Interdisciplinary analysis of perceived precipitation variability and temperature trends in the agricultural Cochabamba region, Bolivia

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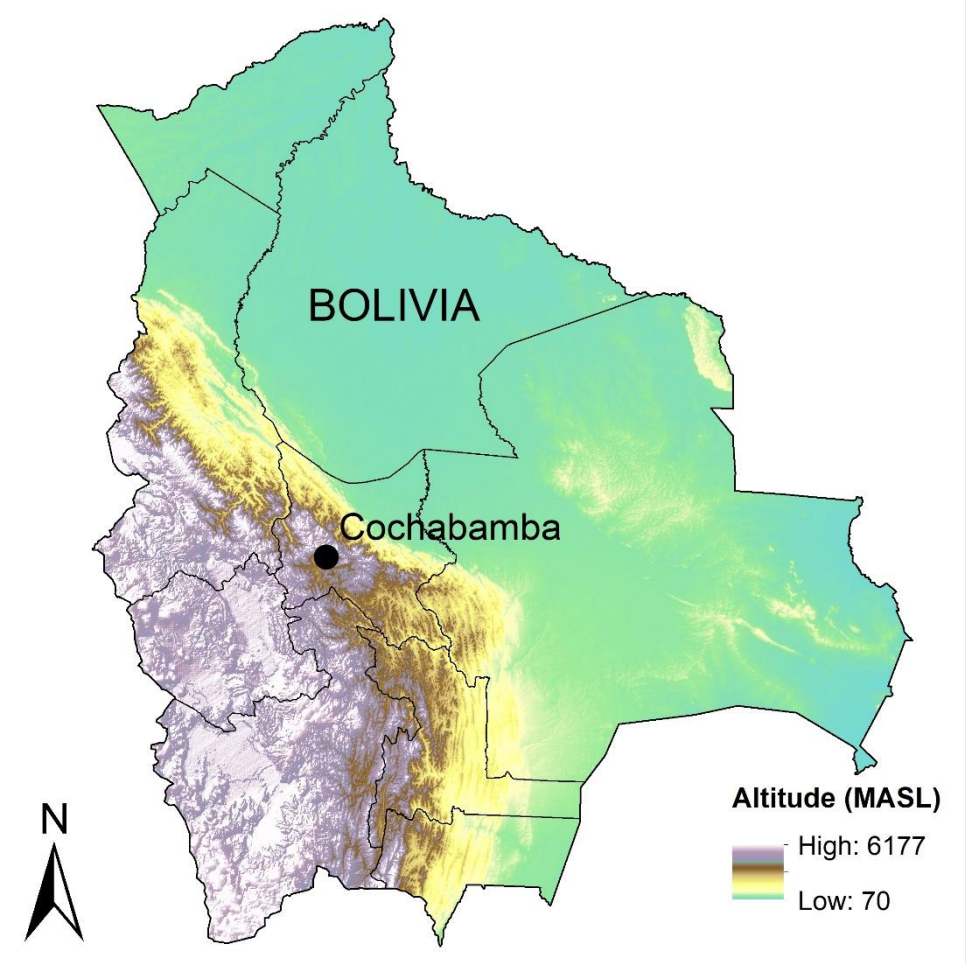
Introduction

