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Workshop Report: Scaling Up Climate Information Services for Farmers and Pastoralists in Tanzania through ICTs and Rural Radio

April 2015

Harneet Kaur, Arame Tall, Sixbert Mwanga, and Juvenal Kisanga

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Scaling Up Climate Information Services for Farmers and Pastoralists in Tanzania through ICTs and Rural Radio, Dar es Salaam on 27-28, April 2015

GFCS Adaptation Programme in Africa

Workshop Report

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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Front cover photo by J. Majura/MAFC, Tanzania

Abstract

Under the auspices of this GFCS Adaptation Programme in Africa, the World Food Program (WFP) and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) co-organized a two-day ICT and Radio Stakeholders' Consultation Workshop in Tanzania to define a nationally appropriate strategy for scaling up climate information services for farmers and pastoralists in Tanzania through ICTs and interactive rural radio. This national ICT and radio consultation workshop brought together 28 participants representing government MDAs, non-governmental organizations (NGOs), UN agencies, academic and research institutions, farmer based organizations, and telecom operators to brainstorm best options to streamline delivering tailored climate information to end users. The two-day workshop was held in Dar es Salaam on 27-28, April 2015.

The workshop began with a brief overview of the objectives, methodology, and key recommendations from each study. This was followed by a summary of important findings, and then a question-and-answer session in which participants agreed with the key recommendations and overall findings. Participants were introduced to a draft information flow model that includes three important components: production, delivery and feedback. The plenary session gave participants room to share feedback from discussion groups. Final consensus was built on the role of each stakeholder and type of intervention needed on the ground in the short- and longer terms to enhance the delivery of climate information services for farmers and pastoralists in Tanzania. The model derived from this workshop gives a clear picture of the information flow needed to communicate agro-advisories and other climate information services at a large scale in the country. The model has three important components: the production side, delivery side, and feedback side. Particular stakeholders and technological interventions were identified for each of these components. Successful stories from India and Africa, that are relevant to the Tanzanian context, were presented to strengthen the discussions. These case studies prompted discussions on the financial sustainability of the business models, and triggered the idea to adopt similar innovations in Tanzania.

Going forward, workshop participants built a consensus to adapt a business model in the next steps of GFCS programme implementation. WFP, CCAFS, and other partners intend to

conduct further consultations sector-wide (production side, delivery side, and feedback side) in relation with GFCS activities. WFP and CCAFS will strive to scale up climate services to other areas and will continue working with partners on farmers' needs. The follow up plans are divided into the three important components of the business model, the production, delivery, and feedback. Follow-up must address several challenges, including: limitations of human and financial resources, private sector engagement, ensuring timely delivery of quality climate information in target areas, and technical challenges to delivering climate information.

Workshop participants agreed on several recommendations. First, broaden the participation of other relevant stakeholders such as radio stations (national and community); telephone operators such AIRTEL, VODACO, TIGO, and ZANTEL; private sector; media; and NGOs. Second, strengthen available ICTs and rural radio channels so that they can operate effectively. Third, scale up climate services to other areas within the target districts and continue working with partners on farmers' needs. Fourth, weather information should be in a simple, understandable, and local language before being sent to farmers. Fifth, districts should include climate change factors during the planning process, and appoint a climate change focal person. Finally, involvement of other types of media, apart from radio, in order for the project to scale up.

The workshop concluded that Tanzania still needs to strengthen its structure for delivering climate services to reach many farmers and pastoralists. For producing tailored climate information for the end users, important stakeholders like the TMA, MAFC, MLFD, research institutions, academic institutions, farmers organizations, NGOs, etc., should coordinate their efforts. For the delivery structure, it was discussed that the private sector, including radio and mobile operators, should be actively engaged in building up radio community clubs and ICT solutions to scale up climate information services for the end users.

Keywords

Climate Services; ICT; Radio; Tanzania.

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We would like to thank Sheila H. Rao (FRI), Bart Sullivan (FRI) and Nilesh Mishra (ICRISAT) for presenting the case studies on successful radio and mobile interventions to upscale climate services and also to facilitate overall workshop along with CCAFS and WFP. The organisers also would like to thank all national stakeholders who took part in the workshop, and contributed to development of a nationally appropriate strategy to scale up climate services communication through ICTs and rural radio in Tanzania. We are grateful to James Hansen and Mea Halperin for providing their reviews and helping in finalizing this report.

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Acronyms

APN	Access Point Name
CICERO	Centre for International Climate and Environmental Research – Oslo
CMI	The Chr. Michelsen Institute
FAO	Food and Agriculture Organization
FEWS NET	Famine Early Warning Systems Network
FRI	Farm Radio International
GFCS	Global Framework for Climate Services
ICRAF	World Forestry Centre (ICRAF)
ICRISAT	International Crop Research Institute for Semi- Arid Tropics
ICT	Information and Communication Technology
IFRC	International Federation of Red Cross and Red Crescent Societies
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MLFD	Ministry of Livestock and Fisheries Development
MoHSW	Ministry of Health and Social Welfare
NGO	Non Governmental Organizations
PDT	Project Delivery Team
PMO-RALG	Prime Minister's Office – Regional Administration and Local Government
SARI	Selian Agricultural Research Institute
SMS	Short Message Service
SUA	Sokoine University of Agriculture
TBC	Tanzania Broadcasting Corporation
TCRA	Tanzania Communications Regulatory Authority
TMA	Tanzania Meteorological Agency
TRCS	Tanzania Red Cross Society
TV	Television
UNDP	United Nations Development Program
UDSM	University of Dar es Salaam
USSD	Unstructured Supplementary Service Data
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization

Introduction

The GFCS is a global partnership of governments and non-governmental organizations that produce and use climate information and services. It seeks to enable researchers, producers and users of climate information to join forces to improve the quality and quantity of climate services worldwide, particularly in developing countries. The aim of the GFCS is to foster better management of the risks society faces from climate change as well seizing opportunities to adapt and thrive.

