Strengthening the climate services chain in Central America

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Introduction

Central American farmers are highly vulnerable to climate variability, with crop losses observed throughout the region on a virtually annual basis. For instance, as indicated by the United Nations's Food and Agriculture Organization (FAO) and World Food Program (WFP), the 2014–2017 drought conditions in Central America affected over 3.5 million people in Guatemala, Honduras, and El Salvador (FAO, 2016; FAO, OPS, WFP y UNICEF, 2018). At the same time, local stakeholders and farmers generally have limited access to existing climate and forecast information, do not have sufficient capacities to understand the climate information and/or mechanisms to relate this information to the impact that climate variations can generate at the local level. This precludes the translation of information into actionable knowledge, and therefore into action.

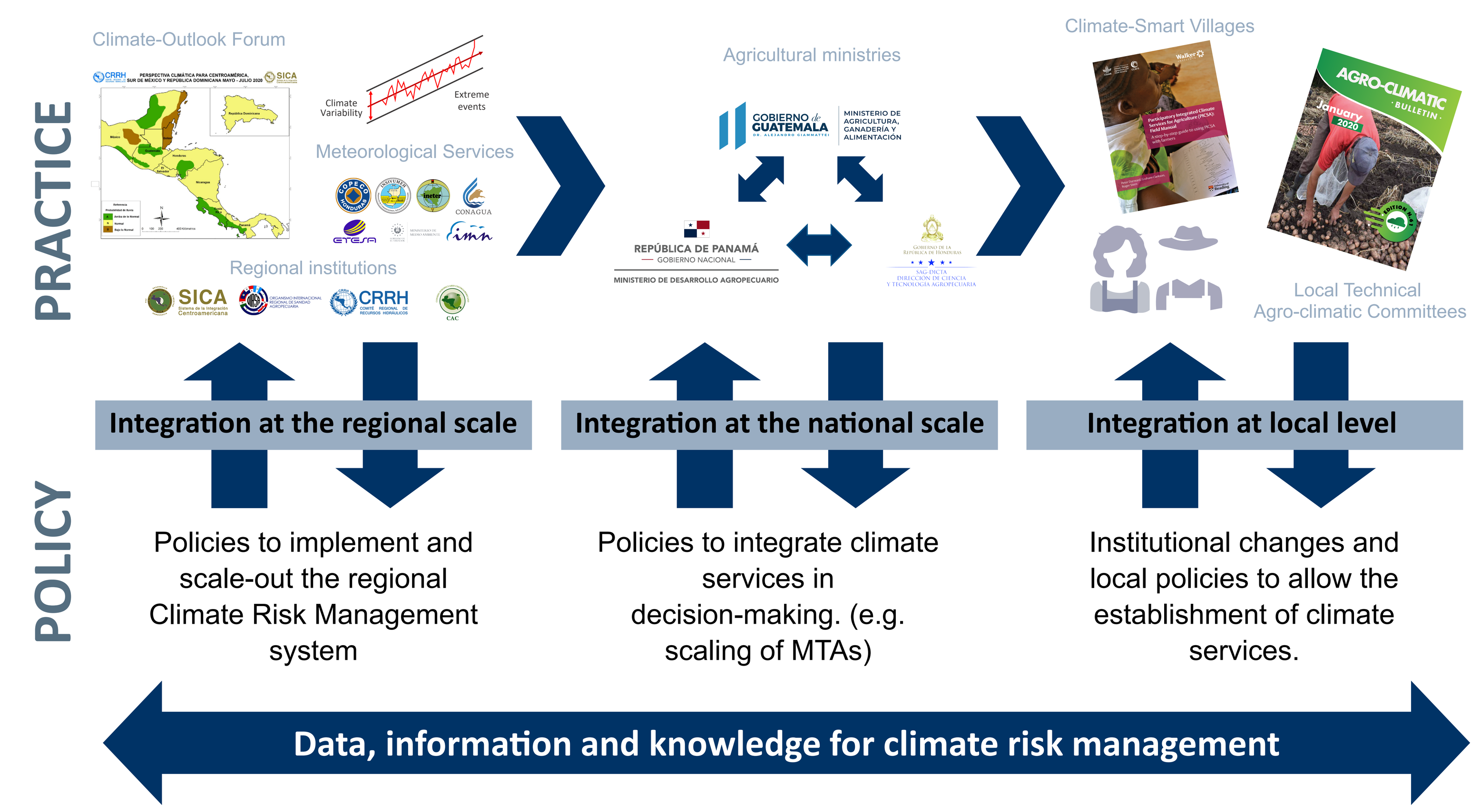
Here we describe a process through which scientists and strategic partners have co-developed, tested, and scaled out approaches to assess, co-produce, translate and transfer climate information to enable agricultural decision making (e.g. Next Generation of climate forecasts -NextGen, the Local Technical Agroclimatic Committees - LTAC, the Participatory Integrated Climate Services for Agriculture -PICSA). Through these approaches' farmers and stakeholders access information about climate variations at multiple timescales, understand how these can affect crops, and design measures to reduce crop loss, particularly providing agronomic recommendations to farmers. We systematically describe the process of evidence generation, creation, partner engagement, scaling up, and monitoring of these approaches throughout Central America at a national level and at the local level especially in application sites known as the Climate-Smart Villages.

