Scoping study brief – State of Climate Information Services in East Africa

Introduction[1]

This brief presents the findings of a scoping study on climate information services in East Africa, conducted as a requirement for the Climate Resilient Agribusiness for Tomorrow (CRAFT) Project, under Work Stream 4 on Enabling Environment for Climate-Smart Agriculture (CSA). The purpose was to ascertain the status of climate information services under the ambit of CSA in each of the three East African countries.

Background information

Rainfed farming systems in East Africa are increasingly impacted by increased climate variability occasioned by climate change, manifesting in the form of droughts, dry spells, floods, excessive rains, storms and heat/frost waves among others. Climate modeling studies indicate that temperature rise is affecting and will continue to affect rainfall patterns both spatially and temporally[2], with significant adverse impacts on agricultural production, leading to the risks of crop failure and food security. Climate change is projected to continue to impact overall crop yields negatively by as much as 5 – 72% in East Africa, averaging @24.3% (SNV 2017, p.8)[3]. Adverse weather conditions also directly affect agricultural marketing systems, leading to the risks of market instability and food price volatility. It may also lead to disruptions in trade, supplies, sales and income.

Methodology

This scoping study was conducted to establish the status of index-based agricultural insurance in East Africa. The study targeted climate information scientists, end-users and intermediaries. The study involved identification of opportunities, gaps and barriers to delivery of climate information services (CIS) in agriculture in Kenya, Tanzania and Uganda. Data was collected through desktop reviews, key informant interviews, focus group discussions and semi-structured questionnaires. Multi-Criteria Analysis (MCA) was used to prioritize the pipeline strategies listed for consideration – to get a sense of their potential to be addressed. Categories of respondents interviewed included academia, financial institutions, government departments and agencies, insurers companies, regulators, meteorological departments/ agencies; NGOs/ CSOs/ CBOs, private sector (social, commercial etc.), projects, and research organizations among others.

Findings

Several CIS pilot projects have been implemented in East Africa with a view to preparing for CIS uptake. Data for generating climate information are sourced mainly from satellite and manual weather stations, with automated weather stations also gaining currency lately (Figure 1-1a). Kenya relies more on manual weather stations for most of its data than other sources while Tanzania relies almost equally both on satellite and automated sources than manual Figure 1-1b). Uganda is reported to rely more on satellite sources than the other sources.

Potential for Climate Information Services

Findings show improvements in climate forecasting capabilities in East Africa, but the gap between climate services and climate information application is still wide. Available reports show that national level actors often prepare general forecasts and issue general alerts and notifications to all areas. FGD findings with CCAFS Climate Smart Village (CSV) groups tend to confirm the usefulness of awareness creation. About 73% of the users reported using CIS information (Figure 2), up from 27% – 54% in 2011 (Mango et al., 2011). All users interviewed need CIS for planning all farming operations. All users agree there is a role for indigenous technical knowledge (ITK) in climate information applications. Reasons users give for using or not using different sources of weather information are presented in Table 1. About 64.29% of the respondents gave favourable (+) comments on why they choose indigenous weather sources. Only 16.67% of those who rated scientific weather forecast gave it a positive (+) reason, meaning the scientific forecast has very few positives for them currently. About 87.5% of those who rated both methods gave a positive (+) comment, indicating that combining both methods carries more favour with the users.

Figure 1-1a: Extent of data sourcing by technology

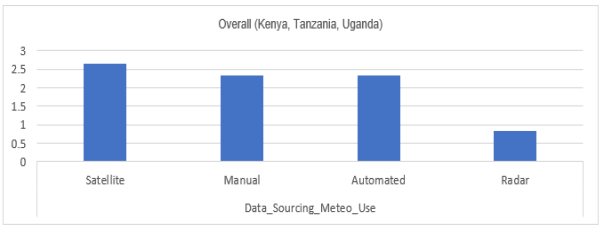

Figure 1-1b: Extent of data sourcing by country

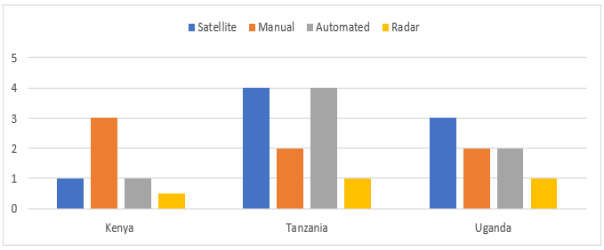

Figure 1: Extent of data sourcing for the meteorological agencies use in the country

