SPOTLIGHT SERIES:
LEARNING AGENDA FOR CLIMATE SERVICES
in Sub-Saharan Africa

Agricultural fields in rural Rwanda (Credit: Tshibangu Kalala).

MAKING CLIMATE SERVICES WORK FOR AFRICA'S FARMERS AT SCALE

The substantial body of knowledge about good practice in climate services suggests that making climate services work for farmers at a national scale requires managing tradeoffs between meeting farmers' context-specific needs and providing cost-effective services at scale.

CONTEXT

To help manage the far-reaching risks of a changing and variable climate in Africa, investments in climate services must simultaneously meet context-specific needs and have a broad scale impact. However, making this investment work for smallholder farmers, at scale, has been challenging. For example, efforts to improve the generation of quality climate information typically work at a national scale through National Meteorological and Hydrological Services (NMHS). However, these supply-side efforts often have difficulty effectively meeting the local needs of diverse rural populations. Other efforts have started at the farm level, using participatory processes to understand farmers' needs, and to provide information and support in ways that farmers can access, understand, and use. These demand-side initiatives, informed by an understanding of the climate service needs and capacity to act, can be quite effective at tailoring services to farmers' needs, but largely remain at a pilot scale. Fortunately, there is growing evidence that climate services can meet farmers' local needs at a national scale, by recognizing and managing the tradeoffs between scaling and tailoring, by adopting good practice in the generation and communication of climate information for farmers, and by bringing farmers' voices into the co-production of services.

DISCLAIMER: This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of its authors and do not necessarily reflect the views of USAID or the United States government.

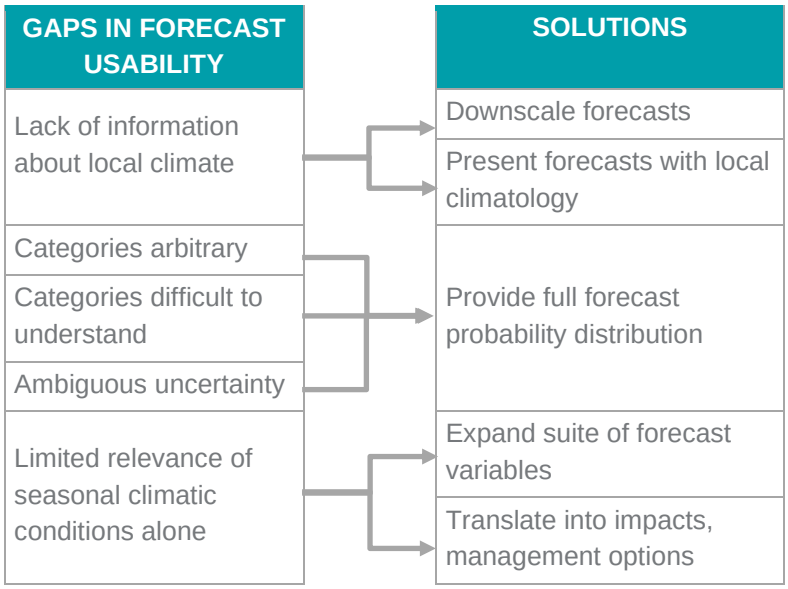
LEARNING HIGHLIGHTS

Different communication processes play complementary roles. Broadcast media is well suited to building awareness and delivering timely weather forecasts, advisories, and other near-term information. For example, mobile phones can be used to push out location-specific weather forecasts and alerts, and to provide information and advisories on demand through call centers or interactive voice response. Broadcast media can also be made responsive to farmers' local needs through community listening groups and interactive programming formats that allow rural listeners to participate. While broadcast media – such as radio or SMS, including gender-responsive information tailored to women's assets and needs – can reach large groups of farmers at relatively low cost, providing context-relevant content that farmers understand, trust and can act on is challenging.

Information at longer time scales, such as seasonal forecasts and analyses of climate risks and trends based on historical records, has greater uncertainty, is more difficult to understand, and, therefore, is more challenging to incorporate into decision-making. Well-designed group participatory communication processes are effective at increasing farmers' understanding of climate information and ability to act on it by helping farmers relate abstract, probabilistic information to their collective experience, and by providing opportunity for training and social learning. Although participatory communication processes are more costly and time-intensive than broadcast media or mobile phones, experience demonstrates that they are effective, and that they can be scaled up through agricultural extension services or other institutions that already provide information and services to farming populations.

Improve usability of climate information by improving the way seasonal forecasts are produced and communicated. Seasonal forecasts, supported by Regional Climate Outlook Forums (RCOFs) since 1996, have been a major information source for climate services across Africa, but continue to face challenges. The RCOFs and most NMHSs use subjective processes to arrive at a consensus among different forecasts, and express a consensus forecast as tercile probabilities that rainfall in the upcoming season will fall in "below-normal," "normal" or "above-normal" categories. These forecasts are difficult to use for agricultural decision-making because they lack information about what the forecast means for local conditions, forecast categories are arbitrary and difficult to understand, and they seldom extend beyond total seasonal rainfall to include other rainfall characteristics that are important for agriculture (e.g., start date, dry spells, length of season).

