

An interdisciplinary, multi-method approach to seasonal climate forecast communication and integration at the local scale

Communities worldwide suffer from variabilities in climate, such as drought or flood. These extreme events threaten livelihoods, creating food and water insecurity, and prompting public health concerns. The impacts of climate variability on food security and economic and social stability are immense. My research focuses on climate risk management to support community adaptation to climate variability. Recent work promotes resilience strategies to address susceptibilities to climate variability (e.g. seasonal climate forecasts), yet evidence of uptake to inform decision-making is scarce, obstructed by large uncertainties, a mismatch between climate and decision-making scales, and risk aversion. An insufficient link exists between well-intentioned strategies developed in the scientific community and communication and integration into local-scale decision making structures. A Graduate Student Summer Fieldwork Award from the Institute for Regional and International Studies allowed me to spend time during summer 2019 in Bahir Dar, Ethiopia (and surrounding villages) to develop and implement a novel interdisciplinary, multi-method approach to communicate local-scale predictive information to decision makers.

My dissertation research aims to better understand the interconnections of modeling methods and communication strategies for effective integration into decision-making across scales, to bridge the gap between theory and practice for enhanced utility of climate risk management research. Prior to travel in summer 2019, I co-created a forecast bulletin to assist in the dissemination of modelling output to decision-makers using best practices in science communication literature (e.g. highly visual, plain language). The forecast bulletin contained seasonal predictions for total rainfall, onset of the rainy season, crops and soil moisture for the 2019 Ethiopian rainy season

(June-September). To foster user-producer engagement throughout the process, preliminary versions of the forecast bulletin were evaluated by our Ethiopian collaborators and project partners in the local region (e.g. academic and government colleagues, agricultural extension experts) through multiple iterations. Preliminary ethnographic fieldwork in the region highlighted the strength of the agricultural extension network in communicating climate and agriculture information to farmers in Ethiopia. Thus, we leveraged the existing and well-trusted agricultural extension system in the dissemination of the forecast bulletin.

Upon arrival in Ethiopia, I first spent time meeting with local contacts and working with our team to make amendments to the forecast bulletin based on user feedback. It was very important to spend time getting to know the communities we are working with and connecting with key contacts personally, before moving forward with the research. Next, our team facilitated a series of participatory training sessions for agricultural extension experts in four local communities. Prior to each training, we spent time gathering materials and supplies, updating the forecast bulletin as necessary, and printing/laminating copies for attendees. I attended each of the training sessions, where a local academic expert led participants through an overview of the project and goals, structured large and small group discussion of the forecast bulletin, interactive locally-relevant analogies and games to better understand probabilistic predictions and answered questions. Agricultural extension leaders then conducted workshops for influential farmers in each village, engaging and training individuals in the content of the forecast bulletin. Influential farmers became familiar with the bulletin this season, ideally incorporating these actions into their current agricultural practices and serving as opinion leaders by communicating with their interpersonal networks.

The later part of my time in Ethiopia was spent meeting with local contacts and using qualitative research methods to provide indication of the reception and success of the multi-method approach to forecast communication. General reactions to the forecast bulletin show evidence that it was well-received and mostly understood by the agricultural extension expert target audience, who have familiarity and some experience with the topics presented. Although active user-producer engagement throughout the development process enhanced the communication and allowed the forecast bulletin to be built upon existing local knowledge, feedback from participants shows that the information still may not be tailored or specific enough to their needs. Consequently, in some cases, we observed that participants seemed to interpret the information according to their own needs (e.g. understanding the prediction of onset as rainfall amounts instead of probability), clearly warranting further consideration of specific communication visuals. Coupling the bulletin with participatory training sessions seemed to enhance users' understanding of the seasonal climate forecast.

The opportunity to conduct international fieldwork and travel to Ethiopia for research in summer 2019 had profound impact on me both personally and professionally. As a researcher, the ability to live and work in local communities of Ethiopia provided a cultural awareness and understanding that contextualizes and increases the relevance of my work in ways that would have been unobtainable from web-based communication alone. The cultural experience challenged and humbled me, fueling my passion for addressing global issues at the climate-water-food-energy nexus. I am very grateful for IRIS funding to support this work.