



## Post-doctoral position in Econometrics / Statistics

**Title:** Climate hazards modelisation in West Africa

**Keywords:** Climate change, extreme value theory

**Host Institution:** CERDI, UMR 6587 CNRS-Université Clermont Auvergne, Pôle Tertiaire, 26 avenue Léon Blum, 63000 Clermont-Ferrand.

**Funding program:** ISITE CAP 20-25

**Post-doc position starting:** 1st June 2019

**Duration of the position:** 24 months

**The project** “Climate hazards modelisation in West Africa” is a multidisciplinary project that involves mathematicians, economists and financial analysts, from three research centers of the University Clermont Auvergne: the *Centre d’Etudes et de Recherches en Développement International* (CERDI), the *Laboratoire de Mathématiques Blaise Pascal* (LMPB) and the *Clermont Recherche Management* (CleRMA).

The overall goal of the project is to make a mathematical modeling in order to better understand climate risk and improve the performance of index insurance products. In West Africa, index-based weather insurance could increase farmers' ability to adapt to extreme weather events, such as droughts and floods, which increase in frequency and intensity with climate change. However, the cost of these insurance products constitutes one of the major obstacles to their diffusion in developing countries. The high insurance premiums result in part from the difficulty for the insurer to model climate risk in a changing environment.

The calibration of these insurance products critically depends on assumptions about the distribution of the underlying climate index. The challenge for insurers is to account for all the complexity of the processes studied, including observed changes in the level of precipitations, their variability and the frequency of extreme events. Another problem facing insurers is the spatial correlation of climate risks, a phenomenon that has received little attention because considered for a long time as an insurmountable obstacle to setting up private insurance mechanisms in the agricultural sector.

To improve the performance of weather index-based insurance and favor its diffusion among African farmers, the project tackles three challenges:

1. modeling the spatio-temporal distribution of precipitations, the main support for weather index, using relevant and innovative mathematical structures;
2. analyzing the spatial distribution of risks associated with extreme events;
3. determining whether weather risk can be diversifiable at the regional level and defining a regional strategy for disaster risk management.

This work will be carried out on high spatio-temporal resolution data derived from satellite and weather station records (daily data at a spatial resolution of a few kilometers).

**Profile of the candidate:** PhD in Econometrics or Statistics with a strong background in probabilistic models and statistic methods with the use of databases under (R) and/or Matlab.

Actually, a recognized skill in R or Matlab is absolutely required.

A knowledge in climatology or in insurance will be greatly appreciated. Applicants are expected to be creative, autonomous, motivated and very enthusiastic about working in an interdisciplinary and challenging research environment.

**To apply:** Detailed CV with a summary of work and two recommendation letters, can be sent by email to Catherine Araujo-Bonjean [catherine.araujo-bonjean@uca.fr](mailto:catherine.araujo-bonjean@uca.fr)

**Salary:** Postdoc with less than 2 years' experience (~2500 € euros /month brut).