Gaps in the usability of the widely used tercile seasonal forecast can be addressed through improved forecast presentation.



Seasonal forecasts can be made more useful by switching to objective forecast

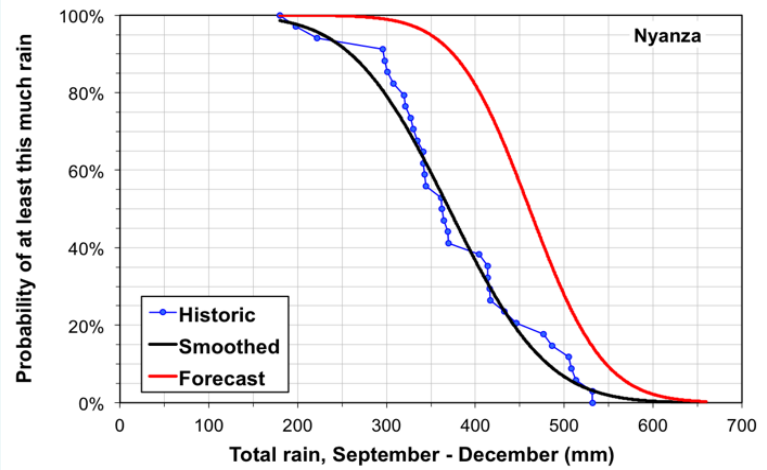
methods, using local historical climate data to calibrate and downscale forecasts, and presenting probability distributions of the forecast along with the climatological distribution.

Long-term historical data are crucial for calibrating, evaluating, communicating, and using forecasts effectively. They also enable decision-makers to better understand and adapt to the variability, seasonality, and trends in their local climate. However, delivering accurate, locally useful climate services at scale is almost impossible where this information is unavailable or inaccessible. Unfortunately, in Africa, underinvestment means the observation network is inadequate and often in decline. The distribution of existing observation stations is uneven and coverage tends to be especially poor in rural areas. Therefore, improving the availability of data must include investment in observing infrastructure.

However, even if the resources were available to upgrade the observational network today, it would take these new stations decades to accumulate records long enough (30+ years) to meet climate information needs. Other means, such as the ENACTS program (see case study), can help improve the historical data record in the near term.

NEXT GENERATION SEASONAL CLIMATE FORECASTS

The most common criticisms of the widely-used tercile format for seasonal forecasts can be overcome by downscaling and presenting the forecast as a calibrated probability distribution along with the corresponding probability distribution of local historical data. When presented in a structured participatory process, farmers find this improved format understandable and useful. However, until recently, the tools used to develop these downscaled forecasts required selecting a single seasonal prediction model, and thus conflicted with the subjective process that RCOFs and NMHSs have developed to produce forecasts based on a consensus among different climate models and institutions. The NMHSs in Rwanda, Ethiopia and Senegal, and ICPAC in East Africa, are implementing or testing a new generation of downscaling tools that objectively combine output from different climate models, making objective forecasts more compatible with existing consensus forecast processes.



Downscaled September-December seasonal rainfall forecast for Nyanza, Rwanda, issued August 2016 by Meteo Rwanda.

Climate services are more effective and more useful if providers and users work together to co-produce them. It is widely accepted that involving users (e.g., farmers) and providers (e.g., NMHSs) in the co-production of climate services improves the usefulness of those services. Participatory processes can provide a forum for dialog and co-learning among farmers, researchers, organizations that reflect farmer diversity, and climate information providers. While such dialog is necessary, if it is to drive the co-production of more effective services, information providers must be responsive and accountable to diverse user needs, and users must have the capacity to understand and express demand for information products and services that may not yet be available. When moving from a pilot to a national scale, co-production requires methods to efficiently capture and prioritize farmers' needs. Furthermore, co-production requires institutional arrangements and accountable processes that incorporate this information into climate services. Achieving these conditions requires formalizing co-production as part of climate services policy and governance.

RECOMMENDATIONS

NMHSs can strategically combine complementary communication processes and partnerships to effectively deliver climate services to rural populations at scale. Easy to understand weather information (e.g., daily rainfall, temperature) can be pushed out to farmers using broadcast media, ICT, and other appropriate channels. Harder to understand information at a climate scale (i.e., seasonal forecast and longer) can be communicated by institutions that farmers already trust and look to for information and advice, such as agricultural extension services, development NGOs, community-based organizations and agribusiness. Innovative participatory communication and planning processes can be particularly effective at building farmers' capacity to understand and act appropriately (see the Rwanda case study). Greater roles for the private sector should also be considered given the limited resources of NMHSs and many agricultural extension services.

Mainstream local historical climate data and analyses into agricultural climate services. With technical and financial support, African NMHSs can overcome gaps in their observations through expanding use of data merging to fill gaps, strategic investment in observing infrastructure, and rescuing and digitizing existing paper records (e.g. ENACTS, see case study). For NMHSs to contribute their potential value to farmers' livelihoods and national agricultural economies, restrictive policies that treat data as a source of revenue for a NMHS should be replaced with more open data policies that prioritize public good.