The goals of GFCS are (1) reducing vulnerability to climate-related hazards through better provision of climate services; (2) advancing the key global development goals through better provision of climate services; (3) mainstreaming the use of climate information in decision-making; (4) strengthening the engagement of providers and users of climate services; and (5) maximizing the utility of existing climate service infrastructure.

One GFCS programme funded by the government of Norway is a three-year project being implemented in Tanzania and Malawi focused on agriculture and food security, health and disaster risk reduction. It is being implemented by a partnership of seven different international agencies and research institutes including: the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS); Centre for International Climate and Environmental Research – Oslo (CICERO); the Chr. Michelson Institute (CMI); International Federation of Red Cross and Red Crescent Societies (IFRC) including the Red Cross national societies of Malawi and Tanzania; the Norwegian Red Cross and Red Cross/Red Crescent Climate Centre; World Food Programme (WFP); World Health Organization (WHO) and World Meteorological Organization (WMO).

In 2014, the GFCS project conducted two scoping studies to identify the needs of rural farmers and the potential for rural radio and ICTs to scale up tailored climate services for millions of farmers and pastoralists in their countries. The first study focused on the potential for ICT to reach farmers at a large scale and to enable two-way communication (Guntuku et al. 2015), while the second study unveiled the role of rural radio in reaching farmers in marginalized areas and strengthening local capacity for demanding relevant services through interactive radio (Hampson et al. 2015).

As a follow up to the study findings, and under the auspices of this GFCS Adaptation Programme in Africa, the WFP and CCAFS co-organized a two-day ICT and radio Stakeholders' Consultation Workshop in Tanzania to define a nationally appropriate strategy for scaling up climate information services for farmers and pastoralists in Tanzania through ICTs and interactive rural radio.

This workshop strategically aimed to (1) review and validate the key findings from baseline and ICT- radio scoping studies on farmers and pastoralists' climate and agro-advisory information needs in Tanzania; (2) analyse current critical gaps in climate and agro-advisory information delivery at a large scale for farmers using ICTs and rural radio (Coulibaly et al. 2015); (3) brainstorm best possible technological (SMS, Beep4Weather, Phablets, GreenSim) and programming (interactive radio stations and advisory programs) options to address the gaps identified during the scoping studies; and (4) validate and develop a consensus on an information flow model for scaling up climate services for millions of farmers in Tanzania using ICTs and radio, with clear roles for national stakeholders and private sector partners.

This national ICT and radio consultation workshop brought together 28 participants representing government MDAs, non-governmental organizations (NGOs), UN agencies, academic and research institutions, farmer-based organizations and telecom operators to brainstorm best options to streamline delivering tailored climate information to end users. The two-day workshop was held in Dar es Salaam on 27-28, April 2015.

Workshop Proceedings

Opening speech and presentations

The opening speech and official opening was done by Dr. Ladislaus Chang'a who is a PDT chair based at the TMA. Dr. Chang'a emphasized that the IPCC AR5 has shown that in Africa there is huge gap in climate information (especially availability, accessibility and even usage). He further pointed out that the GFCS project is in line with global climate services needs, and that it and workshop are important to national policies and strategies to ensure that climate information services are available and accessible for those who need it.

After an official opening the keynote address was given by Jerry Bailey, Deputy Director of the WFP Tanzania office. He said that in the long term, WFP was not concentrating on climate change issues but climate change incidences have increased, significantly calling for quick interventions. In Tanzania the population growth is significant relative to food production speed, while climate change is jeopardizing efforts to produce more food. It is high time that ICT technologies are used to increase food production for the ever-growing population.

Findings from baseline and scoping studies

A brief presentation touching upon the objectives, methodology and key recommendations from each study was presented at the beginning of the workshop followed by a presentation on the summary of important findings relating to (1) climate risks to agricultural productivity as perceived by farmers and pastoralists, (2) analysing any gaps in the available information, (3) types of information needed and provided, (4) preferred sources of communication, (4) necessary information lead times, (5) recommendations for strengthening communications, (6) production of climate information services, (7) delivery of climate information and agriculture advisory through proper communication channels, and (8) assessment of the value of climate information provided to the farmers. The presentation was then followed by a question-and-answer round, wherein participants seemed to agree with the key recommendations and overall findings. Participants were informed that the WFP had recently conducted a stakeholders' consultation workshop in Tanzania to broadly discuss climate services for the food security component, and challenges and opportunities existing in the current structure.

