Can rural climate services meet context-specific needs, and still be scalable? Experience from Rwanda

James W. Hansen[1], Desire M. Kagabo[2], Gloriose Nsengiyumva[2]

Abstract

Investment in national climate services must address trade-offs between meeting context-specific farmer needs and providing cost-effective services at scale. In the context of an ongoing national-scale agricultural climate service initiative in Rwanda, we discuss approaches used to address five scaling challenges (capacity constraints of farmers, communication intermediaries, climate information providers, data gaps, and co-production with farmers) and the resulting lessons.

Keywords: Climate services, Co-production, Scaling, Climate risk management, Agricultural extension, Rwanda

Introduction

Efforts to develop agricultural climate services at a national scale face a trade-off between meeting the context-specific needs of farmers and providing cost-effective services at scale. The challenge posed by this research is viewed differently depending on whether one is looking from the supply side (*How can a National Meteorological Service (NMS) better meet framers' context-specific needs?*), or the demand side (*How can proven approaches for empowering farmers at a pilot scale be scaled nationally?*). In the context of the USAID-funded Rwanda Climate Services for Agriculture project, we discuss approaches and lessons from efforts to address five specific scaling challenges:

i) empower farmers to access, understand and act on climate information;
ii) scale up participatory processes through agricultural extension;
iii) increase NMS capacity to routinely provide tailored local information;
iv) fill gaps in historic meteorological data; and,

1 International Research Institute for Climate and Society (IRI), Columbia University, Palisades, NY, USA

Email: jhansen@iri.columbia.edu

2 International Center for Tropical Agriculture (CIAT), Kigali, Rwanda

v) incorporate farmers' needs into co-produced services.

Methodology

Incorporating farmers' needs into co-produced services

Efforts to understand and incorporate farmers' needs into co-produced services started with a survey of >3000 farm households, implemented during the first project year (2016), designed to provide both insights about farmers' climate service needs and evaluation baseline data.

Based on its features, the project adopted Participatory Integrated Climate Services for Agriculture (PICSA) as the primary approach for equipping farmers to understand and incorporate climate information into their planning. PICSA is a structured approach, developed by University of Reading, which combines the use of graphical representations of local climate information with participatory planning tools to support farmer decision-making around relevant options and risks (Dorward, et al., 2015). PICSA starts with an initial workshop where farmers evaluate their current farming and livelihood strategies in light of climate risk, with the aid of climate time-series graphs and participatory resource mapping and seasonal calendars, and analyse options for changing agricultural practices. Just before a growing season, facilitators introduce the downscaled seasonal forecast, review its interpretation, use it to update a table of crop/cultivar-specific risks developed earlier, and guide farmers to decide on any adjustments for the upcoming season.

PICSA is being integrated into Rwanda's *Twigire Muhinzi* agricultural extension service through training for extension professionals (district and sub-district Agronomists, local Socio-Economic Development Officers) and volunteer Farmer Promoters. As scaling out of PICSA accelerated, the number of intermediaries needing training quickly exceeded the project team's capacity. A training-of-trainers approach was implemented, providing advanced training to equip professionals to train and mentor sector-level staff and volunteer farmers. Four local NGOs were contracted in 2017 to facilitate intermediary training and implementation in farming communities in their respective provinces. Regular radio broadcasts of daily weather forecasts and new climate service programming (since 2017) complement the face-to-face PICSA communication.

The project adapted the IRI's ENACTS (Enhancing National Climate Services) approach (Dinku et al., 2017) to enhance Meteo-Rwanda's capacity to fill data gaps and provide tailored local information at scale. Data gaps were addressed by merging quality-controlled station records with satellite (for precipitation) and reanalysis (for temperature) data, resulting in long-term (>35 years for rainfall, >55 for temperature) gridded (~4km) complete daily datasets. A highly customizable software platform (Blumenthal et al., 2014) supports automated production of a range of derived historical analyses and downscaled seasonal forecasts, and their dissemination through online “Maprooms.”

As a mechanism to sustain co-production of climate services by Meteo-Rwanda, and line ministries and agencies that represent climate-sensitive sectors (agriculture, water, health, disaster risk reduction) at a national scale, the project in 2017 partnered with the World Meteorological Organisation (WMO) to initiate development of a National Framework for Climate Services, under the UN Global Framework for Climate Services (GFCS).

