Disentangling the paradox: climate change extremes as barriers to adaptation in the savanna semi-arid dry lands of northern Ghana

The Sustainable Development Goals (SDGs) are under threat with current and projected impacts of climate change. There is therefore an urgent need to adapt and enhance resilience to climate change both at the global and local level. However, adaptation to climate change is not a straightforward task as stakeholders have to navigate multiple barriers in order to enhance their adaptive capacity. While a number of recent studies abound on non-climatic barriers to adaptation, little is known about climate related barriers to adaptation. We, by focusing on four major adaptation strategies of smallholder farmers, examine how and why climate change extreme events emerge and act as barriers to successful adaptation. The study is based on ethnographic fieldwork in a small rural community in the Upper West Region of northern Ghana. Results show that climatic changes is accompanied by climate extreme events. Of these, drought, windstorms, floods and extreme temperatures are in the community studied perceived as having increased over the past four decades. However, the occurrence, timing and magnitude of these climate extremes remain veiled to smallholder farmers due to lack of information and, inaccuracies and inefficiencies in traditional modes of climate forecast. To enhance their resilience to climatic extremes, smallholders’ use various adaptation strategies including the application of fertilizer and pesticides on crops, cultivation of valleys and marshy fields and sowing of improved crop varieties. However, in several instances, these adaptation strategies were ruined by climate change extremes, for example, heavy rainfall and floods washed-away fertilizer and pesticides applied on crops and drowned crops grown in valleys and marshy fields. Likewise, excessive temperatures, and windstorms caused stunt growth and breakage in crop stocks respectively which in turn cascades into massive agricultural losses. Indeed, our data succinctly show that, climate change extreme events do not only act as barrier to successful implementation and outcomes of adaptation strategies adopted by smallholder farmers but also more importantly accentuate other barriers such as increased transaction cost of adaptation, trigger and set into motion new barriers, for instance conflicts in environmental resource exploitation creating potential limits to adaptation.