The outcomes from this previous consultation workshop were (1) there is limited capacity for the Met agency to produce location-specific forecasts; (2) misinterpretation of information given to the end users reflects the capacity deficit of extension staff and volunteers; (3) the need for a comprehensive mixed-delivery method including radio, mobile, TV, publications, extension workers and volunteers was recognized. Important channels noted are meetings, trainings and workshops; (4) coordination in and among the stakeholders involved in the process of delivering climate information services to the small holder farmers and pastoralists is required; (5) the timeliness and accuracy of the climate forecast are desired; (6) the lack of trust among the end users regarding the scientific information received was noted in the

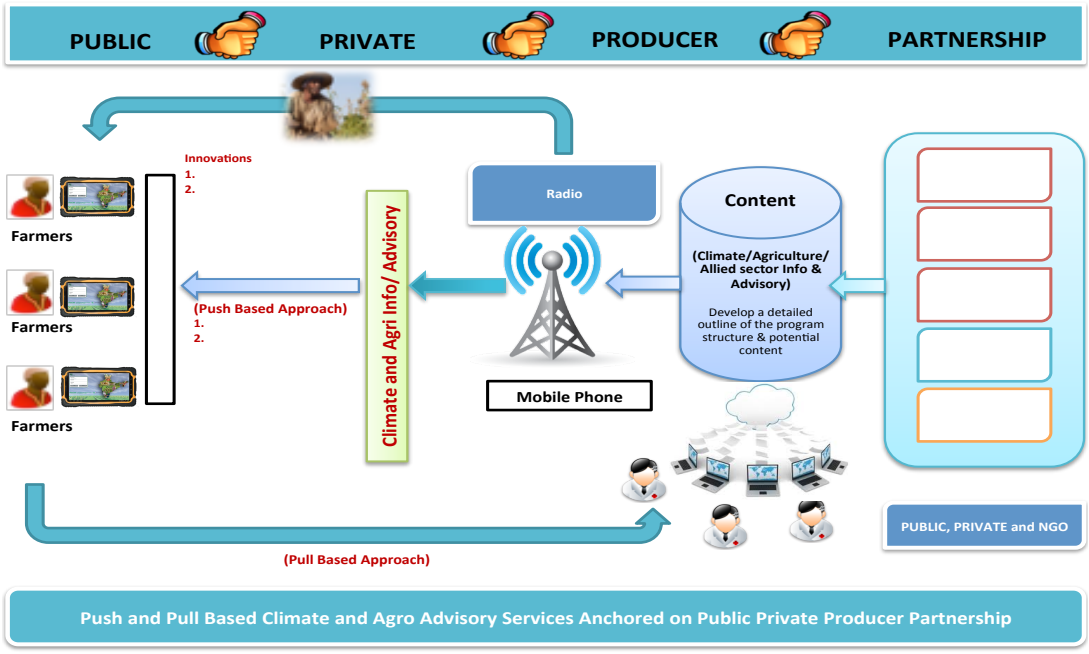
discussions; and (7) addressing the needs of vulnerable groups was presented as a cross cutting issue, which requires empowering women and youth to uptake climate information.

These outcomes from the previous WFP workshop correlate with the findings of baseline and scoping studies that CCAFS conducted in Kiteto and Longido, the pilot project sites in Tanzania. Hence, the need to discuss a business model to deliver tailored climate services to the end users and to capture their feedback to improvise content was strongly advocated.

Building a model for communicating climate services with farmers

Participants were introduced to a draft information flow model (Figure 1), which includes three important components: content packaging (production and supply side), communicating (message delivery side) and pulling the information back from end users (feedback side). Workshop participants were then divided into three groups to discuss content development, message delivery and user feedback components of the model. Group discussions focused on validating these components and populating the proposed blank model, with a special emphasis on national priorities and the capacity of proposed stakeholders to serve a role under each component.

Figure 1: Push-and-pull-based climate and agro-advisory services model based on public-private producer partnership - blank model used for group work



Plenary Discussion

The Day 1 plenary session gave participants room to share feedback from the discussion groups. Final consensus was built on the role of each stakeholder and type of intervention needed on the ground, in the short and longer terms, to enhance the delivery of climate information services for farmers and pastoralists in Tanzania. The model derived from this workshop gives a clear picture of the information flow needed to communicate agro-advisories and other climate information services at a large scale in the country.

Successful ICT cases and model adoption

Day 2 of the workshop started with a recap on what transpired on day 1. To strengthen the discussions on leveraging the power of ICTs and rural radios to reinforce the delivery component of climate information services, successful stories from India and Africa were presented, tying in the context with Tanzania. Participants seemed to relate to these successful stories and engaged in a question-and-answer session with the FRI and ICRISAT presenters to learn more about the business model and their practical and financial feasibility. The FRI explained how successful initiatives like Beep4Weather grew from interactive radio, a combination of rural radio with mobile technology. Similarly ICRISAT presented success stories of ICT innovations like GreenSIM and Green Phablet from India. These successful case studies not only stirred up discussions about the financial sustainability of the business models but also triggered the idea to adopt similar innovations in Tanzania. Participants articulated their interest in learning more about such technological innovations and expressed that such ICT and radio-based initiatives could be a potential mode of communicating climate information to farmers.

Workshop Outcomes

Adapting the model to needs in Tanzania

The model highlights the stakeholders involved in Tanzania who are involved with the production of climate information services and enhance communication between the end users and producers. In addition to mapping stakeholders, the model pinpoints the necessary initiatives required to augment and facilitate the dissemination of tailored climate services to the millions of farmers and pastoralists in Tanzania.

Production: developing tailored climate information services

Participants discussed the content packaging component of the business model, highlighting few challenges. It was pointed out that in the current structure of content development the agromet advisory information generated is often too long and incomprehensive. The seasonal forecast provided is usually based on zones rather than downscaled location-specific forecast information. The agromet bulletins developed by TMA and MAFC are sent via email to the extension workers, but given extension agents' limited access to the Internet, information in these bulletins does not reach them all. Moreover, in some cases, the language used in these bulletins is English instead of Kiswahili, the language spoken by majority Tanzanians, including extension workers. To address this problem members discussed the first step of a production- side business model and agreed that that engaging stakeholders from different sectors is important (Table 1). It was conferred during the workshop that coordination among and within organizations is the key to producing desired climate services to impact farmers' decisions. Hence, strengthening the existing units is important to ensure such advisories and information is integrated in their coordination mechanism (Figure 2). The strengthened coordinating unit should have representation from all the potential stakeholders identified to facilitate development of potential tailored content for climate, agriculture and allied sector information and advisory.