Findings

Incorporating farmers’ needs into co-produced services

Although the project baseline survey included questions on farmers’ climate service needs, responses focused on existing generalised products and provided little insight to prioritise new or improved products or communication channels. Usefulness was constrained by farmers’ limited capacity to articulate demand for potentially useful products or services that they have not yet been exposed to. As an alternative, the research is exploring an iterative co-design process that incorporates farmer’s evolving understanding of needs and gaps into an annual planning process. A Steering Committee, tasked with developing a national climate services governance framework, has been identified as an entry point for piloting such an iterative process.

Empowering farmers’ context-specific risk management decisions

Participatory processes that facilitate interaction between farmers, researchers and information providers have proven effective at enabling farmers to understand and use local climate information. Although the structure of the PICSA process is consistent as it is being implemented across the country, its participatory nature provides flexibility to support farmers’ context-specific communication needs and decisions. An assessment during the first implementation season, based on a survey of a random sample of 8% of the 2631 participating farers, confirmed the effectiveness of PICSA (Clarkson et al., 2017). Most participants changed management practice in response to the climate information and training (93%); perceived improvements in their confidence and their household food security and income; and shared information with an average of 13 peers.

Scaling up participatory processes

As of April 2018, two-thirds through the project, 1018 government staff and volunteer Farmer Promoters were trained, and in-turn trained and facilitated more than 75,000 farmers in the

PICSA process. While this demonstrates the feasibility of scaling rural climate services through participatory processes, the process has been resource-intensive and perhaps slower than needed to reach a critical mass by the project end (December 2019). Opportunities to accelerate process include developing video and e-learning training materials for extension personnel and farmers, and using ICT-equipped local government offices as climate service resource hubs. Sustainability also depends on policy-level adoption of climate services into agricultural extension mandate, funding and training.

National Meteorological Service (NMS) capacity to provide tailored local information and fill data gaps

Effective early participatory work with African farmers on climate services, and the initial development of PICSA, incorporated information products derived through custom analysis of local historical daily station records. However, this intensive approach to producing tailored local climate information cannot be scaled out to locations without long-term station data, or scaled up by a resource-constrained NMS to locations across a country. Meteo-Rwanda faces similar resource challenges as other African NMS, and also faces a more than 10-year data gap from breakdown of its observing system during the 1994 Rwanda Genocide. The development of high-resolution, merged, historic, gridded precipitation and temperature datasets helped overcome gaps in historic records. The greater amount of station observations used (average of 99 stations/year vs. $\leq$ 20 for CHIRPS and $\leq$14 for ARC) since restoration of the observing network following the Genocide, evidence that the amount of station data incorporated largely determines the quality of a merged product (Dinku et al., 2014, 2018), and higher apparent skill of seasonal rainfall forecasts based on national data relative to forecasts based on other products (CHIRPS, ARC)[3], suggest that Meteo-Rwanda's datasets are of higher quality than the best global products. Meteo-Rwanda now provides a rich suite of historical (i.e., frequency of rain days, dry/wet spells; season onset, cessation, duration, dynamic season total) and downscaled seasonal rainfall forecast (issued late August for September-December) products, derived from the gridded datasets, made available as maps or location-specific analyses for any administrative unit or 4-km grid cell. The degree of automation has enabled Meteo-Rwanda to routinely provide locally relevant climate analyses and forecasts at a national scale without over-taxing its human resources. Ongoing enhancements allow the Maprooms to serve as a portal for extension personnel to download all formatted PICSA graphs for their selected location.

[3] Presented in a CCAFS Blog: https://ccafs.cgiar.org/blog/local-beats-global-when-it-comes-national-climate-services-rwanda#.W2SE4y2ZMhA

Conclusion

Our efforts to strengthen rural climate services at scale in Rwanda suggest six lessons. First, recognise that some trade-offs between tailoring and scaling are inevitable and require compromises that manage those trade-offs. Second, participatory communication processes foster relevance by supporting farmer decision-making around options and risks that are important from their perspective. Third, scaling participatory communication process depends on the presence and buy-in of effective agricultural extension or other intermediary institutions. Fourth, gaps in historic climate records prevent provision of locally relevant information nationally, but good approaches are available to fill data gaps. Fifth, through advanced tools such as those employed in ENACTS, NMS can automate generation of a range of tailored products from their data without overtaxing their human resources. Finally, iterative processes that formally incorporate farmers' evolving understanding of their diverse needs into co-production of services are likely to be more effective than designing services around a one-time needs assessment survey.

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