

KEY MESSAGES

- Climate information services are often imprecise and not packaged in easily actionable ways, hampering the ability of farmers to respond to climate change and ensure food security.
- Smallholder farmers need access to accurate, context-specific and understandable climate and weather information.
- ICRAF collects more information, translating it into locally relevant forms, and disseminating it broadly to farmers.

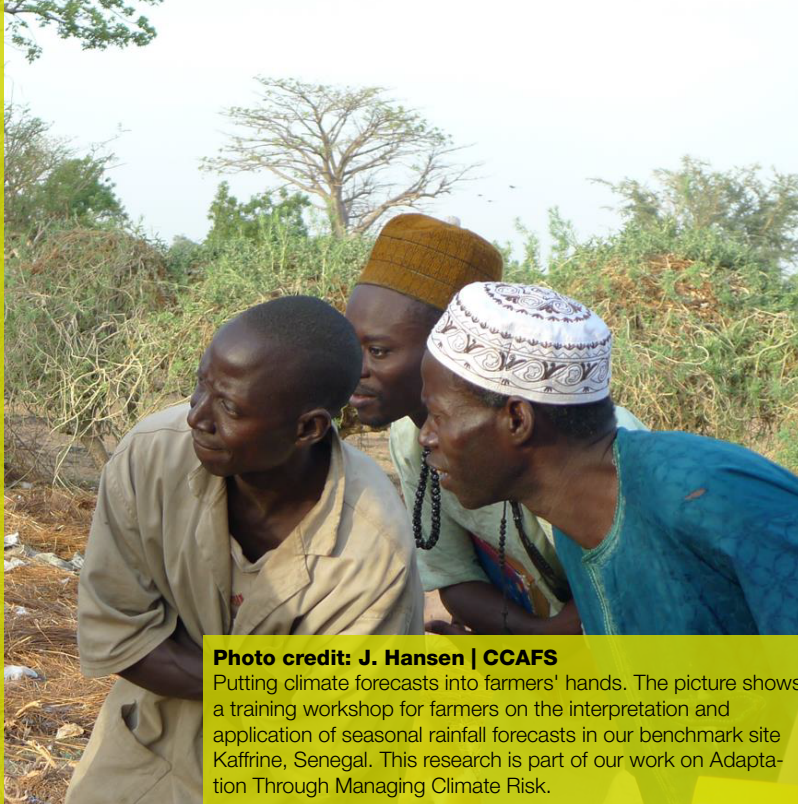


Photo credit: J. Hansen | CCAFS

Putting climate forecasts into farmers' hands. The picture shows a training workshop for farmers on the interpretation and application of seasonal rainfall forecasts in our benchmark site Kaffrine, Senegal. This research is part of our work on Adaptation Through Managing Climate Risk.

Delivering climate information to rural households: Forecasts and capacity building

Introduction

Providing climate and weather services to help farmers plan production operations (e.g. select varieties, determine planting dates) is an important approach to climate-smart agriculture (CSA). These services refer to a broad set of information and products that help farmers understand the impacts of climate and weather on their actions, including: past records, long-term climate predictions, current forecasts, and information about the best farming systems for local conditions. All these are key for adapting the productive system to climate conditions and for designing risk-mitigation instruments (e.g., insurances).

Most smallholders do not have access to the information they need in a systematic, reliable way. There are several steps that can be taken to improve the situation: national meteorological services need to provide locally relevant forecasts; national agricultural research and extension systems need to translate and communicate climate and farming information in ways that farmers can make practical decisions; and meteorological and agricultural institutions need to work together to improve farmers' capacity to understand and use the information provided.

ICRAF and its partners have been at the forefront of improving climate and weather services and helping farmers to respond to climate change and variability. This brief details some of those efforts.

Improving local forecasts

Web-based weather forecasts have become an important tool in agriculture decision-making, as the services are free of charge and updated frequently. ICRAF scrutinized the reliability of the information available through web-based forecasts by comparing observed weather data taken from a weather station in My Loi village (Vietnam) with forecasts from three sources: Vietnam National Hydrometeorological Service, Windyty and Accu-Weather. The study revealed that the amount of rainfall and the number of rainy days was inaccurately predicted by these three sources (under/ overpredicted) and that mean and maximum temperatures were underestimated by all services. The uncertainty of these forecasts creates problems for rain-fed agriculture systems such as those in My Loi,

The study highlighted the value of systematic and continuous evaluations of forecasts and observations. Based on findings, ICRAF was able to draw specific recommendations for national- and local-level action. Accordingly, the national service would better meet farmers' needs by (i) extending the lead time in online forecasts to 7–10 days and providing seasonal outlooks with regular updates, by (ii) indicating rainfall amounts as a range, and by (iii) presenting more weather variables on animated maps. Local forecasters, meanwhile, need to be trained in using and evaluating the performance of different forecasts. Farmers need guidance as to which forecasts work better for which weather indicator, type of weather situation, and at what lead time.