Figure 2: Production-side business model, potential stakeholders enlisted and establishment of a 'Coordination Unit' for content development.

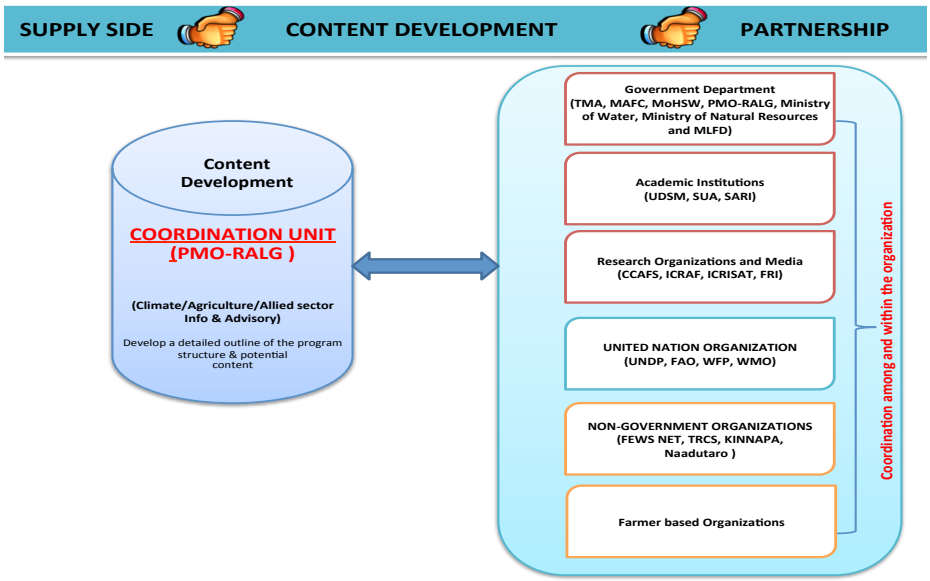


Table 1: Stakeholders identified for production of tailored climate information and agro-advisory across different categories

Categories	Stakeholders	Roles
Government Ministries/ Departments	Tanzania Meteorological Agency (TMA)	TMA's role is to produce seasonal downscaled forecasts while MAFC needs to ensure that advisories to the farmers are reached in user-friendly manner. Other ministries need to ensure advisories on relevant sectors.
	Ministry of Agriculture, Food Security and Cooperatives (MAFC)	
	Prime Minister's Office – Regional Administration and Local Government (PMO-RALG)	
	Ministry of Water	
	Ministry of Natural Resources and Tourism	
	Ministry of Livestock and Fisheries Development (MLFD)	
	Ministry of Health and Social Welfare (MoHSW)	
Academic Institutions	University of Dar es Salaam (UDSM)	Universities need to collaborate with ministries to package the content in a comprehensive fashion.
	Sokoine University of Agriculture (SUA)	
	Selian Agricultural Research Institute (SARI)	
Research Organizations and Media	CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)	Media and research organizations must work on communicating information on the seasonal forecast advisory.
	World Forestry Centre (ICRAF)	
	International Crop Research Institute for Semi- Arid Tropics (ICRISAT)	
	Farm Radio International (FRI)	
UN Organizations	United Nations Development Program (UNDP)	UN-based organizations need to develop the capacity of the met agency and extension systems to ensure delivery of tailored information.
	Food and Agriculture Organization (FAO)	
	World Food Programme (WFP)	
	World Meteorological Organization (WMO)	
	World Health Organization (WHO)	
Non - Governmental Organizations (NGOs)	Tanzania Red Cross Society (TRCS)	NGOs must provide information from the ground-up on whether the seasonal forecast was accurate and useful to farmers. They also need to encourage confidence in scientific information among farmers and pastoralists.
	Famine Early Warning Systems Network (FEWS NET)	
	KINNAPA	
	Naadutaro	
Farmer-Based Organizations		FBOs need to mobilize farmers to use advisories.