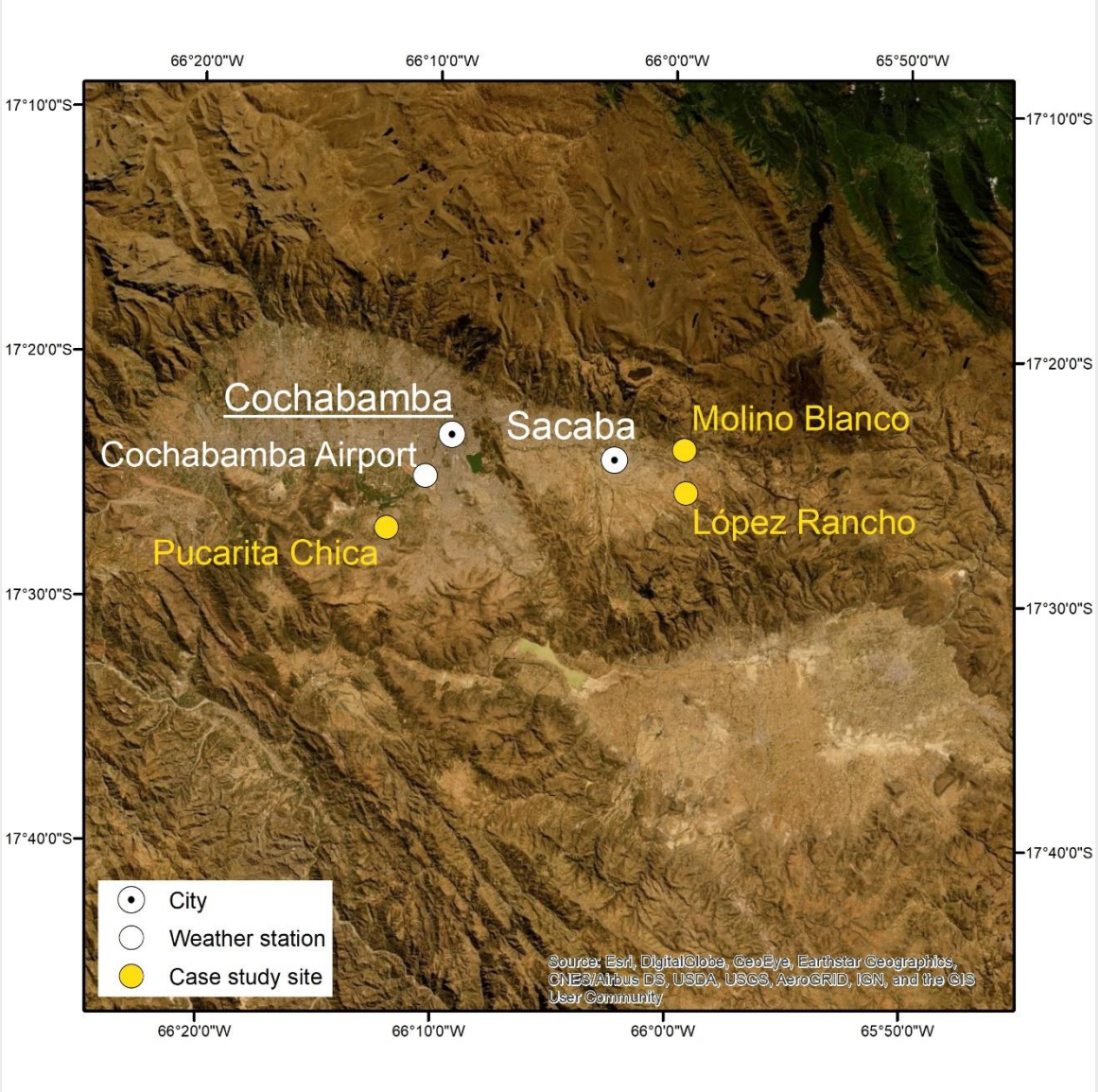
— Changing climatic conditions pose a major threat to continuity of agricultural production in the Bolivian Cochabamba region, along with the processes of rapid urbanization and soil erosion

- Located in the Tunari mountain range in the central section of the Bolivian Cordillera Oriental
- Case study sites situated at 2500-3000 MASL

— Studies comparing local knowledge with precipitation and temperature data analyses in the Andean mountain regions are scarce

