Precipitation-based parametric insurance for West Africa

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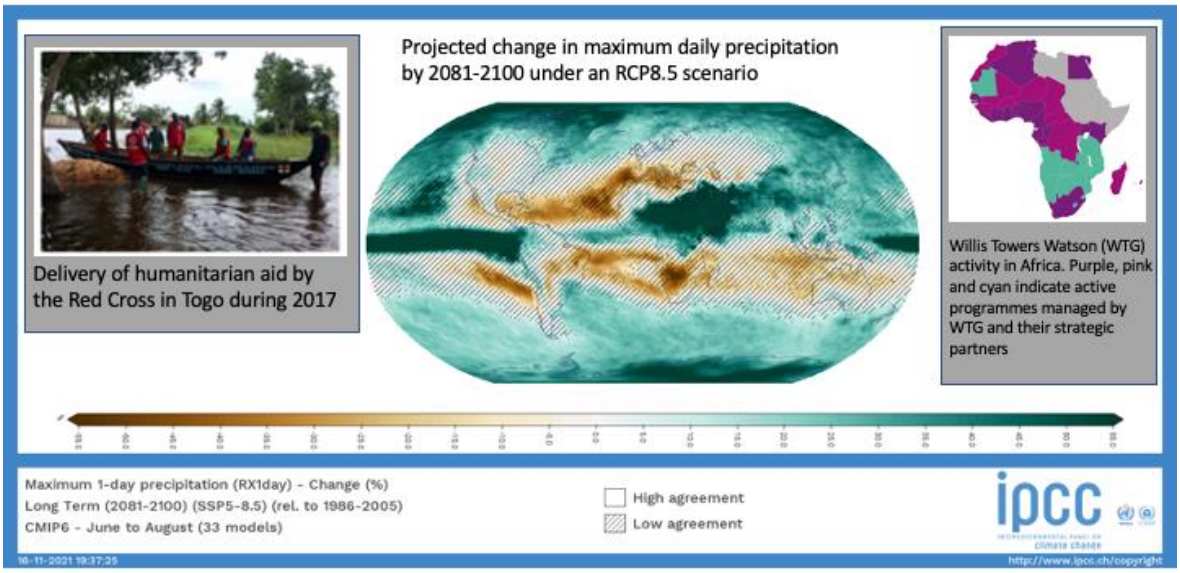
West Africa is a 'hotspot' for the impacts of climate change. Both drought and heavy rainfall threaten livelihoods and lives, and these hazards are projected to worsen over the next century. Understanding the economic risk that droughts and floods pose to the agricultural sector is important for preparation (do they need to change their agricultural system/crop mix to account for future dryness?) and for adaptation and resilience against climate change.



The financial and humanitarian sectors play a crucial role in the management of agricultural risk in Africa, but current efforts are hampered by a lack of robust models and systems. This studentship will contribute to novel models for agricultural risk management - addressing a critical societal and scientific knowledge gap. Specifically, the project aims to quantify the risk of West African precipitation extremes and drought in the context of a changing climate. The student will analyse newly available global and regional climate simulations (for example CMIP6) together with new observational datasets (for example, ERA5). A key aim will be to quantify uncertainty a range of spatial and temporal scales. We envisage a variety of end-users, including sovereign-level drought relief (African Risk Capacity), humanitarian organisations (Red Cross), individual farmers via microinsurance, and reinsurers and those interested in parametric risk transfer who might accept a coarser granularity.

The project will work in close collaboration with two CASE partners. From the humanitarian sector, the Red Cross Red Crescent Climate Centre will provide on-the-ground expertise and data from West Africa. From the financial sector, Willis Towers Watson will guide the student in the development of practical financial instruments for risk management. The proposed project will play a critical role in bringing these two sectors together for the benefit of vulnerable people in West Africa.

Training opportunities:

The project will include a range of training opportunities. The student will participate in the University of Reading's PhD student training programme and the project will be overseen by a thesis committee, who will monitor acquisition of transferrable skills and engagement with training and development. In addition, the student will have the opportunity to attend advanced summer schools, including the NCAS climate modelling summer school and to participate in specialist training on high performance computing, offered by CEDA-Jasmin. Depending on how the student's interests develop, there will be other opportunities to attend training courses and student conferences.

A unique feature of the proposed project is the opportunity to work with the financial industry and humanitarian sector and to see, at first hand, how African climate services are developed. Within the course of the project, the student will spend time at Willis Towers Watson and will meet regularly with the Willis Towers Watson CASE co-supervisors who manage the Willis Research Network. Covid situation permitting, there will be an opportunity to spend time at one of the Red Cross Climate Centres (RCCCs). The student will meet regularly with the RCCC CASE supervisor.

Student profile:

This project would suit a student with a background in physical and mathematical sciences, who also has a strong interest in climate services. Although advanced knowledge of statistics is not required, some prior experience would be beneficial. During the project, the student will be expected to develop advanced programming skills, including the capability to analyse large datasets. Full training will be provided by some background in programming would be beneficial.

Funding particulars:
Willis Towers Watson (WTW) will act as a CASE Industrial Partner and provide £1000 per annum to support the student, as well as opportunities to attend relevant financial industry events and meetings held by WTW colleagues. WTW will also explore the opportunities for a placement with an appropriate business team at WTW relevant to the project, or directly with the Willis Research Network management team to gaining access to a variety of lines of business.

Red Cross Climate Centre (RCCC) will act as a CASE Industrial Partner and provide £1000 per annum to support the student. In addition (RCCC) would appoint the student to a research associate role and (subject to operational constraints) would offer a three-month placement for the student either in the UK or in one of their African country offices.

https://research.reading.ac.uk/scenario/