Improve the usability of seasonal forecasts by improving the way that Regional Climate Centers (RCCs) and NMHSs produce and communicate them. Where long-term historical data are available, seasonal forecasts for local agricultural decision-making can be improved by adopting objective forecast methods, using historical data to downscale and calibrate forecasts, and presenting the full seasonal forecasts distribution along with the corresponding local climatological distribution (see Table). RCCs are positioned to support NMHSs to implement these improvements through RCOFs.

Promote agricultural user engagement with their NMHS to co-produce improved climate services. With facilitation by WMO, the UN Global Framework for Climate Services' national climate services framework process can be leveraged to promote and guide the development of institutional arrangements and governance processes that bring farmers' evolving understanding of their needs into iterative, accountable co-production of improved climate services. Moving beyond typical relationships between the NMHS and various user organizations entails building the capacity of farmers and their representatives to understand what information can feasibly be provided, and building space to meaningfully influence the development of better climate services. The Participatory Climate Information Services Systems Development Methodology was developed to address these needs and has been used successfully in Senegal and Niger (see Spotlight 1). Furthermore, these processes can promote gender-responsive climate services through engagement with community-based and female-dominated groups that circumvent gender disparities typical of farmers associations and cooperatives (Spotlight 4).

Systematically share, evaluate, and improve existing agricultural climate service communication processes. A collaborative effort is needed among those organizations and researchers who are working to improve the communication of climate information to farmers to assess the strengths and limitations of existing communication processes and to use the resulting learning to strengthen these processes and training materials. With modest financial support and convening support of a global organization, such as the Climate Services Partnership or the World Meteorological Organization (WMO), such an effort could identify strengths and gaps in existing approaches, align communication processes with recent advances in tailoring climate information to farmers' needs, make knowledge and training materials more accessible, propose good practice standards, and reduce needless duplication of effort.

SUGGESTED READING:

- *SPOTLIGHT SERIES INTRO – THE CASE FOR AGRICULTURAL CLIMATE SERVICES IN AFRICA, 2020.*
- *SPOTLIGHT 1 – USER AT THE CENTER OF DESIGN, 2020.*
- *SPOTLIGHT 2 – STRENGTHENING GOVERNMENT AGENCIES TO ENHANCE CLIMATE SERVICES, 2020.*
- *SPOTLIGHT 3 – PRIVATE SECTOR SOLUTIONS FOR CLIMATE SERVICES, 2020.*
- *SPOTLIGHT 4 – BENEFITING ALL USERS: GENDER EQUALITY AND INCLUSION, 2020.*
- *SPOTLIGHT 6 – ADVANCING IMPACT EVALUATIONS OF AGRICULTURAL CLIMATE SERVICES IN AFRICA, 2020.*
- *PAPER – SCALING CLIMATE SERVICES TO ENABLE EFFECTIVE ADAPTATION ACTION, 2019.*
- *PAPER – HANSEN, J, ET AL. 2019. CLIMATE SERVICES CAN SUPPORT AFRICAN FARMERS' CONTEXT-SPECIFIC ADAPTATION NEEDS AT SCALE. FRONTIERS IN SUSTAINABLE FOOD SYSTEMS. 3(21). DOI: 10.3389/FSUFS.2019.00021*

The Learning Agenda on Climate Services in sub-Saharan Africa generates new information, evidence, and learning on the effective and sustainable production, delivery, and use of climate information to improve rural agricultural livelihood decision-making and outcomes. More information can be found at: climatelinks.org/projects/learningagendaonclimateservices.

CASE STUDY: COMBINING DELIVERY CHANNELS AND LOCALLY RELEVANT INFORMATION IN RWANDA

The USAID-funded Rwanda Climate Services for Agriculture project has strategically combined participatory radio and mobile phone channels to help farmers access, understand, and act on climate services at a national scale. The project trained more than 1,800 agricultural extension workers, who in turn trained and supported more than 110,000 farmers around the country using an adapted Participatory Integrated Climate Services for Agriculture (PICSA) process.

The farmers learned to access, understand, and incorporate climate information into their management decisions. Interactive biweekly radio programming raises farmers' awareness, addresses risk management concerns of farmers, and provides weather forecasts and advisories. Building on the PICSA process, a set of weekly radio listener clubs combines the benefits of radio, mobile phone and face-to-face communication.

The ENACTS (Enhancing National Climate Services) approach to providing locally relevant climate information enabled Rwanda's NMHS to overcome major gaps in its historical climate record and provide agricultural extension personnel with access to analyses for every location across the country.

Gaps in historical observations are an obstacle to producing actionable climate information at a national scale that is relevant to farmers' local needs. The ENACTS initiative has helped ten NMHS and two Regional Climate Centers in Africa address historical data gaps by combining quality-controlled station records with freely available proxy data (satellite data for precipitation, and climate model reanalysis for temperature) to create high-quality, long-term, spatially complete climate records that are made available through an interactive online "Maproom" portal.

A training of trainers workshop focused on climate information communication in Butare District, Rwanda (Credit: T. Muchaba, CCAFS)