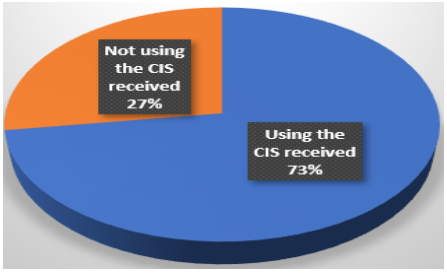

Figure 2: Proportion of the farmers and other actors using the CIS information they receive

[1] This brief has been prepared by CGIAR Research Program on Climate Change, Agriculture and Food Security as a contribution to the CRAFT project
[2] IPCC Assessment Reports (from the 1st to the 5th)
[3] SNV 2017 = CSA-EA Project Document

Table 1: FGD Reasons for CIS Rating

#	Indigenous weather prediction information	Scientific weather forecast information	A combination of both indigenous and scientific forecast information
1.	0: Only moderately helpful	-Not telling the exact time	+Helps in planning planting time
2.	+Easy to know	-Not having a radio	+Helps 100%
3.	+Planting month is known traditionally	+Common in radios	+Helpful to blend the information
4.	+They get info from the elderly	-They (the weather people) are not seen	-Not having chance to get the combined one
5.	+Grandmother was an expert on weather ITK	-They don't access the information	+Most reliable
6.	-Comes late	-They get it free of charge	+Good combination of what is readily available and what comes from media
7.	-Is not specific	-Comes late	+Indigenous can be used as reference to compare with scientific
8.	+Shows signs when it will rain in a particular place	+Regularly available	+More reliable
9.	+It is readily available in nature	-Access not easy	
10.	+Easy to predict	-No access	
11.	-Not reliable	+Very reliable	
12.	+Seeing is believing	-Not very accurate	
13.	+Easy to understand, because related to visible nature		
14.	- Not available		
Summary	0=1; +=9; -=4	0=0; +=3; -=9	0=0; +=7; -=0

Note: Indigenous climate information sources score more positive reasons and less negative reasons than conventional sources. The blended model scored only positive reasons.

Community rating of various important (or appropriate) channels for delivering climate information and advisory services showed that local radio stations, NGOs, CBOs and farmer organizations were the most preferred, followed by national radio stations, Government extension officers and mobile phones SMSs (Figure 3). The channels farmers least prefer include bulletins, emails, websites and magazines among others.

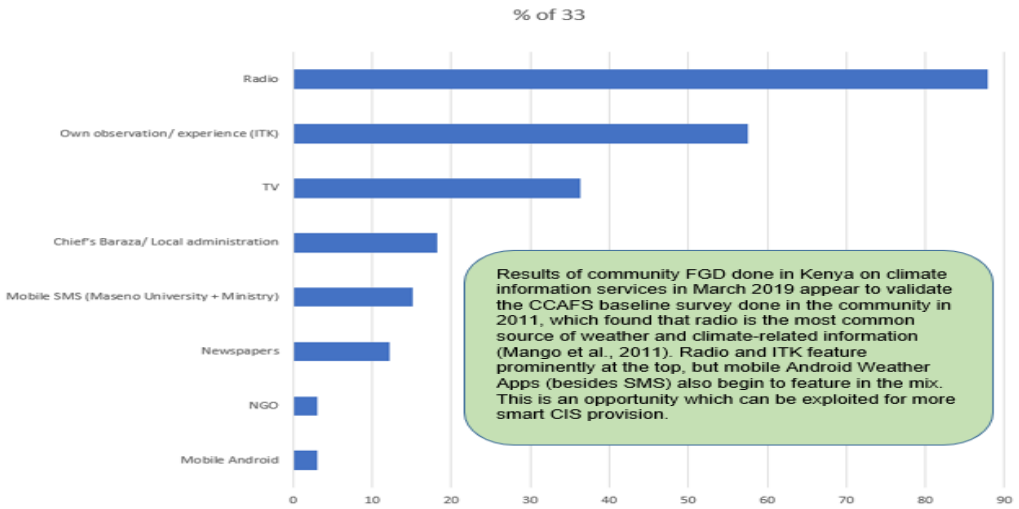

Figure 3: Channels through which farmers & other actors currently receive climate information