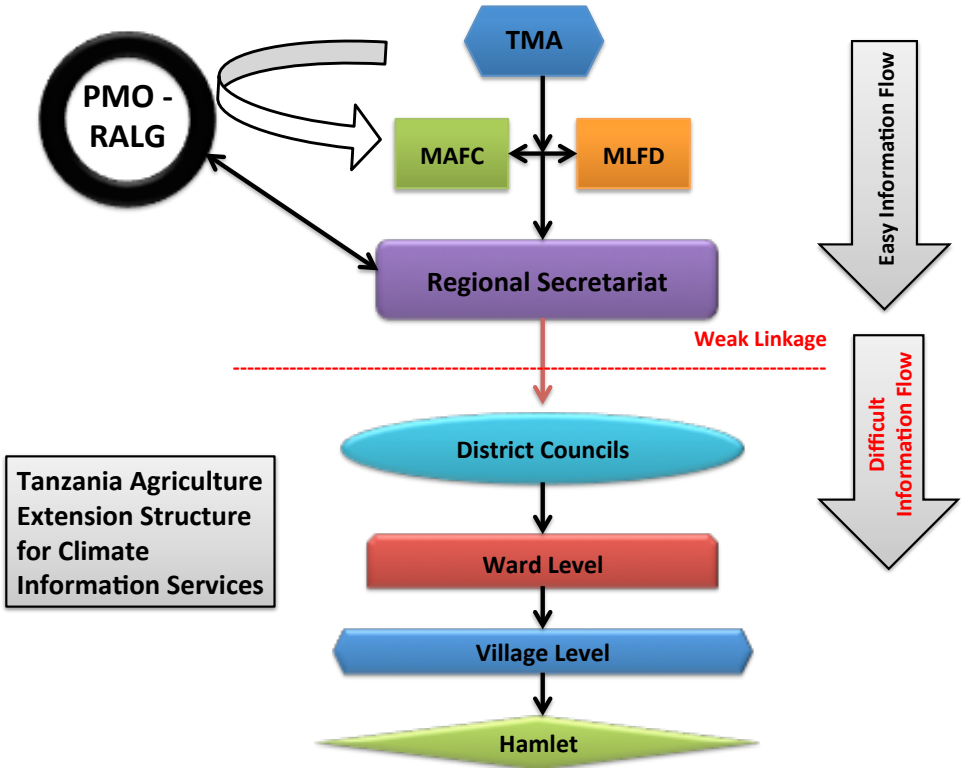
Delivery: communicating through ICTs and rural radio

Participants discussed potential delivery channels and initiatives needed for scaling up climate services for the farmers and pastoralists in Tanzania. A significant challenge in the existing

system was the limited reach of government extension systems. Moreover, most agricultural extension workers are unskilled in climate-related knowledge.

Agricultural extension in Tanzania is not only a multi-layer system of information flow but also has complex relationships and weak linkages within layers (Figure 3). After the TMA produces the forecast information it passes through PMO-RALG and MAFC to the regional secretariat. However, from the regional secretariat to district council, the information does not flow in a timely fashion. Thus the penetration of information gets difficult from region to district to ward. Nevertheless, once information is reached at the ward level, it becomes easy to flow through the village level to reach the hamlets.

Figure 3: Relationships between different levels of agricultural extension system in Tanzania, as discussed in the workshop.



Additionally, the literacy rate of farmers is a big challenge, imposing language barriers for the information to reach to the last mile. Hence, leveraging the power of ICTs seems to be a good option for scaling up climate services in Tanzania. The stakeholders identified for this particular segment of the business model are potentially the mobile operators, radio stations and the communications regulatory body (Table 2).

Table 2: Stakeholders identified for delivery of tailored climate information and agro-advisory in Kiteto and Longido

Categories	Stakeholders
Radio Stations	Tanzania Broadcasting Corporation (TBC)
	Radio Free Africa
	Radio Sauti ya injili
	Laramatak (Longido) Radio
	Farm Radio Trust (FRT)
Mobile Operators	Airtel
	Vodacom

In addition to mapping the potential stakeholders, some impending ICT and radio initiatives were identified which focus on the push mechanism of the business model. The fundamental question was how the right information can be pushed to the farmers. To build upon the recommendations for the delivery channel, we must explore any existing initiatives, which need to be scaled up. The recommendation for the delivery component was made on three platforms: extension system, mobile-based intervention and radio-based intervention, explained below.

Although there are bottlenecks in the existing agriculture extension structure, it cannot be denied that the extension system is an important part of delivering climate information series. In order to strengthen the extension system and overcome the gaps it was recommended that training agriculture extension staff and lead farmers on climate information services should be undertaken on a frequent basis. Since the number of extension staff is very limited, it is advised to engage lead farmers within the communities. There are three major benefits associated with lead farmers. First, the dissemination of information becomes easy by involving leading farmers in the community. Next, farmers tend to rely more on a local advisor than someone outside of the community. Finally, it would encourage farmers to rely on scientific forecasts when they hear the scientific information from their fellow farmers.

Another significant recommendation for strengthening the agriculture extension system is to produce agromet bulletins in the local language through accessible channels. Using channels like radio, mobile and TV to present information from the agromet bulletins, rather than just sending emails to extension workers, would make the information more accessible and useful for the users.

Mobile-based intervention

To have mobile-based intervention participants from ICRISAT, Airtel and some government ministries suggested considering following options:

- *Mobile Cinema:* Farmers can access climate information through mobile vans, which screen movies on agromet advisories. In some villages, farmers do not have proper electricity to charge their phones. Hence the idea of mobile cinema is to engage them through audio-video agromet advisory in their local language.
- *Unstructured Supplementary Service Data (USSD):* Farmers can dial a code to access the information on USSD in the form of an SMS on their mobile phones.
- *Voice Message Service:* Farmers could be sent voice messages daily to communicate forecast information paired with agromet advisories such as the variety of seeds they should plant and buy, and the nearest market to obtain seeds, fertilizers, etc.
- *Access Point Name (APN) Service*: Airtel representatives highlighted the value of providing APN services to farmers as a potential means to communicate the localized climate agro-advisories.

Radio-based intervention

For almost 70% of the respondents interviewed for the GFCS baseline survey, radio is the most widespread vehicle for delivering daily weather forecast information in Tanzania (Coulibaly et al, 2015). Given the broad reach of radio, even further than the agricultural extension, it was discussed during the workshops that launching an initiative based on rural radios would be a robust idea.

In order to ensure the proper dissemination of tailored agromet advisories to farmers, the radio editors, producers, presenters and reporters need to understand the phenomena of climate change and associated services for farmers. Therefore, it is highly recommended that identified community radio staff members be trained in these topics. The suggested radio interventions from the workshop are detailed below.

