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Title: Using the Adaptive Cycle to understand Resilience of Agro-Pastoralist Communities to Drought

Drought has caused the death of more than 11 million people since 1900 and affected more than 2 billion people (FAO, 2014). Although the incidences of drought are observed throughout the globe, with the change in availability and access to natural resources because of drought lowering agricultural productivity, agro-pastoralists in Ethiopia are often highlighted as one of the most vulnerable communities (Mekuyie, Jordaan, & Melka, 2018). However, communities here are not just vulnerable to drought but also changing social-ecological systems due to technological developments within river basins.

Using a case study from Omo-Turkana basin, SW Ethiopia, this paper utilizes the idea of the adaptive cycle, a heuristic used to describe four commonly occurring phases of change in complex systems, to understand agro-pastoral community's resilience to drought in the face of a changing social-ecological system. The transitions between phases of adaptive cycles are determined by the level of potential (resources) and connectedness (networks), for which we identify indicators. These indicators are based on data from an interdisciplinary research project where primary and secondary data was collected over an 18-month period regarding land use, ecosystem services, livelihoods, wealth, and conflict. Methods included remote sensing, participatory mapping, focus groups, interviews, and surveys. By using the adaptive cycle to analyze longitudinal data from this case study, we can detect the relationship between drought, changes in an agro-pastoralist system's social and ecological dimensions, and the resulting impacts on resilience. External drivers, i.e. the technological developments, have affected both potential and connectedness in the social-ecological system, negatively affecting resilience.

Analyses using the adaptive cycle provide opportunities to inform managers on the resilience impacts of their interventions – this is a useful tool for considering the wider implications of technological development projects, particularly those involving energy and agriculture, given the potential for inequitable impacts. Our paper demonstrates how to incorporate equity into resilience analyses.