



Tropentag, September 14-16, 2022, hybrid conference

“Can agroecological farming feed the world?  
Farmers’ and academia’s views”

## What are the benefits of agro-climate service scaling?

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### Abstract

Agricultural practices and outcomes are strongly impacted by past and present weather and climate. Future climate change is expected to raise the frequency and intensity of weather extremes and increase climatic variation. The lack of timely and actionable climate-informed agricultural advice leads to significant input and yield losses, which can render investments in farming unprofitable. Development organisations in Vietnam have provided agro-climate services (ACS) to smallholder farmers on a limited scale. They advocate for the government to consider upscaling the provision of ACS, but a large-scale roll-out could strain the government’s financial and human resources. Evaluating the merits of climate services is challenging, because weather and climate risks, as well as the benefits that information services may provide, cannot be derived from existing datasets.

CARE in Vietnam, a non-government organisation, has provided ACS in two communes in Dien Bien District since 2015 and they hope to see the intervention get scaled-up by the local governments in the years to come. In this study, we used a decision analysis approach to conduct an ex-ante cost-benefit analysis of four candidate interventions aiming to scale ACS in Dien Bien District, Vietnam. Our analysis was conducted in collaboration with CARE’s project staff, Dien Bien government staff and other experts. Together we developed a conceptual model of the scaling-up of ACS to 23 communes in the whole Dien Bien district and later programmed this as a probabilistic simulation. The results indicate a very high chance (98 to 99 %) of the ACS interventions providing net benefits. With 90 % confidence, investments in ACS would return benefits between 1 and 16 USD per 1 USD invested. These benefits include improved yield, reduced losses in agriculture, fewer animal deaths, cleaner water, better health, reduced GHG emissions, and economic returns from improved gender equality.

We demonstrate the usefulness of decision analysis as a powerful tool, given the current dearth of methods capable of addressing data-scarcity, biases and uncertainties in valuing climate services. The approach provides support to uncertain and complex decisions in development planning.

**Keywords:** Agriculture, climate change, cost-benefit analysis, decision analysis, probabilistic modeling, uncertainty