Beep4Weather Service: FRI, along with TMA and other community radio partners, have launched an initiative in Tanzania known as Beep4Weather. In this innovation, a farmer could dial a number (0784 105 777) using his or her mobile phone and hang up after first ring. In a minute, the farmer would receive a call with the weather forecast information. This

information is essentially the same as delivered through radio programs. Per an evaluation survey conducted by FRI after launching this service, it was found that almost 67% of respondents benefitted from this service in their farming activities. 85% of respondents also mentioned that they would recommend this service to other farmers.

Community Radio Clubs: Village communities can collectively own a radio with a recorder, which could be placed at a common meeting area. Farmers and pastoralists can decide on a time to get together to listen to the recorded programs. This overcomes the farmers' challenge of lack of time during day when they are busy at their farms and cannot keep checking on the agro-advisories provided to them at different intervals. The content to be delivered to the communities should include detailed weather forecasts with an emphasis on rainfall and temperature, interpretation of the forecast by an agromet expert and introducing climate adaptation technologies (drought tolerant seeds, new post harvest handling techniques, etc.) Agriculture extension workers can lead such initiatives.

Feedback: feeding farmers' responses into tailored climate services

Gathering the information from the farmers has two purposes. First, it determines if the information provided to the end users was accurate, and in what ways. Second, it enables farmers to provide information about their agricultural practices, which can be input into a database allowing the production side to tailor the advisories more precisely.

The first step in developing a feedback mechanism is to list the end users. The term 'farmer' does not necessarily communicate the target audience of the climate information services. Identifying the end users and stakeholders is important (Table 3) for developing a feedback mechanism that can bridge the gap with the content development unit.

It was noted during the discussions that the existing agriculture extension system not only has bottlenecks while sending information to the farmers, it lacks a mechanism to pull the information back. Thus, it is imperative to have some technological and process interventions for bringing information from the farmers to the producers. The suggested interventions for developing this mechanism are detailed below.

Table 3: Stakeholders identified in Longido and Kiteto that can pull information from farmers to feed into content packaging

Categories	Stakeholders
Unions/Cooperatives	Farmers Unions/Cooperatives
	Livestock Unions/Cooperatives
Research Institutions	UDSM
	SUA
	SARI
Faith-Based Organizations	Churches
	Mosques
NGOs	TRCS
	FEWS NET
	KINNAPA
	Naadutaro
Government Ministries/Committees	TMA
	MLFD
	MAFC
	PMO
	Water User Association (Village Level)
	Ward Resource Centre (Ward Level)
	Division Adaptation Committee (District Level)

Extension systems

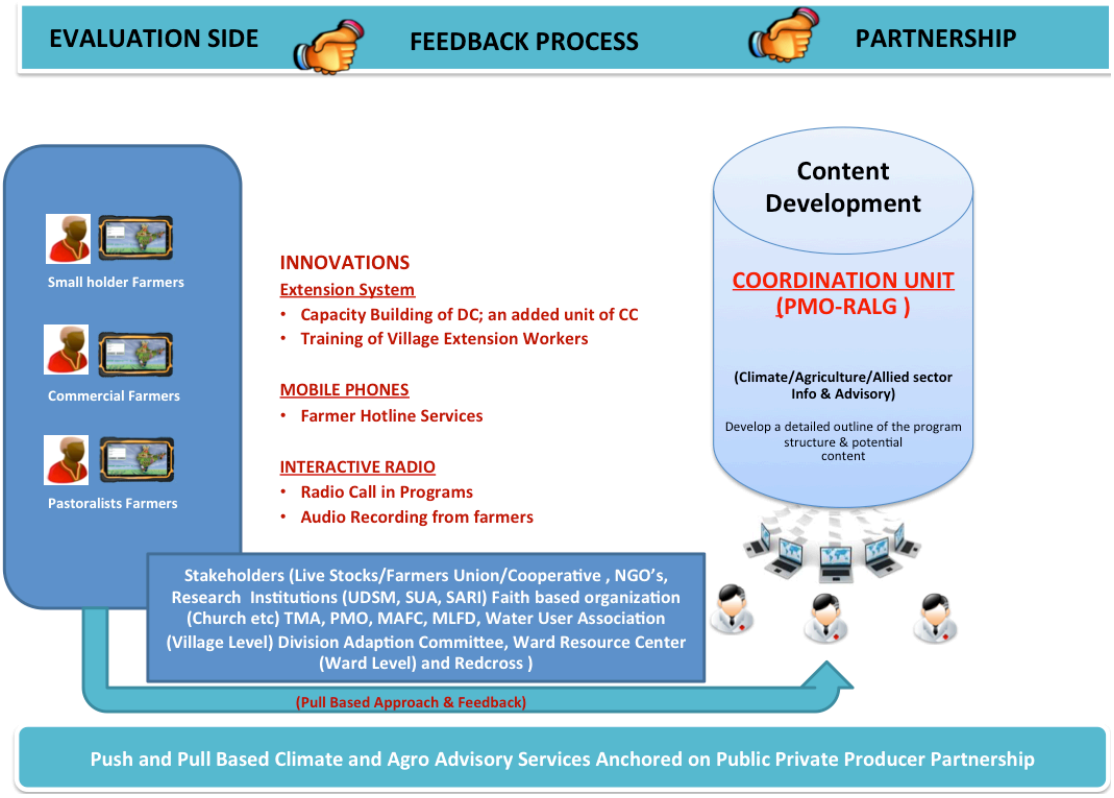
Existing extension officers must be trained on appropriate weather and climate related knowledge that sufficiently builds the capacity of the district to support climate change activities. Another important suggestion made by participants is to train the village extension workers to gather feedback from farmers if the scientific agro-advisory information is provided to them. Village-level extension workers could undertake better post-seasonal reviews by engaging farmer leaders in the process.