Kenya: Potential – found in the Meteo Officers	Tanzania: Potential	Uganda: Potential
Among the plans Kenya Meteorological Department (KMD) will implement are: • Modernize KMD climate information systems and services. • Develop County Climate Information Service Plans (CCISP). • Expand the collection network and weather observing systems • Strengthen the capacity of County Directorates of Meteorology • Initiate a partnership to engage traditional weather forecasters • Support the unpacking of meteorological language and the translation of downscaled climate information into Kiswahili and local languages	Tanzania Meteorological Authority (TMA) is focusing available resources on refining and improving seasonal forecasts, in collaboration with key national universities (Sokoine and Dar es Salaam) and other partners. It is hoped this effort will lead to enhanced climate information and insights into what it means for long term planning	Uganda National Meteorological Authority (UNMA) has tried commercialization through revenue sharing with Mobile telecom companies from weather forecast requests for specific towns. However, this commercialization innovation has not gone to scale. Besides, UNMA has also implemented a project on "Meteorological Support to Plans for Modernization of Agriculture (PMA). They also provide user-tailored information mainly for construction and insurance companies.

Gaps in Climate Information Services

Findings show high exposure to climate hazards among farmers but with low capacity to address impacts through climate information services. Currently implementation of climate services tends to rely on projects or *ad hoc* decisions, with no clear mechanisms to institutionalize the pilots past their funding dates. Further, climate information as currently available in East Africa is inadequate, imprecise, incomprehensible and mostly unreliable. Rainfall information is mostly provided in probabilities while farmers want the information in quantities. In the absence of reliable conventional weather information, many farmers resort to indigenous climate knowledge to fill the gaps. Some communities get climate information, mostly through the media, but most do not know how to act on the information received as it is often either too general, full of jargon or does not just represent the situation prevailing in their area. Majority of users interviewed trust traditional knowledge more than official weather forecasts. Currently there are weak mechanisms for collecting information on climate risks to help tailor the subsequent content.

Kenya: Gaps	Tanzania: Gaps	Uganda: Gaps
• Underinvestment • Poor infrastructure • Deficient services • Low visibility • Insufficient funding • Uptake and access have been limited at the local level	• Climate models used in Tanzania are not downscaled to subnational levels, and the meteorological • Climate information is "useful" to lower level actors, but the info often arrives too late for planning • Climate information products from TMA are not distributed automatically, but on request • Decision-makers rarely use long-term climate information for planning, citing its "uncertainty"	• Capacity of UNMA to implement mass awareness campaign limited • Although UNMA works with IGAD Climate Prediction and Applications Centre (ICPAC), ICPAC helps only up to national level climate information. UNMA cascades (***not downscales***) to lower levels but capacity is low. UNMA translates climate forecasts into local languages, then disseminates downwards through local climate champions, but the dissemination process is essentially a one-way process, without critical provisions for effective interaction/feedback. UNMA tries to solicit feedback from end-users, but the effort made is not enough to get comprehensive feedback • UNMA observes that "climate service" has no direct indicators to measure effective use – which can be used to gauge performance of climate information service providers in agriculture. • Limited participation of the private sector

