

**Project title:** Geomorphological and ecological impacts of sand dams in sub-Saharan Africa under climate change

**Ref:** OP2426

**Keywords:** Geomorphology, Hydrology, Water availability, Climate Change Adaptation

**One Planet Research Theme:**

Climate & Climate Change  | Earth System Processes  | Anthropocene  | Environmental Informatics

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**Key Research Gaps and Questions:**

- What is the geomorphic impact of sand dams on reaches?
- To what extent can these impacts be reduced or mitigated?
- How will climate change impact the function of sand dams?
- How can sand dams help to mitigate the impacts of climate change for local communities?



**Project Description:**

Semi-arid lands are home to 14% of the world's population (UN Decade 2018), yet also experience some of the highest pressure of freshwater reserves. In these areas rain falls in one or two intense periods in the year, so harvesting rainwater and storing it for the dry season is an essential water management strategy. Climate change is expected to increase the frequency of severe drought and climate extremes in drylands, resulting in increased water scarcity. A widely used adaptation method are sand dams. A sand dam is a reinforced concrete wall, built into the bedrock of a seasonal riverbed. During the short but intense rains water flows over a sand dam and deposits sand behind the concrete wall where water is stored, safe from evaporation, contamination and disease, to be harvested over the coming months.

The geomorphic and ecological impacts of sand dams are felt both upstream and downstream. Downstream sand dams impede the downstream flow of sediment. Whilst upstream sand dams can provide increased water and sediment availability, stabilising channels and promoting biodiversity. In order for sand dams to provide a truly holistic and viable climate change adaptation approach, these wider impacts need to be assessed. This project therefore seeks to quantify, for the first time, the geomorphic and habitat impacts of sand dams in order to develop sustainable and effective climate change mitigation approaches. Using a combination of sensor deployment, fieldwork and high-resolution satellite imagery (Sentinel and Planet Scope Imagery), and benefitting from close collaboration with our CASE partner (Sand Dams Worldwide), the project will evaluate the geomorphic, hydrological and ecological role that sand dams play.

**Prerequisites:**

Remote Sensing, GIS, Fieldwork skills

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