Mobile phone platforms

The Farmer Hotline Service was highlighted as an important tool for pulling information from the farmers. This initiative could help in two ways. First, farmers can directly connect to the experts to ask for specific agriculture information. Second, they can also provide their feedback to the agromet experts through a direct channel. It is important to note that the

feedback mechanism should be inclusive to help tailor scientific forecast information according to farmers' needs (Figure 5).

Figure 5: Feedback side of the business model, potential stakeholders enlisted and innovations for pulling the information back to the content development unit



Radio platforms

To use radio as a channel for providing feedback from farmers, it was discussed and agreed that weekly call-in programs with experts could be the best option. Talk shows with the agromet experts can benefit farmers by communicating agro-advisory information and allowing them to call in and directly interact with experts who can provide feedback on the forecast information and advisory. It is important in the feedback mechanism that the information from the farmers should reach the met agencies in a timely manner, before they issue the forecast information and agromet advisory for the next season. For this, radio talk shows are a golden opportunity.

Additionally, audio recordings from farmers can be aired on the radio. These recordings can help inform their fellow farmers in the community about the use of the agro-advisories. The radio can also help farmers' voices reach the agromet experts and to provide their feedback.

Way Forward

Going forward, workshop participants built a consensus toward adapting the use of a business model in the next steps of GFCS program implementation. WFP, CCAFS and other partners intend to conduct further sector-wide consultations (production, delivery and feedback sides) in relation with GFCS activities. WFP and CCAFS will work to scale up climate services to other areas and continue working with partners on farmers' needs. The follow up plans are divided into three important components of the business model: production side, delivery side and feedback side.

Production

The TMA will put dedicated effort into bringing downscaled forecasts and strengthening local weather stations. MAFC will join TMA in providing customized climate information for farmers. The Disaster Management department advocated packaging DRR with climate information services and increasing the awareness about delivery channels and innovations.

Delivery

The TMA is currently planning to provide mobile services to farmers, especially in project areas (Longido and Kiteto), and they are determined to scale up these services. Furthermore, the TMA intends to register more farmers for the service and will consider using the national language, Kiswahili. Airtel is looking to provide APN services to farmers, promote the use of hotlines, talk free, USSD, and to include more partners, and is willing to create other new solutions as needed. MAFC has contracted some local FM radio partners, which it will take forward to build on innovations for climate services. MAFC acknowledges the value of training agriculture extension workers, especially on forecast interpretation. It will also promote media diversification for climate information delivery.

Feedback

The Kiteto district will continue working on weather information and will interpret them into friendly and national languages before sent to farmers. The District Executive Director (DED) will also appoint a climate change focal point at the district level. MLFD intends to add climate change issues to the existing livestock programs, and they already have a contract

with TBC for radio programs. UDSM will continue doing studies, and interpreting the results on climate services and how to communicate the results to farmers.

Challenges

There are limited human resources, especially extension workers and or volunteers with the capacity to interpret climate information before sharing with end users, farmers and pastoralists. Integrating community radio and mobile operators into GFCS activities still needs close follow up. The quality and timely climate information in the pilot project areas remains a challenge.

Additionally, a lack funds, technology and equipment still limit the accessibility of climate information among end users. Further financial resources are needed to execute most activities related to climate information. Finally, private sector representation along the value chain is also limited.

Conclusion and Recommendations

It was discussed in the ICT and radio stakeholder consultation workshop that Tanzania still needs to strengthen its framework for delivering climate services to farmers and pastoralists. In order to produce tailored climate information, important stakeholders like TMA, MAFC, MLFD, research institutions, academic institutions, farmers' organizations, NGOs, etc. should coordinate their efforts. For the delivery structure, it was discussed that private sector organizations, including radio and mobile operators, should be actively engaged in building radio community clubs and ICT solutions to scale up climate information services. It is critical to note that the existing extension system does not work efficiently to bring the information to the end users, given its limited reach. The workshop also led to innovative suggestions for gathering feedback, such as developing a farmer's hotline using mobile technology and call-in radio programs and talk shows with agromet experts, allowing farmers to communicate directly with the production side of climate services.

The business model developed in this workshop would be further regionalized according to the project sites where GFCS partners would be working in coming months. Therefore,

further consultation meetings with stakeholders for all three segments of this model would be undertaken by WFP, CCAFS and other GFCS partners.