Barriers to Scaling Resilient Climate-Smart Investments in Agriculture

Some barriers to CIS in East Africa arise from communication gaps among climate experts, stakeholders and end-users, e.g., jargon language limits forecast understanding and interpretation. Users need information that give quantities, but forecasters give probabilities, not quantities, of national forecasts, generalizing the situation about perceived homogenous regions or a wide range of areas. Farmers find generalized forecasts not usable for local decision-making, even if the information is in a useable format. Other barriers include reinforced "producer supply-user demand" capacity constraints. Producers are sometimes unable to scan the boundaries of climate science to deliver innovative solutions if they don't have the right tools. Users cannot articulate demand for potentially useful products or services they have had limited experience with or have not yet been exposed to. Another constraint is the mismatch between tailoring and scaling in the choice of communication channels to deliver climate services. The face-to-face participatory processes that are found to be effective at pilot scale do not work at scale. Broadcast media, which is found to be most preferred, can reach many receivers at relatively low cost but broadcasts do not necessarily reach all targeted users and cannot provide context-relevant content. Although the efforts have been made to improve the processes, much of this effort has focused more on applying the communication processes to the traditional CIS products the providers routinely generate, rather than on working to tailor the information they provide to the known needs of users.

Kenya: Barriers	Tanzania: Barriers	Uganda: Barriers
• Limited funding • Silo mentality • Limited capacity • Unusable information • Scientific jargon	• Agricultural sector actors struggle to interpret climate info from TMA • Inadequate capacity • Inadequate delivery models	• Inadequate dissemination mechanism/ delivery model • Silo mentality – actors working separately • Limited trust with UNMA's CIS products – not only with end-users but also with value chain decision-makers– who are supposed to allocate funds for CIS. • Insufficient awareness about the importance of weather and climate information. • Liabilities that accrue from uncertainties in the forecasts (to discuss)

Implications of the Findings for Climate Information Services Policy

The findings of this study underscore the communication gaps that exist between producers and users of climate information. Gaps exist in knowledge, relevance/ needs[4], format, precision and usability of climate information, even for the information that is already available. This study has described the current situation with regards to CIS provision in East Africa (Kenya, Tanzania and Uganda). Findings show that precision and reliability of CIS has increased as a result of technological advance, pilots and capacity building. However, description of current situation in all three countries generally illustrates the usual conventional linear supply chain for climate/weather information (*data>information>product>user>application*), without understanding whether the information is useful for decision-making. Co-production is also increasingly considered important, but there is still uncertainty about how co-production processes should be designed and implemented. The climate information available currently, even from co-production, is not tailored enough to be useful to many potential users. Interrogation of good practice for CIS shows that demand-driven weather information products are offered mainly by private service providers but can be more viable through public-private partnerships (PPP). The market for CIS is already growing, through PPP, but not yet well-established in East Africa. This PPP arrangement needs to be explored, adapted and adopted in CRAFT.

Unpack the User Interface of the GFCS

Unlock the GFCS user interface (Figure 4) through downscaling, interactive participation and feedback loops to strengthen the provision of CIS. There is increasing need to unpack the user interface in order to come to a common understanding between producers and consumers. There is a policy of decentralization across the three countries, but a policy on CIS downscaling is urgently needed, because currently decentralized units mainly disseminate national level climate information as given, which is not relevant to lower level users. If a policy on downscaling is put in place, it should include the issue of sub national level budgeting for downscaled CIS.

[4] Study findings show that the most important climate information growers need is timing of rainfall onset, likelihood of extreme events (drought, floods), intra-season distribution of rainfall, and timing of rainfall cessation. Informants emphasized that users need this information with a longer lead time than is currently the case, and be more relevant to local scale, which is also not the case at the moment. They also want this information to come with corresponding agricultural information that is "actionable (i.e. decision options to choose from)", which again is currently not the case