Methods

The Climate-Smart Agricultural (CSA) Strategy for the SICA (Central-American-Integration-System) Region (2018-2030) includes three areas of work on climate risk management (CRM): i) strengthening regional-scale mechanisms for the generation and exchange of agro-climatic information; ii)timely generation and communication of CRM information, including at the Climate Outlook Forum (CA-COF); iii) promoting the use of standardized methods and tools to assess risks and losses in the agricultural sector. In that context, regional and national coordination efforts are required, especially to address climate variability in an agricultural context. CCAFS and IRI scientists are working together with regional (e.g., the Central America Council -CAC, the Regional Committee of Hydraulic Resources -CRRH), national (e.g., agricultural ministries, meteorological services) and local (e.g., farmer associations, academia) partners within the SICA, to boost pro-active CRM through climate services. We have co-developed and/or scaled decision-support approaches so that regional organizations and national governments better understand the expected climatic variability and its implications on farming systems, including:

- A Next Generation of climate forecasts (NextGen; Muñoz et al., 2019), using tools such as IRI's Climate Predictability Tool (CPT) to provide objective, tailored predictions at multiple timescales, including sub-seasonal and seasonal.
- The Local Technical Agro-climatic Committees (MTA; Loboguerrero et al, 2018; see a description in the left-bottom box of this poster).
- The Participatory Integrated Climate Services for Agriculture (PICSA; Dorward et al, 2015), which combines climate data and forecasts with farmers' knowledge of what works in their own context, and then uses participatory planning methods to help them make informed decisions about their agricultural practices.

We combine these approaches to enabled cross-scale information and policy management, involving the integration of decision-makers at national/local levels with regional-scale processes.



Local Technical Agro-climatic Committees (MTA)

They are innovative way for local stakeholders to be informed about the expected climatic variations in their region, and how these can affect their crops. MTA (innitials in Spanish) allow open and clear dialogues about seasonal climate forecastsat multiple timescales, how these can affect crops, and the design of measures to reduce crop loss, particularly providing agronomic recommendations to farmers. Alliances with farmer organizations, national public and private and regional climate outlook forums help deliver improved and accurate climate information to users.

We have helped establish 30+ MTA across Central America empowering almost 170+ institutions with agro-climatic information

Local, national and regional partners

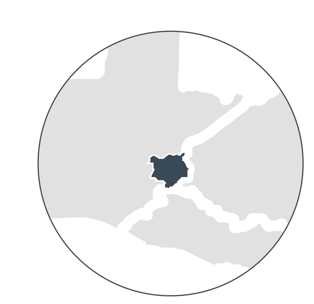
Results

We have developed a user-centered, digitally integrated and scalable system to support information generation, use and exchange within the SICA system, which is co-developed with stakeholders from the regional level (CA-COF) through to the meso (LTACs) and local level (e.g., extension services, farmers).

At a regional level, NextGen forecast system (IRI, 2020) is incrementally adopting. As NextGen is now operational in Guatemala, we advanced into the mainstreaming and adoption of the system. Through the CA-COF, NextGen capacities have been built in all SICA countries, therefore allowing the generation of a consistent and high-performance climate outlook with local relevance but regional coverage. In parallel, through the capacity building in specific sessions of the CA-COF, we advanced towards the integration of the regional climate forecast to crop modeling to produce more tailored agronomical recommendations which are disseminated through a regional agroclimatic bulletin (in coordination with CAC and CRRH), while at the same time establishing a regional agricultural discussion group (RADG). The RADG now meets every CA-COF, producing agronomic recommendations that are then scaled down to local levels.

At mesoscale, IRI-CCAFS scientists and regional and national partners have scaled out Local Technical Agroclimatic Committees (MTA), to co-produce, translate and transfer climate information to enable agricultural decision making. An outcome harvesting study shows that knowledge democratization, understanding and connection of agroclimatic information, and political advocacy are three transformations that have occurred as a result of this work (Giraldo-Mendez, et al, 2020). This required CCAFS scientists to form strategic alliances with the national governments to facilitate national-level coordination on CRM with 170+ other institutions (farmer organizations, the private sector), to deliver timely and accurate agroclimatic information to users. These CRM approaches bridge across scales, with MTAs connecting directly and tailoring the outputs of the CA-COF to the local context, while at the same time generating local recommendations and capacities in support of decision making for local organizations, extension agents, and farmers, and feeding back local needs to the regional scale.

As a result of democratizing climate knowledge, decisions on farming practices and productive assets are made by farmers on the basis of climate information at the local scale. According to the investigation, it is estimated that 40% of the producing families that receive information from the LTACs effectively try to transform their practices (Giraldo-Mendez, et al, 2020). Participatory climate services for agriculture (i.e., PICSA) are key here providing inputs to make better-informed decisions about agricultural practices in a changing climate through the use of locally contextualized agro-climatic information. PICSA has proven to be a very successful mechanism to travel the "last mile to the producer" by providing climate information adapted for its use and allowing it to make a timely decision to mitigate its risk. Integrating the diverse knowledge of the farmers and stakeholders favors the concretion of abstract knowledge (climatology) in the concrete reality (agricultural productive practices). We have carried out successful processes with PICSA in the Climate-Smart Villages (CSV), which serve as 'living laboratories' to generate greater evidence of the effectiveness of CSA in a real environment.



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