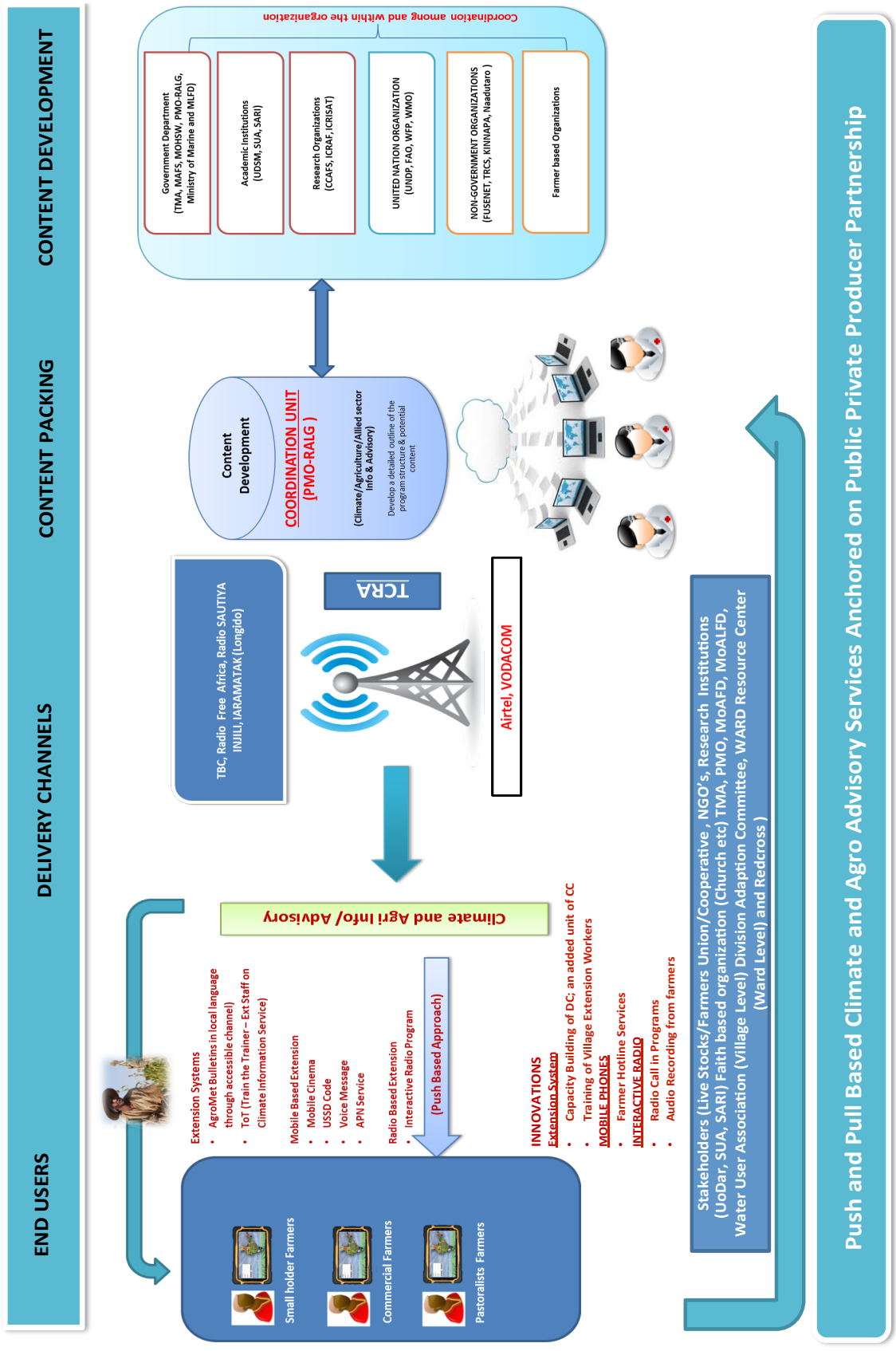
Six recommendations came out of the workshop process. First, the participation of other relevant stakeholders must be broadened to include radio stations (national and community), telephone operators (such as AIRTEL, VODACO, TIGO, and ZANTEL), the private sector, media and NGOs. Second, available ICTs and rural and community radio channels must be strengthened so that they can operate effectively. Third, it is also necessary to scale up climate services to other areas within the target districts and to continue working with partners on farmers' needs. Fourth, wather information should be communicated in a simple, understandable and local language before being sent to farmers. Fifth, districts should incorporate climate change resilience into their plans and must appoint a climate change focal person. Finally, the involvement of other type of media apart from radio is needed for the project scale out.

Appendix 1: Workshop Agenda

Time	Session	Presenter
	Day 1	
8:00-8:30	Registration	
8:30-9:00	Official Opening WFP Remarks 23Workshop Objectives 4Presentation and Validation of workshop agenda 5ICEBREAKER: Who's who: Participant introductions	TMA Official WFP (JB) WFP (KL) WFP (KF) CCAFS (HK)
9:00-10:30	Presentation – Findings from scoping studies Baseline ICT Rural Radio	CCAFS (HK) ICRAF ICRISAT FRI
10:30-12:00	Dissecting findings from scoping studies: Discussion and Validation	WFP, CCAFS
12:00-13:00	LUNCH	
13:00-14:30	Diving Deep: Building our joint model for tailored climate services to get to farmers and back	CCAFS, WFP
14:30-16:00	Bringing it together: presenting a consensus model for scaling up climate services through ICTs and rural radio	WFP, CCAFS
16:00	Coffee	

Time	Session	Presenter
	Day 2	
8:00-8:30	Recap of Day 1	Rapporteur (from the audiences)
8:30-9:15	Successful ICTs at work: Lessons from India	ICRISAT
9:15-10:00	Interactive rural radio to reach millions of farmers: experiences from West (or East) Africa	FRI
10:00-11:30	Building consensus: Group work Clarifying roles and responsibilities of national stakeholders in implementing the proposed climate services scaling up model	CCAFS WFP
11:30-12:00	Closing, partners commitments and next steps	
12:00-14:00	Lunch meeting with activity implementing agencies: strategic planning for 2015 and 2016 to deliver on this activity	
14:00-15:00	Debriefing meeting with facilitators	

Appendix 2: Business Model



Appendix 3: Participant List

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