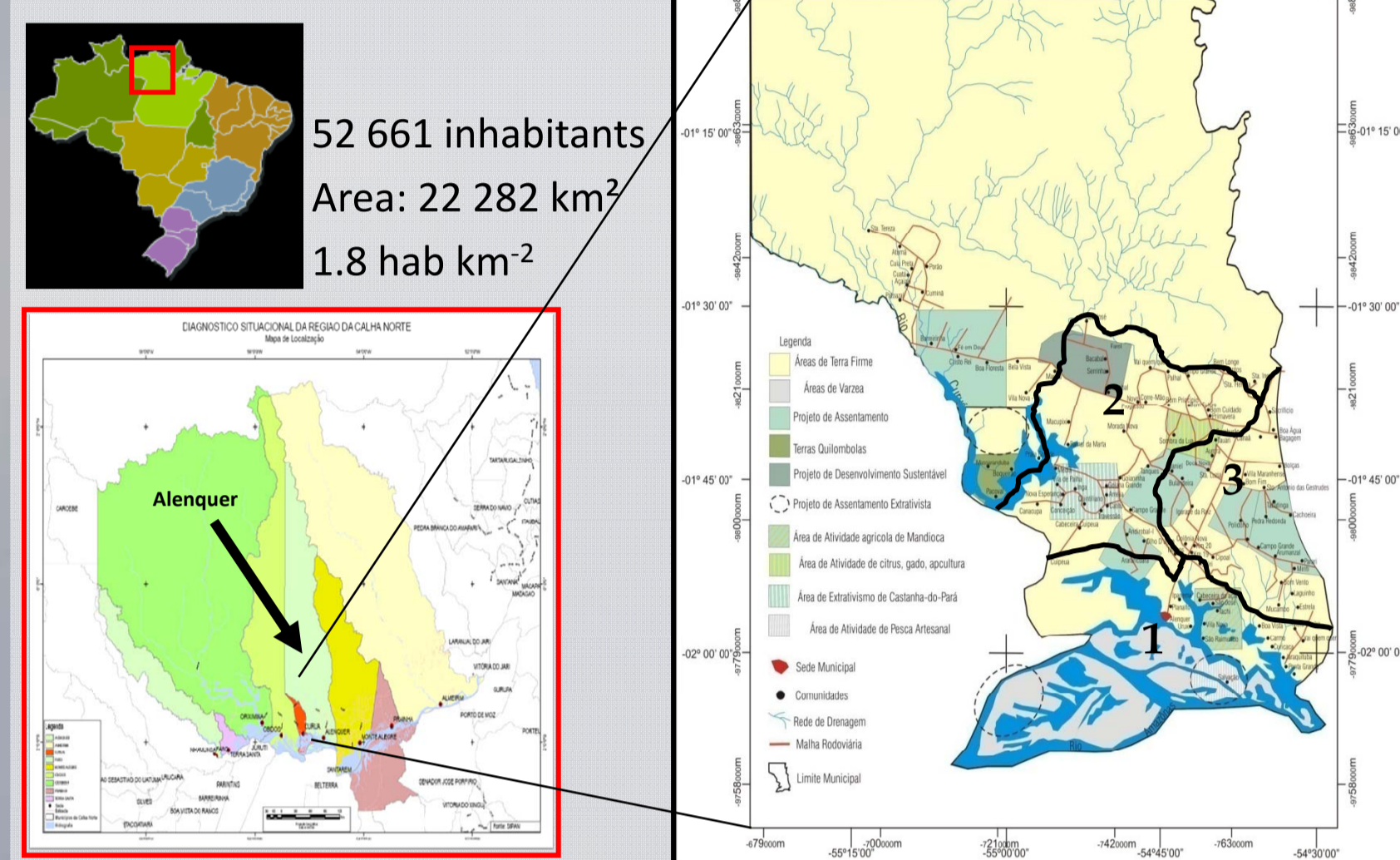


Figure 1. Study area in the Alenquer Municipality, Pará & zonification: 1) *Várzea*, 2) & 3) *Terra Firme*

The local economy is based on agriculture (cassava, beans, rice, corn mainly), non-wood forest product extraction (brazilnut & cumaru), cattle farming and fisheries.

Results

Climate change in the Amazon represents a significant threat to local producer's welfare due to their close dependency on natural resources, which are affected strongly by climatic variability. The livelihood assessment of producers in the region and the categorisation of producers types based mainly on welfare and diversity indices, indicate that less diversified (or specialised) producers of *várzea* are likely to have the lowest adaptive capacity. This fact together with their higher exposure to extreme events (especially floods) result in the highest vulnerability amongst the producer groups. The second most vulnerable group belongs also to less diversified producers with lower welfare index from *terra firme*. Risk types most frequently mentioned and ranked as more important are personal risks (diseases & accidents), followed by market and climate related risks (figure 2).