Building capacity among smallholder farmers

Better forecasts are only part of the solution. Systematic educational processes play an important role in improving farmers' capacity to interpret and act on the available information. ICRAF, together with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and other partners, has piloted several initiatives to facilitate smallholders' access to climate advisories, index insurance and integrated climate services in Burkina Faso, Ghana, Mali, Niger and Senegal.

Through the Participatory Integrated Climate Services in Agriculture (PICSA) approach¹, trained facilitators worked closely with farmers in the design of locally-relevant farm adaptation options based on climate data. Farmers benefited from assistance in three phases: (i) **long before the cropping season**, when farmers and trainers map resources available and activities (through resource maps and seasonal calendars), share their perceptions about the climate, learn to interpret historical climate maps, assess risks of climate events and build an options matrix, listing potential activities, management practices and required resources (including budget); (ii) **shortly before the season**, when trainers go back to the farmers and discuss the readily available seasonal forecasts delivered by the government (through radio, TV, etc.) and (iii) **at the end of the season**, when farmers and trainers document successes, challenges and discuss ways to improve the process based on lessons learned (Dayamba et al, 2018).

Unlike typical climate information systems, PICSA combines historical climate information with seasonal forecasts to better understand climate variability and change and calculate risks (occurrence of events). This also helps improve the information available to extension staff, who are no longer relying solely on qualitative information in their work. Moreover, being a highly participatory process, PICSA has a significant empowerment component, as it allows farmers to make their own farm decisions instead of receiving top-down advisories and recommendations. An evaluation of the implementation of the PICSA approach in Kaffrine (Senegal) and Mopti (Mali) revealed that 97% and 76% of the respondents, respectively considered the process valuable to their farm activities. Farmers reported improved knowledge about sowing dates, the use of locally adapted varieties and about strategies for adapting seasonal production plans (farm size) to the resources available (Ouedraogo et al. 2018a).

To facilitate information dissemination, through public-private partnerships and using climate information, ICRAF and partners also provided index-based insurance services to 750,000 farmers (out of the 2 million farmers target). An additional 8,500 farmers in Senegal now receive climate information via SMS, voice messaging and emails (Ouedraogo et al. 2018b). Apart from information dissemination, mobile phones also open up opportunities for ground truthing observations (e.g., farmers can offer feedback to forecasters and advisors on the data shared)

ICRAF's experience with climate information reveal that there are many ways in which the use of climate data can be improved.

Apart from the above-mentioned approaches, options may include, among others: building capacity and skills of national meteorological staff to integrate weather station data with satellite data for improving availability of context specific data; using educational programs on rural radio networks to disseminate climate information; providing high-resolution forecasts specific to local areas; developing grassroots co-forecasting networks to improve seasonal climate and crop performance predictions; provision of improved crop monitoring based on remote sensing to improve in-season estimates; provision of real-time forecasting to provide early warning on food security issues.

Climate information services are often imprecise and not packaged in easily actionable ways, hampering the ability of farmers to respond to climate change and ensure food security.

Conclusion

Climate services need to make use of the best available climate science and information and be effectively delivered to farmers. ICRAF and its partners work towards improving the full range of climate services so that farmers have access to timely, easily accessible, highly localized information that is relevant to their decision-making. Such information will help them cope with climate risks and take advantage of climate opportunities. Please contact the Elisabeth Simelton (e.simelton@cgiar.org), Jules Bayala (j.bayala@cgiar.org) and Brian Chiputwa (b.chiputwa@cgiar.org) for further information on the work in Vietnam, West Africa and Rwanda, respectively. For general inquiries about work on CSA at ICRAF, please contact Todd Rosentock (t.rosentock@cgiar.org).

Further reading:

- Coulibaly JY et al. Climate services for agriculture in Rwanda. CCAFS InfoNote. Available at: <https://bit.ly/2FWUe0e>
- Dayamba S.D. et al. 2018. Assessment of the use of participatory integrated climate services for agriculture (PICSA) approach by farmers to manage climate risk in Mali and Senegal. Climate Services. <https://doi.org/10.1016/j.cliser.2018.07.003>
- Ouedraogo M. et al. 2018a. Farmers' Willingness to Pay for Climate Information Services: Evidence from Cowpea and Sesame Producers in Northern Burkina Faso. Sustainability 2018, 10, 611; doi:10.3390/su10030611
- Ouedraogo I. et al. 2018b. Closing the Gap between Climate Information Producers and Users: Assessment of Needs and Uptake in Senegal. Climate 2018, 6, 13; doi:10.3390/cli6010013
- Roy A. et al. 2016. Which forecast represents the local weather best? CCAFS InfoNote. Available at: <https://bit.ly/2Q97u6M>

¹ The PICSA approach was initially developed by the University of Reading and initially tested in southern and eastern Africa.