Study area





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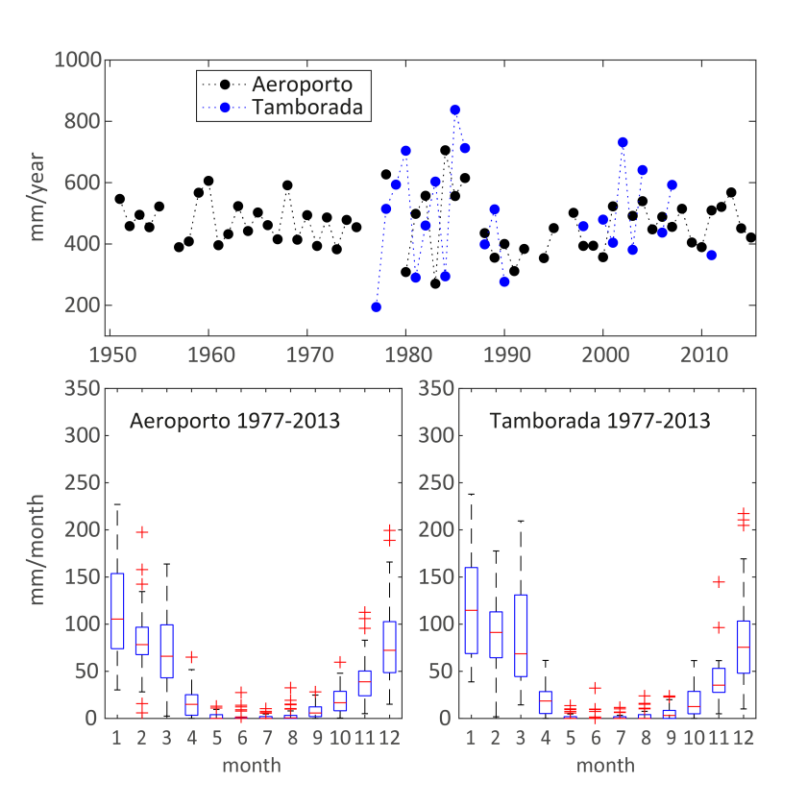
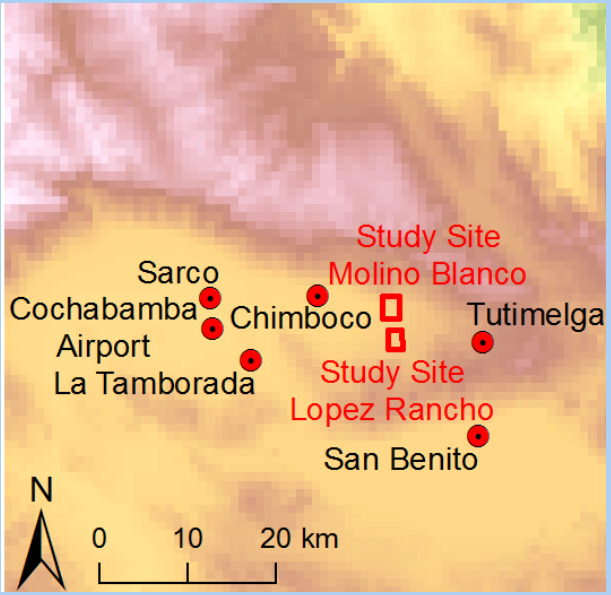
Data and methods

— Qualitative analysis of human perceptions:
- 51 semi-structured interviews with small-scale farmers
- Workshops using participatory techniques
- Fieldwork conducted in peri-urban communities located outside the cities of Cochabamba and Sacaba in 2013, 2014, and 2016

— Climatic analyses of precipitation and temperature records:
- Data from the station of Cochabamba Airport (1949 to 2016)
- Daily precipitation sums
- Trend analyses of minimum and maximum temperatures
- Relative humidity