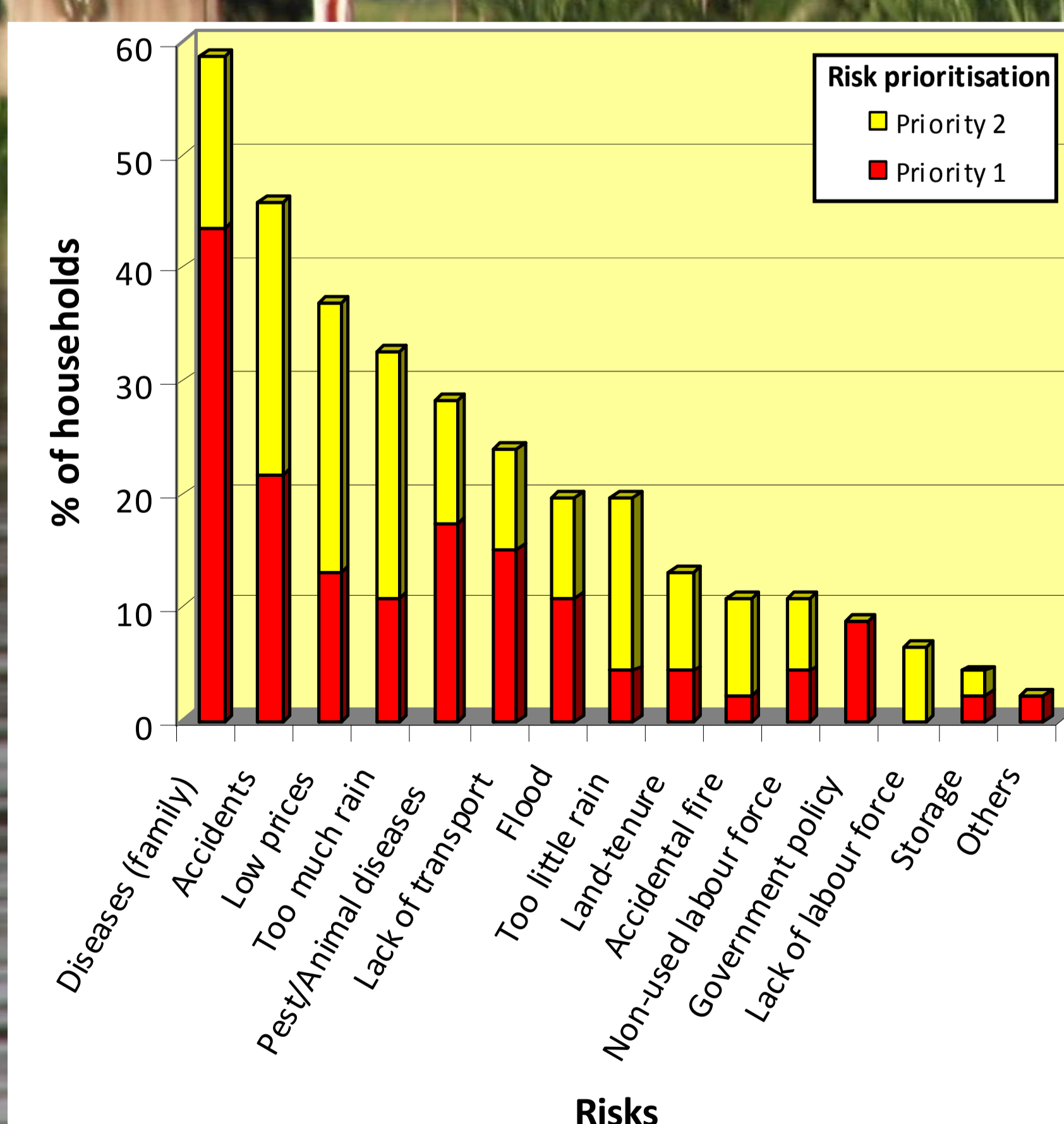


Figure 2. Perceived risks. In the study several priority levels could be assigned to the risks. The figure shows only the percentage of households that assigned priorities 1 and 2 (the most important) to the risks.

There are considerable differences among the risk types and how they affect local producers.

Agriculture: Considerable losses resulting from climatic phenomena were registered in the area. For example, the drought in 2005 or the excessive amount of precipitation in 2009 lead to losses in the order of 50 – 100% in the case of temporary crops (especially cassava, the most important product for the region).

Non-wood forest products: Personal and market risks were more important for producers dealing with these products. Currently market risks (lowest prices since 15 years for brazilnut) affect heavily the income from families depending on these activities. Long-term climatic stresses are not perceived easily & directly, due to the late reaction of forest ecosystems.

Fisheries: Climatic risks, especially floods were considered more significant for those involved in small-scale fisheries (especially for those with only few income sources)



Adaptation strategies

Several adaptation measures against the most important climate related risk (excessive rain) were identified. Associations such as Worker's or Fisher' Union function as a security social network. Other strategies included: planting in higher areas or sandy terrains, using local resistant cassava varieties, diversification of crops, work outside the households, working in other sectors, remittances (family) and experimenting with other varieties.

Conclusions

Few studies have addressed risk in Amazonian production systems and none has been found to assess risk in the way presented in this research.

Abundance of resources does not imply low vulnerability. Health & market related risks are perceived as more important than those related to climate. This is however likely to change. Climate change represents a significant threat to local producer's welfare; the most vulnerable are likely to be the lower income producer's of *várzea*. The resulting producer's classification based on welfare status and diversification considering differences between *terra firme* & *várzea* appear to contribute with valid information on local producer's livelihoods and their adaptive capacity. However, it is essential that further studies build on the generated data, in order to elicit risk profiles and thus create scenarios essential for targeted adaptation efforts.

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For further information:
vanesa.rodriguez@daad-alumni.de

