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## Under a changing climate: Livelihood strategies in rural forest-adjacent communities A socio-economic analysis from lowland Bolivia

Tina Bauer<sup>1</sup>, André Lindner<sup>1</sup>, Jürgen Pretzsch<sup>1</sup>

<sup>1</sup>Institute of International Forestry and Forest Products, Faculty of Environmental Sciences – Technische Universität Dresden

#### BACKGROUND

Agriculture, forestry activities and cattle ranching interact with climatic extreme events like floodings and droughts in tropical lowland Bolivia. The two study areas comprise of indigenous communities located in the Chiquitania, department of Santa Cruz in East Bolivia and in the TCO Tacana, in the North Bolivian Amazon. Both sites raise concerns about the effects of changing weather conditions on livelihoods of rural forest-adjacent communities.



### OBJECTIVES

This ongoing Ph.D. research is part of the International Network on Climate Change (INCA) and is expected to increase understanding on the impact of changing weather conditions on livelihood activities and forest dependency. Furthermore, the study analyzes if farmers shift from climate affected income activities to a more intense forest use. Furthermore, it will identify the role of forest products in climate change adaptation and coping strategies.

#### METHODOLOGY



Fig.1. a) TCO Tacana I . Source: http://www.bicusa.org/wp-content/uploads/2013/07/TCO-Takana-I.jpg, retrieved ary 18, 2014 b) Bolivia, political map with research sites c) community 15 de Agost

The two study sites comprise of four communities (one in the Chiquitania, three form part of the TCO Tacana I). The socio-ecological system is investigated in a holistic way, using a case study approach on household level. Participative tools such as field laboratories and 75 PEN household surveys have been conducted to gain quantitative data. A photo-elicitation method is planned for end 2014 and will show rural people's perspective.



Fig.2. Socio-ecological system. Adapted from "Enhancing Resilience in Social-Ecological Systems: A Quantifiable Framework for Adapting to Change", by Jain 2012, Governance of Adaptation Conference, Amsterdam









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PRELIMINARY FINDINGS



Fig.3. Relative amount of families which were affected by drought or flooding events in two research sites (only families pursuing respective activity were recognized in calculation). No affects were mentioned for environmental and non-farm income and thus were neglected in the graph

- Changing environmental frame conditions (irregular seasons, more frequent extreme weather events) affect agricultural calendars, crop yields, timber harvest and tend to change land-use systems
- The Chiquitanian community suffered yield losses, changed crops to more drought resistant types (like sesame) and invests now more in community-based cattle ranching projects
- In 2013, the majority of Amazonian Tacana families were unable to prepare shifting cultivation fields for subsistence income due to unusual and long-lasting rain periods
- A trend is visible towards an increased harvest of forest products in extreme years as compensation for affected income activities
- Alternative income activities and therewith climate change adaptation opportunities have been recognized in the Chiquitania as reforestation with native almond trees (Dipteryx alata Taub.) and at both research sites the keeping of stingless bees (Meliponini)



Fig.4. Wordclouds of answers in TCO Tacana I (n=50), size relative to amount of mentioned answers a) shows eather perception of changes in recent years b) shows personal consequences pointed out by local farmers

#### KEY LITERATURE

oland Bolivia. Sca Eand Surger forestEconomics14, 42, pp 500 – 524, 44, Issue 1, pp 3-23, velopment and Sustainability, volume 14, and Climatology, volume 52, pp 130-146, nid-drought philto-elicitation study in 200

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