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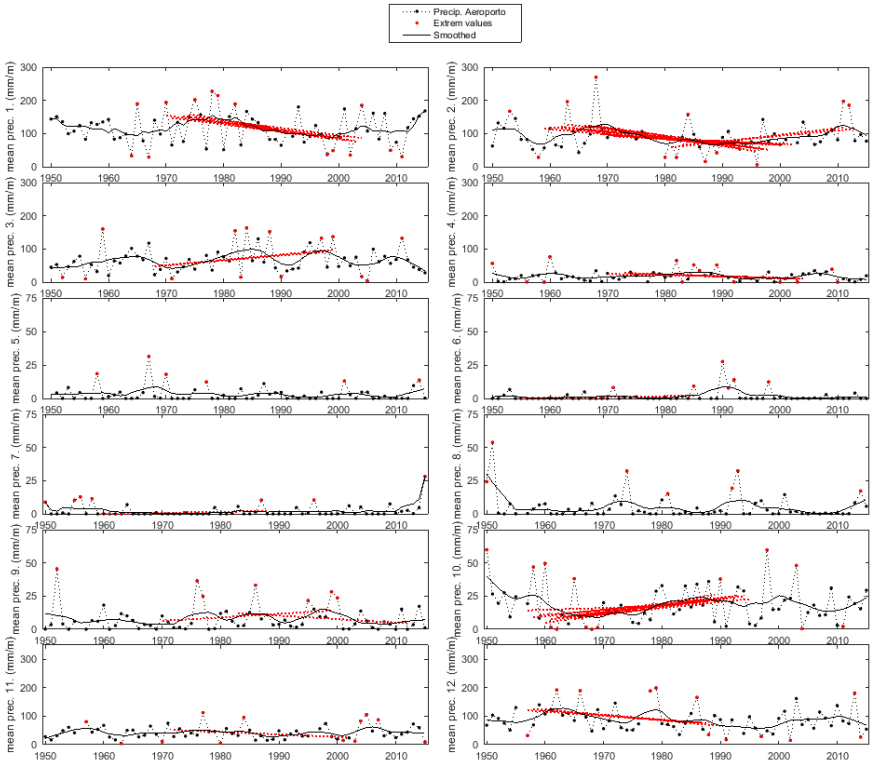
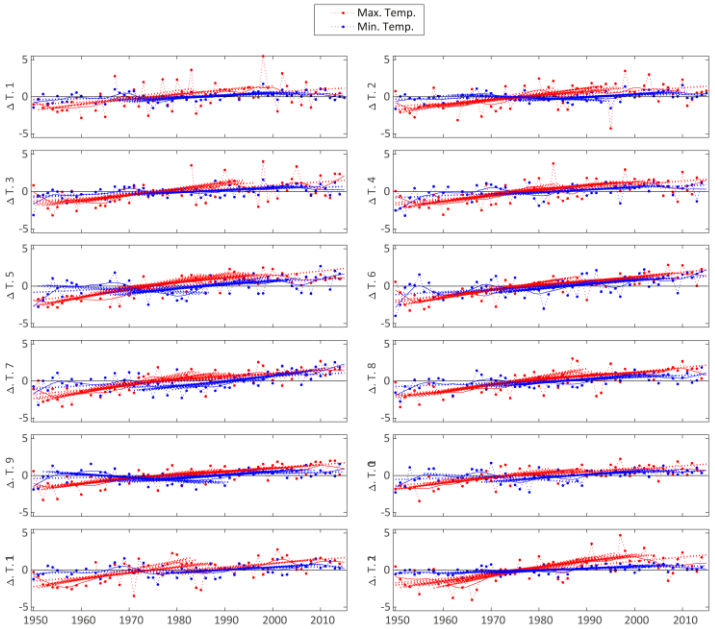
Results

- Farmers' perceptions:
  - Decreasing amount of precipitation
  - Less regular pattern of rainfalls
  - Delays in rainy season onset
  - Warmer temperatures, stronger heat during days
  - Colder temperatures at nights
- Trend analyses of climatic records:
  - Precipitation data: no significant trend on annual scales and over the entire time period
    - Some interesting patterns and significant trends for individual months and shorter time periods
  - Measured min. and max. temperatures increasing throughout the entire period and in all months





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Concluding remarks

— All climatic analyses are expected to be subject to considerable uncertainty due to changed sensors and measurement methods

— There may be potential other reasons besides climate affecting smallholder agriculture
- Environmental degradation
- Proximity of growing cities
- Increasing household involvement in transnational migration
- Decreasing plot sizes through inheritance