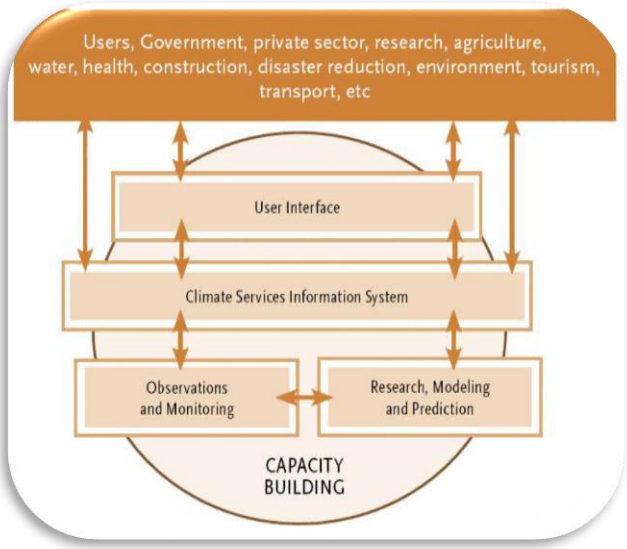

Figure 4: Component pillars of the Global Framework for Climate Services
Source: WMO, 2014 (GFCS)

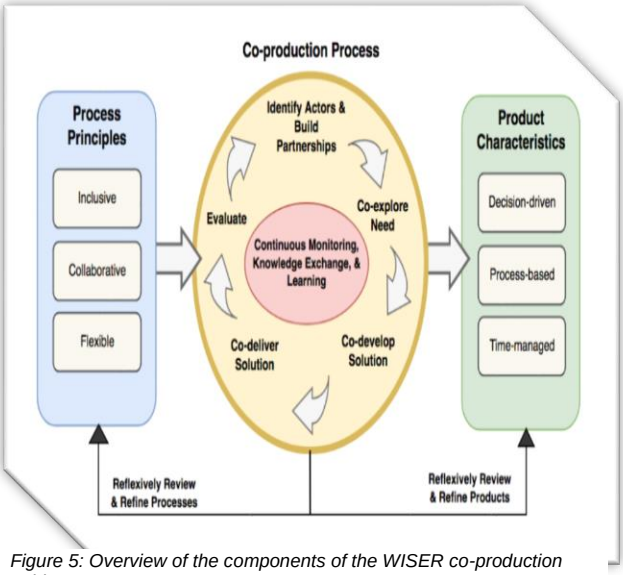

Figure 5: Overview of the components of the WISER co-production guidance
Source: Met Office (2017)

Adopt Co-Production of Climate Information

This felt need to unpack the user interface calls for co-development of climate information (Figure 5) through a public-private-community partnership (PPCP). Issues of timeliness of access and clarity of understanding of CIS messages still pose serious question marks. End-user demand requires at least one month, yet meteorological capacity can only do a lead time of two weeks at best.

Address the Issue of Market Failure in the Climate-Credit-Insurance Triangle

Lastly, a model is needed to address the issue of market failure in the climate-credit-insurance triangle, a model that increases transparency in the process[5]. Transparency improves distribution and information flow by increasing consumer education to improve market behavior. The market will always fail to work if actors (producers and consumers) are misinformed about the products. Since index insurance and agricultural credit rely heavily on climate information, a good point to include cost of associated climate services is to bundle part of it in the cost of premium and cost of credit. The cost of credit or the price of premium therefore should go down for the targeted clients because the services have been de-risked by provision of climate information. Part of the cost of that climate service should be borne by the public sector partners as a social/public cost in a PPP Framework. Private sector partners should work hand in hand with public sector counterparts on this model to: 1) Design an agro-climate-risk scoring tool, to help lenders assess climate risks before offering credit (currently there is no scoring on climate risk for credit); 2) Using Insurance: Banks really want to lend but risks are too high. A package of insurance makes the banks comfortable. 3) Design a sandwich training program that bundles credit and insurance content and load other needs users propose.

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Project information
The Climate Resilient Agribusiness for Tomorrow (CRAFT) project (2018 - 2023), funded by the Ministry of Foreign Affairs of the Netherlands, will increase the availability of climate smart foods for the growing population in Kenya, Tanzania and Uganda. The CRAFT project is implemented by SNV (lead) in partnership with Wageningen University and Research (WUR), CGIAR's Research Program on Climate Change, Agriculture and Food Security (CCAFS), Agriterra, and Rabo Partnerships in Kenya, Tanzania and Uganda

For more information
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[5] Insurers and creditors have a tendency not to provide enough information because, during a market transaction, it may not be in their interest to provide full information to the clients. The market will fail by not supplying the right product or the right quantity of the product, or not provide at the right time