

NILE-NEXUS: Opportunities for a sustainable food-energy-water future in the Blue Nile Mountains of Ethiopia

Call: Mountains as Sentinels of Change

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* Partners bringing their own funding/in-kind support;

Sponsors:

German Research Foundation, Germany

National Research Council - Department of Earth System Science and Environmental Technologies, Italy

National Science Foundation, United States

The mountains of Ethiopia are often called the "water tower of Africa," giving rise to major transboundary rivers. Rapid hydropower development in these mountains is quickly transforming them into the "power plant of Africa" as well. For local people, however, they are first and foremost a land of small farms, engaged primarily in subsistence agriculture. Under changing climate, rapid national economic growth, and steadily increasing population and land pressures, these mountains and their inhabitants have become the focal point of a multi-scale food-energy-water nexus with significant implications across East Africa. The research proposed here is designed to produce a social-ecological systems analysis of adaptation options and risk profiles for the Ethiopian Blue Nile Mountains. Our core research objective is to identify options to address emerging food-energy-water pressures in this rapidly changing tropical mountain system. To do this, we will engage stakeholders at local, regional, and national level to define system components and dynamics, identify favored adaptation strategies, and develop scenarios of probable and of possible futures under externally forced and locally driven change. The research team includes expertise in social-ecological systems analysis, social resilience strategies, East African ecology and agronomy, hydropower development, agricultural economics, and the climate and hydrology of the Ethiopian highlands. Stakeholders include local community organizations, river basin authorities, and national development agencies, among others. The coupled, multi-scale nature of the nexus requires that all project team members and diverse stakeholders participate throughout the research process. We anticipate that this approach will yield new insights on adaptation strategies in tropical mountain environments, and that the stakeholder-informed social-ecological systems framework developed here can be readily transferred to other mountain regions coping with climate change.